



2024-2026 | Catalog

Cutting Tools



KYOCERA UNIMERCO

ADVANCING PRODUCTIVITY

ADVANCING PRODUCTIVITY

Advancing your productivity through efficient cutting tool products and advanced tooling solutions.

Kyocera is the global and comprehensive cutting tool manufacturer who provides innovative materials and tool designs as well as proposes solutions for technological improvements.

Kyocera contributes to a world manufacturing by the innovative products and technology.

Kyocera's management aims to be focused on the user's perspective.

We promise to be a comprehensive value-added manufacturer.

<p>A</p>  <p>Insert grades</p>	<p>B</p>  <p>Turning indexable inserts</p>	<p>C</p>  <p>CBN & PCD tools</p>	<p>D</p>  <p>External</p>
<p>E</p>  <p>Small tools</p>	<p>F</p>  <p>Boring</p>	<p>G</p>  <p>Grooving</p>	<p>H</p>  <p>Cut-off</p>
<p>J</p>  <p>Threading</p>	<p>K</p>  <p>Drilling</p>	<p>M</p>  <p>Milling</p>	<p>P</p>  <p>Spare parts</p>
<p>R</p>  <p>Technical information</p>	<p>T</p>  <p>Index</p>		

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






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OPTIMIZE YOUR PRODUCTION

Highly flexible toolmanagement solutions and powerful hydro chuck toolholders: See on last pages of the catalogue.



Introduction

1. Introduction

Kyocera has put a “caution” or a “warning” label on the package of the cutting tool products, but it is not on the tool itself. Before using and handling any cutting tool products and cutting tool materials, be sure to read this guideline so they are used correctly. Also, as part of your safety education, please make sure to familiarize all of your actual operators with the contents of this guideline.

2. Basic information for cutting tool materials

2.1 Technical terms

Cutting tool material: Terminology for cutting tool materials, such as cemented carbide, coated carbide, cermet, coated cermet, ceramics, CBN and PCD

Carbide material: Cemented carbide with WC (Tungsten carbide) as the main component

2.2 Physical properties

Appearance: Depends on materials. (e.g. gray, black, gold, etc.)

Smell: None

Hardness: Carbide / Cermet 5 ~ 30 GPaHV, Ceramic 10 ~ 40 GPaHV
CBN 20 ~ 50 GPaHV, PCD 80 ~ 120 GPaHV

Sp. Gr.: Carbide 9 ~ 16, Cermet 5 ~ 9, Ceramic 2 ~ 7, CBN / PCD 3 ~ 5

2.3 Composition

Carbide, Nitride, Carbon-nitride and Oxide with W, Ti, Al, Si, Ta, B, etc. and additionally, metals such as Co, Ni, Cr, Mo are included in some cutting materials.

3. Notes for handling cutting tool materials

- These cutting tool materials are very hard, but also brittle. Therefore, they may break by shock or excessive clamp force.
- Carbide base material, in particular, can be very heavy. Handle with care when transferring and storing large size products or large quantities as heavy load.
- Carbide base material has a different rate of thermal expansion to that of normal metals. When brazing the cutting tool material, use the proper temperature to prevent the tool from breaking.

4. Notes for cutting tools

- The cutting edge is very sharp; wear gloves when handling or installing tools to prevent injury.
- When cutting, cutting tools may break due to shock, excessive tool wear or improper conditions. It is essential to wear protective clothing such as safe guards, safety eyeglasses, and gloves to prevent injury.
- Depending on workpiece material and cutting conditions, sparks or fire may occur. Use protective material such as safe guards, safety eyeglasses and gloves.
- When cutting, flying chips or metal pieces may be dangerous. Use protective materials such as safe guards and safety eyeglasses to prevent injury.

Introduction

Precaution for using cutting tools

Target products	Precariousness	Countermeasures
General cutting tools	Direct touch to a sharp cutting edge may cause injury.	When you set up tools to the machine or take tools out of the case, please wear protective gloves.
	Misuse or inappropriate working conditions may cause tool breakage or dispersion of broken pieces.	<ul style="list-style-type: none"> • Please use safety items, such as safety glasses and protective gloves. • Please use in the range of our recommended cutting condition. See our catalog or instruction manuals.
	Excessive impact or heavy wear will increase cutting force and may cause tool breakage and dispersion of broken pieces.	<ul style="list-style-type: none"> • Please use safety items, such as safety glasses and protective gloves. • Early exchanging tools is preferable.
	Dispersion of heated or prolonged chips may cause injury or burn.	<ul style="list-style-type: none"> • Please use safety items, such as safety glasses and protective gloves. • For chips removal, please stop the machine beforehand and use safety items, such as safety glasses and protective gloves.
	Tools and materials reach high temperatures during cutting operation. Direct touch to the tools and materials shortly after cutting may cause burn.	Please prepare safety items, such as safety glasses and protective gloves.
	Sparks, generation of heat or chips in high temperature during operation may cause fire.	<ul style="list-style-type: none"> • Please do not operate around Hazardous zone, in which there is some possibility of fire or explosion. • In case of using oil-coolant, please make sure there is sufficient fire-protection equipment.
	Lack of dynamic balance during high-speed revolutions leads to vibrations which can make the tool break.	<ul style="list-style-type: none"> • Please use safety items, such as safety glasses and protective gloves. • Please conduct test-operation before cutting, and confirm that there is no vibration or unusual sound.
	Direct touch to burrs which were generated on the rough surface of the workpiece may cause injury.	Do not touch workpiece with bare hand.
Indexable cutting tools	If the inserts or other tool parts are not installed properly, they can fall down or break which may cause injuries.	<ul style="list-style-type: none"> • Please clean up insert pockets or clamping parts before setting insert. • Please set up inserts with supplied wrench only, and confirm that the inserts or parts are clamped completely. Never use inserts or parts other than those prescribed.
	If inserts are clamped too tightly by supplementary tools like pipe etc, inserts or body may brake.	Do not use aids such as pipes. Please set up using supplied wrench only.
	When tools are used in high-speed revolution, inserts or parts may burst out of the body due to centrifugal force. When handling, please pay special attention to safety.	Please use in the range of our recommended cutting conditions. See our catalog or instruction manuals.
Milling cutters and other milling tools	Since milling cutters have sharp edges, direct contact with bare hands may cause injury.	Please use safety items, such as safety glasses and protective gloves.
	If a cutter lacks balance, the tool can start to vibrate. The dispersion of broken pieces can cause injuries.	<ul style="list-style-type: none"> • Please use in the range of our recommended cutting condition. • Accuracy and balance of machine spindle should be checked and adjusted regularly to prevent wear of the bearings due to eccentric rotation.
Drilling	When drilling a through-bore, it is possible that a disc is created during the drilling procedure that can fly out of the workpiece at a high speed. This is very dangerous since the disc has sharp edges.	Please use safety items, such as safety glasses and protective gloves. Also attach a cover on a chuck part.
Brazed tools	Dispersion or falling down of broken inserts may cause injury.	<ul style="list-style-type: none"> • Please check that the cutting inserts are brazed firmly before use. • Please do not use brazed tools in the condition that requires high cutting temperature.
Others	If brazing is carried out many times, the strength of carbide insert is deteriorated and can break easily during cutting.	Please do not use tools that have been brazed several times. The quality of the tool deteriorates.
	The tools can only be used for the appropriate application. It may damage tools and machines.	Please follow our recommended usage for the tools.

Introduction

Preface

Thank you very much for using "2024-2026 Kyocera Cutting Tools".
This general catalog is as of **October, 2024**.

The availability of products will be shown as follows:

●	Standard item	☐	Check availability
R	Right-hand only	MTO	Made to order
L	Left-hand only	None	No Stock

The specifications of products in this catalog may be changed due to research / development / modification without prior notice.
Also conventional products might be integrated or centralized due to new material or new product development.

Kyocera Cutting Tools will continue to improve product quality and safety.

For safety data sheet (SDS) of each insert grade, please refer to our machine tool homepage:

<https://www.kyocera-unimerco.com/en-global/support/safety-data-sheets>

Packaging units

Toolholder body / Parts

Type	Pieces/box	Remarks
Toolholder	1 piece/box	
Milling	1 piece/box	
Parts	1 piece/box	Light weight parts (Clamp screws) are in a plastic bag

Inserts

Type	Pieces/box	Remarks
Twin bars	5 pieces/box	TWB / TWBT / TWFG / TWFGT insert
System tip-bars	5 pieces/box	VNB / VNBT / VNFG / VNG / VNT insert
EZ bars	1 piece/box	
CBN inserts	1 piece/box	Insert grades: KBN...
PCD inserts	1 piece/box	Insert grades: KPD...
Threading inserts	5 pieces/box	Insert grades: PR1215 / PR1515 / PR1535 / PR1115 / GW15 only
GC inserts	5 pieces/box	Inserts for SIGC
DA...M-GM type insert	1 piece/box	Inserts for MagicDrill DRA
DC...M-SC type insert	1 piece/box	Inserts for MagicDrill DRC
SEEN-W inserts	5 pieces/box	Insert grades: TN100M / KW10 only
SNEU-W Inserts	5 pieces/box	MB45 insert with wiper edge
PNEG-W inserts	5 pieces/box	MFK insert with wiper edge
PNEU-W inserts	5 pieces/box	MFPN insert with wiper edge
RDFG type insert	2 pieces/box	MRF / MRFW ball end mill insert
RBG Type insert	1 piece/box	
Other than above inserts	10 pieces/box	



**KEEPS YOU
AHEAD**

PSC HOLDER

ENHANCED STABILITY
AND PRECISION FOR
MAXIMUM MACHINING
PERFORMANCE

- Turning
- Grooving
- High feed milling



ISO Turning toolholder

Polygon taper shank with high rigidity and high precision

PSC shank tools

IIS B 6066-1: Dual contact between polygon taper shank and the main spindle face

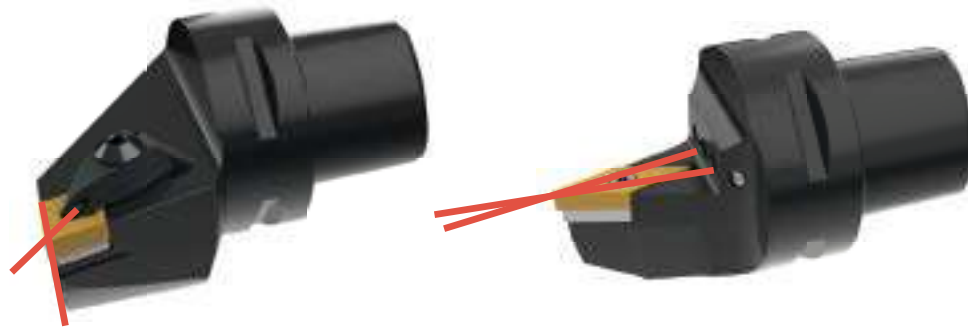
SO26623-1: Polygonal taper interface with flange contact surface

1 High rigidity

Polygon taper design and dual contact between the taper and the flange face for high rigidity

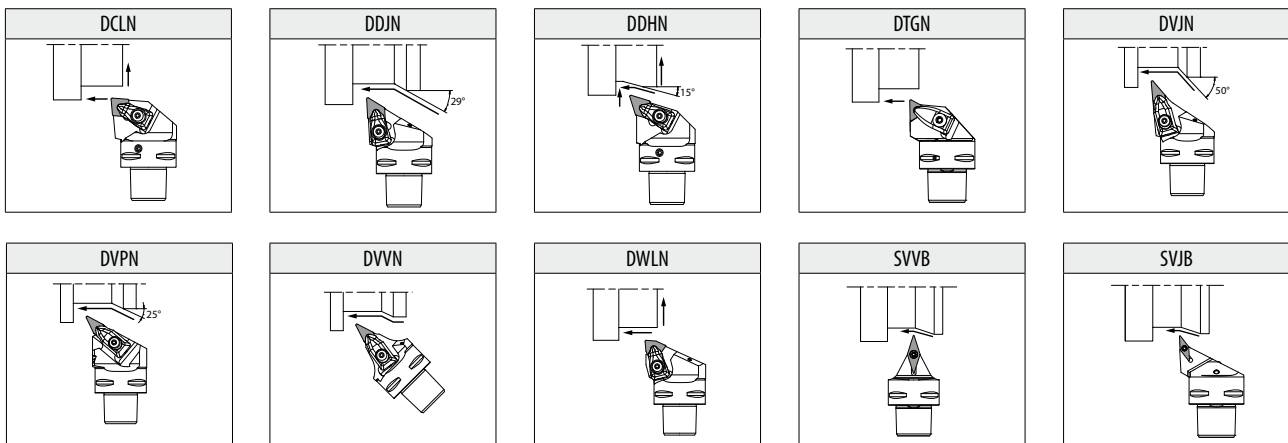
2 Effective cooling

Unique internal coolant design



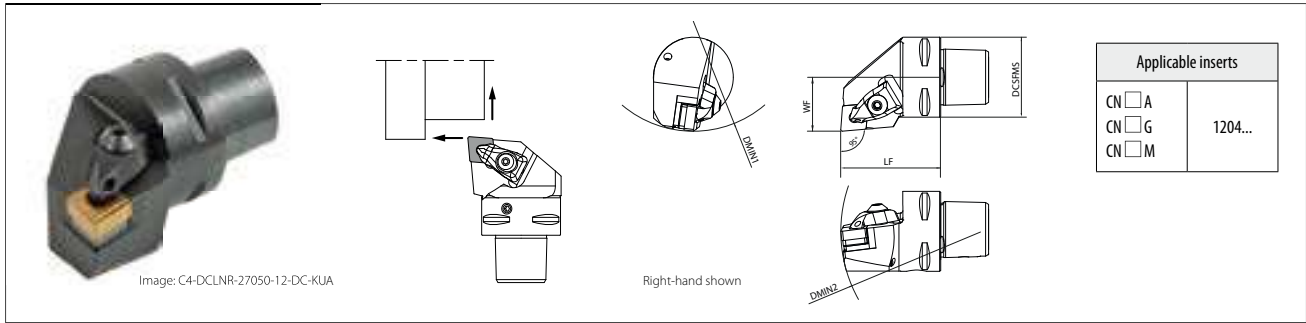
Even distribution of force between 3 faces enhances rigidity and centering

3 Lineup



Turning toolholder PSC

DCLN^{R/L} -12

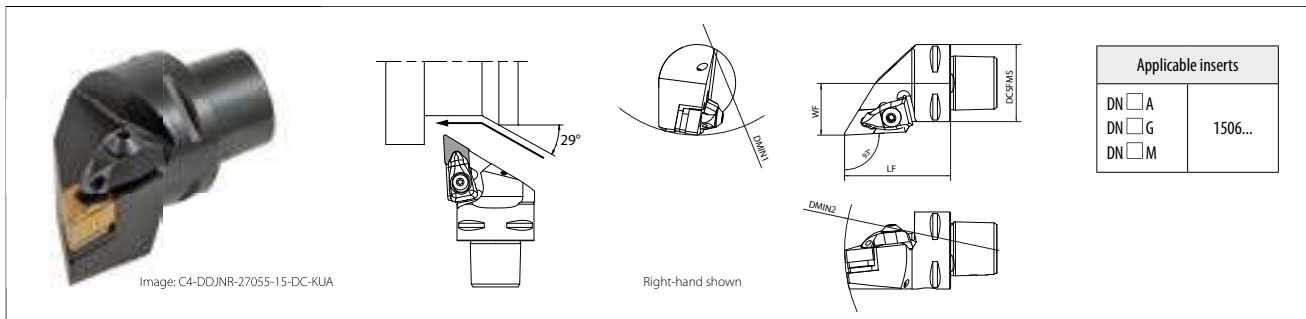


Toolholder dimensions

Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
	C4-DCLN ^{R/L} -27050-12-DC-KUA	●		●	C4	40	50	27						110	150	0.8	KSPK^{R/L}	KVPA.0620.DC	KPPPC.12	KVPP0512.KG
C5-DCLN ^{R/L} -35060-12-DC-KUA	●	●	C5	50	60	35	115	175					
C6-DCLN ^{R/L} -45065-12-DC-KUA	●	●	C6	63	65	45	110	200					

● : Available

DDJN^{R/L} -15



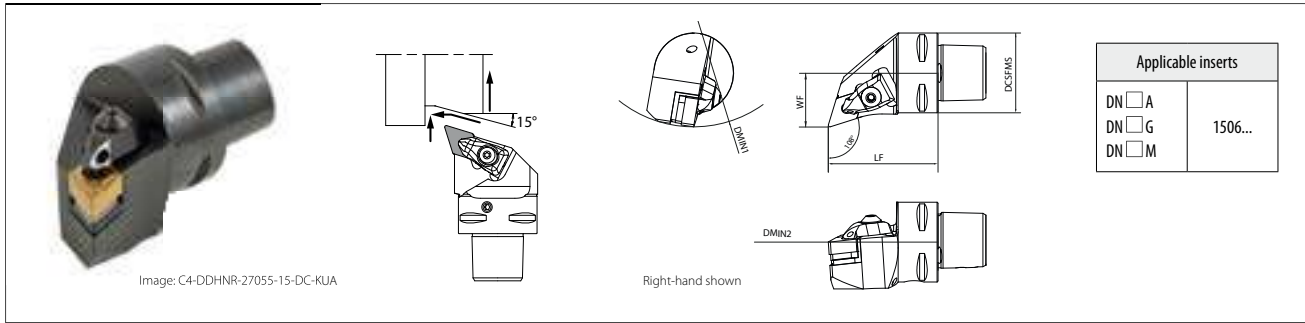
Toolholder dimensions

Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
	C4-DDJN ^{R/L} -27055-15-DC-KUA	●		●	C4	40	55	27						140	170	0.8	KSPK^{R/L}	KVPA.0620.DC	KPPPD.15	KVPP0512.KG
C5-DDJN ^{R/L} -35060-15-DC-KUA	●	●	C5	50	60	35	120	160					
C6-DDJN ^{R/L} -45065-15-DC-KUA	●	●	C6	63	65	45	110	190					

● : Available

Turning toolholder PSC

DDHN^{R/L} -15

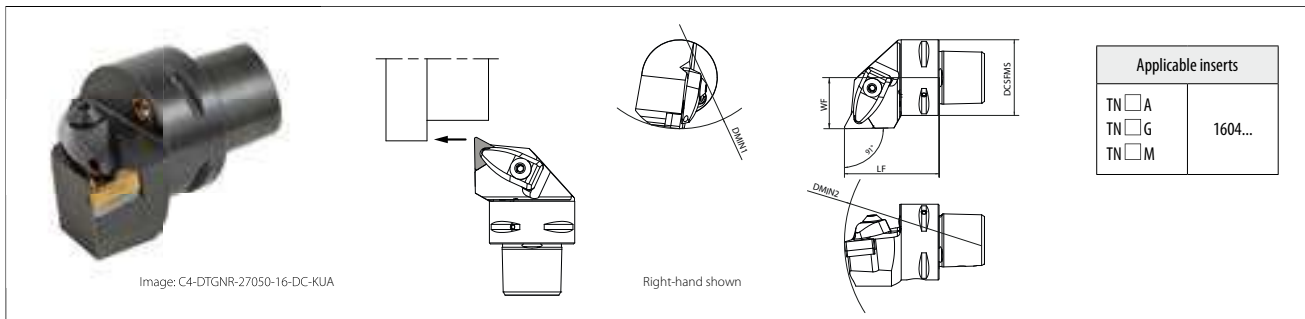


Toolholder dimensions

Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DDHN ^{R/L} -27055-15-DC-KUA	●	●	C4	40	55	27	125	300	0.8	KSPK ^{R/L}	KVPA.0620.DC	KPPPD.15	KVPP.0512.KG
C5-DDHN ^{R/L} -35060-15-DC-KUA	●	●	C5	50	60	35	110	165					
C6-DDHN ^{R/L} -45065-15-DC-KUA	●	●	C6	63	65	45	110	210					

● : Available

DTGN^{R/L} -16



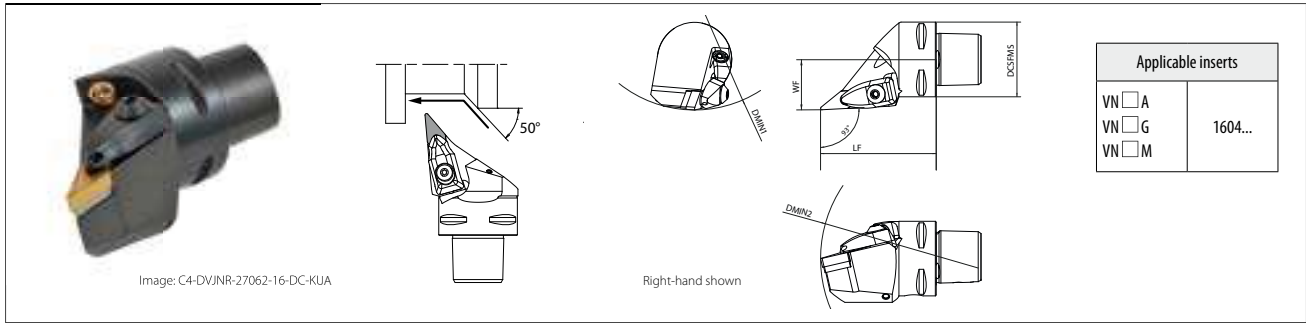
Toolholder dimensions

Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DTGN ^{R/L} -27050-16-DC-KUA	●	●	C4	40	50	27	115	140	0.8	KSPD ^{R/L}	KVPA.0620.DC	KPPPT.16	KVPR.0512.RGT
C5-DTGN ^{R/L} -35060-16-DC-KUA	●	●	C5	50	60	35	110	165					
C6-DTGN ^{R/L} -45065-16-DC-KUA	●	●	C6	63	65	45	110	190					

● : Available

Turning toolholder PSC

DVJN^{R/L}-16

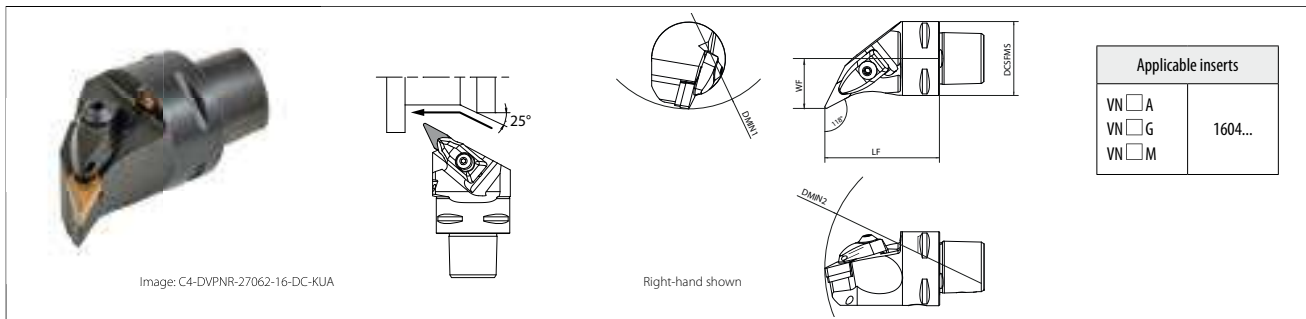


Toolholder dimensions

Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
	C4-DVJN ^{R/L} -27062-16-DC-KUA	●		●	C4	40	62	27						145	140	0.8	KSPD^{R/L}	KVPA.0620.DC	KPPPV.16	KVPP0512.RG
C5-DVJN ^{R/L} -35060-16-DC-KUA	●	●	C5	50	65	35	115	165					
C6-DVJN ^{R/L} -45065-16-DC-KUA	●	●	C6	63	65	45	110	190					

● : Available

DVPN^{R/L}-16



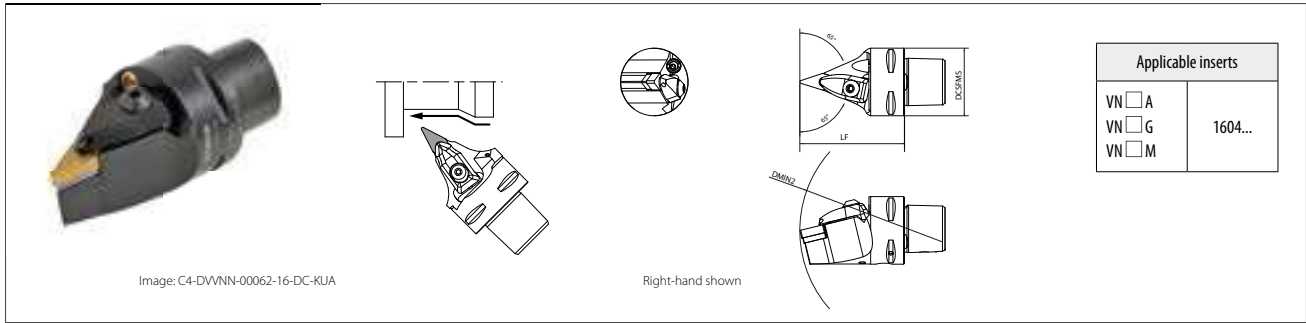
Toolholder dimensions

Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
	C4-DVPN ^{R/L} -27062-16-DC-KUA	●		●	C4	40	62	27						110	140	0.8	KSPD^{R/L}	KVPA.0620.DC	KPPPV.16	KVPP0512.RG
C5-DVPN ^{R/L} -35060-16-DC-KUA	●	●	C5	50	65	35	110	165					
C6-DVPN ^{R/L} -45065-16-DC-KUA	●	●	C6	63	65	45	110	190					

● : Available

Turning toolholder PSC

DVVNN -16

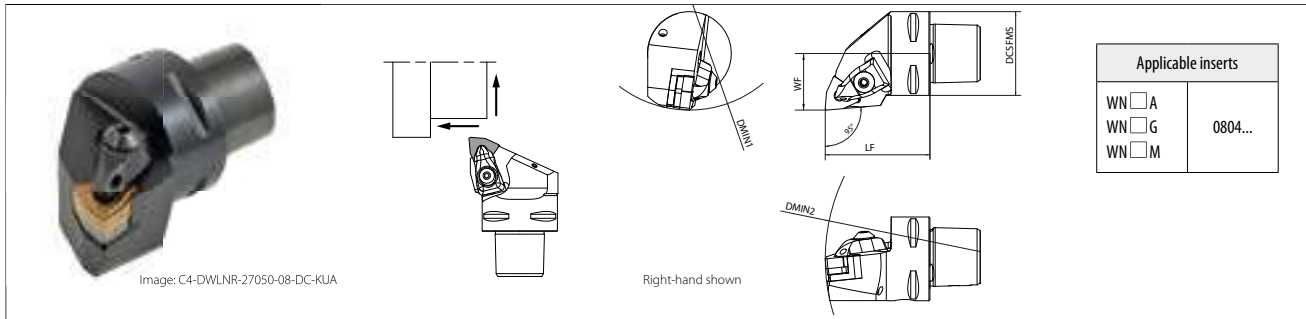


Toolholder dimensions

Description	Availability			Size	Dimensions (mm)					RE	Spare parts			
	R	N	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DVNN-00062-16-DC-KUA	●			C4	40	62	0	-	140	0.8	KSPDR	KVPA.0620.DC	KPPPV.16	KVPP0512.RG
C5-DVNN-00065-16-DC-KUA	●			C5	50	65	0	-	170		KSPDL			
C6-DVNN-00065-16-DC-KUA	●			C6	63	65	0	-	190		KSPDR			

● : Available

DWLN^{R/L} -08



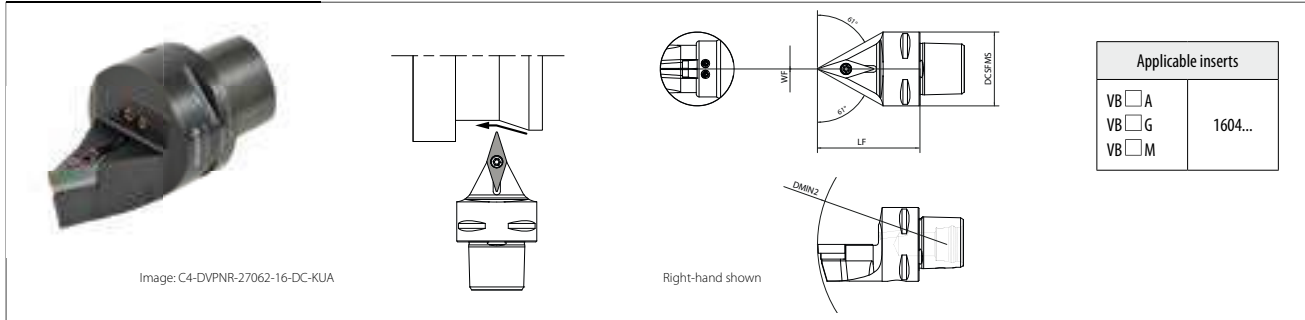
Toolholder dimensions

Description	Availability		Size	Dimensions (mm)					RE	Spare parts			
	R	L		DCSFMS	LF	WF	DMIN1	DMIN2		Clamp	Clamp Screw	Shim	Shim screw
C4-DWLN ^{R/L} -27050-08-DC-KUA	●	●	C4	40	50	27	120	190	0.8	KSPK ^{R/L}	KVPA.0620.DC	KPPPT.16	KVPP0512.RGT
C5-DWLN ^{R/L} -35060-08-DC-KUA	●	●	C5	50	60	35	120	170					
C6-DWLN ^{R/L} -45065-08-DC-KUA	●	●	C6	63	65	45	110	195					

● : Available

Turning toolholder PSC

SVVBN -16

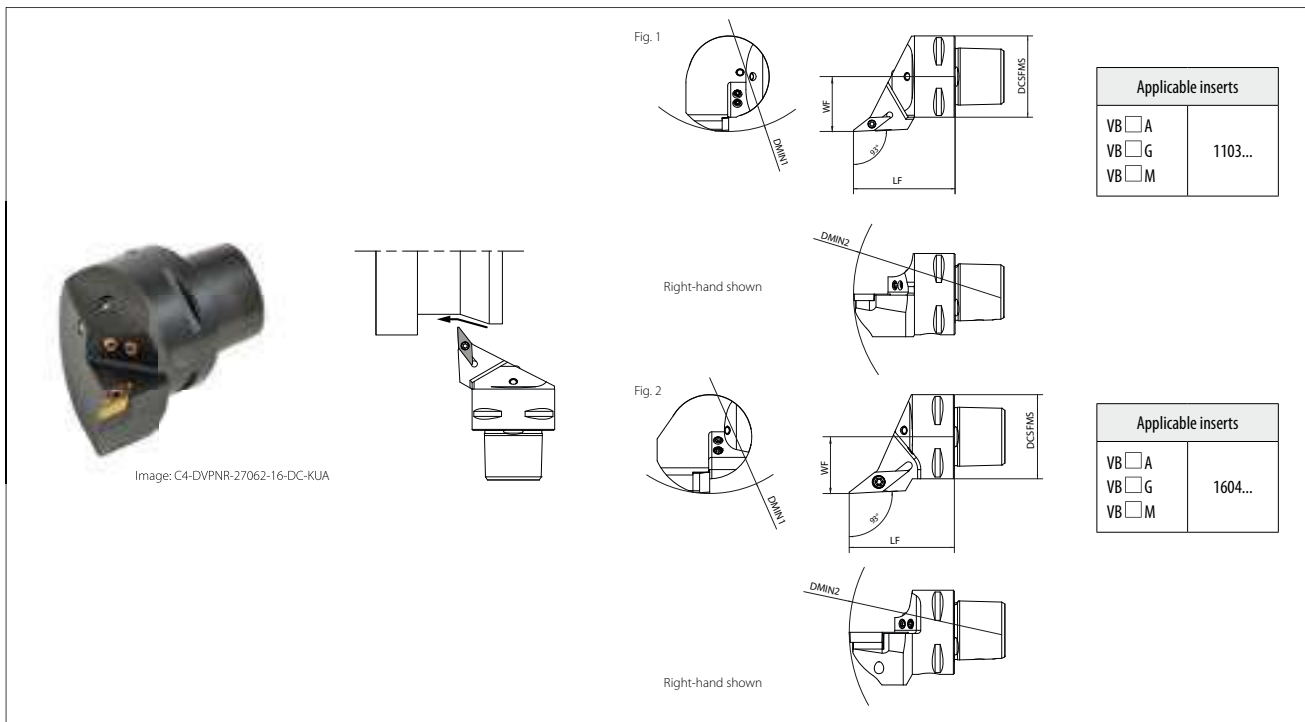


Toolholder dimensions

Description	Availability			Size	Dimensions (mm)					RE	Spare parts			
	R	N	L		DCSFMS	LF	WF	DMIN1	DMIN2		TORX screw	TORX key	Shim	Shim screw
C4-SVVBN-00055-16DC-KUA		●		C4	40	62	0	-	140	0.4	KVPT.3514	KKLJ.T15	KPPPV.16	KVPP.3511
C5-SVVBN-00060-16DC-KUA		●		C5	50	65	0	-	165					
C6-SVVBN-00065-16DC-KUA		●		C6	63	65	0	-	190					

● : Available

SVJB^{R/L} -11 / 16



Toolholder dimensions

Description	Availability			Size	Dimensions (mm)					Drawing	RE	Spare parts			
	R	N	L		DCSFMS	LF	WF	DMIN1	DMIN2			TORX screw	TORX key	Shim	Shim screw
C4-SVJB ^{R/L} -27050-11-DC-KUA	●		●	C4	40	50	27	185	140	Fig. 1	0.4	KVPT.2506	KT08	-	-
C5-SVJB ^{R/L} -35060-11-DC-KUA	●		●	C5	50	60	35	125	165						
C6-SVJB ^{R/L} -45065-11-DC-KUA	●		●	C6	63	65	45	110	190						
C4-SVJB ^{R/L} -27050-16-DC-KUA	●		●	C4	C4	40	50	27	115	Fig. 2		KVPT.3514	KKLJ.T15	KPPPV.16	KVPP.3508
C5-SVJB ^{R/L} -35060-16-DC-KUA	●		●	C5	C5	50	60	35	170						KVPP.3511
C6-SVJB ^{R/L} -45065-16-DC-KUA	●		●	C6	C6	63	65	45	115						

● : Available

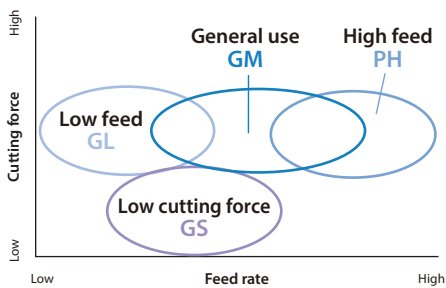
KGD

Good chip control
MEGACOAT coating technology for long tool life and high efficiency machining

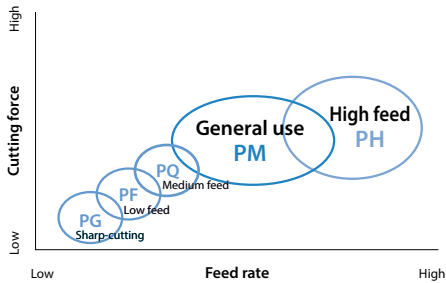
1 Wide range of chipbreakers

Application maps

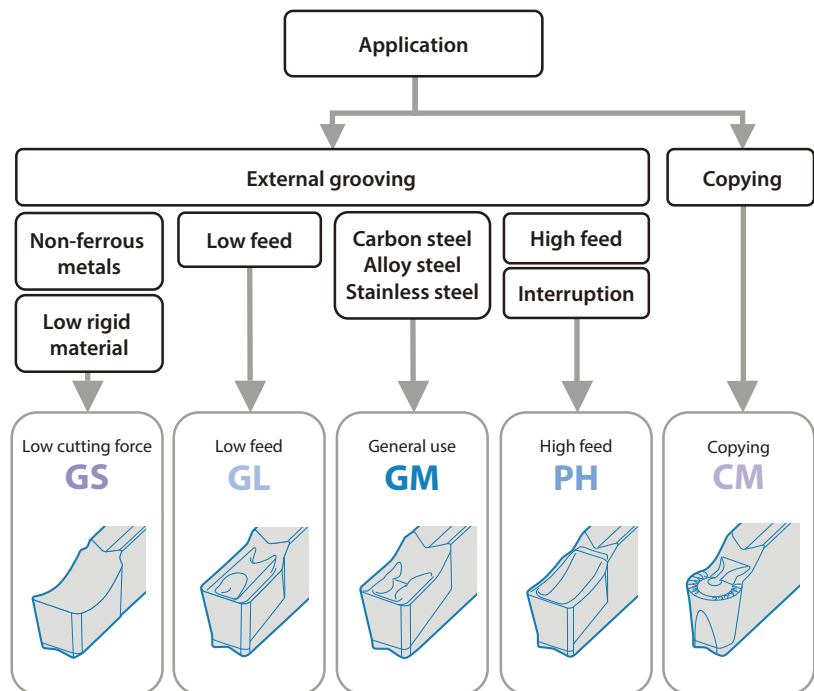
External grooving and traversing



Cut-Off



Chipbreaker selection (external)



Comparison of chip control (In-house evaluation)

Cutting conditions: $V_c = 150 \text{ m/min}$, $f = 0.15 \text{ mm/rev}$ Workpiece : 15CrMo4

Better chip control than competitors

Reduces damage of cutting edge caused by crushing chips

GM chipbreaker



Competitor A

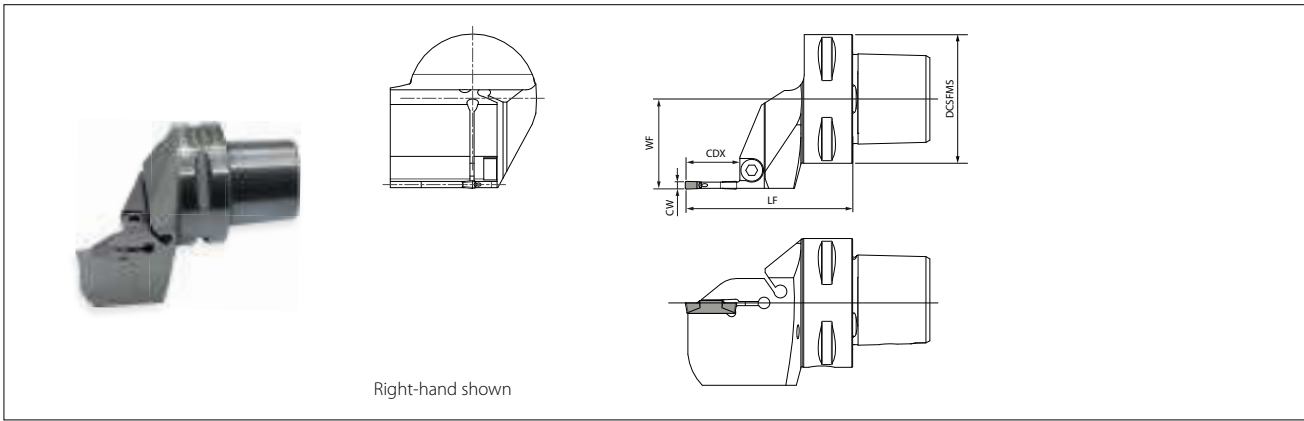


Competitor B



For more information, see the brochure about KGD

KGD-PSC (Grooving/Cut-off toolholder)



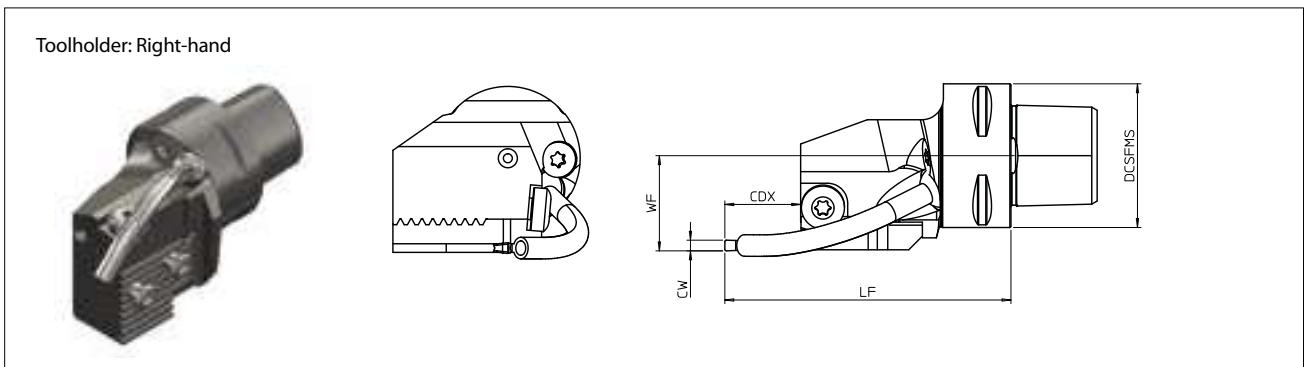
Toolholder dimensions

Groove width CW (mm)	Available grooving depth (mm)	Description	Avail- ability		Size	Dimensions (mm)					Width W (mm)		Spare part	Applicable inserts
			R	L		DCSFMS	LF	WF	CDX	Top coolant	MIN	MAX	Clamp bolt	
2	17	KUA-KPC4-KGD%-2T17	●	●	C4	40	60	27	17	●	2.0	3.0	HH5X16	GDM type GDG type
		KUA-KPC5-KGD%-2T17	●	●	C5	50	60	35	17	●				
3	20	KUA-KPC4-KGD%-3T20	●	●	C4	40	65	27	20	●	3.0	4.0		
		KUA-KPC5-KGD%-3T20	●	●	C5	50	65	35	20	●				
		KUA-KPC6-KGD%-3T20	●	●	C6	60	65	45	20	●				
4	25	KUA-KPC4-KGDR-4T25	●		C4	40	70	27	25	●	4.0	5.0		
		KUA-KPC5-KGDR-4T25	●		C5	50	70	35	25	●				
		KUA-KPC6-KGDR-4T25	●		C6	60	70	45	25	●				
5	25	KUA-KPC4-KGDR-5T25	●		C4	40	70	27	25	●	5.0	6.0		
		KUA-KPC5-KGDR-5T25	●		C5	50	70	35	25	●				
		KUA-KPC6-KGDR-5T25	●		C6	60	70	45	25	●				

The recommended clamping torque is 6.5 Nm and the maximum coolant supply pressure is 80 bar.
CDX dimension shows available grooving depth (When CDX dimension is 20 mm or more, maximum grooving depth with 2 corners is 18 mm).

● : Available

KGD-PSC Blade type



Toolholder dimensions

Groove width CW (mm)	Available grooving depth (mm)	Blade description	Toolholder description	Avail- ability		Size	Dimensions (mm)				
				R	L		DCSFMS	LF	WF	Coolant	
2	17	KGD%-2T17-C	KUA-KPC4-KGD%-BL-CT	●	●	C4	40	77	27	●	
3	10	KGD%-3T10-C		●	●	C4				70	●
3	20	KGD%-3T20-C		●	●	C4				80	●
4	10	KGD%-4T10-C		●	●	C4				70	●
4	20	KGD%-4T20-C		●	●	C4				80	●
4	25	KGD%-4T25-C		●	●	C4				85	●
5	10	KGD%-5T10-C		●	●	C4				70	●
5	25	KGD%-5T25-C		●	●	C4				85	●

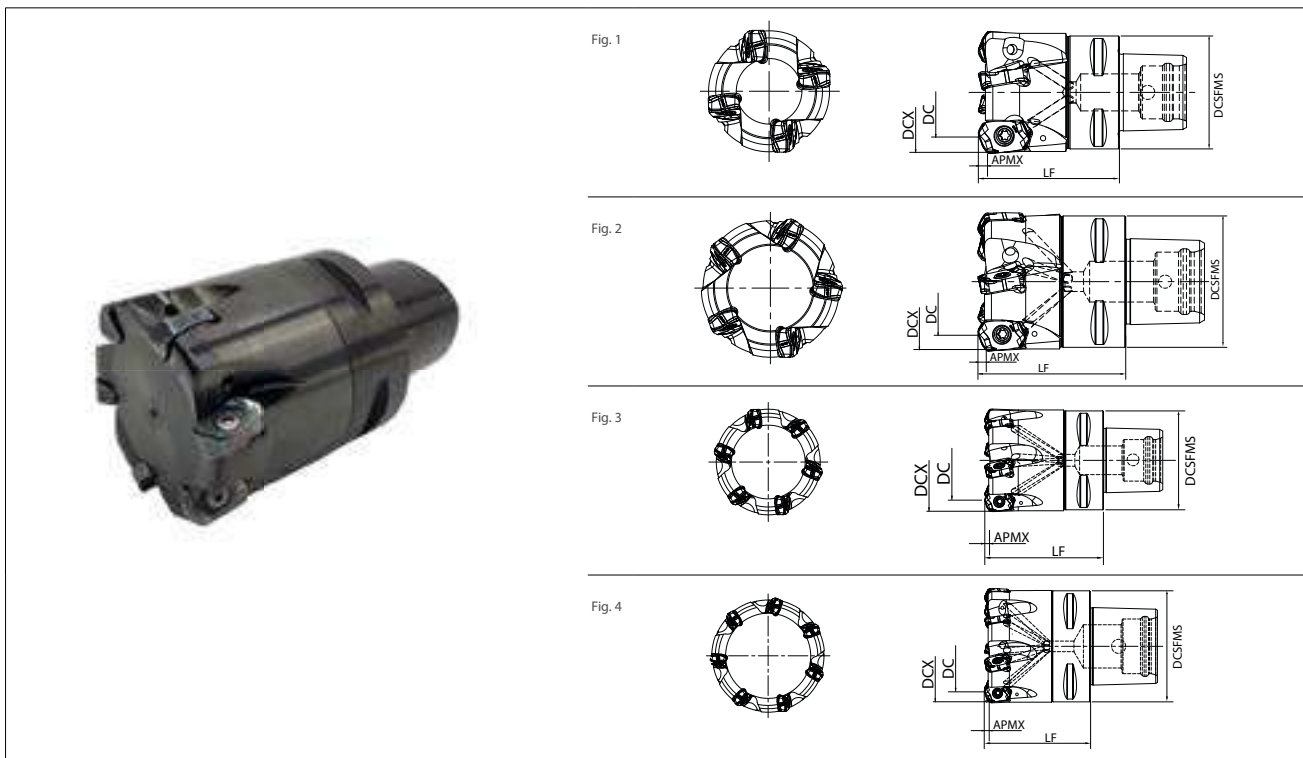
● : Available

MFH



The MFH series is a highly efficiency high feed cutter with convex cutting edge design to reduce chatter for increased chip evacuation. Large line-up from Ø8 to 160 mm to cover a wide application range for multiple metal working processes.

MFH Boost


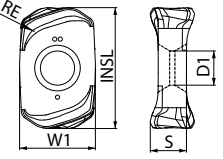


Toolholder dimensions

Description	Availability	No. of inserts	Size	Dimensions (mm)					Drawing	A.R.	Coolant hole
				DCX	DC	DCSFMS	LF	APMX			
MFH 36-04-4T-C3-KUA	●	4	C3	ø36	ø25	ø32	40	2.5	Fig. 1	-10°	Yes
MFH 44-04-5T-C4-KUA	●	5	C4	ø44	ø33	ø40	45		Fig. 2		
MFH 54-04-6T-C5-KUA	●	6	C5	ø54	ø43	ø50	60		Fig. 3		
MFH 66-04-7T-C6-KUA	●	7	C6	ø66	ø55	ø63			Fig. 4		

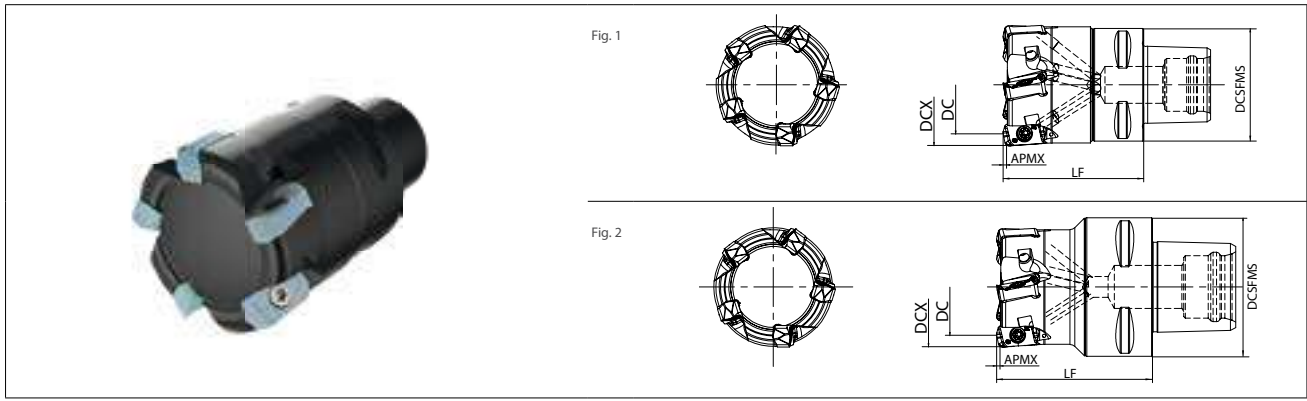
● : Available

Applicable inserts

Shape	Description	Dimensions (mm)					MEGACOAT NANO			CVD Coating	MEGACOAT NANO EX		
		W1	S	D1	INSL	RE	PR1510	PR1525	PR1535	CA6535	PR1810	PR1825	PR1835
 4-edge, Double-sided insert	 LOMU 040410ER-GM	9.1	4.4	4.1	14.5	1.0	●	●	●	●	●	●	●

● : Available

MFH Mini


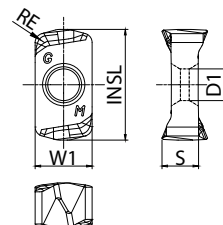

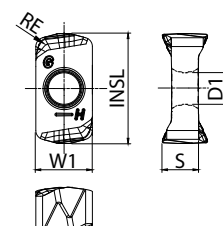


Toolholder dimensions

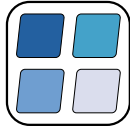
Description	Availability	No. of inserts	Size	Dimensions (mm)					Drawing	A.R.	Coolant hole
				DCX	DC	DCSFMS	LF	APMX			
MFH 36-03-5T-C3-KUA	●	5	C3	ø36	ø28	ø32	40	1	Fig. 1	-10°	Yes
MFH 36-03-5T-C4-KUA	●	5	C4			ø40	45		Fig. 2		
MFH 42-03-6T-C4-KUA	●	6	C4	ø42	ø34	ø40	45		-		
MFH 42-03-6T-C5-KUA	●	6	C5			ø50	50				
MFH 52-03-8T-C5-KUA	●	8	C5	ø52	ø44	ø50	55				
MFH 52-03-8T-C6-KUA	●	8	C6			ø63	60				
MFH 66-03-10T-C5-KUA	●	10	C5	ø66	ø58	ø50	55				
MFH 66-03-10T-C6-KUA	●	10	C6			ø63	60				

● : Available

Applicable inserts

Insert	Description	Dimensions (mm)					MEGACOAT NANO			MEGACOAT HARD	CVD coated carbide	MEGACOAT NANO EX		
		W1	S	D1	INSL	RE	PR1510	PR1525	PR1535	PR0155	CA6535	PR1810	PR1825	PR1835
 General purpose	 LOGU030310ER-GM	6.2	3.96	3.45	11.9	1.0	●	●	●	-	●	●	●	●
 Tough edge	 LOGU030310ER-GH	6.2	3.96	3.45	11.9	1.0	●	●	●	●	-	●	●	●

● : Available



A

Summary of insert grades	A2-A5
Turning	A2
Small parts machining	A3
Grooving / Cut-Off / Threading	A4
Drilling	A5
Milling	A5

Insert grades	A6-A21
Cermet	A6
PVD coated cermet	A6
CVD coated carbide (Turning)	A8
PVD coated carbide (Turning)	A10
PVD / CVD coated carbide (Milling / Drilling)	A12
Carbide	A14
DLC coated carbide	A14
Ceramic	A15
CBN (Cubic boron nitride)	A16
PCD (Polycrystalline diamond)	A17
Honeycomb structure CBN	A18
Insert material selection table	A19
Grade properties	A20

Kyocera promotes research and development to help improve customers' productivity and profitability. Kyocera provides high-quality inserts in various grades including cermet, coated carbide, coated super micro grain carbide, carbide, ceramic, PCD and CBN.



Insert grades

Turning

Workpiece material		Steel				Stainless steel / Cast steel					Cast iron						
Cutting range		Finishing ← → Roughing				Finishing ← → Roughing					Finishing ← → Roughing						
Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30		
Cermet	TN series	TN610, TN620, TN60, TN90					TN610, TN620, TN60, TN90					TN60					
	TC series		TC60					TC60									
	CCX (CVD coated)	CCX											CCX				
	MEGACOAT												PV7005				
	MEGACOAT NANO	PV710, PV720, PV730					PV710, PV720, PV730										
Coated carbide	CA series	CA115P, CA125P, CA510, CA515, CA025P, CA525, CA530					CA6515, CA6525					CA310, CA315, CA320, CA4505, CA4515					
	PR series	PR930, PR1025					PR930, PR1025										
	MEGACOAT		PR1225					PR1225									
	MEGACOAT NANO		PR1535					PR1535									
	MEGACOAT NANO PLUS	PR1705, PR1725					PR1725										
	MEGACOAT TOUGH						PR1205										
	Ceramic												KA30, A66N, PT600M, KS6015, KS6050, CS7050				
		Carbide											KW10				
													KBN475, KBN60M, KBN900				
		CBN											KBN475, KBN60M, KBN900				
												KBN475, KBN60M, KBN900					



Turning

Workpiece material		Non-ferrous metals				Difficult-to-cut materials <small>Heat-resistant alloys / Ni-base heat-resistant alloys</small>				Hard materials				Sintered steel			
Cutting range		Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing			
Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30	01	10	20	30
Coated carbide	CA series						CA6515										
	MEGACOAT HARD							CA6525									
	MEGACOAT TOUGH						PR005S										
	MEGACOAT NANO						PR115S	PR120S									
Cermet														TN610	TN60		
Ceramic							KS6030	KS6040		A66N	PT600M						
CBN	MEGACOAT									KBN510	KBN525	KBN900					
										KBN05M	KBN10M	KBN25M	KBN35M				
														KBN70M	KBN570		
MEGACOAT TOUGH										KBN010	KBN020						

Workpiece material		Non-ferrous metals				Difficult-to-cut materials <small>Titanium / Titanium alloys</small>				Hard materials				Sintered steel			
Cutting range		Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing			
Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30	01	10	20	30
MEGACOAT NANO Coated carbide								PR1535									
Carbide							SW05	SW10	SW25								
DLC coated carbide																	
PCD																	

Small parts machining

Workpiece material		Steel				Stainless steel / Cast steel					Cast iron				
Cutting range		Finishing ↔ Roughing				Finishing ↔ Roughing					Finishing ↔ Roughing				
Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Coated carbide	PR series		PR930					PR930							
	MEGACOAT			PR1025					PR1025						
	MEGACOAT NANO			PR1225					PR1225						
	MEGACOAT NANO PLUS		PR1705						PR1535						

Workpiece material		Non-ferrous metals				Difficult-to-cut materials <small>Heat-resistant alloys / Ni-base heat-resistant alloys</small>				Hard materials				Sintered steel			
Cutting range		Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing			
Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30	01	10	20	30
Carbide			GW05														
DLC coated carbide			PDL010														

Grooving / Cut-Off / Threading

Workpiece material		Steel				Stainless steel / Cast steel					Cast iron				
Cutting range		Finishing ↔ Roughing				Finishing ↔ Roughing					Finishing ↔ Roughing				
Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Cermet	MEGACOAT	PV7040										PV7040			
	TN series	TN620					TN620								
		TN6020					TN6020								
TN60					TN60						TN60				
TN90					TN90										
TC series	TC40					TC60						TC40			
	TC60					CR9025									
Coated carbide	CR series	CR9025					CR9025								
	PR series	PR915					PR915					PR905			
		PR930					PR930								
		PR1025					PR1025								
		PR1115													
MEGACOAT	PR1215					PR1215					PR1215				
	PR1225					PR1225									
MEGACOAT NANO	PR1535					PR1515									
	PR1625					PR1535									
MEGACOAT NANO EX	PR2015					PR1625									
	PR2025					PR2025					PR2015				
Ceramic												A65			
												A66N			
												PT600M			
Carbide												KW10			
												GW15			

Workpiece material		Non-ferrous metals				Difficult-to-cut materials Titanium / Titanium alloys				Hard materials				Sintered steel				
Cutting range		Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing				
Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30	01	10	20	30	
MEGACOAT Coated carbide															PR1215			
															PR1225			
Cermet														TN60				
	Ceramic									A65								
									A66N									
									PT600M									
Carbide		KW10				KW10												
		GW05				GW15												
		GW15																
DLC coated carbide		PDL015																
		PDL025																
CBN										KBN510				KBN570				
										KBN525								
PCD		KPD001				KPD001												
		KPD010				KPD010												

Drilling

Workpiece material		Steel				Stainless steel / Cast steel					Cast iron				
Cutting range		Finishing ↔ Roughing				Finishing ↔ Roughing					Finishing ↔ Roughing				
Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Coated carbide	CA series		CA520D					CA6535				CA415D			
	MEGACOAT		PR1225					PR1225				PR1210			
	MEGACOAT NANO		PR1230					PR1535							
Carbide												KW10		GW15	

Workpiece material		Non-ferrous metals				Difficult-to-cut materials Titanium / Titanium alloys				Hard materials			
Cutting range		Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing			
Classification		N01	N10	N20	N30	S01	S10	S20	S30	H01	H10	H20	H30
MEGACOAT Coated carbide										PR1230			
Carbide		KW10				KW10							
		GW15				GW15							

Milling

Workpiece material		Steel				Stainless steel / Cast steel					Cast iron				
Cutting range		Finishing ↔ Roughing				Finishing ↔ Roughing					Finishing ↔ Roughing				
Classification		P01	P10	P20	P30	P40	M01	M10	M20	M30	M40	K01	K10	K20	K30
Cermet	TN series		TNG20M					TN60							
	MEGACOAT NANO		PV60M					TN100M							
Coated carbide	CA series							CA6535				CA420M			
	MEGACOAT		PR1225					PR1225				PR1210			
	MEGACOAT NANO		PR1230					PR1525				PR1510			
	MEGACOAT NANO EX		PR1525					PR1535							
Carbide												KW10		GW25	
			PR1825					PR1835				PR1810			
			PR1835												

Workpiece material		Non-ferrous metals				Difficult-to-cut materials Heat-resistant alloys / Ni-base heat-resistant alloys				Difficult-to-cut materials Titanium / Titanium alloys				Hard materials			
Cutting range		Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing				Finishing ↔ Roughing			
Classification		N01	N10	N20	N30	S01	S10	S20	S30	S01	S10	S20	S30	H01	H10	H20	H30
Coated carbide	CA series					CA6535				CA6535							
	MEGACOAT									PR1210							
	MEGACOAT HARD													PR155			
	MEGACOAT NANO					PR1535				PR1535							
Carbide		KW10								KW10							
DLC coated carbide		GW25								GW25							
		PDL025															
PCD	CA series	KPD001								KPD001							
	MEGACOAT	KPD010								KPD010							
	MEGACOAT NANO	KPD230															
	MEGACOAT NANO EX	KPD250															

Cermet

Cermet

KYOCERA is known as one of the leading manufacturer of cermets. Cermets combine toughness with superior wear resistance, and provide longer tool life and excellent surface finishes. Typical materials used in cermets are TiC, TiN, TiCN and NbC.

PVD coated cermet (MEGACOAT / MEGACOAT NANO Cermet)

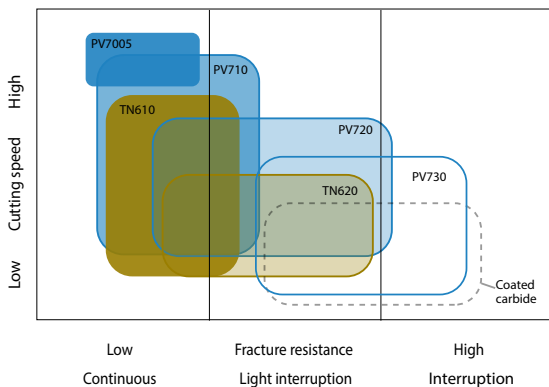
PVD coated cermet is coated on cermet substrate with a thin layer of high wear resistance and high adhesion resistance by PVD (Physical Vapor Deposition) technology. Generally because of the low processing temperature of PVD compared with CVD, PVD coated cermet features less deterioration and more bending strength.



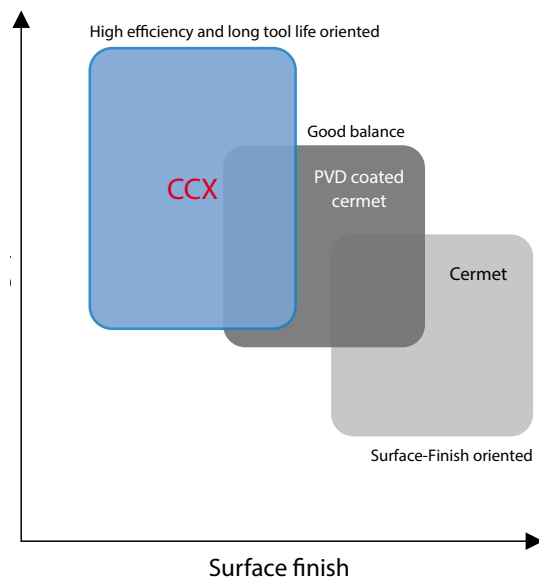
Features of cermet and PVD coated cermet

Classification	Grade	Color	Main component (Coated composition)	Advantages and applications	
<div style="background-color: #0070C0; color: white; padding: 5px; text-align: center; border-radius: 5px;"> P Steel </div>	Cermet	TN610	TiCN	<ul style="list-style-type: none"> High wear resistant cermet due to three types of special reinforcement technology Application: Cermet for steel machining, long tool life in high speed and continuous 	
		TN620	TiCN	<ul style="list-style-type: none"> Three types of special reinforcement technology realized the superior fracture resistance and wear resistance Application: Stable machining of steel 	
		TN60	TiCN+NbC	<ul style="list-style-type: none"> Application: Machining of steel, continuous to interruption 	
		TN6020	Gray	TiCN	<ul style="list-style-type: none"> Application : Uncoated cermet for grooving of steel
		TN620M	TiCN	<ul style="list-style-type: none"> Tough cermet for milling with excellent balance of wear resistance and toughness Application : Milling of steel with high quality surface finish and long tool life 	
		TN100M	TiCN+NbC	<ul style="list-style-type: none"> Tough cermet with improved oxidation resistance and thermal shock resistance Application: Milling of steel at high speed 	
		TC40	TiC+TiN	<ul style="list-style-type: none"> Good balance of wear resistance and toughness Application: Grooving and threading of steel 	
	CVD Coated Cermet	CCX	Gold	TiCN (TiCN+Al ₂ O ₃ +Tin)	<ul style="list-style-type: none"> Specialized high-strength micro grain cermet base material with superior wear-resistant thick CVD coating Excellent wear resistance leads long tool life in high speed machining Application : High speed finishing to light interrupted machining of steel
	MEGACOAT NANO Cermet	PV710	Gold	TiCN (MEGACOAT NANO)	<ul style="list-style-type: none"> Superior wear and adhesion resistant MEGACOAT NANO on the high wear resistant cermet Application: Long tool life and stability in high speed continuous machining of steel, excellent surface
		PV720		TiCN (MEGACOAT NANO)	<ul style="list-style-type: none"> Superior wear and adhesion resistant MEGACOAT NANO on the special reinforcement cermet Application: First choice PVD coated cermet for steel machining, high efficient machining and high quality surface finish
		PV60M	Gold	TiCN+NbC (MEGACOAT NANO)	<ul style="list-style-type: none"> Improved stable grade for milling by MEGACOAT NANO coating technology Application: Milling of steel with high quality surface finish and stable machining
	MEGACOAT Cermet	PV7040	Blackish Red	TiC+TiN (MEGACOAT)	<ul style="list-style-type: none"> MEGACOAT Cermet for Grooving Application: Excellent surface finish and longer tool life in steel grooving
		PV7005		TiC+TiN MEGACOAT	<ul style="list-style-type: none"> Heat-resistant MEGACOAT on cermet with excellent wear resistance Application: High speed finishing of gray and nodular cast iron
<div style="background-color: #D9534F; color: white; padding: 5px; text-align: center; border-radius: 5px;"> K Cast iron </div>					

Application map



Properties of PVD coating





Uncoated CERMET

TN610/TN620

MEGACOAT NANO CERMET

PV710/PV720/PV730

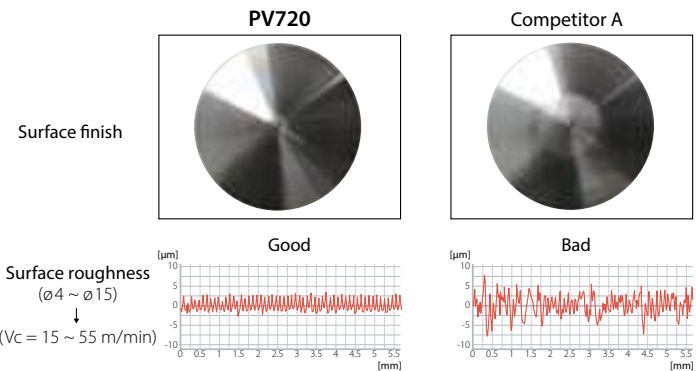
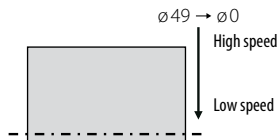
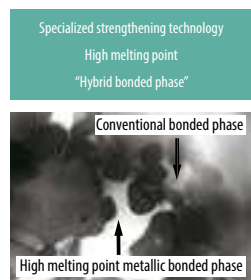
Special reinforcement technology (hybrid technology)
Superior surface finish and machining stability.

1 Excellent surface finish

- Combining the conventional cermet bonded phase (nickel, cobalt) and the special high melting point metallic bonded phase
- Provides high adhesion resistance to eliminate galling of the workpiece

Surface finish comparison (In-house evaluation)

Cutting conditions: $V_c = 180 \sim 0$ m/min (Constant rotational speed), $a_p = 0.5$ mm, $f = 0.1$ mm/rev, wet, CNMG120404 type, workpiece: C10



CVD coated cermet for finishing

CCX

Excellent high speed finishing leads to greater productivity. Applicable to a wide range of cutting conditions from general to high speed machining. Maintains long tool life in soft steel, general steel and cast iron machining

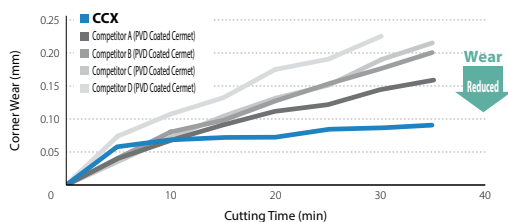
1 Superior wear resistance to PVD coated cermets

2 Unique cermet base material with thick CVD coating

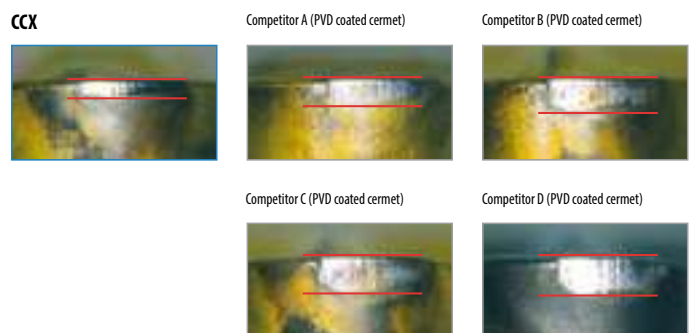
Alloy Steel - 34CrMo4 High speed comparison: $V_c = 400$ m/min

CCX provided better tool life than competitor's PVD cermets by greatly reducing the amount of wear

Wear resistance comparison (Internal evaluation)



Cutting edge (After machining 35 min)



* Picture shows 30 min after machining due to a large amount of wear

Cutting conditions: $V_c = 400$ m/min, $a_p = 0.3$ mm, $f = 0.12$ mm/rev, Wet, CNMG120408 type, external turning

CVD coated carbide (Turning)

CVD coated carbide

Using chemical vapor deposition coating technology, CVD coated carbide grades provide stable, efficient machining at high speeds or for heavy interrupted applications.



Features

- Applicable from low to high speed machining and from finishing to roughing
- Stable machining is achieved due to the superior toughness and crack resistance
- Cutting times are reduced due to good chip control from effective chipbreakers

Features of CVD coated carbide

Classification	Grade	Color	Coated composition	Advantages and applications	
<div style="background-color: #0070C0; color: white; padding: 5px; text-align: center; border-radius: 5px;"> P Steel </div>	CA115P	Black and gold	TiCN+Al ₂ O ₃ +TiN	<ul style="list-style-type: none"> • Thick CVD coating with superior wear and fracture resistance using special carbide substrate with high hardness and thermal deformation and crystal forming technology. • Application: Continuous to light interrupted machining of steel 	
	CA125P		TiCN+Al ₂ O ₃ +TiN	<ul style="list-style-type: none"> • Thick CVD coating with superior wear and fracture resistance using special carbide substrate with high hardness and thermal deformation and crystal forming technology. • Application: First choice for general machining of steel 	
	CA510	Gold	TiCN+Al ₂ O ₃ +TiN	<ul style="list-style-type: none"> • Special substrate with thermal deformation resistance along with a thick and tough coating layer providing high wear resistance • Application: High speed and high efficiency steel machining 	
	CA515		TiCN+Al ₂ O ₃ +TiN	<ul style="list-style-type: none"> • Improved wear resistance and stability due to special substrate with heat deformation resistance and hard and tough coating layer with reinforced interface • Application: Light interrupted machining of steel 	
	CA025P		TiCN+Al ₂ O ₃ +TiN	<ul style="list-style-type: none"> • CVD coating with improved wear resistance. Adopted base material, excellent chipping resistance, resistance to wear and resistance to improve chip performance • Application: Continuous to interrupted machining of steel 	
	CA525		TiCN+Al ₂ O ₃ +TiN	<ul style="list-style-type: none"> • Stable and long tool life machining due to special substrate with heat deformation resistance and tougher coating layer and reinforced interface • Application: Interrupted to general machining of steel 	
	CA530		TiCN+Al ₂ O ₃ +TiN	<ul style="list-style-type: none"> • Special tough substrate and tough coating layer providing high stability and wear resistance • Application: General to heavy interrupted machining (stability oriented) 	
	CR9025		TiCN+TiN	<ul style="list-style-type: none"> • Improved toughness and stability due to specialized carbide substrate with plastic deformation resistance • Application: Cut-off, grooving and multi-function machining of steel 	
	<div style="background-color: #FFD700; color: black; padding: 5px; text-align: center; border-radius: 5px;"> M Stainless steel </div>		CA6515	TiCN+Al ₂ O ₃ +TiN	<ul style="list-style-type: none"> • Specialized carbide substrate for machining stainless steel, excellent wear resistance • Application: Continuous machining of stainless steel
			CA6525	TiCN+Al ₂ O ₃ +TiN	<ul style="list-style-type: none"> • Specialized carbide substrate for machining stainless steel, excellent notching resistance and toughness • Application: First choice for general machining of stainless steel, from finishing to roughing, continuous to interruption
<div style="background-color: #D9534F; color: white; padding: 5px; text-align: center; border-radius: 5px;"> K Cast iron </div>	CA310	Rose Gold	TiCN+Al ₂ O ₃ +Ti base	<ul style="list-style-type: none"> • Grade for high-speed continuous machining and improved tool life through the deposition of a thickened Al₂O₃ coating layer • Application : For finishing to roughing of gray cast iron 	
	CA315		TiCN+Al ₂ O ₃ +Ti base	<ul style="list-style-type: none"> • Both high abrasion resistance and stability are compatible, high efficiency and long life performance are demonstrated. Can be adapted to both continuous machining and interrupted machining. • Application: Compatible with a wide machining area for cast iron and gray cast iron. First recommendation for cast iron 	
	CA320		TiCN+Al ₂ O ₃ +Ti base	<ul style="list-style-type: none"> • Improved stability with CVD layer structure with high adhesion • Application : Heavily interrupted or High-speed machining for Nodular Cast Iron. The 1st Recommendation for the FC0500 or higher application 	
	CA4505	Blackish gray	TiCN+Al ₂ O ₃	<ul style="list-style-type: none"> • Stable, longer tool life due to improved bonding strength of coating layers and special treatment of the surface of the top coating layer • Application: For gray cast iron and nodular cast iron at high speed in continuous to light interrupted machining 	
	CA4515		TiCN+Al ₂ O ₃	<ul style="list-style-type: none"> • Stable, longer tool life due to improved bonding strength of coating layers and special treatment of the surface of the top coating layer • Application: First choice for gray cast iron and nodular cast iron in light to heavy interrupted machining 	



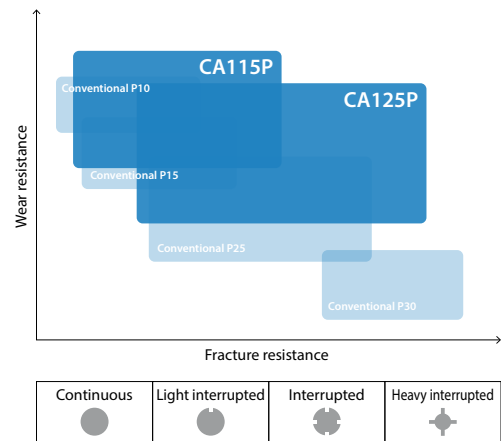
New CVD coated carbide grade for steel

CA115P/CA125P

The new standard for steel machining. Longer tool life in a wide range of machining environments.

1 Extended tool life in a wide variety of applications

Application map



CA115P

Continuous-light interrupted machining of steel
For high-efficient machining with wear and chipping resistance

CA125P

Continuous-heavy interrupted steel machining
First recommendation for steel machining
High versatility

2 Newly developed proprietary coating and carbide substrate with superior wear and fracture resistance.

Optimized coating properties on rake and flank faces provides wear resistance and fracture resistance
The industry's most uniform alumina film* reduces crater wear
*March 2023, by Kyocera research

Flank face Improved wear resistance

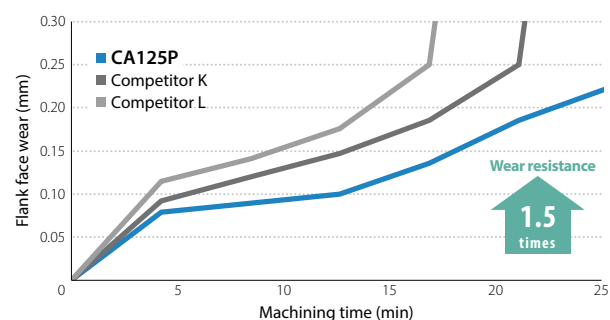
- High hardness surface layer suppresses abrasion
- Uniform alumina layer reduces wear
- Easy to see edge defects with golden surface

Rake face Suppresses crater wear and fracturing

- New surface treatment technology improves fracture resistance
- Highly uniform alumina layer reduces wear

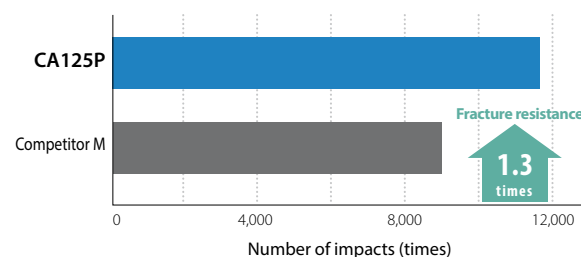


Wear resistance comparison (Internal evaluation)



Cutting Conditions : Vc = 300 m/min, ap = 1.5 mm, f = 0.3 mm/rev, Wet
Workpiece material : 34CrMo4

Fracture resistance comparison (Internal evaluation) Interrupted machining n = 3 mean



Cutting Conditions : Vc = 300 m/min, ap = 1.5 mm, f = 0.35 mm/rev, Wet
Workpiece material : C45 (4 grooves)

PVD coated carbide (Turning)

PVD coated carbide (MEGACOAT / MEGACOAT NANO)

Using a physical vapor deposition coating technology, generally because of the low processing temperature of PVD compared with CVD, PVD coated carbide features less deterioration and more bending strength. PVD coated carbide grades are coated on a very tough carbide substrate and suitable for turning.



PVD coated super micro-grain carbide

- Smooth fine surface of PVD coated carbide provides good surface finish and high precision machining
- Stable machining with excellent toughness

Features of PVD coated carbide

Classification	Grade	Color	Coated composition	Advantages and applications
<div style="background-color: #0070C0; color: white; padding: 5px; text-align: center; border-radius: 5px;"> P Steel </div>	PR915 <small>Super micro-grain</small>	Bluish violet	TiAlN	• Application: Stable and reliable high precision machining of steel
	PR930 <small>Super micro-grain</small>	Reddish gray	TiCN	• Application: Low machining speed, precise machining with sharp edge
	PR1025			• Application: General machining of steel and stainless steel, stable and longer tool life
	PR1115	Purple red	TiAlN	• Superior oxidation resistance with well balanced wear resistance and toughness • Application: Machining of steel and stainless steel, for grooving, cut-off and threading
	PR1215	Blackish red	MEGACOAT	• Superior wear and oxidation-resistant MEGACOAT on micro-grain carbide substrate • Application: Superior adhesion resistance and longer tool life for steel and stainless steel machining
	PR1625	Reddish green	MEGACOAT NANO	• Adopted special nano multi-layer coating "MEGACOAT NANO" excellent in wear resistance and lubricity • Stable processing with steel and stainless steel grooving - Long tool life
	PR1705	Silver	MEGACOAT NANO PLUS	• High-hardness ultrafine particle carbide substrates with special multilayer nano coating MEGACOAT NANO PLUS offer excellent wear resistance and high precision machining. • Application: For free-cutting steel turning. Long tool life with excellent wear resistance and high-precision machining.
	PR1725			• New coating technology "MEGACOAT NANO PLUS" with superior wear resistance and adhesion resistance • Application: General grade for steel and stainless steel machining provides stability and longer tool life
	PR2025	Dark blackish red	MEGACOAT NANO EX	• Nano layer coating "MEGACOAT NANO EX" with superior wear- and fracture resistance • Application: 1st recommendation for grooving and cut-off of steel. Excellent balance between wear and fracture resistance.
<div style="background-color: #FFD700; color: black; padding: 5px; text-align: center; border-radius: 5px;"> M Stainless steel </div>	PR1225	Blackish red	MEGACOAT	• Superior wear and oxidation-resistant MEGACOAT on micro-grain carbide substrate • Application: Light interrupted to interrupted machining of stainless steel
	PR1515	Reddish green	MEGACOAT NANO	• Improved wear resistance and stability by using fine granite carbide base metal and special nano multi-layer coating "MEGACOAT NANO" • Application: For thread cutting of stainless steel
	PR1535			• Nano thin multi-layer coating "MEGACOAT NANO" improved wear resistance and stability • Application: Medium to roughing of stainless steel and heat-resistant alloys, cut-off of stainless steel
	PR2035	Dark blackish red	MEGACOAT NANO EX	• Nano layer coating "MEGACOAT NANO EX" with superior wear- and fracture resistance • Application: 1st recommendation for grooving and cut-off of stainless steel. Excellent fracture resistance.
<div style="background-color: #DC143C; color: white; padding: 5px; text-align: center; border-radius: 5px;"> K Cast iron </div>	PR905	Bluish violet	TiAlN	• Smooth fine surface PVD coated hard carbide with plastic deformation resistance • Application: Suitable for machining gray and nodular cast iron
	PR2015	Dark blackish red	MEGACOAT NANO EX	• Nano layer coating "MEGACOAT NANO EX" with superior wear- and fracture resistance • Application: 1st recommendation for grooving and cut-off of cast iron. Excellent wear resistance and applicable for high speed machining.
<div style="background-color: #8B4513; color: white; padding: 5px; text-align: center; border-radius: 5px;"> S Heat-resistant alloys </div>	PR005S	Grey black	MEGACOAT HARD	• Superior high temperature properties of special carbide substrate and excellent heat-resistance of MEGACOAT HARD enables high wear resistance • Application: Finish processing of heat-resistant alloys, also for high speed machining
	PR115S	Dark grey black	MEGACOAT TOUGH	• Special carbide substrate with excellent heat resistance and "MEGACOAT TOUGH" with excellent adhesion enables high wear resistance. • Application: Continuous finishing of heat-resistant alloys
	PR120S			• Special carbide substrate with excellent heat resistance and stability and "MEGACOAT TOUGH" with excellent adhesion for improved wear resistance and stability. • Application: Continuous finishing of stainless steel, continuous to light-interrupted machining of heat-resistant alloy



PVD coated carbide for small parts machining

PR1725

1st recommendation for steel machining

Excellent surface finish and long tool life

Great performance in small parts machining applications

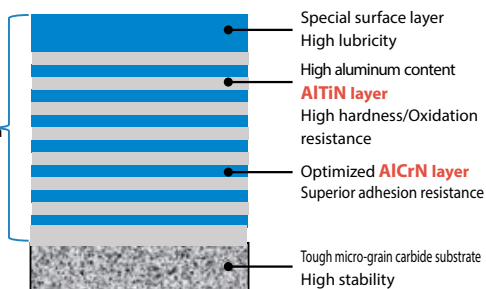


MEGACOAT NANO PLUS

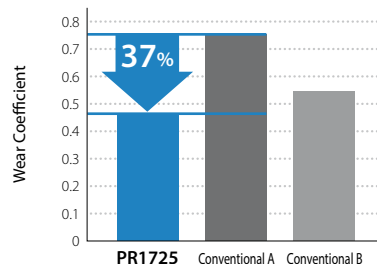
AlTiN/AlCrN Nano laminated film with superior wear resistance and adhesion resistance. Excellent surface finish and long tool life

Reduces cracking

Reduces abnormal damages such as chipping because of increased lamination layer with a thinner gap than conventional coatings



Wear coefficient comparison (Internal evaluation)



Superior wear and chipping resistance

High hardness with nano laminated film layer properties
Internal stress optimization reduces chipping

Excellent surface finish

Special surface layer with great lubricity reduces adhesion

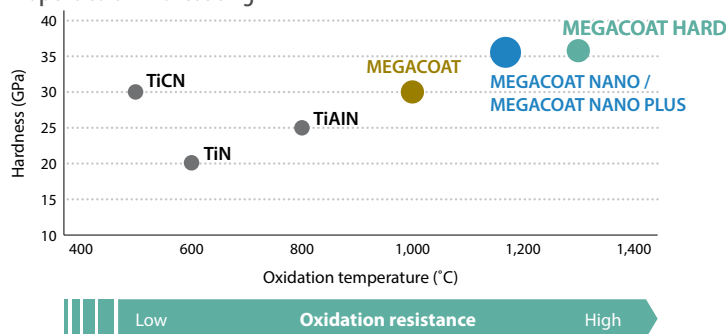
Applicable to various workpiece materials

Excellent oxidation resistance. Superior high temperature properties maintains good performance in steel, stainless steel and free-cutting steel

High machining stability

Tough micro-grain carbide substrate provides stable machining

Properties of PVD coating



Application map

	Steel		
High speed	PR1705	PR1725	
Medium	PR1725		
Low speed	PR930	PR1725	
	Continuous	Light interruption	Heavy interruption

	Stainless Steel		
High speed	PR1725		
Medium	PR1725		
Low speed	PR1725		
	Continuous	Light interruption	Heavy interruption

PVD / CVD coated carbide (Milling / Drilling)

PVD coated carbide (MEGACOAT / MEGACOAT NANO)

PVD coated carbide grades for milling and drilling are coated on a very tough carbide substrate. Because of the low processing temperature of PVD compared with CVD, it features less deterioration and more bending strength.

CVD coated carbide

CVD coated carbide grades provide stable, efficient machining at high speeds or for heavy interrupted applications. Ti-base (TiN, TiCN) coating with superior hardness and wear resistance or ceramic-base (Al₂O₃) coating with high-thermal stability is applied on a tough carbide substrate. Superior fracture resistance and wear resistance.



Insert grades

Features of PVD / CVD coated carbide

Classification	Grade	Color	Coated composition	Advantages and applications
<div style="background-color: #0070C0; color: white; padding: 5px; text-align: center; border-radius: 5px;"> P Steel </div>	PR1230	Blackish red	MEGACOAT	<ul style="list-style-type: none"> • Superior wear and oxidation-resistant MEGACOAT on a special tough carbide substrate • Application: Stable and high feed milling and drilling of steel
	PR1525	Reddish green	MEGACOAT NANO	<ul style="list-style-type: none"> • New coating technology (MEGACOAT NANO) is applied. Nano thin multi-layer coating performs superior wear resistance and high oxidation resistance • Application: Stable and longer tool life for milling of steel and stainless steel
	PR1825	Light reddish green	MEGACOAT NANO EX	<ul style="list-style-type: none"> • "MEGACOAT NANO EX" with excellent wear, oxidation and chipping resistance • Application: Stable machining of steel and stainless steel with extended tool life
	CA520D	Gold	TiCN+Al ₂ O ₃ +TiN (CVD)	<ul style="list-style-type: none"> • Improved abrasion resistance and fracture resistance by improving high toughness • Combination of high toughness substrate, toughened coating and enhanced interface allow both wear and fracture resistance • Application: Drilling of steel - first recommended grade (for high speed machining)
<div style="background-color: #FFD700; color: black; padding: 5px; text-align: center; border-radius: 5px;"> M Stainless steel </div>	PR1225	Blackish red	MEGACOAT	<ul style="list-style-type: none"> • Superior wear and oxidation-resistant MEGACOAT on micro-grain carbide substrate • Application: General machining and high feed milling and drilling of steel and stainless steel
	PR1835	Light reddish green	MEGACOAT NANO EX	<ul style="list-style-type: none"> • "MEGACOAT NANO EX" with excellent wear, oxidation and chipping resistance • Application: Milling of steel and stainless steel achieves stable long tool life of heavy interrupted and high-load machining
<div style="background-color: #C00000; color: white; padding: 5px; text-align: center; border-radius: 5px;"> K Cast iron </div>	PR1210	Blackish red	MEGACOAT	<ul style="list-style-type: none"> • Superior wear and oxidation-resistant MEGACOAT coated on special carbide substrate • Application: Highly efficient stable milling and drilling of gray and nodular cast iron
	PR1510	Reddish green	MEGACOAT NANO	<ul style="list-style-type: none"> • New coating technology (MEGACOAT NANO) is applied. Nano thin multi-layer coating performs superior wear resistance and high oxidation resistance • Application: Highly fracture resistance and wear resistance for gray and nodular cast iron
	PR1810	Light reddish green	MEGACOAT NANO EX	<ul style="list-style-type: none"> • "MEGACOAT NANO EX" with excellent wear, oxidation and chipping resistance • Application: High efficiency stable milling of gray and nodular cast iron
	CA415D	Gold	TiCN+Al ₂ O ₃ +TiN	<ul style="list-style-type: none"> • Special carbide substrate for cast iron, toughened coating and enhanced interface allow both wear and fracture resistance • Application: Drilling of cast iron - 1st recommended material for high speed processing
	CA420M		TiCN+Al ₂ O ₃ +TiN (CVD)	<ul style="list-style-type: none"> • Kyocera's unique crystal control technology and advanced layer adhesion CVD coating with superior wear resistance and toughness • Application: Milling of gray and nodular cast iron
<div style="background-color: #8B4513; color: white; padding: 5px; text-align: center; border-radius: 5px;"> S Heat-resistant alloys Titanium alloys </div>	PR1535	Reddish green	MEGACOAT NANO	<ul style="list-style-type: none"> • Nano thin multi-layer coating (MEGACOAT NANO) improved wear resistance and stability • Application: For milling of Ni-base heat-resistant alloys, titanium alloys and precipitation hardened stainless steel
<div style="background-color: #8B4513; color: white; padding: 5px; text-align: center; border-radius: 5px;"> S Heat-resistant alloys </div>	CA6535	Gold	TiCN+Al ₂ O ₃ +TiN (CVD)	<ul style="list-style-type: none"> • High heat-resistance and wear resistance with CVD coating • Application: For milling of Ni-base heat-resistant alloys and martensitic stainless steel
<div style="background-color: #666666; color: white; padding: 5px; text-align: center; border-radius: 5px;"> H Hard material </div>	PR015S	Blackish Gray	MEGACOAT HARD	<ul style="list-style-type: none"> • Substrate with improved thermal properties reduces sudden fracture and decrease edge wear. MEGACOAT HARD coating technology delivers the high hardness and superior wear resistance • Excellent wear and chipping resistance maintains stable machining for high hard materials • Application : Difficult-to-cut materials and high hard (less than 60HRC) machining



Next-generation PVD coating for milling

PR18 Series

Double lamination technology with special nano layer

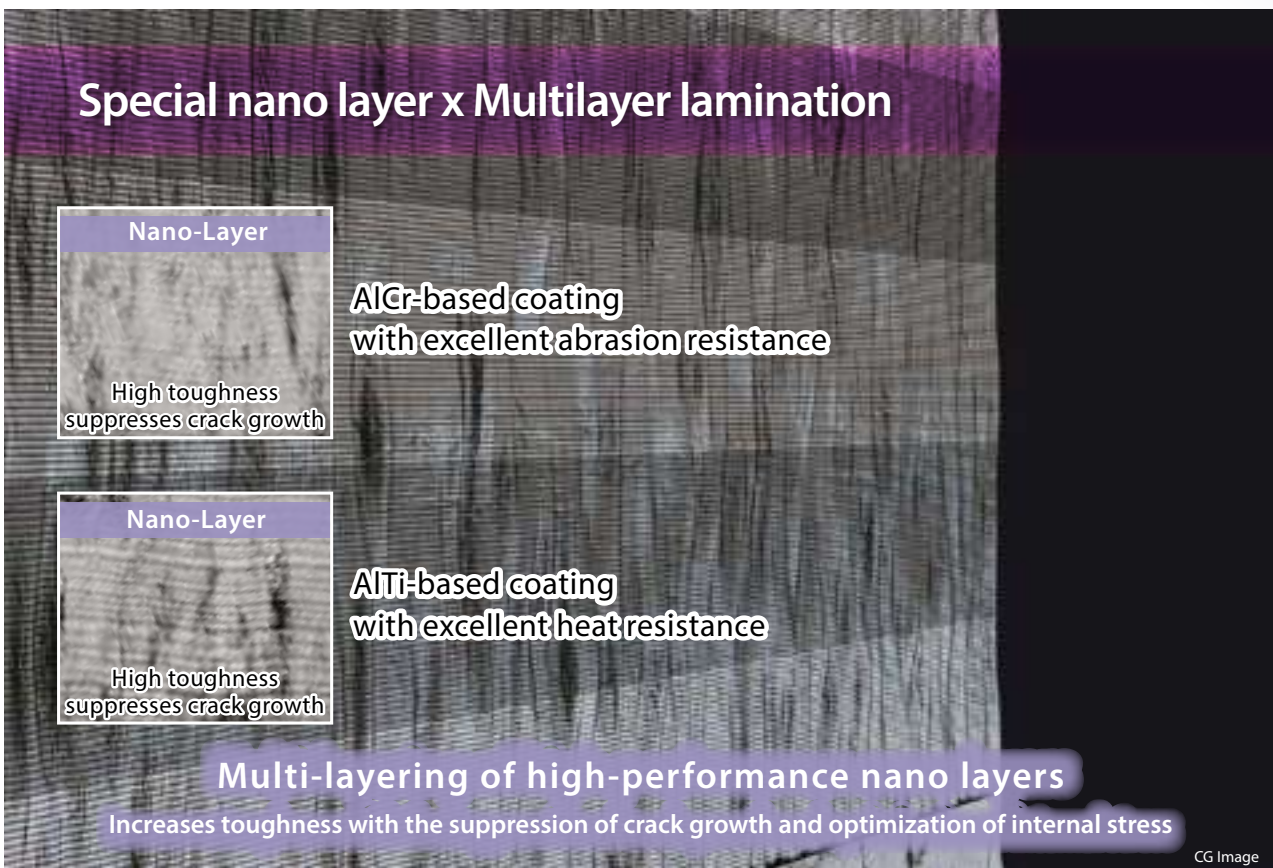
MEGACOAT NANO EX provides longer tool life

Features 3 grades: PR1825/PR1835/PR1810. Available for various machining environments



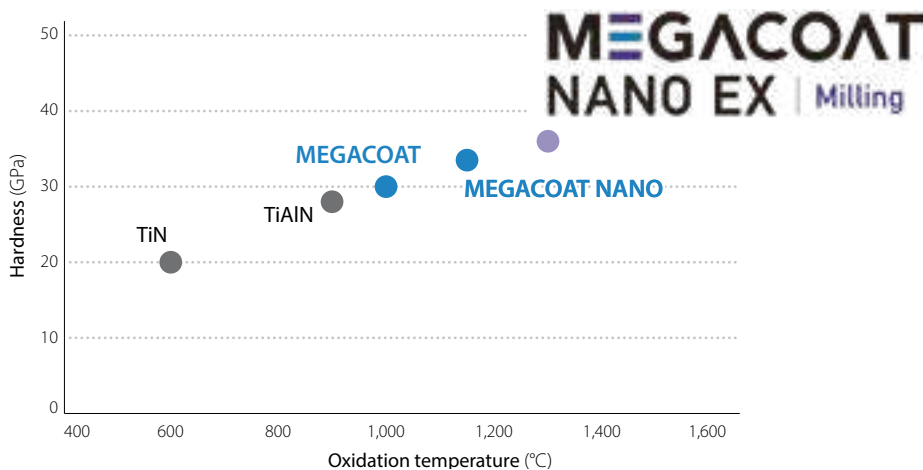
Double lamination technology maintains longer tool life

Multi-layer structure with two unique nano layers
Superior abrasion resistance and fracture resistance



CG Image

Coating characteristics (Internal evaluation)



Carbide

Carbide

Uncoated tungsten carbide grade is used in a variety of applications due to its superior mechanical properties.

Features

- KW10: Suitable for machining cast iron with high hardness and toughness
- GW05, GW15, GW25: Suitable for machining cast iron, non-ferrous metals and non-metals
- SW series: Suitable for machining of titanium and titanium alloy



Features of carbide

Classification	Grade	Color	Main component	Advantages and applications
	KW10	Gray	WC+Co	• ISO identification symbol K carbide (K10 relevant) • Application: Machining cast iron, non-ferrous materials and non-metals
	GW05			• ISO identification symbol K carbide (K05 relevant) • Application: Excellent wear resistance for machining of cast iron and non-ferrous metal
	GW15			• ISO identification symbol K carbide (K10 relevant), tough micro-grain carbide • Application: Machining cast iron, non-ferrous materials and non-metals
	GW25			• ISO identification symbol K carbide (K30 relevant) • Application: Milling operations of aluminum
	SW05			• ISO identification symbol K carbide (K05 relevant) • Application: Titanium alloys for continuous machining and finishing
	SW10 (Made to order)			• ISO identification symbol K carbide (K10 relevant) • Application: Titanium alloys for continuous and light interrupted machining
	SW25 (Made to order)			• ISO identification symbol K carbide (K25 relevant) • Application: Titanium alloys for interrupted and light interrupted machining

DLC coated carbide

DLC coated carbide

DLC (Diamond-Like Carbon) Coated carbide is coated on carbide substrate with a thin layer of amorphous carbon.

Features

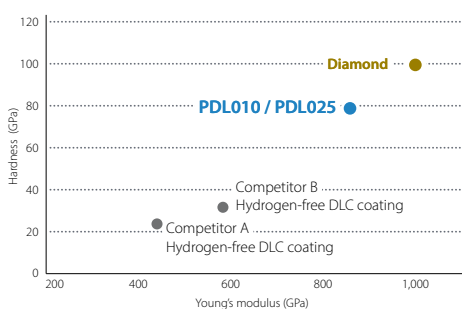
- High Hardness with Kyocera's proprietary hydrogen-free DLC coating
- Excellent surface finish achieved through anti-adhesion performance



Features of DLC coated carbide

Classification	Grade	Color	Coated composition	Advantages and applications
	PDL010	Rainbow color	C	• DLC coating of original technology has high hardness, excellent adhesion resistance and film peeling resistance • Application: Excellent finished surface processing and long service life of aluminum alloy
	PDL015			• High Hardness with Kyocera's Proprietary Hydrogen-free DLC Coating • Application: Grooving of aluminum alloys
	PDL025			• High Hardness with Kyocera's Proprietary Hydrogen-free DLC Coating • Application: Long tool life and stable machining of aluminum alloys

Coating properties



Adhesion resistance comparison



Cutting conditions: $V_c = 800$ m/min, $f_z = 0.1$ mm/t, $ap \times ae = 3 \times 5$ mm
 Dry, cutter dia. $\phi 25$ mm, workpiece material: A5052 cutting length: 57 m
 (Internal evaluation)



Ceramic

Ceramic

Ceramics inserts are capable of machining at high speeds. Recommended for hard turning of hardened steel or rough to finish turning of cast iron and heat-resistant alloys.



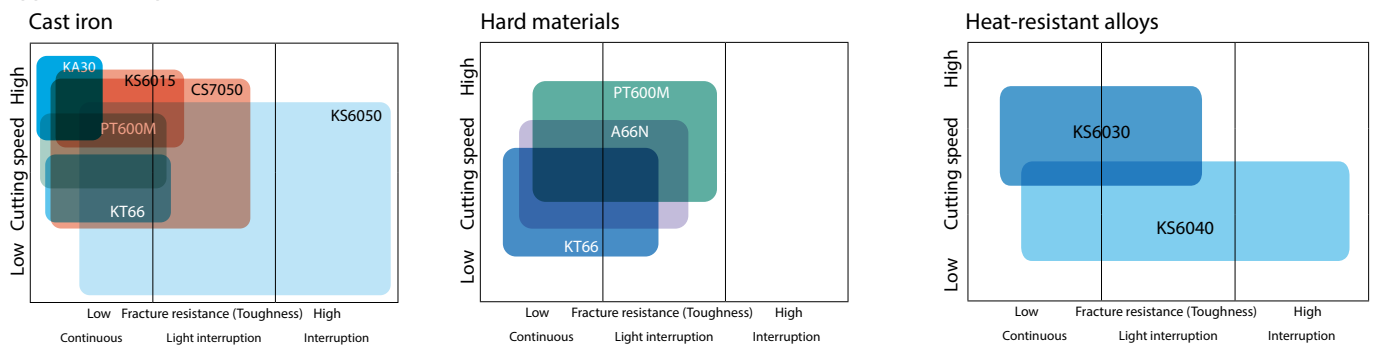
Features

- Excellent wear resistance enables high speeds machining of cast iron
- Ceramic maintains good surface finishes due to the low affinity to workpiece materials
- Silicon nitride ceramic can machine cast iron with coolant due to its superior thermal shock resistance

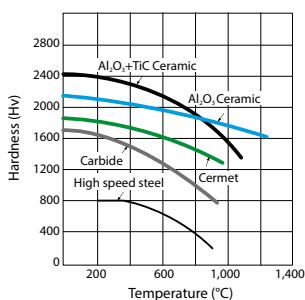
Features of ceramic

Classification	Grade	Color	Main component (Coated composition)	Coating layer	Hardness of substrate (GPa)	Fracture toughness (MPa·m ^{1/2})	Transverse strength (MPa)	Advantages and applications
K Cast iron	KA30	White	Al ₂ O ₃	-	17.5	4.0	750	• Aluminum oxide ceramic (Al ₂ O ₃) • Application: Finishing of cast iron at high cutting speeds without coolant
	KS6015	Gray	Si ₃ N ₄		15.2	7.8	1,000	• Silicon nitride ceramic with superior wear resistance reduces heat at the cutting edge. • Application: Roughing and high speed machining of cast iron (with or without coolant)
	KS6050	Gray	Si ₃ N ₄		15.6	8.0	1,200	• Silicon nitride ceramic (Si ₃ N ₄) • Application: Roughing and interrupted machining of cast iron. Focusing on stability. (with or without coolant)
	CS7050	Grayish white	Si ₃ N ₄ (Special Al ₂ O ₃ COAT)					Thin coating	• Silicon nitride ceramic (Si_{3}N_{4}) + CVD Coating (Special Al_{2}O_{3} COAT) • Application: Finishing and continuous machining, and high speed and high efficient machining. (with or without coolant)
K Cast iron H Hard material	KT66	Black	Al ₂ O ₃ +TiC	Thin coating	20.1	4.1	980	• Aluminum oxide and titanium carbide ceramic (Al ₂ O ₃ +TiC) • Application: Semi-roughing to finishing of cast iron, and hard materials
	A66N	Gold	Al ₂ O ₃ +TiC (TiN COAT)					• TiN PVD coated aluminum oxide and titanium carbide ceramic (TiN coated Al ₂ O ₃ +TiN) • Application: Semi-roughing to finishing of hard materials
	PT600M	Blackish red	Al ₂ O ₃ +TiC (MEGACOAT)					• Heat-resistant MEGACOAT on aluminum oxide and titanium carbide ceramic (MEGACOAT Al ₂ O ₃ +TiC) • Application: Semi-roughing to finishing of cast iron, hard materials and hardened roll materials
S Heat-resistant alloys	KS6030	Gray	SiAlON	-	15.2	6.0	600	• SiAlON Ceramic with superior wear resistance and high resistance against boundary wear • Application: Finishing to medium machining of heat-resistant alloys
	KS6040	Brown			16.7	7.0	900	• High stability SiAlON ceramic with wear resistance and fracture resistance • Application: Roughing of heat-resistant alloys

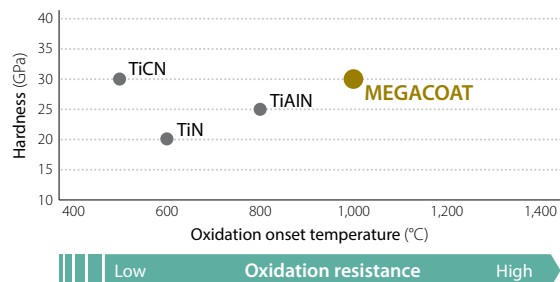
Application map



High-Temperature hardness



Properties of PVD coating



CBN (Cubic boron nitride)

CBN

CBN (Cubic Boron Nitride) is second only to diamond in hardness, and is a synthetically produced material with high thermal conductivity.

Features

- Superior wear resistance when machining hard materials
- Suitable for high speed machining of hard materials, sintered steel and cast iron
- High thermal conductivity provides stable machining



Features of CBN

Classification	Grade	Color	Ave. grain size (µm)	Hardness of substrate (GPa)	Transverse strength (MPa)	Advantages and Applications
	KBN510	Black	2	28	1,000	• Excellent wear resistance and crack resistance, non-coated CBN • Application: Finishing and continuous machining of hardened die steel
	KBN525		1 and under	25	1,250	• Application: General purpose for hardened steel
	KBN05M (MEGACOAT)	Blackish red	0.5-1.5	27	1,000	• Heat-resistant MEGACOAT on highly heat-resistant CBN substrate • Application: High speed finishing of hardened steel
	KBN10M (MEGACOAT)		2	28		• Application: High speed finishing of hardened die steel
	KBN25M (MEGACOAT)		1 and under	25	1,250	• Heat-resistant MEGACOAT on micro-grain CBN with heat-resistant binder phase • Application: Stable machining of hardened steel at high cutting speeds
	KBN010 (MEGACOAT TOUGH)		0.5-1.5	27	1,000	• Chipping resistant "MEGACOAT TOUGH" on heat resistant CBN substrate • Application: High speed finishing of hardened steel
	KBN020 (MEGACOAT TOUGH)		3	31-32	1,300	• High toughness CBN coated with high wear resistance enables machining in a wide range of cutting areas • Application: Continuous to interrupted machining of hardened steel
Sintered steel	KBN570	Black	2-4	34	1,350	• High content CBN • Application: Processing of sintered steel (burr suppression)
	KBN70M (MEGACOAT)	Blackish red				• Heat-resistant MEGACOAT on CBN rich substrate • Application: Stable machining of sintered steel (ferrous sintered alloys)
	KBN475	Black	2	39	1,400	• Excellent wear resistance due to high CBN content and special binder • Application: High speed machining of gray cast iron
	KBN60M (MEGACOAT)	Blackish red	0.5-6	33	1,250	• Heat-resistant MEGACOAT on CBN rich substrate with hard binder phase • Application: High speed finishing of gray cast iron
	KBN900 (TIN COAT)	Gold	9	31	630	• TiN coated solid CBN • Application: Heavy duty, interrupted machining and finishing of hardened steel, hardened roll steel and cast iron

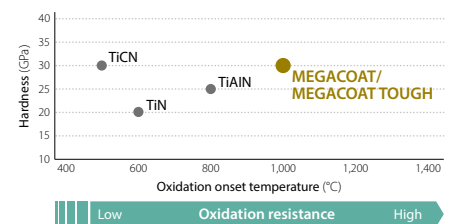
For KBN35M, see page A18.

Advantages of MEGACOAT TOUGH

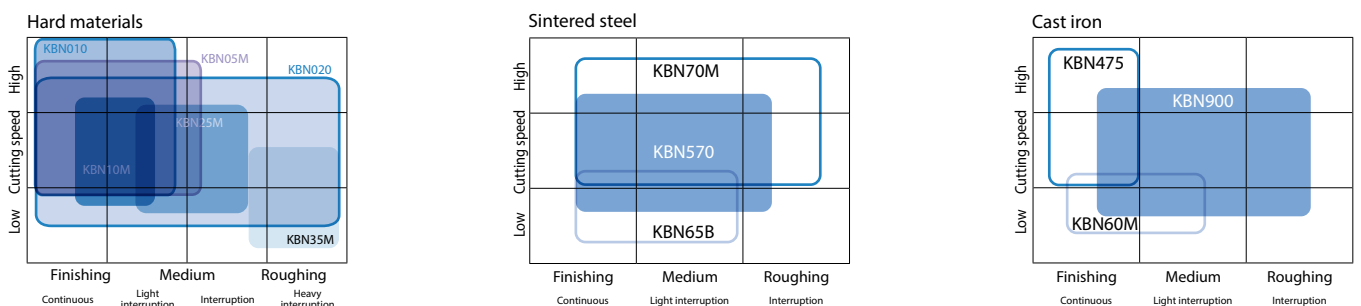
An adhesion layer is laminated between the high wear resistance layer and the CBN. Reduces layer peeling to achieve long tool life and stable machining.



Properties of PVD coating



Application map





PCD (Polycrystalline diamond)

PCD

PCD is a synthetic diamond sintered under high temperatures and pressures.

Features

- Applicable for milling of non-ferrous metals and non-metals
- No edge build-up provides high precision machining
- Diversified applications for machining of non-ferrous metals and non-metals
- Finished surface will be rainbow colored (A mirror-like finished surface will not be obtained)

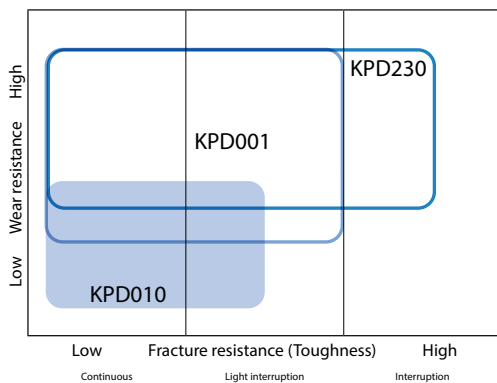
Features of PCD

Classification	Grade	Ave. grain size (µm)	Advantages and applications
	KPD001	0.5	<ul style="list-style-type: none"> • Super Micro-Grain PCD features cutting edge strength, wear resistance, fracture resistance, good edge-sharpening performance and longer, stable tool life • Application: High speed machining of aluminum alloys, brass, non-ferrous metals and non-metals including plastics, and carbide.
	KPD010	10	<ul style="list-style-type: none"> • Good wear resistance and toughness, good grindability • Application: High speed machining of aluminum alloys, brass, non-ferrous metals and non-metals including plastics, and carbide.
	KPD230	2-30	<ul style="list-style-type: none"> • Superior abrasive wear resistance and toughness due to high density PCD with mixed rough and fine grains • Application: High speed machining of aluminum alloys, brass, non-ferrous metals and non-metals including plastics.
	KPD250 (Made to order)	25	<ul style="list-style-type: none"> • Superior wear resistance due to rough grain PCD (25µm) • Application: High speed machining of high silicon aluminum alloy and machining of carbide

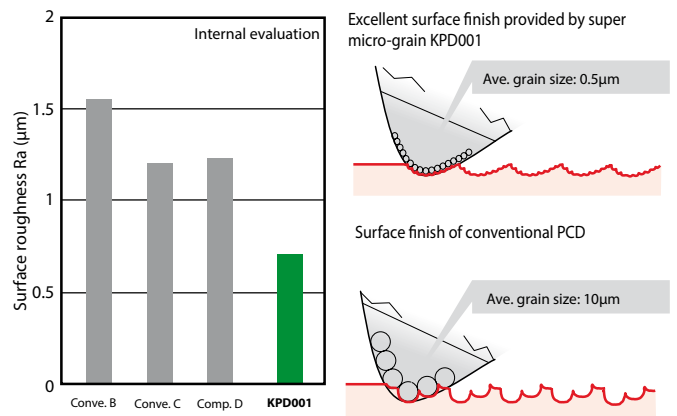
Applications

Workpiece material		Non-ferrous metals				Difficult-to-cut materials			
Cutting range		Finishing ← → Roughing				Finishing ← → Roughing			
Classification		N01	N10	N20	N30	S01	S10	S20	S30
Turning Milling	PCD	KPD001				KPD001			
		KPD010				KPD010			
		KPD230							
		KPD250							

Application map



Surface finish roughness comparison of aluminum machining



(Grain size affects surface finish quality)

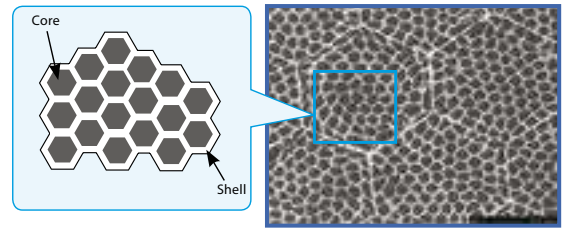
Honeycomb structure CBN

Honeycomb structure CBN

Honeycomb structure is the high structural controlled composite material consisting of a hard and superior wear-resistance core (gray portion) and a tough shell (white portion).

Features

- Honeycomb structure CBN combine a hard, wear-resistant core and a tough shell into one insert.
- The tough shell stops cracks that form in the core.
- CBN is suitable for interrupted machining of exceptionally hard material

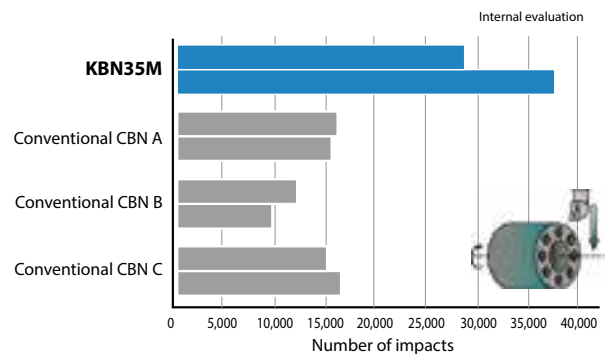
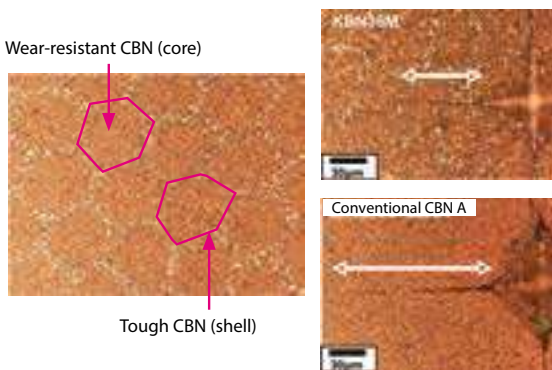


Features of honeycomb structure CBN

Classification	Grade	Color	Main component	Advantages and applications
H Hard materials	KBN35M (MEGACOAT)	Blackish red	CBN	<ul style="list-style-type: none"> • Honeycomb structure CBN composite material consisting of wear resistant CBN (core) and tough CBN (shell) • Heat-resistant MEGACOAT on tough Honeycomb structure CBN • Application: Stable machining of hardened steel at interrupted machining

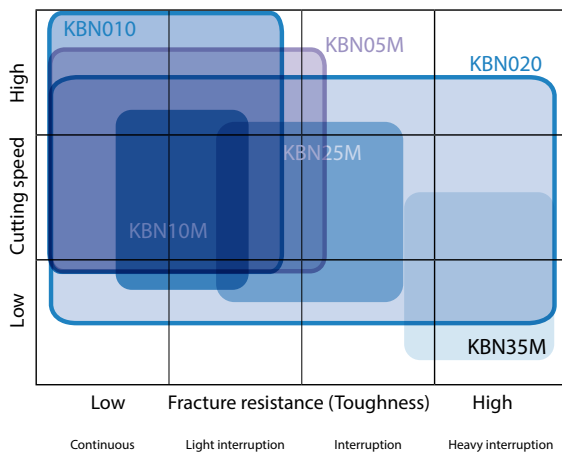
KBN35M (MEGACOAT honeycomb structure CBN)

Tough CBN (shell) prevents crack growth



Application map

Hard materials



Insert material selection table



Applications		Cutting range	Steel	Stainless steel	Gray cast iron	Nodular cast iron	Non-ferrous metals	Heat-resistant alloys	Titanium alloys	Hard materials	Sintered steel		
Turning		Finishing ↑ ↓	TN610	TN610	KBN475								
			CCX	TN620	KBN60M							KT66	
			TN620	TN60	KA30	TN60			KS6040			A66N	TN610
			TN60	PV720	PV7005	PV7005	KPD001	KW10				PT600M	TN60
			PV710	CA6515	CA5505	CA5505	KPD010	CA6515	KPD001	KBN010			
			PV720	CA6525	CA310	CA310	PDL010	CA6525	KPD010	KBN05M			
			PV730	CA510	PR1535	CA315	CA315	PDL025	PR0055	SW05	KBN020		KBN570
			CA510	PR1535			CA320	KW10	PR1155	SW10	KBN25M		KBN70M
			CA115P						PR1205	SW25	KBN35M		
			CA125P						PR1535		KBN900		
Small tools		Finishing ↑ ↓	TN610	TN610									
			TN620	TN620									
			PV710	PV720									
			PV720	PR1725	CA310	CA310	KPD001	CA6515	KPD001	KBN010			TN610
			PR1705	PR930	CA315	CA315	KPD010	PR1125	KPD010	KBN05M			TN60
			PR1725	PR1025	KW10	CA320	PDL010	PR1225	KW10	KBN020			KBN570
			PR930	PR1225		KW10	PDL025	PR1535	PR1535	KBN25M			KBN70M
			PR1025	PR1535			GW05						
			PR1535				KW10						
			Boring		Large ↑ Bore dia. ↓ Small	TN610							
TN620	TN60												
PV710	CA6515	KBN475											
PV720	CA6525	KBN60M										PT600M	TN610
PV730	PR1725	PV7005				PV7005	KPD001	CA6515	KPD001	KBN010			TN60
CA115P	PR1025	CA310				CA310	KPD010	CA6525	KPD010	KBN05M			
CA125P	PR1225	CA315				CA315	PDL010	PR1125	KW10	KBN020			KBN570
CA530	PR930	KW10				CA320	PDL025	PR1225	SW05	KBN25M			KBN70M
PR1705	PR930					KW10	GW05	PR1535	PR1535				
PR1725	PR1535						KW10						
Cut-Off		Large ↑ Cutting dia. ↓ Small	CR9025	CR9025									
			PR930	PR930									
			PR915	PR915	KW10	KW10	PDL025	KW10	KW10				
			PR1215	PR1215	PR1215	PR1215	KW10	PR1225					
			PR1225	PR1225				PR660					
Cut-Off		Depends on the workpiece material	PR1025	PR1025	KW10	KW10	PDL025	KW10	KW10				
			PR2025	PR1535	PR2015	PR2015	KW10	PR1025					
			PR1535	PR2035				PR1225					
Grooving		Glossy finish ↑ ↓ Stable	TC40N	TC40N									
			TN620	TN620									
			TN90	TN90	KW10	KW10	KPD001	PR915	KPD001	KBN510	TC40N		
			PV7040	PV7040	GW15	GW15	PDL025	KW10	KW10	KBN525			
			PR930	PR930	PR905	PR905	KW10	PR1215		PT600M	KBN570		
			PR1115	PR1115	PR2015	PR2015	GW15	PR1225					
			PR2015	PR2015	PR1215	PR1215		PR1535	PR1535				
PR1225	PR1225												
Threading		Glossy finish ↑ ↓ Stable	TC60M	TC60M	KW10	KW10	KW10	KW10	KW10			PR1515	
			PR1215	PR1515	GW15	GW15	GW15	GW15	GW15			PR1115	
			PR1115	PR1115									
			PR930	PR930									
Drilling		Wear resistance ↑ ↓ Toughness	CA520D		CA415D								
			PR1225	PR1225	PR1210	PR1210	KW10	PR1225	KW10				
			PR1230	PR1535	KW10	KW10	GW15	KW10					
			PR1535				GW15	GW15					
Milling		Finishing ↑ ↓ Roughing	TN100M	CA6535			KPD230	CA6535	KPD230				
			TN620M	PR1525	PR1510	PR1510	KPD001	PR1225	KPD001				
			PV60M	PR1835	PR1810	PR1810	KPD010	PR1535	KW10	PR0155			
			PR1825	PR1535	KW10	KW10	PDL025		PR905				
			PR1835				KW10		PR1535				
							GW25						

Highlighted materials are recommended choice.

Grade properties

Cermet

Grade	Color	Main component	Coating layer	Ratio	Hardness of substrate		Fracture toughness (MPa·m ^{1/2})	Transverse strength (MPa)
					(HV)	(GPa)		
TN610	Gray	TiCN	-	6.6	1,750	17.2	6.0	2,100
TN620				6.9	1,550	15.2	9.0	2,500
TN620M				6.9	1,550	15.2	9.0	2,500
TN6020				6.4	1,500	14.7	10.0	2,500
TN60		TiCN+NbC		6.6	1,600	15.7	9.0	1,760
TN90				6.4	1,450	14.2	10.0	1,960
TN100M				6.7	1,520	14.9	10.5	1,860
TC40				TiC+TiN	6.0	1,650	16.2	9.0	1,570
TC60		NbC		8.1	1,500	14.7	10.5	1,670

CVD coated cermet

Grade	Color	Coated composition	Coating layer	Ratio	Hardness of substrate		Fracture toughness (MPa·m ^{1/2})	Transverse strength (MPa)
					(HV)	(GPa)		
CCX	Gold	TiCN+Al ₂ O ₃ +TiN	Thin coating	7.0	1,500	14.7	10.0	2,600

PVD coated cermet

Grade	Color	Coated composition	Coating layer	Ratio	Hardness of substrate		Fracture toughness (MPa·m ^{1/2})	Transverse strength (MPa)
					(HV)	(GPa)		
PV710	Gold	MEGACOAT NANO	Thin coating	6.6	1,750	17.2	6.0	2,100
PV720				6.9	1,550	15.2	9.0	2,500
PV730				7.0	1,550	14.2	10.0	2,500
PV7005	Blackish red	MEGACOAT		6.0	1,650	16.2	8.5	1,470
PV7040				6.0	1,650	16.2	9.0	1,570
PV60M	Gold	MEGACOAT NANO		6.6	1,600	15.7	9.0	1,760

CVD coated carbide

Grade	Color	Coated composition	Coating layer	Ratio	Hardness of substrate		Fracture toughness (MPa·m ^{1/2})	Transverse strength (MPa)	
					(HV)	(GPa)			
CA025P	Gold	TiCN+Al ₂ O ₃ +TiN	Thick coating	14.2	1,400	13.7	13.5	2,800	
CA115P	Black and gold	TiCN+Al ₂ O ₃ +TiN		13.9	1,440	14.1	13.0	2,250	
CA125P				13.8	1,400	13.7	14.5	2,300	
CA310				Rose Gold	TiCN+Al ₂ O ₃ +Ti base	15.0	1,570	15.4	12.0	2,780
CA315	15.0	1,570				15.4	12.0	2,780	
CA320	15.0	1,570				15.4	12.0	2,780	
CA415D	Gold	TiCN+Al ₂ O ₃ +TiN		15.0	1,570	15.4	12.0	2,780	
CA420M				14.5	1,600	15.8	13.0	3,400	
CA450S	Blackish gray	TiCN+Al ₂ O ₃		15.0	1,790	17.5	9.5	2,350	
CA451S				15.0	1,570	15.4	12.0	2,780	
CA510	Gold	TiCN+Al ₂ O ₃ +TiN		14.5	1,470	14.4	11.5	2,500	
CA515				14.4	1,440	14.1	12.5	2,650	
CA520D				14.7	1,370	13.4	16.0	3,100	
CA525				14.2	1,360	13.3	13.5	2,750	
CA530				13.9	1,340	13.1	14.5	2,850	
CA651S				Thin coating	14.7	1,530	15.0	12.0	2,780
CA652S					14.7	1,370	13.4	16.0	3,100
CA653S					14.3	1,320	12.9	16.0	3,700
CR902S					Thick coating	14.5	1,400	13.7	12.0	2,780



Grade properties

PVD coated carbide

Grade	Color	Coated composition	Coating layer	Ratio	Hardness of substrate		Fracture toughness (MPa·m ^{1/2})	Transverse strength (MPa)
					(HV)	(GPa)		
PR005S	Gray black	MEGACOAT HARD	Thin coating	15.0	1,750	17.2	8.0	2,000
PR015S				14.9	1,680	16.5	9.0	2,400
PR115S	Dark grey black	MEGACOAT TOUGH		14.9	1,680	16.5	9.0	2,400
PR120S				14.6	1,500	14.7	14.0	2,700
PR905	Bluish violet	TiAlN		14.8	1,720	16.8	9.0	2,450
PR915				14.1	1,700	16.7	11.0	4,140
PR930	Reddish gray	TiCN		14.1	1,700	16.7	11.0	4,140
PR102S				14.5	1,600	15.8	13.0	3,400
PR111S	Purple red	TiAlN		14.7	1,700	16.7	11.0	3,000
PR1210	Blackish red	MEGACOAT		14.8	1,720	16.8	9.0	2,450
PR121S				14.7	1,700	16.7	11.0	3,000
PR122S				14.5	1,600	15.8	13.0	3,400
PR1230				13.7	1,450	14.2	13.0	2,250
PR1510	Reddish green	MEGACOAT NANO		14.8	1,720	16.8	9.0	2,450
PR151S				14.7	1,700	16.7	11.0	3,000
PR152S				14.5	1,600	15.8	13.0	3,400
PR153S				14.3	1,320	12.9	16.0	3,700
PR162S				14.5	1,600	15.8	13.0	3,400
PR170S	Silver	MEGACOAT NANO PLUS		14.9	1,800	17.6	10.0	3,300
PR172S				14.5	1,600	15.8	13.0	3,400
PR1810	Light reddish green	MEGACOAT NANO EX		14.9	1,680	16.5	9.0	2,400
PR182S				14.5	1,600	15.8	13.0	3,400
PR183S				14.3	1,320	12.9	16.0	3,700
PR201S	Dark blackish red			14.7	1,700	16.7	11.0	3,000
PR202S				14.5	1,600	15.8	13.0	3,400
PR203S				14.3	1,320	12.9	16.0	3,700

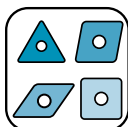
Carbide

Grade	Color	Main component	Coating layer	Ratio	Hardness of substrate		Fracture toughness (MPa·m ^{1/2})	Transverse strength (MPa)
					(HV)	(GPa)		
KW10	Gray	WC+Co	-	15.0	1,650	16.2	10.0	1,470
GW05				14.9	1,800	17.6	10.0	3,300
GW15				14.7	1,700	16.7	11.0	3,000
GW25				14.5	1,600	15.8	13.0	3,400
SW05				15.0	1,790	17.5	9.5	2,350
SW10				14.8	1,720	16.8	9.0	2,450
SW25				14.7	1,370	13.4	16.0	3,100

DLC coated carbide

Grade	Color	Coated composition	Coating layer	Ratio	Hardness of substrate		Fracture toughness (MPa·m ^{1/2})	Transverse strength (MPa)
					(HV)	(GPa)		
PDL010	Rainbow color	C	Thin coating	15.0	1,650	16.2	10.0	1,470
PDL01S				14.7	1,700	16.7	11.0	3,000
PDL02S				14.5	1,600	15.8	13.0	3,400

Turning indexable inserts



B

Introduction		B2	
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Positive type chipbreaker		B12	
Page Guide		B15	
Cermet / coated carbide / carbide lineup		B16	
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	55° Rhombic	B24	
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	90° Square	B33	
	60° Triangle	B38	
	35° Rhombic	B46	
	80° Trigon	B49	
	Small double sided tools	B54	
	Small double sided tools	B55	
	Small double sided tools	B56	
	Positive inserts	80° Rhombic	B58
		55° Rhombic	B68
70° Rhombic		B80	
Round		B81	
90° Square		B82	
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Negative inserts	80° Rhombic	B113	
	55° Rhombic	B114	
	75° Rhombic	B115	
	Round	B116	
	90° Square	B117	
	60° Triangle	B118	
	35° Rhombic	B119	
	Positive inserts	Round	B120
Square		B121	
Triangle		B122	
Inserts for high hardened roll		B123	
Grooving inserts		B124	

B

Turning indexable inserts identification system

Symbol	Shape
H	Hexagon
O	Octagon
P	Pentagon
S	Square
T	Triangle
C	80° Rhombic
D	55° Rhombic
E	75° Rhombic
F	50° Rhombic
M	86° Rhombic
V	35° Rhombic
W	80° Trigon
L	Rectangle
A	85° Parallelogram
B	82° Parallelogram
K	55° Parallelogram
R	Round

Shown angle stands for acute angle for rhombic and parallelogram inserts.

«1» Shape symbol

Symbol	Relief angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°

«2» Relief angle symbol

Symbol class	Tolerance (mm)		
	Corner height	Thickness	I.C. size
A	±0.005	±0.025	±0.025
F			±0.013
C	±0.013		±0.025
H			±0.013
E	±0.025	±0.13	±0.025
G			±0.025
J	±0.005	±0.05 - ±0.15	
K*	±0.013		
L*	±0.025		
M*	±0.08 - ±0.18			±0.13
N*	±0.13 - ±0.38	±0.025	±0.08 - ±0.25
U*		±0.13	

* Insert's periphery is as fired. Tolerance difference is depending on insert size.

«3» Tolerance symbol

Symbol	Hole	Hole shape	Chipbreaker	Shape
N	No	-	No	
R			Single sided	
F			Double sided	
A	With hole	-	No	
M			Single sided	
G			Double sided	
W			No	
T	Yes	With hole and one countersink 40° - 60°	Single sided	
Q			No	
U	Yes	With hole and two countersink 40° - 60°	Double sided	
B			No	
H	Yes	With hole and one countersink 70° - 90°	Single sided	
C			No	
J	Yes	With hole and two countersink 70° - 90°	Double sided	
X			-	-

«4» Hole / Chipbreaker symbol

ISO
metric



ANSI
inch



«5» Edge length symbol (ISO)							I.C. size (mm)	«5» I.C. size (ANSI)	
C	D	R	S	T	V	W		IC size (inch)	Symbol
03	04		03	06			3.97	5/32	12
04	05		04	08	08		4.76	3/16	15
		05					5		
05	06		05	09			5.56	7/32	18
		06					6		
06	07		06	11	11	04	6.35	1/4	2
08	09		07	13		05	7.94	5/16	25
		08					8		
09	11	09	09	16	16	06	9.525	3/8	3
		12	10				10		
		12					12		
12	15	12	12	22	22	08	12.7	1/2	4
16	19	15	15	27	27	10	15.875	5/8	5
		16					16		
19	23	19	19	33	33	13	19.05	3/4	6
		20					20		
22	27		22	38			22.225	7/8	7
		25					25		
25	31	25	25	44	44	17	25.4	1	8
32	38	31	31	54	54	21	31.75	1-1/4	10
		32					32		

«6» Thickness symbol			
ISO		ANSI	
Thickness (mm)	Symbol	Thickness (inch)	Symbol
1.59	01	1/16	1
1.98	T1	5/64	12
2.38	02	3/32	15
2.78	T2	-	-
3.18	03	1/8	2
3.97	T3	5/32	25
4.76	04	3/16	3
5.56	05	7/32	35
6.35	06	1/4	4
7.94	07	5/16	5
9.525	09	3/8	6

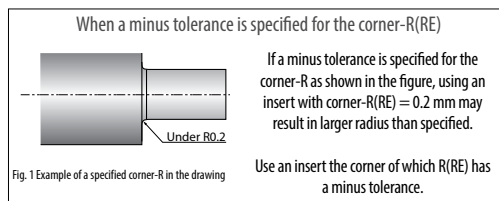
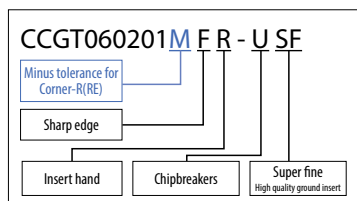
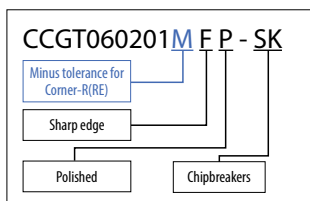
Thickness displayed as the distance between bottom surface and highest point on cutting edge.

«7» Corner-R (RE) symbol			
ISO		ANSI	
Corner-R(RE) (mm)	Symbol	Corner-R(RE) (inch)	Symbol
Sharp corner	00	.000	00
0.03	003	.001	01
0.05	005	.002	013
0.1	01	.004	02
0.2	02	.008	05
0.4	04	1/64	1
0.8	08	1/32	2
1.2	12	3/64	3
1.6	16	1/16	4
2.0	20	5/64	5
2.4	24	3/32	6
2.8	28	7/64	7
3.2	32	1/8	8
Round insert	00 (inch) or M0 (metric)	Round insert	0

«8» Manufacturer's option
Hand symbol, chipbreaker symbol, etc.

· Expressed as edge length for ISO.
· ANSI expresses the inscribed circle diameter in inches.





Positive inserts identification system



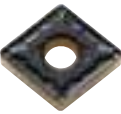



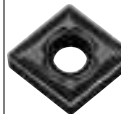

Insert colour

Red colour = New grade







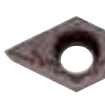
Cermet

Grades	Cermet									CVD coated cermet	MEGACOAT NANO cermet				MEGACOAT cermet	
	TN610	TN620	TN620M	TN6020	TN60	TN90	TN100M	TC40N	TC60M		CCX	PV710	PV720	PV730	PV60M	PV7005	PV7040
Insert colour																


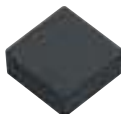

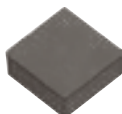
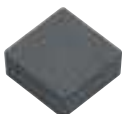
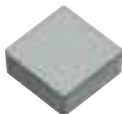
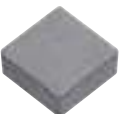
CVD coated carbide

Grades	CVD coated carbide												
	CA115P	CA125P	CA310	CA315	CA320	CA415D	CA520D	CA420M	CA45 series	CA025P	CA5 series	CA65 series	CR9025
													

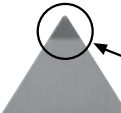


PVD coated carbide

Grades	MEGACOAT NANO					MEGACOAT NANO PLUS		MEGACOAT NANO EX			MEGACOAT HARD			MEGACOAT				PVD coated carbide					
	PR1510	PR1515	PR1525	PR1535	PR1625	PR1705	PR1725	PR1810	PR1825	PR1835	PR0055	PR0155	PR1155	PR1205	PR1210	PR1215	PR1225	PR1230	PR905	PR915	PR930	PR1025	PR1115
																							


Ceramic

Grades	Aluminum oxide ceramic			PVD coated ceramic		MEGACOAT ceramic		Silicon nitride ceramic		CVD coated silicon nitride ceramic		SiAlON ceramic		
	KA30	A65	KT66	A66N		PT600M		KS6015	KS6050	C57050		KS6030	KS6040	
														


CBN & PCD

Grades	CBN				PCD			MEGACOAT TOUGH CBN / MEGACOAT CBN			PVD coated CBN	
	KBN475	KBN510	KBN525	KBN570	KPD001	KPD010	KPD230	KBN010	KBN020	KBN..M	KBN900	
Insert colour												

DLC coated carbide

Grades	DLC coated carbide		
	PDL010	PDL015	PDL025
Insert colour			

Uncoated carbide

Grades	Carbide				
	GW05	GW15	GW25	KW10	SW05
Insert colour					

B



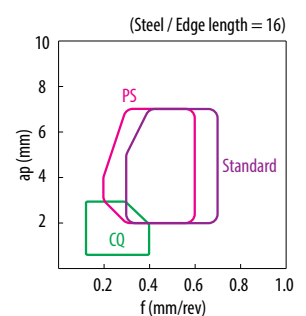
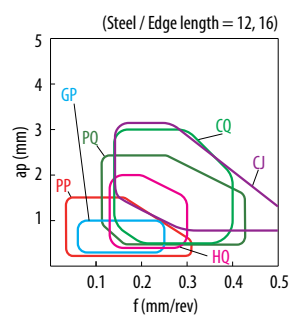
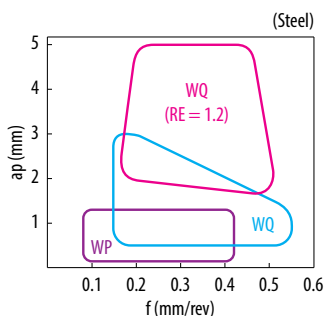
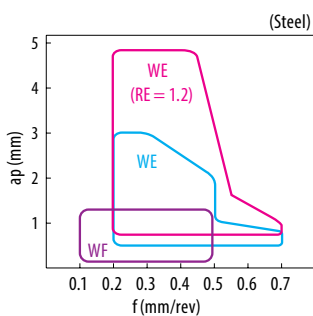
Turning indexable inserts

Chip breakers


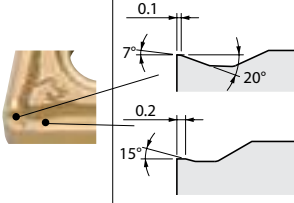
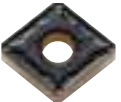
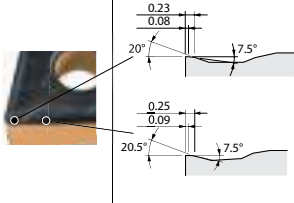

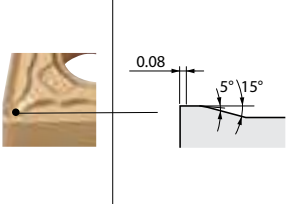

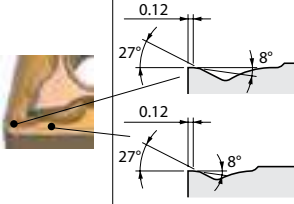

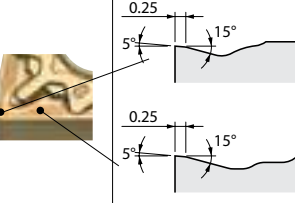

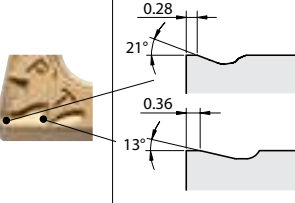

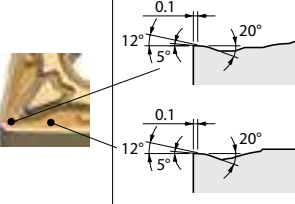

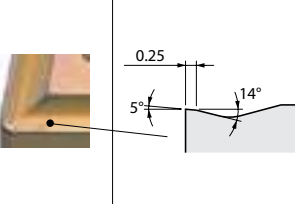
Steel (Molded chipbreaker)

Cutting range	Name	Design		Advantages	Cutting range	Name	Design		Advantages
Finishing	WF			<ul style="list-style-type: none"> Wiper insert Good chip control in finishing operations Excellent surface roughness by controlling adhesion Less cutting force due to sharp cutting edge 	Finishing	PP			<ul style="list-style-type: none"> 3-step dot structure realizes stable chip control at a wide range of feed rate Less cutting force due to sharp cutting edge and smooth rake face
Finishing	WP			<ul style="list-style-type: none"> Wiper insert Good chip control at small machining 	Finishing - Medium	PQ			<ul style="list-style-type: none"> Stable chip control in a wide feed rate range by breaking chips effectively Well-balanced edge sharpness and toughness
Finishing - Medium	WE			<ul style="list-style-type: none"> Wiper insert Good surface finish at high feed machining High productivity with smooth chip control in a wide range of applications 	Finishing	GP			<ul style="list-style-type: none"> Finishing to light machining Good chip control
Finishing - Medium	WQ			<ul style="list-style-type: none"> Wiper insert Double feed rate possible while maintaining a smooth finish High efficiency and good chip control 	Finishing - Medium	HQ			<ul style="list-style-type: none"> Sharp cutting performance with 3-D rake angle and double projection design
					Finishing - Medium	CQ			<ul style="list-style-type: none"> Good chip control for varied ap such as copying Applicable to up facing

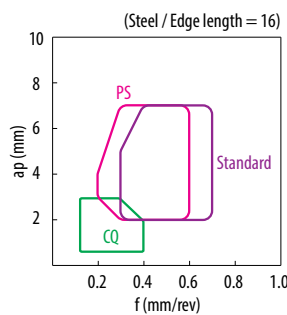
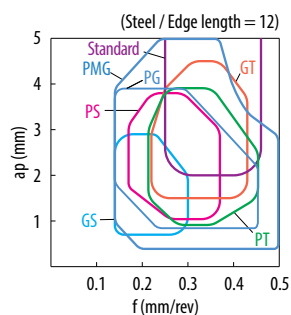
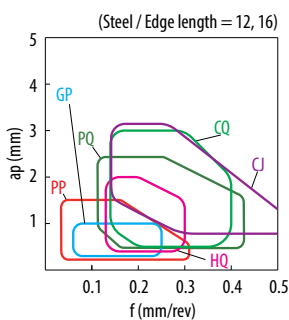
Applicable chipbreaker range (ap indicates radius)



Steel (Molded chipbreaker)

Cutting range	Name	Design		Advantages
Finishing - Medium / up facing	CJ			<ul style="list-style-type: none"> Improved chip curling at small machining and high feed rate machining Improved chip evacuation at copying and up facing
Medium - Roughing	PMG			<ul style="list-style-type: none"> 1st Recommendation for medium-roughing process Good chip control in a wide range of machining areas Reduced crater wear leads to longer tool life
Medium - Roughing	PG			<ul style="list-style-type: none"> Stable machining with good balance of edge sharpness and strength Prevent chip dogging at high feed rate Good chip control at low feed rate Stable machining with wide chip control range
Medium - Roughing	GS			<ul style="list-style-type: none"> Strong edge chipbreaker Stable for continuous machining and light interrupted machining
Medium - Roughing / High feed rate	PS			<ul style="list-style-type: none"> General purpose chipbreaker More stable due to large contact surface
Medium - Roughing / High feed rate	PT			<ul style="list-style-type: none"> Low cutting force at high feed machining Land support structure
Medium - Roughing / High feed rate	GT			<ul style="list-style-type: none"> Strong edge chipbreaker Wide land design and smooth chip control even at high feed rate machining
Roughing (without indication)	Standard (without indication)			<ul style="list-style-type: none"> Low cutting force and applicable to large ap roughing

Applicable chipbreaker range (ap indicates radius)

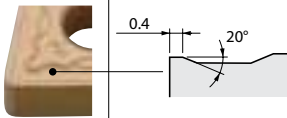


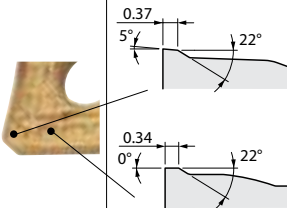
B



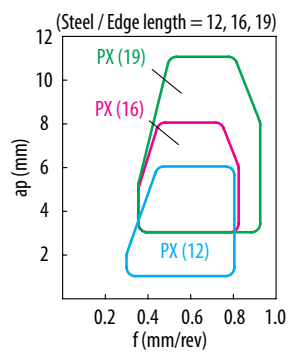
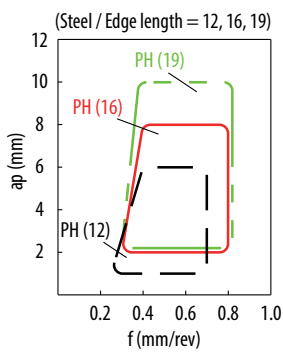
Turning indexable inserts

Steel (Molded chipbreaker)

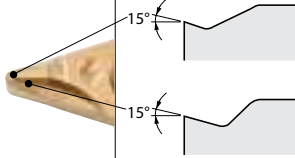
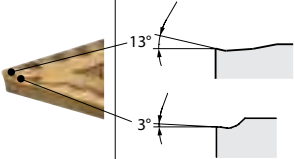
Cutting range	Name	Design	Advantages
Roughing	PH		<ul style="list-style-type: none"> Suitable for heavy interrupted machining and for workpieces with scale due to strong cutting edge

Cutting range	Name	Design	Advantages
Roughing (high feed rate)	PX	 Single-sided	<ul style="list-style-type: none"> Roughing and high feed rate operation Low cutting force chipbreaker

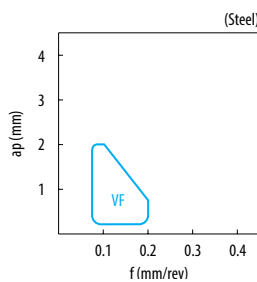
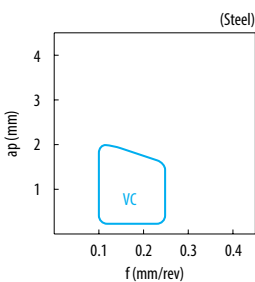
Applicable chipbreaker range (ap indicates radius)




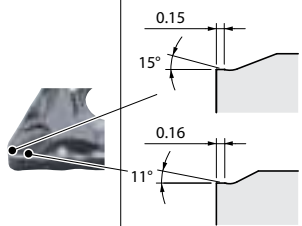

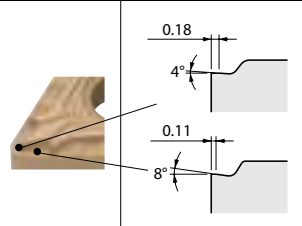

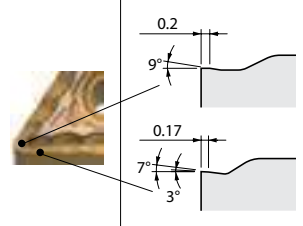

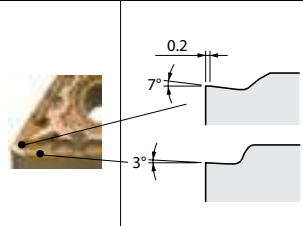
Steel (copying / undercutting, varied ap)

Cutting range	Name	Design	Advantages
Finishing - Medium	VC		<ul style="list-style-type: none"> Handed chipbreaker for copying Good chip control at varied ap because of the large space on the main cutting edge side
Finishing - Medium	VF		<ul style="list-style-type: none"> Good chip control at varied ap such as copying and undercutting

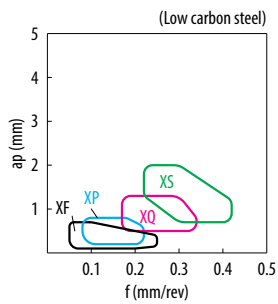
Applicable chipbreaker range (ap indicates radius)




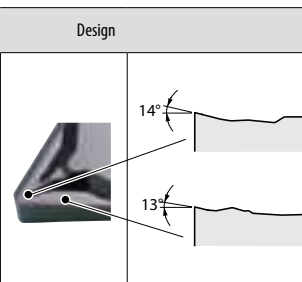

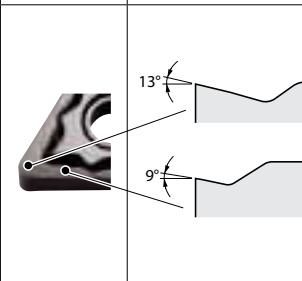

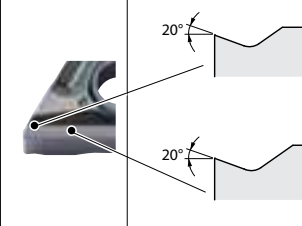
Low carbon steel (pipe / rolled plate / rolled steel)

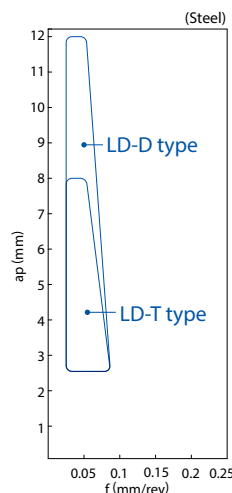
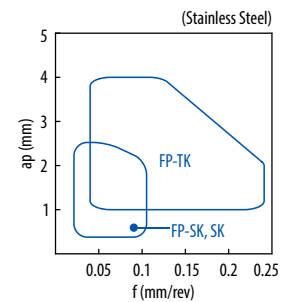
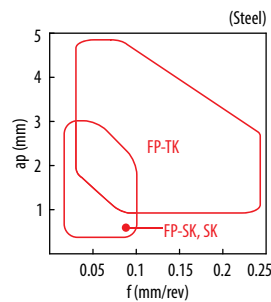
Cutting range	Name	Design		Advantages
Finishing	XF			• Excellent chip control at high speed and small ap machining of low carbon steel
	XP			• Short chips due to sharp cutting and special design
Medium	XQ			• Consistent chip breaking due to moderate rake face and special design
	XS			• Consistent chip breaking due to special rake face and rake angle design

Applicable chipbreaker range (ap indicates radius)



Steel / Stainless steel (for automatic lathe)

Cutting range	Name	Design		Advantages
Finishing - Medium	SK	 - FP-SK: Polished sharp edge - SK: Honed		• Machining in automatic lathes • Sharp cutting performance equivalent to positive inserts • 2-step dot design provides reliable chip control at various ap
Medium - Roughing	FP-TK			• Good in automatic lathes (When machining workpieces of medium to large diameter) • Superior cutting performance achieved by sharp edge and polished surface • Smooth chipbreaker geometry improves chip flow with less adhesion • Large curled chips
Large ap	LD			• Available for greater depths of cut than many conventional chipbreakers • Achieves high-precision machining in a single pass • Chipbreaker shape optimized for various depths of cut • Stable chip control in a wide range of machining applications



B

Turning indexable inserts

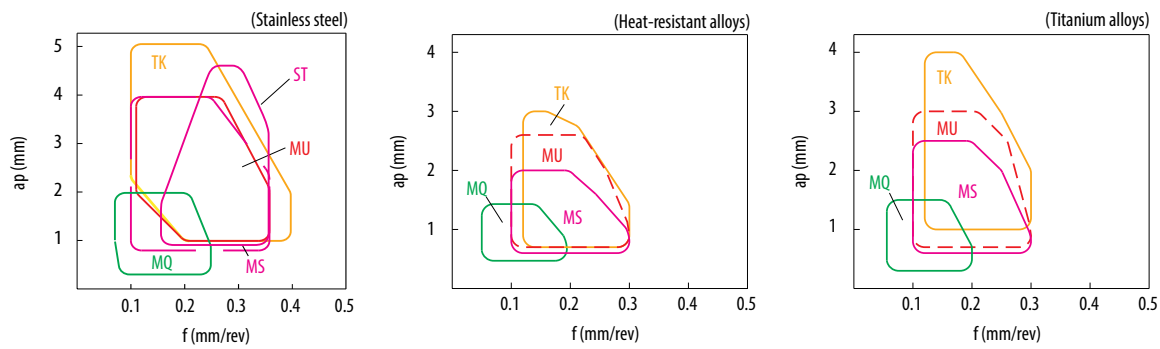


Chip breakers

Stainless steel / Heat-resistant alloys / Titanium alloy

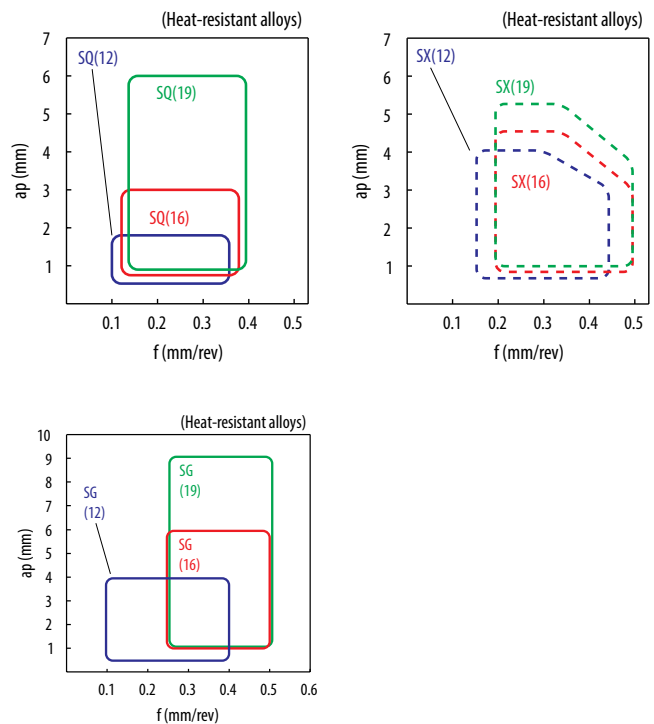
Cutting range	Name	Design	Advantages
Finishing	MQ		<ul style="list-style-type: none"> Large rake angle Low cutting force and good chip control
	TK		<ul style="list-style-type: none"> Smooth chipbreaker geometry improves chip flow with less adhesion Large curled chips
	ST		<ul style="list-style-type: none"> Less cutting force due to large rake angle Less notching by special design
Medium - Roughing	MS		<ul style="list-style-type: none"> Superior cutting edge sharpness and strength achieved by a positive land Extra strength of cutting edge inhibits damage from wall shouldering
	MU		<ul style="list-style-type: none"> Large rake angle reduces cutting force Less burring achieved by diminishing damage from notching

Applicable chipbreaker range (ap indicates radius)


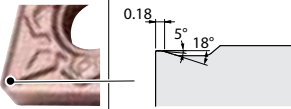

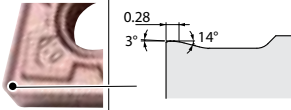

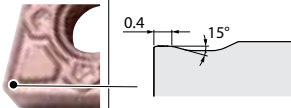


Heat-resistant alloys

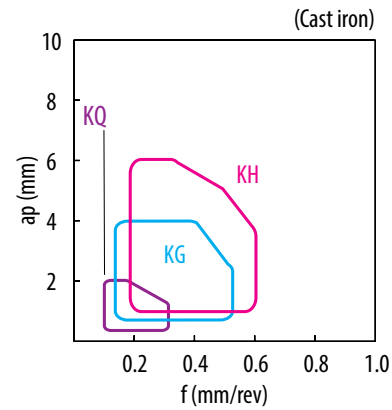
Cutting range	Name	Design	Advantages
Finishing - Medium	SQ		<ul style="list-style-type: none"> Effective for burr suppression and reducing notching by slant cutting edge (inclined in (-) direction)
Roughing	SG		<ul style="list-style-type: none"> Well-balanced edge strength Cutting force reduction for stable machining at high-load cutting Shallow and gently curved breaker controls chips smoothly
Roughing	SX		<ul style="list-style-type: none"> Slant cutting edge reduces cutting force Less burring achieved by unique cutting edge design



Cast iron (K series)

Cutting range	Name	Design		Advantages
Sharp cutting oriented	KQ			<ul style="list-style-type: none"> • Sharp cutting chipbreaker • Edge geometry is suitable for workpieces that require sharpness such as thin-walled
Roughing	KG			<ul style="list-style-type: none"> • Excellent balance of sharpness and strength • Realized stability at continuous machining
Roughing	KH			<ul style="list-style-type: none"> • Good for heavily interrupted machining • Strong edge chipbreaker • Improved locating / seating in the toolholder pocket, high reliability achieved

Applicable chipbreaker range (ap indicates radius)


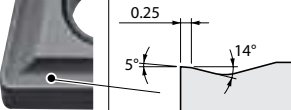
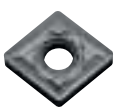
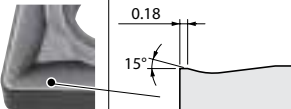



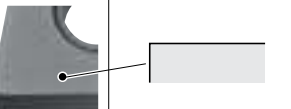


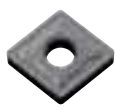
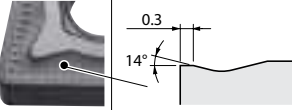

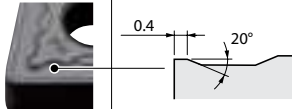
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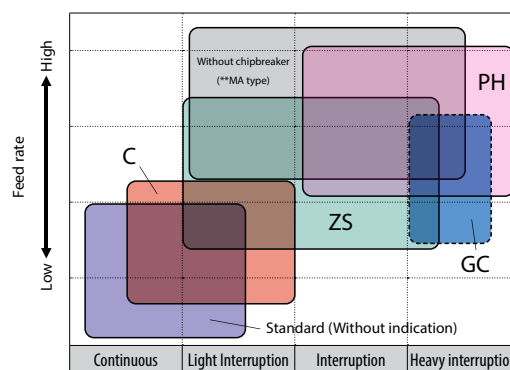


Turning indexable inserts

Cast iron

Cutting range	Name	Design		Advantages
Sharp cutting oriented	Standard (Without Indication)			<ul style="list-style-type: none"> • Standard type for continuous to light interrupted cut (Low cutting force)
	C			<ul style="list-style-type: none"> • High feed rate chipbreaker for continuous to light interrupted cut
	ZS			<ul style="list-style-type: none"> • Standard type for light interrupted to interrupted cut (Stability oriented)
	Without chipbreaker			<ul style="list-style-type: none"> • High feed rate chipbreaker for light interrupted to interrupted cut

Cutting range	Name	Design		Advantages
Stability oriented	GC			<ul style="list-style-type: none"> • For heavy interrupted cut (Tough edge chipbreaker)
	PH			<ul style="list-style-type: none"> • For roughing • Suitable for heavy interrupted cut and for workpieces with scale due to strong cutting edge


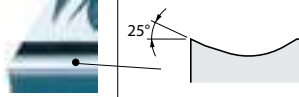



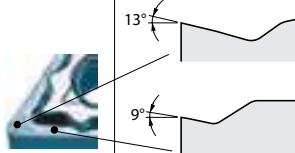
B

Non-ferrous metals

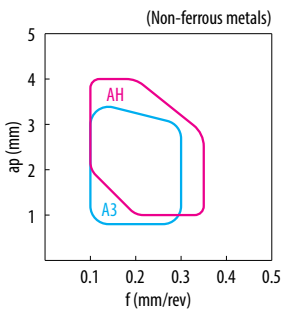




Turning indexable inserts



Cutting range	Name	Design		Advantages
Finishing - Medium	A3			<ul style="list-style-type: none"> • Large rake angle and smooth surface • Good chip control and less adhesion

Cutting range	Name	Design		Advantages
Medium - Roughing	AH		 <p>G class: Sharp edge M class: Horned edge prep.</p>	<ul style="list-style-type: none"> • Polished chipbreaker • Smooth chip control and less adhesion

Applicable chipbreaker range (ap indicates radius)



A3 chipbreaker	
	ap = 2 mm f = 0.2 mm/rev
	ap = 2 mm f = 0.3 mm/rev

AH chipbreaker	
	ap = 2 mm f = 0.2 mm/rev
	ap = 2 mm f = 0.3 mm/rev

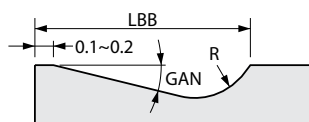
Steel (Ground chipbreaker)

Cutting range	Name	Design		Advantages
Finishing - Medium	S			<ul style="list-style-type: none"> • Sharp edge and less cutting force • Good chip control and smooth chip evacuation
Medium - Roughing / Low cutting force	25R			<ul style="list-style-type: none"> • Applicable to sticky material such as low carbon steel • Large rake angle and suitable for stainless steel

Effectiveness of ground chipbreaker

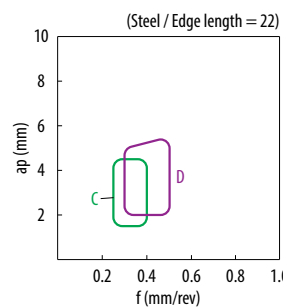
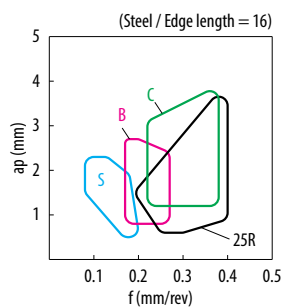
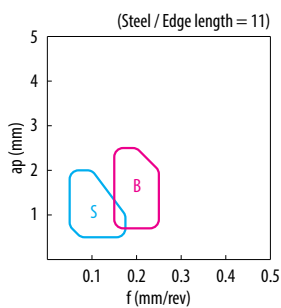
1. Lower cutting force and improve edge
2. Improved adhesion resistance
3. Improved dimension accuracy and finishing surface accuracy
4. Controlled chip evacuation direction

Specification of B, C and parallel ground chipbreaker



Insert type	Size	Chipbreaker name	LBB	GAN	R
CNGG	09,12	Without indication (Similar to C)	2.2	14°	1.0
WNGG	06	Without indication (Similar to C)	2.2	14°	1.0
TNGG	11,16	B	1.5	14°	0.5
	16,22	C	2.2	14°	1.0
DNGG	11,15	Without indication (Similar to C)	2.5	14°	2.0
VNGG	16	Without indication (Similar to B)	1.5	14°	0.5
SNGG	09,12	B	1.5	14°	0.5
	12	C	2.2	14°	1.0

Applicable chipbreaker range (ap indicates radius)



B



Turning indexable inserts

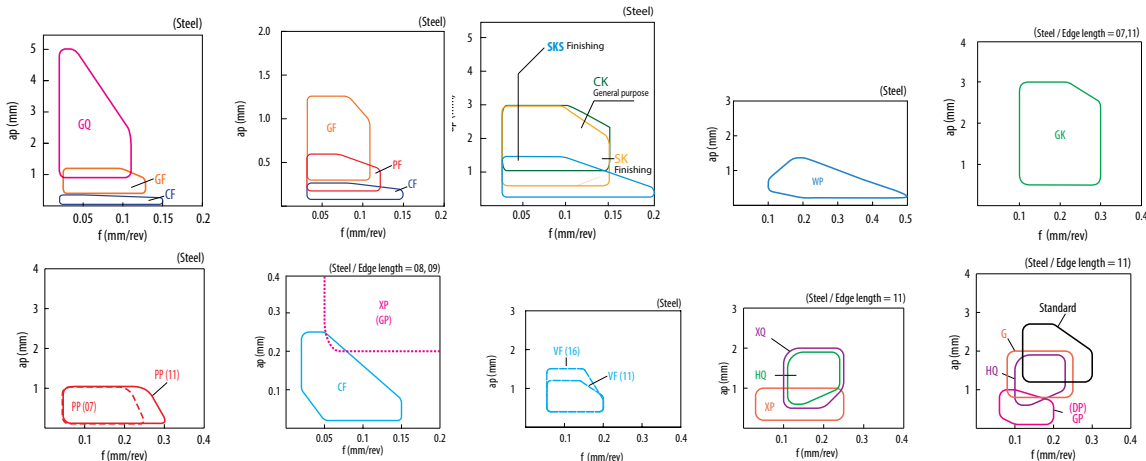
Chip breakers

Steel (Molded chipbreaker)

Cutting range	Name	Design	Advantages
Minute ap	CF		• Available for minute ap (0.02 to 0.2 mm) finishing
Finishing	PF		• Chipbreaker for finishing boring available from ap 0.15~0.6 mm
Finishing	GF		• Chips fragmented in small pieces in machining of small ap
Finishing - Medium	GQ		• Wide range of conditions by using the optimum chipbreaker width according to the cutting depth
Finishing	SKS		• Chipbreaker for finishing available from 0.2~1.5mm • Rake face, bottom face and chipbreaker face provide stable chip control.
Finishing	SK		• Sharp cutting performance due to large rake angle • Large dot to the corner edge improved chip control in a wide feed rate range
Finishing	CK		• Good cutting performance • Applicable without hand for two direction machining on automatic lathe
Finishing	WP		• Wiper insert • Good surface finish and good chip control at high feeds • Reduces surface finish galling

Cutting range	Name	Design	Advantages
Finishing - Medium	GK		• Good chip evacuation at wide range by breaker dot and wide chip pocket
Finishing	PP		• 1st. recommendation • Stable chip control in a wide feed rate range • Stable tool life due to special edge design with sharpness and improved strength
Finishing	DP		• Consistent chip breaking performance for finishing
Finishing	GP		• Good chip control
Finishing	VF		• Good chip control for varied ap such as copying and undercutting
Finishing - Medium	HQ		• General purpose chipbreaker for medium machining
Medium	G		• Chipbreaker for short chips
Medium (without indication)			• Strong edge chipbreaker

Applicable chipbreaker range (ap indicates radius)

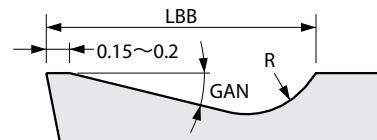


Steel (Ground chipbreaker)

Cutting range	Name	Design		Advantages
Finishing	Lead (Without Indication)			• Good chip control at finishing to light machining with low cutting force
Finishing	F			• Good chip control at finishing to light machining with low cutting force
Finishing	P			• Flows chips towards the inlet of hole • Sharp edge
Medium	Y			• Sharp cutting performance and good surface finish
Low Feed	J			• Slant chipbreaker width and chip control at various ap • Applicable to automatic lathes
Low Feed	U			• Good chip control at low feed rate and varied ap with low cutting force

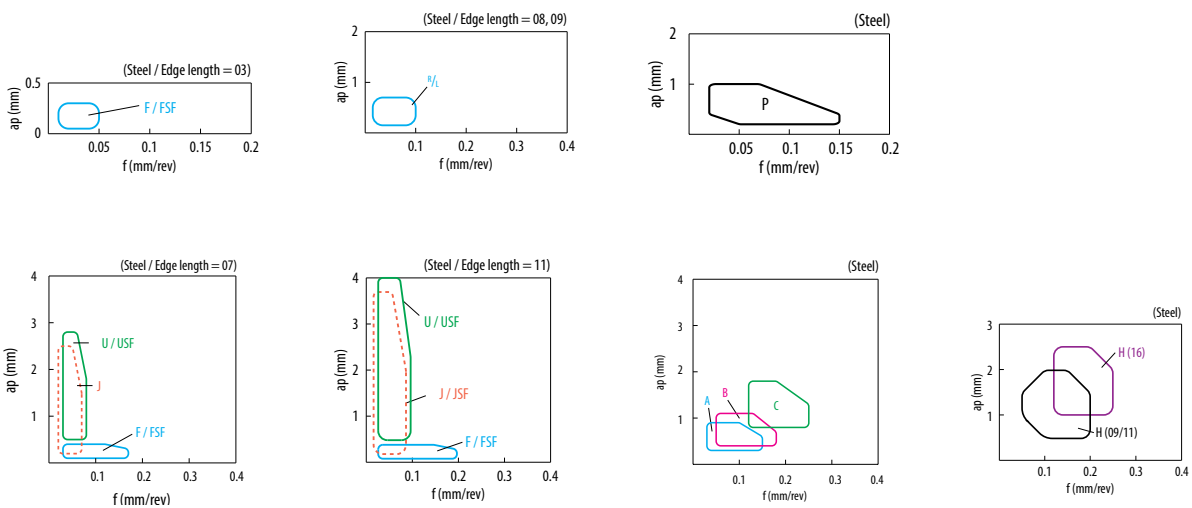
Cutting range	Name	Design		Advantages
Finishing	A			• Large rake angle and low cutting force • Narrow chipbreaker width and consistent chip control
Finishing - Medium	B			• General purpose chipbreaker for medium machining • Good balance between chip control and sharp cutting
Medium	C			• Applicable to high load machining • Good chip flow and less resistance
Medium	H			• Sharp cutting performance and small curled chips

Specification of A, B, C and parallel ground chipbreaker




Insert type	Size	Chipbreaker name	LBB	GAN	R
TPGR	11	A	1.0	17°	0.5
	11,16	B	1.5	14°	0.5
	16	C	2.2	14°	1.0
SPGR	09	Without indication (Similar to B)	1.5	14°	0.5
	12	Without indication (Similar to C)	2.2	14°	1.0

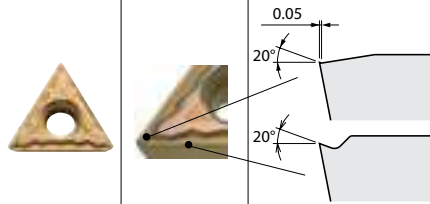
Applicable chipbreaker range (ap indicates radius)



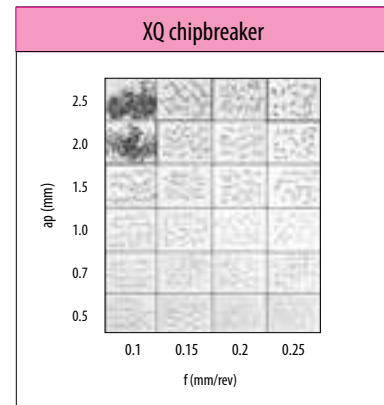
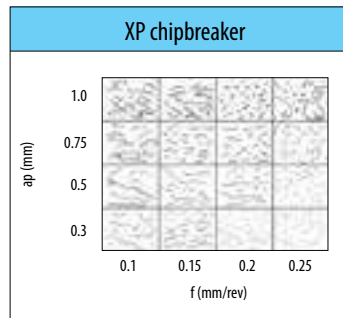
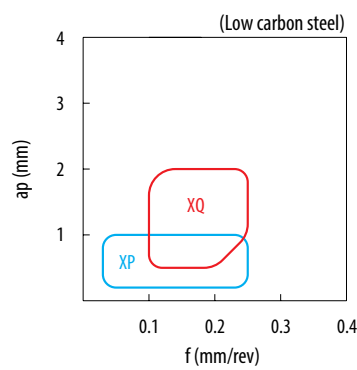
B

Low carbon steel (pipe / rolled plate / rolled steel)

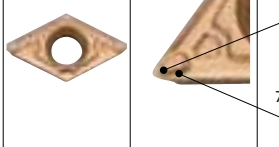
Cutting range	Name	Design	Advantages
Finishing	XP		<ul style="list-style-type: none"> Consistent chip breaking performance even for low carbon steel and sticky material

Cutting range	Name	Design	Advantages
Finishing - Medium	XQ		<ul style="list-style-type: none"> Wide chip control range and sharp cutting performance Suitable for low carbon steel and sticky material

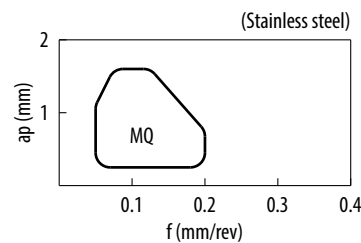
Applicable chipbreaker range (ap indicates radius)



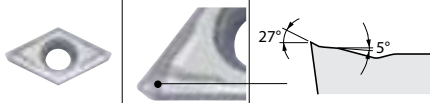
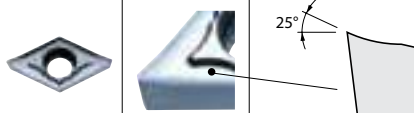
Stainless steel


Cutting range	Name	Design	Advantages
Finishing	MQ		<ul style="list-style-type: none"> Good chip evacuation at internal turning Small curled chips Prevents chip entanglement with toolholder and stabilizes surface roughness

Applicable chipbreaker range (ap indicates radius)

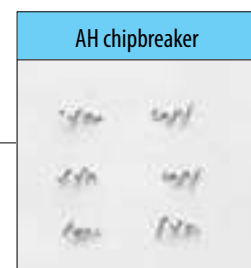
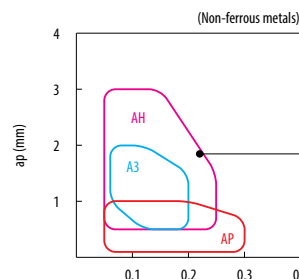


Non-ferrous metals

Cutting range	Name	Design	Advantages
Finishing	AP		<ul style="list-style-type: none"> Curved edge and shape of chipbreaker lead good chip control Sharp cutting edge provides excellent surface finish Polished chipbreaker
Finishing - Medium	AH		<ul style="list-style-type: none"> Positive chip groove and good chip control with low cutting force Polished surface reduces adhesion

Cutting range	Name	Design	Advantages
Finishing - Medium	A3		<ul style="list-style-type: none"> Large rake angle, smooth chip flow and less adhesion Superior cutting performance achieved by sharp edge

Applicable chipbreaker range (ap indicates radius)

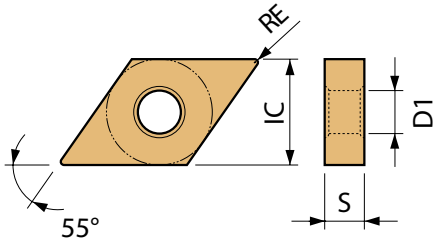


Turning indexable inserts

Chip breakers

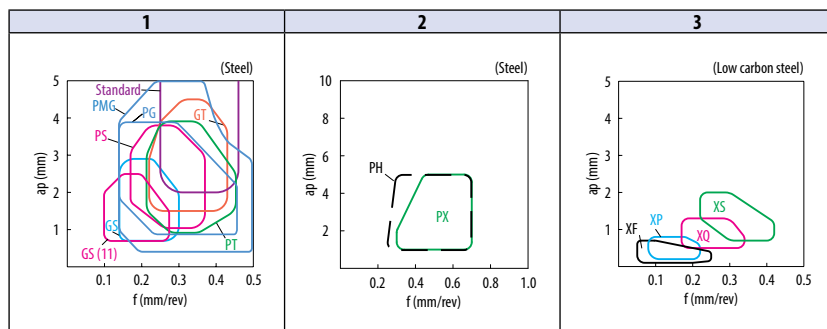
55° Rhombic

How to read pages of "Turning inserts" See page B15



Insert	Description	Applicable chipbreaker range	No. of edges	Dimension (mm)				Material										Applicable toolholder										
				IC	S	D1	RE	Material																				
								Free-cutting steel	Carbon steel / Alloy steel	Stainless steel	Gray cast iron	Nodular cast iron	Non-ferrous metals	Heat-resistant alloy	Titanium alloy	Hard materials	P		M	K	N	S	H					
Roughing	DNMG 150404 150408 150412	1	4	12.7	4.76	5.16	0.4 0.8 1.2	CA02SP	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17 F120, F136 F138~F140
	CA02SP							CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17	
Roughing	DNMG 150408PH 150412PH 150416PH	2	4	12.7	4.76	5.16	0.8 1.2 1.6	CA02SP	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17 F120, F136 F138~F140
	CA02SP							CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17	
Roughing	DNMM 150408PX 150412PX 150416PX	2	2	12.7	4.76	5.16	0.8 1.2 1.6	CA02SP	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17 F120, F136 F138~F140
	CA02SP							CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17	
Low carbon steel	DNMG 150404XF 150408XF	3	4	12.7	4.76	5.16	0.4 0.8	CA02SP	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17 F120, F136 F138~F140
Finishing / Minute ap	CA02SP							CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17	
Low carbon steel	DNMG 150404XP 150408XP	3	4	12.7	4.76	5.16	0.4 0.8	CA02SP	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17
	Finishing							CA02SP	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17
Low carbon steel	DNMG 150404XQ 150408XQ	3	4	12.7	4.76	5.16	0.4 0.8	CA02SP	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17 F120, F136 F138~F140
	Medium							CA02SP	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17
Low carbon steel	DNMG 150408XS	3	4	12.7	4.76	5.16	0.8	CA02SP	CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17 F120, F136 F138~F140
Roughing	CA02SP							CA115P	CA125P	CA310	CA315	CA320	CA4505	CA4515	CA510	CA515	CA525	CA530	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620	D13~D17	

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

B



Turning indexable inserts

55° Rhombic

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Negative

C

D

R

S

T

V

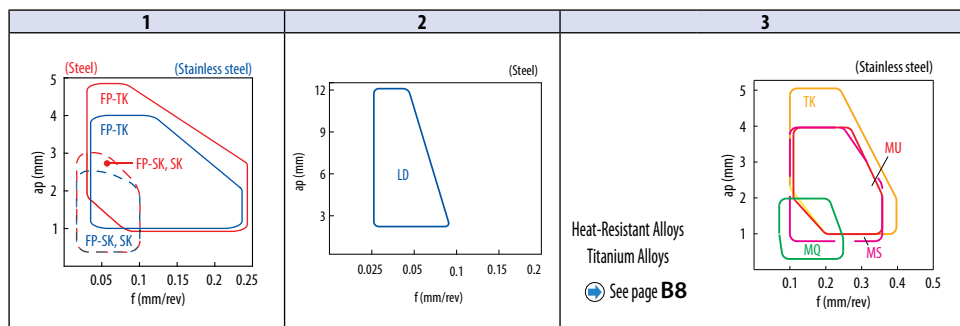
W

Ceramic

Insert	Description	Applicable chipbreaker range	Dimension (mm)				Carbide							Applicable toolholder					
			No. of edges	IC	S	D1	RE	CVD			PVD				Cermet				
								CA6515	CA6525	PR0055	PR1155	PR1205	PR1225			PR1535	PR1725	SV05	PV730
Finishing - Medium Polished / Sharp edge	DNMG 150402MFP-SK 150404MFP-SK	1	4	12.7	4.76	5.16	< 0.2 < 0.4												
Large-ap	DNMG 150402R-LD 150404R-LD	2	4	12.7	4.76	5.16	0.2 0.4												
Medium - Roughing Polished / Sharp edge	DNMG 150404FP-TK 150408FP-TK	1	4	12.7	4.76	5.16	0.4 0.8												
Medium - Roughing / Sharp edge	DNMG 150404TK 150408TK	3	4	12.7	4.76	5.16	0.4 0.8												
	DNMG 150404TK 150408TK	3	4	12.7	4.76	5.16	0.4 0.8												
Medium - Roughing	DNMG 150604TK 150608TK	3	4	12.7	6.35	5.16	0.4 0.8												
Stainless steel / Heat-resistant alloys	DNMG 150404MQ 150408MQ	3	4	12.7	4.76	5.16	0.4 0.8												
Finishing - Medium	DNMG 150604MQ 150608MQ	3	4	12.7	6.35	5.16	0.4 0.8												

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Negative

C

D

R

S

T

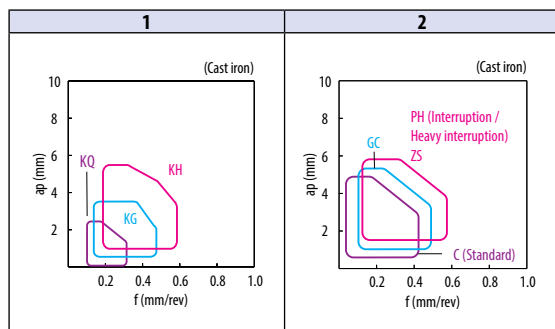
V

W

Ceramic

Insert	Description	Applicable chipbreaker range	Dimension (mm)				Carbide					Applicable toolholder	
			No. of edges	IC	S	D1	RE	CVD					
								CA310	CA315	CA320	CA4505		CA4515
Cast iron Sharp cutting oriented	DNMG 150404KQ 150408KQ	1	4	12.7	4.76	5.16	0.4	●	●	●	●	●	D13~D17 F120, F136 F138~F140
	DNMG 150604KQ 150608KQ	1	4	12.7	6.35	5.16	0.4	●	●	●	●	●	D13~D17
Cast iron Roughing	DNMG 150404KG 150408KG 150412KG	1	4	12.7	4.76	5.16	0.4	●	●	●	●	●	D13~D17 F120, F136 F138~F140
	DNMG 150604KG 150608KG 150612KG	1	4	12.7	6.35	5.16	0.4	●	●	●	●	●	D13~D17
	DNMG 150408KH 150412KH	1	4	12.7	4.76	5.16	0.8	●	●	●	●	●	D13~D17 F120, F136 F138~F140
Cast iron Roughing	DNMG 150608KH 150612KH	1	4	12.7	6.35	5.16	0.8	●	●	●	●	●	D13~D17
	DNMG 150404C 150408C 150412C	2	4	12.7	4.76	5.16	0.4	●	●	●	●	●	D13~D17 F120, F136 F138~F140
Cast iron Roughing	DNMG 150604C 150608C 150612C	2	4	12.7	6.35	5.16	0.4	●	●	●	●	●	D13~D17
	DNMG 150408ZS 150412ZS	2	4	12.7	4.76	5.16	0.8	●	●	●	●	●	D13~D17 F120, F136 F138~F140
	DNMG 150608ZS 150612ZS	2	4	12.7	6.35	5.16	0.8	●	●	●	●	●	D13~D17
Cast iron Roughing	DNMG 150408GC 150412GC	2	4	12.7	4.76	5.16	0.8	●	●	●	●	●	D13~D17 F120, F136 F138~F140
	DNMG 150608GC 150612GC	2	4	12.7	6.35	5.16	0.8	●	●	●	●	●	D13~D17

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Round

How to read pages of "Turning inserts" See page B15

B




Turning indexable inserts

Chip breakers

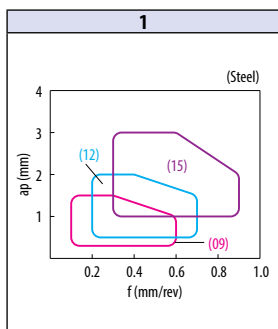
Negative



Ceramic

Insert	Description	Applicable chipbreaker range	Dimension (mm)			Carbide					Cermet		Applicable toolholder			
			IC	S	D1	CVD					PVD	-				
						CA02SP	CA11SP	CA12SP	CA310	CA315				CA320	CA515	CA525	CA530	PV7005	PV720	TN60	TN620
	RNMG 090300	1	9.525	3.18	3.81	●	●					●	●	●	D42	
	RNMG 120400	1	12.7	4.76	5.16	●	●	●	●	●	●	●	●	●		
	RNMG 150600	1	15.875	6.35	6.35	●	●	●	●	●	●					-

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

90° Square

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Negative

C

D

R

S

T

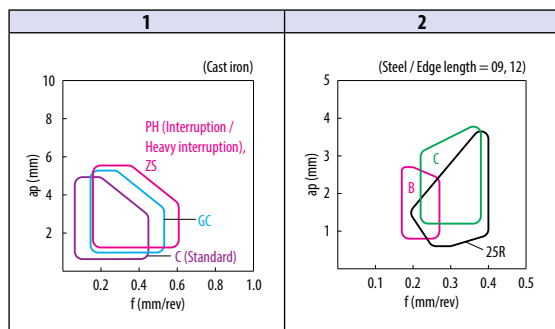
V

W

Ceramic

Insert	Description	Applicable chipbreaker range	Dimension (mm)				Carbide				Cermet				Applicable toolholder
			No. of edges	IC	S	D1	RE	CVD		PVD		-			
								CA310	CA315	CA320	CA4505	CA4515	KW10	PV7005		PV710	Ti60	Ti610	Ti620
Cast iron	SNMG 120408ZS 120412ZS	1	8	12.7	4.76	5.16	0.8 1.2	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	D19~D21 F142
Cast iron	SNMG 120408GC 120412GC	1	8	12.7	4.76	5.16	0.8 1.2	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	
Cast iron	SNGA 120404 120408	-	8	12.7	4.76	5.16	0.4 0.8	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	
Cast iron	SNMA 120404 120408 120412 120416 120420	-	8	12.7	4.76	5.16	0.4 0.8 1.2 1.6 2	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	D20 D21
Finishing - Medium	SNGG 090304R-B 090304L-B 090308R-B 090308L-B	2	8	9.525	3.18	3.81	0.4 0.4 0.8 0.8	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	
Medium - Roughing	SNGG 120404R-C 120404L-C 120408R-C 120408L-C	2	8	12.7	4.76	5.16	0.4 0.4 0.8 0.8	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	
Medium - Roughing	SNMG 120404R-C 120404L-C 120408R-C 120408L-C	2	8	12.7	4.76	5.16	0.4 0.4 0.8 0.8	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	D19~D21 F142
Medium - Roughing	SNGG 120404R-25R 120404L-25R 120408R-25R 120408L-25R	2	8	12.7	4.76	5.16	0.4 0.4 0.8 0.8	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	●●●●●●	


Applicable chipbreaker range

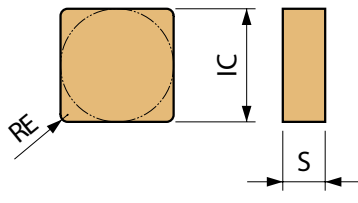


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

90° Square

How to read pages of "Turning inserts" See page B15

Insert		Description		Applicable chipbreaker range		Dimension (mm)			Carbide			Applicable toolholder
						No. of edges	IC	S	RE	CA310	CA315		CA320
Cast iron		SNMN	120408 120412	-	8	12.7	4.76	0.8 1.2	●	●	●	D52~D54 D63 D64
									●	●	●	



Free-cutting steel												P
Carbon steel / Alloy steel												
Stainless steel												M
Gray cast iron	●	●	●	●	●	●	●	●	●	●	●	K
Nodular cast iron	○	○	○	○	○	○	○	○	○	○	○	
Non-ferrous metals												N
Heat-resistant alloy												
Titanium alloy												S
Hard materials												H

B
Turning indexable inserts

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

B

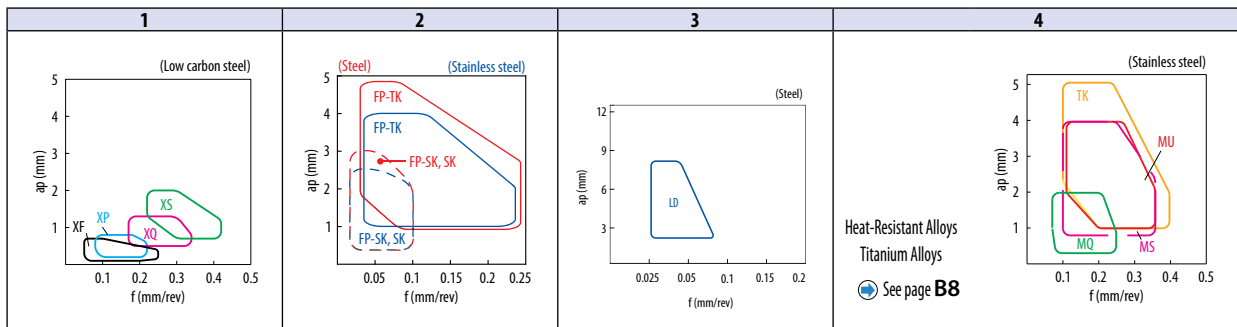


Turning indexable inserts

		Material Compatibility																Applicable toolholder											
		Free-cutting steel	Carbon steel / Alloy steel	Stainless steel	Gray cast iron	Nodular cast iron	Non-ferrous metals	Heat-resistant alloy	Titanium alloy	Hard materials	Carbide						Cermet				Applicable toolholder								
		Dimension (mm)										CVD		PVD		-													
Insert	Description	No. of edges	IC	S	D1	RE	CA02SP	CA115P	CA125P	CA510	CA515	CA525	CA530	CA6515	CA6525	PR115S	PR120S	PR122S	PR135S	PR172S		SW05	CCX	PV710	PV720	PV730	TN60	TN610	TN620
Low carbon steel	Finishing TNMG 160404XP 160408XP	1	6	9.525	4.76	3.81	0.4	●	●	●	●	●	●	●	●								●	●	●	●	●	●	
Low carbon steel	Medium TNMG 160404XQ 160408XQ	1	6	9.525	4.76	3.81	0.4	●	●	●	●	●	●	●	●								●	●	●	●	●	●	
Low carbon steel	Roughing TNMG 160408XS	1	6	9.525	4.76	3.81	0.8	●	●	●	●	●	●	●	●								●	●	●	●	●	●	
Finishing - Medium	Polished / Sharp edge TNGG 160401MFP-SK 160402MFP-SK 160404MFP-SK	2	6	9.525	4.76	3.81	< 0.1 < 0.2 < 0.4									●	●	●	●	●	●					●	●	●	
	Polished / Sharp edge TNGG 160402M-SK 160404M-SK	2	6	9.525	4.76	3.81	< 0.2 < 0.4																			●	●	●	
Large ap	Large ap TNMG 160402R-LD 160404R-LD	3	6	9.525	4.76	3.81	0.2 0.4															●	●						
Medium - Roughing	Polished / Sharp edge TNGG 160404FP-TK 160408FP-TK	2	6	9.525	4.76	3.81	0.4 0.8									●	●	●	●	●	●								
Stainless steel / Heat-resistant alloys	Medium - Roughing / Sharp edge TNGG 160404TK 160408TK	4	6	9.525	4.76	3.81	0.4 0.8															●	●						
	Medium - Roughing / Sharp edge TNMG 160404TK 160408TK	4	6	9.525	4.76	3.81	0.4 0.8									●	●												

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Negative

C

D

R

S

T

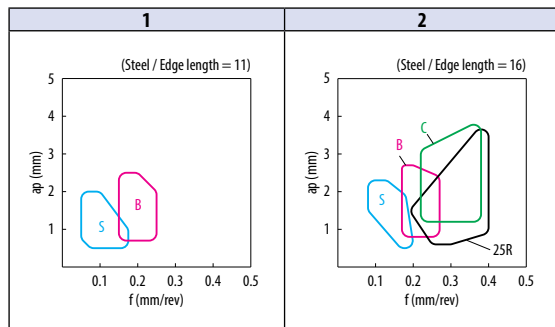
V

W

Ceramic

Insert	Description	Applicable chipbreaker range	Dimension (mm)				Carbide		Cermet		Applicable toolholder							
			No. of edges	IC	S	D1	RE	PVD		-								
								PR1535	PR1725	PR930		KW10	PV705	PV710	PV730	TN60	TN610	TN620
Finishing	TNEG 160402R-SSF 160402L-SSF 160404R-SSF 160404L-SSF	2	6	9.525	4.76	3.81	0.2 0.2 0.4 0.4	● ● ● ●	● ● ● ●	● ● ● ●	D22~D25 D27, D28 F122 F143 F144							
Finishing	TNGG 110402R-S 110402L-S 110404R-S 110404L-S 110408R-S 110408L-S	1	6	6.35	4.76	2.26	0.2 0.2 0.4 0.4	● ●	● ●	● ●	D24 D25 F144							
	TNGG 160401R-S 160401L-S 160402R-S 160402L-S 160404R-S 160404L-S 160408R-S 160408L-S						2	6	9.525	4.76	3.81	0.1 0.1 0.2 0.2 0.4 0.4 0.8 0.8	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●	D22~D25 D27, D28 F122 F143 F144			
Finishing - Medium	TNGG 110302R-B 110302L-B 110304R-B 110304L-B	1	6	6.35	3.18	2.26	0.2 0.2 0.4 0.4	● ● ● ●	● ● ● ●	● ● ● ●	D24 D25							
	TNGG 160304R-B						2	6	9.525	3.18	3.81	0.4	●	●	-			
	TNGG 160402R-B 160402L-B 160404R-B 160404L-B 160408R-B 160408L-B						2	6	9.525	4.76	3.81	0.2 0.2 0.4 0.4 0.8 0.8	● ● ● ● ● ●	● ● ● ● ● ●	D22~D25 D27, D28 F122 F143 F144			

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

35° Rhombic

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Negative

C

D

R

S

T

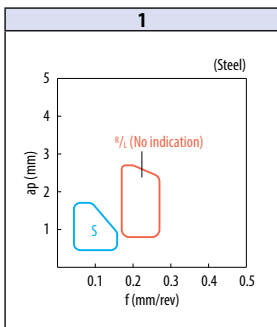
V

W

Ceramic

Insert	Description	Applicable chipbreaker range	Dimension (mm)				Carbide		Cermet		Applicable toolholder															
			No. of edges	IC	S	D1	RE	PVD		-																
								PR1535 PR930	KW10	PV7005 PV710 PV720 PV730		TN60 TN610 TN620														
Cast iron Without chipbreaker	VNGA 160404 160408	-	4	9.525	4.76	3.81	0.4 0.8																			
Finishing Sharp edge / Surface finish oriented	VNGG 160402R-S 160402L-S 160404R-S 160404L-S	1	4	9.525	4.76	3.81	0.2	●																		
							0.2	●																		
							0.4	●																		
							0.4	●																		
Medium	VNGG 160402R 160402L 160404R 160404L 160408R 160408L	1	4	9.525	4.76	3.81	0.2	●																		
							0.2	●																		
							0.4	●																		
							0.4	●																		
							0.8	●																		

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

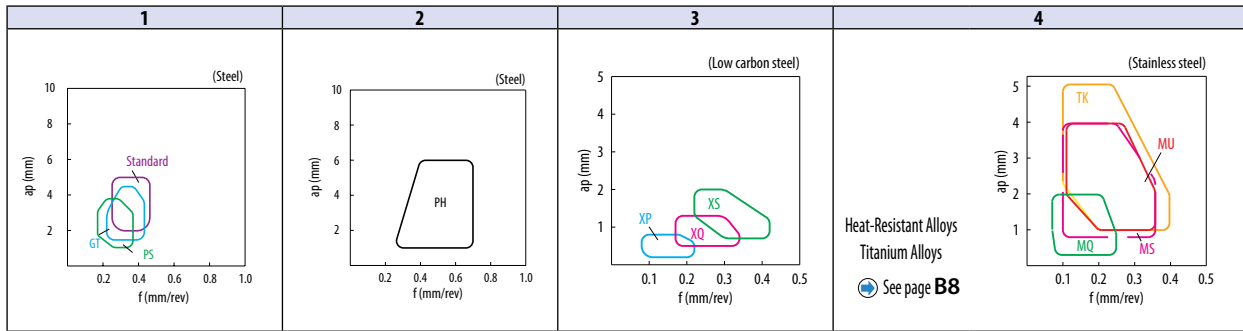
80° Trigon

How to read pages of "Turning inserts" See page B15

B
Turning indexable inserts

Insert	Description	Applicable chipbreaker range	Dimension (mm)				Material												Applicable toolholder					
			No. of edges	IC	S	D1	RE	Carbide						Cermet										
								CVD						PVD	CVD		PVD			-				
CA02SP	CA11SP	CA12SP	CA310	CA315	CA320	CA4505	CA4515	CA515	CA525	CA530	CA6515	CA6525	PR1535	SW05	CCX	PV7005	PV710	PV720	PV730	TN60	TN610	TN620		
Medium - Roughing High feed	WNMG 080408PT 080412PT	B50 3	6	12.7	4.76	5.16	0.8	●																
Medium - Roughing High feed	WNMG 080408GT 080412GT	1	6	12.7	4.76	5.16	0.8	●																
Roughing	WNMG 080404 080408 080412	1	6	12.7	4.76	5.16	0.4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Roughing	WNMG 080408PH 080412PH	2	6	12.7	4.76	5.16	0.8	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Low carbon steel Finishing	WNMG 080404XP 080408XP	3	6	12.7	4.76	5.16	0.4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Low carbon steel Medium	WNMG 080404XQ 080408XQ	3	6	12.7	4.76	5.16	0.4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Low carbon steel Roughing	WNMG 080408XS	3	6	12.7	4.76	5.16	0.8	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel / Heat-resistant alloys Medium - Roughing / Sharp edge	WNGG 080404TK 080408TK	4	6	12.7	4.76	5.16	0.4								●									
Stainless steel Medium - Roughing	WNMG 080404TK 080408TK	4	6	12.7	4.76	5.16	0.4								●	●	●	●	●	●	●	●	●	●

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Small double sided tools

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Negative

C

D

R

S

T

V

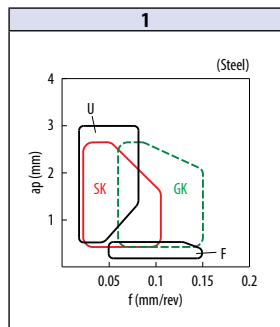
W

Ceramic

Insert	Description	Applicable chipbreaker range	Dimension (mm)				Carbide			Applicable toolholder	
			No. of edges	IC	S	D1	RE	PVD			
								PRI1225	PRI1535		PRI1705
										P	
										P	
										M	
										K	
										K	
										N	
										S	
										S	
										H	
	070301MFP-SK	1	4	7.5	3.18	3.6	< 0.1				E60
	070302MFP-SK						< 0.2				
	070302E-GK	1	4	7.5	3.18	3.6	0.2				
	070304E-GK						0.4				
	0703005MFR-F	1	4	7.5	3.18	3.6	< 0.05				
	070301MFR-F						< 0.1				
	070302MFR-F						< 0.2				
	070304MFR-F						< 0.4				
	0703005MFR-U	1	4	7.5	3.18	3.6	< 0.05				
	070301MFR-U						< 0.1				
	070302MFR-U						< 0.2				
	070304MFR-U						< 0.4				

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

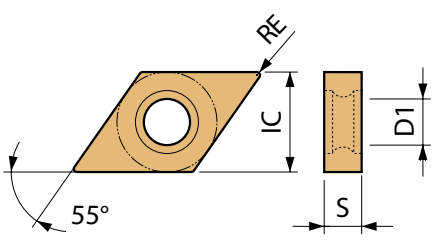
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Small double sided tools

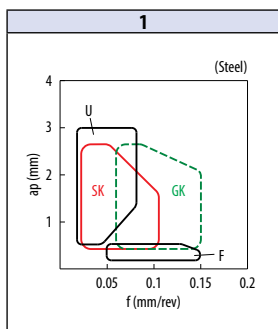
How to read pages of "Turning inserts" See page B15



Insert	Description	Applicable chipbreaker range	Dimension (mm)				Carbide	Applicable toolholder						
			No. of edges	IC	S	D1			RE	PVD				
										PR1225	PR1535	PR1705		
Free-cutting steel	Carbon steel / Alloy steel	Stainless steel	Gray cast iron	Nodular cast iron	Non-ferrous metals	Heat-resistant alloy	Titanium alloy	Hard materials	P	M	K	N	S	H
Finishing - Medium Polished / Sharp edge	DNGU 080301MFP-SK 080302MFP-SK 080304MFP-SK	1	4	7	3.18	3.6	< 0.1 < 0.2 < 0.4	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
Medium - Roughing With honing	DNMU 080302E-GK 080304E-GK	1	4	7	3.18	3.6	0.2 0.4	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
Finishing Sharp edge	DNGU 080301MFR-F 080302MFR-F 080304MFR-F	1	4	7	3.18	3.6	< 0.1 < 0.2 < 0.4	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
Low feed Sharp edge	DNGU 080301MFR-U 080302MFR-U 080304MFR-U	1	4	7	3.18	3.6	< 0.1 < 0.2 < 0.4	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●
Low feed With honing	DNGU 080301MER-U 080302MER-U 080304MER-U	1	4	7	3.18	3.6	< 0.1 < 0.2 < 0.4	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

B
Turning indexable inserts

Small double sided tools

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Negative

C

D

R




S

T

V

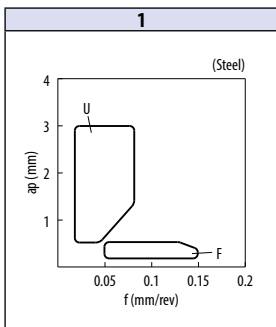
W

Ceramic

Insert	Description	Applicable chipbreaker range	Dimension (mm)				Carbide			Applicable toolholder	
			No. of edges	IC	S	D1	RE	PVD			
								PR1225	PR1535		PR1705
Finishing 	TNGU 0903005MFR-F 090301MFR-F 090302MFR-F 090304MFR-F	1	6	5.56	3.18	3	< 0.05 < 0.1 < 0.2 < 0.4	● ● ● ●	● ● ● ●	E62	
Low feed 	TNGU 090301MFR-U 090302MFR-U 090304MFR-U	1	6	5.56	3.18	3	< 0.1 < 0.2 < 0.4	● ● ●	● ● ●		
Low feed 	TNGU 090304MER-U	1	6	5.56	3.18	3	< 0.4	●	●		

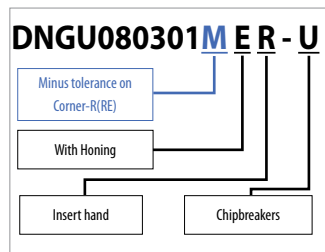
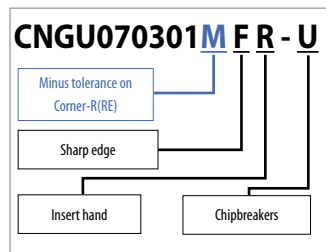
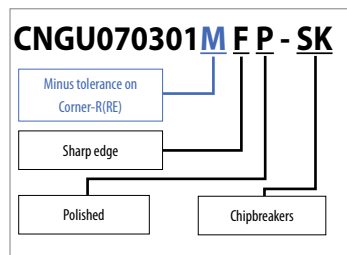
Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Small double sided tools identification system



When a minus tolerance is specified for the corner-R(RE)

If a minus tolerance is specified for the corner-R(RE) as shown in the Fig. 1, using an insert with corner-R(RE)=0.2 mm may result in larger radius than specified. Use an insert the corner of which R(RE) has a minus tolerance.

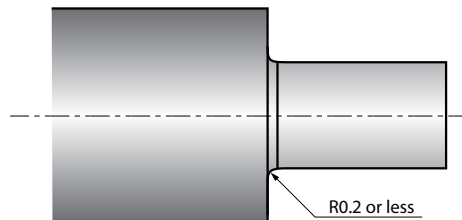


Fig. 1 Example of a specified corner-R in the drawing

Chipbreaker selection (Negative inserts)

Cutting range	Name	Cross-section	Advantages
Finishing - Medium	SK		A low cutting force chipbreaker designed for chip control in steel and stainless steel. Cutting performance is similar to comparable sized positive inserts.
Medium - Roughing	GK		Good chip evacuation at wide range by breaker dot and wide chip pocket.
Finishing	F		Good chip control at finishing with low cutting force.
Low feed	U		Good chip control at low feed rate and varied ap with low cutting force.

80° Rhombic

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Positive

C

D

R

S

T

V

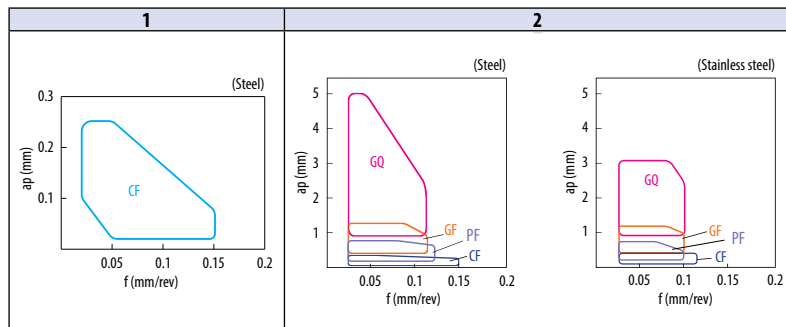
W

Ceramic

Insert	Description	Applicable chipbreaker range		Dimension (mm)				Angle (°)	Carbide				Applicable toolholder	
		No. of edges	IC	S	D1	RE	AN		DLC		PVD			
								PDL010	PDL025	PR1725	PR1535	PR1705		PR1725
	CCGT 030101MP-CF 030102MP-CF	1	2	3.5	1.4	2	< 0.1 < 0.2	7	●	●	●	●	F31 F32 F60 F62	
	CCGT 040101MP-CF 040102MP-CF	1	2	4.3	1.8	2.4	< 0.1 < 0.2	7	●	●	●	●		
	CCGT 030101MFP-PF 030102MFP-PF	2	2	3.5	1.4	2	< 0.1 < 0.2	7	●	●	●	●		
	CCGT 040101MFP-PF 040102MFP-PF	2	2	4.3	1.8	2.4	< 0.1 < 0.2	7	●	●	●	●		
	CCGT 060201MFP-PF 060202MFP-PF 060204MFP-PF	2	2	6.35	2.38	3	< 0.1 < 0.2 < 0.4	7	●	●	●	●		E26, E28 E54
	CCGT 060201MFP-GF 060202MFP-GF 060204MFP-GF	2	2	6.35	2.38	3	< 0.1 < 0.2 < 0.4	7	●	●	●	●		F31, F32 F60~F62 F124
	CCGT 09T301MFP-GF 09T302MFP-GF 09T304MFP-GF	2	2	9.525	3.97	4.7	< 0.1 < 0.2 < 0.4	7	●	●	●	●	E26~E28 E54 F60~F62 F124	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

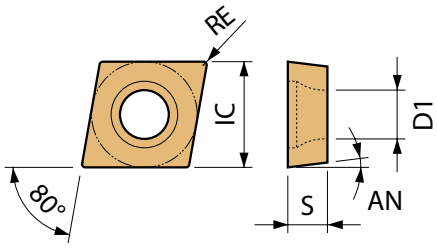
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

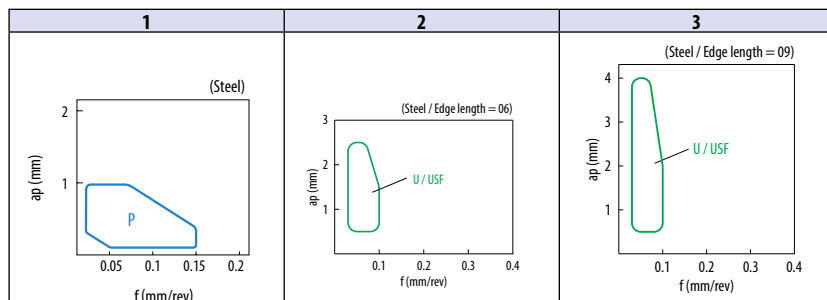
How to read pages of "Turning inserts" See page B15



Insert	Description	Applicable chipbreaker range	Dimension (mm)				Angle (°)	Carbide				Cermet		Applicable toolholder					
			IC	S	D1	RE		AN	DLC		PVD		-						
									PDL010	PDL025	PR1225	PR1535			PR1705	PR1725	PR930	PV710	PV720	PV730	TN60	TN610	TN620
Finishing Sharp edge	CCET	09T301MR-P 09T301ML-P 09T302MR-P 09T302ML-P 09T304MR-P 09T304ML-P	1	2	9.525	3.97	4.4	< 0.1 < 0.1 < 0.2 < 0.2 < 0.4 < 0.4	7			●	●					E26~E28 E54 F60~F62 F124	
	Low feed Precision / Sharp edge	CCET	0602003FR-USF 0602003FL-USF 060201FR-USF 060201FL-USF 060202FR-USF 060202FL-USF	2	2	6.35	2.38	2.8	0.03 0.03 0.1 0.1 0.2 0.2	7			●	●					E26, E28 E54 F31, F32 F60~F62 F124
		CCET	09T3003FR-USF 09T301FR-USF 09T301FL-USF 09T302FR-USF 09T302FL-USF	3	2	9.525	3.97	4.4	0.03 0.1 0.1 0.2 0.2	7			●	●					E26~E28 E54 F60~F62 F124
		CCET	0602005MFR-USF 0602005MFL-USF 060201MFR-USF 060201MFL-USF 060202MFR-USF 060202MFL-USF	2	2	6.35	2.38	2.8	< 0.05 < 0.05 < 0.1 < 0.1 < 0.2 < 0.2	7			●	●					E26, E28 E54 F31, F32 F60~F62 F124
		CCET	09T3005MFR-USF 09T3005MFL-USF 09T301MFR-USF 09T301MFL-USF 09T302MFR-USF 09T302MFL-USF	3	2	9.525	3.97	4.4	< 0.05 < 0.05 < 0.1 < 0.1 < 0.2 < 0.2	7			●	●					E26~E28 E54 F60~F62 F124
Low feed Sharp edge		CCET	0602005MFR-U 0602005MFL-U 060201MFR-U 060201MFL-U 060202MFR-U 060202MFL-U	2	2	6.35	2.38	2.8	< 0.05 < 0.05 < 0.1 < 0.1 < 0.2 < 0.2	7			●	●	●	●	●	●	
	CCET	09T3005MFR-U 09T3005MFL-U 09T301MFR-U 09T301MFL-U 09T302MFR-U 09T302MFL-U 09T304MFR-U 09T304MFL-U	3	2	9.525	3.97	4.4	< 0.05 < 0.05 < 0.1 < 0.1 < 0.2 < 0.2 < 0.4 < 0.4	7			●	●	●	●	●	●		E26~E28 E54 F60~F62 F124

Applicable chipbreaker range

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

B
Turning indexable inserts

80° Rhombic

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Positive

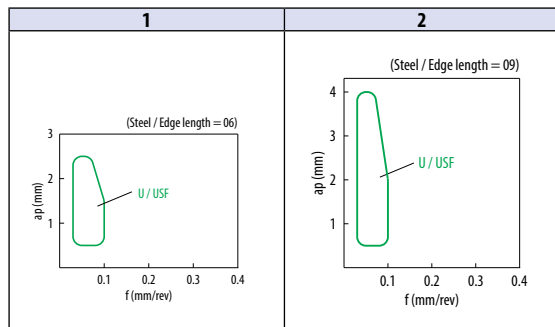


Ceramic

Insert	Description	Applicable chipbreaker range		Dimension (mm)				Angle (°)	Carbide				Applicable toolholder
		No. of edges	No. of chipbreakers	IC	S	D1	RE		AN	Cermet			
								PVD		-	-	-	
<p>Sharp edge</p>	CCGT 0602003FR-U	1	2	6.35	2.38	2.8	0.03	7	●	●	●	●	E26, E28 E54 F31, F32 F60~F62 F124
	0602003FL-U						0.03		●	●	●	●	
	060201FR-U						0.1		●	●	●	●	
	060201FL-U						0.1		●	●	●	●	
	060202FR-U						0.2		●	●	●	●	
	060202FL-U						0.2		●	●	●	●	
	CCGT 09T3003FR-U	2	2	9.525	3.97	4.4	0.03	7	●	●	●	●	E26~E28 E54 F60~F62 F124
	09T3003FL-U						0.03		●	●	●	●	
	09T301FR-U						0.1		●	●	●	●	
	09T301FL-U						0.1		●	●	●	●	
	09T302FR-U						0.2		●	●	●	●	
	09T302FL-U						0.2		●	●	●	●	
	CCGT 0602005MFR-U	1	2	6.35	2.38	2.8	< 0.05	7	●	●	●	●	E26, E28 E54 F31, F32 F60~F62 F124
	0602005MFL-U						< 0.05		●	●	●	●	
	060201MFR-U						< 0.1		●	●	●	●	
	060201MFL-U						< 0.1		●	●	●	●	
	060202MFR-U						< 0.2		●	●	●	●	
	060202MFL-U						< 0.2		●	●	●	●	
	CCGT 09T3005MFR-U	2	2	9.525	3.97	4.4	< 0.05	7	●	●	●	●	E26~E28 E54 F60~F62 F124
	09T3005MFL-U						< 0.05		●	●	●	●	
09T301MFR-U	< 0.1						●		●	●	●		
09T301MFL-U	< 0.1						●		●	●	●		
09T302MFR-U	< 0.2						●		●	●	●		
09T302MFL-U	< 0.2						●		●	●	●		

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

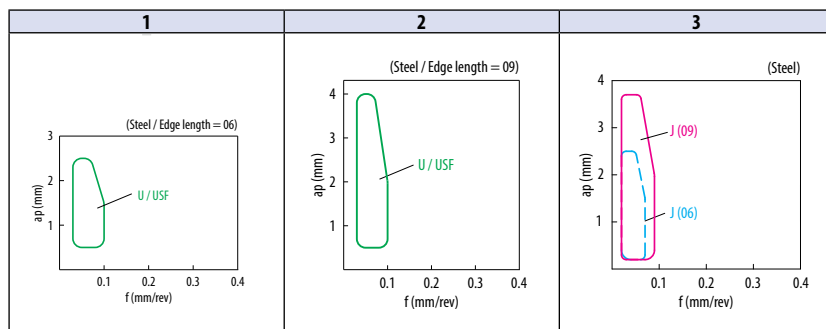
80° Rhombic

How to read pages of "Turning inserts" See page B15

Insert		Description		Applicable chipbreaker range		Dimension (mm)				Angle (°)		Carbide			Cermet			Applicable toolholder			
						IC	S	D1	RE	AN	PVD			-							
											PR1225	PR1535	PR1725	PR830	PV710	PV720	PV730		Ti60	Ti610	Ti620
										7		P			M			K			
												N			S				H		
Low feed 	CCGT	060201ER-U	060201EL-U	1	2	6.35	2.38	2.8	0.1	7	●	●	●	●	●	●	●	E26, E28 E54 F31, F32 F60~F62 F124			
		060202ER-U	060202EL-U								●	●	●	●	●	●	●		●	●	
		060204ER-U	060204EL-U								●	●	●	●	●	●	●		●	●	●
		060202MER-U	060202MEL-U								●	●	●	●	●	●	●		●	●	●
Low feed 	CCET	09T301ER-U	09T301EL-U	2	2	9.525	3.97	4.4	0.1	7	●	●	●	●	●	●	●	E26~E28 E54 F60~F62 F124			
		09T302ER-U	09T302EL-U								●	●	●	●	●	●	●		●	●	
		09T304ER-U	09T304EL-U								●	●	●	●	●	●	●		●	●	●
		09T301MER-U	09T301MEL-U								●	●	●	●	●	●	●		●	●	●

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

B
Turning indexable inserts

80° Rhombic

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

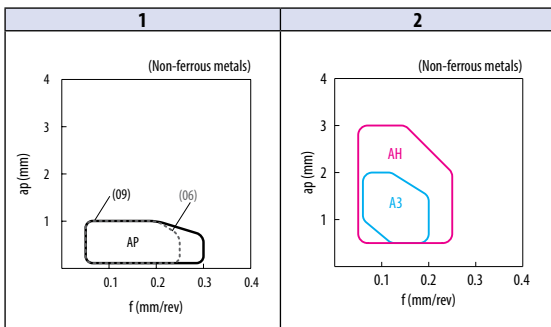
Positive



Ceramic

Insert	Description	Applicable chipbreaker range		Dimension (mm)					Angle (°)	Carbide			Applicable toolholder
		No. of edges	No. of chipbreakers	IC	S	D1	RE	AN	DLC				
									PDL010	PDL025	KW10		
Non-ferrous metals Finishing / Sharp edge	CCGT 060202AP 060204AP	1	2	6.35	2.38	3	0.2 0.4	7	●	●	●	E26, E28, E54 F31, F32 F60~F62, F124	
	CCGT 09T302AP 09T304AP 09T308AP	1	2	9.525	3.97	4.7	0.2 0.4 0.8	7	●	●	●	E26~E28 E54 F60~F62 F124	
Non-ferrous metals Finishing - Medium / Sharp edge	CCGT 09T302R-A3 09T302L-A3 09T304R-A3 09T304L-A3 09T308R-A3 09T308L-A3	2	2	9.525	3.97	4.4	0.2 0.2 0.4 0.4 0.8 0.8	7	●	●	●	E26~E28 E54 F60~F62 F124	
	CCGT 120402R-A3 120402L-A3 120404R-A3 120404L-A3 120408R-A3 120408L-A3	2	2	12.7	4.76	5.5	0.2 0.2 0.4 0.4 0.8 0.8	7	●	●	●	E28	
Non-ferrous metals Finishing - Medium / Sharp edge	CCGT 09T304AH 09T308AH	2	2	9.525	3.97	4.4	0.4 0.8	7	●	●	●	E26~E28 E54 F60~F62 F124	
Cast iron Without chipbreaker	CCGW 060201 060202	-	2	6.35	2.38	2.8	0.1 0.2	7	●	●	●	E26, E28, E54 F31, F32 F60~F62, F124	
	CCGW 09T300 09T301 09T302 09T304	-	2	9.525	3.97	4.4	0 0.1 0.2 0.4	7	●	●	●	E26~E28 E54 F60~F62 F124	

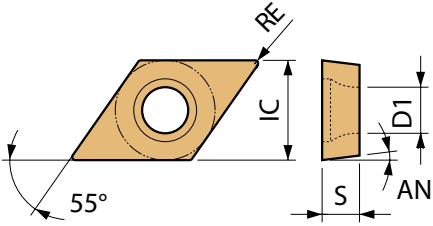
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

How to read pages of "Turning inserts" See page B15

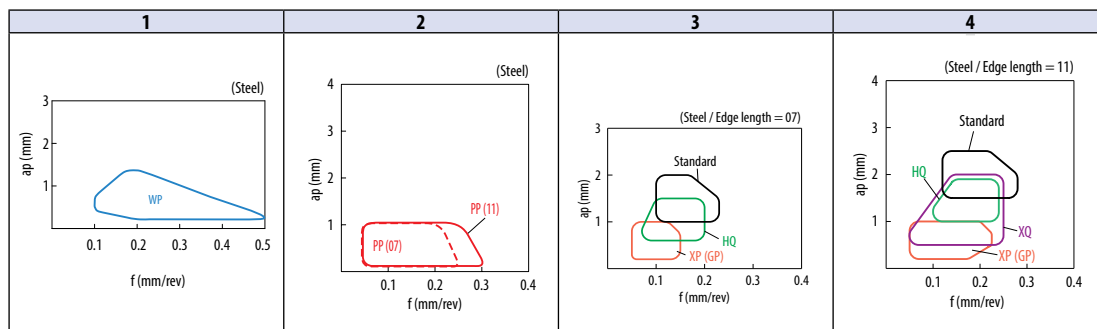


Insert	Description	Applicable chipbreaker range	Dimension (mm)					Angle (°)	Material										Applicable toolholder									
			No. of edges						Carbide					Cermet														
			IC	S	D1	RE	AN		CVD		PVD			CVD		PVD												
					CA02SP	CA11SP	CA12SP	CA510	CA515	CA530	PR1155	PR1205	PR1225	PR1535	PR1705	PR1725	PR930	CCX	PV710	PV720	PV730	Ti60	Ti610	Ti620				
Finishing - Medium Polished / Sharp edge	DCGT 070201MFP-GQ 070202MFP-GQ 070204MFP-GQ	B68 1	2	6.35	2.38	3	< 0.1 < 0.2 < 0.4	7																				*1
	DCGT 11T301MFP-GQ 11T302MFP-GQ 11T304MFP-GQ	B68 1	2	9.525	3.97	4.7	< 0.1 < 0.2 < 0.4	7																				*2
Finishing With Wiper Edge	DCMX 070202WP 070204WP 070208WP	1	2	6.35	2.38	3	0.2 0.4 0.8	7																				*3
	DCMX 11T302WP 11T304WP 11T308WP	1	2	9.525	3.97	4.7	0.2 0.4 0.8	7																				*4
Finishing With Wiper Edge	DCMX 070204R-WP 070204L-WP	1	2	6.35	2.38	3	0.4	7																				*3
	DCMX 11T304R-WP 11T304L-WP	1	2	9.525	3.97	4.7	0.4	7																				*4
Finishing	DCMT 070202PP 070204PP	2	2	6.35	2.38	3	0.2 0.4	7																				*1
	DCMT 11T302PP 11T304PP 11T308PP	2	2	9.525	3.97	4.7	0.2 0.4 0.8	7																				*2
Finishing	DCMT 070202GP 070204GP	3	2	6.35	2.38	2.8	0.2 0.4	7																				*1
	DCMT 11T304GP 11T308GP	4	2	9.525	3.97	4.4	0.4 0.8	7																				*2

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).
See "Precautions when using Wiper inserts" in the R36 and R37 for WP chipbreaker.

- *1: DC..07type E29, E31, E34 E35, E55, E56, F66~F68, F70~F72, F74~F76, F125
- *2: DC..11type E23, E29~E32, E34, E35, E55, E56, F66~F68, F70~F72, F74~F76, F125
- *3: DC..07type WP E29, E31, E55, F66~F68, F74~F76, F125
- *4: DC..11type WP E23, E29~E32, E55, F66~F68, F74~F76, F125

Applicable chipbreaker range

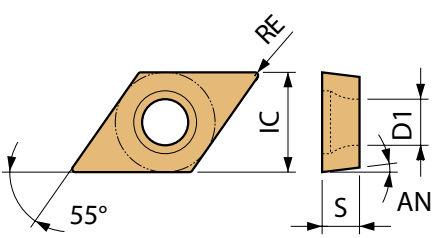


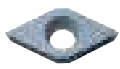
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

B
Turning indexable inserts

55° Rhombic

How to read pages of "Turning inserts" See page B15



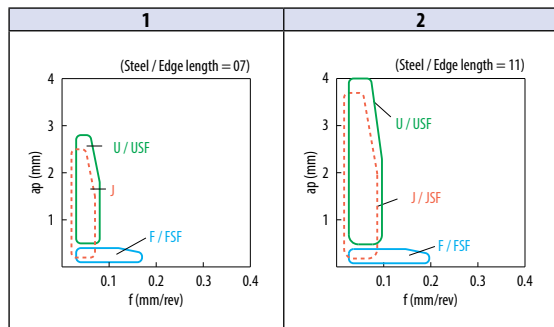
Insert	Description	Applicable chipbreaker range		Dimension (mm)				Angle (°)	Carbide				Applicable toolholder
		No. of edges		IC	S	D1	RE		AN	PVD	-	Cermet	
Finishing  Sharp edge	DCGT 0702003R-F	1	2	6.35	2.38	2.8	0.03	7	●	●	●	●	●
	DCGT 0702003L-F						0.03						
	DCGT 070201R-F						0.1						
	DCGT 070201L-F						0.1						
	DCGT 070202R-F						0.2						
	DCGT 070202L-F						0.2						
	DCGT 070204R-F						0.4						
	DCGT 070204L-F	0.4											
	DCGT 11T3003R-F	2	2	9.525	3.97	4.4	0.03	7	●	●	●	●	●
	DCGT 11T3003L-F						0.03						
	DCGT 11T301R-F						0.1						
	DCGT 11T301L-F						0.1						
	DCGT 11T302R-F						0.2						
	DCGT 11T302L-F						0.2						
	DCGT 11T304R-F						0.4						
	DCGT 11T304L-F	0.4											
	DCGT 0702005MR-F	1	2	6.35	2.38	2.8	< 0.05	7	●	●	●	●	●
	DCGT 0702005ML-F						< 0.05						
	DCGT 070201MR-F						< 0.1						
	DCGT 070201ML-F						< 0.1						
	DCGT 070202MR-F						< 0.2						
	DCGT 070202ML-F						< 0.2						
	DCGT 070204MR-F						< 0.4						
	DCGT 070204ML-F	< 0.4											
DCGT 11T3005MR-F	2	2	9.525	3.97	4.4	< 0.05	7	●	●	●	●	●	
DCGT 11T301MR-F						< 0.1							
DCGT 11T301ML-F						< 0.1							
DCGT 11T302MR-F						< 0.2							
DCGT 11T302ML-F						< 0.2							
DCGT 11T304MR-F						< 0.4							
DCGT 11T304ML-F						< 0.4							

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

*1: DC..07type E29, E31, E34 E35, E55, E56, F66~F68, F70~F72, F74~F76, F125

*2: DC..11type E23, E29~E32, E34, E35, E55, E56, F66~F68, F70~F72, F74~F76, F125

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

B
Turning indexable inserts

55° Rhombic

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Positive

C

D

R



S

T

V

W

Ceramic

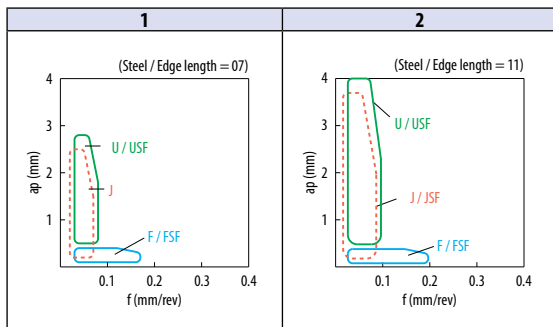
Insert	Description	Applicable chipbreaker range		Dimension (mm)				Angle (°)	Carbide						Cermet		Applicable toolholder			
				No. of edges	IC	S	D1		RE	AN	DLC		PVD		PVD	-				
											PDL010	PDL025	PR1225	PR1535				PR1705	PR1725	PR930	PV710	PV720	PV730	TN60	TN610	TN620
 <p>Precision / Sharp edge</p>	DCET 0702003FR-USF 0702003FL-USF 070201FR-USF 070201FL-USF 070202FR-USF 070202FL-USF	1	2	6.35	2.38	2.8	0.03 0.03 0.1 0.1 0.2 0.2	7												
	DCET 11T3003FR-USF 11T3003FL-USF 11T301FR-USF 11T301FL-USF 11T302FR-USF 11T302FL-USF	2	2	9.525	3.97	4.4	0.03 0.03 0.1 0.1 0.2 0.2	7												
	DCET 0702005MFR-USF 070201MFR-USF 070202MFR-USF 070202MFL-USF	1	2	6.35	2.38	2.8	<0.05 <0.1 <0.2 <0.2	7												
	DCET 11T3005MFR-USF 11T301MFR-USF 11T301MFL-USF 11T302MFR-USF 11T302MFL-USF	2	2	9.525	3.97	4.4	<0.05 <0.1 <0.1 <0.2 <0.2	7												
	 <p>Sharp edge</p>	DCET 0702003FR-U	1	2	6.35	2.38	2.8	0.03	7											
		DCET 0702005MFR-U 070201MFR-U 070201MFL-U 070202MFR-U 070202MFL-U	1	2	6.35	2.38	2.8	<0.05 <0.1 <0.1 <0.2 <0.2	7											
		DCET 11T3005MFR-U 11T301MFR-U 11T301MFL-U 11T302MFR-U 11T302MFL-U 11T304MFR-U	2	2	9.525	3.97	4.4	<0.05 <0.1 <0.1 <0.2 <0.2 <0.4	7											

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

*1: DC..07type E29, E31, E34 E35, E55, E56, F66~F68, F70~F72, F74~F76, F125

*2: DC..11type E23, E29~E32, E34, E35, E55, E56, F66~F68, F70~F72, F74~F76, F125

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Positive

C

D

R



S

T

V

W

Ceramic

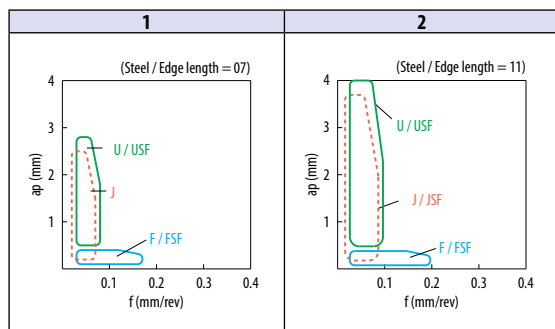
		Material										Applicable toolholder									
		Free-cutting steel													P						
		Carbon steel / Alloy steel	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺							
		Stainless steel	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	☺	M						
		Gray cast iron													K						
		Nodular cast iron																			
		Non-ferrous metals													N						
		Heat-resistant alloy													S						
		Titanium alloy																			
		Hard materials													H						
Insert	Description	Applicable chipbreaker range	Dimension (mm)				Angle (°)	Carbide		Cermet			Applicable toolholder								
			No. of edges	IC	S	D1		RE	AN	PVD	PVD	-									
														PR1225	PR1725	PV710	PV720	PV730	TN60	TN610	TN620
Low feed  With honing	DCGT 070201ER-U	1	2	6.35	2.38	2.8	7	0.1	●						*1						
	DCGT 070201EL-U								●												
	DCGT 070202ER-U								●	●	●	●	●	●		●	●	●	●	●	●
	DCGT 070202EL-U								●	●	●	●	●	●		●	●	●	●	●	●
	DCGT 070204ER-U								●	●	●	●	●	●		●	●	●	●	●	●
	DCGT 070204EL-U								●	●	●	●	●	●		●	●	●	●	●	●
	DCGT 11T301ER-U	2	2	9.525	3.97	4.4	7	0.1	●	●	●	●	●	●	●	*2					
	DCGT 11T301EL-U								●	●	●	●	●	●	●		●	●	●	●	
	DCGT 11T302ER-U								●	●	●	●	●	●	●		●	●	●	●	●
	DCGT 11T302EL-U								●	●	●	●	●	●	●		●	●	●	●	●
	DCGT 11T304ER-U								●	●	●	●	●	●	●		●	●	●	●	●
	DCGT 11T304EL-U								●	●	●	●	●	●	●		●	●	●	●	●
	DCGT 070201MER-U	1	2	6.35	2.38	2.8	7	<0.1	●						*1						
	DCGT 070202MER-U								●												
	DCGT 070202MEL-U								●	●	●	●	●	●		●	●	●	●	●	●
	DCGT 070204MER-U								●	●	●	●	●	●		●	●	●	●	●	●
DCGT 070204MEL-U	●								●	●	●	●	●	●		●	●	●	●	●	
DCGT 11T301MER-U	2								2	9.525	3.97	4.4	7	<0.1		●	●	●	●	●	●
DCGT 11T301MEL-U		●	●	●	●	●	●	●							●	●	●	●			
DCGT 11T302MER-U		●	●	●	●	●	●	●							●	●	●	●	●		
DCGT 11T302MEL-U		●	●	●	●	●	●	●							●	●	●	●	●		
DCGT 11T304MER-U		●	●	●	●	●	●	●							●	●	●	●	●		
DCGT 11T304MEL-U		●	●	●	●	●	●	●							●	●	●	●	●		
Low feed  Precision / Sharp edge	DCET 11T3003FR-JSF	2	2	9.525	3.97	4.4	7	0.03	●					*2							
	DCET 11T301FR-JSF								●												
	DCET 11T301FL-JSF								●	●	●	●	●		●	●	●	●	●	●	●
	DCET 11T302FR-JSF								●	●	●	●	●		●	●	●	●	●	●	●
	DCET 11T302FL-JSF								●	●	●	●	●		●	●	●	●	●	●	●
	DCET 11T3005MFR-JSF	2	2	9.525	3.97	4.4	7	<0.05	●												
	DCET 11T301MFR-JSF								●												
	DCET 11T302MFR-JSF								●	●	●	●	●		●	●	●	●	●	●	●
	DCET 11T302MFL-JSF								●	●	●	●	●		●	●	●	●	●	●	●
	DCET 11T302MFL-JSF								●	●	●	●	●		●	●	●	●	●	●	●

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

*1: DC..07type E29, E31, E34 E35, E55, E56, F66~F68, F70~F72, F74~F76, F125

*2: DC..11type E23, E29~E32, E34, E35, E55, E56, F66~F68, F70~F72, F74~F76, F125

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Positive

C

D

R

S

T

V

W

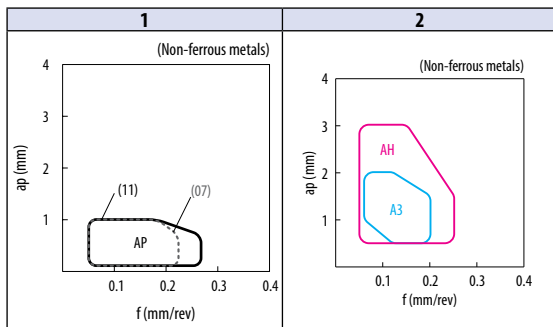
Ceramic

Insert	Description	Applicable chipbreaker range		Dimension (mm)					Angle (°)	Carbide			Applicable toolholder
		No. of edges	No. of chipbreakers	IC	S	D1	RE	AN	DLC				
									PDL010	PDL025	KW10		
Non-ferrous metals Finishing / Sharp edge	DCGT 070202AP 070204AP	1	2	6.35	2.38	2.8	0.2 0.4	7	●	●	●	*1	
	DCGT 11T302AP 11T304AP 11T308AP	1	2	9.525	3.97	4.4	0.2 0.4 0.8	7	●	●	●		
Non-ferrous metals Finishing - Medium / Sharp edge	DCGT 11T302R-A3	2	2	9.525	3.97	4.4	0.2	7	●	●	●	*2	
	11T302L-A3						0.2		●	●	●		
	11T304R-A3						0.4		●	●	●		
	11T304L-A3						0.4		●	●	●		
	11T308R-A3 11T308L-A3						0.8 0.8		● ●	● ●	● ●		
Non-ferrous metals Finishing - Medium / Sharp edge	DCGT 11T304AH 11T308AH	2	2	9.525	3.97	4.4	0.4 0.8	7	●	●	●		
	Cast iron Without chipbreaker	DCGW 070201 070202	-	2	6.35	2.38	2.8	0.1 0.2	7	●	●	●	*1
DCGW 11T301 11T302 11T304		-	2	9.525	3.97	4.4	0.1 0.2 0.4	7	●	●	●	*2	

*1: DC..07type E29, E31, E34 E35, E55, E56, F66~F68, F70~F72, F74~F76, F125

*2: DC..11type E23, E29~E32, E34, E35, E55, E56, F66~F68, F70~F72, F74~F76, F125

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

70° Rhombic

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Positive

C

D

R

S

T

V

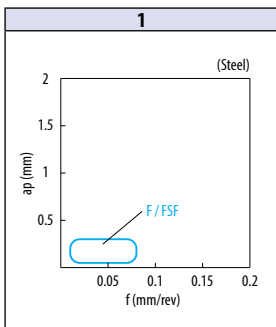
W

Ceramic

Insert	Description	Applicable chipbreaker range		Dimension (mm)						Angle (°)	Carbide				Cermet	Applicable toolholder
		No. of edges	No. of chipbreakers	IC	S	D1	RE	AN	PVD	-	-	-	-	-		
															PR1535		PR1725	PR930	KW10	TN60
Finishing Precision / Sharp edge	JCET 030102L-FSF	1	2	3.5	1.4	1.9	0.2	7								
	JCET 030101MR-FSF 030101ML-FSF	1	2	3.5	1.4	1.9	< 0.1	7								
Finishing Sharp edge	JCET 030102MR-F	1	2	3.5	1.4	1.9	< 0.2	7								F78 F79
	JCET 030102ML-F						< 0.2									
	JCET 030104MR-F						< 0.4									
	JCET 030104ML-F						< 0.4									
Finishing Sharp edge	JCGT 030101R-F	1	2	3.5	1.4	1.9	0.1	7								
	JCGT 030101L-F						0.1									
	JCGT 030102R-F						0.2									
	JCGT 030102L-F						0.2									
	JCGT 030104R-F						0.4									
JCGT 030104L-F	0.4															

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).



Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

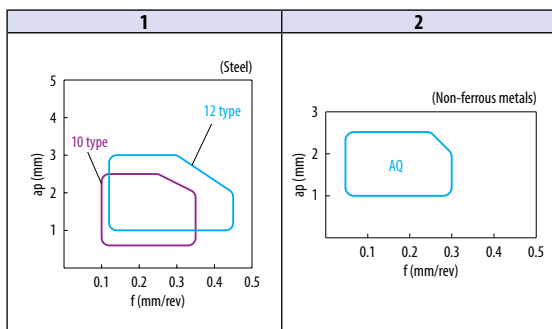
Round

How to read pages of "Turning inserts" See page B15

Insert		Description	Applicable chipbreaker range	Dimension (mm)				Angle (°)	Material										Applicable toolholder						
				IC	S	D1	AN		Carbide											Cermet					
									CVD											-	PVD	-			
								CA02SP	CA11SP	CA12SP	CA310	CA315	CA320	CA4515	CA510	CA515	CA525	CA530	CA6525	KW10	PV720	PV730	TN60	TN620	
Medium		RCMX 1003M0	1	10	3.18	3.6	7	●	●																
		RCMX 1204M0	1	12	4.76	4.2	7	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metals	 Finishing - Medium	RCGX 1003M0-AQ	2	10	3.18	3.6	7													●					

Chipbreaker shape of RCMX... varies by grade (cermet / PVD coated cermet / CVD coated carbide)

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

90° Square

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Positive

C

D

R

S

T

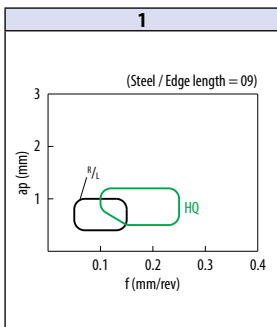
V

W

Ceramic

Insert	Description	Applicable chipbreaker range		Dimension (mm)				Angle (°)	Carbide			Cermet			Applicable toolholder								
		No. of edges	No. of chipbreakers	IC	S	D1	RE		CVD			PVD											
								CA02SP	CA11SP	CA12SP	CA510	CA515	CA525	CA530		PV710	PV720	PV730	TN60	TN610	TN620		
Finishing - Medium	SCMT 09T304HQ 09T308HQ	1	4	9.525	3.97	4.4	0.4 0.8	7	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
Finishing	SPGH 090304L	1	4	9.525	3.18	4.6	0.4	11															F111

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Positive

C

D

R



S

T

V

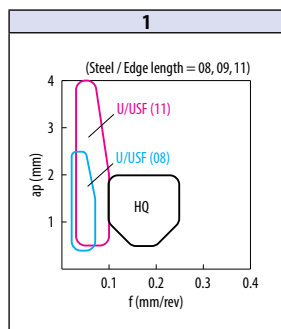
W

Ceramic

Insert	Description	Applicable chipbreaker range		Dimension (mm)				Angle (°)	Carbide				Cermet	Applicable toolholder
		No. of edges	IC	S	D1	RE	AN		PVD					
								PR1225	PR1725	PR930	KW10	TN60		
 <p>Sharp edge</p>	TCGT 080201FR-U	1	3	4.76	2.38	2.5	0.1	7						E38
	TCGT 080202FR-U						0.2							
	TCGT 080202FL-U						0.2							
	TCGT 1103003FR-U	1	3	6.35	3.18	2.8	0.03	7						
	TCGT 110301FR-U						0.1							
	TCGT 110301FL-U						0.1							
	TCGT 110302FR-U						0.2							
	TCGT 110302FL-U						0.2							
	TCGT 080201MFR-U	1	3	4.76	2.38	2.5	<0.1	7						
	TCGT 080202MFR-U						<0.2							
	TCGT 080202MFL-U						<0.2							
	TCGT 1103005MFR-U	1	3	6.35	3.18	2.8	<0.05	7						
	TCGT 1103005MFL-U						<0.05							
	TCGT 110301MFR-U						<0.1							
	TCGT 110301MFL-U						<0.1							
TCGT 110302MFR-U	<0.2													
TCGT 110302MFL-U	<0.2													
TCGT 110304MFR-U	<0.4													
TCGT 110304MFL-U	<0.4													
 <p>With honing</p>	TCGT 080202ER-U	1	3	4.76	2.38	2.5	0.2	7					E38	
	TCGT 080202EL-U						0.2							
	TCGT 110301ER-U	1	3	6.35	3.18	2.8	0.1	7						
	TCGT 110302ER-U						0.2							
	TCGT 110302EL-U						0.2							
	TCGT 110304ER-U						0.4							
	TCGT 110304EL-U	0.4												
	TCGT 080202MER-U	1	3	4.76	2.38	2.5	<0.2	7						
TCGT 110302MER-U	1	3	6.35	3.18	2.8	<0.2	7							
TCGT 110302MEL-U						<0.2								
TCGT 110304MER-U						<0.4								

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

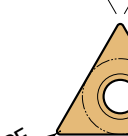

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

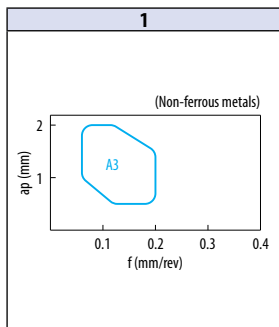
60° Triangle

How to read pages of "Turning inserts" See page B15

		Applicable chipbreaker range		Dimension (mm)					Angle (°)	Carbide			Applicable toolholder
Insert	Description	No. of edges	IC	S	D1	RE	AN	DLC	-				
									PDL010	PDL025	KW10		
Non-ferrous metals  Finishing - Medium / Sharp edge	TCGT 110302R-A3	1	3	6.35	3.18	2.8	0.2	7	●	●	●	E38	
	110302L-A3						0.2		●	●			
	110304R-A3						0.4		●	●			
	110304L-A3						0.4		●	●			
	110308R-A3						0.8		●	●			
	110308L-A3						0.8		●	●			
Cast iron  Without chipbreaker	TCGW 080201	-	3	4.76	2.38	2.5	0.1	7	●	●	●	E38	
	080202						0.2		●	●			
	TCGW 110301	-	3	6.35	3.18	2.8	0.1	7	●	●	●		
							110302		0.2	●	●		
110304							0.4		●	●			

Turning indexable inserts

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Positive

C

D

R

S

T

V

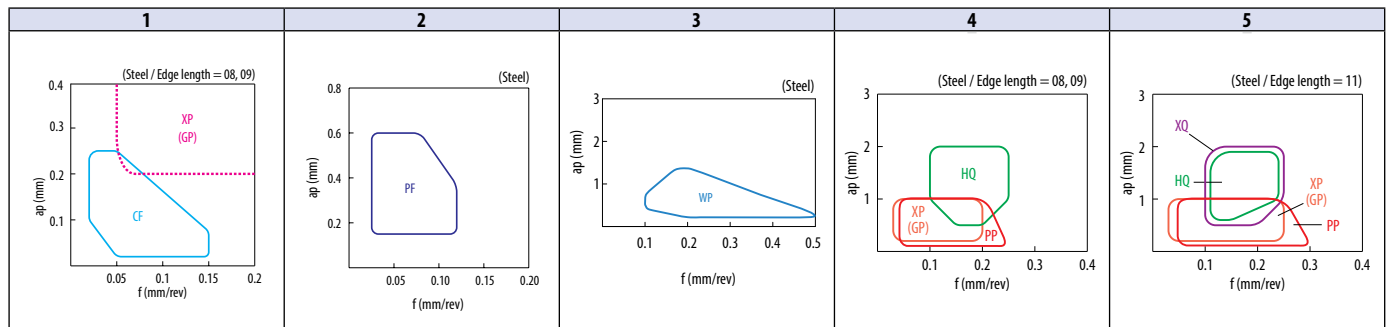
W

Ceramic

Insert	Description	Applicable chipbreaker range	Dimension (mm)					Angle (°)	Carbide						Cermet		Applicable toolholder							
			No. of edges	IC	S	D1	RE		AN	CVD			PVD			CVD		PVD						
										CA02SP	CA11SP	CA12SP	CA510	CA515	CA525				CA530	PR1225	PR1535	PR1705	PR1725	PR830
Minute ap Sharp edge	TPGT 080202CF	1	3	4.76	2.38	2.3	0.2	11										E39 F80~F82 F86						
	TPGT 090202CF	1	3	5.56	2.38	2.8	0.2	11										F33, F34 F80~F82 F86						
Minute ap Polished / Sharp edge	TPGT 080201MP-CF 080202MP-CF	1	3	4.76	2.38	2.3	<0.1 <0.2	11										E39 F80~F82 F86						
	TPGT 090201MP-CF 090202MP-CF	1	3	5.56	2.38	2.8	<0.1 <0.2	11										F33, F34 F80~F82 F86						
Finishing Polished / Sharp edge	TPGT 090201MFP-PF 090202MFP-PF 090204MFP-PF	2	3	5.56	2.38	2.8	<0.1 <0.2 <0.4	11										F33, F34 F80~F82 F86						
	TPMX 090202WP 090204WP 090208WP	3	3	5.56	2.38	2.8	0.2 0.4 0.8	11										F33, F34 F80~F82						
		TPMX 110302WP 110304WP 110308WP	3	3	6.35	3.18	3.3	0.2 0.4 0.8	11										F80~F82 F126					
Finishing With Wiper Edge	TPMX 110304R-WP 110304L-WP	3	3	6.35	3.18	3.3	0.4	11										F33, F34 F80~F82 F86						
Finishing	TPMT 090202PP 090204PP	4	3	5.56	2.38	2.8	0.2 0.4	11										E39 F80~F82 F84, F85 F126						
	TPMT 110302PP 110304PP 110308PP	5	3	6.35	3.18	3.3	0.2 0.4 0.8	11																

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).
See "Precautions when using Wiper inserts" in the R36 and R37 for WP chipbreaker.

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

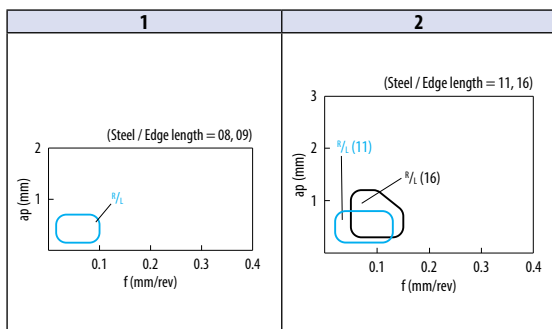
How to read pages of "Turning inserts" See page B15

		Applicable chipbreaker range		Dimension (mm)					Angle (°)	Car-bide	Applicable toolholder		
Insert	Description	No. of edges	IC	S	D1	RE	AN	PRI705 PRI725	PVD				
Finishing	TPGH	080201ML	1	3	4.76	2.38	2.3	11	●	●	E39 F80~F82 F86		
		080202MR										●	●
		080202ML										●	●
		080204MR										●	●
		080204ML										●	●
	TPGH	090201ML	1	3	5.56	2.38	3.2	11	●	●	F33, F34 F80~F82 F86		
		090202MR										●	●
		090202ML										●	●
		090204MR										●	●
		090204ML										●	●
	TPGH	110202ML	2	3	6.35	2.38	3.7	11	●	●	F84 F85		
		110204ML										●	●
	TPGH	110302MR	2	3	6.35	3.18	3.3	11	●	●	E39 F80~F82 F84, F85 F126		
		110302ML										●	●
		110304MR										●	●
110304ML		●										●	
110308ML		●										●	
TPGH	160302ML	2	3	9.525	3.18	4.7	11	●	●	F80~F82 F84 F126			
	160304MR										●	●	
	160304ML										●	●	
	160304ML										●	●	
	160308ML										●	●	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Turning indexable inserts

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

60° Triangle

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Positive

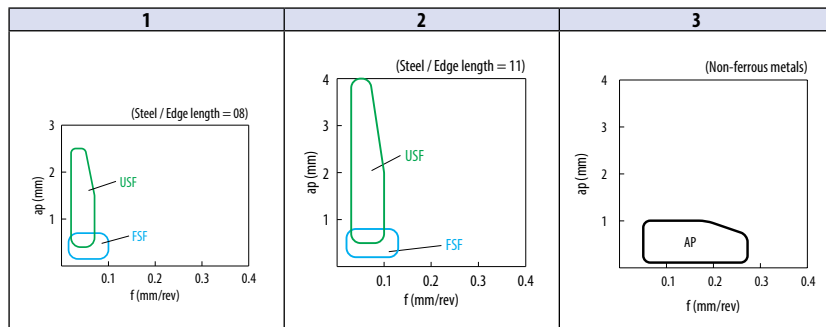


Ceramic

Insert	Description	Applicable chipbreaker range		Dimension (mm)				Angle (°)	Material						Applicable toolholder	
		No. of edges	IC	S	D1	RE	AN		Carbide			Cermet				
									DLC	PVD	-	PVD	-	-		
<p>Precision / Sharp edge</p>	TPET 080201FL-USF 080202FR-USF 080202FL-USF	1	3	4.76	2.38	2.3	0.1 0.2 0.2	11	●	●	●	●	●	●	●	E39 F80~F82 F86
	TPET 110301FR-USF 110301FL-USF 110302FR-USF 110302FL-USF	2	3	6.35	3.18	3.3	0.1 0.1 0.2 0.2	11	●	●	●	●	●	●	●	E39 F80~F82 F84, F85, F126
	TPET 080202MFR-USF 080202MFL-USF	1	3	4.76	2.38	2.3	<0.2	11	●	●	●	●	●	●	●	E39 F80~F82 F86
	TPET 110301MFL-USF 110302MFR-USF 110302MFL-USF	2	3	6.35	3.18	3.3	<0.1 <0.2 <0.2	11	●	●	●	●	●	●	●	E39 F80~F82 F84, F85, F126
<p>Finishing / Sharp edge</p>	TPGT 090202AP 090204AP 090208AP	3	3	5.56	2.38	2.8	0.2 0.4 0.8	11	●	●	●	●	●	●	●	F33, F34 F80~F82 F86
	TPGT 110302AP 110304AP 110308AP	3	3	6.35	3.18	3.3	0.2 0.4 0.8	11	●	●	●	●	●	●	●	E39 F80~F82 F84, F85, F126
<p>Without chipbreaker</p>	TPGB 080202 080204 080208	-	3	4.76	2.38	2.3	0.2 0.4 0.8	11	●	●	●	●	●	●	●	E39 F80~F82 F86
	TPGB 090202 090204	-	3	5.56	2.38	3.2	0.2 0.4	11	●	●	●	●	●	●	●	F33, F34 F80~F82 F86
	TPGB 1102005 110201 110202 110204	-	3	6.35	2.38	3.7	0.05 0.1 0.2 0.4	11	●	●	●	●	●	●	●	F84 F85
	TPGB 1103005 110301 110302 110304 110308	-	3	6.35	3.18	3.3	0.05 0.1 0.2 0.4 0.8	11	●	●	●	●	●	●	●	E39 F80~F82 F84, F85, F126
	TPGB 160304 160308	-	3	9.525	3.18	4.7	0.4 0.8	11	●	●	●	●	●	●	●	F80~F82 F84, F126

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

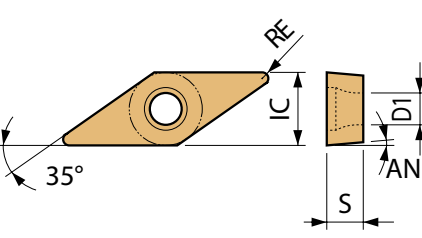
Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

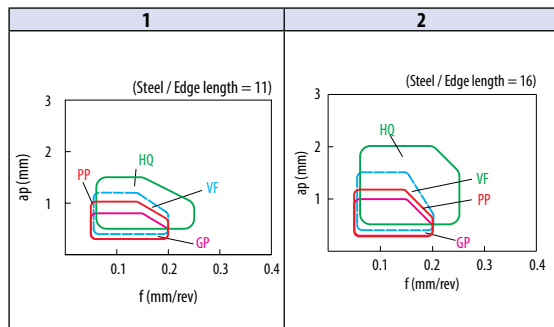
35° Rhombic

How to read pages of "Turning inserts" See page B15



Insert	Description	Applicable chipbreaker range		Dimension (mm)					Angle (°)	Carbide										Cermet					Applicable toolholder					
		No. of edges	IC	S	D1	RE	AN	CVD					PVD					-												
								CA02SP		CA11SP	CA12SP	CA510	CA515	CA525	CA530	CA6515	CA6525	PR1225	PR1535	PR1725	PR930	CCX	PV7005	PV710		PV720	PV730	Ti60	Ti610	Ti620
Finishing	VBMT 110302PP 110304PP 110308PP	1	2	6.35	3.18	2.8	0.2 0.4 0.8	5	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	E40~E43 E58 F90, F91 F94~F99, F127					
	VBMT 160404PP 160408PP 160412PP	2	2	9.525	4.76	4.4	0.4 0.8 1.2	5	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	E41~E43 F90, F91 F94~F99, F127						
Finishing	VBMT 110304GP	1	2	6.35	3.18	2.8	0.4	5	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	E40~E43 E58 F90, F91 F94~F99, F127						
	VBMT 160404GP 160408GP	2	2	9.525	4.76	4.4	0.4 0.8	5	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	E41~E43 F90, F91 F94~F99, F127						
Finishing	VBMT 110302VF 110304VF 110308VF	1	2	6.35	3.18	2.8	0.2 0.4 0.8	5	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	E40~E43 E58 F90, F91 F94~F99, F127						
	VBMT 160402VF 160404VF 160408VF 160412VF	2	2	9.525	4.76	4.4	0.2 0.4 0.8 1.2	5	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	E41~E43 F90, F91 F94~F99, F127						
Finishing - Medium	VBMT 110304HQ 110308HQ	1	2	6.35	3.18	2.8	0.4 0.8	5	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	E40~E43 E58 F90, F91 F94~F99, F127						
	VBMT 160404HQ 160408HQ 160412HQ	2	2	9.525	4.76	4.4	0.4 0.8 1.2	5	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	●●●●●	E41~E43 F90, F91 F94~F99, F127						

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Turning indexable inserts

35° Rhombic

How to read pages of "Turning inserts" See page B15

B

Turning indexable inserts

Chip breakers

Positive

C

D

R

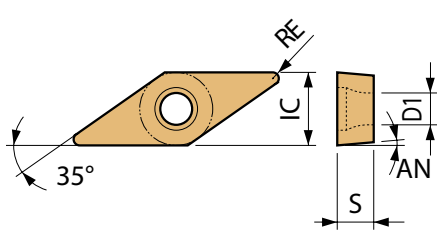
S

T

V

W

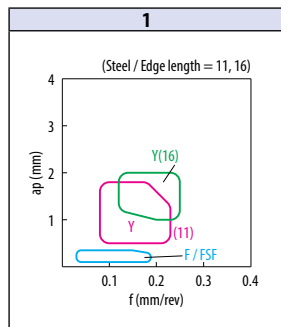
Ceramic



Insert	Description	Applicable chipbreaker range		Dimension (mm)				Angle (°)	Carbide				Cermet				Applicable toolholder				
		No. of edges	IC	S	D1	RE	AN		PVD		-		PVD		-						
								PR1225	PR1535	PR1705	PR1725	PR830	KW10	PV710	PV720	PV730		TN60	TN610	TN620	
Finishing Precision / Sharp edge	VBET 1103003R-FSF 1103003L-FSF 110301R-FSF 110301L-FSF 110302R-FSF 110302L-FSF	1	2	6.35	3.18	2.8	0.03	5													
							0.03														
							0.1														
							0.1														
							0.2														
	VBET 1103005MR-FSF 1103005ML-FSF 110301MR-FSF 110301ML-FSF 110302MR-FSF 110302ML-FSF	1	2	6.35	3.18	2.8	< 0.05	5													
							< 0.05														
							< 0.1														
							< 0.1														
							< 0.2														
Finishing Sharp edge	VBET 1103005MR-F 1103005ML-F 110301MR-F 110301ML-F 110302MR-F 110302ML-F	1	2	6.35	3.18	2.8	< 0.05	5													
							< 0.05														
							< 0.1														
							< 0.1														
							< 0.2														
	VBGT 1103003R-F 1103003L-F 110301R-F 110301L-F 110302R-F 110302L-F	1	2	6.35	3.18	2.8	0.03	5													
							0.03														
							0.1														
							0.1														
							0.2														
VBGT 1103005MR-F 1103005ML-F 110301MR-F 110301ML-F 110302MR-F 110302ML-F	1	2	6.35	3.18	2.8	< 0.05	5														
						< 0.05															
						< 0.1															
						< 0.1															
						< 0.2															

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

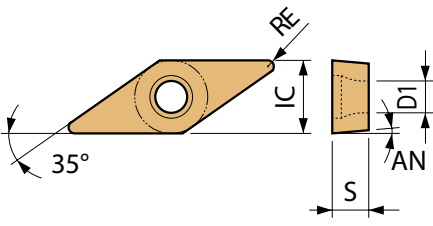
Applicable chipbreaker range





● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

35° Rhombic

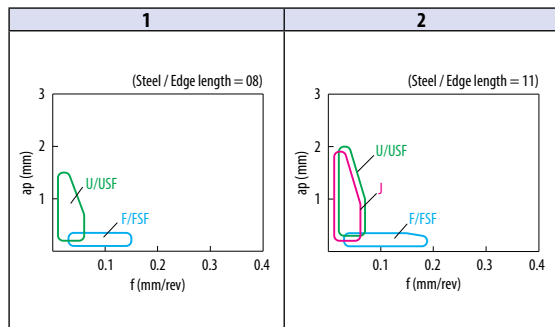
How to read pages of "Turning inserts" See page B15



Insert	Description	Applicable chipbreaker range		Dimension (mm)					Angle (°)	Carbide				Cermet	Applicable toolholder
		No. of edges	No. of inserts	IC	S	D1	RE	AN		PVD					
									PR1225	PR1535	PR1725	PR930	TN60		
Finishing  Precision / Sharp edge	VPET 080201R-FSF 080201L-FSF 080202R-FSF 080202L-FSF	1	2	4.76	2.38	2.3	0.1 0.1 0.2 0.2	11		●	●	●	●		E48, E49 F90, F91
	VPET 1103003R-FSF 110301R-FSF 110301L-FSF 110302R-FSF 110302L-FSF	2	2	6.35	3.18	2.8	0.03 0.1 0.1 0.2 0.2	11		●	●	●	●		E24 E47~E49
	VPET 080201MR-FSF 080201ML-FSF 080202MR-FSF 080202ML-FSF	1	2	4.76	2.38	2.3	<0.1 <0.1 <0.2 <0.2	11	●	●	●	●		E48, E49 F90, F91	
	VPET 1103005MR-FSF 110301MR-FSF 110301ML-FSF 110302MR-FSF 110302ML-FSF	2	2	6.35	3.18	2.8	<0.05 <0.1 <0.1 <0.2 <0.2	11	●	●	●	●		E24 E47~E49	
	Finishing  Sharp edge	VPET 080201MR-F 080201ML-F 080202MR-F 080202ML-F	1	2	4.76	2.38	2.3	<0.1 <0.1 <0.2 <0.2	11	●	●	●	●		E48, E49 F90, F91
		VPET 1103005MR-F 110301MR-F 110302MR-F 110302ML-F	2	2	6.35	3.18	2.8	<0.05 <0.1 <0.2 <0.2	11	●	●	●	●		E24 E47~E49

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

Applicable chipbreaker range



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Turning indexable inserts

25° Rhombic

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Positive





Ceramic

Insert	Description	No. of edges	Dimension (mm)				Angle (°)	Car-bide				Applicable toolholder	
			IC	S	D1	RE		AN	Cermet				
									PVD	PVD	-		
							PR1535	PR1725	PV720	PV730	TN620		
Finishing	ZBMT 13T302GF 13T304GF 13T308GF	2	6.35	3.97	3.7	0.2 0.4 0.8	5	●	●	●	●	●	E52, E53 F106~F110
Finishing	ZBMT 13T304R-GF-15D	2	6.35	3.97	3.7	0.4	5	●	●				

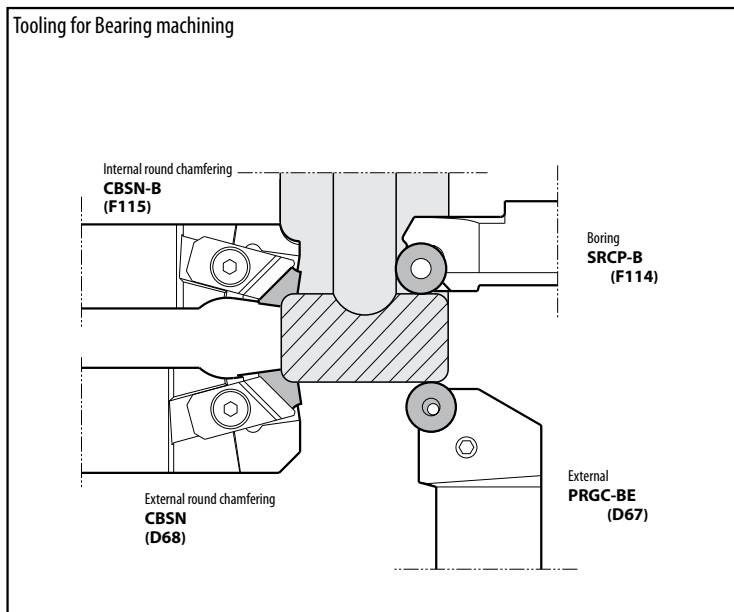
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Round / SNMF Type

How to read pages of "Turning inserts" See page B15

		Free-cutting steel		Carbon steel / Alloy steel		Stainless steel		Gray cast iron		Nodular cast iron		Non-ferrous metals		Heat-resistant alloy		Titanium alloy		Hard materials	
Insert	Description	No. of edges	Dimension (mm)							Angle (°)	Cermet	Applicable toolholder							
			CDX	INSL	IC	S	D1	RE	AN										
 External / Boring / Facing	RCMT 1204M0-BB	-	-	-	12	4.76	4.2	-	7	●	D67								
	RCMT 1606M0-BB	-	-	-	16	6.35	5.5	-	7	●									
	RPMT 1203M0-BB	-	-	-	12	3.18	4.4	-	11	●	F114								
	RPMT 1604M0-BB	-	-	-	16	4.76	5.5	-	11	●									
 Round Chamfering	SNMF 120406-21	8	1.5	12.7	-	4.76	-	0.6	-	●	D68 F115								
	SNMF 120410-21		3							●									
	SNMF 120416-21		3.1							●									
	SNMF 120421-21		3.2							●									
	SNMF 120426-21		3.3							●									

Tooling for Bearing machining



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



ABS / ABW

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Negative

C

D

R

S

T

V

W

Ceramic


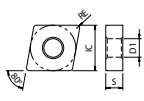
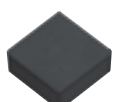
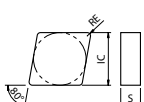
Insert		Description	No. of edges	Dimension (mm)	Material						Applicable toolholder	
					Free-cutting steel							P
					Carbon steel / Alloy steel							M
					Stainless steel							K
Gray cast iron						N						
Nodular cast iron						S						
Non-ferrous metals						H						
Heat-resistant alloy												
Titanium alloy												
Hard materials												
					Carbide			Cermet				
					PVD							
					PR1225	PR1705	PR1725	PR930	KW10	TC60		
		ABS 15R4005M 15R4015M	2	< 0.05 < 0.15	●	●	●				E20	
		ABS 15R4005 15R4015	2	0.05 0.15					●	●	E20	
		ABW 15R4005M 15R4015M	2	< 0.05 < 0.15	●	●	●				E21	
		ABW 15R4005 15R4015	2	0.05 0.15					●	●	E21	
		ABW 23R5005M 23R5015M	2	< 0.05 < 0.15	●	●	●				E22	
		ABW 23R5005 23R5015	2	0.05 0.15					●	●	E22	

Insert whose corner-R(RE) dimension expressed with less than sign (e.g. <0.05, <0.1, <0.2 etc.) indicate models with minus tolerance on corner-R(RE).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Material compatibility											Applicable toolholder					
Symbol	Specification	Example	Gray cast iron (with scale)	Gray cast iron (without scale)	Nodular cast iron (with scale)	Nodular cast iron (without scale)	Heat-resistant alloy	Hard materials	CVD	PVD	Ceramic								
			IC	S	D1	RE	CS7050	AG6N	PT600M	AG6	KA30	KS6015	KS6040	KS6050	K				
			Dimension (mm)				Ceramic												
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)				Ceramic											Applicable toolholder
				IC	S	D1	RE	CVD	PVD	Ceramic									
 	CNGA 120412S01025	S01025	4	12.7	4.76	5.16	1.2					●			D8~D10 F118 F131 F132				
	CNGA 120404S01525 120408S01525 120412S01525	S01525	4	12.7	4.76	5.16	0.4 0.8 1.2	●	●	●									
	CNGA 120404S02025 120408S02025 120412S02025	S02025	4	12.7	4.76	5.16	0.4 0.8 1.2	●	●	●									
	CNGA 120404T02025 120408T02025 120412T02025	T02025	4	12.7	4.76	5.16	0.4 0.8 1.2	●	●	●	●	●	●	●					
	CNGA 120404S03030 120408S03030 120412S03030	S03030	4	12.7	4.76	5.16	0.4 0.8 1.2	●	●	●									
	CNMA 120408S03030 120412S03030	S03030	4	12.7	4.76	5.16	0.8 1.2	●	●										
 	CNGN 120408T01020	T01020	4	12.7	4.76	-	0.8					●			D49				
	CNGN 120412S01025	S01025	4	12.7	4.76	-	1.2					●							
	CNGN 120408T02025 120412T02025 120416T02025	T02025	4	12.7	4.76	-	0.8 1.2 1.6	●	●			●	●	●					
	CNGN 120708S01525 120712S01525	S01525	4	12.7	7.94	-	0.8 1.2	●	●										
	CNGN 120704T02025 120708T02025 120712T02025 120716T02025	T02025	4	12.7	7.94	-	0.4 0.8 1.2 1.6			●	●	●	●						
	CNGN 160712T02025 160716T02025	T02025	4	15.875	7.94	-	1.2 1.6			●	●								
	CNMN 120708T02025	T02025	4	12.7	7.94	-	0.8			●									

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

55° Rhombic

How to read pages of "Turning inserts" See page B15

B




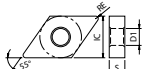
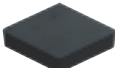
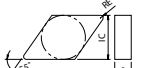
Turning indexable inserts

Chip breakers

Negative



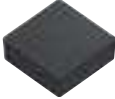
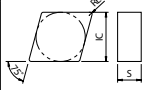
Ceramic

Cutting edge preparation			Gray cast iron (with scale)				Gray cast iron (without scale)				Nodular cast iron (with scale)				Nodular cast iron (without scale)				Heat-resistant alloy				Hard materials			
Symbol	Specification	Example																								
S	Chamfered and R-honed	S01525 0.15mm × 25° chamfered and R-honed																								
T	Chamfered	T02025 0.20mm × 25° chamfered																								
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)				Ceramic			Applicable toolholder															
				IC	S	D1	RE	PVD	-																	
 	DNGA 150404S01525 150408S01525	S01525	4	12.7	4.76	5.16	0.4 0.8	● ●		D13~D17 F120, F136 F138~F140																
	DNGA 150404S02025 150408S02025	S02025	4	12.7	4.76	5.16	0.4 0.8	● ●																		
	DNGA 150404T02025 150408T02025 150412T02025	T02025	4	12.7	4.76	5.16	0.4 0.8 1.2	● ● ●																		
	DNGA 150408S03030	S03030	4	12.7	4.76	5.16	0.8	●																		
	DNGA 150604T02025 150608T02025 150612T02025	T02025	4	12.7	6.35	5.16	0.4 0.8 1.2	● ● ●			D13~D17															
 	DNGN 150704S01525 150708S01525 150712S01525	S01525	4	12.7	7.94	-	0.4 0.8 1.2	● ● ●		D50																
	DNGN 150708S02025	S02025	4	12.7	7.94	-	0.8	●																		
	DNGN 150704T02025 150708T02025 150712T02025 150716T02025	T02025	4	12.7	7.94	-	0.4 0.8 1.2 1.6	● ● ● ●																		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

75° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Gray cast iron (with scale)		Gray cast iron (without scale)		Nodular cast iron (with scale)		Nodular cast iron (without scale)		Heat-resistant alloy		Hard materials		
Symbol	Specification	Example														
S	Chamfered and R-honed	S01525	0.15mm × 25° chamfered and R-honed													
T	Chamfered	T02025	0.20mm × 25° chamfered													
 				Description ENGN 130708S01525		S01525	4	12.7	7.94	0.8	●					
				ENGN 130704T02025 130708T02025 130712T02025 130716T02025 130720T02025		T02025	4	12.7	7.94	0.4 0.8 1.2 1.6 2	● ● ● ● ●					
				Applicable toolholder												
				D51 F151												



Turning indexable inserts

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Round

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Negative

C

D

R


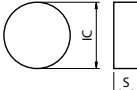
S

T

V

W


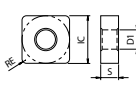

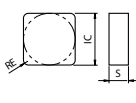
Ceramic

Cutting edge preparation				Material compatibility										Applicable toolholder	
Symbol	Specification	Example		Gray cast iron (with scale)	Gray cast iron (without scale)	Nodular cast iron (with scale)	Nodular cast iron (without scale)	Heat-resistant alloy	Hard materials	Ceramic					
E	R-honed	E005	R0.05mm honed		☺				☹	-					
K	Double chamfered	K15015	1.5mm × 15° chamfered		☺				☹	-					
S	Chamfered and R-honed	S01525	0.15mm × 25° chamfered and R-honed						☹	-					
T	Chamfered	T02025	0.20mm × 25° chamfered						☹	-					
				IC	S	A66N	PI600M	AG5	KS6015	KS6030	KS6040	KS6050			
 	RNGN	090300T01020	T01020	9.525	3.18				●				D61		
	RNGN	090400S01525	S01525	9.525	4.76	●									
	RNGN	090400S02025	S02025	9.525	4.76	●									
	RNGN	090400T02025	T02025	9.525	4.76	●	●								
	RNGN	120400E003	E003	12.7	4.76				●				D58 D61		
	RNGN	120400T01020	T01020	12.7	4.76				●						
	RNGN	120400S01525	S01525	12.7	4.76	●									
	RNGN	120400S02025	S02025	12.7	4.76	●	●								
	RNGN	120400T02025	T02025	12.7	4.76	●	●	●				●			
	RNGN	120700E003	E003	12.7	7.94				●						
	RNGN	120700E005	E005	12.7	7.94					●					
	RNGN	120700T01020	T01020	12.7	7.94				●	●					
	RNGN	120700K15015	K15015	12.7	7.94	●									
	RNGN	120700S01525	S01525	12.7	7.94	●									
	RNGN	120700S02025	S02025	12.7	7.94	●									
	RNGN	120700T02025	T02025	12.7	7.94	●	●	●				●			
	RNGN	150700S01525	S01525	15.875	7.94	●							D58		
	RNGN	150700S02025	S02025	15.875	7.94	●									
	RNGN	150700T02025	T02025	15.875	7.94		●								
	RNGN	190700E003	E003	19.05	7.94				●				-		
RNGN	190700T01020	T01020	19.05	7.94				●	●			-			
RNGN	250700E003	E003	25.4	7.94				●				-			

● : Standard item R : Right-hand only L : Left-hand only ☐ : Check availability

90° Square

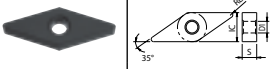
How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Material compatibility											Applicable toolholder			
Symbol	Specification	Example	Gray cast iron (with scale)	Gray cast iron (without scale)	Nodular cast iron (with scale)	Nodular cast iron (without scale)	Heat-resistant alloy	Hard materials	CVD	PVD	Ceramic						
			Edge preparation type	No. of edges	IC	S	D1	RE	C57050	A66N	PT600M	A65	KA30	KS6015	KS6040	KS6050	
 	SNGA	120408S01525 120412S01525	S01525	8	12.7	4.76	5.16	0.8 1.2	●								D19~D21 F142
	SNGA	120408S02025 120412S02025	S02025	8	12.7	4.76	5.16	0.8 1.2		●							
	SNGA	120408T02025 120412T02025 120416T02025	T02025	8	12.7	4.76	5.16	0.8 1.2 1.6	●	●	●	●	●	●	●	●	
	SNMA	120408S03030	S03030	8	12.7	4.76	5.16	0.8	●								
 	SNGN	120412T01020	T01020	8	12.7	4.76	-	1.2						●			D52~D54 D63 D64
	SNGN	120408S01025 120412S01025 120416S01025 120420S01025	S01025	8	12.7	4.76	-	0.8 1.2 1.6 2					●	●	●	●	
	SNGN	120408S01525 120412S01525 120416S01525	S01525	8	12.7	4.76	-	0.8 1.2 1.6	●								
	SNGN	120408S02025 120412S02025 120416S02025	S02025	8	12.7	4.76	-	0.8 1.2 1.6		●							
	SNGN	120404T02025 120408T02025 120412T02025 120416T02025 120420T02025	T02025	8	12.7	4.76	-	0.4 0.8 1.2 1.6 2	●	●	●	●	●	●	●	●	
	SNGN	120704S01525 120708S01525 120712S01525 120716S01525 120720S01525	S01525	8	12.7	7.94	-	0.4 0.8 1.2 1.6 2	●	●	●	●	●	●	●	●	
	SNGN	120708S02025 120712S02025 120716S02025 120720S02025	S02025	8	12.7	7.94	-	0.8 1.2 1.6 2		●	●	●	●	●	●	●	
	SNGN	120704T02025 120708T02025 120712T02025 120716T02025 120720T02025	T02025	8	12.7	7.94	-	0.4 0.8 1.2 1.6 2			●	●	●	●	●	●	
	SNMN	120716T02025	T02025	8	12.7	7.94	-	1.6			●						
	SNGN	150712T02025	T02025	8	15.875	7.94	-	1.2			●						

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Gray cast iron (with scale)				Gray cast iron (without scale)				Nodular cast iron (with scale)				Nodular cast iron (without scale)				Heat-resistant alloy				Hard materials			
Symbol	Specification	Example																									
S	Chamfered and R-honed	S01525	0.15mm × 25° chamfered and R-honed																								
T	Chamfered	T02025	0.20mm × 25° chamfered																								
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)				Ceramic			Applicable toolholder																
				IC	S	D1	RE	PVD -																			
								AG6N	PT600M	AG5																	
	VNGA 160404S01525 160408S01525	S01525	4	9.525	4.76	3.81	0.4 0.8	● ●	-	-	D30~D39																
	VNGA 160404S02025 160408S02025	S02025	4	9.525	4.76	3.81	0.4 0.8	● ●	-	-																	
	VNGA 160404T02025 160408T02025 160412T02025	T02025	4	9.525	4.76	3.81	0.4 0.8 1.2	● ● ●	● ●	-																	



Turning indexable inserts

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Round

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Positive



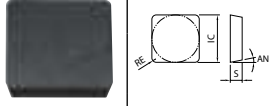
Ceramic

Cutting edge preparation				Gray cast iron (with scale)			K
				Gray cast iron (without scale)			
Symbol	Specification	Example		Nodular cast iron (with scale)			
				Nodular cast iron (without scale)			
E	R-honed	E003	R0.03mm honed				S
T	Chamfered	T01020	0.10mm x 20° chamfered				
				Heat-resistant alloy			H
				Hard materials			
Insert	Description	Edge preparation type	Dimension (mm)		Angle (°)	Ceramic	Applicable toolholder
			IC	S	AN		
	RPGN 090300E003	E003	9.525	3.18	11	●	-
	RPGN 090300T01020	T01020	9.525	3.18	11	●	
	RPGN 120400E003	E003	12.7	4.76	11	●	
	RPGN 120400T01020	T01020	12.7	4.76	11	●	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Square

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Gray cast iron (with scale)		Gray cast iron (without scale)		Nodular cast iron (with scale)		Nodular cast iron (without scale)		Heat-resistant alloy		Hard materials		K S H
Symbol	Specification	Example													
S	Chamfered and R-honed	S00820 0.08mm × 20° chamfered and R-honed													
T	Chamfered	T00820 0.08mm × 20° chamfered													
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)			Angle (°)	Cera-mic		Applicable toolholder					
				IC	S	RE		AN	PVD		-				
	SPGN 090308S00820	S00820	4	9.525	3.18	0.8	11	●	-	F112					
	SPGN 090308T00820	T00820	4	9.525	3.18	0.8	11	●	-						
	SPGN 120308S00820	S00820	4	12.7	3.18	0.8	11	●	-						
	SPGN 120308T00820 120312T00820	T00820	4	12.7	3.18	0.8 1.2	11	● ●	- -						



Turning indexable inserts

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Triangle

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Positive




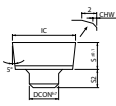

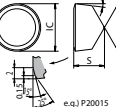

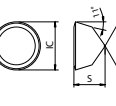
Ceramic

Cutting edge preparation			Gray cast iron (with scale)				Gray cast iron (without scale)				Nodular cast iron (with scale)				Nodular cast iron (without scale)				Heat-resistant alloy				Hard materials			
Symbol	Specification	Example																								
S	Chamfered and R-honed	S00820	0.08mm × 20° chamfered and R-honed																							
T	Chamfered	T00820	0.08mm × 20° chamfered																							
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)			Angle (°)	Ceramic			Applicable toolholder															
				IC	S	RE		AN	PVD -																	
									AG6N	PT600M		AG5														
	TBGN 060104S00820 060108S00820	S00820	3	3.97	1.59	0.4 0.8	5	●	●	●	-															
	TPGN 090204T00820 090208T00820	T00820	3	5.56	2.38	0.4 0.8	11	●	●	●	F113															
	TPGN 110304S00820 110308S00820	S00820	3	6.35	3.18	0.4 0.8	11	●	●	●	F113															
	TPGN 110304T00820 110308T00820	T00820	3	6.35	3.18	0.4 0.8	11	●	●	●	F113															
	TPGN 160304S00820 160308S00820 160312S00820	S00820	3	9.525	3.18	0.4 0.8 1.2	11	●	●	●	F113															
	TPGN 160304T00820 160308T00820	T00820	3	9.525	3.18	0.4 0.8	11	●	●	●	F113															

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Inserts for high hardened roll

How to read pages of "Turning inserts" See page B15

Cutting edge preparation														
Symbol	Specification	Example												
E	R-honed	E005	R0.05mm honed											
K	Double chamfered	K20003	2.0mm × 3° chamfered											
P	Double chamfered and R-honed	P20015	2.0mm × 15° chamfered and R-honed											
S	Chamfered and R-honed	S01020	0.10mm × 20° chamfered and R-honed											
T	Chamfered	T01020	0.10mm × 20° chamfered											
				Gray cast iron (with scale)					✳					K
				Gray cast iron (without scale)										
				Nodular cast iron (with scale)										
				Nodular cast iron (without scale)										
				Heat-resistant alloy					✳			S		
				Hard materials					✳			H		
Insert	Description	Edge preparation type	Dimension (mm)					Ceramic			Applicable toolholder			
			IC	DCON	S	S2	CHW	PVD						
 	RBG 16K20003	K20003	16	8	8	5	0.2	●			-			
	RCGX 060600E005	E005	6.35	-	6.35	-	-	●			-			
 	RCGX 060600T01020	T01020	6.35	-	6.35	-	-	●	●					
	RCGX 090700T01020	T01020	9.525	-	8	-	-	●	●					
	RCGX 090700P20015	P20015	9.525	-	8	-	-	●			-			
	RCGX 120700E003	E003	12.7	-	8	-	-	●			-			
	RCGX 120700T01020	T01020	12.7	-	8	-	-	●			-			
	RCGX 120700P20015	P20015	12.7	-	8	-	-	●			-			
 	RPGX 060600E003	E003	6.35	-	6.35	-	-	●			-			
	RPGX 060600T01020	T01020	6.35	-	6.35	-	-	●			-			
	RPGX 090700E003	E003	9.525	-	8	-	-	●			-			
	RPGX 090700T01020	T01020	9.525	-	8	-	-	●			-			
	RPGX 120700E003	E003	12.7	-	8	-	-	●			-			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Grooving inserts

How to read pages of "Turning inserts" See page B15

B



Turning indexable inserts

Chip breakers

Grooving

C

D

R

S

T

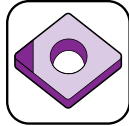
V

W

Ceramic

Cutting edge preparation			Material compatibility										Applicable toolholder	
Symbol	Specification	Example											K	
S	Chamfered and R-honed	S01020 0.10mm × 20° chamfered and R-honed											● ○	
T	Chamfered	T01020 0.10mm × 20° chamfered												
			Heat-resistant alloy										S	
			Hard materials										○ ●	
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)				Tolerance (mm)		Ceramic			Applicable toolholder	
				CW	S	RE	INSL	CW min.	CW max.	PVD				
										A66N	PT600M	A65		
	GH 4020-05	S01020 T01020	2	4	7.5	0.5	20	-0.05	+0.05	●	●	●	G62 G63 G93	
	GH 5020-05	S01020 T01020	2	5	7.5	0.5	20	-0.05	+0.05	●	●	●		
	GH 6020-05	T01020	2	6	7.5	0.5	20	-0.05	+0.05			●		
	GH 7020-05	T01020	2	7	7.5	0.5	20	-0.05	+0.05			●		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



CBN Lineup		C2
Negative inserts	80° Rhombic	C8
	55° Rhombic	C10
	90° Square	C12
	60° Triangle	C13
	35° Rhombic	C14
	80° Trigon	C15
	80° Rhombic / Solid	C16
	Round / Solid	C17
	90° Square / Solid	C18
Positive inserts	60° Triangle / Solid	C19
	80° Rhombic	C20
	55° Rhombic	C22
	60° Triangle	C23
	35° Rhombic	C26
Grooving inserts	80° Trigon	C28
	GBA	C29
	GDGS	C30
	GMN	C31
Solid bar	EZB-NB	C32
PCD Lineup		C33
Negative inserts	80° Rhombic	C34
	55° Rhombic	C35
	60° Triangle	C36
	35° Rhombic	C37
	80° Trigon	C38
	Positive inserts	80° Rhombic	C39
55° Rhombic		C42
90° Square		C43
60° Triangle		C44
35° Rhombic		C49
80° Trigon		C51
25° Rhombic		C53
Grooving inserts		GBA	C54
	GV/GVF	C55
	GDGS	C56
	GMN	C57
	GMGW	C58
	TKF	C59
Solid bar	EZB-NB	C60
	VNBR-NB	C61
	VNGR-NB	C62
Milling inserts	Available inserts	C64

Identification system (Turning insert / CBN)



Turning Indexable Inserts Identification System* See B2

Insert type	Description	Edge preparation	Manufacturer's option	Edge length	Number of edges	Re-grinding
Negative	CNGA120404MEF	F	MEF	Short (Small edge)	2	Not recommended
	CNGA120404ME4	S01225	ME4		4 (Multi edge double-sided)	
	CNGA120404S01225ME		ME		2	
	CNGA120404S00545MEP	S00545	MEP		2	
	CNGA120404S01225SE	S01225	SE		1	
	CNMN120404S02020	S02020	Without indication (Only KBN900)	Long	Multi edge	Possible
Positive	CCMW09T304MEF	F	MEF	Short (Small edge)	2	Not recommended
	CCMW09T304T00815ME	T00815	ME		2	
	CCMW09T304S01225MES	S01225	MES		2	
	CCMW09T304T00815SE	T00815	SE		1	

About re-grinding

- Re-grinding is possible for inserts without any indication in manufacturer's option. Regrinding can not be available depending on the edge condition.
- Re-grinding is not recommended for inserts with manufacturer's symbol like "ME" or "SE"

Edge preparation identification system

Edge preparation				
Symbol	Cutting edge spec.	Example		Shape
F	Sharp edge	F	Sharp edge	
E	Honed cutting edge	E008	R0.08 mm honed cutting edge	
T	Chamfered cutting edge	T01215	0.12 mm x 15° chamfered cutting edge	
S	Chamfered and honed cutting edge	S01225	0.12 mm x 25° chamfered and honed cutting edge	

Features of chamfer width and angle

Chamfer width and angle

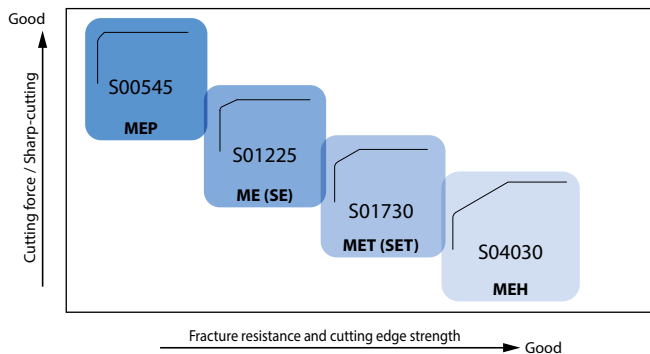
Small ← → Large

Cutting force	Good ← → Poor
Wear resistance	Good ← → Poor
Fracture resistance	Poor ← → Good
Application	Continuous ← → Interruption

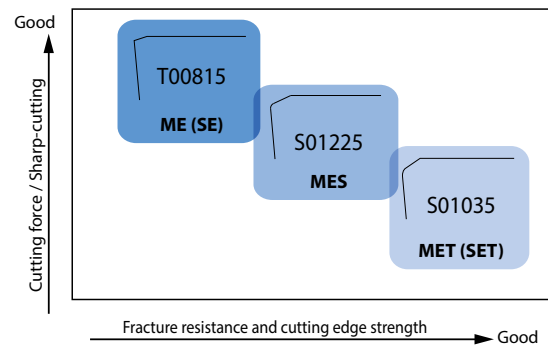
Chamfered cutting edge (chamfered + honed)

Standard cutting edge preparation

Negative type (machining of hard materials)



Positive type (machining of hard materials)



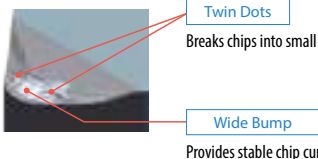
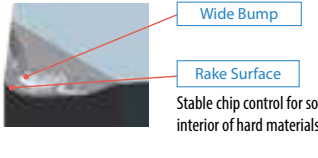
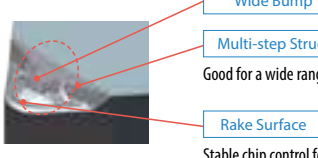
Manufacturer's option	Edge preparation		Application and features
MEP	S00545	0.05 mm x 45° + Honed cutting edge	High speed, continuous cut. Excellent crater wear resistance.
ME	S01225	0.12 mm x 25° + Honed cutting edge	General purpose.
MET	S01730	0.17 mm x 30° + Honed cutting edge	Superior fracture resistance.
MEH	S04030	0.40 mm x 30° + Honed cutting edge	Interrupted high feed machining. Prevention of flaking.

Manufacturer's option	Edge preparation		Application and features
ME	T00815	0.08 mm x 15°	Chamfered type. Sharp-cutting oriented, less burring.
MES	S01225	0.12 mm x 25° + Honed cutting edge	General purpose.
MET	S01035	0.10 mm x 35° + Honed cutting edge	Interrupted machining. Stable machining oriented.

CBN inserts for machining hardened material

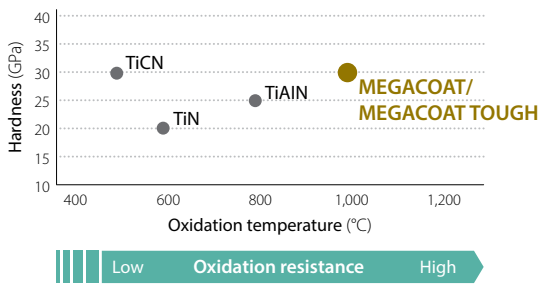
H chipbreaker series

Unique molded chipbreaker provides excellent chip control when machining hardened material. 3 Chipbreaker styles for a wide range of machining applications.

Chipbreaker	Application	Recommended cutting range
<p>HH</p> <p>1st Recommendation</p>  <p>Twin Dots Breaks chips into small pieces</p> <p>Wide Bump Provides stable chip curls</p>	<p>Hardened steel finishing</p> <p>55HRC or more</p>	<p>Small D.O.C.</p> <p>ap = 0.1 ~ 0.3 mm</p>
<p>HL</p>  <p>Wide Bump</p> <p>Rake Surface Stable chip control for softer interior of hard materials</p>	<p>Hardened steel finishing</p> <p>55HRC or less</p>	
<p>HD</p>  <p>Wide Bump</p> <p>Multi-step Structure Good for a wide range of conditions</p> <p>Rake Surface Stable chip control for softer interior of hard materials</p>	<p>Removing carburized layer</p> <p>From carburized layer to unhardened layer</p>	<p>Large D.O.C.</p> <p>ap = 0.3 ~ 0.7 mm</p>

MEGACOAT CBN

Properties of PVD coating



Advantages of MEGACOAT

Long tool life and stable machining due to superior heat-resistance and hardness.

Stability improvement through prevention of crater wear (oxidation, diffusional wear).

High thermal stability and surface smoothness provide excellent surface finish.

New coated CBN for machining hardened material

KBN010/KBN020

Long tool life and stable machining results with wear resistance and fracture resistance.

Supports a wide range of applications and reduces the cost of machining hardened materials.

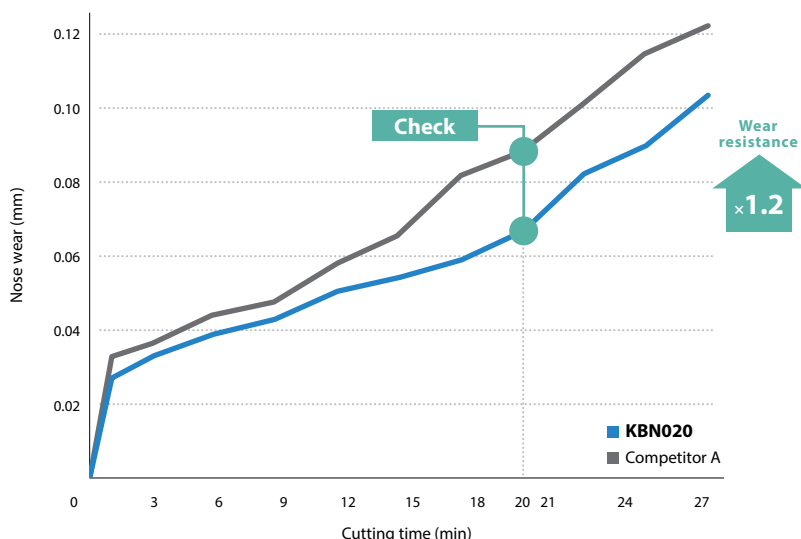
1 Combination of new coating technology and high content CBN provides exceptional wear resistance and fracture resistance

Wear resistance

New coating "MEGACOAT TOUGH" suppresses layer peeling.

Excellent wear resistance

Wear Resistance Comparison (Internal evaluation)

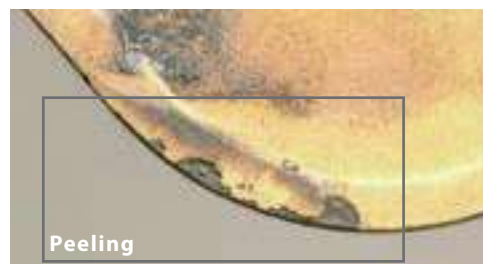


Cutting conditions: $V_c = 150$ m/min, $a_p = 0.2$ mm, $f = 0.1$ mm/rev, Wet
Workpiece material: 15CrMo4 60HRC

KBN020



Competitor A



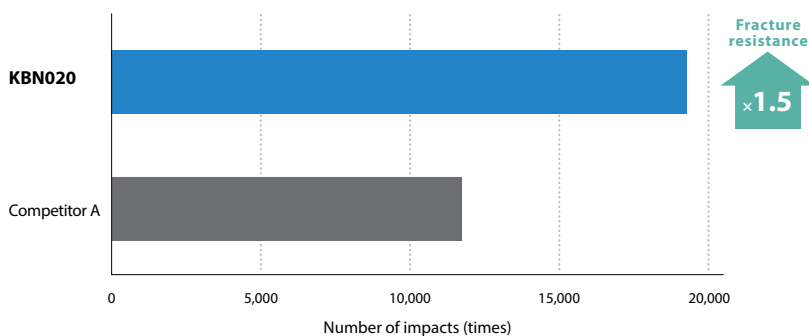
Fracture resistance

KBN010 : Mixed structure of micro grain CBN and coarse grain CBN

KBN020 : High content CBN and high purity TiN binder improves strength of CBN.

Excellent fracture resistance

Continuous to interrupted machining comparison (Internal evaluation)



Cutting conditions: $V_c = 150$ m/min, $a_p = 0.2$ mm, $f = 0.2$ mm/rev, Dry
Workpiece material: 15CrMo4 60HRC

2 Newly developed coating "MEGACOAT TOUGH"

Features

An adhesion layer is laminated between the high wear resistance layer and the CBN.
Reduces layer peeling to achieve long tool life and stable machining.



High wear resistance layer with TiAlN + Oxidation resistance components.
Suppresses oxidation/diffusional wear

Check New technology

Interlayer for stress relief

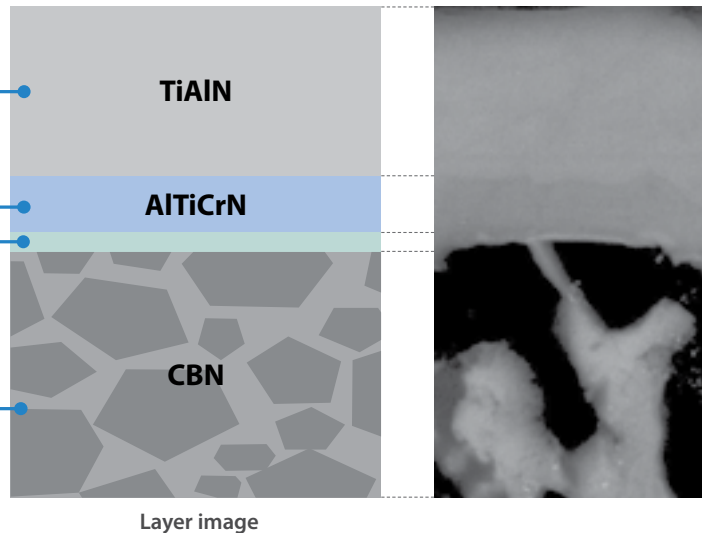
High adhesion layer

Two layers dedicated to CBN.
Improved adhesion between CBN and high wear resistant layer.
Suppressed layer peeling.

Check

High content CBN

KBN010 : Mixed structure of micro grain CBN and coarse grain CBN
Improved wear resistance in high speed machining
KBN020 : High content CBN with high purity TiN binder
Improved heat resistance and toughness



Solution for Automotive parts

CVT shaft

Workpiece

17Cr3

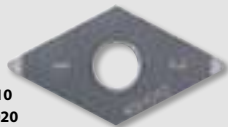
Insert

1st recommendation : KBN010
2nd recommendation : KBN020

DNGA150404S01225ME

Applications

External finishing



(Image)

Sun gear

Workpiece

C45 (Carburizing and quenching)

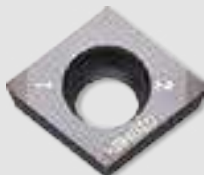
Insert

1st recommendation : KBN020

CCMW09T308S01035MET

Applications

Boring finishing for spline part (Interruption)

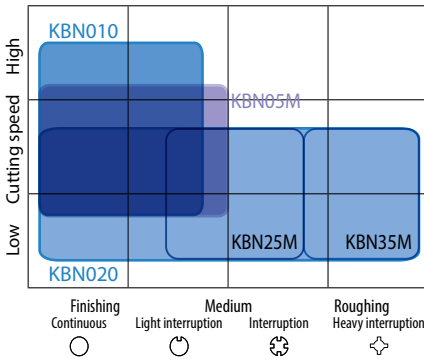


(Image)



Application map

Hard materials



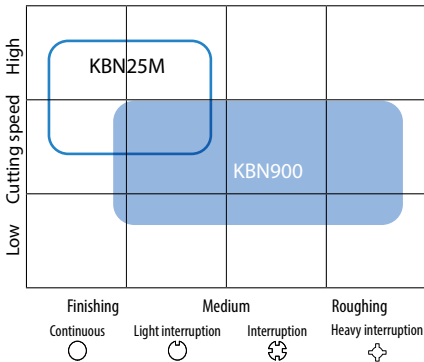
KBN010 : High wear resistance for continuous,high-speed nishing
KBN020 : 1st recommended grade for a wide range of application from continuous (high speed finishing) to interrupted machining.
KBN05M : Applicable for continuous (high speed finishing) to interrupted machining. With chipbreaker Inserts are available.
KBN25M : General machining.
KBN35M : Honeycomb structure CBN (Superior fracture resistance in heavy interrupted machining).

Coolant for KBN010/KBN020

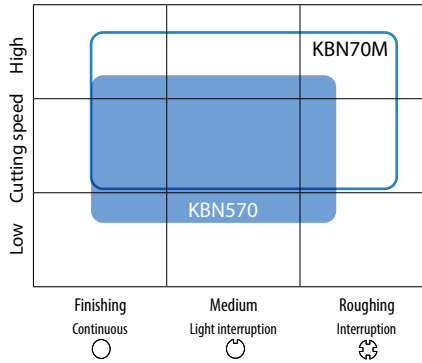
Application	Wet	Dry	
Continuous	✓	⊘	Recommended
Interruption	Partially*	✓	Not Recommended

*Use KBN05M when using coolant.

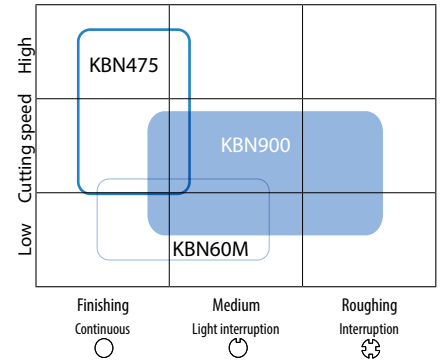
Roll materials (Chilled cast iron)



Sintered steel



Cast iron



Recommended cutting conditions

Workpiece material	Hardness	Applications		Recommended insert grade	Cutting conditions		
					Vc: (m/min)	ap: (mm)	f: (mm/rev)
Hardened steel	Over 55HRC	High speed finishing	Continuous	KBN010	80 - 180 - 230	0.05 - 0.2 - 0.35	0.05 - 0.15 - 0.3
		General finishing	Continuous ~ Interruption	KBN020	80 - 150 - 200	0.05 - 0.2 - 0.5	0.05 - 0.2 - 0.45
		HH chipbreaker for hardened steel finishing	Continuous ~ Interruption	KBN05M	100 - 150 - 200	0.1 - 0.2 - 0.3	0.1 - 0.15 - 0.25
		High efficient stable machining	Light interruption ~ Interruption	KBN020	80 - 150 - 200	0.05 - 0.2 - 0.5	0.05 - 0.2 - 0.45
		Interruption (Small ap)	Interruption ~ Heavy interruption	KBN020	80 - 130 - 180	0.05 - 0.2 - 0.5	0.05 - 0.2 - 0.4
		Heavy machining	Continuous ~ Interruption	KBN900	70 - 90 - 110	0.5 - 1.0 - 2.0	0.05 - 0.1 - 0.2
	Under 55HRC	HL chipbreaker for hardened steel finishing	Continuous ~ Interruption	KBN05M	100 - 150 - 200	0.1 - 0.2 - 0.3	0.1 - 0.15 - 0.25
		Finishing	Continuous	*PT600M	60 - 80 - 120	0.2 - 0.5 - 0.7	0.05 - 0.1 - 0.15
Gray cast iron	Under 250HB	Finishing	Continuous ~ Light interruption	KBN475	400 - 800 - 1,200	0.05 - 0.2 - 0.5	0.1 - 0.2 - 0.3
		Finishing	Continuous ~ Light interruption	KBN60M	300 - 500 - 700	0.05 - 0.2 - 0.5	0.1 - 0.2 - 0.3
		High efficient finishing	Continuous~Light interruption	KBN900	500 - 900 - 1,200	0.1 - 0.5 - 1.0	0.05 - 0.1 - 0.2
		Heavy machining	Continuous ~ interruption	KBN900	500 - 700 - 900	0.5 - 1.5 - 3.0	0.1 - 0.3 - 0.5
Roll materials (Chilled cast iron)	Over 55HRC	Finishing	Continuous ~ interruption	KBN25M	80 - 120 - 160	0.05 - 0.3 - 0.5	0.05 - 0.08 - 0.1
		Heavy machining	Continuous ~ interruption	KBN900	70 - 90 - 110	0.3 - 0.7 - 1.0	0.05 - 0.1 - 0.15
Sintered steel	-	Finishing	Continuous ~ Light interruption	KBN570	50 - 150 - 250	0.05 - 0.15 - 0.25	0.03 - 0.1 - 0.2
	-	Finishing	Continuous ~ Interruption	KBN70M	100 - 200 - 250	0.05 - 0.2 - 0.3	0.05 - 0.15 - 0.25

*PT600M: MEGACOAT on Al₂O₃+TiC ceramic

Case studies

20Cr4 (58HRC)	
<ul style="list-style-type: none"> • Gear • External , facing & chamfering • Vc = 130 m/min • ap = 0.6 mm • f = 0.12 mm/rev • Wet • CNGA120408S01225ME (KBN05M) 	
KBN05M	300 pcs/edge
Competitor C	200 pcs/edge
<ul style="list-style-type: none"> • KBN05M achieved 1.5 times longer tool life than competitor C. • Its longer tool life contributes to cost-cutting. 	
Evaluation by the user	

15CrMo (55HRC)	
<ul style="list-style-type: none"> • Stator • Boring • Vc = 170 m/min • ap = 0.4 mm • f = 0.1 mm/rev • Wet • CNGA120408S01225ME (KBN05M) 	
KBN05M	600 pcs/edge
Competitor D	300 pcs/edge
<ul style="list-style-type: none"> • KBN05M achieved twice longer tool life than competitor D. • Its longer tool life contributes to cost-cutting. 	
Evaluation by the user	

20Cr4 (58HRC)	
<ul style="list-style-type: none"> • Pulley • Facing (Continuous) • Vc = 120 m/min • ap = 0.15 ~ 0.2 mm • f = 0.24 mm/rev • Wet • DNGA120408S00545MEP (KBN05M) 	
KBN05M-MEP (Edge preparation: 0.05 × 45°)	150 pcs/edge
KBN05M-ME (Edge preparation: 0.12 × 25°)	100 pcs/edge
Competitor E	100 pcs/edge
<ul style="list-style-type: none"> • Tool life of KBN05M-ME type (Edge prep.: 0.12 × 25° chamfered + R honed) is same as comp. E's. • KBN05M-MEP (Edge prep.: 0.05 × 45° chamfered + R honed) type achieved 1.5 times longer tool life, preventing crater wear. 	
Evaluation by the user	

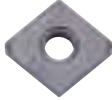

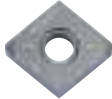

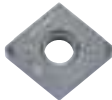

Chromium steel (61~65HRC)	
<ul style="list-style-type: none"> • Gear • External & facing (Interrupted) • Vc = 120 m/min • ap = 0.15 mm • f = 0.1~0.15 mm/rev (External) • Wet • CNGA120408S04030MEH (KBN05M) 	
KBN05M-MEH (Edge preparation: 0.40 × 30°)	150 pcs/edge
Competitor F	100 pcs/edge
<ul style="list-style-type: none"> • Compared to competitor F, KBN05M-MEH type (Edge prep.: 0.40 × 30° chamfered + R honed) achieved 1.5 times longer tool life. • No chipping in interrupted machining, and improved productivity. Competitor F's cutting edge got many chipping. • Feed rate could be increased from 0.15 to 0.25 mm/rev in facing. • Achieved cycle time and cost reduction. 	
Evaluation by the user	

Chromium Molybdenum Hardened Steel (55 ~ 62HRC)	
<ul style="list-style-type: none"> • Pinion • Vc = 130 m/min • ap = 0.05 mm • f = 0.08 mm/rev • Dry • CNGM120408ME-HH (KBN05M) 	
KBN05M HH Chipbreaker	70 pcs/edge
Competitor G	30 pcs/edge
<p>The HH chipbreaker maintained 2.3 times longer tool life than Competitor F. The molded chipbreaker provided stable chip control.</p>	
Evaluation by the user	

17Cr3 (59HRC)	
<ul style="list-style-type: none"> • Clutch • Vc = 100 m/min • ap = 0.15 mm • f = 0.10 mm/rev • Wet • WNGA080408S01225ME (KBN020) 	
KBN020	650 pcs/edge
Competitor H	400 pcs/edge
<p>KBN020 can be stable machining and long tool life.</p>	
Evaluation by the user	

80° Rhombic

How to read pages of "Turning inserts" See page B15

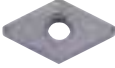
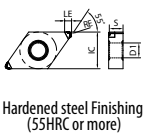
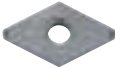
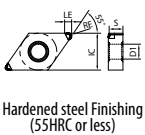
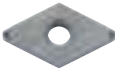
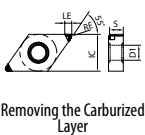
Cutting edge preparation				Material										Applicable toolholder	
Symbol	Specification	Example		Material										Applicable toolholder	
Symbol	Specification	Example	Example	Gray cast iron (with scale)	Gray cast iron (without scale)	Nodular cast iron (with scale)	Hard materials (Roughing)	Hard materials (Finishing)	Hard materials (Chip control)	Sintered steel	CBN	PVD	KBNG5M		
F	Sharp edge	F	Sharp edge	●	●	●	●	●	●	●	●	●	●	●	D8~D10 F118 F131 F132
E	R-honed	E008	R0.08mm honed	●	●	●	●	●	●	●	●	●	●	●	
T	Chamfered	T01215	0.12mm × 15° chamfered	●	●	●	●	●	●	●	●	●	●	●	
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed	●	●	●	●	●	●	●	●	●	●	●	●
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					CBN	PVD	KBNG5M	Applicable toolholder			
				IC	S	D1	RE	LE							
	 Hardened steel Finishing (55HRC or more)	CNGM	120404ME-HH 120408ME-HH 120412ME-HH	E	2	12.7	4.76	5.16	0.4 0.8 1.2	2.6 2.6 2.5	● ● ●	D8~D10 F118 F131 F132			
	 Hardened steel Finishing (55HRC or less)	CNGM	120404ME-HL 120408ME-HL 120412ME-HL	E	2	12.7	4.76	5.16	0.4 0.8 1.2	2.6 2.6 2.5	● ● ●				
	 Removing the Carburized Layer	CNGM	120404ME-HD 120408ME-HD 120412ME-HD	S01235	2	12.7	4.76	5.16	0.4 0.8 1.2	2.6 2.6 2.5	● ● ●				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

55° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Gray cast iron (with scale)		Gray cast iron (without scale)		Modular cast iron (with scale)		Hard materials (Roughing)		Hard materials (Finishing)		Hard materials (Chip control)		Sintered steel	
Symbol	Specification	Example		K		H		-									
F	Sharp edge	F	Sharp edge														
E	R-honed	E008	R0.08mm honed														
T	Chamfered	T01215	0.12mm x 15° chamfered														
S	Chamfered and R-honed	S01225	0.12mm x 25° chamfered and R-honed														
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					CBN	PVD	Applicable toolholder						
				IC	S	D1	RE	LE									
	 <p>DNGM 150404ME-HH 150408ME-HH 150412ME-HH</p> <p>Hardened steel Finishing (55HRC or more)</p>	E	2	12.7	4.76	5.16	0.4 0.8 1.2	2.6 2.2 1.9	● ● ●								
	 <p>DNGM 150404ME-HL 150408ME-HL 150412ME-HL</p> <p>Hardened steel Finishing (55HRC or less)</p>	E	2	12.7	4.76	5.16	0.4 0.8 1.2	2.6 2.2 1.9	● ● ●	D13~D17 F120, F136 F138~F140							
	 <p>DNGM 150404ME-HD 150408ME-HD 150412ME-HD</p> <p>Removing the Carburized Layer</p>	S01235	2	12.7	4.76	5.16	0.4 0.8 1.2	2.6 2.2 1.9	● ● ●								



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Material										K										
Symbol	Specification	Example	Gray cast iron (with scale)										K										
F	Sharp edge	F Sharp edge	Gray cast iron (without scale)																				
E	R-honed	E008 R0.08mm honed	Modular cast iron (with scale)										H										
T	Chamfered	T01215 0.12mm x 15° chamfered	Hard materials (Roughing)																				
S	Chamfered and R-honed	S01225 0.12mm x 25° chamfered and R-honed	Hard materials (Finishing)																				
			Hard materials (Chip control)																				
			Sintered steel										-										
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					CBN										Applicable toolholder				
				IC	S	D1	RE	LE	PVD					-									
										KBN010	KBN020	KBN05M	KBN10M	KBN25M	KBN35M	KBN60M	KBN70M	KBN475	KBN510	KBN525	KBN570		
		TNGA	160404S00545MEP 160408S00545MEP 160412S00545MEP	S00545	3	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1													
		TNGA	160404MEF 160408MEF 160412MEF	F	3	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1													
		TNGA	160404ME6 160408ME6 160412ME6	S01225	6	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1													
		TNGA	160404T01215ME 160408T01215ME 160412T01215ME	T01215	3	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1													
		TNGA	160401S01225ME 160402S01225ME 160404S01225ME 160408S01225ME 160412S01225ME	S01225	3	9.525	4.76	3.81	0.1 0.2 0.4 0.8 1.2	2.9 2.8 2.7 2.4 2.1													
		TNGA	160404S01730MET 160408S01730MET 160412S01730MET	S01730	3	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1													
		TNGA	160404S04030MEH 160408S04030MEH 160412S04030MEH	S04030	3	9.525	4.76	3.81	0.4 0.8 1.2	2.7 2.4 2.1													







● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

80° Trigon

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Material compatibility										K						
Symbol	Specification	Example																	
F	Sharp edge	F Sharp edge																	
E	R-honed	E008 R0.08mm honed																	
T	Chamfered	T01215 0.12mm x 15° chamfered																	
S	Chamfered and R-honed	S01225 0.12mm x 25° chamfered and R-honed																	
			Gray cast iron (with scale)																
			Gray cast iron (without scale)																
			Modular cast iron (with scale)																
			Hard materials (Roughing)																
			Hard materials (Finishing)																
			Hard materials (Chip control)																
			Sintered steel																
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					CBN						Applicable toolholder				
				IC	S	D1	RE	LE	PVD			-							
									KBND10	KBND20	KBNG5M	KBN2.5M	KBN3.5M	KBNG0M		KBM75	KBNS25		
	WNGA 080404MEF 080408MEF	F	3	12.7	4.76	5.16	0.4 0.8	2 2.6											
	WNGA 080404T01215ME 080408T01215ME	T01215	3	12.7	4.76	5.16	0.4 0.8	2 2.6											
	WNGA 080404S01225ME 080408S01225ME 080412S01225ME	S01225	3	12.7	4.76	5.16	0.4 0.8 1.2	2 2.6 2.5	●	●	●	●	●	●	●	●	●	●	
	WNGA 080404S01730MET 080408S01730MET 080412S01730MET	S01730	3	12.7	4.76	5.16	0.4 0.8 1.2	2 2.6 2.5	●	●	●	●	●	●	●	●	●	●	

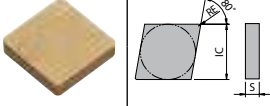


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

80° Rhombic / Solid

How to read pages of "Turning inserts" → See page B15

Cutting edge preparation				Gray cast iron (with scale)			✖		K
Symbol	Specification	Example		Gray cast iron (without scale)			✖		
F	Sharp edge	F	Sharp edge	Nodular cast iron (with scale)					
E	R-honed	E008	R0.08mm honed	Hard materials (Roughing)					
T	Chamfered	T01215	0.12mm × 15° chamfered	Hard materials (Finishing)			●		
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed	Hard materials (Chip control)					
				Sintered steel					
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)			CBN	PVD	Applicable toolholder
				IC	S	RE			
	CNMM 090308S02020 090312S02020	S02020	4	9.525	3.18	0.8 1.2	● ●	D60	
	CNMM 120412S02020 120416S02020	S02020	4	12.7	4.76	1.2 1.6	● ●	D49	



- C
- CBN & PCD Tools
- CBN
- PCD
- Negative
- C
- D
- S
- T
- V
- W
- Solid
- Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

Round / Solid

How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Gray cast iron (with scale)			K
Symbol	Specification	Example		Gray cast iron (without scale)			
F	Sharp edge	F	Sharp edge	Nodular cast iron (with scale)			
E	R-honed	E008	R0.08mm honed	Hard materials (Roughing)			H
T	Chamfered	T01215	0.12mm × 15° chamfered	Hard materials (Finishing)			
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed	Hard materials (Chip control)			
				Sintered steel			-
Insert	Description	Edge preparation type	Dimension (mm)		CBN	PVD	Applicable toolholder
			IC	S				KBN900
 	RNMN 090300S02020	S02020	9.525	3.18	●		D61
	RNMN 120300S02020	S02020	12.7	3.18	●		
	RNMN 120400S02020	S02020	12.7	4.76	●		D58, D61



CBN & PCD Tools

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

90° Square / Solid

How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Gray cast iron (with scale)				✖	
Symbol	Specification	Example		Gray cast iron (without scale)				✖	
				Nodular cast iron (with scale)					
F	Sharp edge	F	Sharp edge	Hard materials (Roughing)				H	
E	R-honed	E008	R0.08mm honed	Hard materials (Finishing)					
T	Chamfered	T01215	0.12mm × 15° chamfered	Hard materials (Chip control)					
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed	Sintered steel				-	

Insert	Description	Edge preparation type	No. of edges	Dimension (mm)			CBN	PVD	Applicable toolholder
				IC	S	RE			
				KBW900					
	SNMN 090308S02020 090312S02020	S02020	8	9.525	3.18	0.8 1.2	● ●	D63, D64	
	SNMN 120308S02020 120312S02020	S02020	8	12.7	3.18	0.8 1.2	● ●		
	SNMN 120412S02020 120416S02020 120420S02020	S02020	8	12.7	4.76	1.2 1.6 2	● ● ●	D52~D54 D63, D64	

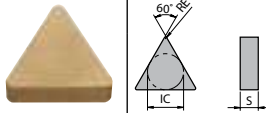
- C
- CBN & PCD Tools
- CBN
- PCD
- Negative
- C
- D
- S
- T
- V
- W
- Solid
- Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle / Solid

How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Gray cast iron (with scale)				✖	
Symbol	Specification	Example		Gray cast iron (without scale)				✖	
F	Sharp edge	F	Sharp edge	Nodular cast iron (with scale)					
E	R-honed	E008	R0.08mm honed	Hard materials (Roughing)					
T	Chamfered	T01215	0.12mm × 15° chamfered	Hard materials (Finishing)				●	
S	Chamfered and R-honed	S01225	0.12mm × 25° chamfered and R-honed	Hard materials (Chip control)					
				Sintered steel				-	
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)			CBN	Applicable toolholder	
				IC	S	RE			
	TNMN 110308S02020	S02020	6	6.35	3.18	0.8	●	D66, F152	
	TNMN 160408S02020 160412S02020	S02020	6	9.525	4.76	0.8 1.2	● ●	D56	



CBN & PCD Tools


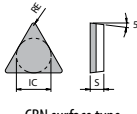

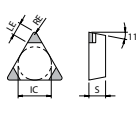

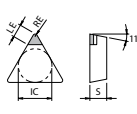

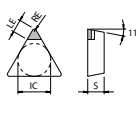



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Gray cast iron (with scale)				Gray cast iron (without scale)				Nodular cast iron (with scale)				Hard materials (Roughing)				Hard materials (Finishing)				Hard materials (Chip control)				Sintered steel			
Symbol	Specification	Example																													
F	Sharp edge	F	Sharp edge																												
E	R-honed	E008	R0.08mm honed																												
T	Chamfered	T01215	0.12mm x 15° chamfered																												
S	Chamfered and R-honed	S01225	0.12mm x 25° chamfered and R-honed																												

Insert	Description	Edge preparation type	No. of edges	Dimension (mm)				CBN			Applicable toolholder
				IC	S	RE	LE	PVD			
								KBNT0M	KBNS10	KBNS25	
	 TBGN 060102T00815 060104T00815 060108T00815 CBN surface type	T00815	3	3.97	1.59	0.2 0.4 0.8	-	●	●	●	-
	 TPGN 110304T00815ME T00815 3 6.35 3.18 0.4 2.5	T00815	3	6.35	3.18	0.4 2.5		●			
	 TPGN 110304T00815SE T00815 1 6.35 3.18 0.4 2.5	T00815	1	6.35	3.18	0.4 2.5		●			
	 TPGN 160302T00815SE 160304T00815SE 160308T00815SE T00815 1 9.525 3.18 0.4 2.4 0.8 2.1	T00815	1	9.525	3.18	0.2 0.4 0.8	2.6 2.4 2.1	●	●	●	F113
	 TPGN 110304S01035SET S01035 1 6.35 3.18 0.4 2.5	S01035	1	6.35	3.18	0.4 2.5		●			
	 TPGN 160304S01035SET S01035 1 9.525 3.18 0.4 2.4	S01035	1	9.525	3.18	0.4 2.4		●			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Material compatibility												Applicable toolholder		
Symbol	Specification	Example		Gray cast iron (with scale)	Gray cast iron (without scale)	Modular cast iron (with scale)	Hard materials (Roughing)	Hard materials (Finishing)	Hard materials (Chip control)	Sintered steel	CBN							
				Edge preparation type	No. of edges	Dimension (mm)					CBN							
						IC	S	D1	RE	LE	PVD			-				
									KBN010	KBN020	KBNG5M	KBNT0M	KBNZ5M	KBNG0M	KBM475	KBNS10	KBNG25	
		VCGW	080202T00815ME 080204T00815ME 080208T00815ME	T00815	2	4.76	2.38	2.3	0.2 0.4 0.8	2 2 1.7	●	●	●	●	●	●	●	E59 F90, F91 F94~F99
		VCGW	080202S01035MET 080204S01035MET 080208S01035MET	S01035	2	4.76	2.38	2.3	0.2 0.4 0.8	2 2 1.7	●	●	●	●	●	●	●	
		VCGW	080202T00815SE 080204T00815SE	T00815	1	4.76	2.38	2.3	0.2 0.4	2.4 2	●	●	●	●	●	●	●	
		VCGW	080204S01035SET 080208S01035SET	S01035	1	4.76	2.38	2.3	0.4 0.8	2 1.8	●	●	●	●	●	●	●	

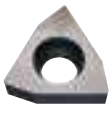
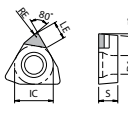

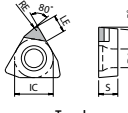






● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

80° Trigon

How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Material										Applicable toolholder
Symbol	Specification	Example		Material										Applicable toolholder
F	Sharp edge	F	Sharp edge	Material										
E	R-honed	E008	R0.08mm honed	Material										
T	Chamfered	T01215	0.12mm x 15° chamfered	Material										
S	Chamfered and R-honed	S01225	0.12mm x 25° chamfered and R-honed	Material										
				Gray cast iron (with scale)										K
				Gray cast iron (without scale)										
				Nodular cast iron (with scale)										
				Hard materials (Roughing)										H
				Hard materials (Finishing)										
				Hard materials (Chip control)										
				Sintered steel										-
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					CBN			Applicable toolholder		
				IC	S	D1	RE	LE	PVD					
		WBGW	060102T00815L-SE 060104T00815L-SE	T00815	1	3.97	1.59	2.3	0.2 0.4	1.9	PVD			F36 F100~F102
											●	●	●	
		WBGW	080202T00815L-SE 080204T00815L-SE	T00815	1	4.76	2.38	2.3	0.2 0.4	2.3	PVD			F36 F100~F102
											●	●	●	
		WBGW	060102S01035LSET 060104S01035LSET	S01035	1	3.97	1.59	2.3	0.2 0.4	1.9	PVD			F36 F100~F102
											●	●	●	
		WBGW	080202S01035LSET 080204S01035LSET	S01035	1	4.76	2.38	2.3	0.2 0.4	2.3	PVD			F36 F100~F102
											●	●	●	


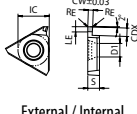
- C
- CBN & PCD Tools
- CBN
- PCD
- Positive
- C
- D
- S
- T
- V
- W
- Solid
- Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

GBA


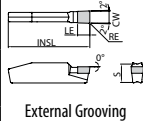
How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Material										Applicable toolholder	
Symbol	Specification	Example		Material										Applicable toolholder	
F	Sharp edge	F	Sharp edge	Gray cast iron (with scale)										K	
E	R-honed	E008	R0.08mm honed	Gray cast iron (without scale)											
T	Chamfered	T01215	0.12mm x 15° chamfered	Nodular cast iron (with scale)											
S	Chamfered and R-honed	S01225	0.12mm x 25° chamfered and R-honed	Hard materials (Roughing)										H	
				Hard materials (Finishing)											
				Hard materials (Chip control)											
				Sintered steel										-	
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)								Tolerance (mm)		CBN	Applicable toolholder
				CW	CDX	IC	S	D1	RE	LE	CW min.	CW max.	KBN510			KBN625
  External / Internal Grooving	GBA43R	E008	1	125-020	2	12.7	4.76	5.5	0.2	1.9	-0.03	+0.03	●	●	G13~G17 G89
	150-020			3.5	●								●		
	200-020			3.5	●								●		
	250-020			4	●								●		
	300-020			4	●								●		
	GBA43L	E008	1	125-020	2	12.7	4.76	5.5	0.2	1.9	-0.03	+0.03	●	●	G13~G17 G89
	150-020			3.5	●								●		
	200-020			3.5	●								●		
	250-020			4	●								●		
	300-020			4	●								●		

Right-hand shown
CDX shows available grooving depth.

GDGS

How to read pages of "Turning inserts" See page B15

Cutting edge preparation														K	
Symbol	Specification	Example												H	
F	Sharp edge	F	Sharp edge												
E	R-honed	E008	R0.08mm honed												
T	Chamfered	T01215	0.12mm x 15° chamfered												
S	Chamfered and R-honed	S01225	0.12mm x 25° chamfered and R-honed												
				Hard materials (Roughing)											
				Hard materials (Finishing)											
				Hard materials (Chip control)											
				Sintered steel										-	
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		CBN		Applicable toolholder		
				CW	S	RE	INSL	LE	CW min.	CW max.	PVD	-			
  External Grooving	GDGS 2020N-020NB	E008	1	2	4.3	0.2	20	2.9	-0.03	+0.03	●	-	G34~G43		
		E002									●	-			
	GDGS 3020N-040NB	E008	1	3	4.3	0.4	20	2.9	-0.03	+0.03	●	-	G34~G43		
		E002									●	-			
	GDGS 4020N-040NB	E008	1	4	4.3	0.4	20	2.9	-0.03	+0.03	●	-	G34~G43		
		E002									●	-			
	GDGS 5020N-040NB	E008	1	5	4.3	0.4	20	2.9	-0.03	+0.03	●	-	G34 G40~G43		
		E002									●	-			
	GDGS 6020N-040NB	E008	1	6	4.3	0.4	20	2.9	-0.03	+0.03	●	-	G34 G40~G43		



 CBN & PCD Tools


CBN

PCD

Positive



 C



 D



 S



 T



 V



 W

Solid

Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

GMN

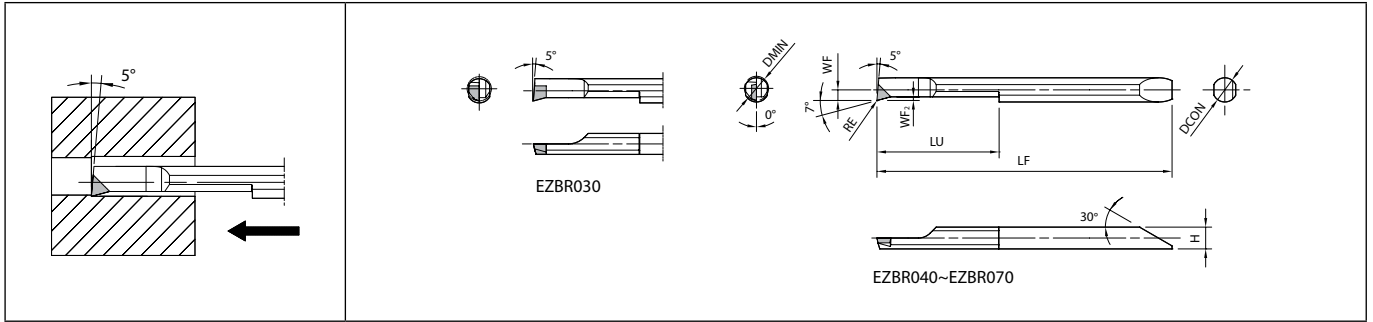
How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Material										Applicable toolholder	
Symbol	Specification	Example		Material										Applicable toolholder	
F	Sharp edge	F	Sharp edge	Gray cast iron (with scale)										K	
E	R-honed	E008	R0.08mm honed	Gray cast iron (without scale)											
T	Chamfered	T01215	0.12mm x 15° chamfered	Modular cast iron (with scale)											
S	Chamfered and R-honed	S01225	0.12mm x 25° chamfered and R-honed	Hard materials (Roughing)										H	
				Hard materials (Finishing)											
				Hard materials (Chip control)											
				Sintered steel										-	
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		CBN		Applicable toolholder		
				CW	S	RE	INSL	LE	CW min.	CW max.	KBNS10	KBNS25			
<p>External Grooving</p>	GMN 2	E008	1	2	4.3	0.2	20	2.9	-0.05	+0.05	●	●	G55 G57		
	GMN 3	E008	1	3	4.3	0.4	20	2.9	-0.05	+0.05	●	●	G55~G58		
	GMN 4	E008	1	4	4.3	0.4	20	2.9	-0.05	+0.05	●	●			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

EZB-NB (Boring)



Right-hand shown

Dimensions

How to read pages of "Turning inserts" See page B15

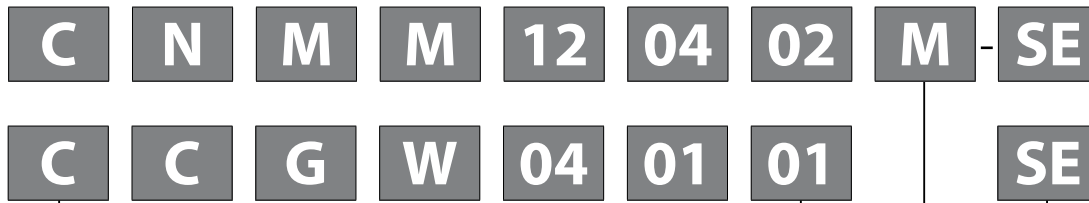
Cutting edge preparation				Material										Tolerance (mm)		Applicable sleeve	
Symbol	Specification	Example												CBN	PVD	F38~F43	
F	Sharp edge	F	Sharp edge	Gray cast iron (with scale)												K	
E	R-honed	E008	R0.08mm honed	Gray cast iron (without scale)												K	
T	Chamfered	T01215	0.12mm x 15° chamfered	Nodular cast iron (with scale)												K	
S	Chamfered and R-honed	S01225	0.12mm x 25° chamfered and R-honed	Hard materials (Roughing)										●		H	
				Hard materials (Finishing)												H	
				Hard materials (Chip control)												H	
				Sintered steel												-	
Description	Edge preparation type	No. of edges	Dimension (mm)									Tolerance (mm)		CBN	PVD	Applicable sleeve F38~F43	
			DMIN	DCON	H	LF	LU	WF	WF ₂	RE	RE min.	RE max.					
EZBR	030030-003NB	T00815	1	3	3	2.6	38.8	13	1.25	0.3	0.035	-0.015	+0.015	●		EZH030...	
EZBR	040040-003NB	T00815	1	4	4	3.6	48.8	20	1.75	0.5	0.035	-0.015	+0.015	●		EZH040...	
EZBR	050050-003NB	T00815	1	5	5	4.6	58.1	25	2.25	0.5	0.035	-0.015	+0.015	●		EZH050...	
EZBR	060060-003NB	T00815	1	6	6	5.6	66.1	30	2.75	0.5	0.035	-0.015	+0.015	●		EZH060...	
EZBR	070070-003NB	T00815	1	7	7	6.6	74.1	35	3.25	0.5	0.035	-0.015	+0.015	●		EZH070...	

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

CBN & PCD Inserts are sold in 1 piece boxes

CBN & PCD Tools
 CBN
 PCD
 Positive
 C
 D
 S
 T
 V
 W
 Solid
 Grooving

Identification system (Turning insert / PCD)



Turning indexable inserts identification system [See B2](#)

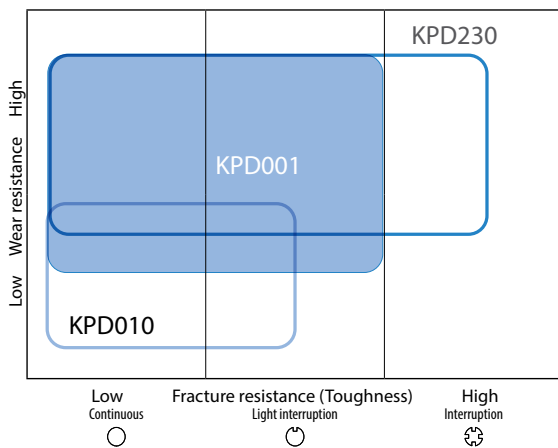
Insert type	Description	Manufacture's option 1	Manufacture's option 2	Series name	Edge length	Number of edges	Re-grinding
Negative	CNMM120402M-SE	M (Indicates the tool is for negative inserts/toolholders)	SE	Small edge	Short (Small edge)	1	Not recommended
	CNMM120402M-NE		NE	New value edge	Long (85% length compared with no Indication's cutting edge)	1	Possible
	CNMM120402M		Without indication	-	Long	1	
Positive	CCGW040101SE	-	SE	Small edge	Short (Small edge)	1	Not recommended
	CCGW040101NE		NE	New value edge	Long (85% length compared with no Indication's cutting edge)	1	Possible
	CCGW040101		Without indication	-	Long	1	

- No edge preparation symbols for PCD inserts. Most of the PCD inserts' edge prep. are sharp edge.
- "M" in manufacturer's option 1 indicates the inserts are applicable to negative toolholders.

About re-grinding:

- Re-grinding is possible with the inserts with "NE" and no symbol in manufacturer's option 2.
- Re-grinding can not be available depending on the edge condition.
- Re-grinding is not recommended for inserts with "SE" in manufacturer's option 2.

Application map



Grades	Applications	Features
KPD001 Average grain size under 0.5 µm	<ul style="list-style-type: none"> • High speed machining of non-ferrous metals and brass • High speed machining of plastics • Machining of carbide 	<ul style="list-style-type: none"> • The world highest level micro-grain diamond • High edge strength, and superior to wear resistance, fracture resistance and edge sharpening performance
KPD010 Average grain size 10 µm	<ul style="list-style-type: none"> • High speed machining of non-ferrous metals and brass • High speed machining of plastics • Machining of carbide 	<ul style="list-style-type: none"> • Good balance of wear resistance and flexural strength • General purpose
KPD230 Mixture of fine grain with average grain size 2~30 µm and coarse grain	<ul style="list-style-type: none"> • High speed machining of non-ferrous metals and brass • High speed machining of plastics 	<ul style="list-style-type: none"> • High density PCD with mixture of coarse and fine grains features excellent abrasive wear resistance and fracture resistance
KPD250 Average grain size 25 µm Made to order	<ul style="list-style-type: none"> • High speed machining of high silicon aluminium alloy • Machining of carbide 	<ul style="list-style-type: none"> • Coarse grain PCD • Ave. grain size 25 µm • Superior to wear resistance

Recommended cutting conditions


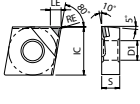

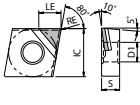
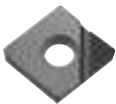
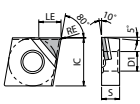
Workpiece material	Insert grades		Cutting conditions				Remarks
	KPD001	KPD010	Vc (m/min)	ap (mm)		f (mm/rev)	
				Small edge and positive inserts	Negative inserts		
Aluminum alloys Zinc alloys	●	○	300 ~ 1,500	~1.0	~2.0	0.03 ~ 0.5	Both: Dry and coolant
Copper, Brass, Bronze	●	○	300 ~ 1,000	~1.0	~2.0	0.03 ~ 0.5	
Magnesium alloys	●	○	400 ~ 1,200	~1.0	~2.0	0.03 ~ 0.5	
Carbide	●	○	10 ~ 30	~0.3	~0.3	0.03 ~ 0.1	
Titanium alloys	●	○	100 ~ 200	~1.0	~2.0	0.05 ~ 0.2	Coolant
Glass fiber reinforced plastics Carbon fiber	●	○	100 ~ 600	~1.0	~2.0	0.05 ~ 0.5	Dry
Silica filling plastic Particle board	●	○	400 ~ 800	~1.0	~2.0	0.05 ~ 0.5	

●: 1st Recommendation ○: 2nd Recommendation



80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)		Non-ferrous metals (without interruption)		Titanium alloys (with interruption)		Titanium alloys (without interruption)		N	
											S	
PCD all items	F	Sharp edge										
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD	Applicable toolholder		
				IC	S	D1	RE	LE			KPD001	KPD010
	 Small Edge CNMM 120402M-SE 120404M-SE 120408M-SE	F	1	12.7	4.76	5.16	0.2 0.4 0.8	2.8 2.8 2.7	●● ●● ●●	D8~D10 F118 F131 F132		
	 New Value Edge CNMM 120402M-NE 120404M-NE 120408M-NE	F	1	12.7	4.76	5.16	0.2 0.4 0.8	5.1 5 4.9	● ● ●			
	 CNMM 120402M 120404M 120408M 120412M	F	1	12.7	4.76	5.16	0.2 0.4 0.8 1.2	5.8 5.8 5.7 5.6	●● ●● ●● ●●			

C

CBN & PCD Tools

CBN

PCD

Negative

C

D

S

T

V

W

Solid

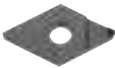
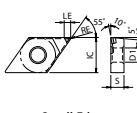
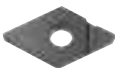
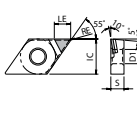
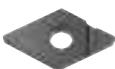
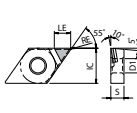
Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

55° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation					Non-ferrous metals (with interruption)		Non-ferrous metals (without interruption)		Titanium alloys (with interruption)		Titanium alloys (without interruption)		PCD		Applicable toolholder
					N		S		S		S		-		
PCD all items			F		Sharp edge										
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD						
				IC	S	D1	RE	LE	KPD001	KPD010					
	 Small Edge DNMM 150402M-SE 150404M-SE 150408M-SE	F	1	12.7	4.76	5.16	0.2 0.4 0.8	2.8 2.6 2.2	● ● ●	● ● ●	D13~D17 F120, F136 F138~F140				
	 New Value Edge DNMM 150402M-NE 150404M-NE 150408M-NE	F	1	12.7	4.76	5.16	0.2 0.4 0.8	5.2 5 4.6	● ● ●	● ● ●					
	 DNMM 150402M 150404M 150408M	F	1	12.7	4.76	5.16	0.2 0.4 0.8	5.9 5.8 5.4	● ● ●	● ● ●					

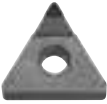
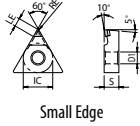
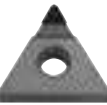
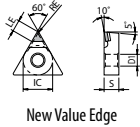
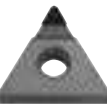
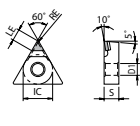


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)		Non-ferrous metals (without interruption)		Titanium alloys (with interruption)		Titanium alloys (without interruption)		PCD		Applicable toolholder
			●	●	●	●	●	●	●	●	●	●	
PCD all items	F	Sharp edge	Edge preparation type	No. of edges	Dimension (mm)					KPD001 KPD010	PCD		
					IC	S	D1	RE	LE				
		TNMM 160402M-SE 160404M-SE 160408M-SE	F	1	9.525	4.76	3.81	0.2 0.4 0.8	2.7 2.6 2.3	● ● ●		D22~D25 D27, D28 F122 F143 F144	
		TNMM 160402M-NE 160404M-NE 160408M-NE	F	1	9.525	4.76	3.81	0.2 0.4 0.8	3.2 3.1 2.8	● ● ●			
		TNMM 160402M 160404M 160408M 160412M	F	1	9.525	4.76	3.81	0.2 0.4 0.8 1.2	3.8 3.6 3.3 3	● ● ● ●			

C

CBN & PCD Tools

CBN

PCD

Negative

C

D

S

T

V

W

Solid


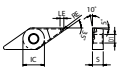

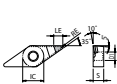

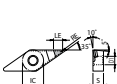
Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation					Non-ferrous metals (with interruption)		Non-ferrous metals (without interruption)		Titanium alloys (with interruption)		Titanium alloys (without interruption)		PCD	
					N		S		S		S		-	
PCD all items			F		Sharp edge									
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD	Applicable toolholder				
				IC	S	D1	RE	LE						
				KPD001			KPD010							
	 Small Edge	VNMM	160402M-SE 160404M-SE 160408M-SE	F	1	9.525	4.76	3.81	0.2 0.4 0.8	2.9 2.5 1.6	●●●	●●●	D30~D39	
	 New Value Edge	VNMM	160402M-NE 160404M-NE 160408M-NE	F	1	9.525	4.76	3.81	0.2 0.4 0.8	4.7 4.2 3.4	●●●	●●●		
		VNMM	160402M 160404M 160408M	F	1	9.525	4.76	3.81	0.2 0.4 0.8	5.3 4.8 4	●●●	●●●		

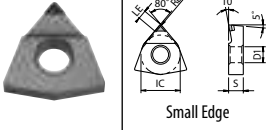
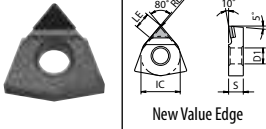


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

80° Trigon

How to read pages of "Turning inserts" See page B15

Cutting edge preparation					Non-ferrous metals (with interruption)					●		N
					Non-ferrous metals (without interruption)					●		
PCD all items	F	Sharp edge	Titanium alloys (with interruption)					●		S		
			Titanium alloys (without interruption)					●				
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD		Applicable toolholder	
				IC	S	D1	RE	LE	KPD001	KPD010		
	WNMM 080402M-SE 080404M-SE 080408M-SE	F	1	12.7	4.76	5.16	0.2 0.4 0.8	2.8 2.8 2.7	● ● ●	● ●	D43~D46 F146 F148 F149	
	WNMM 080402M-NE 080404M-NE	F	1	12.7	4.76	5.16	0.2 0.4	5	● ●	●		

C

CBN & PCD Tools

CBN

PCD

Negative Positive

C

D

S

T

V

W

Solid

Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation					Non-ferrous metals (with interruption)					●		N	
PCD all items			F		Non-ferrous metals (without interruption)					●			
Sharp edge					Titanium alloys (with interruption)					●		S	
					Titanium alloys (without interruption)					●			
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD	Applicable toolholder			
				IC	S	D1	RE	LE					
										KPD001	KPD010		
	CCGW 040101SE 040102SE 040104SE	F	1	4.3	1.8	2.3	0.1 0.2 0.4	1.3	● ● ●	F31, F32 F60, F62			
	CCGW 060201SE 060202SE 060204SE	F	1	6.35	2.38	2.8	0.1 0.2 0.4	2.3	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124			
	CCGW 09T302SE 09T304SE 09T308SE	F	1	9.525	3.97	4.4	0.2 0.4 0.8	2.7	● ● ●	E26~E28, E54 F60~F62 F124			
	CCGW 040101NE 040102NE	F	1	4.3	1.8	2.3	0.1 0.2	1.7 1.6	● ●	F31, F32 F60, F62			
	CCGW 060201NE 060202NE 060204NE	F	1	6.35	2.38	2.8	0.1 0.2 0.4	3.1 3 3	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124			
	CCGW 09T301NE 09T302NE 09T304NE 09T308NE	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	3.4 3.4 3.4 3.3	● ● ● ●	E26~E28, E54 F60~F62 F124			
	CCGW 040101 040102 040104	F	1	4.3	1.8	2.3	0.1 0.2 0.4	1.9	● ● ●	F31, F32 F60, F62			
	CCGW 060201 060202 060204	F	1	6.35	2.38	2.8	0.1 0.2 0.4	3.5	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124			
	CCGW 09T301 09T302 09T304 09T308	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	3.8 3.8 3.7 3.6	● ● ● ●	E26~E28, E54 F60~F62 F124			
	CCMT 060202SE 060204SE	F	1	6.35	2.38	2.8	0.2 0.4	2.2	● ●	E26, E28, E54 F31, F32 F60~F62, F124			
	CCMT 09T301SE 09T302SE 09T304SE 09T308SE	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	2.7	● ● ● ●	E26~E28, E54 F60~F62 F124			
	CCMT 060201NE 060202NE 060204NE	F	1	6.35	2.38	2.8	0.1 0.2 0.4	2.8	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124			
	CCMT 09T301NE 09T302NE 09T304NE 09T308NE	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	3.4 3.4 3.4 3.3	● ● ● ●	E26~E28, E54 F60~F62 F124			
	CCMT 060201 060202 060204	F	1	6.35	2.38	2.8	0.1 0.2 0.4	3.3 3.3 3.2	● ● ●	E26, E28, E54 F31, F32 F60~F62, F124			
	CCMT 09T301 09T302 09T304 09T308	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	3.9 3.9 3.9 3.8	● ● ● ●	E26~E28, E54 F60~F62 F124			


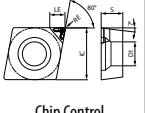
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes



80° Rhombic

How to read pages of "Turning inserts" ➔ See page B15

Cutting edge preparation								Non-ferrous metals (with interruption)		●		N	
PCD all items			F					Sharp edge					
								Non-ferrous metals (without interruption)		●			
								Titanium alloys (with interruption)		●		S	
								Titanium alloys (without interruption)		●			
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD	Applicable toolholder			
				IC	S	D1	RE	LE					
	 Chip Control	CCMT	09T302APD 09T304APD 09T308APD	F	1	9.525	3.97	4.4	0.2 0.4 0.8	2.7	RPD001	● E26~E28, E54 ● F60~F62 ● F124	

C

CBN & PCD Tools

CBN

PCD

Positive

C

D

S

T

V

W

Solid

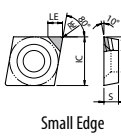
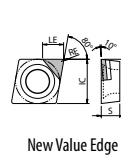
Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

80° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)							●		N
PCD all items			Non-ferrous metals (without interruption)							●		
F			Titanium alloys (with interruption)							●		S
Sharp edge			Titanium alloys (without interruption)							●		
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD	Applicable toolholder		
				IC	S	D1	RE	LE				
										KPD001	KPD010	
	CPMH 090302SE 090304SE	F	1	9.525	3.18	4.5	0.2 0.4	2.7	● ●	F64 F65		
	CPMH 080202NE 080204NE	F	1	7.94	2.38	3.5	0.2 0.4	3.2	● ●			
	CPMH 090301NE 090302NE 090304NE 090308NE	F	1	9.525	3.18	4.5	0.1 0.2 0.4 0.8	3.4 3.4 3.4 3.3	● ● ● ●			
	CPMH 080201 080202 080204	F	1	7.94	2.38	3.5	0.1 0.2 0.4	3.7	● ● ●			
	CPMH 090301 090302 090304 090308	F	1	9.525	3.18	4.5	0.1 0.2 0.4 0.8	4 3.9 3.9 3.8	● ● ● ●			
											● ● ● ●	

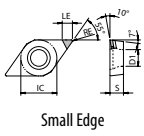
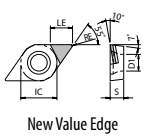
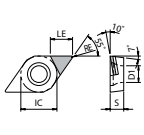
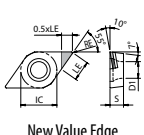
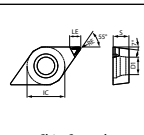


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

55° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		Non-ferrous metals (with interruption)		Non-ferrous metals (without interruption)		Titanium alloys (with interruption)		Titanium alloys (without interruption)		N		S	
		PCD all items	F	Sharp edge									
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD	Applicable toolholder			
				IC	S	D1	RE	LE					
										KPD001	KPD010		
	DCMT 070201SE 070202SE 070204SE	F	1	6.35	2.38	2.8	0.1 0.2 0.4	2.7	● ● ●	E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125			
	DCMT 11T301SE 11T302SE 11T304SE 11T308SE	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	2.7	● ● ● ●	E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125			
	DCMT 070201NE 070202NE 070204NE	F	1	6.35	2.38	2.8	0.1 0.2 0.4	3.4 3.4 3.2	● ● ●	E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125			
	DCMT 11T301NE 11T302NE 11T304NE 11T308NE	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	3.4 3.3 3.2 2.8	● ● ● ●	E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125			
	DCMT 070201 070202 070204	F	1	6.35	2.38	2.8	0.1 0.2 0.4	4 3.9 3.7	● ● ●	E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125			
	DCMT 11T301 11T302 11T304 11T308	F	1	9.525	3.97	4.4	0.1 0.2 0.4 0.8	4 3.9 3.7 3.3	● ● ● ●	E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125			
	DCMT 070202R-NE 070202L-NE 070204R-NE 070204L-NE	F	1	6.35	2.38	2.8	0.2 0.2 0.4 0.4	3.3 3.3 3.2 3.2	● ● ● ●	E29, E31, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125			
	DCMT 11T302R-NE 11T302L-NE 11T304R-NE 11T304L-NE	F	1	9.525	3.97	4.4	0.2 0.2 0.4 0.4	3.3 3.3 3.2 3.2	● ● ● ●	E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125			
	DCMT 11T302APD 11T304APD 11T308APD	F	1	9.525	3.97	4.4	0.2 0.4 0.8	2.7	● ● ●	E23, E29~E32, E34 E35, E55, E56 F66~F68 F70~F72 F74~F76, F125			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

C

CBN & PCD Tools

CBN

PCD

Positive

C

D

S

T

V


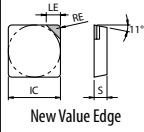

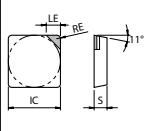
W

Solid

Grooving

90° Square

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)				●		N		
PCD all items			F				Sharp edge		●		
			Titanium alloys (with interruption)				●		S		
			Titanium alloys (without interruption)				●				
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)				PCD	Applicable toolholder		
				IC	S	RE	LE				
								KP001 KP010			
		SPGN	120304NE	F	1	12.7	3.18	0.4	3.6	●	F112
		SPGN	120304	F	1	12.7	3.18	0.4	4.2	●	


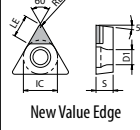
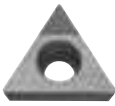
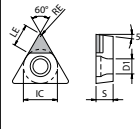
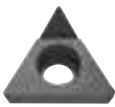
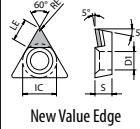
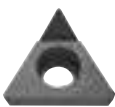
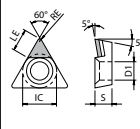


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)		Non-ferrous metals (without interruption)		Titanium alloys (with interruption)		Titanium alloys (without interruption)		N	
											S	
PCD all items	F	Sharp edge										
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD	Applicable toolholder		
				IC	S	D1	RE	LE			KPD001	KPD010
	 New Value Edge	TBGW	060102NE 060104NE	F	1	3.97	1.59	2.4	0.2 0.4	2.1 1.9	● ●	F33, F34 F80~F82 F86, F87
		TBGW	060102 060104	F	1	3.97	1.59	2.4	0.2 0.4	2.4 2.2	● ●	
	 New Value Edge	TBMT	060101NE 060102NE 060104NE 060108NE	F	1	3.97	1.59	2.4	0.1 0.2 0.4 0.8	2.2 2.1 2 1.7	● ● ● ●	
		TBMT	060102 060104 060108	F	1	3.97	1.59	2.4	0.2 0.4 0.8	2.5 2.3 2	● ● ●	

C

CBN & PCD Tools

CBN

PCD

Positive

C

D

S

T

V

W

Solid


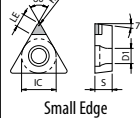

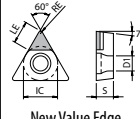

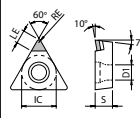

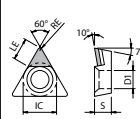

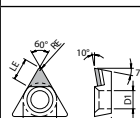
Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)		Non-ferrous metals (without interruption)		Titanium alloys (with interruption)		Titanium alloys (without interruption)		PCD		Applicable toolholder
											PCD all items	F		Sharp edge	●	●
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					KPD001 KPD010	● ●	E38		
				IC	S	D1	RE	LE					
	 Small Edge TCGW 110302SE 110304SE	F	1	6.35	3.18	2.8	0.2 0.4	2.5 2.4	● ●	E38			
	 New Value Edge TCGW 110302NE 110304NE	F	1	6.35	3.18	2.8	0.2 0.4	3.3 3.2	● ●				
	 Small Edge TCMT 110301SE 110302SE 110304SE	F	1	6.35	3.18	2.8	0.1 0.2 0.4	2.6 2.5 2.4	● ● ●				
	 New Value Edge TCMT 080202NE TCMT 110302NE	F	1	4.76	2.38	2.5	0.2	2.1	●				
	 TCMT 080202 080204	F	1	4.76	2.38	2.5	0.2 0.4	2.4 2.2	● ●				

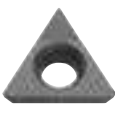
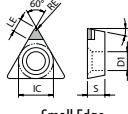
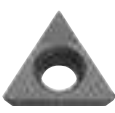
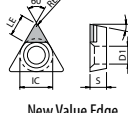

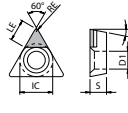


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)							N	
			Non-ferrous metals (without interruption)							S	
PCD all items			F							Sharp edge	
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD	Applicable toolholder	
				IC	S	D1	RE	LE			
										KPD001	KPD010
  Small Edge	TPGB 090202SE 090204SE 090208SE	F	1	5.56	2.38	3.2	0.2 0.4 0.8	2.1	● ● ●	F33, F34 F80~F82, F86	
	TPGB 110301SE 110302SE 110304SE	F	1	6.35	3.18	3.3	0.1 0.2 0.4	2.7 2.6 2.5	●● ●● ●●	E39 F80~F82 F84, F85	
	TPGB 160302SE 160304SE	F	1	9.525	3.18	4.7	0.2 0.4	2.6 2.4	●● ●●	F80~F82 F84	
  New Value Edge	TPGB 080202NE 080204NE 080208NE	F	1	4.76	2.38	2.3	0.2 0.4 0.8	2.2 2.1 1.8	● ● ●	E39 F80~F82, F86	
	TPGB 090202NE 090204NE	F	1	5.56	2.38	3.2	0.2 0.4	2.7 2.6	● ●	F33, F34 F80~F82, F86	
	TPGB 110302NE 110304NE 110308NE	F	1	6.35	3.18	3.3	0.2 0.4 0.8	3.4 3.3 3	● ●● ●●	E39 F80~F82 F84, F85	
	TPGB 160304NE 160308NE	F	1	9.525	3.18	4.7	0.4 0.8	3.2 2.9	● ●	F80~F82 F84	
 	TPGB 080202 080204	F	1	4.76	2.38	2.3	0.2 0.4	2.6 2.4	●● ●●	E39 F80~F82, F86	
	TPGB 090202 090204	F	1	5.56	2.38	3.2	0.2 0.4	3.2 3	● ●●	F33, F34 F80~F82, F86	
	TPGB 110302 110304 110308	F	1	6.35	3.18	3.3	0.2 0.4 0.8	3.9 3.7 3.4	●● ●● ●	E39 F80~F82 F84, F85	

C

CBN & PCD Tools

CBN

PCD

Positive

C

D

S

T

V

W

Solid






Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		Non-ferrous metals (with interruption)		Non-ferrous metals (without interruption)		Titanium alloys (with interruption)		Titanium alloys (without interruption)		PCD		Applicable toolholder
		PCD all items	F	Sharp edge								
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					KPD001 KPD010	PCD		
				IC	S	D1	RE	LE				
 Small Edge	TPMH 080202SE 080204SE	F	1	4.76	2.38	2.3	0.2 0.4	2 1.8	● ●	E39 F80~F82, F86		
	TPMH 090202SE 090204SE	F	1	5.56	2.38	3.2	0.2 0.4	2.4 2.2	● ●	F33, F34 F80~F82, F86		
	TPMH 110301SE 110302SE 110304SE	F	1	6.35	3.18	3.3	0.1 0.2 0.4	2.7 2.6 2.5	● ● ●	E39 F80~F82 F84, F85		
	TPMH 160302SE 160304SE	F	1	9.525	3.18	4.7	0.2 0.4	2.6 2.4	● ●	F80~F82 F84		
 New Value Edge	TPMH 080201NE 080202NE 080204NE	F	1	4.76	2.38	2.3	0.1 0.2 0.4	2.3 2.2 2.1	● ● ●	E39 F80~F82, F86		
	TPMH 090201NE 090202NE 090204NE 090208NE	F	1	5.56	2.38	3.2	0.1 0.2 0.4 0.8	2.7 2.6 2.5 2.2	● ● ● ●	F33, F34 F80~F82, F86		
	TPMH 110301NE 110302NE 110304NE 110308NE	F	1	6.35	3.18	3.3	0.1 0.2 0.4 0.8	3.4 3.3 3.2 2.9	● ● ● ●	E39 F80~F82 F84, F85		
	TPMH 160304NE 160308NE	F	1	9.525	3.18	4.7	0.4 0.8	3.3 3	● ●	F80~F82 F84		
 	TPMH 080202 080204	F	1	4.76	2.38	2.3	0.2 0.4	2.5 2.3	● ●	E39 F80~F82, F86		
	TPMH 090201 090202 090204	F	1	5.56	2.38	3.2	0.1 0.2 0.4	3 2.9 2.8	● ● ●	F33, F34 F80~F82, F86		
	TPMH 110301 110302 110304 110308	F	1	6.35	3.18	3.3	0.1 0.2 0.4 0.8	3.9 3.9 3.7 3.4	● ● ● ●	E39 F80~F82 F84, F85		
	TPMH 160302 160304 160308	F	1	9.525	3.18	4.7	0.2 0.4 0.8	4 3.8 3.6	● ● ●	F80~F82 F84		
 New Value Edge	TPMH 110302L-NE 110304L-NE	F	1	6.35	3.18	3.3	0.2 0.4	3.8 3.6	● ●	E39 F80~F82 F84, F85		
 Chip Control	TPMT 110302APD 110304APD 110308APD	F	1	6.35	3.18	3.3	0.2 0.4 0.8	2.6 2.5 2.5	● ● ●	E39 F80~F82 F84, F85		

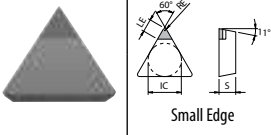
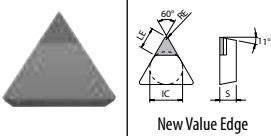
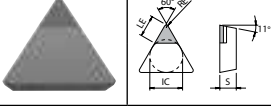
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes



60° Triangle

How to read pages of "Turning inserts" See page B15

Cutting edge preparation				Non-ferrous metals (with interruption)				●		N	
PCD all items		F	Sharp edge	Non-ferrous metals (without interruption)				●			
				Titanium alloys (with interruption)				●		S	
				Titanium alloys (without interruption)				●			
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)				PCD		Applicable toolholder	
				IC	S	RE	LE	KPD001	KPD010		
	TPGN 110301SE 110302SE 110304SE	F	1	6.35	3.18	0.1 0.2 0.4	2.6 2.5 2.4	● ● ●		F113	
	TPGN 160301SE 160302SE 160304SE	F	1	9.525	3.18	0.1 0.2 0.4	2.6 2.6 2.4	● ● ●			
	TPGN 160304NE 160308NE	F	1	9.525	3.18	0.4 0.8	3.2 2.9	● ●			
	TPGN 110302 110304	F	1	6.35	3.18	0.2 0.4	3.9 3.7	● ●			
	TPGN 160304 160308	F	1	9.525	3.18	0.4 0.8	3.7 3.4	● ●			

C

CBN & PCD Tools

CBN

PCD

Positive

C

D

S

T

V

W

Solid


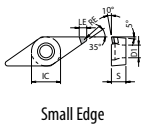

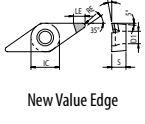

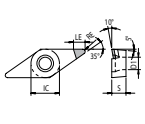


Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		PCD all items		F		Sharp edge		Non-ferrous metals (with interruption)		Non-ferrous metals (without interruption)		Titanium alloys (with interruption)		Titanium alloys (without interruption)		N		S	
								●		●		●		●		●		●	
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD	Applicable toolholder									
				IC	S	D1	RE	LE											
										KPD001	KPD010								
	 <p>Small Edge</p>	F	1	6.35	3.18	2.8	0.1	2.5	●	E40~E43 E58 F90, F91 F94~F99									
							0.2	2.3	●										
							0.4	1.9	●										
							0.8	1.9	●										
	 <p>New Value Edge</p>	F	1	9.525	4.76	4.4	0.1	2.7	●	E41~E43 F90, F91 F94~F99									
							0.2	2.5	●										
							0.4	2.1	●										
							0.8	2	●										
		F	1	6.35	3.18	2.8	0.1	2.6	●	E40~E43 E58 F90, F91 F94~F99									
							0.2	2.4	●										
							0.4	2	●										
							0.8	3.1	●										
		F	1	9.525	4.76	4.4	0.1	3.2	●	E41~E43 F90, F91 F94~F99									
							0.2	3	●										
							0.4	2.6	●										
							0.8	3.5	●										




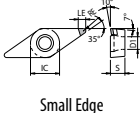

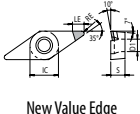

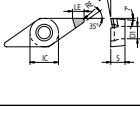
CBN & PCD Tools

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

35° Rhombic

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)		Non-ferrous metals (without interruption)		Titanium alloys (with interruption)		Titanium alloys (without interruption)		PCD		Applicable toolholder
											KPD001	KPD010	
PCD all items	F	Sharp edge	Edge preparation type	No. of edges	Dimension (mm)					PCD		Applicable toolholder	
					IC	S	D1	RE	LE	KPD001	KPD010		
		VCMT 080202SE 080204SE 080208SE	F	1	4.76	2.38	2.3	0.2 0.4 0.8	1.4	● ● ●		E59 F90, F91 F94~F99	
		VCMT 080201NE 080202NE 080204NE 080208NE	F	1	4.76	2.38	2.3	0.1 0.2 0.4 0.8	1.7 1.7 1.8 1.9	● ● ● ●			
		VCMT 080201 080202 080204 080208	F	1	4.76	2.38	2.3	0.1 0.2 0.4 0.8	2 2 2.1 2.2	● ● ● ●			

C

CBN & PCD Tools

CBN

PCD

Positive

C

D

S

T

V

W

Solid

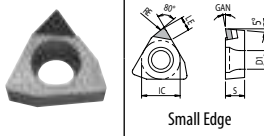
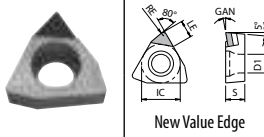
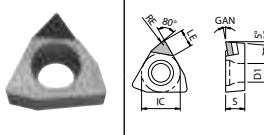
Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

80° Trigon

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)										N							
			Non-ferrous metals (without interruption)																	
PCD all items	F	Sharp edge	Titanium alloys (with interruption)										S							
										Titanium alloys (without interruption)										
Insert		Description		Edge preparation type	No. of edges	Dimension (mm)					PCD		Applicable toolholder							
						IC	S	D1	RE	LE	KPD001	KPD010								
		WBMT 060102L-SE		F	1	3.97	1.59	2.3	0.2	1.3	●		F36 F100~F102							
		WBMT 080202L-SE		F	1	4.76	2.38	2.3	0.2	1.6	●									
		WBMT 060101L-NE 060102L-NE 060104L-NE		F	1	3.97	1.59	2.3	0.1 0.2 0.4	1.7 1.6 1.6	● ● ●									
		WBMT 080202L-NE 080204L-NE		F	1	4.76	2.38	2.3	0.2 0.4	2.1	● ●									
		WBMT 060101L 060102L 060104L		F	1	3.97	1.59	2.3	0.1 0.2 0.4	1.9	● ● ●									
		WBMT 080202L 080204L		F	1	4.76	2.38	2.3	0.2 0.4	2.4 2.3	● ●									


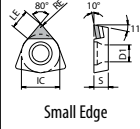

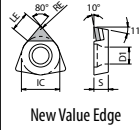

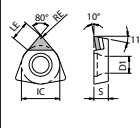


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

80° Trigon

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)							N		
PCD all items			Non-ferrous metals (without interruption)							S		
F			Titanium alloys (with interruption)							S		
Sharp edge			Titanium alloys (without interruption)							S		
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					PCD	Applicable toolholder		
				IC	S	D1	RE	LE				
				KPD001						KPD010		
	 Small Edge	WPMT	110202SE	F	1	6.35	2.38	2.8	0.2	2.1	●	F100~F102
	 New Value Edge	WPMT	110202NE	F	1	6.35	2.38	2.8	0.2	2.7	●	
		WPMT	110202	F	1	6.35	2.38	2.8	0.2	3.1	●	

C

CBN & PCD Tools

CBN

PCD

Positive

C

D

S

T

V

W

Solid


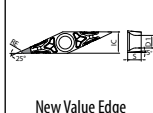
Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

25° Rhombic


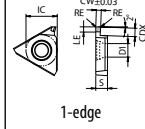

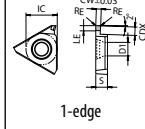
How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)							●		N
			Non-ferrous metals (without interruption)							●		
PCD all items	F	Sharp edge	Titanium alloys (with interruption)							●		S
			Titanium alloys (without interruption)							●		
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)				Angle (°)		PCD	Applicable toolholder	
				IC	S	D1	RE	AN	RPD001			
 	ZBMT 13T301NE 13T302NE 13T304NE	F	1	6.35	3.97	3.7	0.1 0.2 0.4	5	● ● ●	E52, E53 F106~F110		



GBA

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)										N		
PCD all items			Non-ferrous metals (without interruption)										S		
F			Titanium alloys (with interruption)										S		
Sharp edge			Titanium alloys (without interruption)										S		
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)								Tolerance (mm)		PCD	Applicable toolholder
				CW	CDX	IC	S	D1	RE	LE	CW min.	CW max.	KPD001			KPD010
  <p>1-edge</p>	GBA32R 125-010 150-010 200-010	F	1	1.25	2	9.525	3.18	4.4	0.1	1.7	-0.03	+0.03	●	●	
				1.5	2								●	●	
				2	2.5								●	●	
  <p>1-edge</p>	GBA43R 125-010 150-010 200-010 250-010 300-010	F	1	1.25	2	12.7	4.76	5.5	0.1	1.9	-0.03	+0.03	●	●	
				1.5	3.5								●	●	
				2	3.5								●	●	
	2.5			4	●								●		
	3			4	●								●		
	3			4	●								●		
GBA43L 125-010 150-010 200-010 250-010 300-010				1.25	2								●	●	
				1.5	3.5								●	●	
				2	3.5								●	●	

CDX shows available grooving depth. Right-hand shown

C

CBN & PCD Tools

CBN

PCD

Positive

C

D

S

T

V

W

Solid

Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

GV/GVF

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)										●		N
			Non-ferrous metals (without interruption)										●		
PCD all items	F	Sharp edge	Titanium alloys (with interruption)										●		S
Titanium alloys (without interruption)										●					
Insert		Description		Edge preparation type	No. of edges	Dimension (mm)						Tolerance (mm)		PCD	Applicable toolholder
						CW	CDX	S	RE	INSL	W1	CW min.	CW max.	KPD010	
		GVR 145-020A 200-020A		F	1	1.45 2	2.3	5	0.2	12	4	-0.03	+0.03	● ●	G86~G88
		GVR 200-020B 250-020B		F	1	2 2.5	3.2	5.5	0.2	15	4.5	-0.03	+0.03	● ●	
		GVFR 250-020B 300-020B 400-020B		F	1	2.5	4.8	5	0.2	20	5.8	-0.03	+0.03	● ● MTO	G127~G130 G133
		GVFL 250-020B 300-020B 400-020B				3	4.8							● ● MTO	
		GVFR 350-040C				4	5.3							MTO	

CDX shows available grooving depth.
Right-hand shown




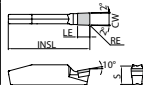
CBN & PCD Tools

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

CBN & PCD Inserts are sold in 1 piece boxes

GDGS

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)										●	N	
PCD all items			F	Sharp edge										●	S
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		PCD	Applicable toolholder			
				CW	S	RE	INSL	LE	CW min.	CW max.					
 	GDGS 2020N-020NB	F	1	2	4.3	0.2	20	2.9	-0.03	+0.03	●	G34~G42			
	GDGS 3020N-020NB	F	1	3	4.3	0.2	20	2.9	-0.03	+0.03	●				
	GDGS 4020N-020NB	F	1	4	4.3	0.2	20	2.9	-0.03	+0.03	●				
	GDGS 5020N-020NB	F	1	5	4.3	0.2	20	2.9	-0.03	+0.03	●	G34 G40~G42			
	GDGS 6020N-020NB	F	1	6	4.3	0.2	20	2.9	-0.03	+0.03	●				

C

CBN & PCD Tools

CBN

PCD

Positive

C

D

S

T

V

W

Solid

Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

GMN

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)										●		N							
			Non-ferrous metals (without interruption)										●									
PCD all items			F			Sharp edge				Titanium alloys (with interruption)										●		S
										Titanium alloys (without interruption)										●		
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		PCD		Applicable toolholder									
				CW	S	RE	INSL	LE	CW min.	CW max.	KP001	KP010										
	GMN 2	F	1	2	4.3	0.2	20	2.9	-0.05	+0.05	●	●	G55 G57									
	GMN 3	F	1	3	4.3	0.2	20	2.9	-0.05	+0.05	●	●	G55~G58									
	GMN 4	F	1	4	4.3	0.2	20	2.9	-0.05	+0.05	●	●										
	GMN 5	F	1	5	4.3	0.2	20	2.9	-0.05	+0.05	●	●										
	GMN 6	F	1	6	4.3	0.2	20	2.9	-0.05	+0.05	●	●	G56 G57									



CBN & PCD Tools

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

GMGW

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		Non-ferrous metals (with interruption)										●	N
		Non-ferrous metals (without interruption)										●	
GMGW		Titanium alloys (with interruption)										●	S
R-honed		Titanium alloys (without interruption)										●	
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		PCD	KPD001	Applicable toolholder
				CW	S	RE	INSL	LE	CW min.	CW max.			
	GMGW 6030-30R	F	1	6	5.5	3	30	4.5	-0.03	+0.03	●	G67	
	GMGW 8030-40R	F	1	8	5.5	4	30	6	-0.03	+0.03	●		
	GMGW 8030-40R-HR	F	1	8	5.5	4	30	5	-0.03	+0.03	●		

GMGW inserts are exclusively used for KGMW toolholder. It cannot be used for other toolholder because of its different installation angle.
 GMGW inserts Edge Preparation : R-honed Cutting Edge.

C

CBN & PCD Tools

CBN

PCD

Positive

C

D

S

T

V

W

Solid





Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

TKF

How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)														●	N		
PCD all items			F	Sharp edge	Non-ferrous metals (without interruption)														●	
					Titanium alloys (with interruption)														●	S
					Titanium alloys (without interruption)														●	
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)										Angle (°)	Tolerance (mm)				PCD	Applicable toolholder
				CW	CDX	S	S1	D1	RE	LE	W1	PSIR%	CW min.	CW max.	RE (+/-) min.	RE (+/-) max.	KPD001			
	TKF12R 200-AGT 250-AGT	F	1	2 2.5	4.8	8.7	8.3	5	0.1	4.2	3	0	-0.03	+0.03	-0.05	0	●	●	E15 E16	
	TKF12R 200-AS TKF12L 200-AS TKF12R 250-AS	F	1	2 2.5	5	8.7	7.3	5	0.1	5.3	3	0	-0.03	+0.03	-0.05	0	●	●		
	TKF16R 250-AS TKF16L 250-AS	F	1	2.5	8	9.5	8	5	0.1	6.3	4	0	-0.03	+0.03	-0.05	0	●	●		
	TKF12R 150-NB 200-NB 250-NB	F	1	1.5 2 2.5	3.5 4 4	8.7	8.3	5	0.1	2 3 3	3	0	-0.03	+0.03	-0.05	0	●	●		

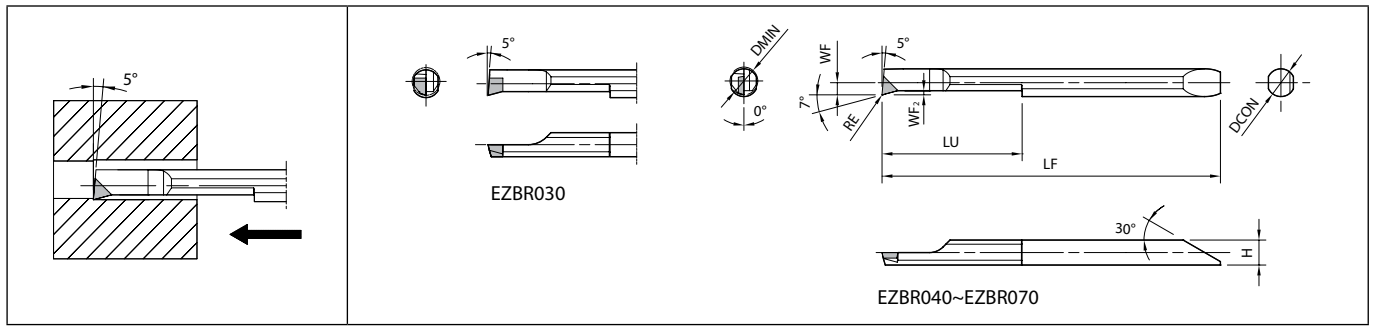
Right-hand shown



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

EZB-NB (Boring)



Right-hand shown

Dimensions

How to read pages of "Turning inserts" See page B15

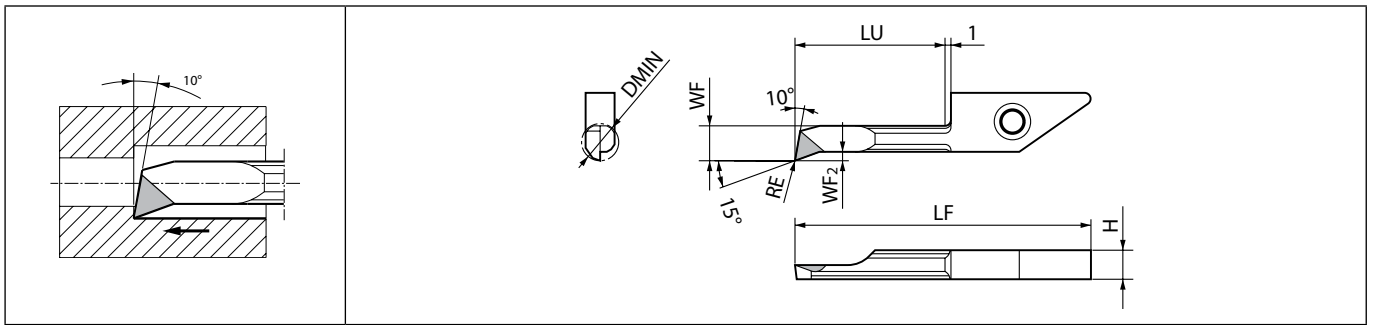
Cutting edge preparation			Non-ferrous metals (with interruption)										●	N		
PCD all items			F	Sharp edge	Non-ferrous metals (without interruption)										●	S
Description			No. of edges	Dimension (mm)							Tolerance (mm)		PCD	Applicable sleeve		
				DMIN	DCON	H	LF	LU	WF	WF ₂	RE	RE min.	RE max.	KPD001	F39 F41 F43	
EZBR 040040-003NB			1	4	4	3.6	48.8	20	1.75	0.5	0.035	-0.015	+0.015	●	EZH040...	
EZBR 050050-003NB			1	5	5	4.6	58.1	25	2.25	0.5	0.035	-0.015	+0.015	●	EZH050...	
EZBR 060060-003NB			1	6	6	5.6	66.1	30	2.75	0.5	0.035	-0.015	+0.015	●	EZH060...	
EZBR 070070-003NB			1	7	7	6.6	74.1	35	3.25	0.5	0.035	-0.015	+0.015	●	EZH070...	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

C
CBN & PCD Tools
CBN
PCD
Positive
C
D
S
T
V
W
Solid
Grooving

VNB-NB (Boring)



Right-hand shown

Dimensions

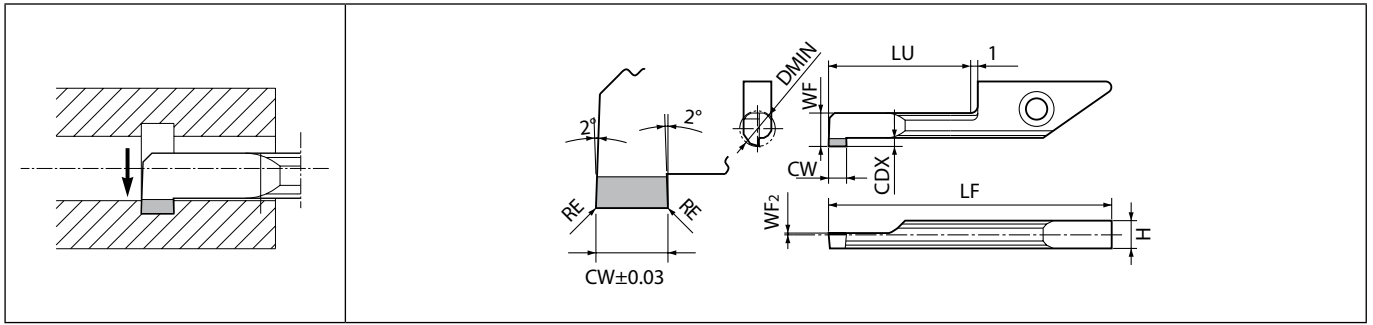
How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Dimension (mm)							Applicable toolholder								
PCD all items	F	Sharp edge	Non-ferrous metals (with interruption)							● N								
			Non-ferrous metals (without interruption)							●								
			Titanium alloys (with interruption)							● S								
			Titanium alloys (without interruption)							●								
Description	No. of edges	Dimension (mm)							PCD	Applicable toolholder								
		DMIN	H	LF	LU	WF	WF ₂	RE										
VNBR 0411-02NB	1	4	3.66	30.8	11			3.5	0.5	0.2	●	F48~F51						
VNBR 0420-02NB				39.8									20					
VNBR 0511-02NB	1	5	3.9	30.8	11			4.5	0.7	0.2			●	F48~F51				
VNBR 0520-02NB				39.8											20			
VNBR 0620-02NB	1	6	3.9	39.8	20			5.3	1	0.2					●	F48~F51		
VNBR 0630-02NB				49.8													30	
VNBR 0720-02NB	1	7	3.9	39.8	20			6.2	1	0.2							●	F48~F51
VNBR 0730-02NB				49.8															30

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

VNG



Right-hand shown

Dimensions

How to read pages of "Turning inserts" See page B15

Cutting edge preparation		Non-ferrous metals (with interruption)											●	N		
PCD all items		F		Sharp edge									Non-ferrous metals (without interruption)		●	S
Titanium alloys (with interruption)													●			
Titanium alloys (without interruption)													●			
Description	No. of edges	Dimension (mm)										Tolerance (mm)		PCD	Applicable toolholder	
		DMIN	CW	CDX	H	LF	LU	WF	WF ₂	RE	CW min.	CW max.	RPD001			
VNGR 0410-11NB	1	4	1	0.8	3.9	30.8	11	3.5	0.1	0.05	-0.03	+0.03	MTO	F48~F51		
VNGR 0420-11NB			2										MTO			
VNGR 0510-11NB	1	5	1	1	3.9	30.8	11	4.4	0.1	0.05	-0.03	+0.03	MTO			
VNGR 0520-11NB			2										MTO			
VNGR 0720-20NB	1	7	2	2	3.9	39.8	20	6.2	0.3	0.05	-0.03	+0.03	MTO			

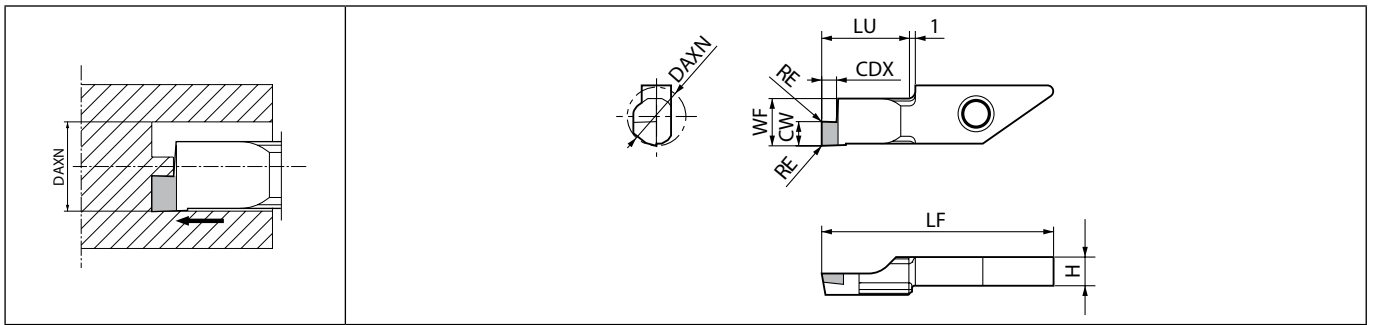
CDX shows available grooving depth.

- C
- CBN & PCD Tools
- CBN
- PCD
- Positive
- C
- D
- S
- T
- V
- W
- Solid
- Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

CBN & PCD Inserts are sold in 1 piece boxes

VNFG



Right-hand shown

Dimensions


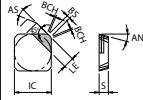
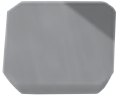
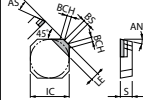
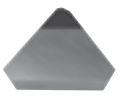
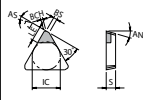




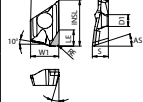
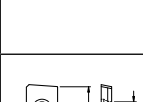

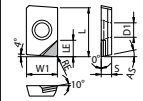
How to read pages of "Turning inserts" See page B15

Cutting edge preparation			Non-ferrous metals (with interruption)		Non-ferrous metals (without interruption)		Titanium alloys (with interruption)		Titanium alloys (without interruption)		PCD		Applicable toolholder
PCD all items	F	Sharp edge	●		●		●		●		N		
			●		●		●		●		S		
Description	No. of edges	External dia. of the groove (mm)		Dimension (mm)								PCD	
		DAXN (min.)	DAXX (max.)	CW	CDX	H	LF	LU	WF	RE	KPD001		
VNFGR 0830-10NB	1	8 (0)	∞ (∞)	3	3	3.9	29.6	10	7.3	0.05	MT0	F48 F50 F51	

CDX shows available grooving depth.

External dia. of the groove DAXN (0) means that you can make the initial groove within DAXN ~ DAXX and then widen it to the center.

Available inserts

Cutting edge preparation		Non-ferrous metals (with interruption)													Non-ferrous metals (without interruption)			Titanium alloys (with interruption)			Titanium alloys (without interruption)			N
		PCD all items			F			Sharp edge																
Insert	Description	No. of edges	Dimension (mm)											Angle (°)		PCD			Applicable toolholder					
			IC	S	D1	RE	INSL	LE	BCH	BS	W1	AN	AS	KPD001	KPD010	KPD230								
	 SDKN 1203AUFN-NE	1	12.7	3.18	-	-	-	3.1	0.5	1.2	-	15	23	●			-							
	 SEEN 1203AFFN 1203AFFN-NE	1	12.7	3.18	-	-	-	3.5 3	0.5	1.4	-	20	25	●	●		-							
	 TEEN 1603PTFR 1603PTFR-NE	1	9.525	3.18	-	-	-	4.7 4.1	0.6	1.4	-	20	22	●	●		-							
	 BDGT 11T302FR 11T304FR 11T308FR	1	-	3.8	2.8	0.2 0.4 0.8	11.5	3.8	-	-	6.7	13	18	●	●	●	M86, M87 M89, M90							
	 BDGT 11T302FR-LE 11T304FR-LE 11T308FR-LE	1	-	3.8	2.8	0.2 0.4 0.8	11.5	5.2	-	-	6.7	13	18	●	●	●								
	 BDMT 11T302FR 11T304FR	1	-	3.8	2.8	0.2 0.4	11	3.6	-	-	6.7	13	18	●	●	●	M88~M90							
	 BDMT 170402FR 170404FR	1	-	4.9	4.4	0.2 0.4	17	4.4	-	-	9.6	13	18	●	●	●								
	 NDCW 150302FRX 150302FRX-NE	1	-	3.18	4.4	0.2	15	5.7 5.1	-	-	9.525	-	15	●	●		M171							

Handed insert shows Right-hand

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

C

CBN & PCD Tools

CBN

PCD

Positive

C

D

S

T

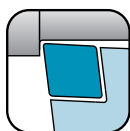
V

W

Solid

Grooving

D



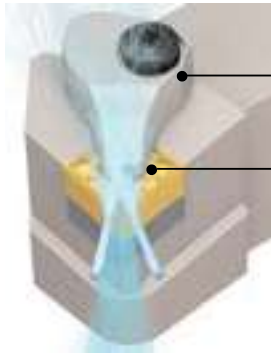
Introduction		D2
Toolholders for general purpose		D8
CN insert	DCLN/DCLN-JCT/PCLN	D8
DN insert	DDJN/DDJN-JCT/DDHN	D13
	PDJN/PDHN	D16
SN insert	DSBN/PSBN	D19
	PSKN/PSSN/PSDN	D20
TN insert	DTGN/PTGN/PTFN	D22
	WTJN/WTKN/WTEN	D27
VN insert	DVLN/DVLN-JCT/DVFN/DVFN-JCT/DVVN/DVVN-JCT	D30
	MVLN/MVFN	D36
	PVLN/PVFN/PVFN	D38
RC insert	PRGC/PRXC	D40
RN insert	PRGN	D42
WN Insert	DWLN/DWLN-JCT/PWLN/WWLN	D43
Toolholders for ceramic inserts		D48
CN insert	CCLN	D49
DN insert	CDJN	D50
EN insert	CELN	D51
SN insert	CSRN/CS-N/CSKN/CSYN/CSSN/CSDN	D52
TN insert	CTJN/CTUN	D56
RN insert	CRSN/CRDN	D58
Toolholders for solid CBN inserts		D60
CNMN insert	CCRN-A/CCLN-A	D60
RNMN insert	CRSN-A/CRDN-A	D61
SNMN insert	CSRN-A/CSKN-A/CSSN-A/CSDN-A	D63
TNMN insert	CTJN-A	D66
Toolholders for bearing machining		D67
RCMT insert	PRGC-BE	D67
SNMF insert	CBSN	D68
Recommended cutting conditions		D69

Great for high pressure coolant

Double clamp-JCT

D

1 Superior chip control performance



Double clamp

Firm insert clamp and easy to use in single operations
High-density coolant supply close to the cutting edge

Unique nozzle shape

Provides coolant to a wide area of the insert surface

Chip control comparison (Internal evaluation)

Double clamp-JCT



Competitor A



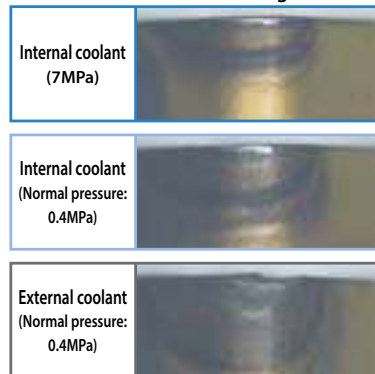
f = 0.05 mm/rev f = 0.15 mm/rev f = 0.05 mm/rev f = 0.15 mm/rev
Cutting conditions: Vc = 150 m/min, ap = 0.5 mm, Wet, CNMG120408 type Workpiece material: 15CrMo4 External turning

2 Longer tool life and high speed machining

Coolant is also directed from two directions towards the flank face of the insert to ensure even cooling action
Longer tool life and high-speed machining with improved wear resistance

Alloy steel (34CrMo4)

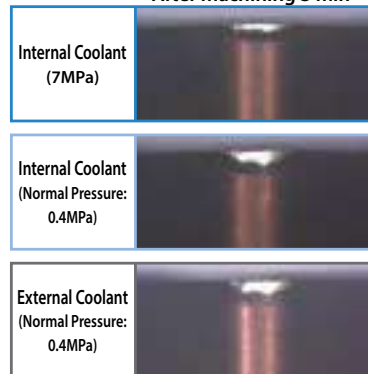
After machining 42.2 min



UP
Abrasion
resistance

Heat-resistant alloys (Inconel®718)

After machining 3 min



UP
Abrasion
resistance

Cutting conditions: Vc = 250 m/min, ap = 2 mm, f = 0.3 mm/rev, Wet, CNMG120408 type External turning

Cutting conditions: Vc = 80 m/min, ap = 0.5 mm, f = 0.15 mm/rev, Wet, CNMG120408 type External turning

Using internal coolant improves wear-resistance in alloy steel and heat-resistant alloys
High-pressure coolant is more effective

External turning toolholders identification system (Square shank)

Clamping system	
A	Back clamp
C	Top clamp
D	Double clamp
M	Multi lock
P	Pin lock or lever lock
S	Screw clamp
W	Wedge lock

Insert shape	
C	80° Rhombic
D	55° Rhombic
R	Round
S	90° Square
T	60° Triangle
V	35° Rhombic
W	80° Trigon

Hand of tool	
R	Right-hand
L	Left-hand
N	Neutral

Shank height
Shank height (mm)

Shank width
Shank width (mm)

Manufacturer's option
Optional mark or number

D

C

L

N

R

20

20

K

-

12

Cutting edge angle			
A 90°	B 75°	C 90°	D 45°
E 60°	F 90°	G 90°	H 107.5°
J 93°	K 75°	L 95°	N 63°
P 117.5°	R 75°	S 45°	T 60°
U 93°	V 72.5°	W 60°	Y 85°

Insert relief angle	
B	5° Positive
C	7° Positive
D	15° Positive
E	20° Positive
N	0° Negative
P	11° Positive

Toolholder length					
A	32	J	110	R	200
B	40	JX	120	S	250
C	50	K	125	T	300
D	60	L	140	U	350
E	70	M	150	V	400
F	80	N	160	W	450
G	90	P	170	Y	500
H	100	Q	180	X	Special

Insert size	
R L	S L
T L	C L
D L	V L



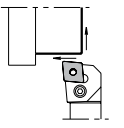
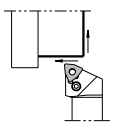
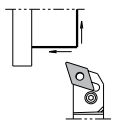
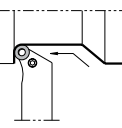
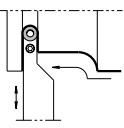
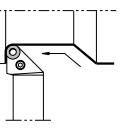
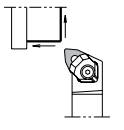
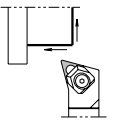
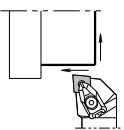
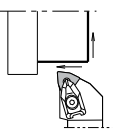
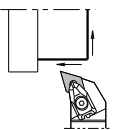
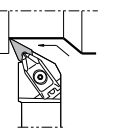
External turning

- Specification may change without any prior notice.
- Due to the installation size constraints on the machine, the toolholder length of some products may not match with the symbol.

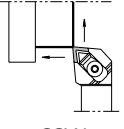
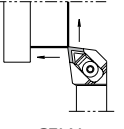
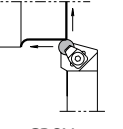
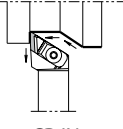
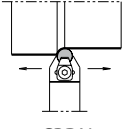
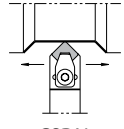
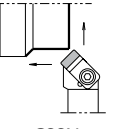
D

External turning

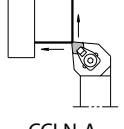
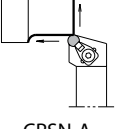
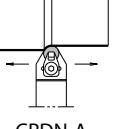
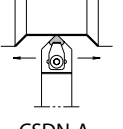
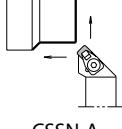
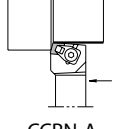
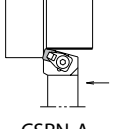
External Turning Toolholders

Applicable Insert Shape	CN..	WN..	TN..	DN..	RC..	RN..	VN..
Applications	External / Facing			External / Facing / Copying			External / Facing / Copying / Undercutting
Cutting Edge Angle	95°		105°	107.5°	Special		117.5°
Lever Lock (Pin Lock)							
See Page	D10	D45		D17	D40	D40	D42
Wedge Lock Multi Lock							
See Page		D46	D27				
Double Clamp (Coolant-through holders)							
See Page	D8 / D9	D43 / D44		D15			D32 / D33

Toolholders for Ceramic Tools

Applications	External / Facing			External / Copying		External / Chamfering	External / Facing / Chamfering
Cutting Edge Angle	95°	97.5°	Special	93°	Special	45°	45°
Top Clamp							
See Page	D49	D51	D58	D50	D58	D54	D54

Toolholders for Solid CBN Tools

Applications	External / Facing		External / Copying	External / Chamfering	External / Facing / Chamfering	External	
Cutting Edge Angle	95°	Special	Special	45°	45°	75°	
Top Clamp							
See Page	D60	D61	D61	D64	D64	D60	D63
							D66



VN..		DN..	SN..	TN..	SN..	SN..	TN..	SN..	TN..
		 TN..							
External / Copying			External / Chamfering		External / Facing / Chamfering	External		Facing	
72.5°	95°	93°	45°	60°	45°	75°	91°	15°	-1°
PVVN (Pin Lock)	PVLN (Pin Lock)	PDJN	PSDN		PSSN	PSBN	PTGN	PSKN	PTFN
D39	D38	D16	D21		D20	D19	D24	D20	D25
MVVN	MVLN	WTJN-N		WTEN-N					
D37	D36	D27		D28					
DVVN (-JCT)	DVLN (-JCT)	DDJN (-JCT)				DSBN	DTGN (-JCT)		
D34 / D35	D30 / D31	D13 / D14				D19	D22 / D23		

External			Facing		
75°	85°	93°	5°	15°	-3°
CSRN	CS-N	CTJN	CSYN	CSKN	CTUN
D52	D52	D56	D53	D53	D56

Toolholders for Bearing Machining

Facing
15°
CSKN-A
D63

Applications	External
Cutting Edge Angle	Special
Lever Lock	
	PRGC-BE
See Page	D67

Applications	Round Chamfering
Cutting Edge Angle	Special
Top Clamp	
	CBSN
See Page	D68

Clamping systems

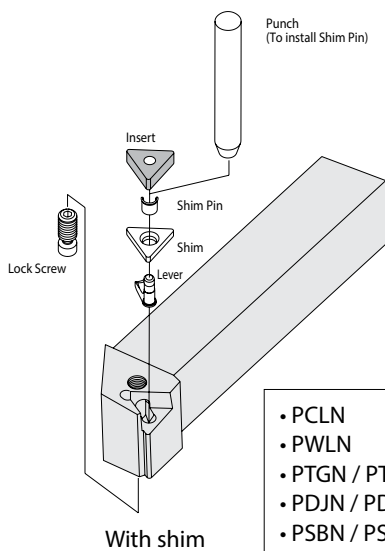
D



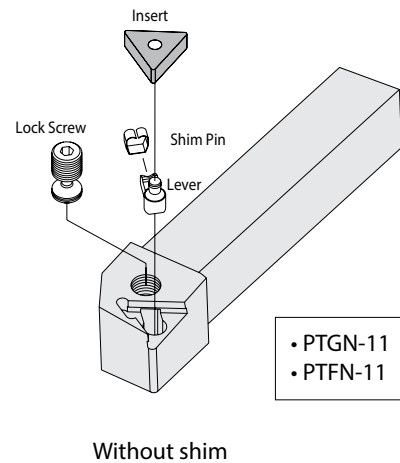
External turning

Series	Design	Features	Series	Design	Features
Top clamp (C)		<ul style="list-style-type: none"> • Rigid clamping • Negative Insert: Medium to heavy machining (Mainly for ceramic insert) 	Multi lock (M)		<ul style="list-style-type: none"> • Combination of top clamp and pin lock • Rigid clamping • Heavy machining
Double clamp (D)		<ul style="list-style-type: none"> • Firmly clamp the insert in two directions with one action. 	Lever lock (P)		<ul style="list-style-type: none"> • Easy insert replacement • General use
Pin lock (P)		<ul style="list-style-type: none"> • Easy insert replacement 	Wedge lock (W)		<ul style="list-style-type: none"> • Rigid clamping • Heavy machining
Screw clamp (S)		<ul style="list-style-type: none"> • Simple mechanism • Fewer parts • Finishing to medium machining 			

Lever lock

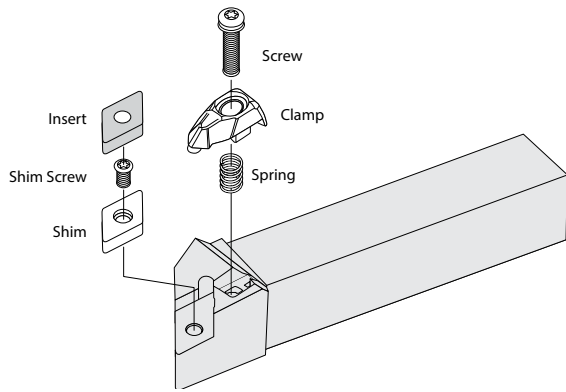


- PCLN
- PWLN
- PTGN / PTFN / PTLN
- PDJN / PDHN
- PSBN / PSKN / PSSN / PSDN
- PRGN
- PRGC / PRXC



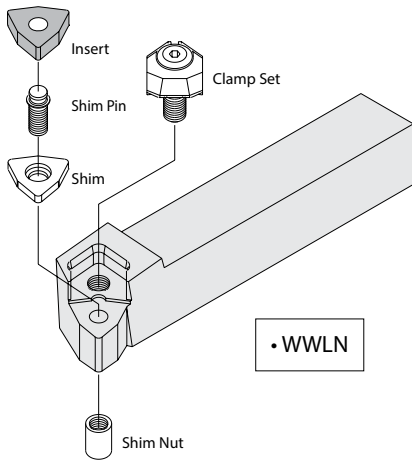
- PTGN-11
- PTFN-11

Double clamp

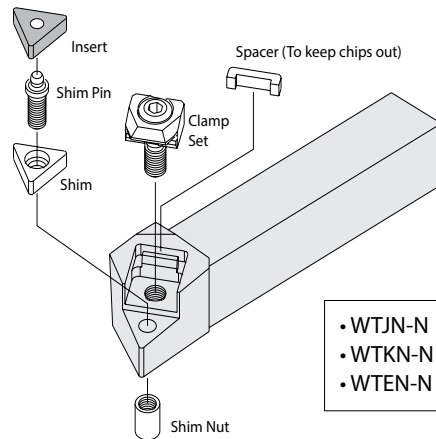


- DCLN
- DDJN / DDHN
- DSBN
- DTGN
- DVLN / DVPN / DVVN
- DWLN

Wedge lock

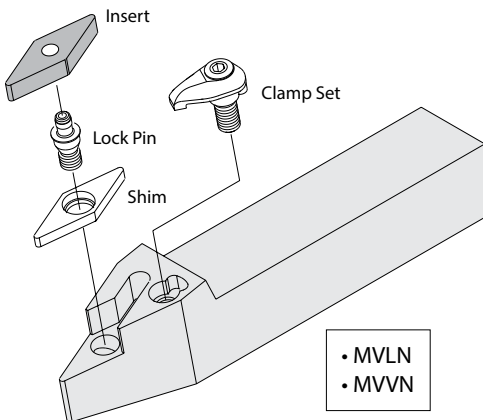


- WWLN



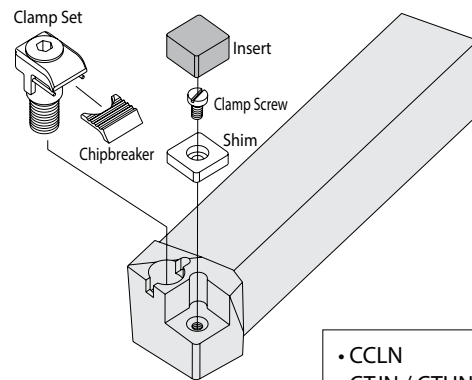
- WTJN-N
- WTKN-N
- WTEN-N

Multi lock



- MVLN
- MVVN

Top clamp

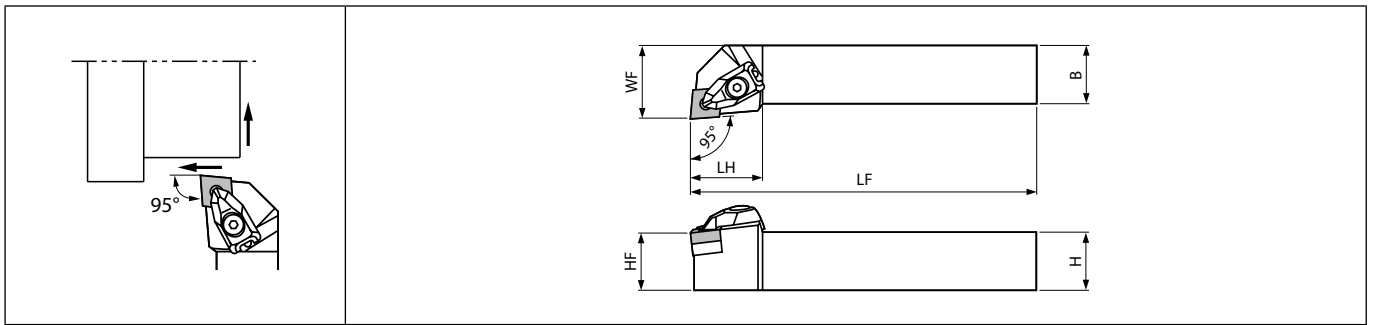


- CCLN
 - CTJN / CTUN
 - CDHN / CDJN
 - CELN
 - CSRN / CS-N / CSKN
 - CSYN / CSSN / CSDN
 - *CRSN / *CRDN
- *Chipbreaker is not included



External turning















DCLN (External turning / External facing)



Right-hand shown

External turning

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	
	R	L	H	B	LH	HF	LF	WF											
DCLN% 2020K-12	●	●	20	20	33	20	125	25	0.8	-6	-6								CN□A1204... CN□G1204... CN□M1204...
2525M-12	●	●	25	25	32	25	150	32												CP-3D	CS-3D	SP-3D	LW-3	DC-44 (DC-44-C*)	SB-4085TR	FT-15

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

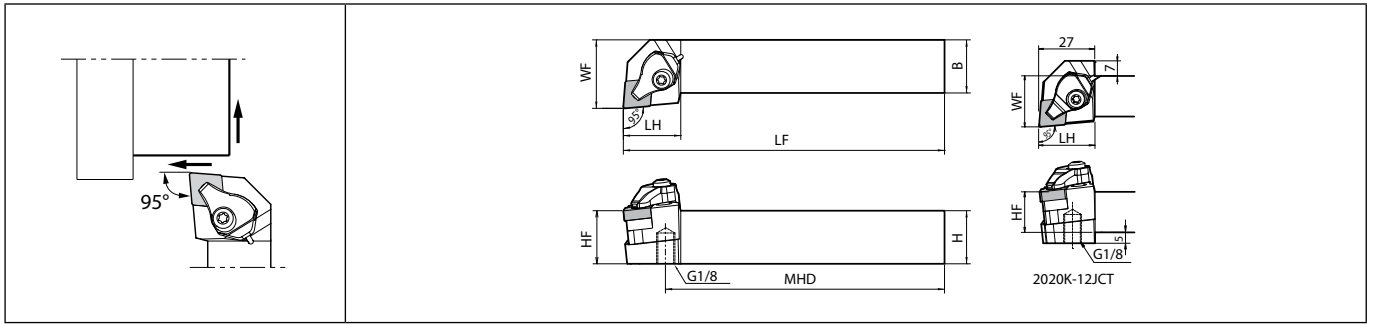
When using the inserts with SX chipbreaker, prepare a shim (-C type) separately.

Wrench (FT-15) is sold separately.

Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DCLN-JCT (External turning / External facing, Coolant-through holders)



Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
															Clamp	Pipe connection	Screw (for clamp)	Screw (for shim)	Shim	Spring		Wrench
	R	L	H	B	LH	MHD	HF	LF	WF												
DCLN [®] 2020K-12JCT	●	●	20	20	27	109	20	125	25	0.8	Yes	-6	-6								CN□A1204... CN□G1204... CN□M1204...
2525M-12JCT	●	●	25	25	27	134	25	150	32												

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

When using the inserts with SX chipbreaker, prepare a shim (-C type) separately.

Clamp : CP-3D-R-JCT for Right-hand Toolholder, CP-3D-L-JCT for Left-hand Toolholder.

Please see page **D12** for piping parts of coolant-through holders.

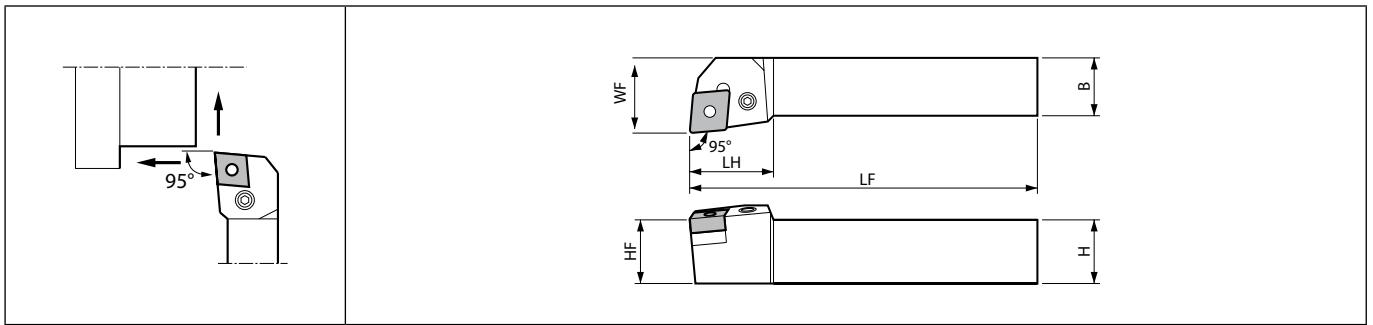
Only the O-ring (SS-035) included with the pipe connection can be ordered.

Recommended tightening torque : 3.9N·m



External turning

PCLN (External turning / External facing)



Right-hand shown

Toolholder dimensions


Description	Availability		Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
	R	L	H	B	LH	HF	LF	WF	Lever	Lock screw				Punch	Shim pin	Shim	Wrench	Wrench			
PCLN%L 1616H-09	●	●	16	16		16	100	20										CN□G0904...			
2020K-09	●	●	20	20	22	20	125	25	0.8	-6	-6	LL-1N	LS-1N	PC-1	LSP-1	LC-32N	-		FH-2.5		
2525M-09	●	●	25	25		25	150	32													
PCLN%L 2020H-12	●		20	20		20	100	25										CN□A1204... CN□G1204... CN□M1204...			
2020K-12	●	●			27	25	125		0.8	-6	-6	LL-2N	LS-2N	PC-2	LSP-2	LC-42N (LC-42N-C*) (LC-42N-20*)	LW-3		-		
2525M-12	●	●	25			25	150														
3225P-12	●	●	32	25		32	170														
PCLN%L 2525M-16	●	●	25	25		25	150	32	0.8	-6	-6	LL-5N	LS-4N	-	LSP-3	LC-53N (LC-53N-C*)	LW-3	-	CNMG1606... CNMM1606...		
3232P-16	●	●	32	32	32	32	170	40													
PCLN%L 3232P-19	●	●	32	32	40	32	170	40	1.6	-6	-6	LL-6	LS-5	-	LSP-4	LC-63 (LC-63-C*)	LW-4	-	CNMG1906... CNMM1906...		

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim and use it in order to prevent workpiece and shim from interfering each other.
When using the inserts with SX chipbreaker, prepare a shim (-C type) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability




Applicable inserts

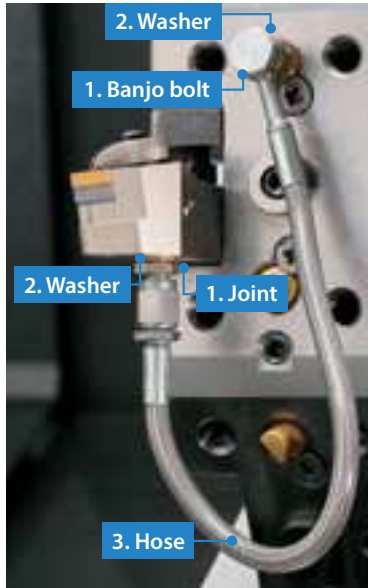
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B16	B16	B16	B16	B16	B16	B16	B17
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	TN-V	PMG	GS	PG	PS	PT
Page	B17	B17	B17	B17	B17	B18	B18	B18
Applications	Medium - Roughing	Roughing	Roughing	Roughing	Finishing	Medium	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	GT	STD	PH	PX	1/2-S	R/L	1/2-25R	Z
Page	B18	B18	B19	B19	B23	B23	B23	B23
Applications	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	XF	XP	XQ	XS	SK	FP-TK	TK	MQ
Page	B19	B19	B19	B20	B20	B20	B20	B20
Applications	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MS	MU	KQ	KG	KH	C	ZS	GC
Page	B21	B21	B22	B22	B22	B22	B22	B22
Applications	Cast iron	Cast iron / Hard materials	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Heat-resistant alloys	Heat-resistant alloys	Heat-resistant alloys
Insert								
Chipbreaker type	No CB	Ceramic	1/2-A3	AH	PCD	SQ	SG	1/2-SX
Page	B22	B113	B23	B23	C34	B20	B21	B21
Applications	Hard materials / Cast iron	Hard materials	Hard materials	Hard materials				
Insert								
Chipbreaker type	CBN	HH	HL	HD				
Page	C8	C9	C9	C9				



External turning

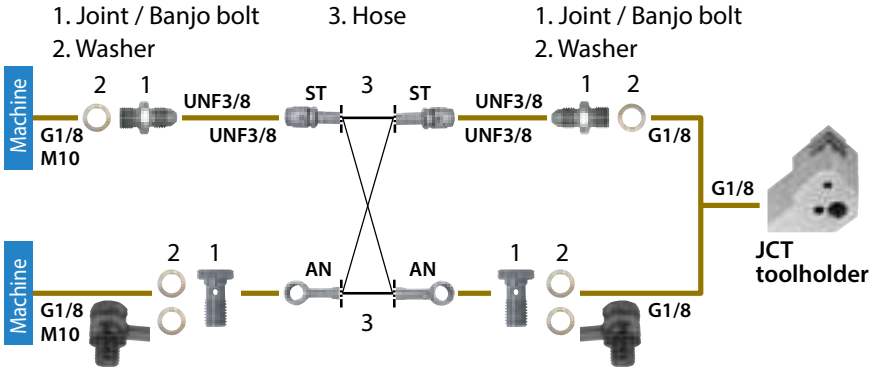
Recommended cutting conditions  D69~D70

Easy connection with high pressure hose and joint



- Even without a high pressure pump, internal coolant can be used at a normal pressure
- Banjo bolt available for angled hose connection. Can be used in a variety of machines

Piping installation guide



Piping parts

Optional piping parts available (sold separately)
Choose from parts below to match your machine specifications

1. Joint / Banjo bolt × 2 2. Washer × 2-4 3. Hose × 1

1. Joint / Banjo bolt

Applicable pressure: ~ 30 MPa

Shape	Description	Availability	Thread standard	
			Thread connection to the machine	
	J-G1/8-UNF3/8	●	G1/8	
	J-M10X1.5-UNF3/8	●	M10X1.5	
Banjo bolt (For the angle hose)	BB-G1/8	●	G1/8	
	BB-M10X1.5	●	M10X1.5	

2. Washer

Applicable pressure: ~ 30 MPa

Shape	Description	Availability
	WS-10	●

* Use 2 washers for a banjo bolt

3. Hose

Applicable pressure: ~ 30 MPa

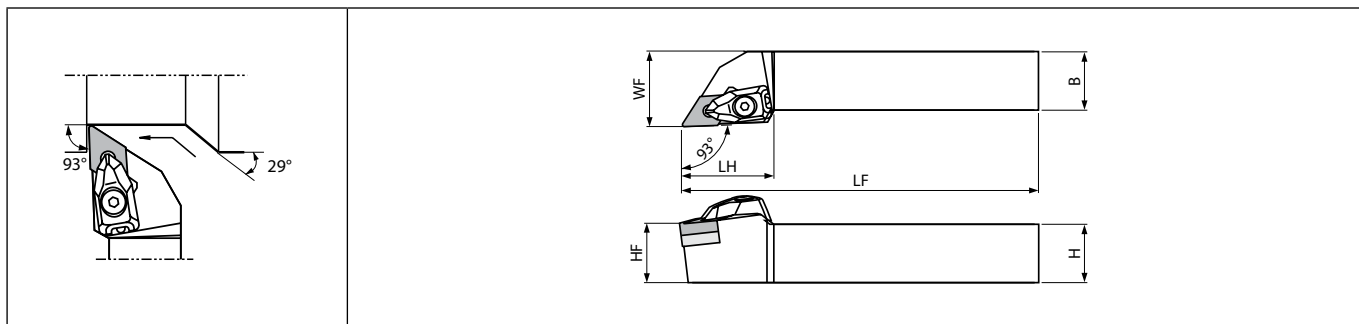
Shape	Description	Availability	Thread standard		Dimensions (mm)
					L
	HS-ST-ST-200	●	UNF3/8	UNF3/8	200
	HS-ST-ST-250	●			250
	HS-ST-AN-200	●	UNF3/8	Banjo bolt	200
	HS-ST-AN-250	●			250
	HS-AN-AN-200	●	Banjo bolt	Banjo bolt	200
	HS-AN-AN-250	●			250

Precautions

1. Make sure machine door is completely closed before use of these parts.
2. Use appropriate seal for the male thread of the piping parts and make sure the connection is secure. Use plugs to seal off unused coolant holes.
3. Connect and fasten the coolant hose firmly.
4. The use of copper washers may cause leakage but will have no effect on the performance.
5. Commercial piping parts can be used if the thread standards are same. Check the applicable pressure before use.
6. Regularly changing the coolant filter is recommended.








● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DDJN (External turning / External copying)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	
	R	L	H	B	LH	HF	LF	WF											
DDJN%L 2020K-1504	●	●	20	20	39	20	125	25	0.8	-6	-6	CP-3D	CS-3D	SP-3D	LW-3	DD-44 (DD-43*)	SB-408STR	FT-15	DN□A1504...
2525M-1504	●	●	25	25		25	150	32								DN□G1504...			
2020K-1506	●	●	20	20	39	20	125	25	0.8	-6	-6					DD-43 (DD-44*)	DN□A1506...		
2525M-1506	●	●	25	25		25	150	32								DN□G1506...			

Shims indicated * are not included with the toolholder. To change insert thickness, please purchase it separately.

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on R34 and R35.

Wrench (FT-15) is sold separately.

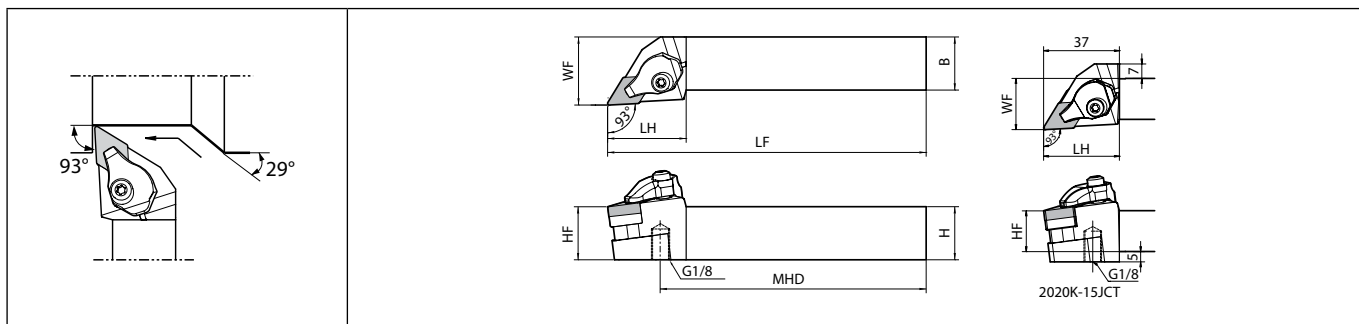
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



External turning

DDJN-JCT (External turning / External copying, Coolant-through holders)



Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts		
															Clamp	Pipe connection	Screw (for clamp)	Screw	Shim	Spring	Wrench			
	R	L	H	B	LH	MHD	HF	LF	WF															
DDJN%L 2020K-15JCT	●	●	20	20	37	101	20	125	25	0.8	Yes	-6	-7	CP-4D-R(-)JCT	FP-12	CS-3D-TR	SB-4085TR	DD-44 (DD-43*)	SP-3D	FT-15	DN□A1504...	DN□G1504...	DN□M1504...	DN□X1504...
2525M-15JCT	●	●	25	25		126	25	150	32					CP-4D-L(-)JCT										

Shims indicated * are not included with the toolholder. To change insert thickness, please purchase it separately.

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on R34 and R35.

Please see page D12 for piping parts of coolant-through holders.

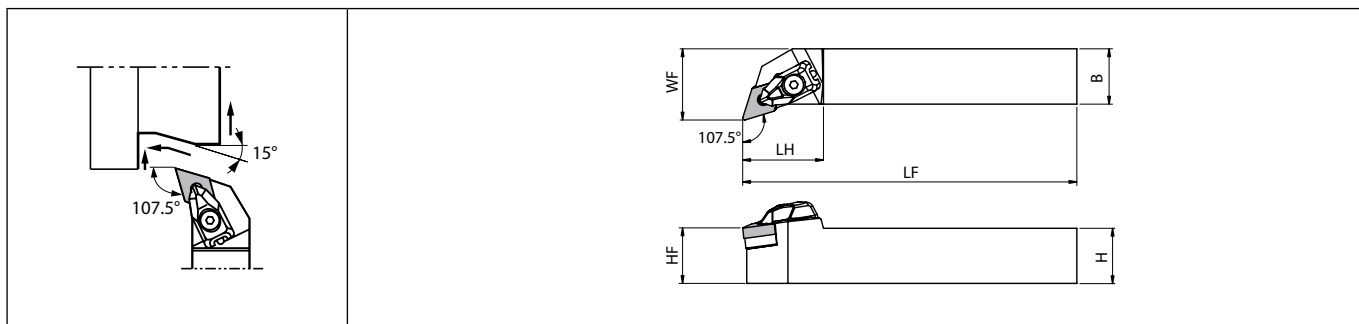
Clamp : CP-4D-R-JCT for Right-hand Toolholder, CP-4D-L-JCT for Left-hand Toolholder.

Only the O-ring (SS-035) included with the pipe connection can be ordered.

Recommended tightening torque : 3.9N·m








● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DDHN (External turning / External facing / External copying)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts		
													Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)		Wrench* (for shim)	
	R	L	H	B	LH	HF	LF	WF													
DDHN%L 2020K-1504 2525M-1504	●	●	20	20	37	20	125	25	0.8	-6	-6	CP-3D	CS-3D	SP-3D	LW-3	DD-44 (DD-43*)	SB-408STR	FT-15	DN□A1504...	DN□G1504...	DN□M1504...
	●	●	25	25		25	150	32								DD-43 (DD-44*)			DN□A1506...	DN□G1506...	DN□M1506...
2020K-1506 2525M-1506	●	●	20	20	37	20	125	25	0.8	-6	-6	CP-3D	CS-3D	SP-3D	LW-3	DD-44 (DD-43*)	SB-408STR	FT-15	DN□A1504...	DN□G1504...	DN□M1504...
	●	●	25	25		25	150	32								DD-43 (DD-44*)			DN□A1506...	DN□G1506...	DN□M1506...

Shims indicated * are not included with the toolholder. To change insert thickness, please purchase it separately.

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

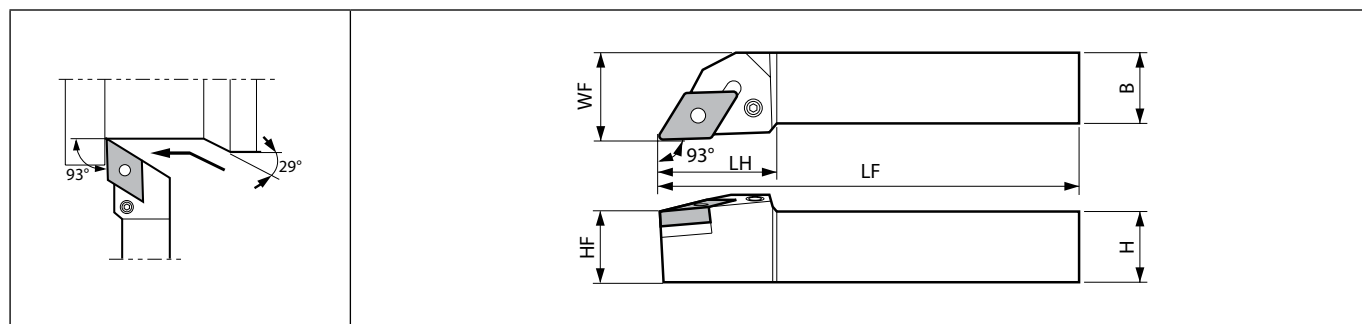
Wrench (FT-15) is sold separately.

The insert with WF chipbreaker is not applicable for DDHN type toolholder.

Recommended tightening torque : 3.9N·m



PDJN (External turning / External copying)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF											
PDJN% 1616H-11	●	●	16	16		16	100	20	0.4	-6	-7	LL-1DN	LS-1N	PC-1	LSP-1	LD-32N	-	FH-2.5	DN□G1104...
2020K-11	●	●	20	20	28	20	125	25											
2525M-11	●	●	25	25		25	150	32											
PDJN% 2020K-15	●	●	20	20		20	125	25	0.8	-6	-7	LL-3N	LS-2N	PC-2	LSP-2	LD-42 (LD-42-20*)	LW-3	-	DN□A1504...
2525M-15	●	●	25		36	25	150	32								DN□G1504...			
3225P-15	●	●	32			32	170	32				DN□M1504...							
2525M-15U	●	●	25	25	34	25	150	32				LD-42 (LD-42-20*) (LD-43**) (LD-43-20**)	DN□A1506...						
3232P-15U	●	●	32	32	36	32	170	40				LL-4N	LS-3	DN□G1506...					
																			DN□M1506...
																			DNMX1506...

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.

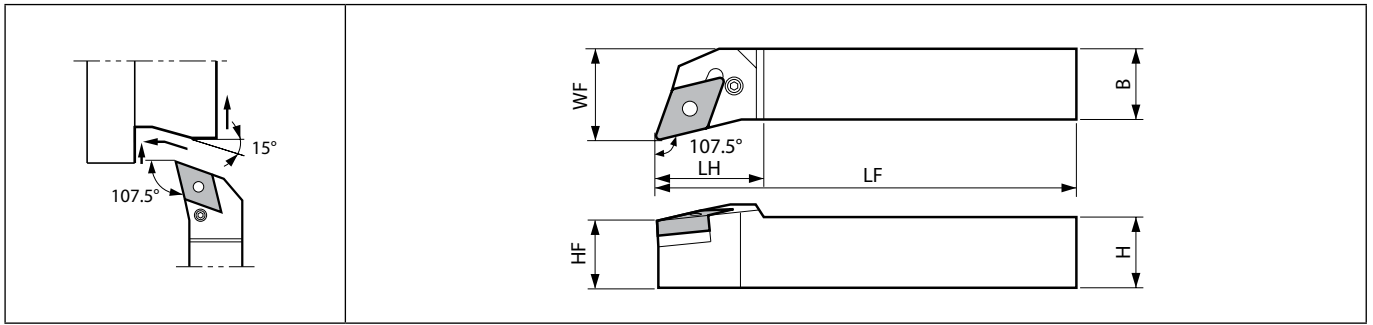
Shim : PDJN%-15U ... LD-42 is attached to PDJN%-15U. When using DN□1504 type insert, please purchase LD-43 (or LD-43-20 when using inserts whose corner-R(RE) is greater than 1.6mm) separately.

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on R34 and R35.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability









PDHN (External turning / External facing / External copying)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF											
PDHN%L 2020K-15	●	●	20	20	35	20	125	25	0.8	-6	-6	LL-4N	LS-3	PC-2	LSP-2	LD-43 (LD-43-20*) (LD-42**)*) (LD-42-20**)	LW-3	DN□A1504... DN□G1504... DN□M1504...	
2525M-15	●	●	25	25	34	25	150	32											

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
 Shim : PDHN ...LD-43 is attached to PDHN. When using DN□1506 type Insert, please purchase LD-42 (or LD-42-20 when using inserts whose corner-R(RE) is greater than 1.6mm) separately.
 The insert with WF chipbreaker is not applicable for PDHN type toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability




External turning

Applicable inserts (DDJN / DDJN-JCT / DDHN / PDJN / PDHN)

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium
Insert								
Chipbreaker type	WF*	PP	GP	PQ	HQ	CQ	CJ	TN-V
Page	B24	B24	B24	B24	B25	B25	B25	B25
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PMG	GS	PG	PS	PT	GT	STD	PH
Page	B25	B25	B26	B26	B26	B26	B27	B27
Applications	Roughing	Finishing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium
Insert								
Chipbreaker type	PX	³/₄-S	R/L	XF	XP	XQ	XS	SK
Page	B27	B31	B31	B27	B27	B27	B27	B28
Applications	Large ap	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron
Insert								
Chipbreaker type	R-LD	FP-TK	TK	MQ	M5	MU	KQ	KG
Page	B28	B28	B28	B28	B29	B29	B30	B30
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Non-ferrous metals	Non-ferrous metals
Insert								
Chipbreaker type	KH	C	ZS	GC	No CB	Ceramic	³/₄-A3	AH
Page	B30	B30	B30	B30	B31	B114	B31	B31
Applications	Non-ferrous metals	Heat-resistant alloys	Heat-resistant alloys	Hard materials / Cast iron	Hard materials	Hard materials	Hard materials	
Insert								
Chipbreaker type	PCD	SQ	SG	CBN	HH	HL	HD	
Page	C35	B29	B29	C10	C11	C11	C11	

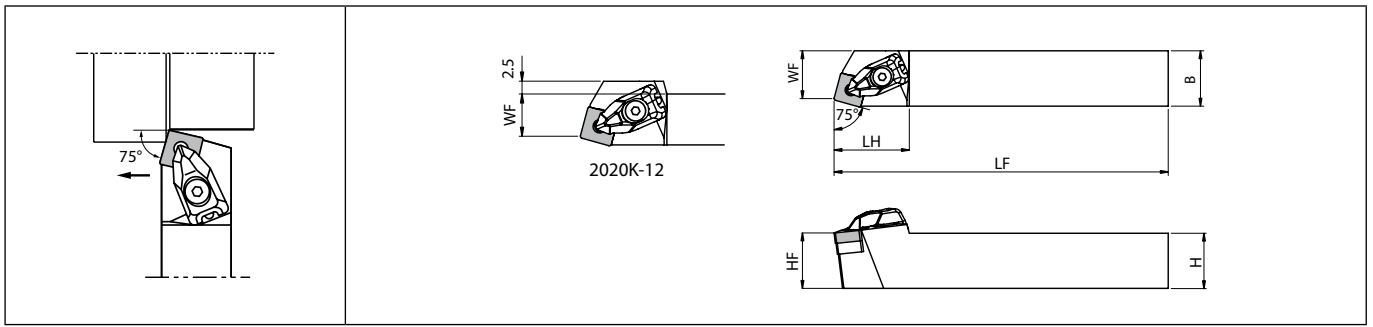
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on R34 and R35.
The insert with WF chipbreaker is not applicable for DDHN type and PDHN type toolholder.

Recommended cutting conditions  D69~D70

D

External turning

DSBN (External turning)



Right-hand shown

Toolholder dimensions

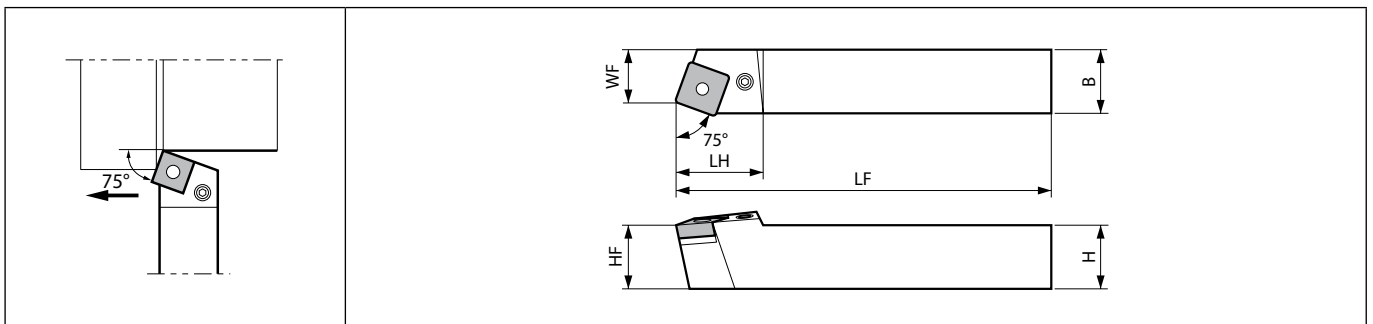
Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts			
													Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)		Wrench* (for shim)		
	R	L	H	B	LH	HF	LF	WF														
DSBN%L 2020K-12	●	●	20	20	34	20	125	17	0.8	-4	-7		CP-3D		CS-3D		SP-3D	LW-3	DS-44	SB-4085TR	FT-15	SN□A1204... SN□G1204... SN□M1204...
2525M-12	●	●	25	25		25	150	22														

Wrench (FT-15) is sold separately.

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

Recommended tightening torque : 3.9N·m

PSBN (External turning)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts	
													Lever	Lock screw	Punch	Shim pin	Shim	Wrench		
	R	L	H	B	LH	HF	LF	WF												
PSBN%L 2020K-12	●	●	20	20	27	20	125	17	0.8	-4	-7		LL-2N		LS-2N	PC-2	LSP-2	LS-42	LW-3	SN□A1204... SN□G1204... SN□M1204...
2525M-12	●	●	25	25	24	25	150	22												

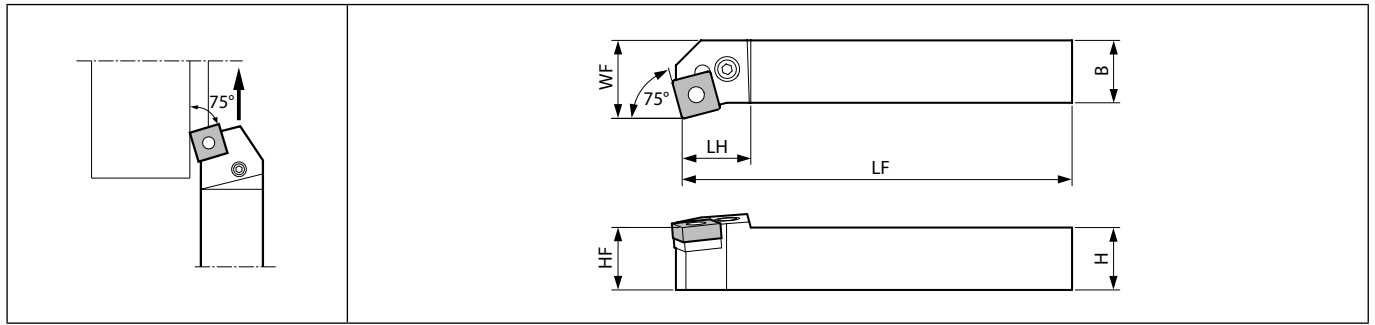
When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



External turning

PSKN (External facing)



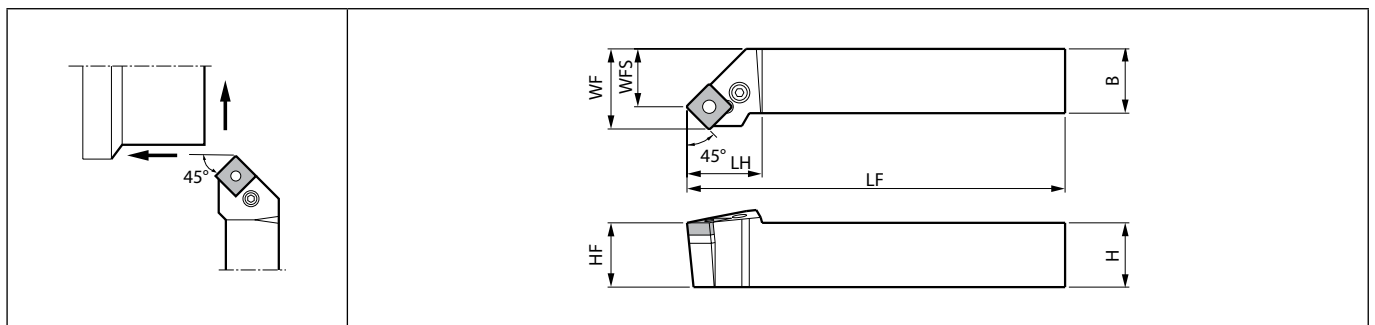
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
														Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF												
PSKN%L 2020K-12	●	●	20	20	22.5	20	125	25	0.8	-4	-7	LL-2N	LS-2N	PC-2	LSP-2	LS-42	LW-3	SN□A1204... SN□G1204... SN□M1204...		
2525M-12	●	●	25	25		25	150	32				LL-2N	LS-2N	PC-2	LSP-2	LS-42	LW-3			

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
 PSKN%L : Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

PSSN (External turning / External facing / External chamfering)



Right-hand shown

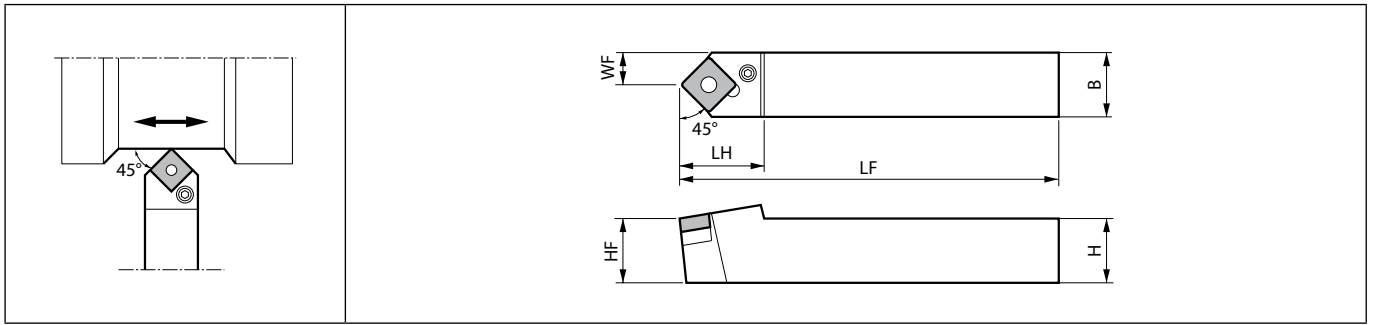
Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts
														Lever	Lock screw	Punch	Shim pin	Shim	Wrench	Wrench	
	R	L	H	B	LH	HF	LF	WF	WFS												
PSSN%L 1616H-09	●	●	16	16	22	16	100	20	13.6	0.8	-8	0	LL-1N	LS-1N	PC-1	LSP-1	LS-32	-	FH-2.5	SN□G0903...	
PSSN%L 2020K-12 2525M-12	●	●	20	20	29	20	125	25	16.4	0.8	-8	0	LL-2N	LS-2N	PC-2	LSP-2	LS-42	LW-3	-	SN□A1204... SN□G1204... SN□M1204...	
	●	●	25	25		25	150	32	23.4				LL-2N	LS-2N	PC-2	LSP-2	LS-42	LW-3	-		

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
 PSSN%L: When using handed inserts, For External Turning, Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.
 For Facing, Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PSDN (External turning / External chamfering)



Toolholder dimensions

Description	Availability		Dimension (mm)					Standard corner-R(RE)		Back rake angle (°)		Spare parts							Applicable inserts
	N	H	B	LH	HF	LF	WF			Lever	Lock screw	Punch	Shim pin	Shim	Wrench	Wrench			
PSDNN 1616H-09	●	16	16	21	16	100	8	0.8	-8.5	LL-1N	LS-1N	PC-1	LSP-1	LS-32	-	FH-2.5	SN□G0903...		
PSDNN 2020K-12	●	20	20	30	20	125	10	0.8	-8.5	LL-2N	LS-2N	PC-2	LSP-2	LS-42	LW-3	-	SN□A1204... SN□G1204... SN□M1204...		
2525M-12	●	25	25		25	150	12.5												

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

Applicable inserts (DSBN / PSBN / PSKN / PSSN / PSDN)

Applications	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PQ	HQ	PMG	PG	PS	PT	STD	PH
Page	B33	B33	B33	B33	B33	B33	B33	B34
Applications	Roughing	Finishing - Medium	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	PX	%L-B	%L-C	%L-25R	XP	XQ	XS	MQ
Page	B34	B36	B36	B36	B34	B34	B34	B35
Applications	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials
Insert								
Chipbreaker type	MS	KG	KH	C	ZS	GC	No CB	Ceramic
Page	B35	B35	B35	B35	B36	B36	B36	B117
Applications	Heat-resistant alloys	Hard materials / Cast iron						
Insert								
Chipbreaker type	SG	CBN						
Page	B35	C12						

Recommended cutting conditions Ⓢ D69~D70

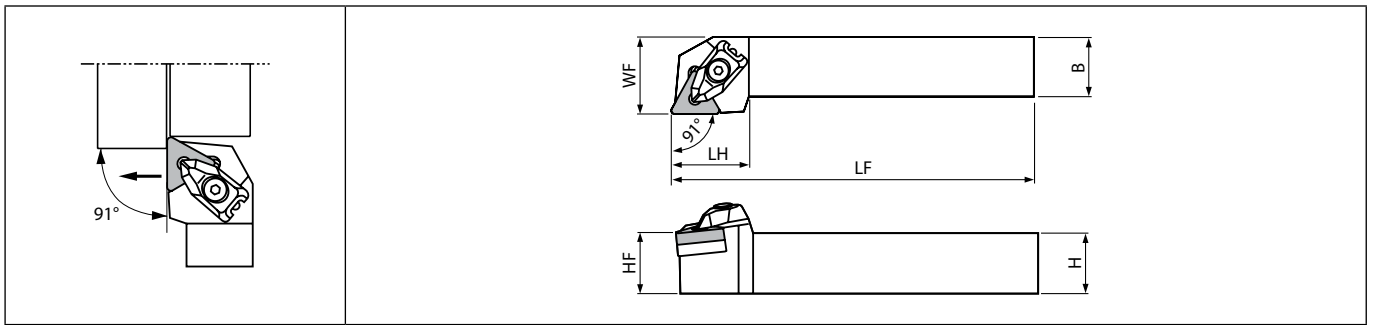
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

D



External turning















DTGN (External turning)



Right-hand shown

External turning

Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
														Clamp	Screw (for clamp)	Screw	Shim	Spring	Wrench	
	R	L	H	B	LH	HF	LF	WF												
DTGN [®] L 2020K-16	●	●	20	20	25	20	125	25	0.8	-6	-6								TN□A1604... TN□G1604... TN□M1604... TN□X1604...	
2525M-16	●	●	25	25		25	150	32												CP-2D	CS-2D	SB-3080TR	DT-32	SP-2D	LW-2.5	FT-10

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

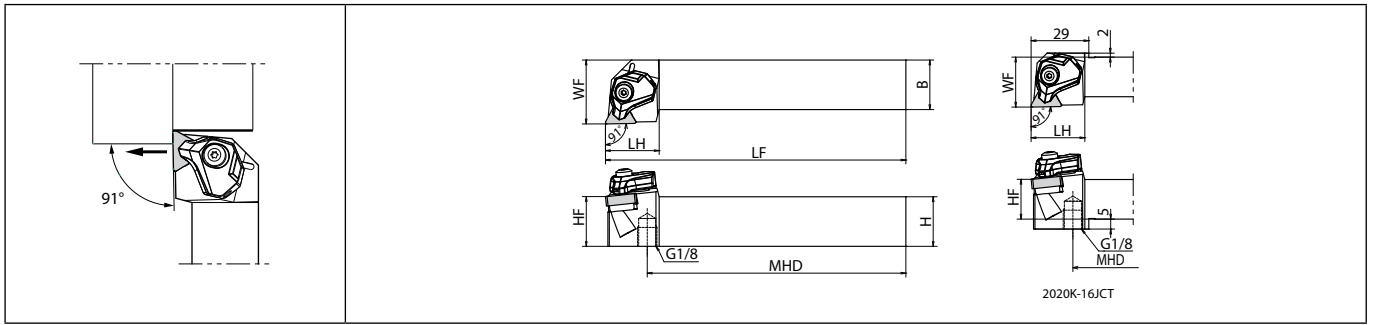
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on R34 and R35.

Wrench (FT-10) is sold separately.

Recommended tightening torque : 1.7N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DTGN-JCT (External turning, Coolant-through holders)



Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Applicable inserts
	R	L	H	B	LH	MHD	HF	LF	WF					
DTGN% 2020K-16JCT	●	●	20	20	27	104	20	125	25	0.8	Yes	-6	-6	TN□A1604... TN□G1604... TN□M1604... TNMX1604...
2525M-16JCT	●	●	25	25		129	25	150	32					

Description	Spare parts							
	Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	Pipe connection
DTGN% 2020K-16JCT								
2525M-16JCT	CP-2D-%-JCT	CS-3D-TR	SP-3D	FT-15	DT-32	SB-3080TR	FT-10	FP-12

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.

Wrench (FT-10) is sold separately.

Please see page **D12** for piping parts of coolant-through holders.

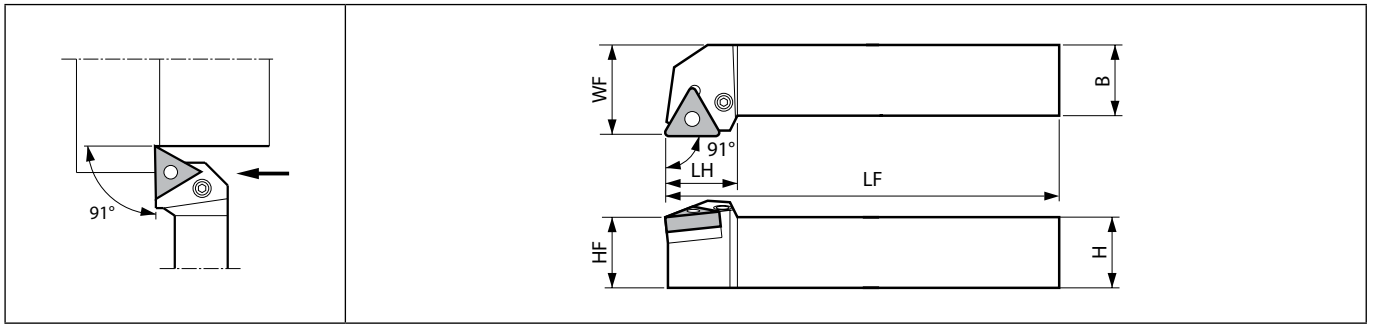
Only the O-ring (SS-035) included with the pipe connection can be ordered.

Recommended tightening torque : 3.9N·m



External turning

PTGN (External turning)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts	
													Lever	Lock screw	Punch	Shim pin	Shim pin	Shim	Wrench		Wrench
	R	L	H	B	LH	HF	LF	WF													
PTGN% 1212F-11	●	●	12	12	18	12	80	16	0.8	-6	-6	LL-03N	LS-03N	-	-	P-03	-	FH-2	TNGG/A1103...		
1616H-11	●		16	16		16	100	20				LL-03TN	LS-03SN	-	-	P-03S	-	-	FH-2.5	TNGG1104... TNMG1104...	
2020K-11	●	●	20	20	22	20	125	25													
2525M-11	●	●	25	25		25	150	32													
PTGN% 1616H-16	●	●	16	16		16	100	20	0.8	-6	-6	LL-1N	LS-1N	PC-1	LSP-1	-	LT-32N (LT-32N-20*)	-	FH-2.5	TN□A1604... TN□G1604... TN□M1604... TNMX1604...	
2020H-16	●		20	20	24	20	125	25													
2020K-16	●	●																			
2525M-16	●	●	25	25		25	150	32													
PTGN% 2525M-22	●	●	25	25	29	25	150	32	0.8	-6	-6	LL-2N	LS-2N	PC-2	LSP-2	-	LT-42N (LT-42N-20*)	LW-3	-	TN□G2204... TN□M2204...	

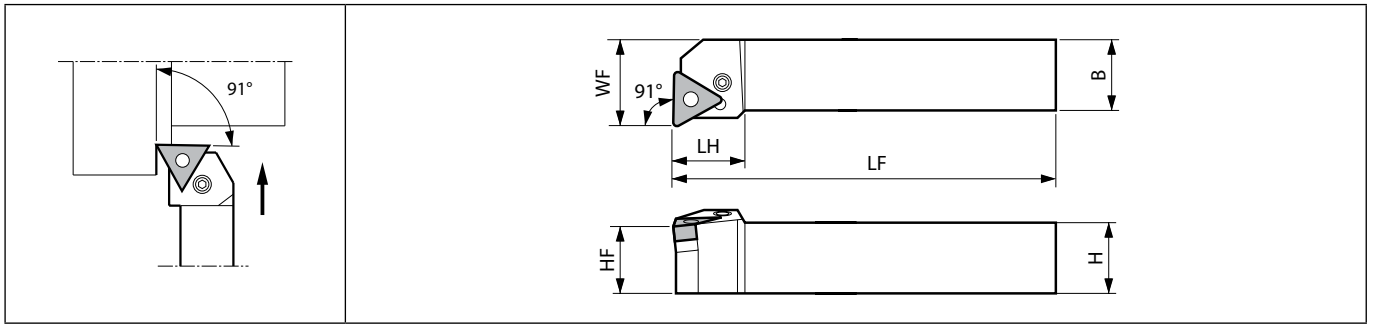
When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on R34 and R35.

PTGN% 1212F-11 : TNGA1103 and TNGG1103 type Inserts are applicable.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PTFN (External facing)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts							Applicable inserts						
													Lever	Lock screw	Punch	Shim pin	Shim pin	Shim	Wrench		Wrench					
	R	L	H	B	LH	HF	LF	WF																		
PTFN%L 1212F-11 1616H-11 2020K-11 2525M-11	●	●	12	12	15	12	80	16	0.8	-6	-6			-	-	P-03	-	-	FH-2	TN□□1103...						
	●	●	16	16	16	100	20	LL-03N				LS-03N	P-03S			FH-2.5			TN□□1104...							
	●		20	20	22.5	20	125	25				LL-03TN	LS-03SN													
	●	●	25	25	25	150	32																			
PTFN%L 2020K-16 2525M-16	●	●	20	20	22	20	125	25	0.8	-6	-6			PC-1	LSP-1	-	LT-32N (LT-32N-20*)	-	FH-2.5	TN□A1604... TN□G1604... TN□M1604... TNMX1604...						
	●	●	25	25	23	25	150	32				LL-1N	LS-1N													
PTFN%L 2525M-22	●	●	25	25	28	25	150	32	0.8	-6	-6			PC-2	LSP-2	-	LT-42N (LT-42N-20*)	LW-3	-	TN□G2204... TN□M2204...						

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on R34 and R35.

PTFN%L 1212F-11 : TNGA1103 and TNGG1103 type inserts are applicable.

PTFN%L : Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.




External turning

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (DTGN / DTGN-JCT / PTGN / PTFN)

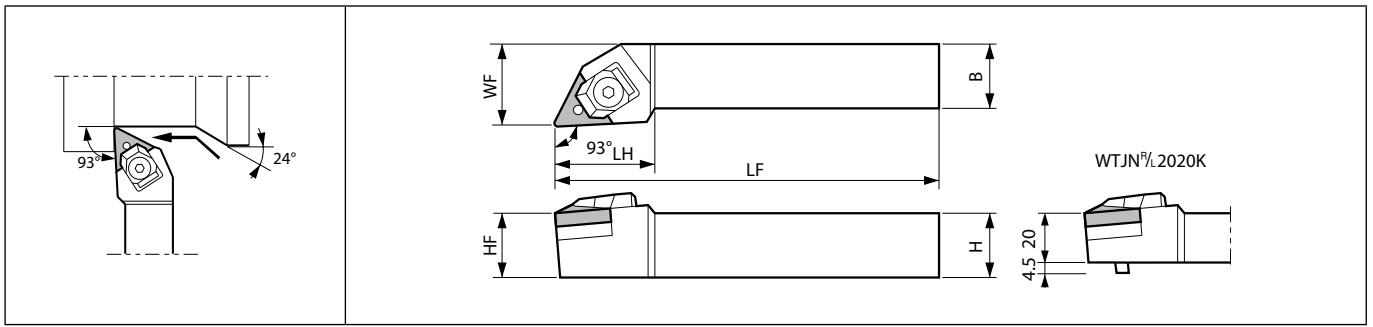
Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	WF	PP	GP	PQ	HQ	CQ	PMG	GS
Page	B38	B38	B38	B38	B38	B38	B39	B39
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing	Roughing	Finishing
Insert								
Chipbreaker type	PG	PS	PT	GT	STD	PH	PX	P/L-SSF
Page	B39	B39	B39	B39	B40	B40	B40	B44
Applications	Finishing	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel
Insert								
Chipbreaker type	P/L-S	P/L-B	P/L-C	R/L	P/L-25R	XF	XP	XQ
Page	B44	B44	B45	B45	B45	B40	B41	B41
Applications	Low carbon steel	Finishing - Medium	Large ap	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	XS	SK	R-LD	FP-TK	TK	MQ	MS	MU
Page	B41	B41	B41	B41	B41	B42	B42	B42
Applications	Stainless steel	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	P/L-ST	KQ	KG	KH	C	ZS	GC	No CB
Page	B42	B42	B42	B42	B43	B43	B43	B43
Applications	Cast iron / Hard materials	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Heat-resistant alloys	Hard materials / Cast iron		
Insert								
Chipbreaker type	Ceramic	P/L-A3	AH	PCD	SG	CBN		
Page	B118	B43	B43	C36	B42	C13		

Recommended cutting conditions  D69~D70

D

External turning

WTJN (External turning / External copying)



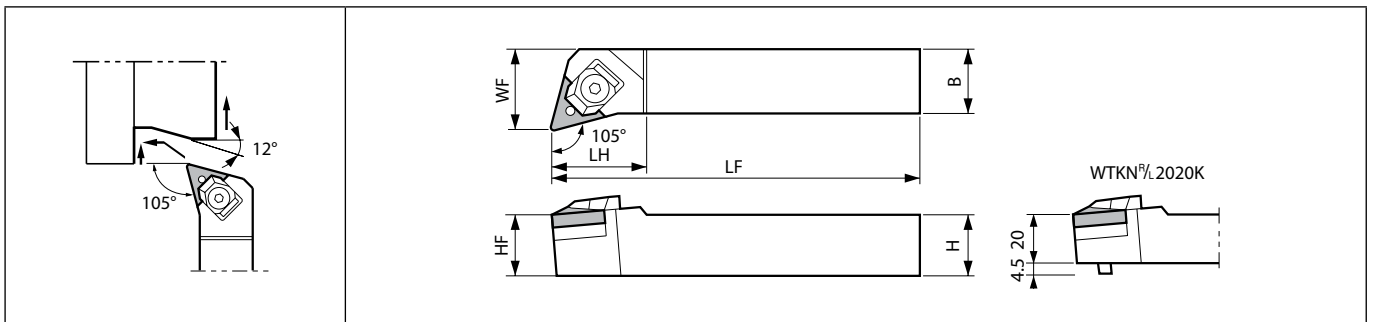
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Clamp set	Nut	Shim pin	Shim	Spacer	Wrench	
	R	L	H	B	LH	HF	LF	WF											
WTJN [®] /L 2020K-16N	●	●	20	20	32	20	125	25	0.8	-6	-6							TN□A1604... TN□G1604... TN□M1604...	
2525M-16N	●	●	25	25		25	150	32											

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other. In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.

WTKN (External turning / External facing / External copying)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Clamp set	Nut	Shim pin	Shim	Spacer	Wrench	
	R	L	H	B	LH	HF	LF	WF											
WTKN [®] /L 2020K-16N	●	●	20	20	32	20	125	25	0.8	-6	-6							TN□A1604... TN□G1604... TN□M1604...	
2525M-16N	●	●	25	25		25	150	32											

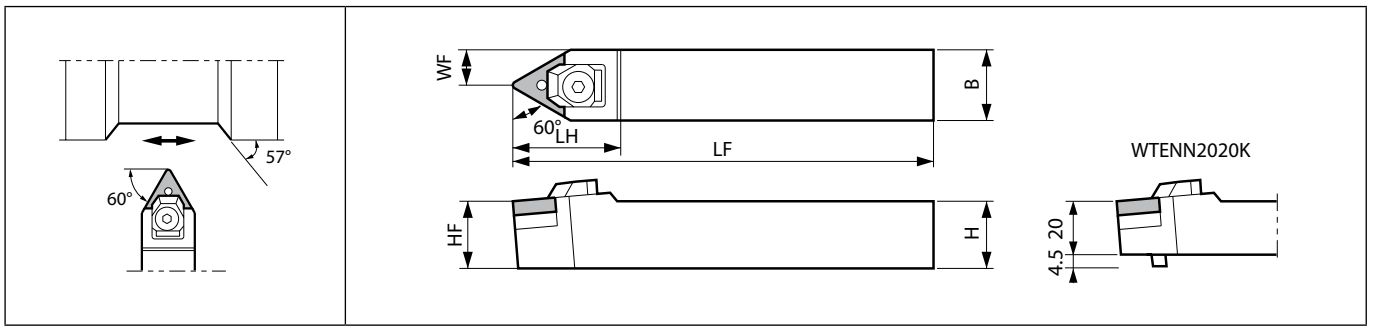
When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other. In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



External turning

WTEN (External turning / External chamfering)



External turning

Toolholder dimensions

Description	Availability	Dimension (mm)							Standard corner-R(RE)	Back rake angle (°)	Spare parts						Applicable inserts
		N	H	B	LH	HF	LF	WF			Clamp set	Nut	Shim pin	Shim	Spacer	Wrench	
WTENN 2020K-16N	●	20	20		20	125	10	0.8	-8.5							TN□A1604... TN□G1604... TN□M1604...	
2525M-16N	●	25	25	32	25	150	12.5			WCS-1N	WN-1	WP-1S	WTN-33 (WTN-33-20*)	WSP-1	LW-3		

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other. In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (WTJN / WTKN / WTEN)

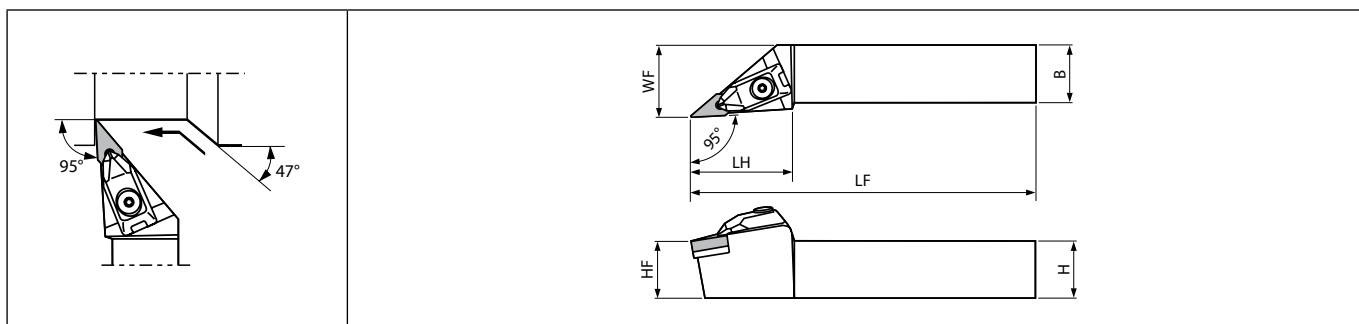
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	PP	GP	PQ	HQ	CQ	PMG	GS	PG
Page	B38	B38	B38	B38	B38	B39	B39	B39
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing	Roughing	Finishing	Finishing
Insert								
Chipbreaker type	PS	PT	GT	STD	PH	PX	1/2-SSF	1/2-S
Page	B39	B39	B39	B40	B40	B40	B44	B44
Applications	Finishing - Medium	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium
Insert								
Chipbreaker type	1/2-B	1/2-C	1/2-25R	XF	XP	XQ	XS	SK
Page	B44	B45	B45	B40	B41	B41	B41	B41
Applications	Large ap	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel	Cast iron
Insert								
Chipbreaker type	R-LD	FP-TK	TK	MQ	M5	MU	1/2-ST	KQ
Page	B41	B41	B41	B42	B42	B42	B42	B42
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Non-ferrous metals	Non-ferrous metals
Insert								
Chipbreaker type	KG	KH	C	ZS	GC	No CB	1/2-A3	AH
Page	B42	B42	B43	B43	B43	B43	B43	B43
Applications	Non-ferrous metals	Heat-resistant alloys	Hard materials / Cast iron					
Insert								
Chipbreaker type	PCD	SG	CBN					
Page	C36	B42	C13					



External turning

Recommended cutting conditions ➔ D69~D70















DVLN (External turning / External copying)



Right-hand shown

External turning

Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
														Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	
	R	L	H	B	LH	HF	LF	WF												
DVLN%L 2020K-16	●	●	20	20	45	20	125	25	0.8	-6	-9								VN□A1604... VN□G1604... VN□M1604...	
2525M-16	●	●	25	25		25	150	32				CP-5D	CS-5D	SP-5D	LW-3	DV-33	SB-4085TR	FT-15		

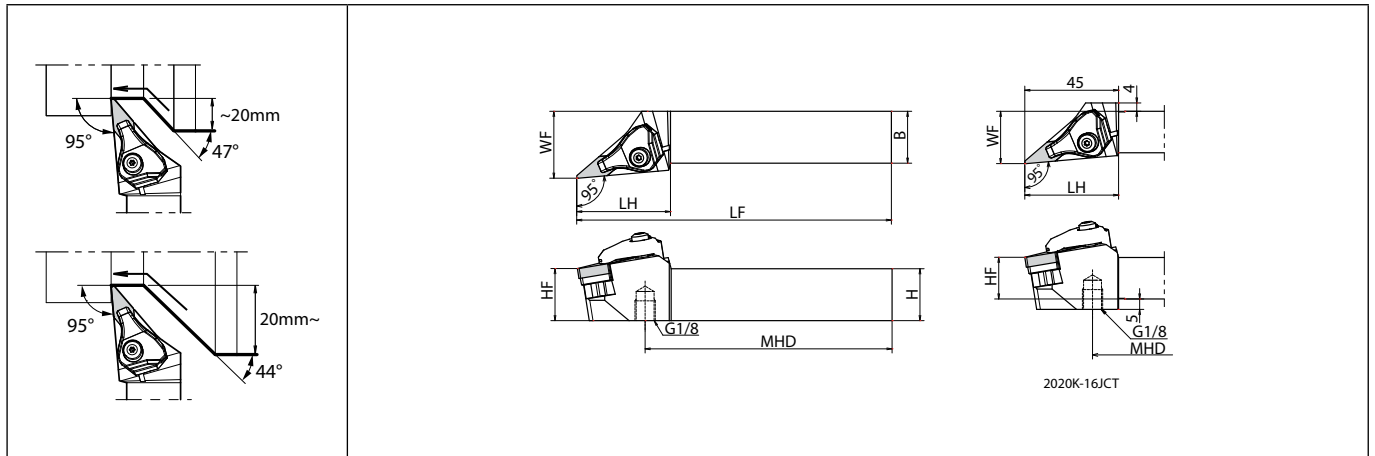
When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

Wrench (FT-15) is sold separately.

Recommended tightening torque : 3.0N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DVLN-JCT (External turning / External copying, Coolant-through holders)










Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

D
External turning

Toolholder dimensions

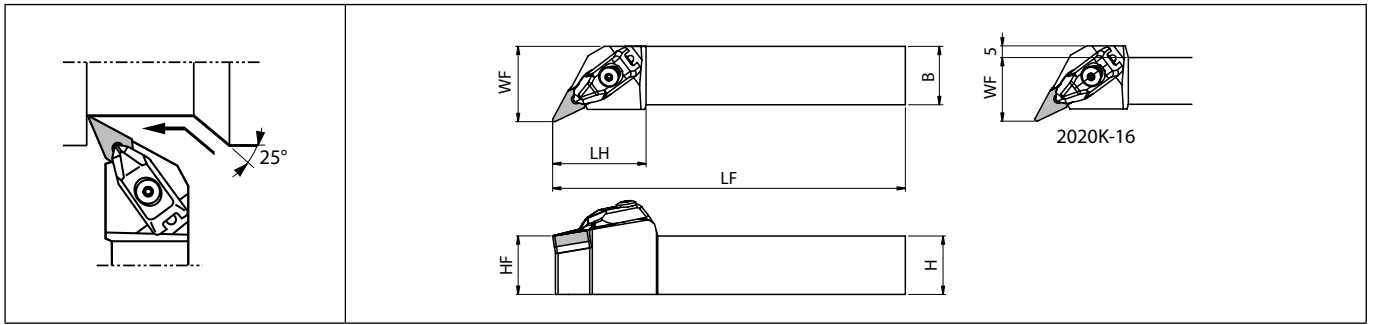
Description	Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Applicable inserts
	R	L	H	B	LH	MHD	HF	LF	WF					
DVLNR 2020K-16JCT	●		20	20	45	92.5	20	125	25	0.8	Yes	-6	-9	VN□A1604... VN□G1604... VN□M1604...
DVLNL 2020K-16JCT		●				88.5								
DVLNR 2525M-16JCT	●		25	25	117.5	25	150	32						
DVLNL 2525M-16JCT		●			113.5									

Description	Spare parts						
	Clamp	Pipe connection	Screw (for clamp)	Screw	Shim	Spring	Wrench
							
DVLN%L 2020K-16JCT 2525M-16JCT	CP-5D-JCT	FP-12	CS-3D-TR	SB-4085TR	DV-33	SP-3D	FT-15

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other. The washer may protrude from the holder. To prevent interference, additional modifications to the washer may be required.
 Only the O-ring (SS-035) included with the pipe connection can be ordered.
 Please see page D12 for piping parts of coolant-through holders.
 Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DVPN (External turning / External facing / External copying / Undercutting)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	
	R	L	H	B	LH	HF	LF	WF											
DVPN ^{R/L} 2020K-16	●	●	20	20	40	20	125	27	0.8	-13	-10								VN□A1604... VN□G1604... VN□M1604...
2525M-16	●	●	25	25		25	150	32											

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

Wrench (FT-15) is sold separately.

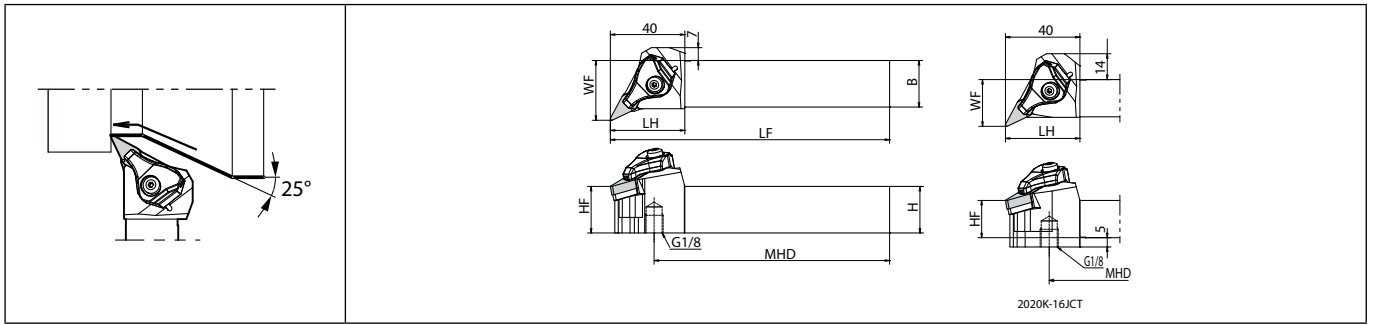
Recommended tightening torque : 3.0N·m

External turning

D

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DVPN-JCT (External turning / External facing / External copying / Undercutting, Coolant-through holders)



Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Applicable inserts
	R	L	H	B	LH	MHD	HF	LF	WF					
DVPNR 2020K-16JCT	●		20	20	40	101.5	20	125	25	0.8	Yes	-13	-10	VN□A1604... VN□G1604... VN□M1604...
DVPL 2020K-16JCT		●				93.5								
DVPNR 2525M-16JCT	●		25	25		126.5	25	150	32					
DVPL 2525M-16JCT		●				118.5								

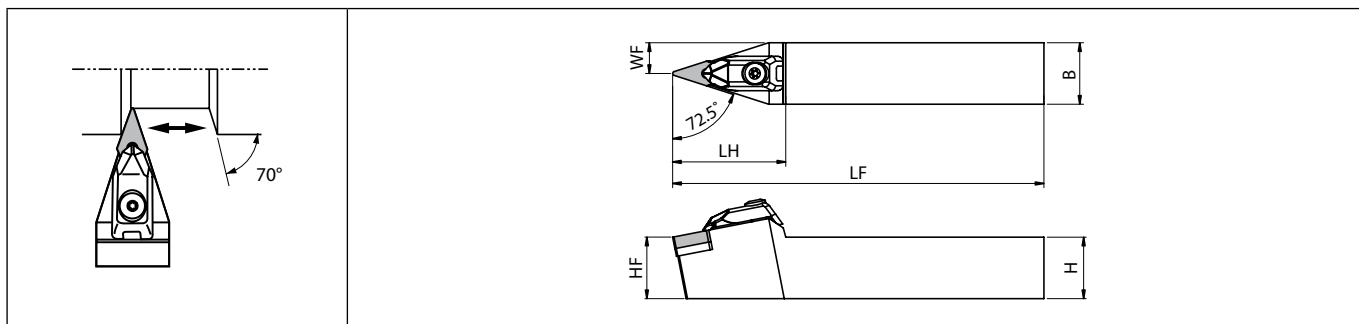
Description	Spare parts						
	Clamp	Pipe connection	Screw (for clamp)	Screw	Shim	Spring	Wrench
	DVPN ^{R/L} 2020K-16JCT 2525M-16JCT						
	CP-5D-JCT	FP-12	CS-3D-TR	SB-4085TR	DV-33	SP-3D	FT-15

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other. The washer may protrude from the holder. To prevent interference, additional modifications to the washer may be required. Only the O-ring (SS-035) included with the pipe connection can be ordered. Please see page D12 for piping parts of coolant-through holders. Recommended tightening torque : 3.9N·m










External turning

DVNN (External turning / External copying)



External turning

Toolholder dimensions

Description	Availability		Dimension (mm)					Standard corner-R(RE)	Back rake angle (°)	Spare parts							Applicable inserts
	N	H	B	LH	HF	LF	WF			Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	
																	
DVNN 2020K-16	●	20	20	46	20	125	10	0.8	-11	CP-5D	CS-5D	SP-5D	LW-3	DV-33	SB-4085TR	FT-15	VN□A1604... VN□G1604... VN□M1604...
2525M-16	●	25	25		25	150	12.5										

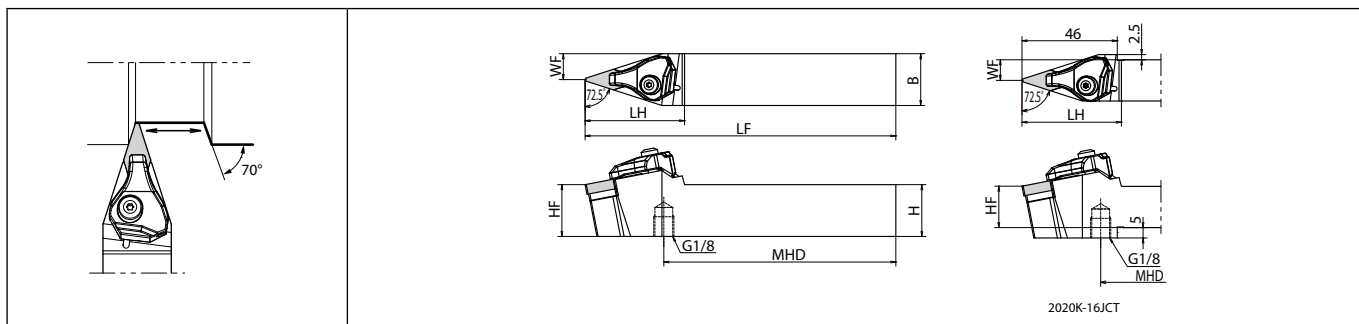
When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

Wrench (FT-15) is sold separately.

Recommended tightening torque : 3.0N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DVNN-JCT (External turning / External copying, Coolant-through holders)



with coolant supply | Applicable pressure : ~30MPa

Toolholder dimensions

Description	Availability	Dimension (mm)							Standard corner-R(RE)	Coolant hole	Back rake angle (°)	Applicable inserts	
		N	H	B	LH	MHD	HF	LF					WF
DVNN 2020K-16JCT	●	20	20		48	87	20	125	10	0.8	Yes	-11	VN□A1604... VN□G1604...
2525M-16JCT	●	25	25		48	112	25	150	12.5				VN□M1604...

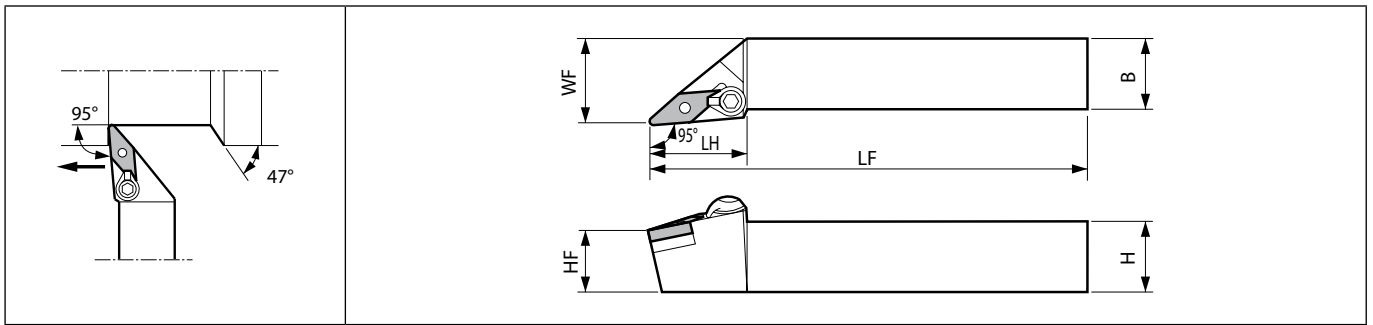
Description	Spare parts						
	Clamp	Pipe connection	Screw (for clamp)	Screw	Shim	Spring	Wrench
DVNN 2020K-16JCT							
2525M-16JCT	CP-5D-JCT	FP-12	CS-3D-TR	SB-4085TR	DV-33	SP-3D	FT-15

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other. The washer may protrude from the holder. To prevent interference, additional modifications to the washer may be required.
 Only the O-ring (SS-035) included with the pipe connection can be ordered.
 Please see page **D12** for piping parts of coolant-through holders.
 Recommended tightening torque : 3.9N·m



External turning

MVLN (External turning / External copying)



Right-hand shown

External turning

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
													Clamp set	Wrench (for clamp set)	Lock pin	Shim	Wrench (for lock pin)	
	R	L	H	B	LH	HF	LF	WF										
MVLN ^{90°} 2020K-16	●	●	20	20	38	20	125	25	0.8	-6	-9						VN□A1604... VN□G1604... VN□M1604...	
2525M-16	●	●	25	25		25	150	32										

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

Clamp set : CPS-SR for Right-hand Toolholder, CPS-SL for Left-hand Toolholder.

Clamp set : CPS-SR has Right-hand thread.

When clamping the insert, turn the screw in the arrow direction (clockwise).

When removing the insert, turn the screw away from the arrow (counterclockwise).

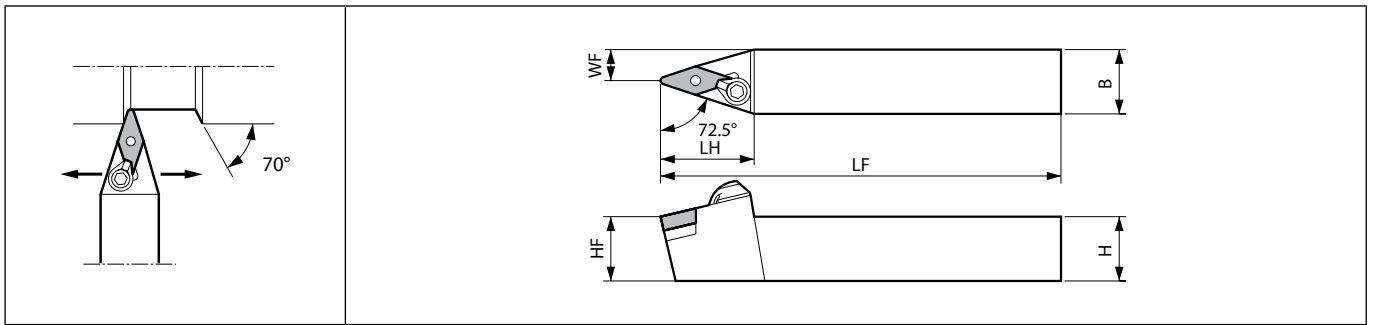
Clamp set : CPS-SL has Left-hand thread.

When clamping the insert, turn the screw in the arrow direction (counterclockwise).

When removing the insert, turn the screw away from the arrow (clockwise).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MVVN (External turning / External copying)



Toolholder dimensions

Description	Availability	Dimension (mm)						Standard corner-R(RE)	Back rake angle (°)	Spare parts					Applicable inserts	
		N	H	B	LH	HF	LF			WF	Clamp set	Wrench (for clamp set)	Lock pin	Shim		Wrench (for lock pin)
		MVVNN 2020K-16	●	20	20	39	20			125	10	0.8	-11			
2525M-16	●	25	25	25	150		12.5	CPS-5R	FH-2.5	TS-3S	MVN-32			FH-2		

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

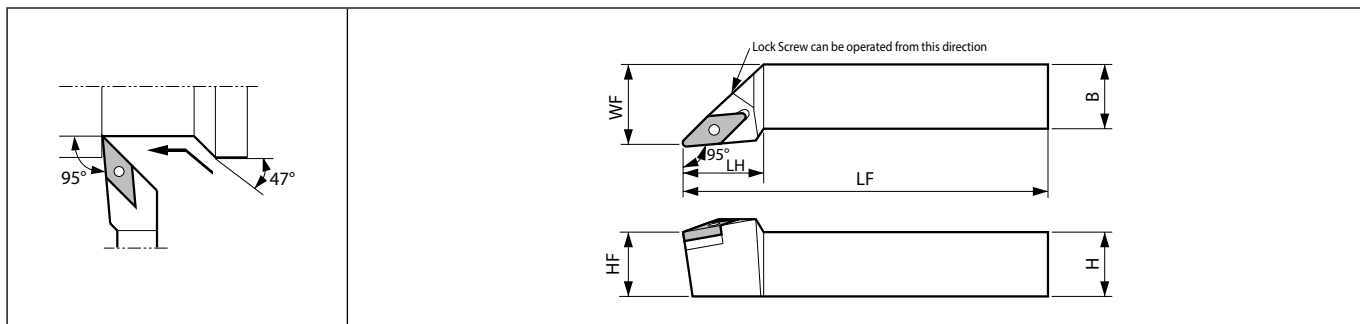
Clamp set : CPS-5R has Right-hand thread.

When clamping the insert, turn the screw in the arrow direction (clockwise).

When removing the insert, turn the screw away from the arrow (counterclockwise).



PVLN (External turning / External copying)



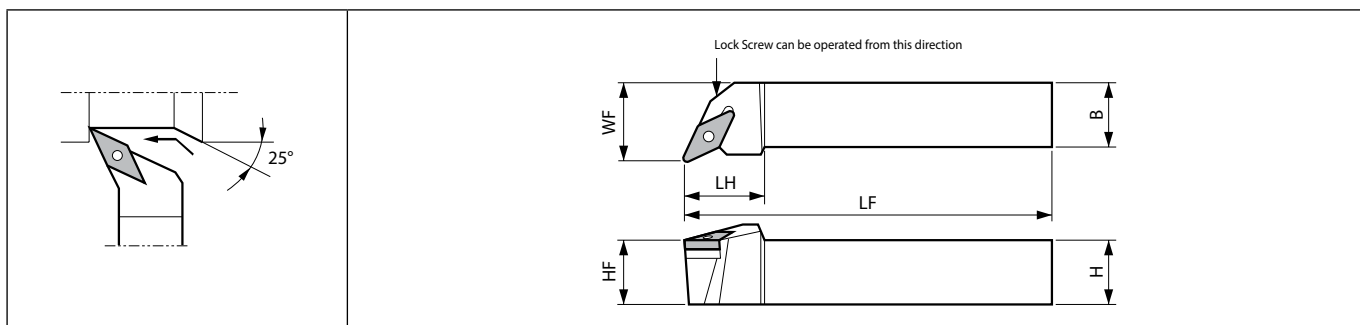
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
	R	L	H	B	LH	HF	LF	WF	Lock pin				Lock screw	Shim	Wrench		
PVLN%L 2525M-16Q	●	●	25	25	37	25	150	32	0.8	-6	-9	LP-6S	LS-15	KVN-32	LW-3	VN□A1604... VN□G1604... VN□M1604...	

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

PVPN (External turning / External facing / External copying / Undercutting)



Right-hand shown

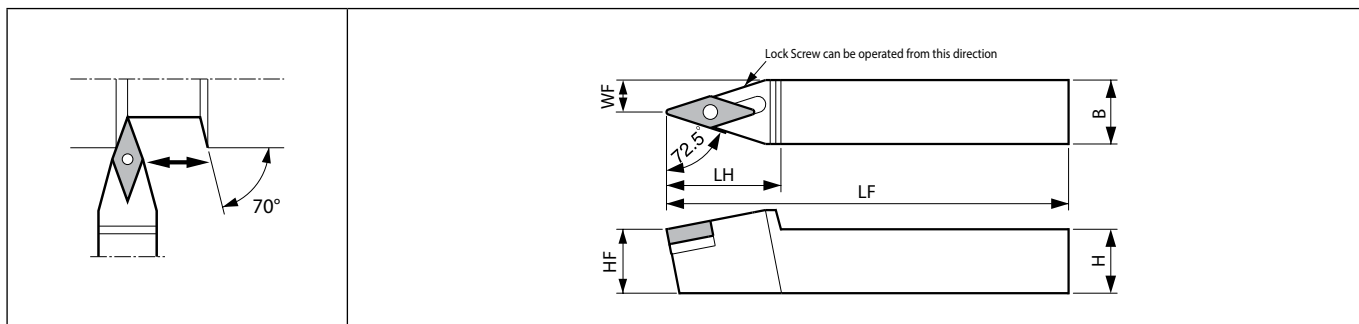
Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
	R	L	H	B	LH	HF	LF	WF	Lock pin				Lock screw	Shim	Wrench		
PVPN%L 2020K-16Q	●	●	20	20	30	20	125	25	0.8	-13	-10	LP-2S	LS-11	KVN-32	LW-3	VN□A1604... VN□G1604... VN□M1604...	
2525M-16Q	●	●	25	25		25	150	32				LP-6S					

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PVVN (External turning / External copying)



Toolholder dimensions

Description	Availability		Dimension (mm)					Standard corner-R(RE)	Back rake angle (°)	Spare parts				Applicable inserts
	N	H	B	LH	HF	LF	WF			Lock pin	Lock screw	Shim	Wrench	
	PVVNN 2020K-16Q	●	20	20	35	20	125			10	0.8	-11		
2525M-16Q	●	25	25	40	25	150	12.5							

When using inserts whose corner-R(RE) is greater than 1.2 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.

Applicable inserts

Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium	Roughing
Insert								
Chipbreaker type	PP	GP	5/8-VC	VF	PQ	HQ	TN-V	STD
Page	B46	B46	B46	B46	B46	B46	B46	B46
Applications	Finishing - Medium	Finishing	Medium	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron
Insert								
Chipbreaker type	SK	5/8-S	R/L	MQ	MS	MU	KG	KH
Page	B47	B48	B48	B47	B47	B47	B47	B47
Applications	Cast iron	Cast iron / Hard materials	Non-ferrous metals	Heat-resistant alloys	Hard materials / Cast iron			
Insert								
Chipbreaker type	No CB	Ceramic	PCD	SG	CBN			
Page	B48	B119	C37	B47	C14			

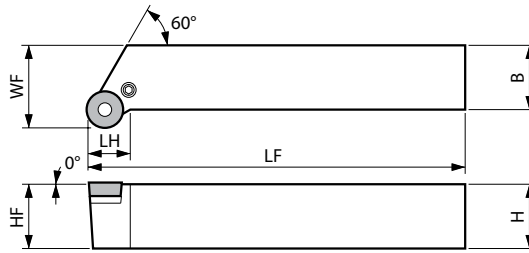
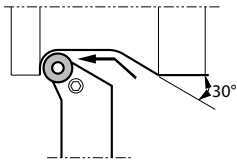
Recommended cutting conditions D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



External turning

PRGC (External turning / External facing / External copying)

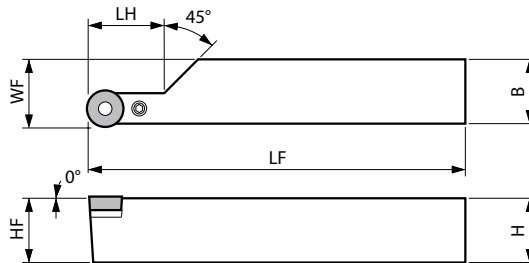
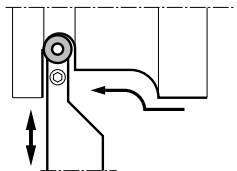


Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
												Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF										
PRGC%L 2020K-10	●	●	20	20	15	20	125	25	0	0							RCX1003M0	
2525M-10	●	●	25	25		25	150	32										
PRGC%L 2020K-12	●	●	20	20	14	20	125	25	0	0							RCMX1204M0	
2525M-12	●	●	25	25	17	25	150	32										

PRXC (External turning / External facing / External copying)



Right-hand shown



Toolholder dimensions


Description	Availability		Dimension (mm)							Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
												Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF										
PRXC%L 2020K-10	●	●	20	20	25	20	125	20.5	0	0							RCX1003M0	
2525M-10	●	●	25	25	30	25	150	25.5										
2525Q-10	●	●					180											
PRXC%L 2525M-12	●	●	25	25	30	25	150	25.7	0	0							RCMX1204M0	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Applicable inserts

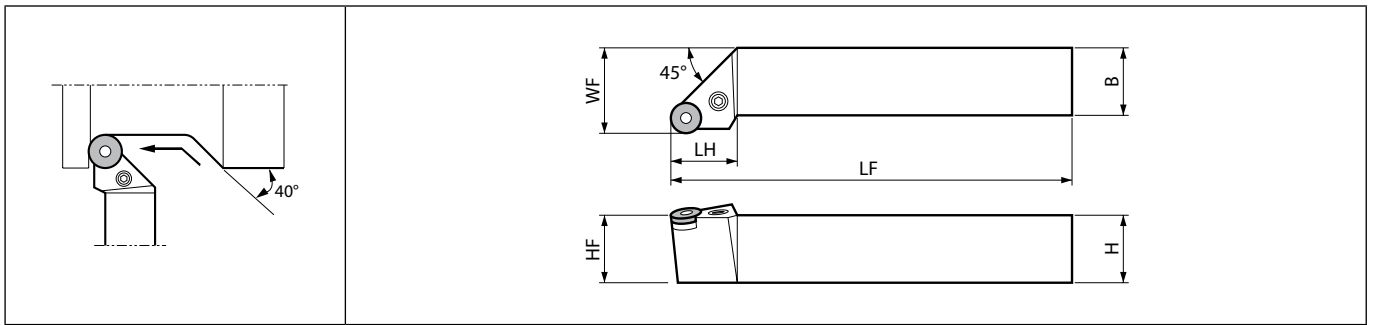
Applications	Medium	Non-ferrous metals
Insert		
Chipbreaker type	STD	AQ
Page	B81	B81

Recommended cutting conditions  D69~D70



External turning

PRGN (External turning / External facing / External copying)



Right-hand shown

External turning

Toolholder dimensions

Description	Availability		Dimension (mm)								Side rake angle (°)		Inclination angle (°)		Spare parts							Applicable inserts
															Lever	Lock screw	Punch	Shim pin	Shim	Wrench	Wrench	
PRGN%L 2020K-09	●	●	20	20	19	20	125	25	-6	-6	LL-1N	LS-1N	PC-1	LSP-1	LR-80	-	FH-2.5	RNMG090300				
PRGN%L 2525M-12	●	●	25	25	26	25	150	32	-6	-6	LL-2N	LS-2N	PC-2	LSP-2	LR-81	LW-3	-	RNMG120400				

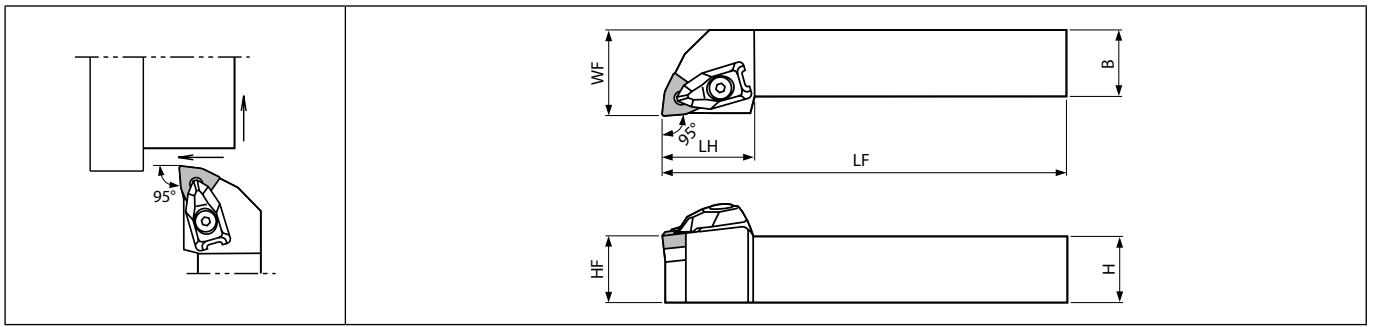
Applicable inserts

Applications	Medium - Roughing
Insert	
Chipbreaker type	STD
Page	B32

Recommended cutting conditions D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DWLN (External turning / External facing)

















Right-hand shown



External turning

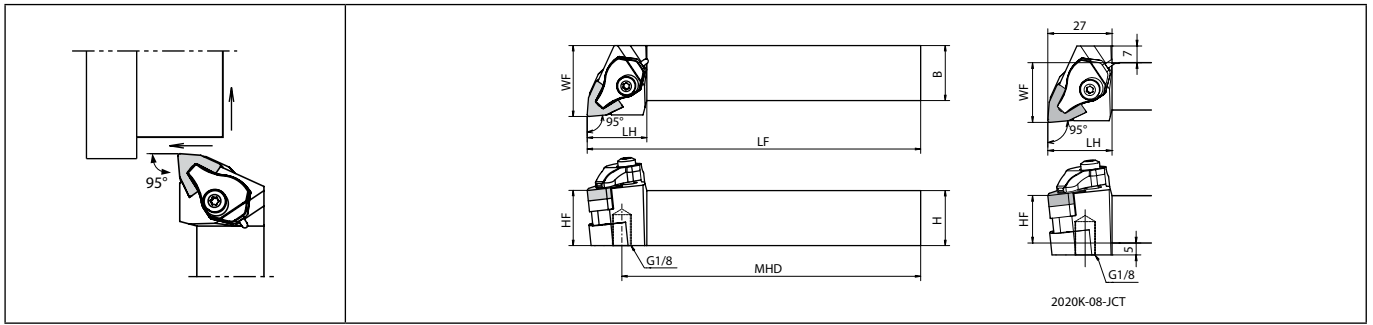
Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	
	R	L	H	B	LH	HF	LF	WF											
DWLN [°] L 2020K-08	●	●	20	20	34	20	125	25	0.8	-6	-6								WN□A0804... WN□G0804... WN□M0804...
2525M-08	●	●	25	25		25	150	32											

Wrench (FT-15) is sold separately.
Recommended tightening torque : 3.9N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DWLN-JCT (External turning / External facing, Coolant-through holders)










Right-hand shown | with coolant supply | Applicable pressure : ~30MPa

External turning

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Side rake angle (°)	Inclination angle (°)	Applicable inserts
	R	L	H	B	LH	MHD	HF	LF	WF					
DWLN ^{95°} 2020K-08JCT	●	●	20	20	27	109	20	125	25	0.8	Yes	-6	-6	WN□A0804... WN□G0804... WN□M0804...
2525M-08JCT	●	●	25	25		134	25	150	32					

Description	Spare parts						
	Clamp	Pipe connection	Screw (for clamp)	Screw	Shim	Spring	Wrench
DWLN ^{95°} 2020K-08JCT							
DWLN ^{95°} 2525M-08JCT	CP-3D-R-JCT	FP-12	CS-3D-TR	SB-4085TR	DW-44	SP-3D	FT-15

Clamp : CP-3D-R-JCT for Right-hand Toolholder, CP-3D-L-JCT for Left-hand Toolholder.

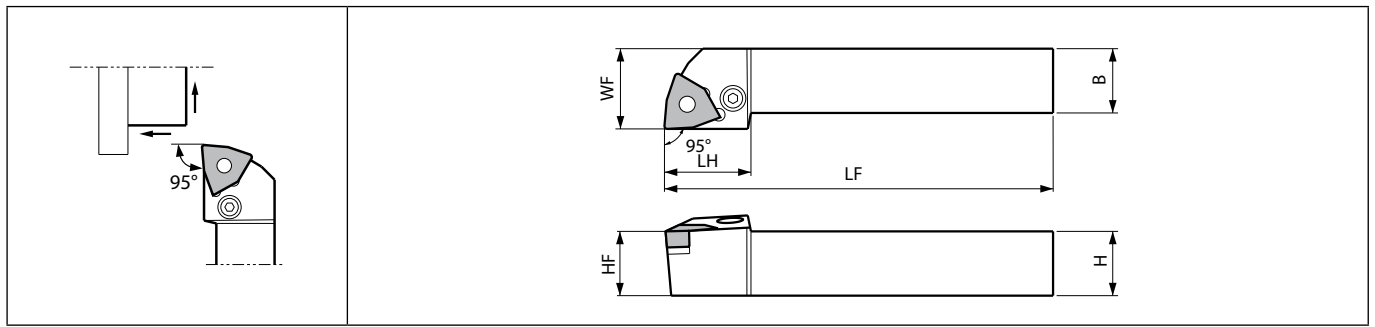
Please see page D12 for piping parts of coolant-through holders.

Only the O-ring (SS-035) included with the pipe connection can be ordered.

Recommended tightening torque : 3.9N·m








● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PWLN (External turning / External facing)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF											
PWLN ⁵ 1616H-06 2020K-06 2525M-06	●	●	16	16	22	16	100	20	0.8	-6	-6	LL-1N	LS-1N	PC-1	LSP-1	LW-32N	-	FH-2.5	WN□G0604...
	●	●	20	20		20	125	25											
	●	●	25	25		25	150	32											
PWLN ⁵ 2020K-08 2525M-08	●	●	20	20	26	20	125	25	0.8	-6	-6	LL-2N	LS-2N	PC-2	LSP-2	LW-42N	LW-3	-	WN□A0804... WN□G0804... WN□M0804...
	●	●	25	25		25	150	32											
	●	●	25	25		25	150	32											

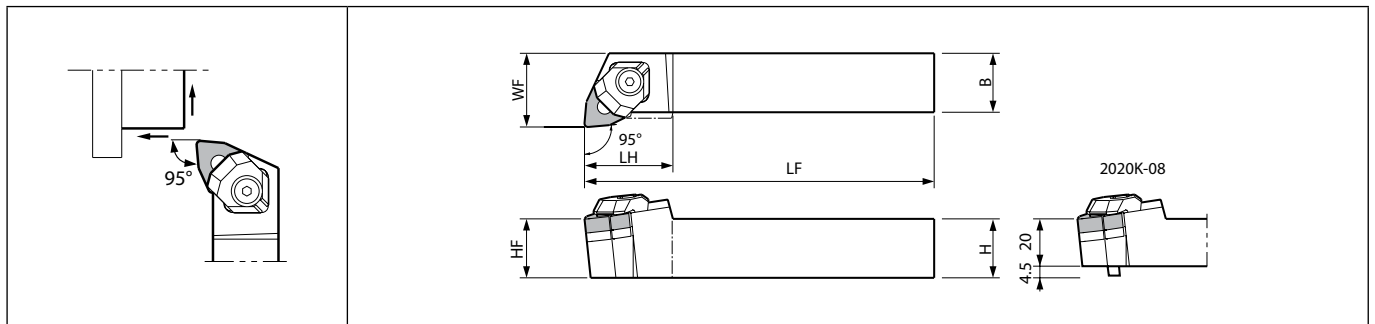
When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.



External turning

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability






WWLN (External turning / External facing)



Right-hand shown

External turning















Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
													Clamp set	Nut	Shim pin	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF										
WWLN [°] 2020K-08	●	●	20	20	30	20	125	25	1.2	-6	-6	WCS-8	WN-1	WP5X15	WWN-42	LW-3	WN□A0804... WN□G0804... WN□M0804...	
2525M-08	●	●	25	25		25	150	32										


In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (DWLN / DWLN-JCT / PWLN / WWLN)

Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B49	B49	B49	B49	B49	B49	B49	B50
Applications	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	PMG	GS	PG	PS	PT	GT
Page	B50	B50	B50	B50	B50	B50	B51	B51
Applications	Roughing	Roughing	Finishing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	STD	PH	1/2-S	R/L	XP	XQ	XS	TK
Page	B51	B51	B53	B53	B51	B51	B51	B51
Applications	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MQ	MS	MU	KQ	KG	KH	C	ZS
Page	B52	B52	B52	B52	B52	B52	B53	B53
Applications	Cast iron	Cast iron	Non-ferrous metals	Non-ferrous metals	Heat-resistant alloys	Hard materials / Cast iron		
Insert								
Chipbreaker type	GC	No CB	AH	PCD	SG	CBN		
Page	B53	B53	B53	C38	B52	C15		

In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.






Recommended cutting conditions  D69~D70



External turning

Selection guide for ceramic inserts

Select the suitable ceramic insert and specifications from the table below:

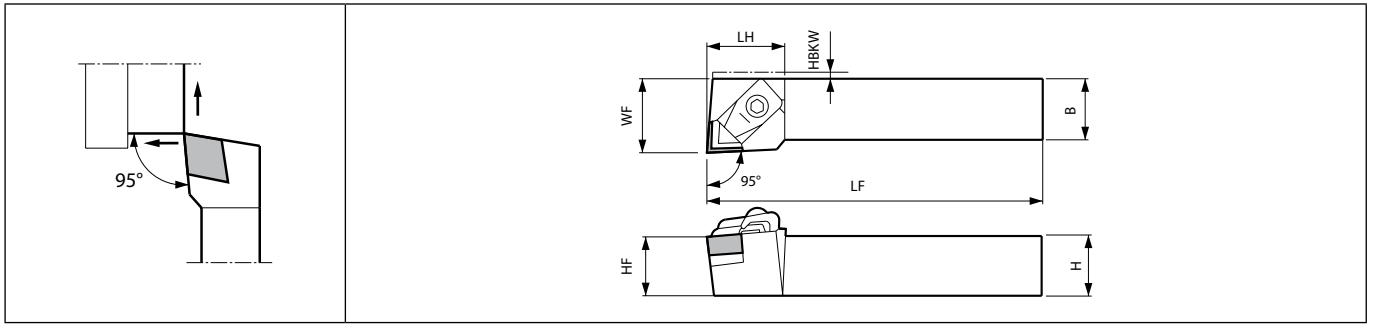
Insert shape	Corner-R (RE)	f (mm/rev)										ap (mm)
		0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.60	
 RN	-	→										0.3~4
 SN	2.0	→										0.3~4
	1.6	→										
 EN CN	1.2	→										
	0.8	→										
	0.4	→										
 TN	1.6	→										0.3~2
	1.2	→										
 DN	0.8	→										
Chamfer		0.05mm x 20°		(0.1~0.2)mm x (20°~25°)				0.3mm x 30°				-
Insert thickness		7.94mm										-

(GG25, Cutting edge angle: 0°~15°)

D

External turning

CCLN (External turning / External facing)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
	R	L	H	B	LH	HF	HBKW	LF	WF	Chipbreaker				Clamp set	Shim screw	Shim	Wrench		
	CCLN ⁹⁰ L 2020K-12	●	●	20	20		20	5	125	27				0.8	-6	-6	CB-16	CE-010		M3X8 (M3X12*)	SP-441 (SP-443*)	LW-4	CN□N1207... (CN□N1204...*)
2525M-12	●	●	25	25	32	25	-	150	32										
CCLN ⁹⁰ L 3225P-16	●	●	32	25	35	32	-	170	32	0.8	-6	-6	CB-17	CE-220	M4X10	SP-454	LW-4	CNGN1607...	

Shims indicated * are not included with the toolholder. When using CN□N1204 type insert, please purchase shim (SP-443) and screw (M3X12) separately.

Applicable inserts

Applications	Cast iron / Hard materials	Hard materials / Cast iron
Insert		
Type	Ceramic	CBN
Page	B113	C16

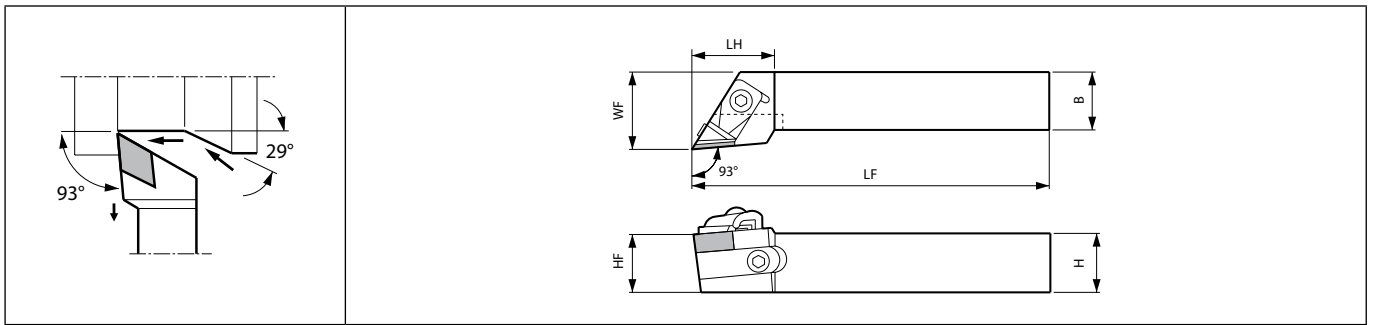
Recommended cutting conditions D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CDJN (External turning / External copying / Back turning)

D

External turning



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
	R	L	H	B	LH	HF	LF	WF	Chipbreaker				Clamp bolt	Clamp set	Shim	Wrench		
	CDJN ^{R/L} 2525M-15 3225P-15	●	●	25	25	32	25	150	32				0.8	-5	-8			

Chipbreaker : CB-14 for Right-hand Toolholder, CB-15 for Left-hand Toolholder.
 Shim : 556CR for Right-hand Toolholder, 556CL for Left-hand Toolholder.

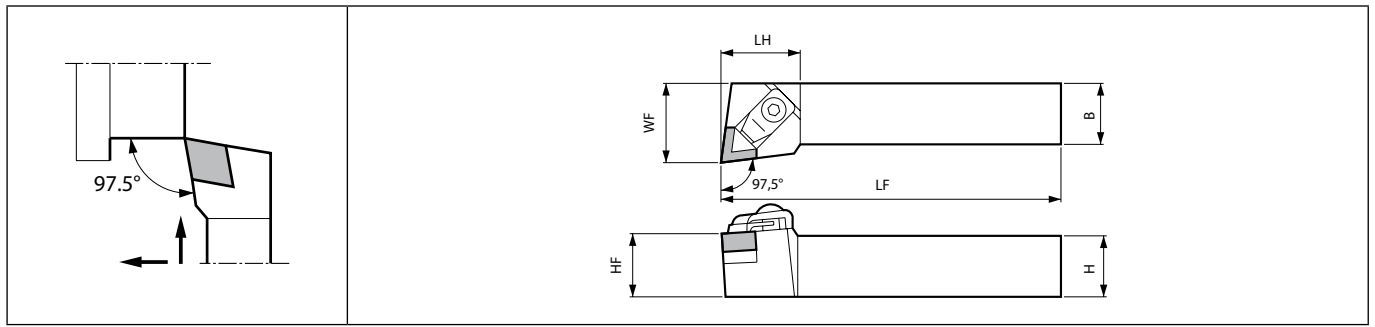
Applicable inserts

Applications	Cast iron / Hard materials
Insert	
Type	Ceramic
Page	B114

Recommended cutting conditions D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CELN (External turning / External facing)



Right-hand shown



External turning

Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
														Chipbreaker	Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF											
CELN [®] L 2525M-13	●	●	25	25	32	25	150	32	0.8	-6	-6						ENGN1307...		

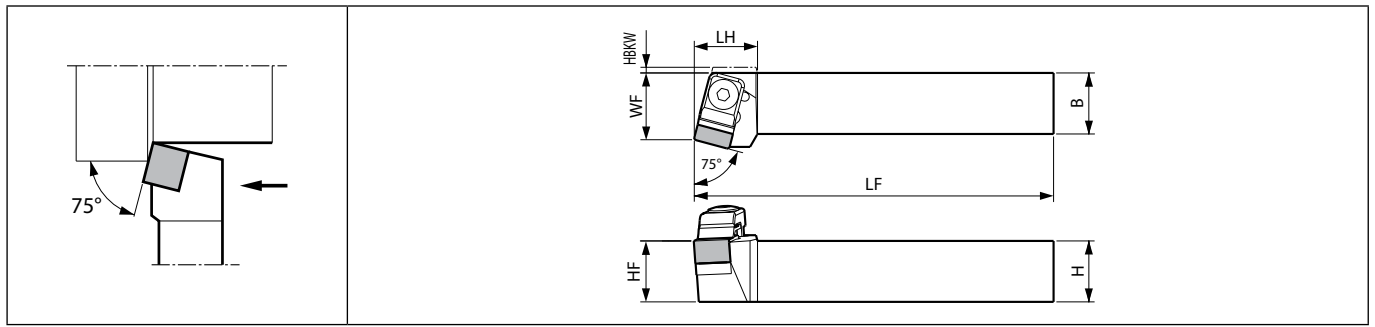
Applicable inserts

Applications	Cast iron / Hard materials
Insert	
Type	Ceramic
Page	B115

Recommended cutting conditions D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CSRN (External turning)



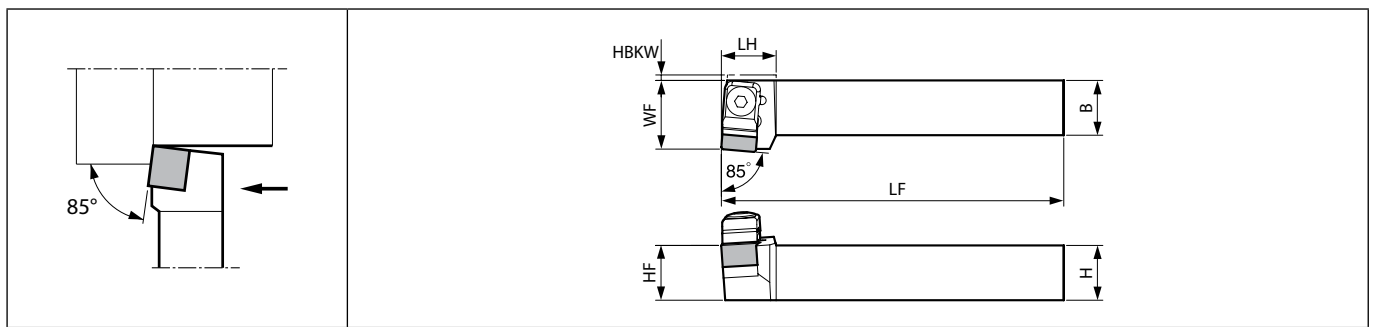
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts	
													Chipbreaker	Clamp set	Clamp set	Shim screw	Shim	Wrench		
	R	L	H	B	LH	HF	HBKW	LF	WF											
CSRN ^{R/L} 2020K-12	●	●	20	20	20	2	125	22	0.8	-6	-4		CB-11		-	M3X8 (M3X12*)	SP-141 (SP-143*)	LW-4	SN□N1207... (SN□N1204...*)	
2525M-12	●	●	25	25	22	25	-	150												27
3225P-12	●	●	32	25	32	-	170	27												
CSRN ^{R/L} 3225P-15	●	●	32	25	30	32	-	170	32.4	1.2	-6	-4		-	CE-220	M4X10	SP-162	LW-4	SNGN1507...	
4040R-15	●	●	40	40	40	-	200	43												

Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

CS-N (External turning)



Right-hand shown

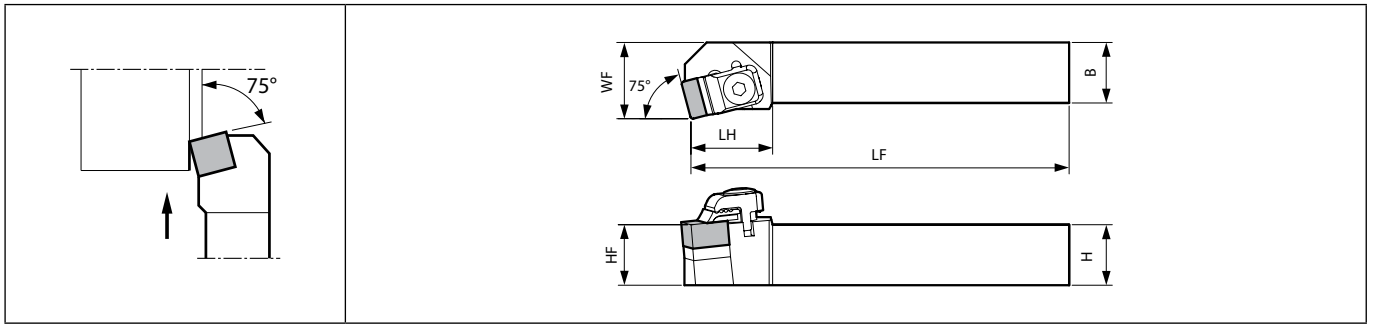
Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
													Chipbreaker	Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF										
CS-N ^{R/L} 2525M-12	●	●	25	25	20	25	150	32	0.8	-6	-4			M3X8 (M3X12*)	SP-141 (SP-143*)	LW-4	SN□N1207... (SN□N1204...*)	

Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CSKN (External facing)



Right-hand shown



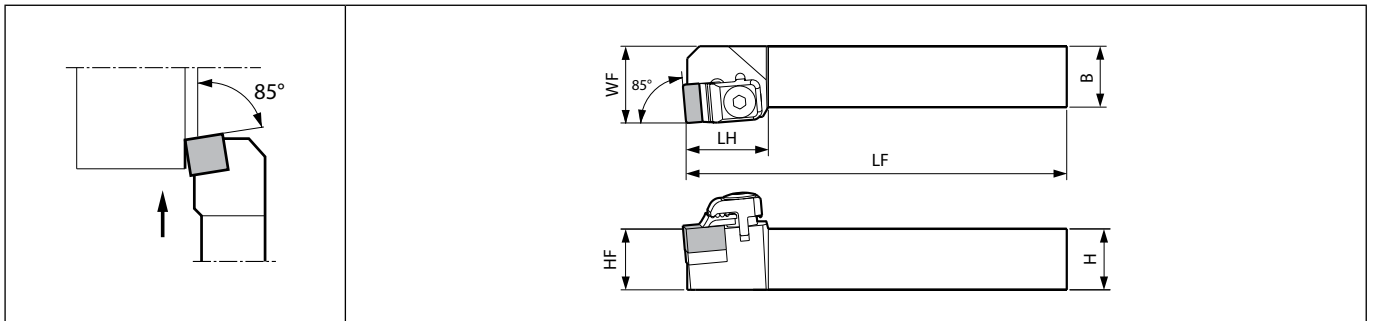
External turning

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
													Chipbreaker	Clamp set	Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF											
CSKN%L 2020K-12	●		20	20	27	20	125	25	0.8	-6	-4	CB-11	CE-020	-	M3X8 (M3X12*)	SP-141 (SP-143*)	LW-4	SN□N1207... (SN□N1204...*)	
2525M-12	●	●	25	25		25	150	32											
CSKNR 3225P-15	●		32	25	37	32	170	32	1.2	-6	-4	CB-51	-	CE-220	M4X10	SP-162	LW-4	SNGN1507...	

Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

CSYN (External facing)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
													Chipbreaker	Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF										
CSYN%L 2525M-12	●	●	25	25	27	25	150	32	0.8	-6	-4	CB-11	CE-020	M3X8 (M3X12*)	SP-141 (SP-143*)	LW-4	SN□N1207... (SN□N1204...*)	

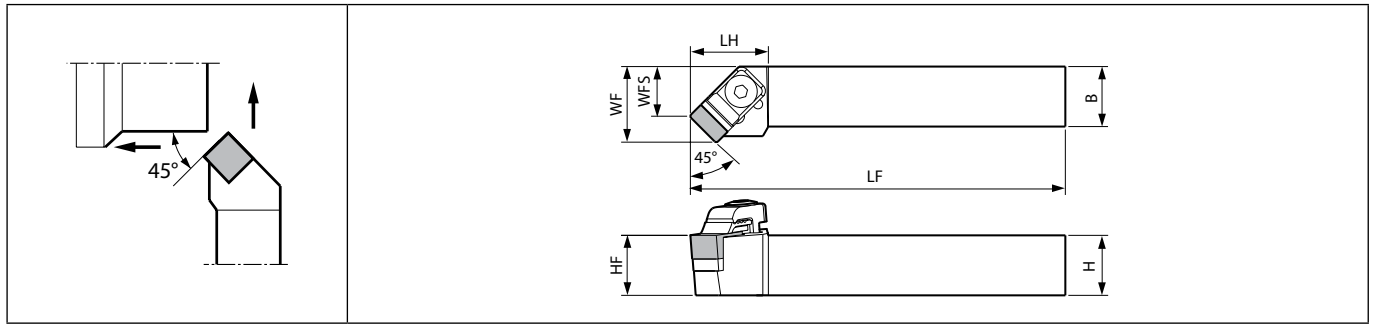
Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CSSN (External turning / External facing / Chamfering)



External turning



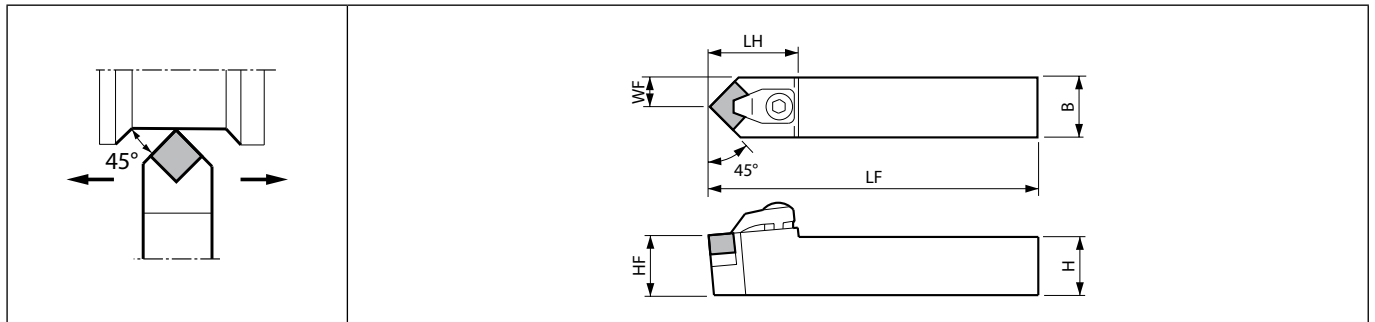
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
	R	L	H	B	LH	HF	LF	WF	WFS				Chipbreaker	Clamp set	Shim screw	Shim	Wrench	
	CSSN%L 2020K-12 2525M-12	●		20	20	26	20	125	25				16	0.8	-6	0		

Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

CSDN (External turning / Chamfering)



Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Back rake angle (°)	Spare parts				Applicable inserts
	N	H	B	LH	HF	LF	WF	Clamp set	Shim screw			Shim	Wrench			
	CSDNN 2020K-12 2525M-12 3225P-12	●	20	20		20	125	10	0.8			-8.5				

Shims indicated * are not included with the toolholder. When using SN□N1204 type insert, please purchase shim (SP-143) and screw (M3X12) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

Applications	Cast iron / Hard materials	Cast iron	Hard materials / Cast iron
Type	Ceramic	Coated carbide	CBN
Toolholder	Insert		
CSRN [®] /L ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
CSRN [®] /L ...-15	SNGN1507..	-	-
CS-N [®] /L ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
CSKN [®] /L ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
CSKN [®] /L ...-15	SNGN1507..	-	-
CSYN [®] /L ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
CSSN [®] /L ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
CSDNN ...-12	SNGN1207..(SNGN1204..) SNMN1207..	(SNMN1204..)	(SNMN1204..)
Page	B117	B37	C18

Recommended cutting conditions D69~D70

Spare parts (When using as toolholder for CBN tools (KBN900), please purchase separately.)

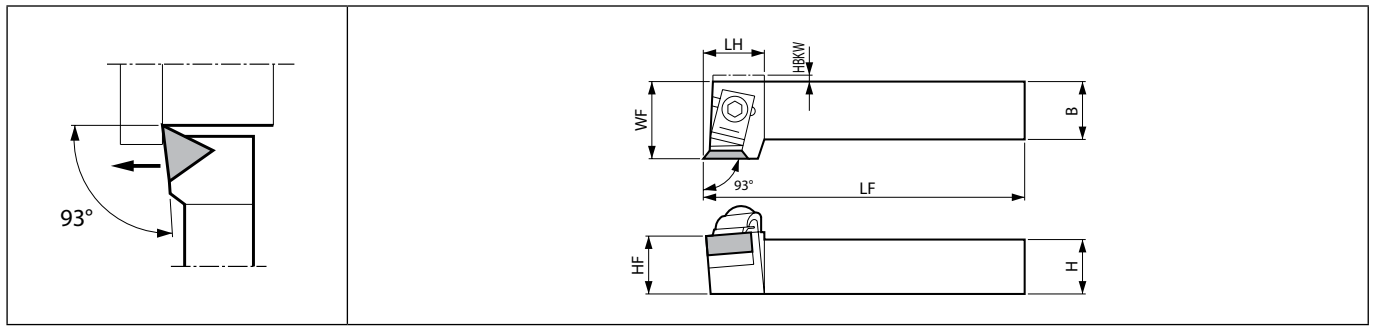
Applications	Hard materials / Cast iron	Spare parts		
Type	CBN	Clamp set	Shim	Shim screw
Toolholder	Insert			
CSRN [®] /L ...-12	(SNMN1204..)	CE-030A	SP-143	M3X12
CSRN [®] /L ...-15	-	-	-	-
CS-N [®] /L ...-12	(SNMN1204..)	CE-030A	SP-143	M3X12
CSKN [®] /L ...-12	(SNMN1204..)	CE-030A	SP-143	M3X12
CSKN [®] /L ...-15	-	-	-	-
CSYN [®] /L ...-12	(SNMN1204..)	CE-030A	SP-143	M3X12
CSSN [®] /L ...-12	(SNMN1204..)	CE-030A	SP-143	M3X12
CSDNN ...-12	(SNMN1204..)	*-	SP-143	M3X12

* CSDNN...-12 : Clamp set CE-040 is used continuously.



External turning

CTJN (External turning)



Right-hand shown

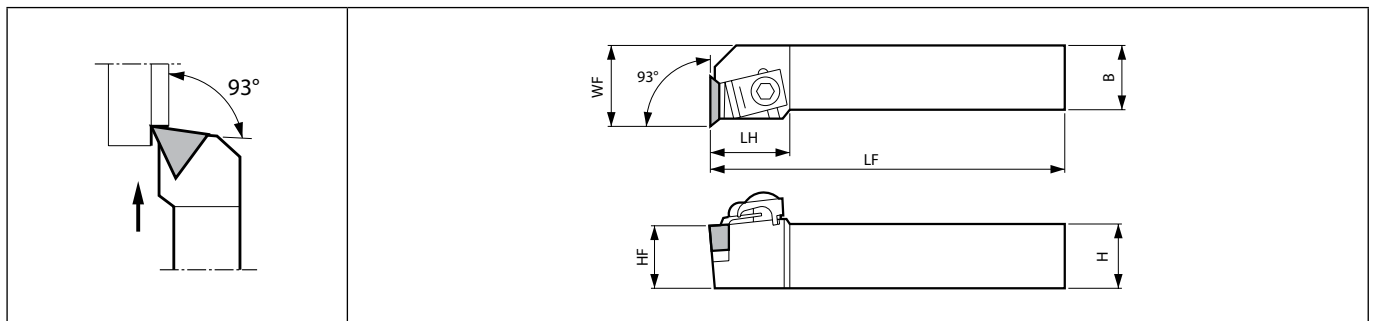
Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
													Chipbreaker	Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	HBKW	LF	WF									
CTJN% 2020K-16 2525M-16	●	●	20	20	21	20	2	125	25	0.8	-6	-4						TNGN1607... (TN□N1604...*)

Chipbreaker : CB-12 for Right-hand Toolholder, CB-13 for Left-hand Toolholder.

Shims indicated * are not included with the toolholder. When using TN□N1604 type insert, please purchase shim (SP-223) and screw (M3X12) separately.

CTUN (External facing)



Right-hand shown

Toolholder dimensions



Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts					Applicable inserts
													Chipbreaker	Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF										
CTUN% 2525M-16	●	●	25	25	27	25	150	32	0.8	-6	-4						TNGN1607... (TN□N1604...*)	


Chipbreaker : CB-13 for Right-hand Toolholder, CB-12 for Left-hand Toolholder.

Shims indicated * are not included with the toolholder. When using TN□N1604 type insert, please purchase shim (SP-223) and screw (M3X12) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (CTJN / CTUN)



Applications	Cast iron / Hard materials	Hard materials / Cast iron
Insert		
Type	Ceramic	CBN
Page	B118	C19


Recommended cutting conditions  D69~D70







External turning

Applicable inserts

Applications	Cast iron / Hard materials	Hard materials / Cast iron
Type	Ceramic	CBN
Insert		
Toolholder		
CRSN [®] /L ...-12	RNGN120700 (RNGN120400)	(RNMN120400)
CRDNN ...-12	RNGN120700 (RNGN120400)	(RNMN120400)
CRDNN ...-15	RNGN150700	-
Page	B116	C17

Recommended cutting conditions  **D69~D70**

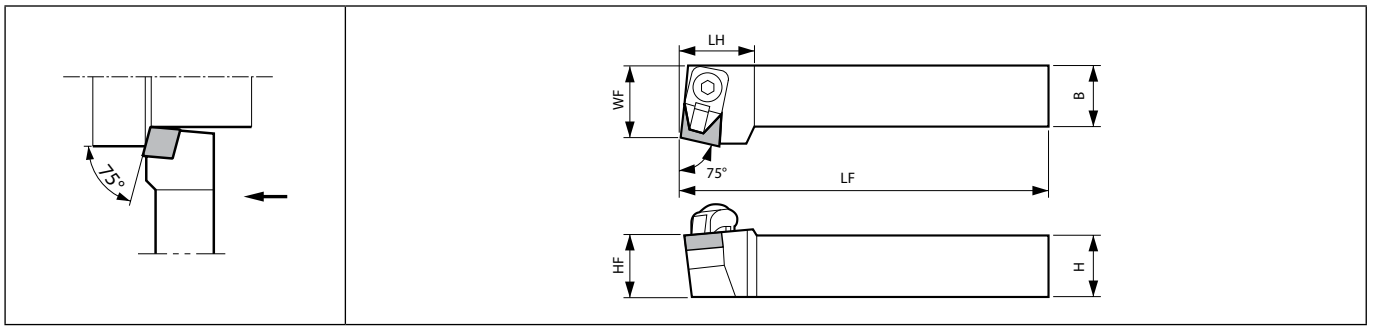
Spare parts (When using as toolholder for CBN tools (KBN900), please purchase separately.)

Applications	Hard materials / Cast iron	Spare parts		
Type	CBN	Clamp set	Shim	Shim screw
Insert				
Toolholder				
CRSN [®] /L ...-12	(RNMN120400)	CE-030A	SP-843	M3X12
CRDNN ...-12	(RNMN120400)	CE-030A	SP-843	M3X12
CRDNN ...-15	-	-	-	-



External turning

CCRN-A (External turning)

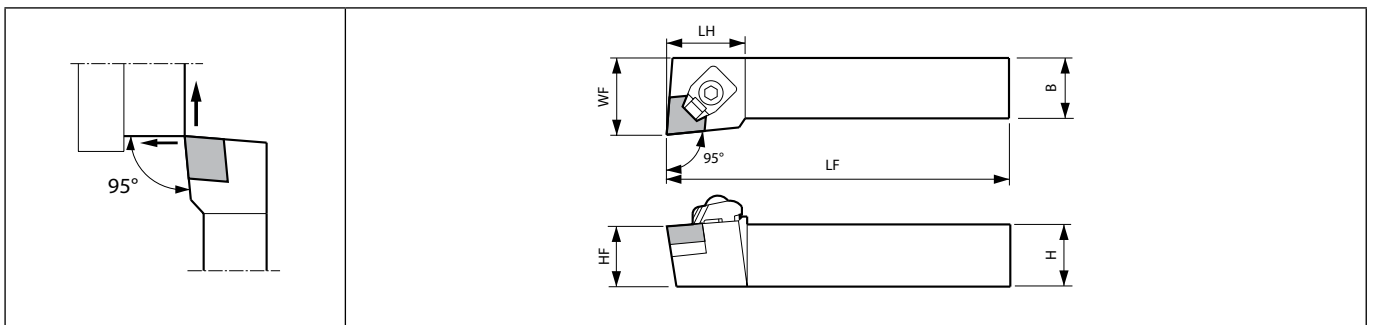


Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
	R	L	H	B	LH	HF	LF	WF				Clamp set	Shim screw	Shim	Wrench	
	CCRN%L 2525M-09A	●		25	25	27	25	150				27	0.8	-6	-6		CE-030A	HH3X12	SP-429	LW-4	CNMN0903...

CCLN-A (External turning / External facing)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
	R	L	H	B	LH	HF	LF	WF				Clamp set	Shim screw	Shim	Wrench	
	CCLN%L 2525M-09A	●	●	25	25	28	25	150				32	0.8	-5	-5		CE-030A	HH3X12	SP-429	LW-4	CNMN0903...

For CNMN1204 Insert toolholder, see page D49

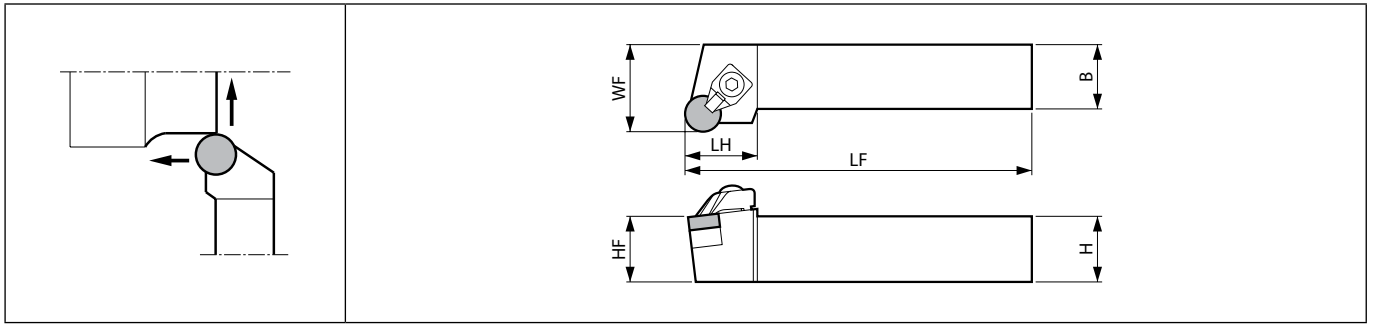
Applicable inserts

Applications	Hard materials / Cast iron
Insert	
Type	CBN
Page	C16

Recommended cutting conditions D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CRSN-A (External turning / External facing)



Right-hand shown



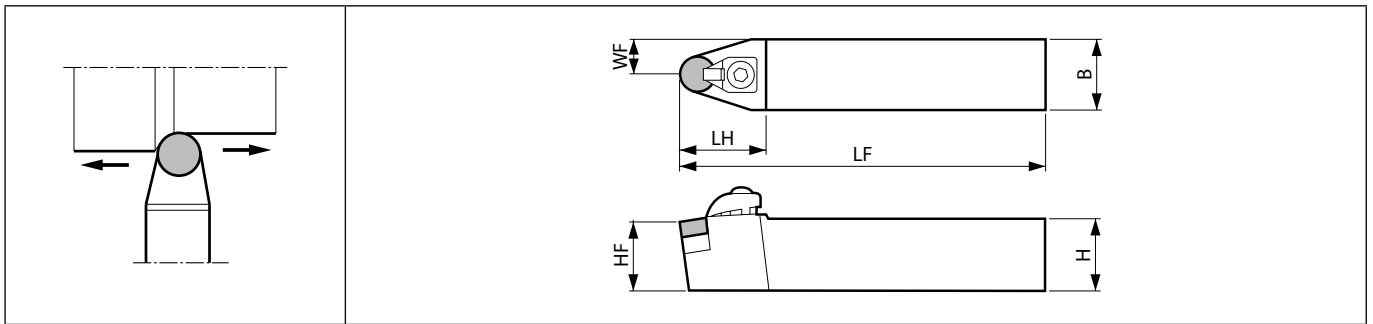
External turning

Toolholder dimensions

Description	Availability		Dimension (mm)							Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
												Clamp set	Shim screw	Shim screw	Shim	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF										
CRSN%L 2525M-09A 3225P-09A	●	●	25	25	26	25	150	32	-6	-6	CE-030A	-	HH3X12	SP-829 (SP-826*)	-	LW-4	RNMN0903... (RNGN0904...*)	
CRSN%L 2525M-12A 3225P-12A	●	●	25	25	26	25	150	32	-6	-6	CE-030A	BH3X12	-	-	SP-849 (SP-843***) (SP-841***)	LW-4	RNMN1203... (RN□N1204...***) (RNGN1207...***)	

When using RNGN0904 type insert, please purchase shim (SP-826) separately.
 When using RN□N1204 type insert, please purchase shim (SP-843) separately.
 When using RNGN1207 type insert, please purchase shim (SP-841) separately.

CRDN-A (External turning / External copying)





Toolholder dimensions


Description	Availability		Dimension (mm)							Back rake angle (°)	Spare parts						Applicable inserts
											Clamp set	Shim screw	Shim screw	Shim	Shim	Wrench	
	N	H	B	LH	HF	LF	WF										
CRDNN 2525M-09A 3225P-09A	●	25	25	29	25	150	12.5	-8.5	CE-030A	-	HH3X12	SP-829 (SP-826*)	-	LW-4	RNMN0903... (RNGN0904...*)		
CRDNN 2525M-12A 3225P-12A	●	25	25	28	25	150	12.5	-8.5	CE-030A	BH3X12	-	-	SP-849 (SP-843***) (SP-841***)	LW-4	RNMN1203... (RN□N1204...***) (RNGN1207...***)		

When using RNGN0904 type insert, please purchase shim (SP-826) separately.
 When using RN□N1204 type insert, please purchase shim (SP-843) separately.
 When using RNGN1207 type insert, please purchase shim (SP-841) separately.




● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

Applications	Hard materials / Cast iron	Cast iron / Hard materials
Type	CBN	Ceramic
Insert		
Toolholder		
CRSN [®] /L ...-09A	RNMN090300	(RNGN090400)
CRSN [®] /L ...-12A	RNMN120300 (RNMN120400)	(RNGN120400) (RNGN120700)
CRDNN ...-09A	RNMN090300	(RNGN090400)
CRDNN ...-12A	RNMN120300 (RNMN120400)	(RNGN120400) (RNGN120700)
Page	C17	B116

Recommended cutting conditions  **D69~D70**

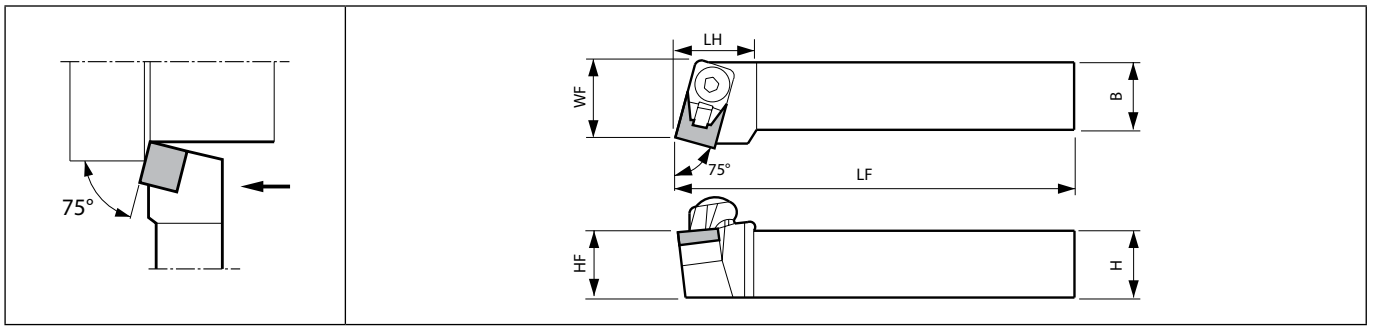
Spare parts (When using as toolholder for Ceramic tools, please purchase separately.)

Applications	Cast iron / Hard materials	Spare parts	
Type	Ceramic	Shim	Shim screw
Insert			
Toolholder			
CRSN [®] /L ...-09A	(RNGN090400)	SP-826	-
CRSN [®] /L ...-12A	(RNGN120400)	SP-843	M3X12
	(RNGN120700)	SP-841	M3X8
CRDNN ...-09A	(RNGN090400)	SP-826	-
CRDNN ...-12A	(RNGN120400)	SP-843	M3X12
	(RNGN120700)	SP-841	M3X8

D

External turning

CSRN-A (External turning)



Right-hand shown



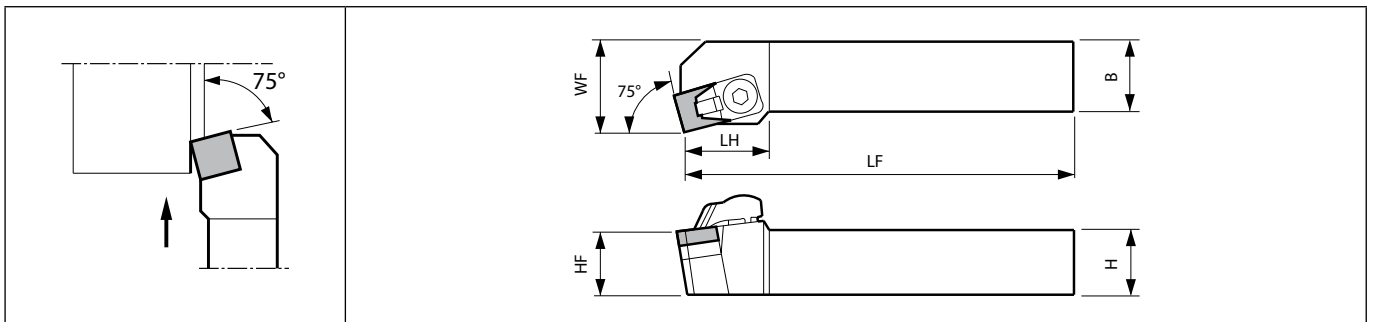
External turning

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
	R	L	H	B	LH	HF	LF	WF				Clamp set	Shim screw	Shim	Wrench	
	CSRN%L 2525M-12A	●	●	25	25	22	25	150				27	0.8	-6	-4		CE-030A	BH3X12	SP-148 (SP-143*)	LW-4	SNMN1203... (SN□N1204...)

When using SN□N1204 type insert, please purchase shim (SP-143) separately.

CSKN-A (External facing)



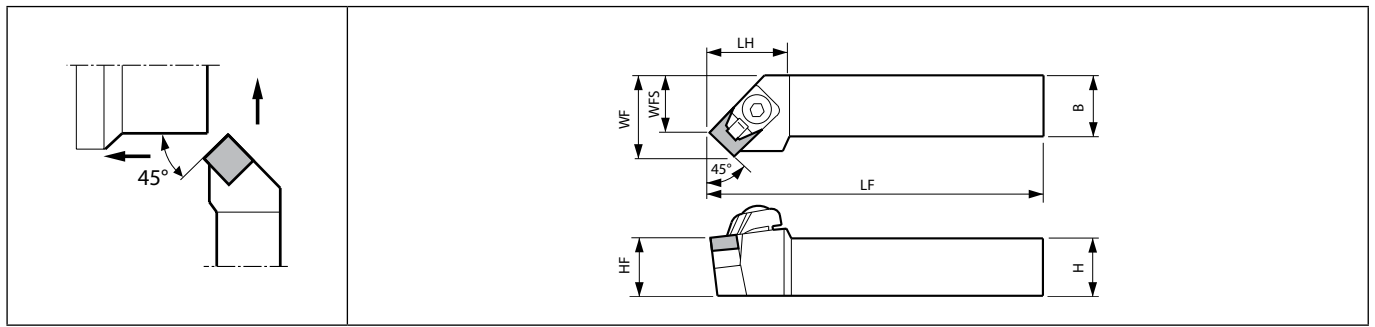
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
	R	H	B	LH	HF	LF	WF	Clamp set				Shim screw	Shim	Wrench		
	CSKNR 2525M-09A	●		25	25	27	25	150				32	0.8	-6	-4		CE-030A	HH3X12	SP-129	LW-4	SNMN0903...

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CSSN-A (External turning / External facing / Chamfering)



Right-hand shown

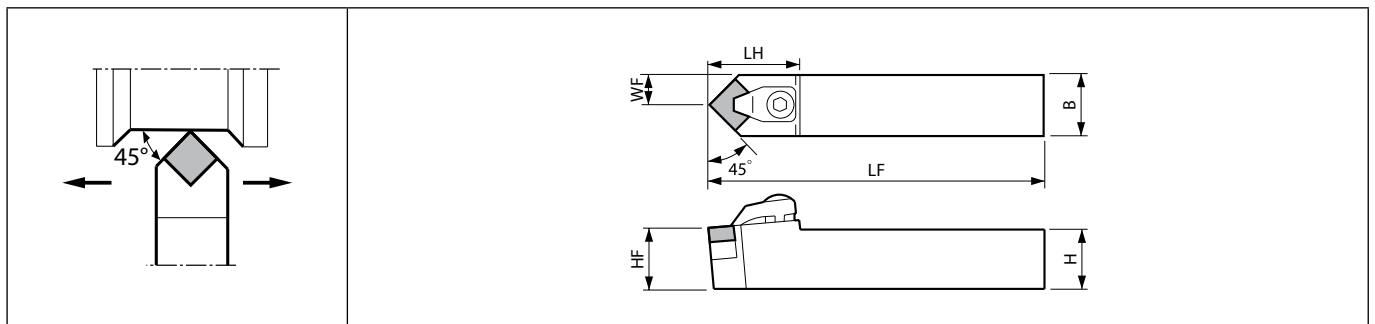
External turning

Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-R(RE)		Side rake angle (°)		Inclination angle (°)		Spare parts						Applicable inserts
																	Clamp set	Shim screw	Shim screw	Shim	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF	WFS														
CSSN% 2525M-09A	●	●	25	25	26	25	150	32	25	0.8	-6	0	CE-030A	-	HH3X12	SP-129	-	LW-4	SNMN0903...				
CSSN% 2525M-12A	●	●	25	25	26	25	150	32	23	0.8	-6	0	CE-030A	BH3X12	-	-	SP-148 (SP-143*) (SP-141*)	LW-4	SNMN1203... (SN□N1204...*) (SN□N1207...*)				

When using SN□N1204 type insert, please purchase shim (SP-143) separately. When using SN□N1207 type insert, please purchase shim (SP-141) separately.

CSDN-A (External turning / Chamfering)






Toolholder dimensions


Description	Availability		Dimension (mm)								Standard corner-R(RE)		Back rake angle (°)		Spare parts						Applicable inserts
															Clamp set	Shim screw	Shim screw	Shim	Shim	Wrench	
	N	H	B	LH	HF	LF	WF														
CSDNN 2525M-09A	●		25	25	32	25	150	12.5	0.8	-8.5	CE-040	-	HH3X12	SP-129	-	LW-4	SNMN0903...				
CSDNN 2525M-12A	●		25	25	32	25	150	12.5	0.8	-8.5	CE-040	BH3X12	-	-	SP-148 (SP-143*) (SP-141*)	LW-4	SNMN1203... (SN□N1204...*) (SN□N1207...*)				

When using SN□N1204 type insert, please purchase shim (SP-143) separately. When using SN□N1207 type insert, please purchase shim (SP-141) separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts






Applications	Hard materials / Cast iron	Cast iron	Cast iron / Hard materials
Type	CBN	Coated carbide	Ceramic
Toolholder			
CSRN [®] /L ...-12A	SNMN1203.. (SNMN1204..)	(SNMN1204..)	(SNGN1204..)(SNMN1204..) (SNGN1207..)(SNMN1207..)
CSKN [®] /L ...-09A	SNMN0903..	-	-
CSSN [®] /L ...-09A	SNMN0903..	-	-
CSSN [®] /L ...-12A	SNMN1203.. (SNMN1204..)	(SNMN1204..)	(SNGN1204..)(SNMN1204..) (SNGN1207..)(SNMN1207..)
CSDNN ...-09A	SNMN0903..	-	-
CSDNN ...-12A	SNMN1203.. (SNMN1204..)	(SNMN1204..)	(SNGN1204..)(SNMN1204..) (SNGN1207..)(SNMN1207..)
Page	C18	B37	B117

Recommended cutting conditions  D69~D70

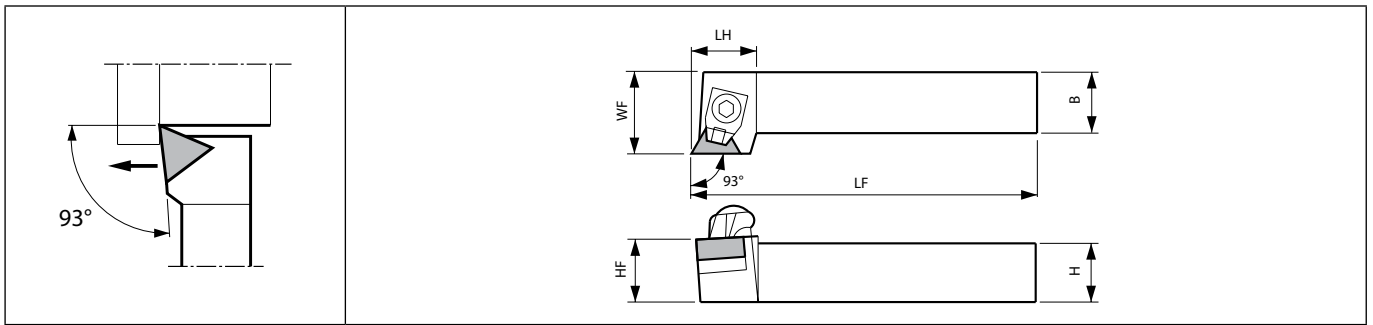


External turning

Spare parts (When using as toolholder for Ceramic tools, please purchase separately.)

Applications	Cast iron / Hard materials	Spare parts			
Type	Ceramic	Chipbreaker	Clamp set	Shim	Shim screw
Toolholder					
CSRN [®] /L ...-12A	(SNGN1204..)(SNMN1204..)	CB-11	CE-020	SP-143	M3X12
	(SNGN1207..)(SNMN1207..)			SP-141	M3X8
CSKN [®] /L ...-09A	-	-	-	-	-
CSSN [®] /L ...-09A	-	-	-	-	-
CSSN [®] /L ...-12A	(SNGN1204..)(SNMN1204..)	CB-11	CE-020	SP-143	M3X12
	(SNGN1207..)(SNMN1207..)			SP-141	M3X8
CSDNN ...-09A	-	-	-	-	-
CSDNN ...-12A	(SNGN1204..)(SNMN1204..)	-	-	SP-143	M3X12
	(SNGN1207..)(SNMN1207..)			SP-141	M3X8

CTJN-A (External turning)



Right-hand shown

External turning

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts				Applicable inserts
	R	L	H	B	LH	HF	LF	WF	Clamp set				Shim screw	Shim	Wrench		
	CTJN [°] L 2525M-11A	●	●	25	25	22	25	150	32				0.8	-6	-4		

For TNMN1604 Insert toolholder, see page D56.

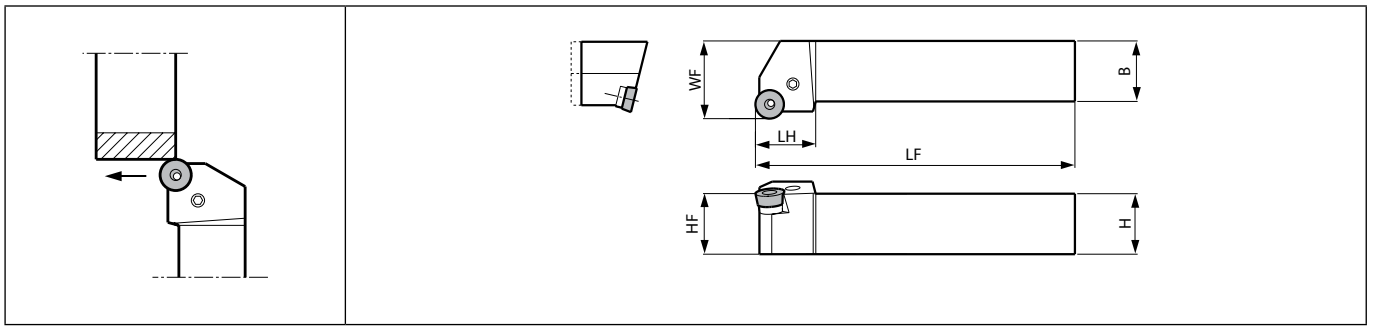
Applicable inserts

Applications	Hard materials / Cast iron	Cast iron / Hard materials
Insert		
Type	CBN	Ceramic
Page	C19	B118

Recommended cutting conditions ➔ D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PRGC-BE (External turning)








Right-hand shown





External turning

Toolholder dimensions

Description	Availability	Dimension (mm)						Spare parts					Applicable inserts	
								Lever	Lock screw	Punch	Shim pin	Shim		Wrench
		R	H	B	LH	HF	LF	WF						
PRGCR 2525M-12BE	●	25	25	25	25	150	32	LL-1CN	LS-1N	PC-1	LSP-1	LR-12C	FH-2.5	RCMT1204M0-BB

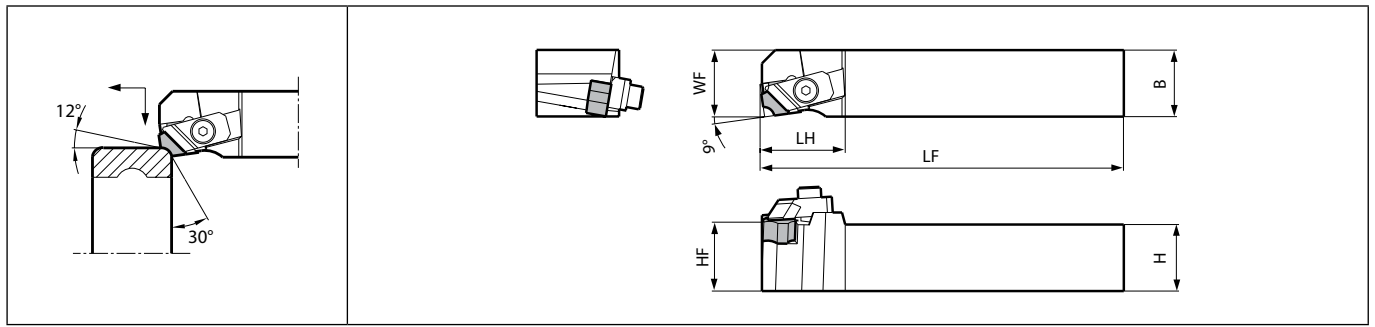
Applicable inserts

Applications	Finishing
Insert	
Chipbreaker type	BB
Page	B109

Recommended cutting conditions  D69~D70

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability





CBSN (External round chamfering)



Right-hand shown


External turning


Toolholder dimensions

Description	Availability		Dimension (mm)							Spare parts				Applicable inserts
										Clamp set	Shim screw	Shim	Wrench	
	R	L	H	B	LH	HF	LF	WF						
CBSN ^{R/L} 2020K-12	●	●	20	20	32	20	125	20	CP-RC ^{R/L}	SP3X8	SP-RC	LW-5	SNMF1204..-21	
2525M-12	●	●	25	25		25	150	25						

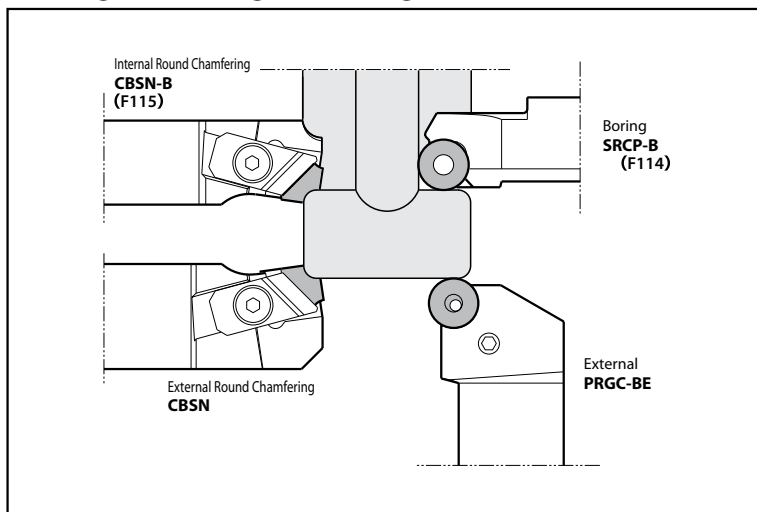
Clamp set : CP-RCR for Right-hand Toolholder, CP-RCL for Left-hand Toolholder.

Applicable inserts

Applications	Finishing
Insert	
Chipbreaker type	21
Page	B109

Recommended cutting conditions  D69~D70

Tooling for bearing machining



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

External turning - Negative insert

ap indicates radius

ISO Classification	Workpiece material	Hardness	Cutting range	Applications	Recommended chipbreaker	Recommended insert grade	Corner-R(RE)	Lower Limit - Recommendation - Upper Limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
P	Low carbon steel Low carbon alloy	HB ≤ 300	Finishing (High Speed Machining)	Continuous	XP	CCX	0.8	300 - 600 - 800	0.2 - 0.5 - 0.7	0.07 - 0.12 - 0.2
			Finishing (Small ap)	Continuous Interruption	XF	PV710 PV720	0.4 0.8	250 - 350 - 520 240 - 320 - 480	0.05 - 0.12 - 0.6 0.05 - 0.15 - 0.6	0.03 - 0.1 - 0.22 0.04 - 0.12 - 0.25
			Finishing (Gloss Oriented)	Continuous Interruption	XP	TN610 TN620	0.4 0.8	250 - 320 - 400 240 - 310 - 370	0.2 - 0.5 - 0.7 0.2 - 0.5 - 0.7	0.07 - 0.12 - 0.2 0.07 - 0.12 - 0.2
			Finishing (Tool Life Oriented)	Continuous Interruption	XP	PV710 PV720	0.4 0.8	250 - 300 - 370 240 - 290 - 340	0.2 - 0.5 - 0.7 0.2 - 0.5 - 0.7	0.07 - 0.12 - 0.2 0.07 - 0.12 - 0.2
			Finishing - Medium (Gloss Oriented)	Continuous Interruption	XQ	TN610 TN620	0.4 0.8	250 - 320 - 400 240 - 280 - 340	0.5 - 1.0 - 1.5 0.5 - 1.0 - 1.5	0.17 - 0.25 - 0.3 0.17 - 0.25 - 0.3
			Finishing - Medium (Tool Life Oriented)	Continuous Interruption	XQ	PV710 PV720	0.8 0.8	250 - 300 - 370 240 - 280 - 340	0.5 - 1.0 - 1.5 0.5 - 1.0 - 1.5	0.17 - 0.25 - 0.3 0.17 - 0.25 - 0.3
			Medium - Roughing	Continuous Interruption	XS	PV720 CA125P	0.8 0.8	220 - 260 - 320 160 - 210 - 260	0.8 - 1.5 - 2.0 0.8 - 1.5 - 2.0	0.25 - 0.3 - 0.4 0.25 - 0.3 - 0.4
			Roughing	Continuous Interruption	PMG	CA115P CA125P	0.8 1.2	180 - 220 - 260 150 - 200 - 240	1.0 - 2.5 - 3.5 1.0 - 2.5 - 3.5	0.2 - 0.3 - 0.4 0.2 - 0.3 - 0.4
			Roughing High Feed Rate	Continuous Interruption	PH	CA115P CA125P	1.2 1.6	150 - 200 - 240 120 - 180 - 220	2.0 - 5.0 - 8.0 2.0 - 5.0 - 8.0	0.4 - 0.6 - 0.8 0.3 - 0.5 - 0.7
			Roughing (Low Cutting Force)	Continuous Interruption	PX (Single-sided)	CA115P CA125P	1.2 1.6	150 - 200 - 240 120 - 180 - 220	2.0 - 5.0 - 8.0 2.0 - 5.0 - 8.0	0.4 - 0.6 - 0.8 0.3 - 0.5 - 0.7
	Medium carbon steel Medium carbon alloy	HB ≤ 300	Finishing (Time Oriented)	Continuous Interruption	WF (Wiper)	PV710 CA125P	0.8 0.8	200 - 250 - 320 160 - 220 - 280	0.3 - 0.5 - 1.0 0.3 - 0.5 - 1.0	0.2 - 0.3 - 0.4 0.2 - 0.3 - 0.4
			Finishing - Medium (Time Oriented)	Continuous Interruption	WE (Wiper)	PV710 CA125P	0.8 0.8	180 - 220 - 280 130 - 180 - 240	1.0 - 2.0 - 3.0 1.0 - 2.0 - 3.0	0.2 - 0.3 - 0.4 0.2 - 0.3 - 0.4
			Finishing (High Speed Machining)	Continuous	PP	CCX	0.8	200 - 300 - 450	0.2 - 0.5 - 1.5	0.04 - 0.16 - 0.28
			Finishing (Gloss Oriented)	Continuous Interruption	PP	TN610	0.4 0.8	200 - 250 - 320 180 - 230 - 300	0.2 - 0.5 - 1.5 0.2 - 0.5 - 1.5	0.04 - 0.16 - 0.28 0.05 - 0.2 - 0.35
			Finishing (Tool Life Oriented)	Continuous Interruption	PP	PV710 PV720	0.4 0.8	200 - 250 - 320 200 - 240 - 290	0.2 - 0.5 - 1.5 0.2 - 0.5 - 1.5	0.04 - 0.16 - 0.28 0.05 - 0.2 - 0.35
			Finishing - Medium (Gloss Oriented)	Continuous Interruption	PQ	TN610 TN620	0.8 1.2	180 - 230 - 300 160 - 220 - 260	0.5 - 1.5 - 2.5 0.5 - 1.5 - 2.5	0.1 - 0.2 - 0.3 0.1 - 0.17 - 0.25
			Finishing - Medium (Tool Life Oriented)	Continuous Interruption	PQ	PV710 CA125P	0.8 0.8	160 - 210 - 280 140 - 200 - 240	0.5 - 1.5 - 2.5 0.5 - 1.5 - 2.5	0.1 - 0.2 - 0.3 0.1 - 0.17 - 0.25
			Medium - Roughing	Continuous Interruption	PMG	CA115P CA125P	0.8 1.2	150 - 200 - 240 120 - 160 - 200	1.0 - 2.5 - 3.5 1.0 - 2.5 - 3.5	0.2 - 0.3 - 0.4 0.2 - 0.3 - 0.4
			Roughing High Feed Rate	Continuous Interruption	PH	CA115P CA125P	1.2 1.6	120 - 180 - 230 100 - 150 - 200	2.0 - 5.0 - 8.0 2.0 - 5.0 - 8.0	0.4 - 0.6 - 0.8 0.3 - 0.5 - 0.7
			Roughing (Low Cutting Force)	Continuous Interruption	PX (Single-sided)	CA115P CA125P	1.2 1.6	120 - 180 - 230 100 - 150 - 200	2.0 - 5.0 - 8.0 2.0 - 5.0 - 8.0	0.4 - 0.6 - 0.8 0.3 - 0.5 - 0.7
	High carbon alloy	HB ≤ 280	Finishing (High Speed Machining)	Continuous	PP	CCX	0.8	200 - 300 - 400	0.2 - 0.5 - 1.5	0.04 - 0.16 - 0.28
			Finishing (Gloss Oriented)	Continuous Interruption	PP	TN610 TN620	0.4 0.8	150 - 200 - 280 140 - 180 - 240	0.2 - 0.5 - 1.5 0.2 - 0.5 - 1.5	0.04 - 0.16 - 0.28 0.05 - 0.2 - 0.35
			Finishing (Tool Life Oriented)	Continuous Interruption	PP	PV710 CA125P	0.4 0.8	120 - 180 - 260 100 - 150 - 200	0.2 - 0.5 - 1.5 0.2 - 0.5 - 1.5	0.04 - 0.16 - 0.28 0.05 - 0.2 - 0.35
			Finishing - Medium	Continuous Interruption	PQ	CA115P CA125P	0.8 0.8	120 - 160 - 220 100 - 140 - 180	0.5 - 1.5 - 2.5 0.5 - 1.5 - 2.5	0.15 - 0.25 - 0.3 0.15 - 0.2 - 0.25
			Medium - Roughing	Continuous Interruption	PMG	CA115P CA125P	0.8 0.8	120 - 150 - 200 100 - 130 - 180	1.0 - 2.0 - 3.0 1.0 - 2.0 - 3.0	0.2 - 0.3 - 0.5 0.15 - 0.2 - 0.3
			Roughing High Feed Rate	Continuous Interruption	PH	CA115P CA125P	1.2 1.6	100 - 140 - 180 80 - 120 - 160	2.0 - 5.0 - 8.0 2.0 - 5.0 - 8.0	0.4 - 0.6 - 0.8 0.3 - 0.5 - 0.7
			Roughing (Low Cutting Force)	Continuous Interruption	PX (Single-sided)	CA115P CA125P	1.2 1.6	100 - 140 - 180 80 - 120 - 160	2.0 - 5.0 - 8.0 2.0 - 5.0 - 8.0	0.4 - 0.6 - 0.8 0.3 - 0.5 - 0.7



External turning

External turning - Negative insert

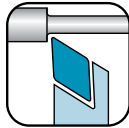
ap indicates radius

ISO Classification	Workpiece material	Hardness	Cutting range	Applications	Recommended chipbreaker	Recommended insert grade	Corner-R(RE)	Lower limit - Recommendation - Upper limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
M	Stainless steel (Austenitic related)	HB ≤ 220	Finishing (Gloss Oriented)	Continuous	PQ	TN620	0.8	120 - 160 - 200	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2
				Interruption			0.8	100 - 120 - 150	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.15
			Finishing	Continuous	MQ	CA6515	0.4	120 - 180 - 240	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2
				Interruption		CA6525	0.8	100 - 160 - 220	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.15
			Medium - Roughing (Chip Control Oriented)	Continuous	MS	CA6515	0.4	120 - 160 - 200	1.0 - 2.0 - 3.0	0.1 - 0.2 - 0.3
				Interruption		CA6525	0.8	80 - 140 - 180	1.0 - 2.0 - 3.0	0.2 - 0.3 - 0.4
			Medium - Roughing (Sharpness Oriented)	Continuous	MU	CA6515	0.4	120 - 160 - 200	1.0 - 2.0 - 3.0	0.15 - 0.25 - 0.35
				Interruption		CA6525	0.8	80 - 140 - 180	1.0 - 2.0 - 3.0	0.15 - 0.25 - 0.3
	Roughing	Continuous	Standard	CA6515	0.8	100 - 140 - 180	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4		
		Interruption		CA6525	1.2	80 - 120 - 150	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4		
	Stainless steel (Precipitation hardening)	HB ≤ 300	Finishing (Gloss Oriented)	Continuous	PQ	TN620	0.8	100 - 120 - 150	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.15
				Interruption			0.8	80 - 100 - 120	0.5 - 1.0 - 1.5	0.05 - 0.08 - 0.1
			Finishing	Continuous	MQ	CA6515	0.4	100 - 120 - 150	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2
				Interruption		CA6525	0.8	80 - 100 - 120	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.15
			Medium - Roughing (Chip Control Oriented)	Continuous	MS	CA6515	0.4	100 - 120 - 150	1.0 - 1.5 - 2.0	0.1 - 0.15 - 0.25
				Interruption		CA6525	0.8	80 - 100 - 120	1.0 - 2.0 - 3.0	0.1 - 0.15 - 0.2
Medium - Roughing (Sharpness Oriented)			Continuous	MU	CA6515	0.4	100 - 120 - 150	1.0 - 1.5 - 2.0	0.1 - 0.15 - 0.25	
			Interruption		CA6525	0.8	80 - 100 - 120	1.0 - 2.0 - 3.0	0.1 - 0.15 - 0.2	
Roughing	Continuous	Standard	CA6515	0.8	80 - 100 - 120	1.0 - 2.0 - 3.0	0.2 - 0.3 - 0.4			
	Interruption		CA6525	1.2	60 - 80 - 100	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4			
K	Gray cast iron	HB ≤ 250	High Speed Machining	Continuous	Without chipbreaker	KBN475	0.8	400 - 800 - 1200	0.05 - 0.2 - 0.5	0.1 - 0.2 - 0.3
				Continuous		KBN900	1.2	500 - 900 - 1200	0.1 - 0.5 - 1.0	0.05 - 0.1 - 0.2
				Interruption		KBN900	1.2	500 - 700 - 900	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.2
			Finishing (Gloss Oriented)	Continuous	Standard	PV7005	0.8	300 - 350 - 400	0.5 - 1.0 - 1.5	0.1 - 0.2 - 0.3
				Interruption		PV720	0.8	150 - 200 - 300	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2
			Finishing (Ceramic)	Continuous	Without chipbreaker	KA30	1.2	300 - 500 - 700	0.3 - 0.5 - 1.0	0.1 - 0.2 - 0.3
				Continuous		PT600M	0.8	300 - 450 - 600	0.3 - 0.5 - 1.0	0.1 - 0.2 - 0.3
			Medium (Ceramic)	Continuous		CS7050	1.2	300 - 450 - 550	1.0 - 2.0 - 3.0	0.15 - 0.25 - 0.35
				Interruption		KS6050	1.2	250 - 400 - 500	1.0 - 2.0 - 3.0	0.15 - 0.2 - 0.3
			Medium	Continuous	KH	CA310	0.8	200 - 250 - 300	0.5 - 2.0 - 2.5	0.1 - 0.2 - 0.3
	Interruption			CA315	1.2	150 - 200 - 250	0.5 - 2.0 - 2.5	0.08 - 0.15 - 0.2		
	Roughing	Continuous	KH	CA310	0.8	200 - 250 - 300	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4		
		Interruption		CA315	1.2	150 - 200 - 250	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4		
	Nodular cast iron	HB ≤ 270	High Speed Machining	Continuous	Without chipbreaker	KBN60M	0.4	200 - 300 - 400	0.1 - 0.3 - 0.5	0.1 - 0.15 - 0.2
				Continuous		PT600M	0.8	200 - 250 - 350	0.1 - 0.5 - 1.0	0.1 - 0.2 - 0.4
			Finishing (Gloss Oriented)	Continuous	Standard	PV7005	0.8	150 - 250 - 300	0.5 - 1.0 - 1.5	0.1 - 0.2 - 0.3
Interruption					PV720	0.8	120 - 200 - 250	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2	
Medium			Continuous	KG	CA310	0.8	150 - 200 - 250	0.5 - 2.0 - 2.5	0.1 - 0.2 - 0.3	
			Interruption		CA315	1.2	120 - 180 - 220	0.5 - 2.0 - 2.5	0.08 - 0.15 - 0.2	
Roughing	Continuous	KG	CA315	0.8	150 - 200 - 250	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4			
	Interruption	KH	CA310	0.8	120 - 180 - 220	1.0 - 2.0 - 4.0	0.2 - 0.3 - 0.4			
N	Non-ferrous metals Copper alloy Aluminum Aluminum alloys	HB ≤ 100	High Speed Machining (Rainbow Surface Gross)	Continuous	Without chipbreaker	KPD001	0.4	300 - 800 - 2000	0.05 - 0.5 - 1.0	0.05 - 0.1 - 0.15
				Continuous						
			Finishing (Long Tool Life)	Continuous	A3	PDL025	0.4	400 - 500 - 700	0.5 - 1.0 - 2.0	0.1 - 0.2 - 0.25
				Interruption			0.8	400 - 500 - 700	0.5 - 1.0 - 2.0	0.1 - 0.2 - 0.25
			Finishing	Continuous	A3	KW10	0.8	400 - 500 - 700	0.5 - 1.0 - 2.0	0.1 - 0.2 - 0.25
Interruption				0.8	400 - 500 - 700	0.5 - 1.0 - 2.0	0.1 - 0.2 - 0.25			
Medium	Continuous	AH	KW10	0.8	200 - 300 - 500	1.0 - 2.0 - 3.5	0.1 - 0.3 - 0.4			
	Interruption			0.8	200 - 300 - 500	1.0 - 2.0 - 3.5	0.1 - 0.3 - 0.4			
S	Titanium alloys	HB ≤ 400	Precision Finishing (Rainbow Surface Gross)	Continuous	Without chipbreaker	KPD001	0.4	100 - 150 - 180	0.05 - 0.3 - 0.5	0.03 - 0.1 - 0.15
				Interruption			0.4	70 - 120 - 150	0.05 - 0.3 - 0.5	0.03 - 0.07 - 0.1
			Finishing	Continuous	MQ	SW05	0.4	40 - 70 - 100	0.2 - 0.5 - 1.0	0.05 - 0.2 - 0.3
				Interruption			0.4	40 - 70 - 100	0.2 - 0.5 - 1.0	0.05 - 0.15 - 0.2
			Medium	Continuous	MU	SW05	0.8	40 - 60 - 80	0.5 - 1.0 - 3.0	0.1 - 0.25 - 0.35
	Interruption				0.8	40 - 60 - 80	0.5 - 1.0 - 3.0	0.1 - 0.2 - 0.3		
	Heat-resistant alloys	HB ≤ 350	Finishing	Continuous	MQ	PR005S	0.4	30 - 55 - 90	0.2 - 0.3 - 1.0	0.05 - 0.08 - 0.15
				Interruption		PR120S	0.8	25 - 45 - 70	0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2
			Medium	Continuous	SQ	PR005S	0.8	30 - 55 - 90	0.3 - 0.5 - 1.5	0.1 - 0.17 - 0.35
				Interruption		PR120S	0.8	25 - 45 - 70	0.3 - 0.5 - 1.5	0.1 - 0.17 - 0.35
Roughing			Continuous	SX	PR005S	-	30 - 55 - 90	0.5 - 2.0 - 4.0	0.15 - 0.3 - 0.45	
	Interruption		PR120S	-	25 - 45 - 70	0.5 - 2.0 - 4.0	0.15 - 0.3 - 0.45			
H	Hardened steel Hard materials	40-50 HRC	Finishing	Continuous	PQ	CA115P	0.8	60 - 100 - 120	0.1 - 0.3 - 0.5	0.05 - 0.08 - 0.1
				Interruption	Standard		0.8	30 - 50 - 70	0.1 - 0.3 - 0.5	0.05 - 0.08 - 0.1
		40-50 HRC 50-65 HRC	Finishing	Continuous	Without chipbreaker	PT600M	0.8	60 - 80 - 100	0.2 - 0.5 - 0.7	0.05 - 0.1 - 0.15
				Continuous			1.2	30 - 40 - 60	0.2 - 0.5 - 0.7	0.05 - 0.1 - 0.15
		50-68 HRC	Finishing	Continuous	ME	KBN010	0.8	100 - 150 - 200	0.05 - 0.3 - 0.5	0.05 - 0.08 - 0.1
				Interruption	MET	KBN020	1.2	90 - 140 - 180	0.05 - 0.3 - 0.5	0.05 - 0.08 - 0.1
Medium	Continuous	Without chipbreaker	KBN900	1.2	80 - 100 - 120	0.5 - 1.0 - 2.0	0.05 - 0.1 - 0.2			
	Interruption			Radius	70 - 90 - 110	0.3 - 0.7 - 1.0	0.05 - 0.1 - 0.15			



External turning



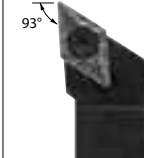


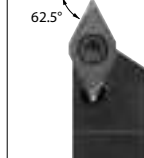

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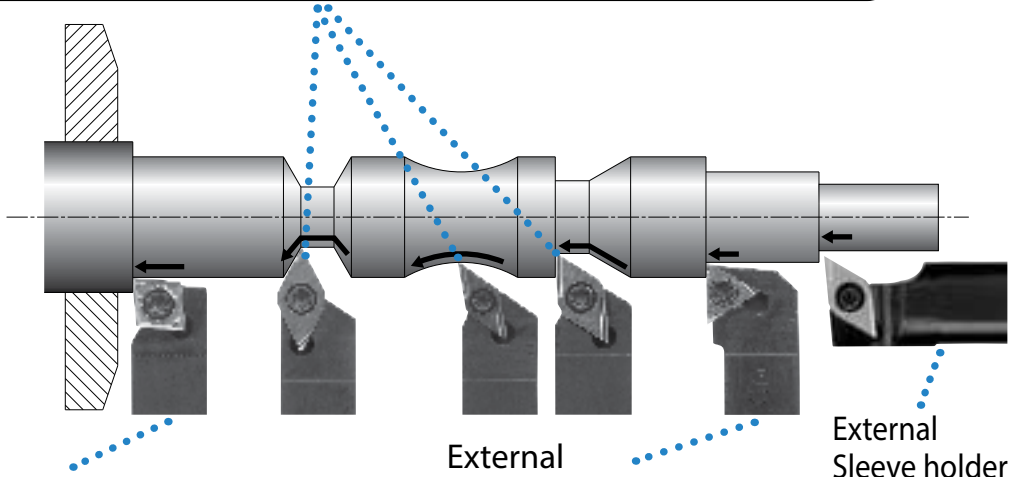


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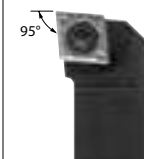
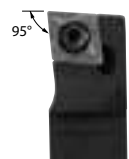
Summary of External turning

External / Copying

						
ADJC-FF	SDJC-FF(JCTM) SDJC-FF-Y	SDJC	SDLC-FF SDLP-FF	SDLN-FF	SDNC-F	SDNC
Back clamp Without offset	Screw clamp Without offset	Screw clamp	Screw clamp Without offset	Screw clamp Without offset	Screw clamp	Screw clamp
➔ E29	➔ E29, E30, E32	➔ E31	➔ E34, E37	➔ E61	➔ E35	➔ E35




External / Facing

			
ACLFC-FF	SCLC-FF(JCTM)	SCLC	SCLN-FF
Back clamp Without offset	Screw clamp Without offset	Screw clamp	Screw clamp Without offset
➔ E26	➔ E26, E27	➔ E28	➔ E60

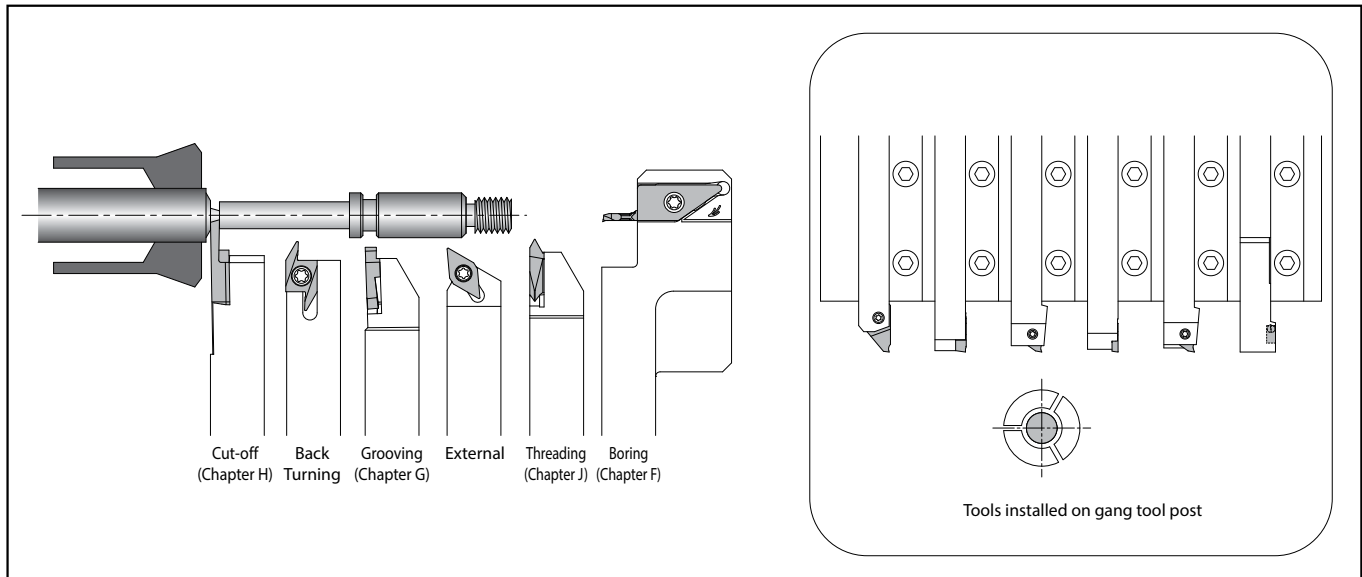
External

	
STGC(P)	STLN-FF
Screw clamp	Screw clamp Without offset
➔ E38, E39	➔ E62

External Sleeve holder

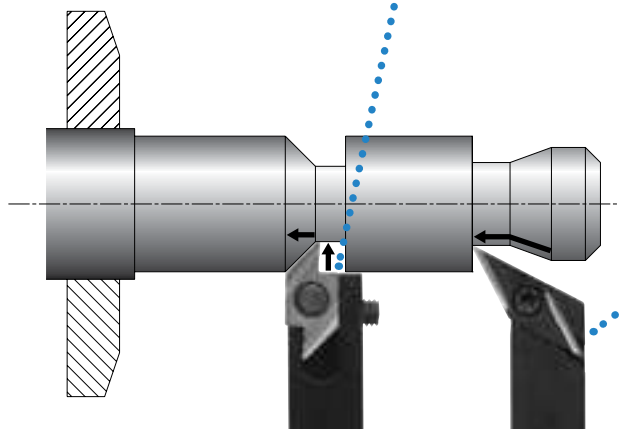

S-SDLC
Screw clamp Shank dia. ø12~ø25.4
➔ E56

Tooling example (1) CNC Automatic lathe (Gang type)



Back turning

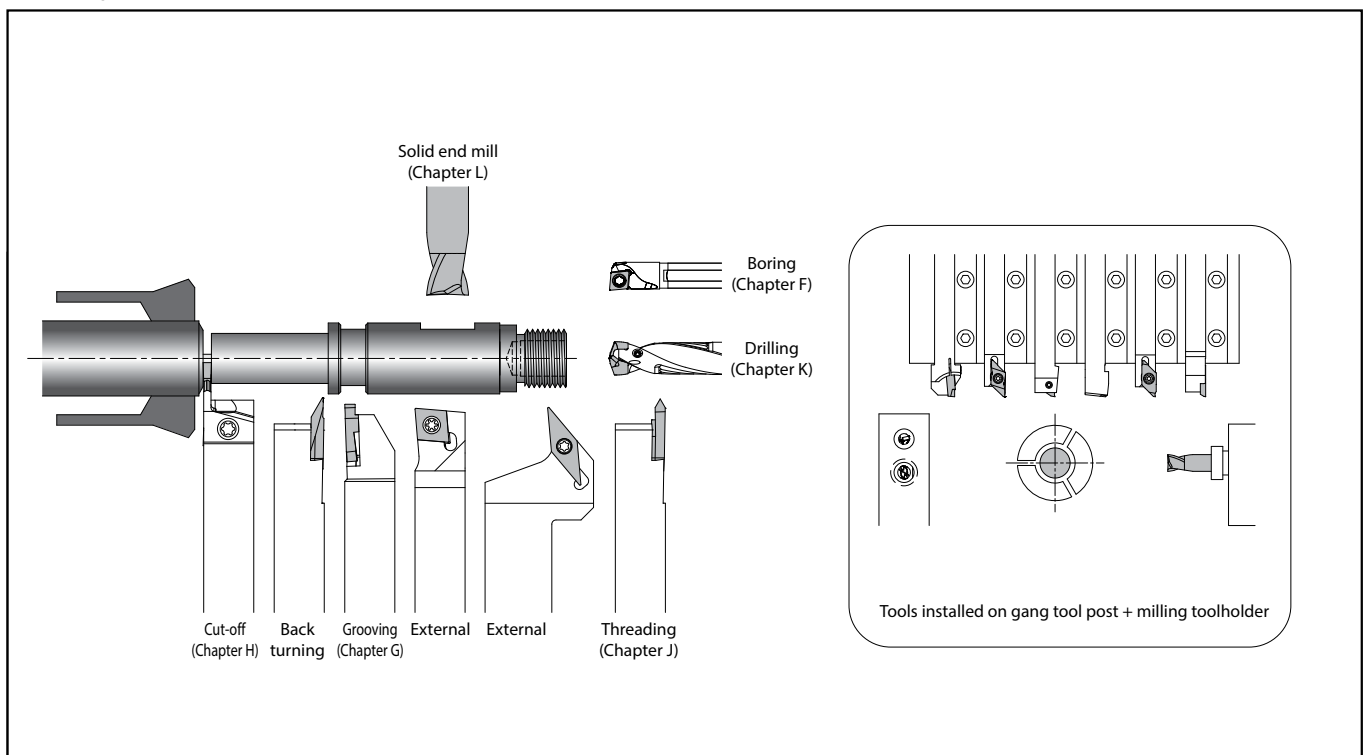
AABS-40F	SABS-40F	AABW-40F	SABW-40F	AABW-50F	SABW-50F	KTKF
Back clamp Edge width : 2.8 ap : ~4.0	Screw clamp Edge width : 2.8 ap : ~4.0	Back clamp Edge width : 4.7 ap : ~4.0	Screw clamp Edge width : 4.7 ap : ~4.0	Back clamp Edge width : 4.7 ap : ~5.0	Screw clamp Edge width : 4.7 ap : ~5.0	Screw clamp Edge width : 1.5~3.8 Max. ap : 1.8~5.5



External / Facing / Copying / Undercutting

SVPB	SVPP-FF
Screw clamp	Screw clamp Without offset

Tooling example (2) CNC Automatic lathe (Gang type)



How to use goose-neck holder for swiss tool automatic lathe (Gang type tool post)



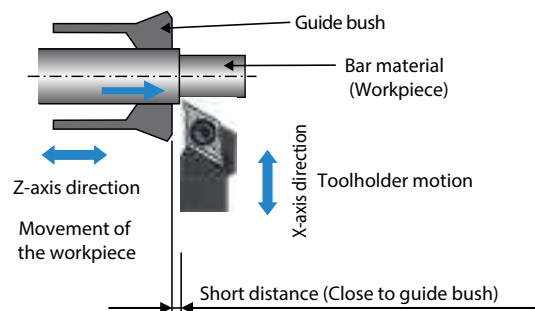
E

Swiss tool automatic lathe (Guide bush system)

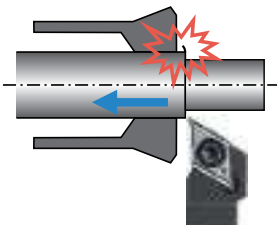
Goose-neck holder is applicable to automatic lathes whose toolholder does not move to longitudinal direction (Z-axis direction).

In case of machining with the conventional toolholder

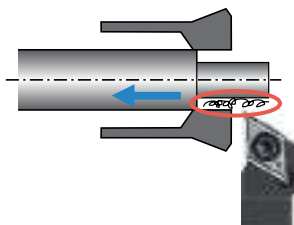
Goose-neck holder is applicable to automatic lathe that toolholder does not move to longitudinal direction (Z-axis direction)



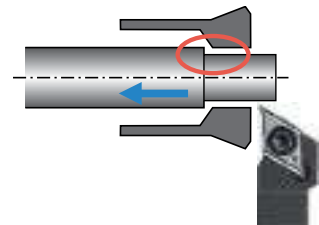
Problems of machining with the conventional toolholder



Case 1
During multiple passes, when bar material returns into guide bush, the burr contacts and breaks guide bush.



Case 3
During multiple passes, when bar material returns into guide bush, the chips contacts and breaks guide bush.



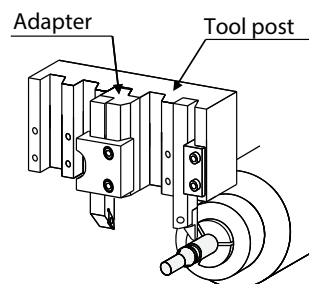
Case 4
Bar material deviation from the guide bush disables machining.

Case 2
The workpiece burr contacts the guide bush and causes dimensional variation.

Problems of toolholder Installation

When using a conventional toolholder

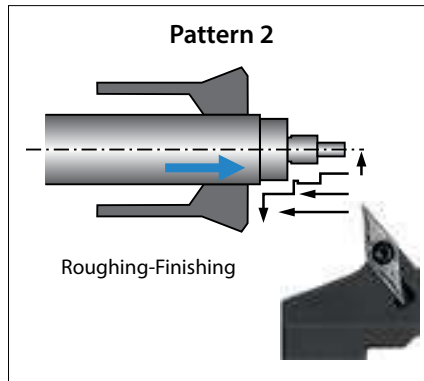
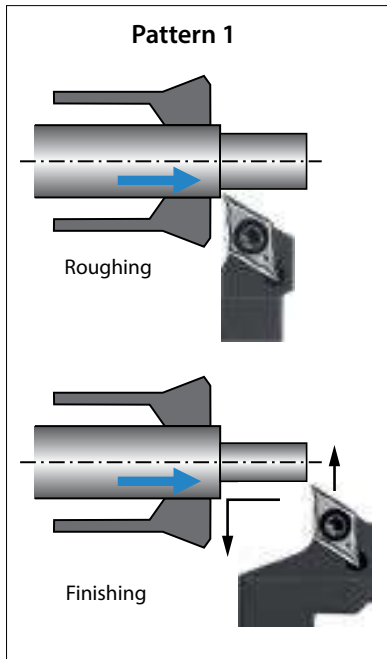
1. Additional space is required for an adapter.
2. Toolholder's handling is difficult due to limited space.
3. Necessary to buy an adapter.
4. An adapter may interfere with the next tool post.



Advantages of goose-neck holder

When using goose-neck holder

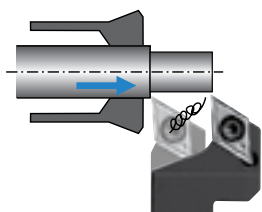
1. Machining precision improves by additional finishing process.
2. Chips do not come into the guide bush.
3. Better chip control due to large chip evacuation space.



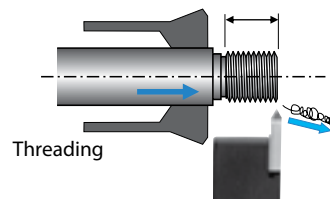
Available for roughing and finishing with one Goose-neck holder.

Available for machining after roughing without returning bar material into guide bush, preventing damages and improving precision.

For better chip control



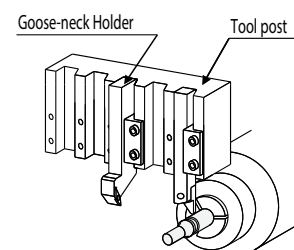
Optimum cutting edge position and large space for efficient chip evacuation.



With conventional threading toolholders, chip biting into guide bush can cause damages on threads.

Advantages of Toolholder installation - When using a goose-neck holder

1. Maximum number of toolholders can be attached.
2. No interference with next tool post.



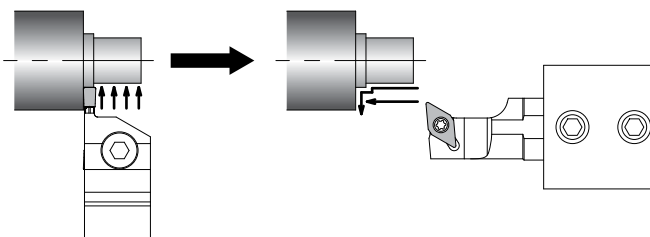
Summary of External turning

External sleeve holder

S-SCLC	S-SDUC	S-SDLC	S-SVUB(C)	
Screw clamp Shank dia. $\phi 12 \sim \phi 25.4$	Screw clamp Shank dia. $\phi 14 \sim \phi 25.4$	Screw clamp Shank dia. $\phi 12 \sim \phi 25.4$	Screw clamp Shank dia. $\phi 12 \sim \phi 25.4$	

For tooling layout and automatic lathe list by manufacturer, See page

● Finishing by sleeve holder



- 1) Roughing by grooving toolholder
- 2) Finishing by sleeve holder improves chip control and reduces cutting time

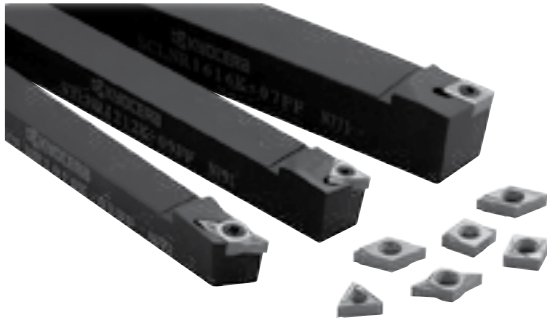
Small tools

Tooling example (3) CNC automatic lathe (Opposed gang type)

- External / Facing
- External / Copying
- Grooving
- Threading
- Boring

For tooling layout and automatic lathe list by manufacturer, See page

Toolholders for small double sided tooling (Screw clamp)



Applications	External / Facing	External / Up Facing	External / Copying
Cutting edge angle	95°	95°	95°
Screw clamp (Without offset)			
See page	E60	E62	E61

Newly designed negative inserts (double-sided) enable high productivity and stability by economical doubled insert edge numbers
Sharp cutting equivalent to positive inserts (single-sided)

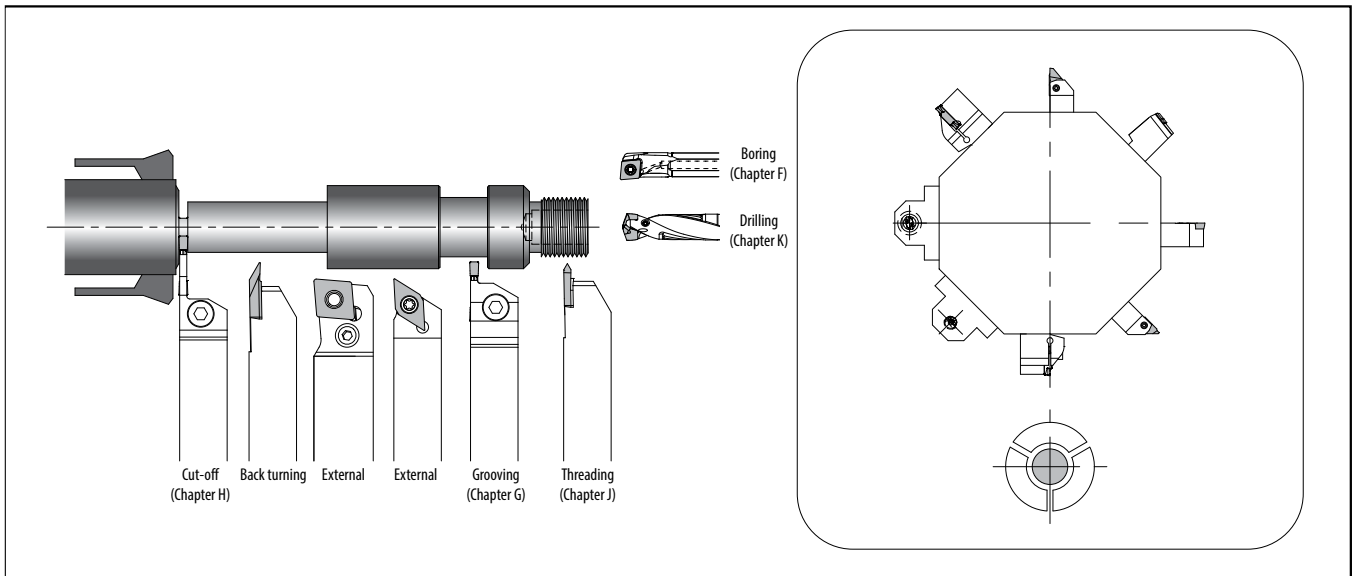
Toolholder for double sided tooling for automatic lathe (Lever Lock, Without Offset)



Applications	External / Facing	External / Up Facing
Cutting edge angle	95°	95°
Lever lock (Without offset)		
See page	E63	E64

The lever lock type is available for small parts machining for external machining

Tooling example (4)



For tooling layout and automatic lathe list by manufacturer, See page [R46~R54](#)



JCTM Series direct coolant holder for small parts machining

JCTM Series

Applicable to different supply styles.

Supports internal coolant with/without piping system.

Lineup of turning, grooving (KGBF), and cut-off (KGZ/KGD/KTKF) holders

E



Small tools

1 Using internal coolant to enhance tool performance



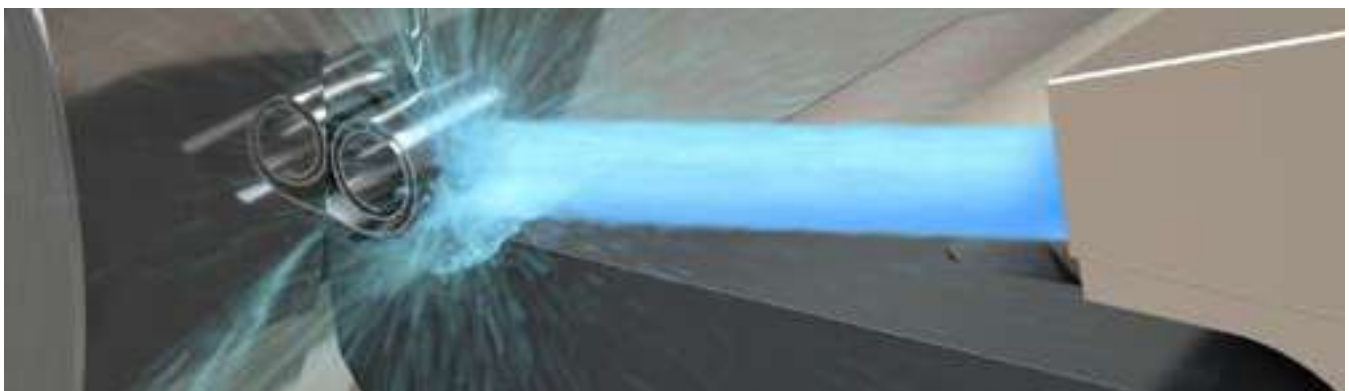
CG Image

Challenges

- Difficulty in automatic operation due to sudden chip entanglement
- Insert change is not enough to extend tool life

Solution

- The JCTM series is compatible with internal coolant supply system in a wide range of machines and also works under normal pressure
- Reduces down time by improving chip control and reduces cost by extending tool life



CG Image

Switching to internal coolant toolholder reduces chip entanglement

Internal coolant (2.5 MPa)



External coolant



Pin Alloy tool steel (SKS93, JIS)

Vc = 180 m/min, ap = 1.4 mm
 f = 0.13 mm/rev, wet
 SDJC / DCMT11T304 type (User evaluation)

2 Applicable to different supply styles. Supports internal coolant with/without piping system

Internal coolant without piping

*When the tool turret supports direct coolant



Coolant is supplied directly from tool turret into the holder. No need for piping just by installing tools

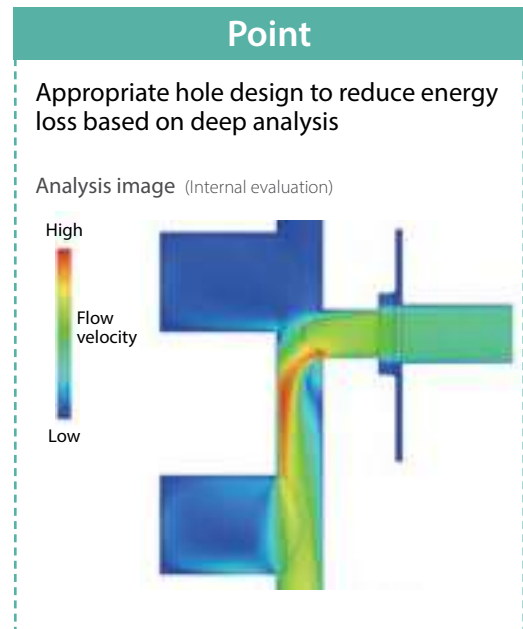
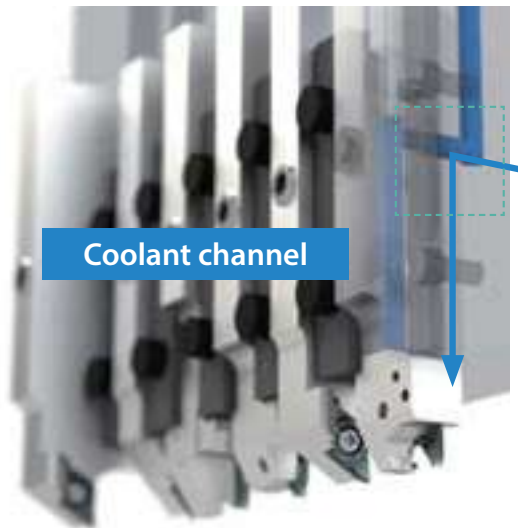
Applicable to wide range of machines

The tool turret is optional. Please contact our company sales representative for details.

CITIZEN MACHINERY CO., LTD. (L20, D25, M32)
STAR MICRONICS CO., LTD. (SB-R series, SR series, SV series)
TSUGAMI CORPORATION (S205/206-II □16 type, S205A/206A-II □16 type)

Compatible with various machine including the above. Toolholders can be customized as well.

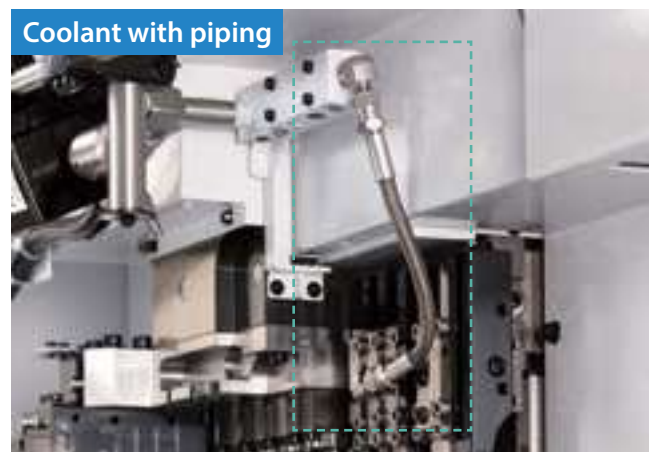
(Random order)
Based on Kyocera survey in January 2021



Internal coolant with piping

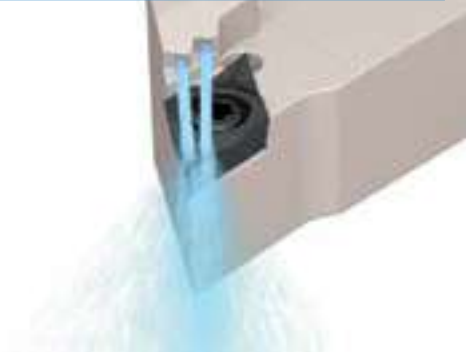
Compatible with internal coolant on any machine with standard piping parts

Commercial piping parts are available when using at normal pressure



3 Large lineup for various tooling operations

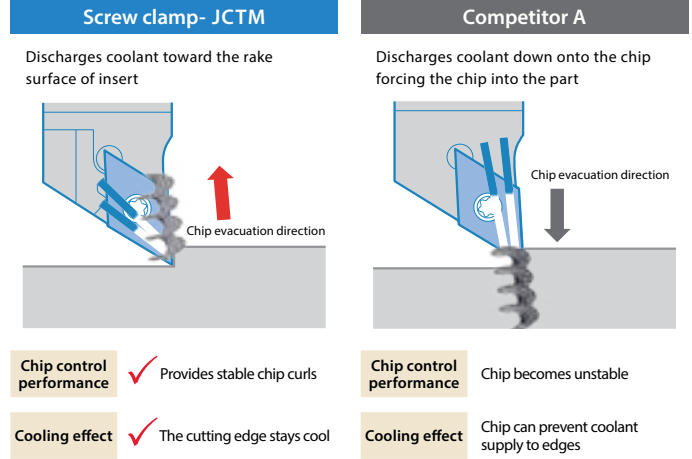
Turning Screw clamp - JCTM



- **Double coolant holes**
Provide coolant toward the rake face of the insert
(V Type □12: Single hole)

- **Lineup**
SCLC-JCTM / SDJC-JCTM
SVJB-JCTM / SVJP-JCTM

Coolant supply structure comparison (Internal evaluation) (Image)



External grooving KGBF-JCTM



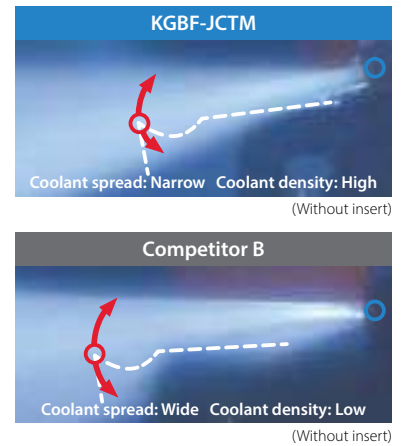
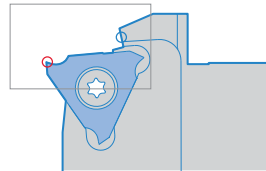
- Provides coolant toward the rake surface of insert

- **Specification**
Edge width: 0.25 -3 mm
Ground chipbreaker/3D GL chipbreaker
Maximum groove depth: 3 mm

Coolant discharging comparison (Internal evaluation)

Small chips and better cooling of the insert leads to longer tool life.

- Cutting edge
- Coolant hole

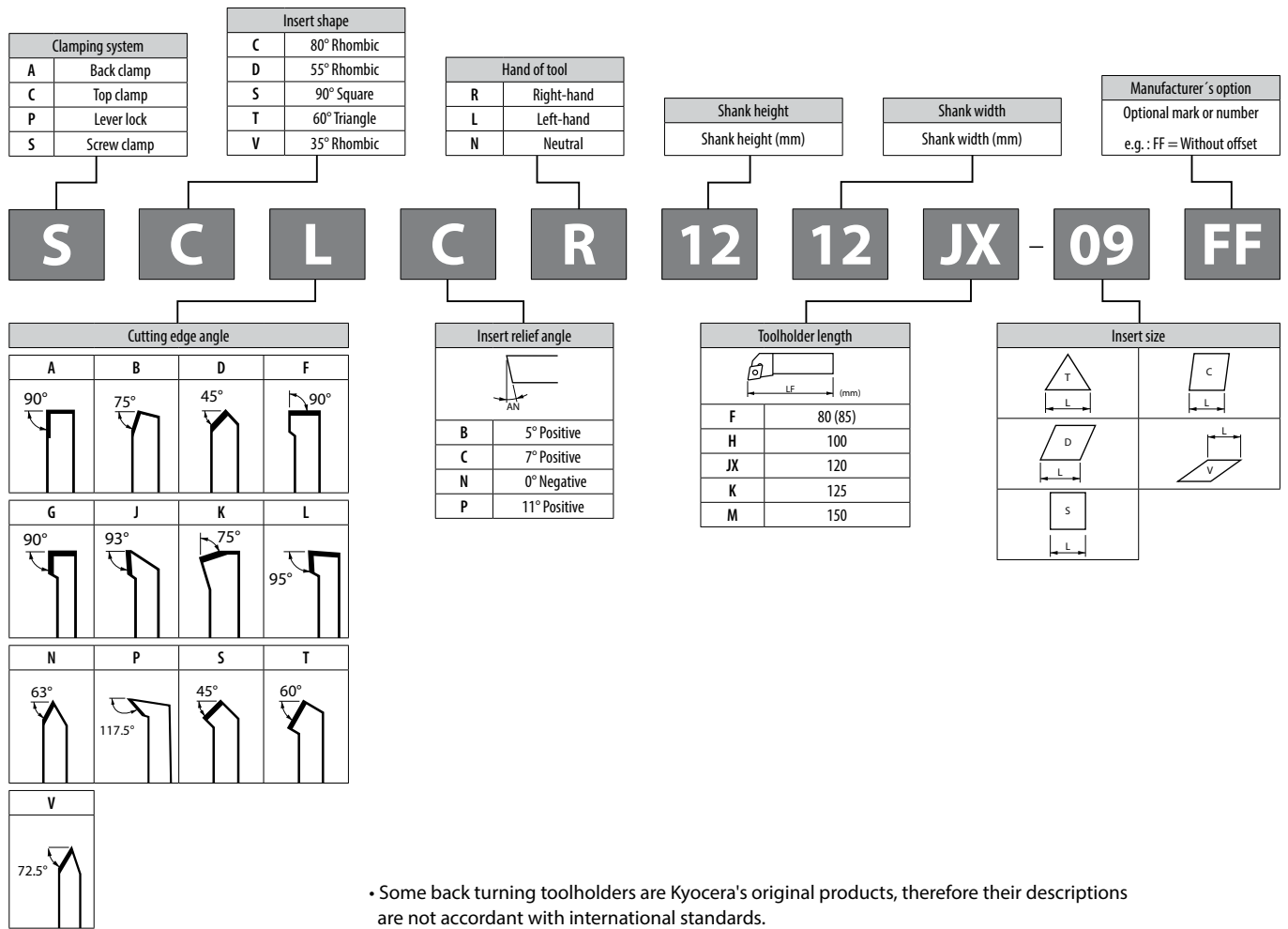


E

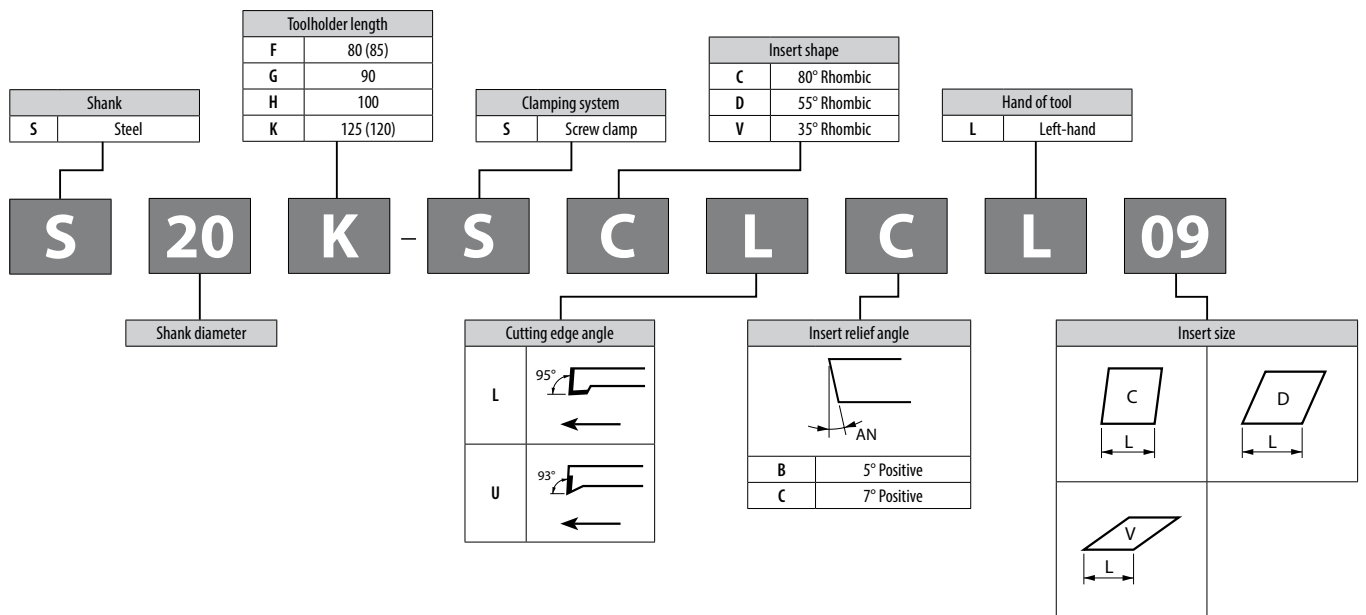


Small tools

Square shank identification system (small tools)


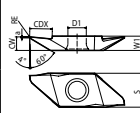

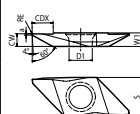

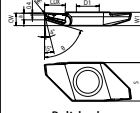

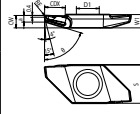

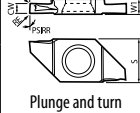

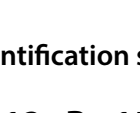
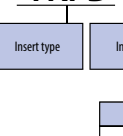
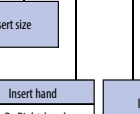


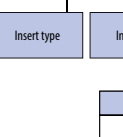
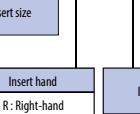


External sleeve holder identification system



- Specification may change without any prior notice.
- Due to the installation size constraints on the machine, the toolholder length of some products may not match with the symbol.

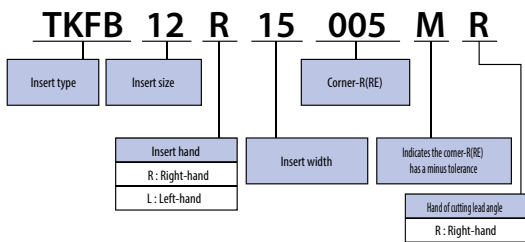
TKF / TKFB

Insert		Description	No. of edges	Dimension (mm)							Angle (°)		Carbide			Applicable toolholder E15, E16
				CW	CDX	S	D1	RE	W1	a	PSIR%	θ	PVD	-		
														PR1225	PR1535		PR1725	KV10
				Carbon steel / Alloy steel							☺ ☹		☹ ☺		P	
				Stainless steel							☺ ☹		☹ ☺		M	
				Gray cast iron							☹ ☺		☹ ☺		K	
				Non-ferrous metals							☹ ☺		☹ ☺		N	
		TKFB 12R15005M	2	1.5	2.6	8.7	5.2	< 0.05	3	0.25	-	-	●	●	●	KTKFR...-12 KTKFR...-12-Y
		TKFB 12R28005M	2	2.8	4.6	8.7	5.2	< 0.05	3	0.3	-	-	●	●	●	
TKFB 12R28010M	2	2.8	4.6	8.7	5.2	< 0.1	3	0.3	-	-	-	●	●	●		
		TKFB 16R38005M	2	3.8	6.3	9.5	5.2	< 0.05	4	0.3	-	-	●	●	●	KTKFR...-16
		TKFB 16R38010M	2	3.8	6.3	9.5	5.2	< 0.1	4	0.3	-	-	●	●	●	
		TKFB 12L28005MR	2	2.8	4.6	8.7	5.2	< 0.05	3	0.3	-	-	●	●	●	KTKFL...-12
		TKFB 12L28010MR	2	2.8	4.6	8.7	5.2	< 0.1	3	0.3	-	-	●	●	●	
		TKFB 16L38005MR	2	3.8	6.3	9.5	5.2	< 0.05	4	0.3	-	-	●	●	●	KTKFL...-16
		TKFB 16L38010MR	2	3.8	6.3	9.5	5.2	< 0.1	4	0.3	-	-	●	●	●	
		TKFB 12R28005P-GQ	2	2.8	4.6	8.7	5.2	0.05	3	1.5	-	74	●	●	●	KTKFR...-12 KTKFR...-12-Y
		TKFB 12R28015P-GQ	2	2.8	4.6	8.7	5.2	0.15	3	1.5	-	74	●	●	●	
		TKFB 16R38005P-GQ	2	3.8	6.3	9.5	5.2	0.05	4	1.8	-	72	●	●	●	KTKFR...-16
		TKFB 16R38015P-GQ	2	3.8	6.3	9.5	5.2	0.15	4	1.8	-	72	●	●	●	
		TKFB 12R28005-GQ	2	2.8	4.6	8.7	5.2	0.05	3	1.5	-	74	●	●	●	KTKFR...-12 KTKFR...-12-Y
		TKFB 12R28015-GQ	2	2.8	4.6	8.7	5.2	0.15	3	1.5	-	74	●	●	●	
		TKFB 16R38005-GQ	2	3.8	6.3	9.5	5.2	0.05	4	1.8	-	72	●	●	●	KTKFR...-16
		TKFB 16R38015-GQ	2	3.8	6.3	9.5	5.2	0.15	4	1.8	-	72	●	●	●	
		TKF 12R200-GTP	2	2	4.3	8.7	5	0.08	3	-	0	-	●	●	●	KTKFR...-12 KTKFR...-12-Y
		TKF 16R300-GTP	2	3	5.8	9.5	5	0.08	4	-	0	-	●	●	●	

Recommended cutting conditions E67

Small tools

Inserts identification system (Ref. to Tables 1 and 2)



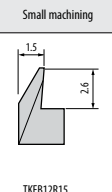
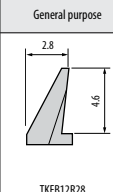
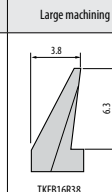
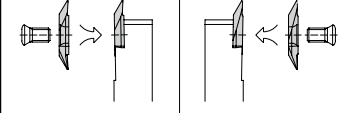
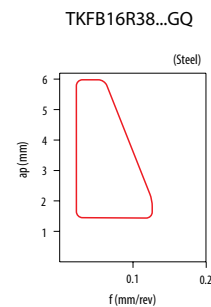
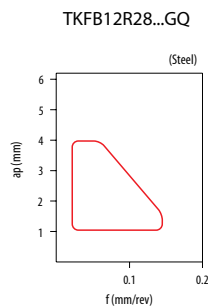
Small machining	General purpose	Large machining
 TKFB12R15.	 TKFB12R28.	 TKFB16R38.

Table 2	
Toolholder	Right-hand / Left-hand
Insert	Right-hand / Left-hand
Lead angle	Right-hand / Left-hand



Applicable chipbreaker range



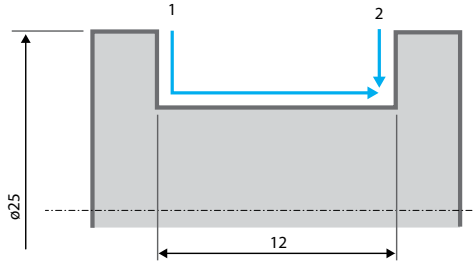
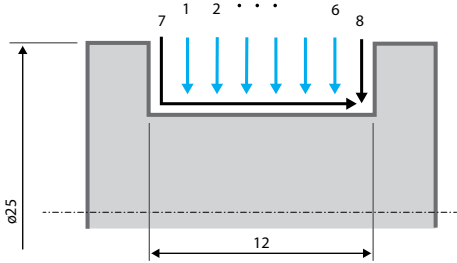
●: Standard item R: Right-hand only L: Left-hand only □: Check availability

GTP chipbreaker - Grooving and Turning available

Cutting time comparison (Internal evaluation)

Competitor A
Multiple grooves and a finishing pass
Workpiece material : C45(ø25)

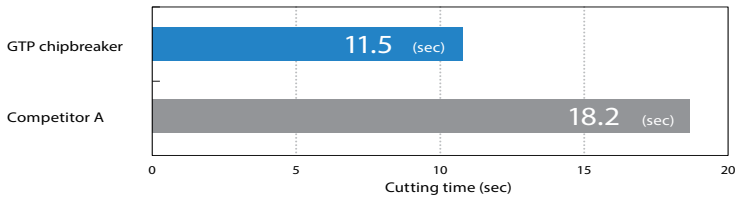
TKF12R200-GTP
Grooving and Turning
Workpiece material : C45(ø25)



Cutting conditions: Multiple grooves
Vc=100m/min
ap=3.5mm, f=0.10mm/rev

Cutting conditions: Finishing
Vc=100m/min
ap=0.5mm, f=0.05mm/rev

Cutting conditions: Grooving and Turning
Vc=100m/min
ap=4mm, f=0.05mm/rev



GTP chipbreaker required fewer machining paths than competitor



Cutting time reduction

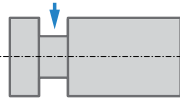
E
Small tools

Chip control comparison (Internal evaluation)

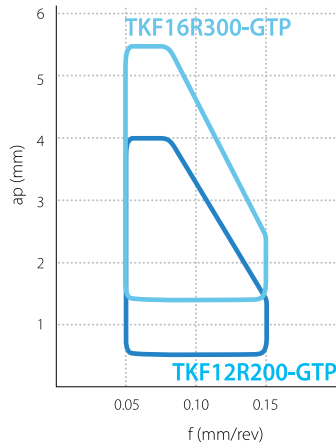
Grooving

f (mm/rev)	0.05	0.07	0.10
TKF12R200-GTP			
Competitor B			

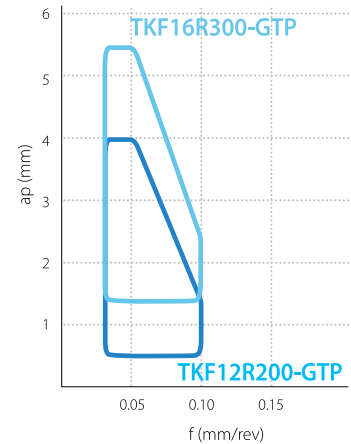
Cutting conditions: Vc=100m/min, ap=4mm, Wet
Workpiece material: C45 (ø25)



Recommended chipbreaker range (Steel)

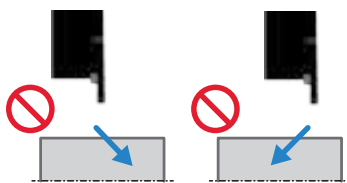


Recommended chipbreaker range (Stainless steel)



Caution for machining

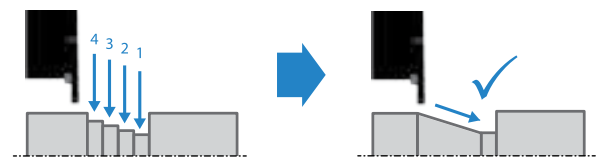
Ramping



Ramping is not recommended if the workpiece is not pre-machined as shown in the right gures

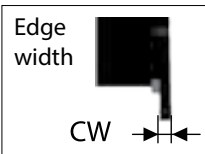
Tips for ramping

Step grooving is required before ramping. (Refer to the gure below)



CW >


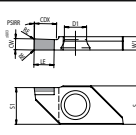

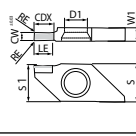

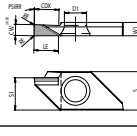
*The width of the groove must be smaller than the edge width to overlap the previous groove



Back turning is not recommended on the tapered surface.



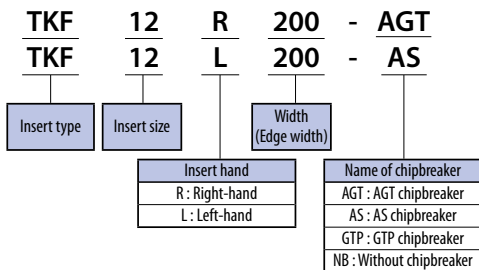
TKF

Insert		Description	No. of edges	Dimension (mm)							Angle (°)	Tolerance				PCD	Applicable toolholder E15, E16		
				CW	CDX	S	S1	D1	RE	LE		W1	PSIR%/L	CW min.	CW max.			RE (+/-) min.	RE (+/-) max.
				Carbon steel / Alloy steel								P							
				Stainless steel								M							
				Gray cast iron								K							
				Non-ferrous metals								N							
		TKF12R 150-NB	1	1.5	3.5	8.7	8.3	5	0.1	2	3	3	0	-0.03	+0.03	-0.05	0	●	KTKFR...-12 KTKFR...-12-Y
		200-NB	1	2	4	8.7	8.3	5	0.1	3	3	3	0	-0.03	+0.03	-0.05	0	●	
		250-NB	1	2.5	4	8.7	8.3	5	0.1	3	3	3	0	-0.03	+0.03	-0.05	0	●	
			1	2	4.8	8.7	8.3	5	0.1	4.2	3	3	0	-0.03	+0.03	-0.05	0	●	
		TKF12R 200-AGT	1	2	4.8	8.7	8.3	5	0.1	4.2	3	3	0	-0.03	+0.03	-0.05	0	●	KTKFR...-12 KTKFR...-12-Y
		250-AGT	1	2.5	4.8	8.7	8.3	5	0.1	4.2	3	3	0	-0.03	+0.03	-0.05	0	●	
		TKF12R 200-AS	1	2	5	8.7	7.3	5	0.1	5.3	3	3	0	-0.03	+0.03	-0.05	0	●	KTKF [®] /L...-12 KTKFR...-12-Y
		250-AS	1	2.5	5	8.7	7.3	5	0.1	5.3	3	3	0	-0.03	+0.03	-0.05	0	●	
		TKF12L 200-AS	1	2	5	8.7	7.3	5	0.1	5.3	3	3	0	-0.03	+0.03	-0.05	0	●	
		TKF16R 250-AS	1	2.5	8	9.5	8	5	0.1	6.3	4	4	0	-0.03	+0.03	-0.05	0	●	
		TKF16L 250-AS	1	2.5	8	9.5	8	5	0.1	6.3	4	4	0	-0.03	+0.03	-0.05	0	●	

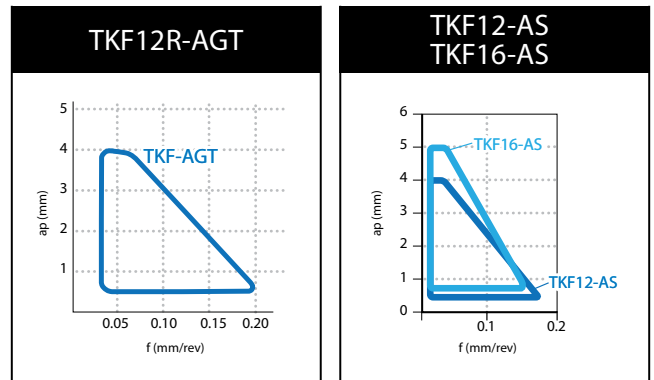
Recommended cutting conditions E17

Small tools

Inserts identification system



Applicable range



* PCD Inserts for turning and grooving

* Not recommended for cut-off

Note 1) The cutting edge of the TKF-AS / -ASR will be 1 mm lower than the center line when attached to the KTKF toolholder (Ref. to Fig. 2).

Adjust the height by making NC lathe parameter settings or inserting a plate.

2) If the 1 mm adjustment is not possible, use the TKF...-AGT/TKF...-NB. (Ref. to Fig. 3)

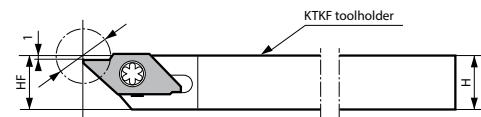


Fig. 2 When a TKF-AS / -ASR insert is attached (The cutting edge is 1mm lower than the center line)

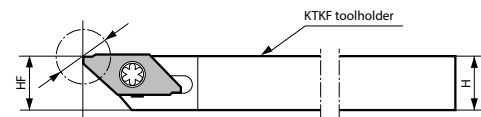
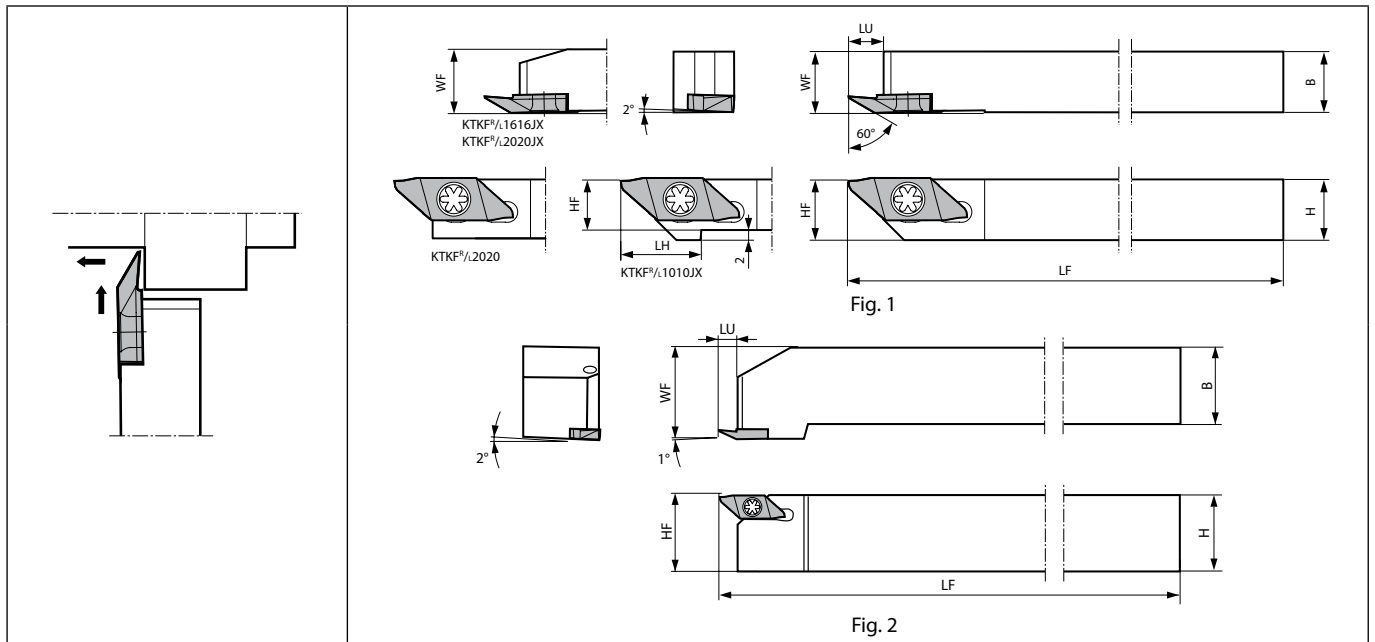


Fig. 3 When a TKF-NB insert is attached

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

KTKF (Back turning)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.



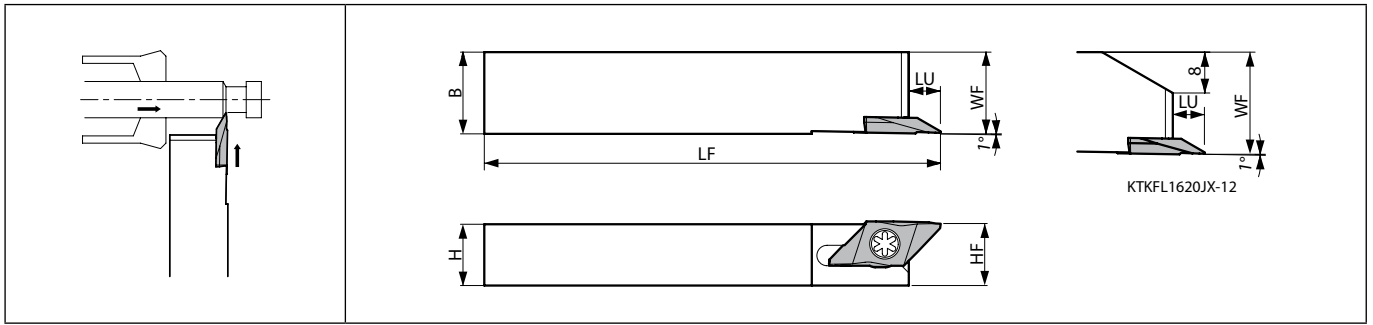
Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts		Applicable inserts E12, E14
											Screw	Wrench	
	R	L	H	B	LH	HF	LF	LU	WF				
KTKF%/L 1010JX-12 1212F-12 1212JX-12 1616JX-12 2020JX-12 2525M-12	●	●	10	10	15	10	120	10	1	6	SB-4590TRWN	FT-10	TKF12%/... TKFB12%/...
	●	●	12	12		12	85	12	1				
	●	●	16	16	-	16	120	16	1				
	●	●	20	20		20	120	20	1				
	●	●	25	25		25	150	30	2				
	●	●	20	20		20	120	20	1				
KTKF%/L 1010JX-16 1212F-16 1212JX-16 1616JX-16 2020JX-16 2525M-16	●	●	10	10	20	10	120	10	1	8	SB-4590TRWN	FT-10	TKF16%/... TKFB16%/...
	●	●	12	12		12	85	12	1				
	●	●	16	16	-	16	120	16	1				
	●	●	20	20		20	120	20	1				
	●	●	25	25		25	150	30	2				
	●	●	20	20		20	120	20	1				

LU shows the distance from the toolholder to the cutting edge.
See Page H15 for internal coolant type (coolant-through holders)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF (Back turning , Goose-neck holder)



Left-hand shown | Left-hand Insert for Left-hand Toolholder.

E



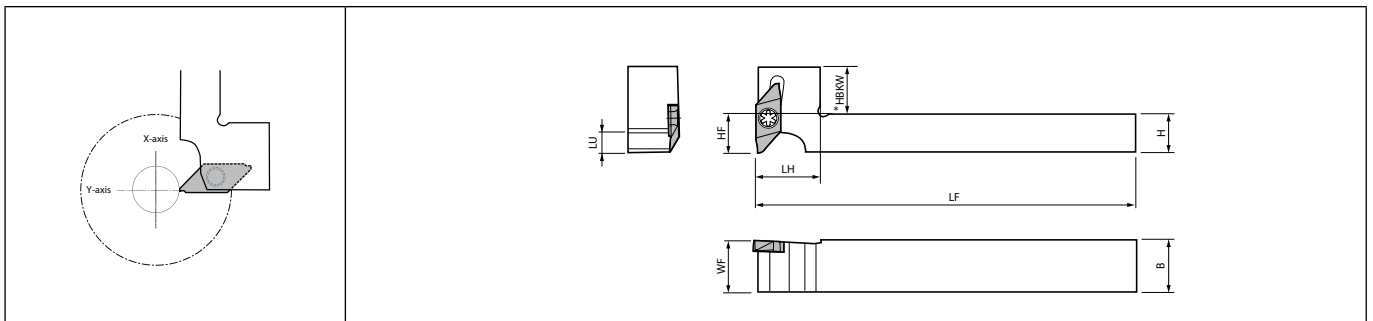
Small tools

Toolholder dimensions

Description	Availability	Dimension (mm)							Spare parts		Applicable inserts E12, E14
		L	H	B	HF	LF	LU	WF	Screw	Wrench	
KTKFL 1216JX-12 1620JX-12	●	12	16	12	12	120	6	16	SB-4590TRWN	FT-10	TKF12L... TKFB12L...

LU shows the distance from the toolholder to the cutting edge.

KTKF-Y (Back turning , Y-axis toolholder)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)									Spare parts		Applicable inserts E12, E14
		R	H	B	LH	HF	HBKW	LF	LU	WF	Screw	Wrench	
KTKFR 1216JX-12-Y 1616JX-12-Y	●	12	16	20	12	15	120	6	16	SB-4590TRWN	FT-10	TKF12R... TKFB12R...	

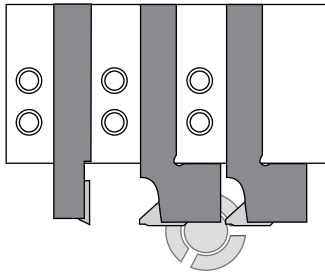
LU shows the distance from the toolholder to the cutting edge.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

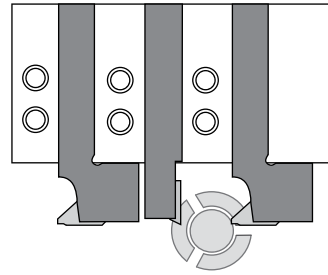
Precautions for using Y-axis toolholder

Do not use Y-axis toolholders side by side to prevent interference. (Only two Y-axis holder can be used at the same time)

With interference

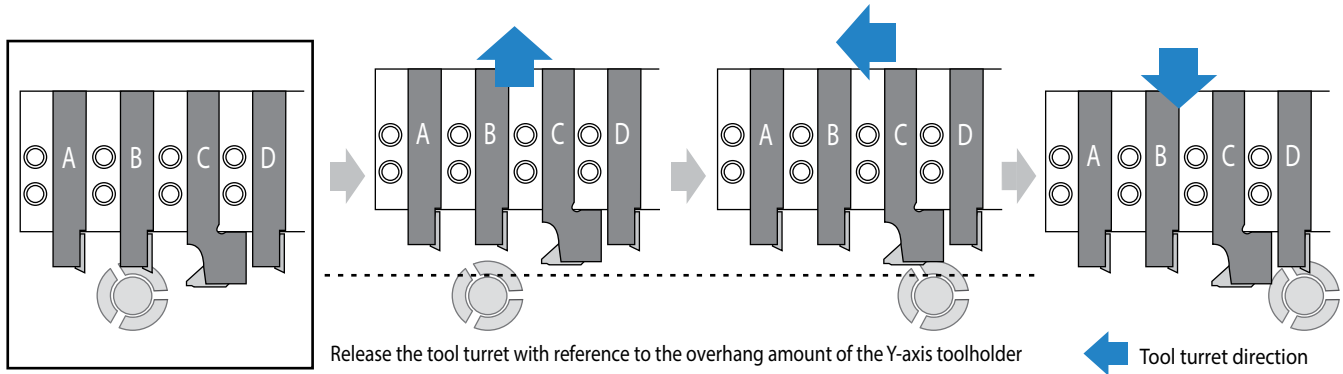


Without interference



Standard toolholders may be mounted between two Y-axis toolholders

When changing the tool, set the retracted position with reference to the cutting edge of the Y-axis holder. (When exchanging from tool B to D)



E



Small tools

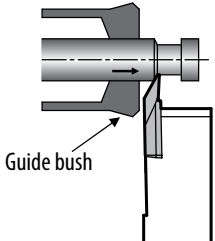
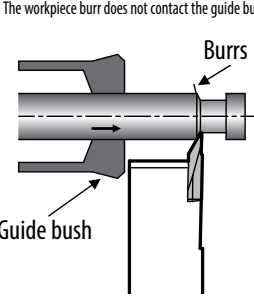
Note that using other toolholders together will result in different outside diameters

(Unit : mm)

Y-axis toolholder overhang	Examples	Overhang amount L			
		Available outside cutting diameter (φ)	20	22	25
20		A	Without restriction	Without restriction	Without restriction
		B	13.0	13.0	13.0
		C	Without restriction	Without restriction	Without restriction
25		A	38.0	58.0	Without restriction
		B	14.9	13.6	13.0
		C	45.0	60.0	Without restriction

Toolholders for back turning - TKFB insert

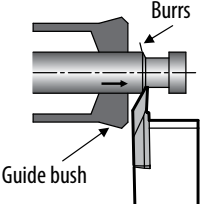
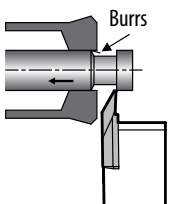
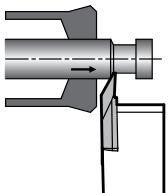
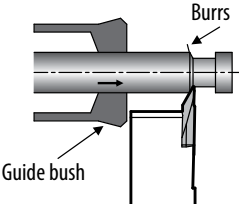
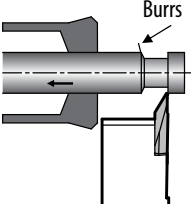
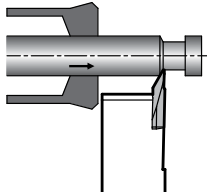
How to select back turning toolholder hand

<p>Right-hand</p>	 <p>Guide bush</p>	<ul style="list-style-type: none"> • Machining near the guide bush is possible • Narrow cutting edge width of TKFB12R15005M • Optimum for small parts and high precision machining
<p>Left-hand</p>	<p>The workpiece burr does not contact the guide bush.</p>  <p>Burrs</p> <p>Guide bush</p>	<ul style="list-style-type: none"> • Machining with a distance from guide bush • Good chip control due to large space between the guide bush and the tool. • Excellent chip control in roughing and finishing (plural passes) • Stable accuracy of external diameter dimension: <ul style="list-style-type: none"> • When burrs occur, if a left-hand toolholder is used, it is not necessary to return workpiece into guide bush in finishing. • Also, left-hand toolholders prevent guide bush wear caused by chip biting.

E

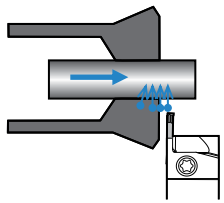
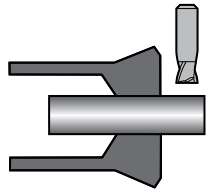
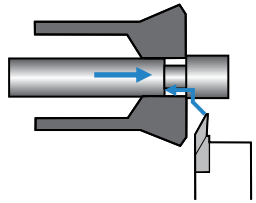
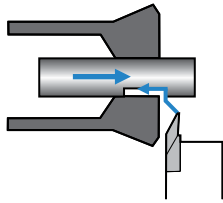
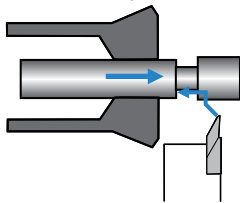
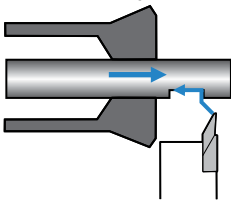
Small tools

Workpiece movement and tool hand selection - in roughing and finishing

	Roughing	Workpiece position after roughing	Finishing
<p>Right-hand</p>	 <p>Burrs</p> <p>Guide bush</p>	 <p>Burrs</p>	
<p>Left-hand</p>	 <p>Burrs</p> <p>Guide bush</p>	 <p>Burrs</p>	

* Good dimension accuracy: If a left-hand toolholder is used, burrs on workpiece generated in roughing do not damage the guide bush in finishing.

Chip control improvement in back turning

	Chip control improvement by tool pass changes - 1	Chip control improvement by tool pass changes - 2
Roughing	<p>Roughing with grooving tools</p> <p>1. GMM2420-020MW (Grooving)</p> 	<p>Pre-Stage machining is processed with solid end mill</p> <p>1. Solid end mill</p> 
↓		
Finishing (Countermeasures 1) Use right-hand toolholder	<p>When using TKFB12R28010M (for back turning / right hand)</p>  <p><u>Advantages:</u></p> <ul style="list-style-type: none"> • Good surface roughness <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> • If a machining pass is long, the guide bush can not support the workpiece. 	<p>When using TKFB12R28010M (for back turning / right hand)</p>  <p><u>Advantages:</u></p> <ol style="list-style-type: none"> 1. Minimal deflection in long machining passes 2. Chips are broken into small pieces, though the workpiece material is sticky <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> • The pre-stage machining may cause fractures, because of interrupted machining
Finishing (Countermeasures 2) Use left-hand toolholder	<p>When using TKFB12L28010M (for back turning / left hand)</p>  <p><u>Advantages:</u></p> <ol style="list-style-type: none"> 1. Good surface roughness 2. High precision machining if the machined portion does not contact the guide bush. <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> • If a machining pass is long, the guide bush can not support the workpiece. 	<p>When using TKFB12L28010M (for back turning / left hand)</p>  <p><u>Advantages:</u></p> <ol style="list-style-type: none"> 1. Minimal deflection in long machining passes 2. Chips are broken into small pieces, though the workpiece material is sticky. 3. High precision machining if the machined portion does not contact the guide bush. <p><u>Disadvantages:</u></p> <ul style="list-style-type: none"> • The pre-stage machining may cause fractures, because of interrupted machining.

E

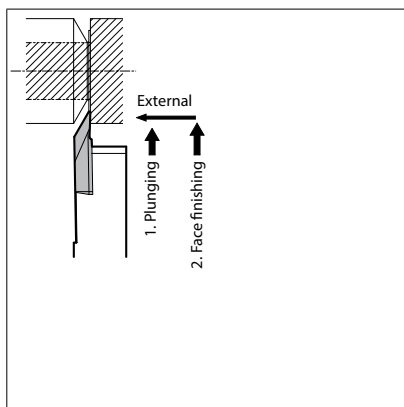


Small tools

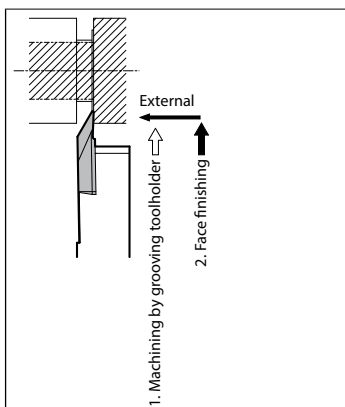
Countermeasure against peeled surface in face back turning

When peeled surface occurs on the workpiece face, please apply the countermeasures below.

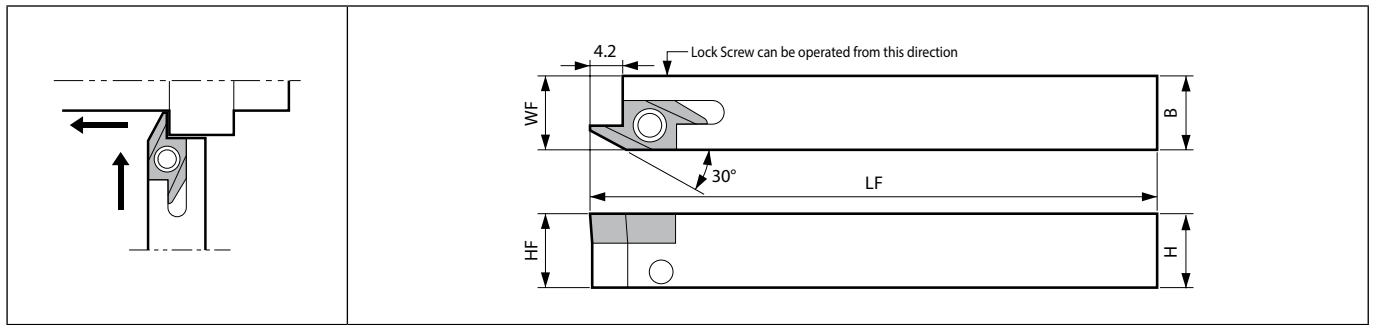
Countermeasures 1 Face finishing



Countermeasures 2 Face finishing after grooving



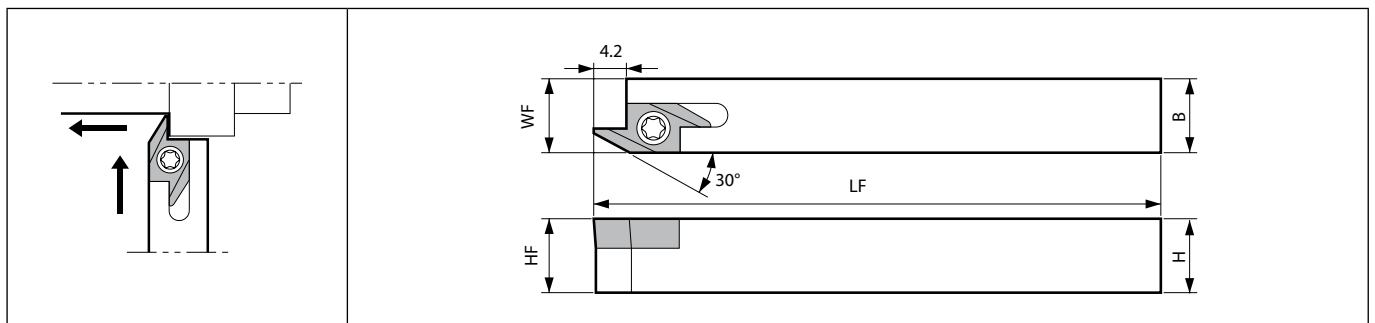
AABS-40F (Back turning / Edge width : 2.8mm, Max. depth : 4mm)



Toolholder dimensions

Description	Availability		Dimension (mm)				Standard corner-R(RE)	Spare parts			Applicable inserts ➔ B112
	R	H	B	HF	LF	WF		Anchor pin	Lock screw	Wrench	
	AABSR 1010JX-40F	●	10	10	10	120		10.2	LPA-11	HSB4X8R		FH-2	ABS15R40...
1212JX-40F	●	12	12	12	120	12.2	LPA-13				
1616JX-40F	●	16	16	16	120	16.2	LPA-17				

SABS-40F (Back turning / Edge width : 2.8mm, Max. depth : 4mm)

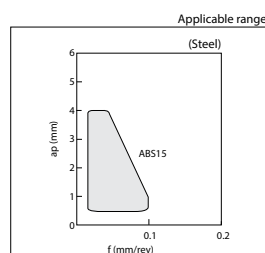


Toolholder dimensions

Description	Availability		Dimension (mm)				Standard corner-R(RE)	Spare parts		Applicable inserts ➔ B112
	R	H	B	HF	LF	WF		Screw	Wrench	
	SABSR 1010JX-40F	●	10	10	10	120		10.2	SB-3080TR		FT-10	ABS15R40...
1212F-40F	●	12	12	12	85	12.2				
1212JX-40F	●			120	12.2					
1616JX-40F	●	16	16	16	120	16.2				
2020K-40F	●	20	20	20	125	20.2				

Applicable inserts

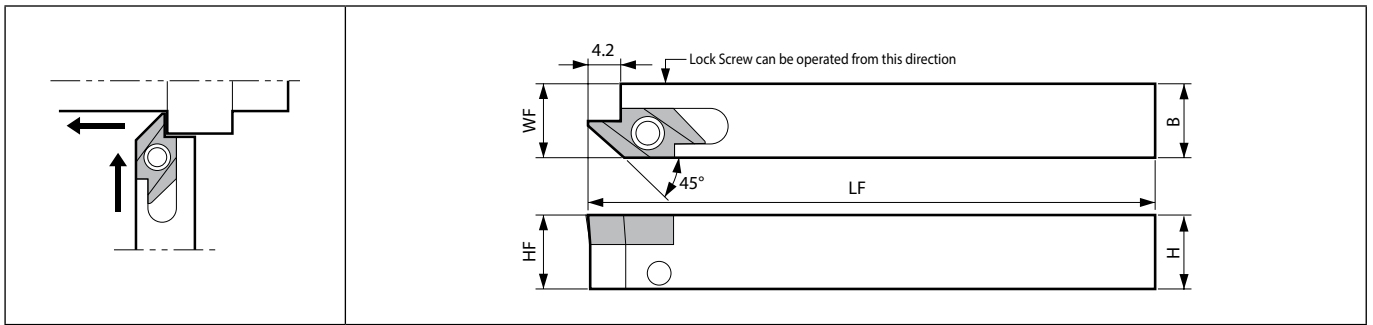
Applications	Back turning
Insert	
Type	ABS15
Page	B112



Recommended cutting conditions ➔ E67

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

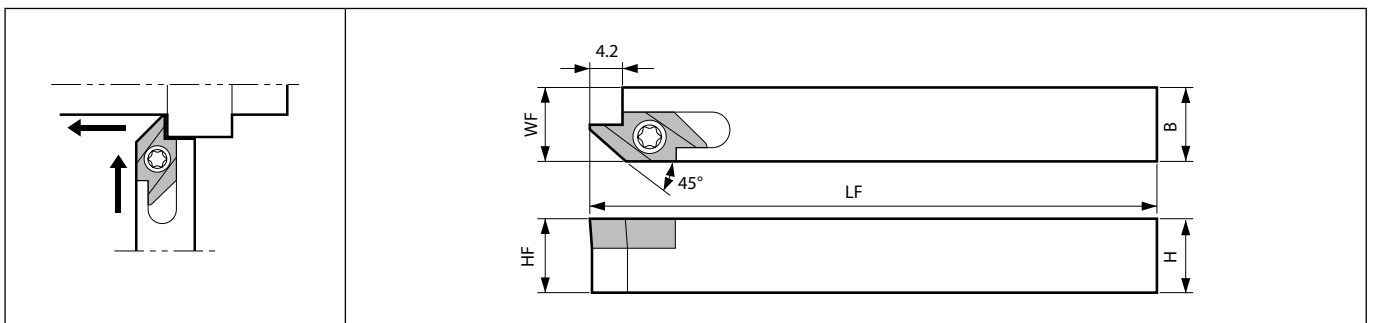
AABW-40F (Back turning / Edge width : 4.7mm, Max. depth : 4mm)



Toolholder dimensions

Description	Availability		Dimension (mm)					Standard corner-R(RE)	Spare parts			Applicable inserts ➔ B112
	R	H	B	HF	LF	WF	Anchor pin		Lock screw	Wrench		
	AABWR	1010JX-40F	●	10	10	10	10.2		0.15	LPA-11	HSB4X8R		FH-2	ABW15R40...
	1212JX-40F	●	12	12	12	120	LPA-13					
	1616JX-40F	●	16	16	16	16.2	LPA-17					

SABW-40F (Back turning / Edge width : 4.7mm, Max. depth : 4mm)

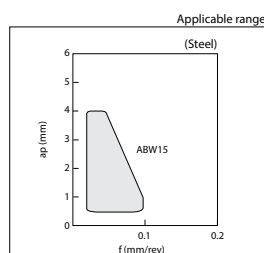


Toolholder dimensions

Description	Availability		Dimension (mm)					Standard corner-R(RE)	Spare parts		Applicable inserts ➔ B112
	R	H	B	HF	LF	WF	Screw		Wrench		
	SABWR	1010JX-40F	●	10	10	10	10.2		0.15	SB-3080TR		FT-10	ABW15R40...
	1212JX-40F	●	12	12	12	120					
	1616JX-40F	●	16	16	16	16.2					
	2020K-40F	●	20	20	20	125	20.2				

Applicable inserts

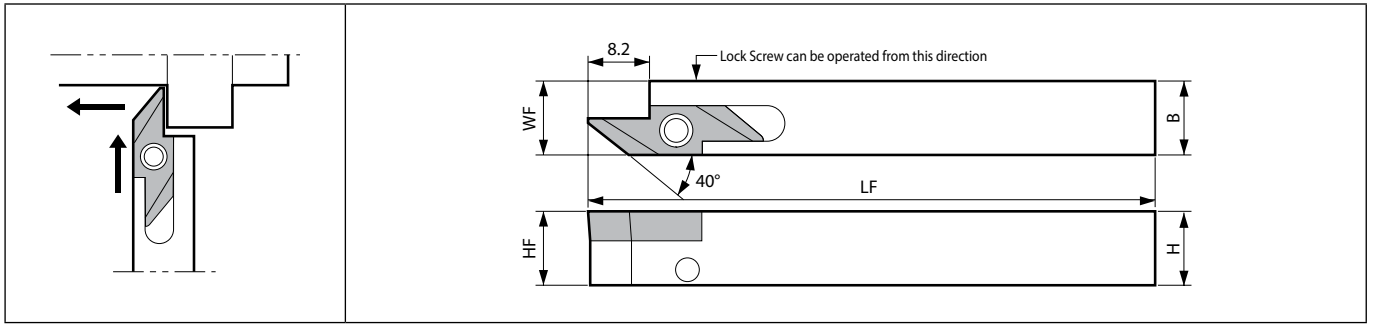
Applications	Back turning
Insert	
Type	ABW15
Page	B112



Recommended cutting conditions ➔ E67

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

AABW-50F (Back turning / Edge width : 4.7mm, Max. depth : 5mm)

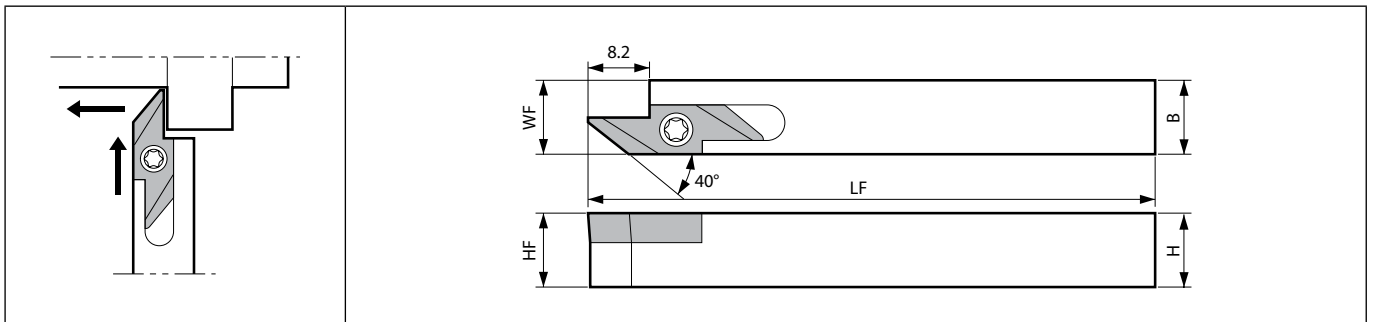


E

Toolholder dimensions

Description	Availability		Dimension (mm)				Standard corner-R(RE)	Spare parts			Applicable inserts ➔ B112
	R	H	B	HF	LF	WF		Anchor pin	Lock screw	Wrench	
	AABWR	●	10	10	10			10.2	LPA-11				ABW23R50...
1212JX-50F	●	12	12	12	120	12.2	LPA-13	HSB4X8R	FH-2		
1616JX-50F	●	16	16	16		16.2	LPA-17				

SABW-50F (Back turning / Edge width : 4.7mm, Max. depth : 5mm)

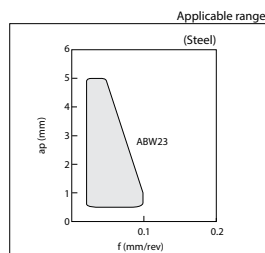


Toolholder dimensions

Description	Availability		Dimension (mm)				Standard corner-R(RE)	Spare parts		Applicable inserts ➔ B112
	R	H	B	HF	LF	WF		Screw	Wrench	
	SABWR	●	10	10	10			10.2				ABW23R50...
1212JX-50F	●	12	12	12	120	12.2	SB-3080TR	FT-10		
1616JX-50F	●	16	16	16		16.2				
2020K-50F	●	20	20	20	125	20.2				

Applicable inserts

Applications	Back turning
Insert	
Type	ABW23
Page	B112



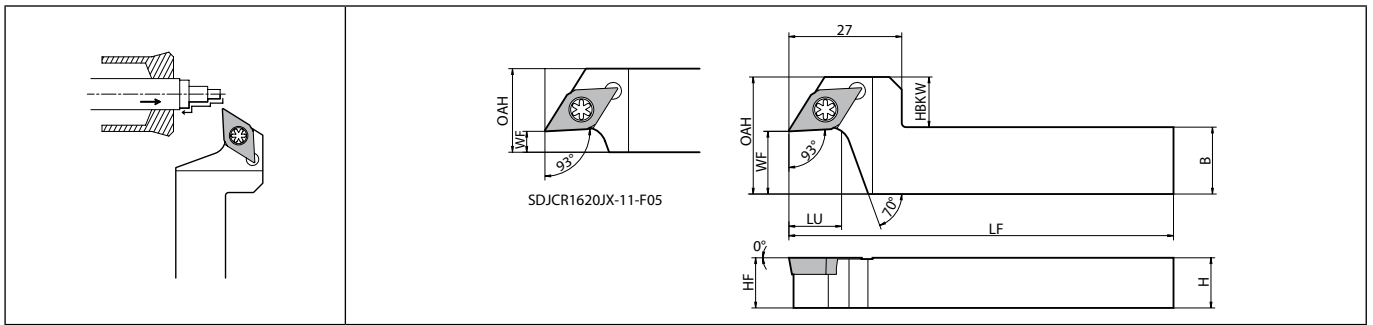
Recommended cutting conditions ➔ E67

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Small tools

SDJC (External turning / External copying)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-R(RE)	Spare parts		Applicable inserts
	R	H	B	OAH	HF	HBKW	LF	LU	WF	Screw		Wrench		
	SDJCR 1216JX-11-F05	●	12	16	18	12	2			5		0.2	SB-408STR		FT-15	DC□T11T3... DC□W11T3... DC□X11T3...
1216JX-11-F15	●			28	12			15						
1620JX-11-F05	●	16	20	20	16	-	120	12.6	5					
1620JX-11-F15	●			28	16	8		15						

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.

Applicable inserts

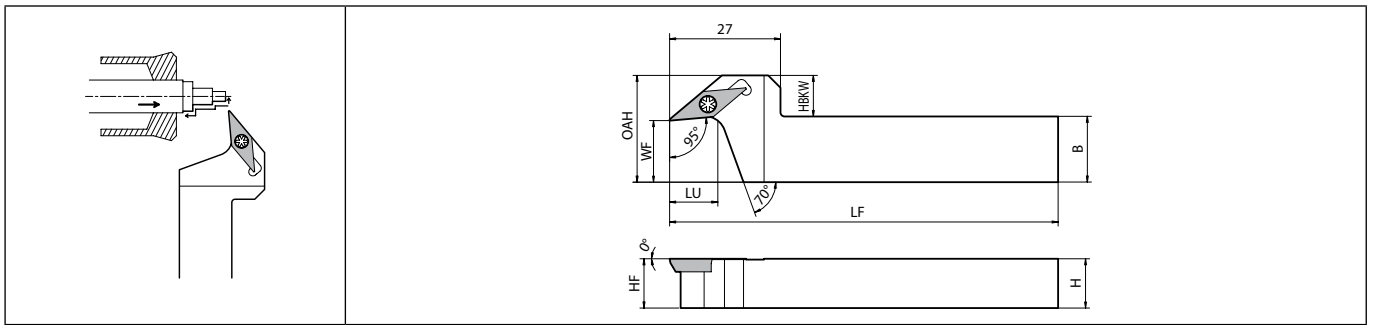
Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	WP	1/2-WP
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	PP	GP	GK	HQ	STD	MF	1/2-F	1/2-FSF
Page	B69	B69	B70	B70	B70	B70	B72, B73	B72
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	1/2-U	1/2-USF	1/2-J	1/2-JSF	XP	XQ	MQ	No CB
Page	B74~B76	B74	B77	B76	B71	B71	B71	B78
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	1/2-A3	AH	PCD	APD	CBN		
Page	B78	B78	B78	C42	C42	C22		

Recommended cutting conditions E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



SVLP (External turning / External copying)



Right-hand shown

E

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts		Applicable inserts
	R	H	B	OAH	HF	HBKW	LF	LU	WF		Screw	Wrench	
	SVLPR 1216JX-11-F15 1620JX-11-F15	●	12 16	16 20	26 16	12 16	10 6	120	12		15	0.2		SB-2570TR	FT-8	VP□T1103...

Small tools

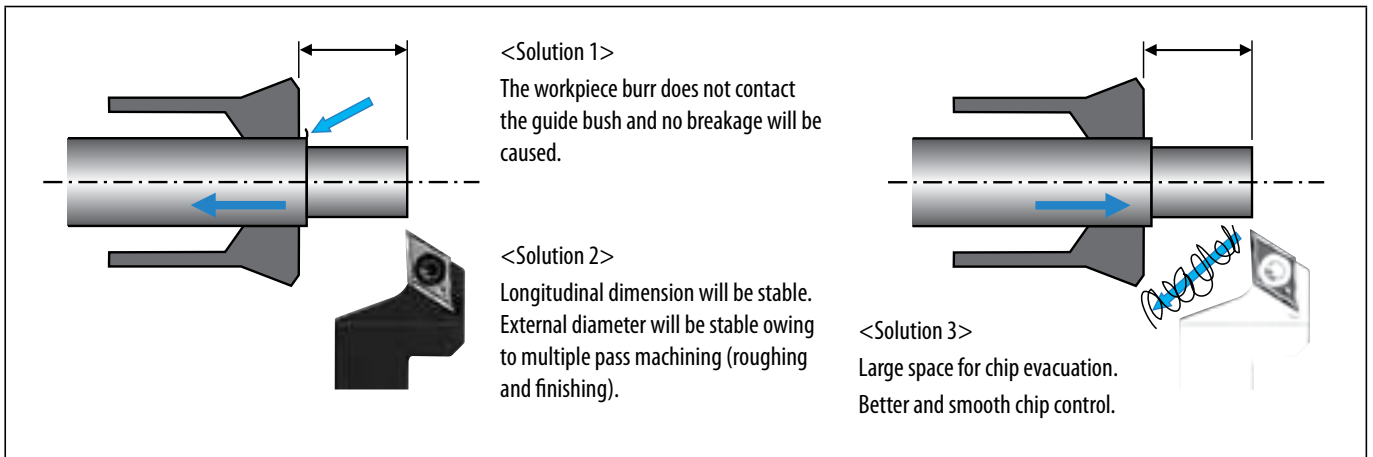
Applicable inserts

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Low feed	Low feed
Insert								
Chipbreaker type	CF	GF	SKS	CK	°/-F	°/-FSF	°/-U	°/-USF
Page	B102	B102	B102	B102	B103	B103	B104	B104
Applications	Low feed							
Insert								
Chipbreaker type	°/-J							
Page	B104							

Recommended cutting conditions E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Goose-neck holder is available for multiple passes at roughing and finishing

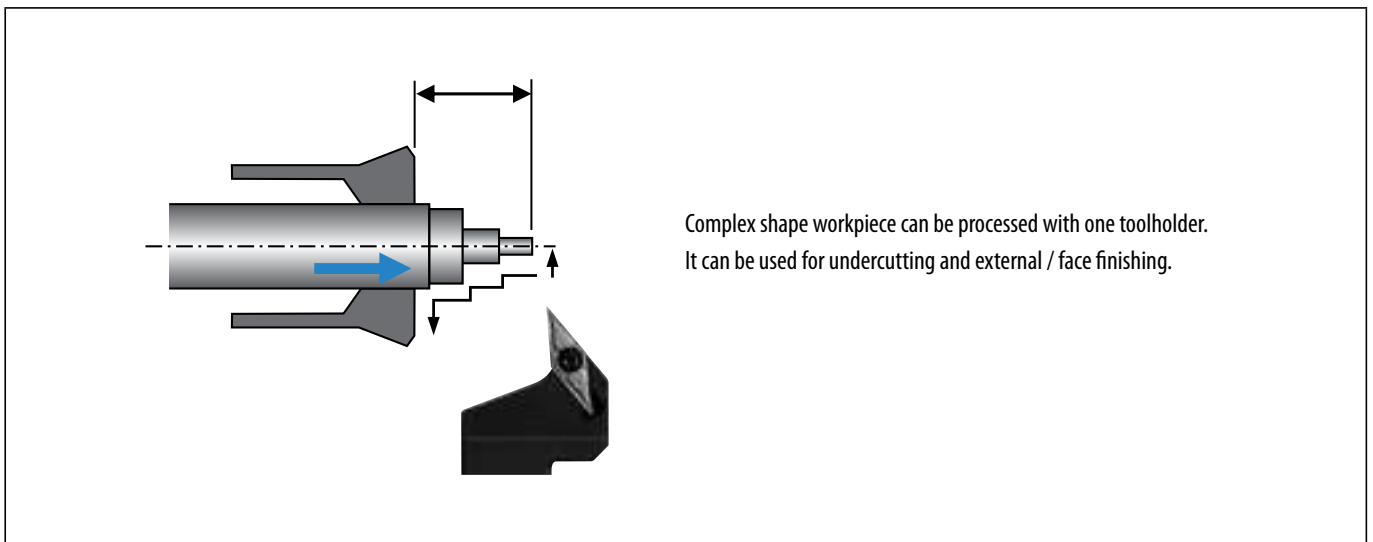


<Solution 1>
The workpiece burr does not contact the guide bush and no breakage will be caused.

<Solution 2>
Longitudinal dimension will be stable. External diameter will be stable owing to multiple pass machining (roughing and finishing).

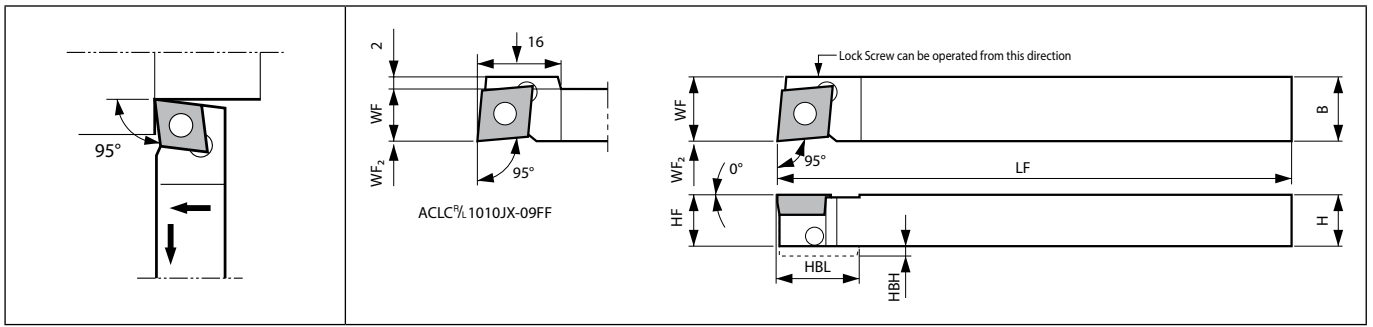
<Solution 3>
Large space for chip evacuation. Better and smooth chip control.

One toolholder for complex shape workpiece



Complex shape workpiece can be processed with one toolholder. It can be used for undercutting and external / face finishing.

ACLC-FF (External turning / External facing , Back clamp, Without offset)



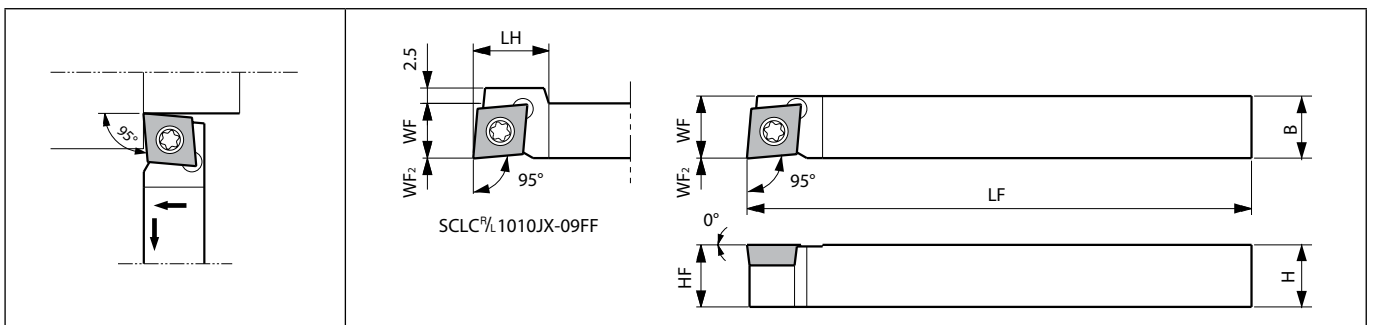
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)									Standard corner-R(RE)	Spare parts			Applicable inserts
													Anchor pin	Lock screw	Wrench	
	R	L	H	B	HF	HBH	HBL	LF	WF	WF ₂						
ACLC% 1010JX-06FF	●	●	10	10	10	-	-	120	10	0	0.2	LPF-11	HSB4X8%	FH-2	CC□T0602... CC□W0602...	
ACLC% 1010JX-09FF	●	●	10	10	10	2	16	-	10	-	0.2	LPF-13	HSB4X8%	FH-2	CC□T09T3... CC□W09T3...	
1212JX-09FF	●	●	12	12	12	-	-	120	12	0		LPF-17				
1616JX-09FF	●	●	16	16	16	-	-	-	16	-						

Lock screw : HSB4X8R for Right-hand Toolholder, HSB4X8L for Left-hand Toolholder.

SCLC-FF (External turning / External facing , Screw clamp, Without offset)



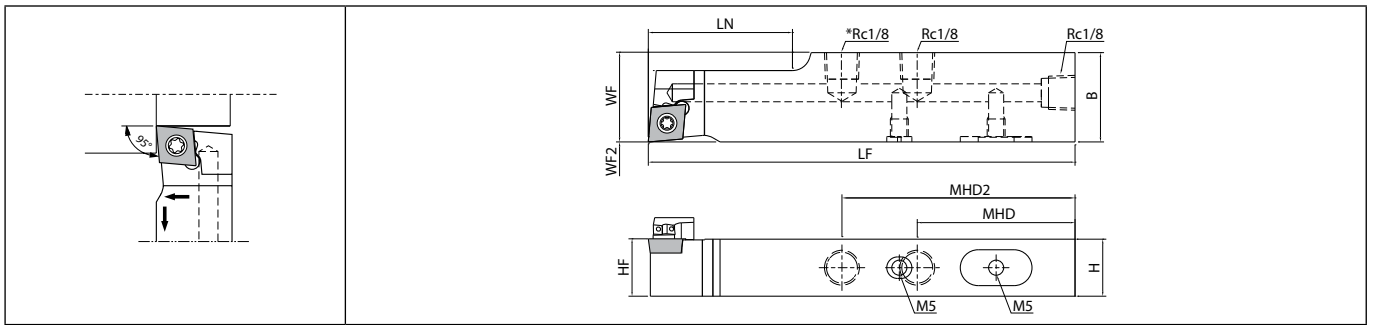
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)									Standard corner-R(RE)	Spare parts			Applicable inserts
													Screw	Wrench	Wrench	
	R	L	H	B	LH	HF	LF	WF	WF ₂							
SCLC% 0808F-06FF	●	●	8	8	-	8	85	8	-	-	0.2	SB-2570TR	-	FT-8	CC□T0602... CC□W0602...	
1010JX-06FF	●	●	10	10	-	10	120	10	-							
SCLC% 1010JX-09FF	●	●	10	10	15	10	120	10	-	0.2	SB-4085TR	FT-15	-	CC□T09T3... CC□W09T3...		
1212F-09FF	●	●	-	-	-	12	85	12	-							
1212JX-09FF	●	●	12	12	-	12	-	-	-							
1616JX-09FF	●	●	16	16	-	16	120	16	-							
2020JX-09FF	●	●	20	20	-	20	-	20	-							

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SCLC-FFJCTM (External turning / External facing , Screw clamp, Without offset, Coolant-through holder)



Right-hand shown | SCLCR12...: 2-Rc1/8

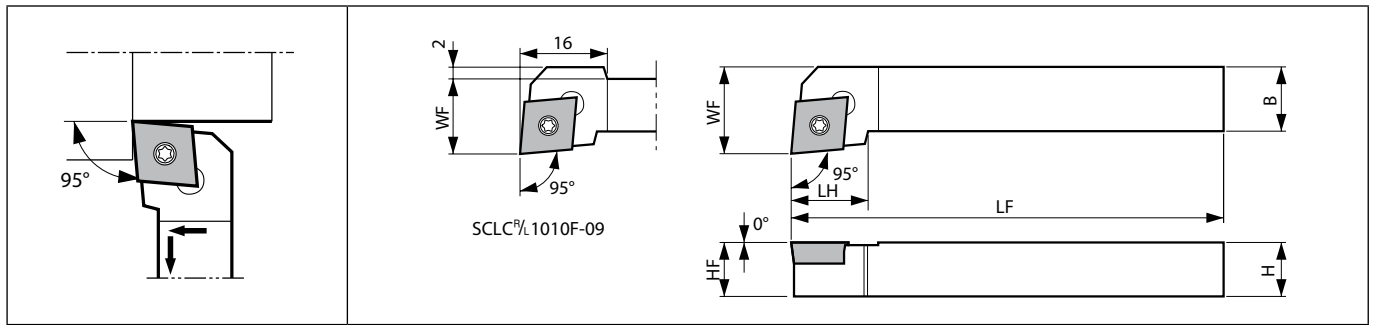
Toolholder dimensions

Description	Availability		Dimension (mm)									Standard corner-R(RE)		Spare parts				Applicable inserts
	R	H	B	MHD	MHD2	HF	LF	LN	WF	WF2	Standard corner-R	Coolant hole	Plug	Plug	Screw	Wrench		
SCLCR 1218JX-09FFJCTM	●	12	18	54	-	12		28	18		0	0.2	Yes	GP-1	HS5X4LP	SB-4085TR	FT-15	CC□T09T3...
1625JX-09FFJCTM	●	16	25	44		16	120	40	25									CC□W09T3...
2025JX-09FFJCTM	●	20				20												

Please see page H16 and H17 for piping parts of coolant-through holders.



SCLC (External turning / External facing , Screw clamp)



Right-hand shown

E

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts				Applicable inserts
	R	L	H	B	LH	HF	LF	WF	Screw		Wrench	Wrench	Wrench		
SCLC% 1010F-06	●	●	10	10	9	10	80	12	0.2	SB-2570TR	-	FT-8	-	CC□T0602... CC□W0602...	
SCLC% 1010F-09	●	●	10	10	14	10	80	14	0.2	SB-4085TR	FT-15	-	-	CC□T09T3... CC□W09T3...	
1212H-09	●	●	12	12		12	100	16							
1616H-09	●	●	16	16	15	16	20								
2020K-09	●	●	20	20	20	20	125	25							
2525M-09	●	●	25	25	22	25	150	32							
SCLC% 1616H-12	●	●	16	16	20	16	100	20	0.4	SB-5090TR	-	-	LTW-20	CC□T1204...	
2020K-12	●	●	20	20	22	20	125	25							
2525M-12	●	●	25	25		25	150	32							

Applicable inserts (ACLC-FF / SCLC-FF / SCLC-FFJCTM / SCLC)

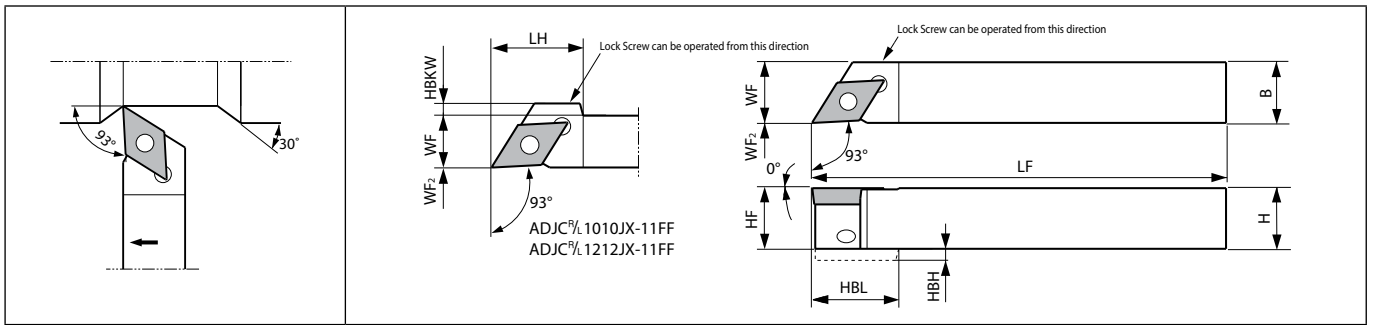
Applications	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	PF	GF	SKS	SK	CK	GQ	WP	PP
Page	B58	B58	B59	B59	B59	B59	B60	B60
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium	Low feed	Low feed	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	GK	HQ	STD	MF	%-U	%-J	MQ	No CB
Page	B60	B60	B60	B61	B63-B65	B65	B61	B66
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	%-A3	AH	PCD	APD	CBN		
Page	B66	B66	B66	C39	C40	C20		

Recommended cutting conditions E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Small tools

ADJC-FF (External turning / External copying , Back clamp, Without offset)



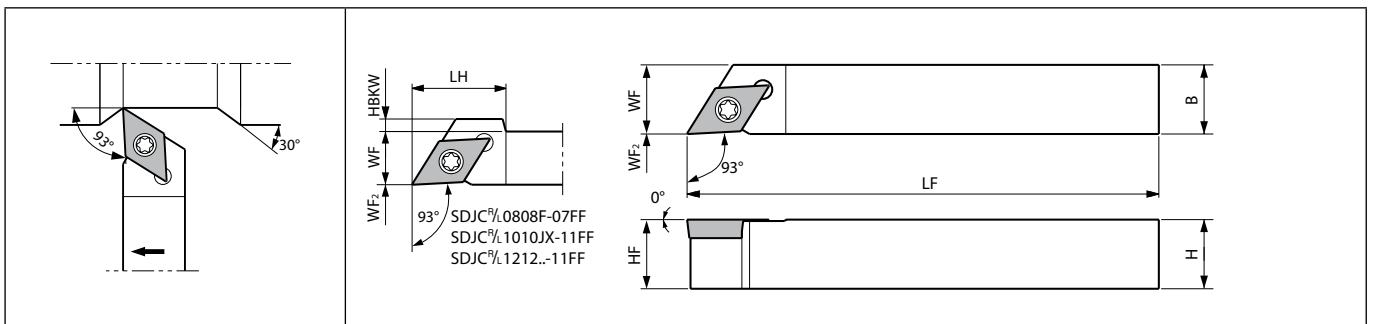
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)										Standard corner-R(RE)	Spare parts			Applicable inserts
	R	L	H	B	LH	HF	HBH	HBKW	HBL	LF	WF	WF ₂		Anchor pin	Lock screw	Wrench	
ADJC%L 1010JX-07FF	●	●	10	10	-	10	-	-	-	120	10	0	0.2	LPF-11	HSB4X8%	FH-2	DC□T0702... DC□W0702... DC□X0702...
ADJC%L 1010JX-11FF 1212JX-11FF 1616JX-11FF	●	●	10	10	20	10	2	3	20	120	10	0	0.2	LPF-13	HSB4X8%	FH-2	DC□T11T3... DC□W11T3... DC□X11T3...
	●	●	12	12		12	1	12	12								
	●	●	16	16	-	16	-	-	-	16	16	LPF-17					

Lock screw : HSB4X8R for Right-hand Toolholder, HSB4X8L for Left-hand Toolholder.
For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

SDJC-FF (External turning / External copying, Screw clamp, Without offset)



Right-hand shown

Toolholder dimensions

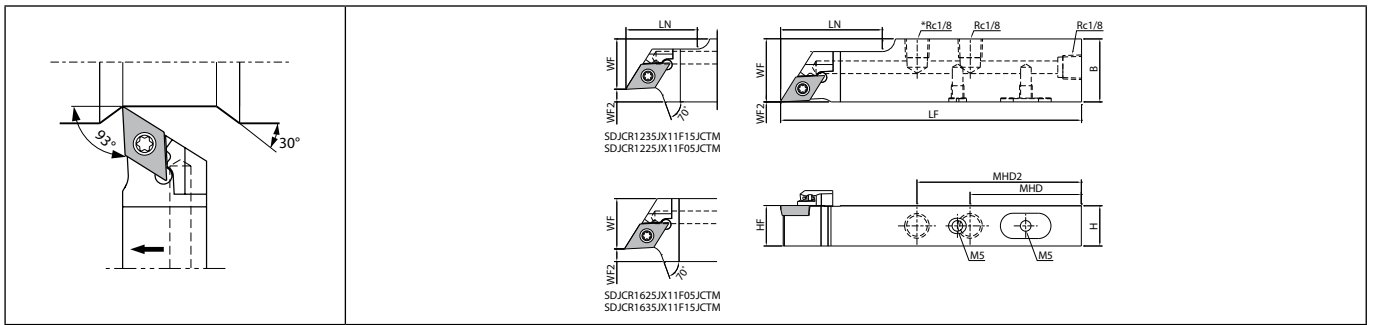
Description	Availability		Dimension (mm)										Standard corner-R(RE)	Spare parts			Applicable inserts
	R	L	H	B	LH	HF	HBKW	LF	WF	WF ₂	Screw	Wrench		Wrench			
SDJC%L 0808F-07FF 1010JX-07FF	●	●	8	8	14	8	0.5	85	8	0	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...		
	●	●	10	10	-	10	-	120	10								
SDJC%L 1010JX-11FF 1212F-11FF 1212JX-11FF 1616JX-11FF 2020JX-11FF	●	●	10	10	20	10	3	120	10	0	0.2	SB-4085TR	FT-15	-		DC□T11T3... DC□W11T3... DC□X11T3...	
	●	●	12	12		12	1	85	12								
	●	●	16	16	-	16	-	120	16								
	●	●	20	20	-	20	-	20	20								

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



SDJC-FFJCTM (External turning / External copying, Screw clamp, Without offset, Coolant-through holder)



Right-hand shown | SDJCR12...:2-Rc1/8

E



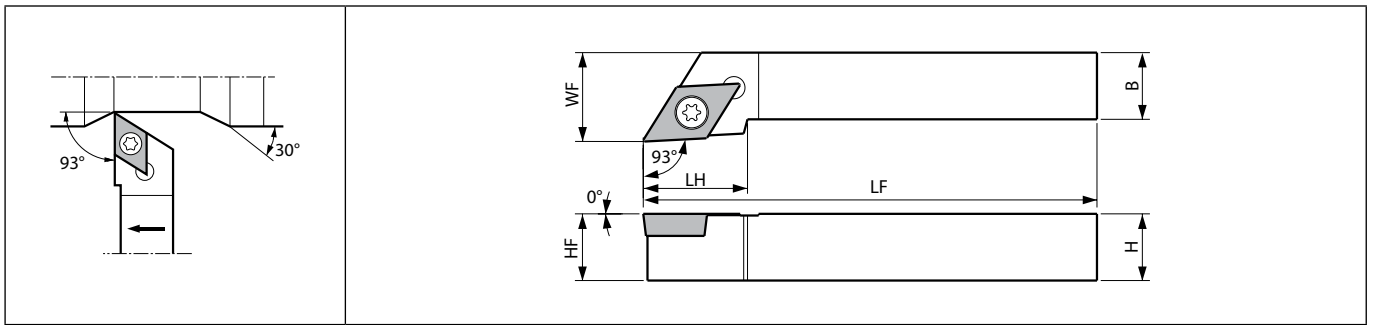
Small tools

Toolholder dimensions

Description	Availability	Dimension (mm)										Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
		R	H	B	MHD	MHD2	HF	LF	LN	WF	WF2			Plug	Plug	Screw	Wrench	
SDJCR 1218JX-11FFJCTM 1625JX-11FFJCTM 2025JX-11FFJCTM	● ● ●	12 16 20	18 25 25	54 44 44	- 65 65	12 16 20	120	28 40 40	18 25 25	0	0.2	Yes	GP-1	H55X4LP -	SB-4085TR	FT-15	DC□T11T3... DC□W11T3... DC□X11T3...	
SDJCR 1225JX11F05JCTM 1235JX11F15JCTM 1625JX11F05JCTM 1635JX11F15JCTM	● ● ● ●	12 16	25 35 25 35	54 44	- 65 65	12 16	120	28 120	20 15 5 15	0.2	Yes	GP-1	H55X4LP	SB-4085TR	FT-15	DC□T11T3... DC□W11T3... DC□X11T3...		




Please see page H16 and H17 for piping parts of coolant-through holders.
For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.

SDJC (External turning / External copying , Screw clamp)



Right-hand shown

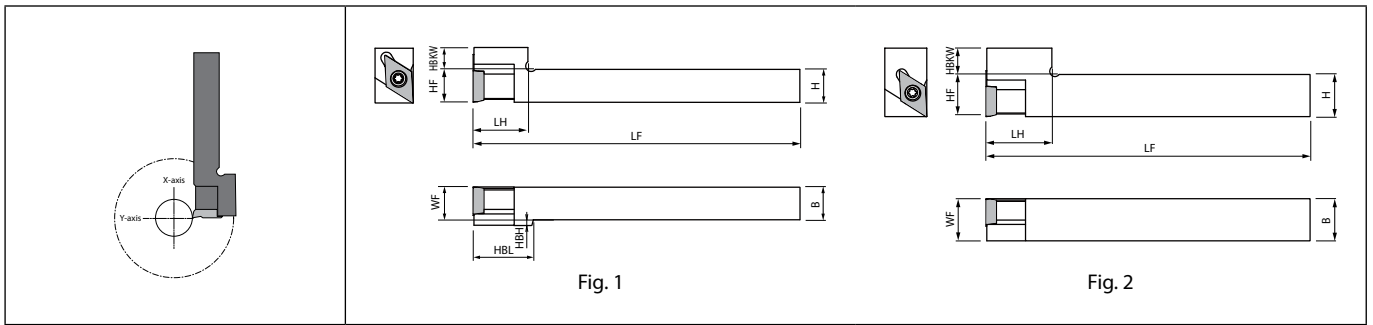
Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts			Applicable inserts
	R	L	H	B	LH	HF	LF	WF	Screw		Wrench	Wrench		
														
SDJC ^{R/L} 1010F-07	●	●	10	10	12	10	80	12	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...	
SDJC ^{R/L} 1010F-11	●	●	10	10	18	10	80	12	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...	
1212H-11	●	●	12	12		12	100	16						
1616H-11	●	●	16	16		16	125	20						
2020K-11	●	●	20	20		20	150	25						
2525M-11	●	●	25	25	23	25	150	32						

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.



SDJC-FF-Y (External turning / External copying , Y-axis toolholder)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)										Fig.	Coolant hole	Spare parts		Applicable inserts
		R	H	B	LH	HF	HBH	HBKW	HBL	LF	WF			Screw	Wrench	
SDJCR 1212JX-11FF-Y	●	12	12	20	12	2	8	22	120	12	1	No	SB-4085TR	FT-15	DC□T11T3... DC□W11T3... DC□X11T3...	
1616JX-11FF-Y	●	16	16	25	16	-	10	-	-	16	2					

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.

Applicable inserts (ADJC-FF / SDJC-FF / SDJC-FFJCTM / SDJC / SDJC-FF-Y)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	WP	1/2-WP
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	PP	GP	GK	HQ	STD	MF	1/2-F	1/2-FSF
Page	B69	B69	B70	B70	B70	B70	B72, B73	B72
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	1/2-U	1/2-USF	1/2-J	1/2-JSF	XP	XQ	MQ	No CB
Page	B74~B76	B74	B77	B76	B71	B71	B71	B78
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	1/2-A3	AH	PCD	APD	CBN		
Page	B78	B78	B78	C42	C42	C22		

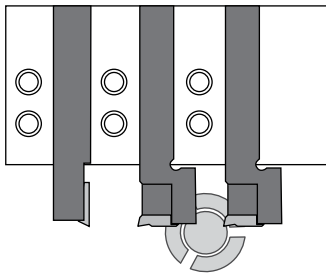
Recommended cutting conditions

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

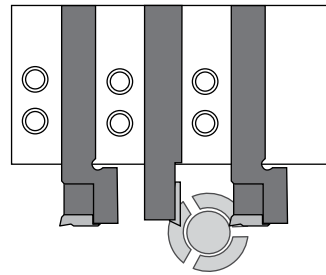
Precautions for using Y-axis toolholder

Do not use Y-axis toolholders side by side to prevent interference. (Only two Y-axis holder can be used at the same time)

With interference

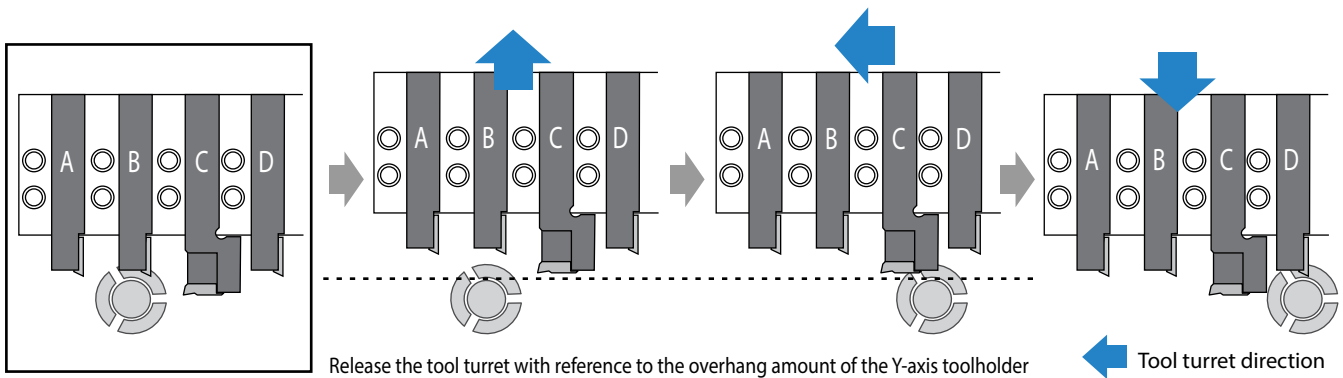


Without interference



Standard toolholders may be mounted between two Y-axis toolholders

When changing the tool, set the retracted position with reference to the cutting edge of the Y-axis holder. (When exchanging from tool B to D)



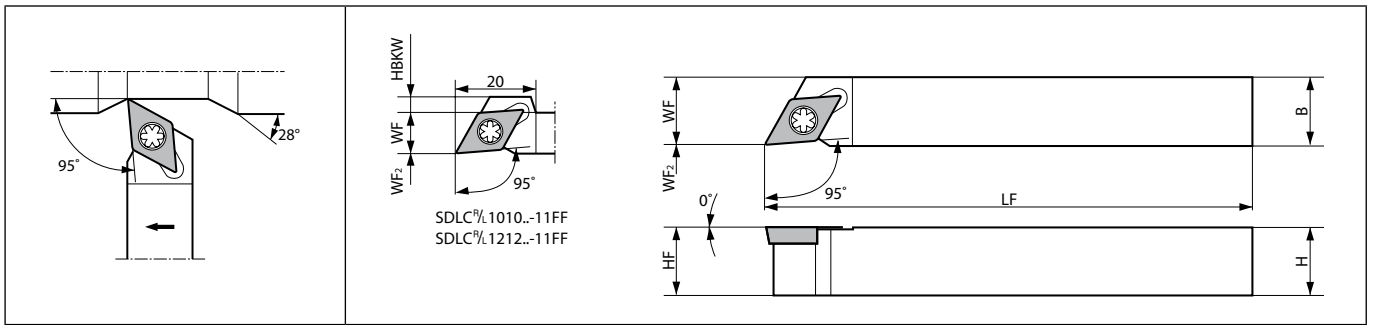
E
Small tools

Note that using other toolholders together will result in different outside diameters

(Unit : mm)

Y-axis toolholder overhang	Examples	Overhang amount L			
		Available outside cutting diameter (φ)	20	22	25
20		A	Without restriction	Without restriction	Without restriction
		B	13.0	13.0	13.0
		C	Without restriction	Without restriction	Without restriction
25		A	38.0	58.0	Without restriction
		B	14.9	13.6	13.0
		C	45.0	60.0	Without restriction

SDLC-FF (External turning / External copying, Screw clamp, Without offset)

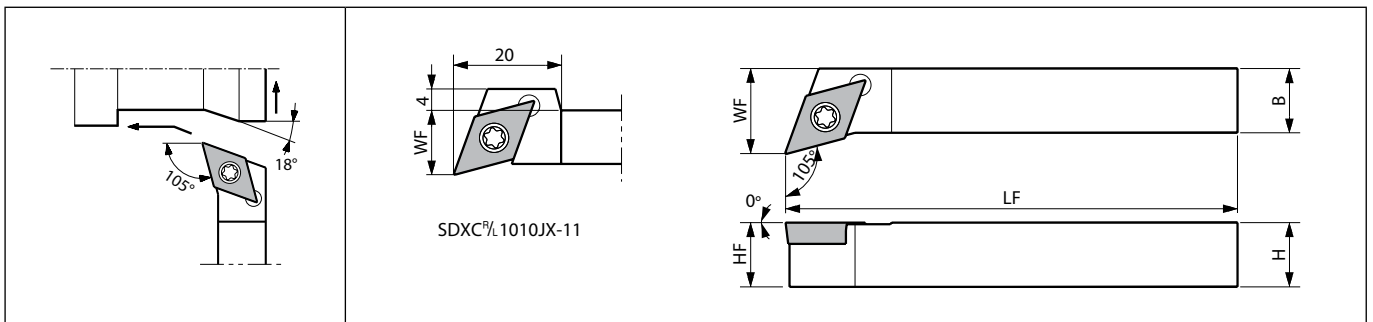


Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts			Applicable inserts
											Screw	Wrench	Wrench	
	R	L	H	B	HF	HBKW	LF	WF	WF ₂					
SDLC [°] /L 1010JX-07FF 1212F-07FF 1212JX-07FF 1616JX-07FF	●	●	10	10	10	-	120	10	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702...	
	●	●	12	12	12	-	85	12						
	●	●	16	16	16	-	120	16						
	●	●	16	16	16	-	120	16						
SDLC [°] /L 1010F-11FF 1010JX-11FF 1212F-11FF 1212JX-11FF 1616H-11FF 1616JX-11FF	●	●	10	10	10	4	80	10	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...	
	●	●	12	12	12	2	85	12						
	●	●	12	12	12	2	120	12						
	●	●	16	16	16	-	100	16						
	●	●	16	16	16	-	100	16						
	●	●	16	16	16	-	120	16						

SDXC (External turning / External facing / External copying)



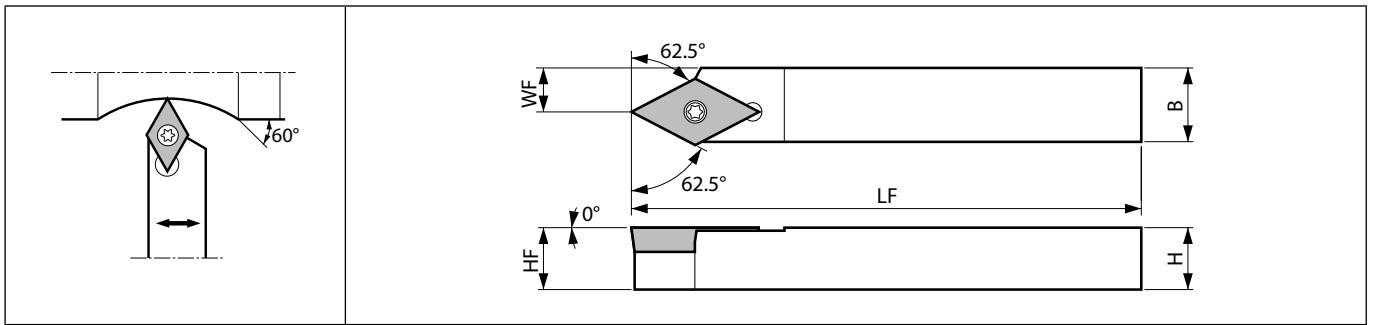
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts			Applicable inserts
											Screw	Wrench	Wrench	
	R	L	H	B	HF	LF	WF							
SDXC [°] /L 1010JX-07	●	●	10	10	10	120	12	0.2	SB-2570TR	-	FT-8	DC□T0702... DC□W0702...		
SDXC [°] /L 1010JX-11 1212JX-11 1616JX-11	●	●	10	10	10	12	16	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...		
	●	●	12	12	12	16								
	●	●	16	16	16	20								

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SDNC-F (External turning / External copying)



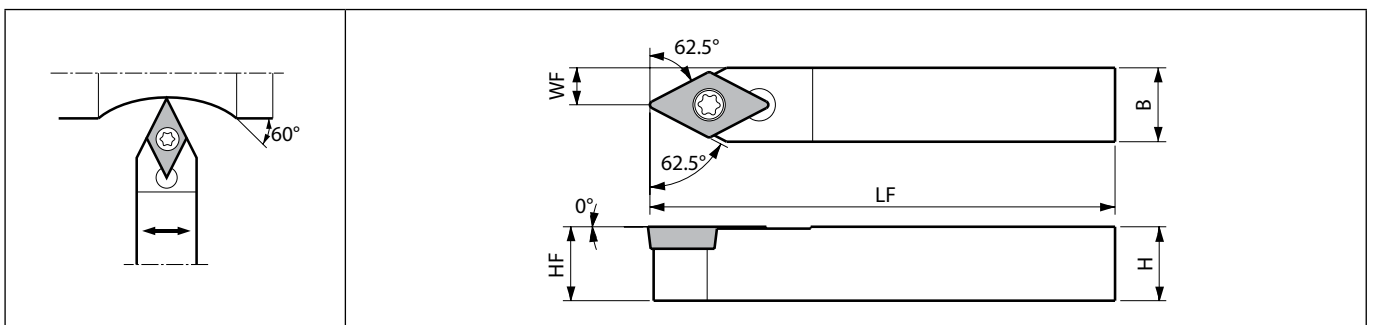
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)					Standard corner-R(RE)	Spare parts		Applicable inserts
	R	L	H	B	HF	LF	WF		Screw	Wrench	
	SDNCR 1010JX-07F	●		10	10	10	120		7	0.2		SB-2570TR	FT-8	DC□T0702... DC□W0702...



SDNC (External turning / External copying)



Toolholder dimensions

Description	Availability		Dimension (mm)					Standard corner-R(RE)	Spare parts			Applicable inserts
	N	H	B	HF	LF	WF	Screw		Wrench	Wrench		
	SDNCN 0808F-07	●	8	8	8	85	4		0.2	SB-2570TR	-		FT-8	DC□T0702... DC□W0702...
1010JX-07	●	10	10	10	120	5						
1212JX-07	●	12	12	12	120	6						
SDNCN 1010F-11	●	10	10	10	80	5	0.2	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...	
1010JX-11	●				120							
1212F-11	●	12	12	12	85	6						
1212JX-11	●				120							
1616H-11	●	16	16	16	100	8						
1616JX-11	●				120							

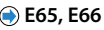
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (SDLC-FF / SDXC / SDNC-F / SDNC)

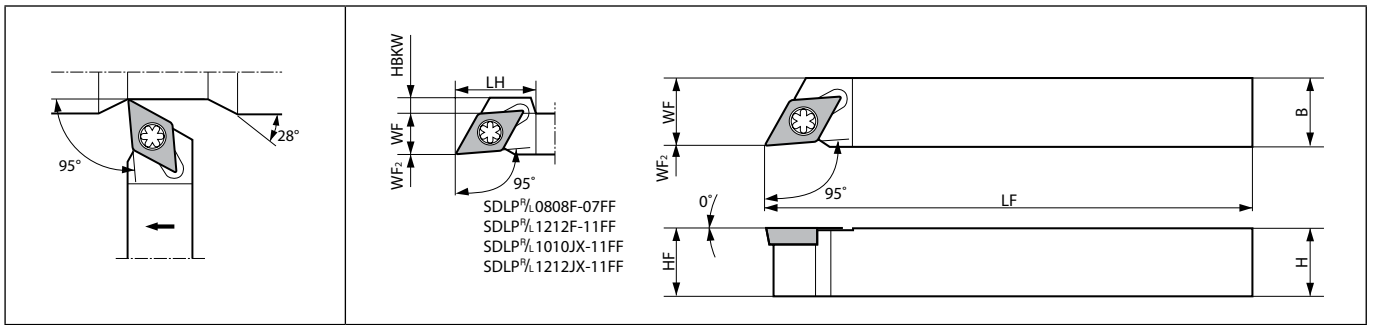
Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	PP	GP
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing	Low feed	Low feed
Insert								
Chipbreaker type	GK	HQ	STD	MF	P/L-F	P/L-FSF	P/L-U	P/L-USF
Page	B70	B70	B70	B70	B72, B73	B72	B74~B76	B74
Applications	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron	Non-ferrous metals	Non-ferrous metals
Insert								
Chipbreaker type	P/L-J	P/L-JSF	XP	XQ	MQ	No CB	AP	P/L-A3
Page	B77	B76	B71	B71	B71	B78	B78	B78
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials				
Insert								
Chipbreaker type	AH	PCD	APD	CBN				
Page	B78	C42	C42	C22				

E

Small tools




Recommended cutting conditions 

SDLP-FF (External turning / External copying, Screw clamp, Without offset)






Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)									Standard corner-R(RE)	Spare parts			Applicable inserts
													Screw	Wrench	Wrench	
	R	L	H	B	LH	HF	HBKW	LF	WF	WF ₂						
SDLP% 0808F-07FF 1010JX-07FF	●	●	8	8	14	8	0.5	85	8	0	0.2	SB-2570TR	-	FT-8	DPET0702...	
SDLP% 1010JX-11FF 1212JX-11FF 1616JX-11FF	●	●	10	10	20	10	4	10	10	0	0.2	SB-4085TR	FT-15	-	DPET11T3...	

Applicable inserts

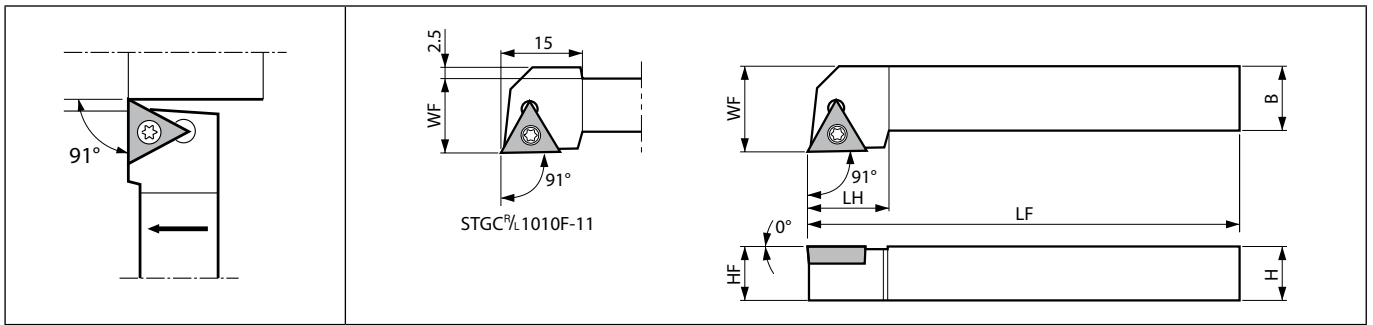
Applications	Finishing	Low feed
Insert		
Chipbreaker type	³ / _L -FSF	³ / _L -USF
Page	B79	B79

Recommended cutting conditions  E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



STGC (External turning)



Right-hand shown

E

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RRE)	Spare parts		Applicable inserts
	R	L	H	B	LH	HF	LF	WF	Screw		Wrench		
STGC 90L 0808E-08	●		8	8	12	8	70	10	0.2	SB-2050TR	FT-6	TC 0802... TC W0802...	
1010F-08	●	●	10	10		10	80	12					
STGC 90L 1010F-11	●	●	10	10	15	10	80	14	0.4	SB-2570TR	FT-8	TC 1103... TC W1103...	
1212H-11	●	●	12	12		12	100	16					
1616H-11	●	●	16	16		16	125	25					
2020K-11	●	●	20	20		20	150	32					
2525M-11	●	●	25	25		20	25	150					32

Small tools

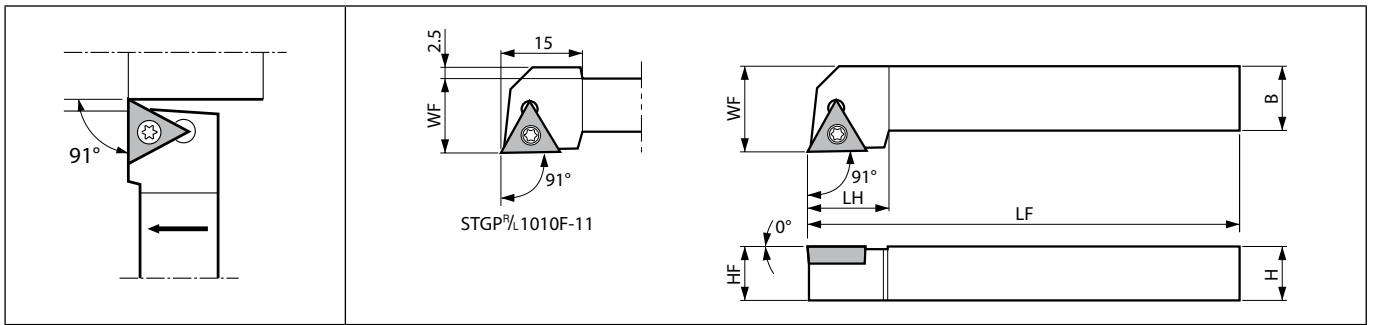
Applicable inserts

Applications	Low feed	Low feed	Cast iron	Non-ferrous metals	Non-ferrous metals
Insert					
Chipbreaker type	90L-U	90L-USF	No CB	90L-A3	PCD
Page	B86	B85	B87	B87	C45

Recommended cutting conditions E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

STGP (External turning)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts		Applicable inserts
											Screw	Wrench	
	R	L	H	B	LH	HF	LF	WF					
STGPR 0808E-08	●		8	8	12	8	70	10	0.2	SB-2050TR	FT-6	TP□B0802..., TP□H0802... TP□T0802...	
STGP%L 1010F-11	●	●	10	10	15	10	80	14	0.2	SB-3080TR	FT-10	TP□B1103... TP□H1103... TP□T1103...	
1212H-11	●	●	12	12		12	100	16					
1616H-11	●	●	16	16		16	20						



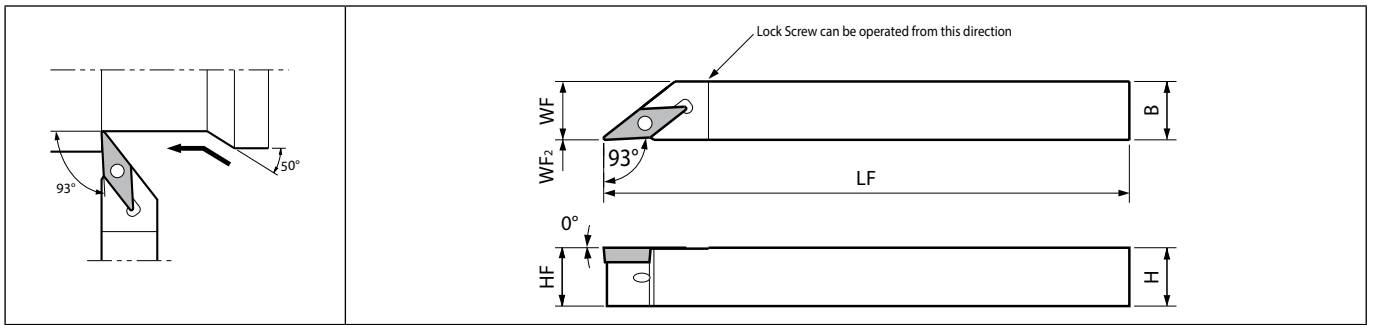
Applicable inserts

Applications	Minute ap	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Low feed	Medium
Insert								
Chipbreaker type	CF	PP	GP	HQ	R/L	%L-FSF	%L-USF	%L-H
Page	B88	B88	B89	B89	B90, B91	B92	B94	B93
Applications	Low carbon steel	Low carbon steel	Cast iron	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials	
Insert								
Chipbreaker type	XP	XQ	No CB	AP	PCD	APD	CBN	
Page	B89	B89	B94	B94	C46, C47	C47	C23	

Recommended cutting conditions E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

AVJB-FF (External turning / External copying , Back clamp, Without offset)



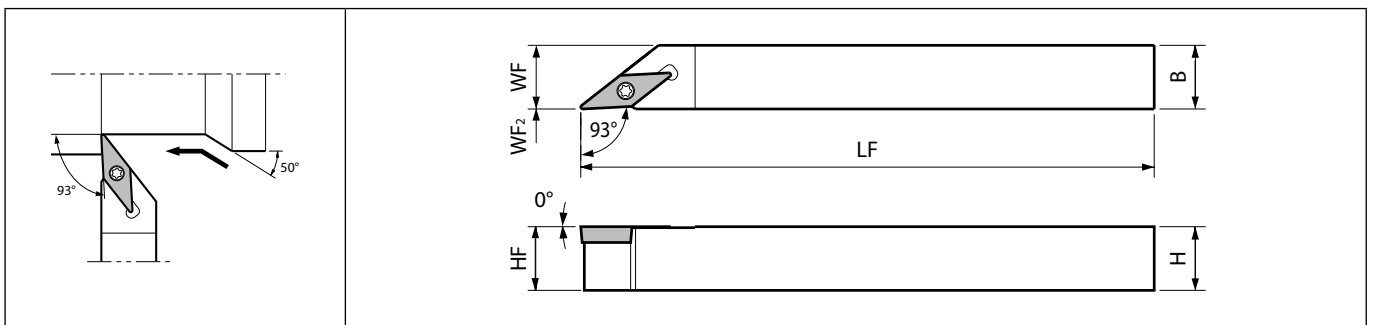
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts			Applicable inserts
	R	L	H	B	HF	LF	WF	WF ₂	Anchor pin		Lock screw	Wrench		
	AVJB ^{R/L} 1010JX-11FF	●	●	10	10	10		10			0.4				FH-2	VB□T1103... VB□W1103...
1212JX-11FF	●	●	12	12	12	120	12	0		HSB4X8 ^{R/L}				
1616JX-11FF	●	●	16	16	16		16							

Lock screw : HSB4X8R for Right-hand Toolholder, HSB4X8L for Left-hand Toolholder.

SVJB-FF (External turning / External copying, Screw clamp, Without offset)



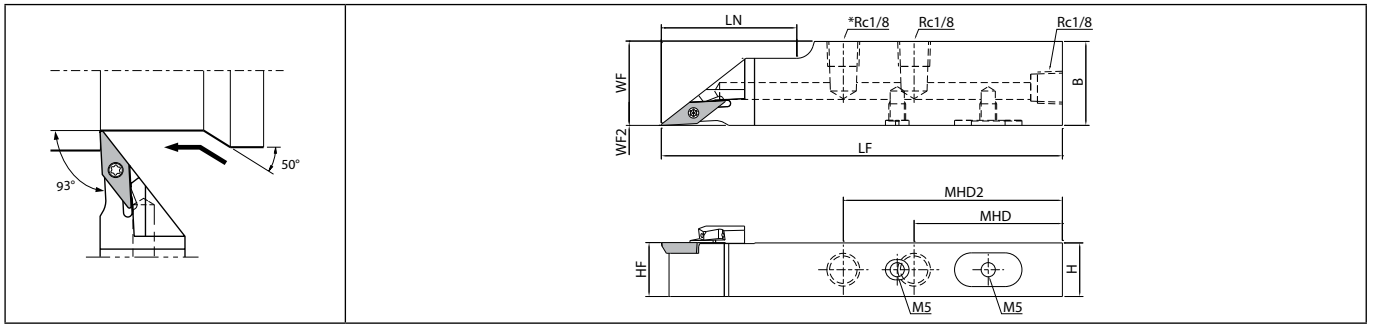
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts		Applicable inserts
	R	L	H	B	HF	LF	WF	WF ₂	Screw		Wrench		
	SVJB ^{R/L} 1010JX-11FF	●	●	10	10	10		10			0.4			FT-8	VB□T1103... VB□W1103...
1212JX-11FF	●	●	12	12	12	120	12	0					
1616JX-11FF	●	●	16	16	16		16						
2020JX-11FF	●	●	20	20	20		20						

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVJB-FFJCTM (External turning / External copying, Screw clamp, Without offset, Coolant-through holder)



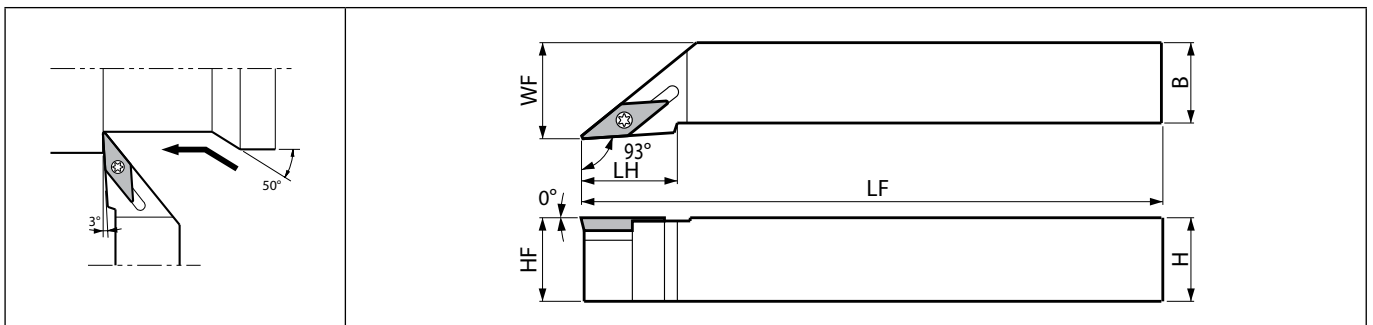
Right-hand shown | SVJBR12...: 2-Rc1/8

Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
	R	H	B	MHD	MHD2	HF	LF	LN	WF	WF2			Plug	Plug	Screw	Wrench	
	SVJBR 1218JX-11FFJCTM	●	12	18	54	-	12	28	18	0			0.4	Yes	GP-1	HS5X4LP		SB-2570TR	FT-8	VB□T1103... VB□W1103...
1625JX-11FFJCTM	●	16	25	44	65	16	120	40	25								
2025JX-11FFJCTM	●	20				20											

Please see page H16 and H17 for piping parts of coolant-through holders.

SVJB (External turning / External copying, Screw clamp)



Right-hand shown

Toolholder dimensions

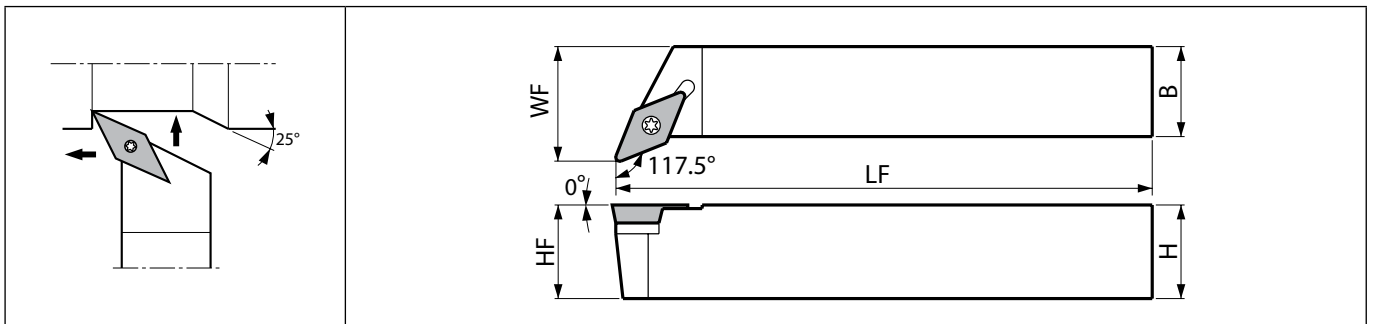
Description	Availability		Dimension (mm)						Standard corner-R(RE)	Spare parts						Applicable inserts
	R	L	H	B	LH	HF	LF	WF		Screw	Wrench	Wrench	Shim screw	Shim	Wrench	
	SVJB% 2020K-11	●	●	20	20	30	20	125		25	0.4	SB-2570TR	-	FT-8	-	
2525M-11	●	●	25	25	35	25	150	32								
SVJB% 2020K-16N	●	●	20	20	30	20	125	25	0.8	SB-4012STRN	FT-15	-	SS-4N	SVN-32N (SVN-32S*)	LW-4	VB□T1604..., VB□W1604... VC□T1604...
2525M-16N	●	●	25	25	30	25	150	32								

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E
Small tools

SVPB (External turning / External facing / External copying / Undercutting, Screw clamp)



Right-hand shown

E



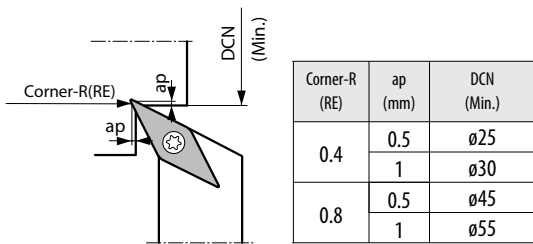
Small tools

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	Spare parts						Applicable inserts
										Screw	Wrench	Wrench	Shim screw	Shim	Wrench	
	R	L	H	B	HF	LF	WF									
SVPB% 1010JX-11 1212JX-11 1616JX-11 2020K-11 2525M-11	●	●	10	10	10		14.5	0.4	SB-2570TR	-	FT-8	-	-	-	-	VB□T1103... VB□W1103...
	●	●	12	12	12	120	16.5									
	●	●	16	16	16		20.5									
	●	●	20	20	20	125	25									
	●	●	25	25	25	150	32									
SVPB% 2020K-16N 2525M-16N	●	●	20	20	20	125	25	0.8	SB-40125TRN	FT-15	-	SS-4N	SVN-32N (SVN-32S*)	LW-4	VB□T1604...; VB□W1604... VC□T1604...	
	●	●	25	25	25	150	32									

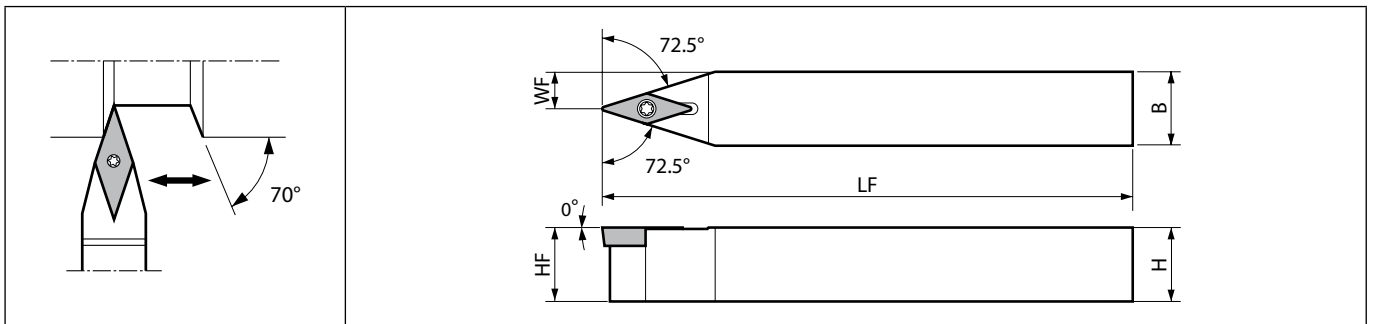
When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

Undercutting diameter of SVPB



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVVB (External turning / External copying)



Toolholder dimensions

Description	Availability	Dimension (mm)						Standard corner-R(RE)	Spare parts						Applicable inserts
		N	H	B	HF	LF	WF		Screw	Wrench	Wrench	Shim screw	Shim	Wrench	
SVVBN 1010F-11 1010JX-11 1212F-11 1212JX-11 1616H-11 1616JX-11 2020K-11 2525M-11	●	10	10	10	80	5	0.4	SB-2570TR	-	FT-8	-	-	-	-	VB-T1103... VB-W1103...
	●	12	12	12	85	6									
	●	16	16	16	100	8									
	●	20	20	20	125	10									
	●	25	25	25	150	12.5									
	●	20	20	20	125	10									
	●	25	25	25	150	12.5									
SVVBN 2020K-16N 2525M-16N	●	20	20	20	125	10	0.8	SB-40125TRN	FT-15	-	SS-4N	SVN-32N (SVN-32S*)	LW-4	VB-T1604..., VB-W1604... VC-T1604...	
	●	25	25	25	150	12.5									

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

Applicable inserts (AVJB-FF / SVJB-FF / SVJB-FFJCTM / SVJB / SVPB / SVVB)

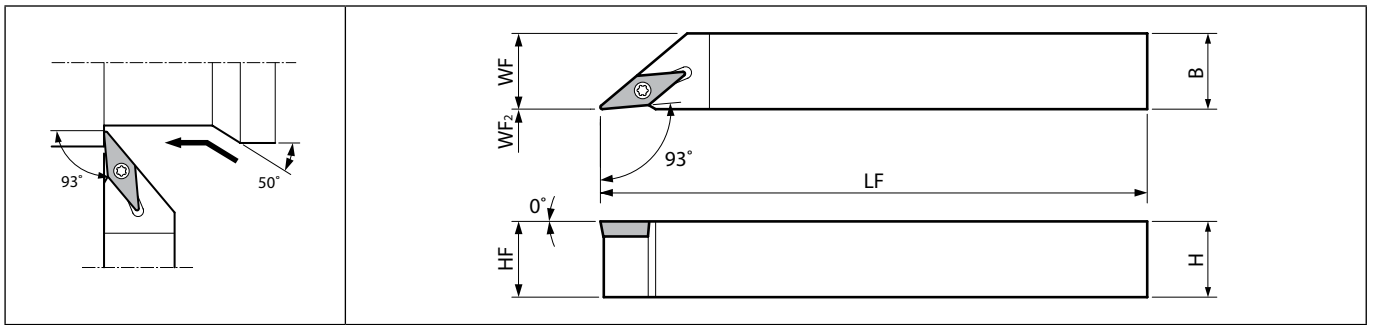
Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-ferrous metals
Insert								
Chipbreaker type	PP	GP	VF	HQ	1/4-F	1/4-FSF	1/4-Y	PCD
Page	B97	B97	B97	B97	B98	B98	B99	C49
Applications	Hard materials							
Insert								
Chipbreaker type	CBN							
Page	C26							

Recommended cutting conditions ➔ E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



SVJC-FF (External turning / External copying, Screw clamp, Without offset)



Right-hand shown

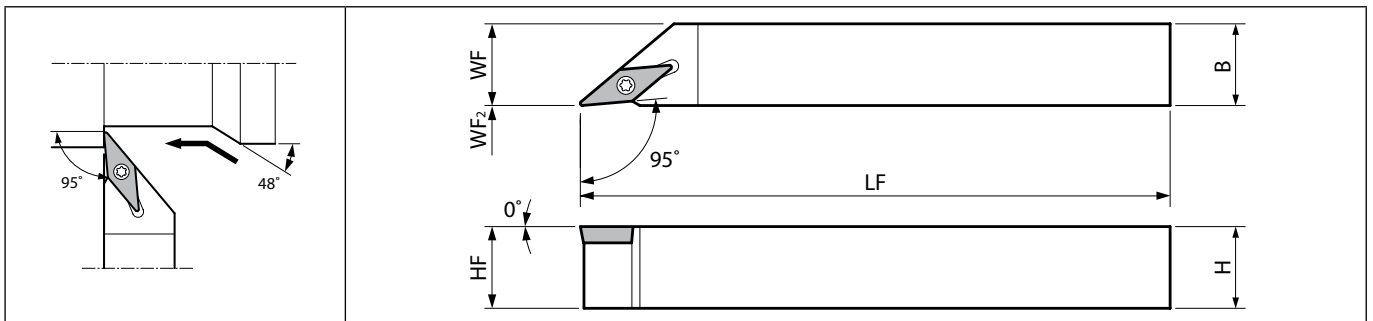
E

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts		Applicable inserts
	R	L	H	B	HF	LF	WF	WF ₂	Screw		Wrench		
SVJC% 1010JX-11FF	●	●	10	10	10	120	10	0	0.2	SB-2570TR	FT-8	VC□T1103...	
1212F-11FF	●	●	12	12	12	85	12						
1212JX-11FF	●	●	12	12	12	120	12						
1616JX-11FF	●	●	16	16	16	120	16						
2020JX-11FF	●	●	20	20	20	120	20						

Small tools

SVLC-FF (External turning / External copying, Screw clamp, Without offset)



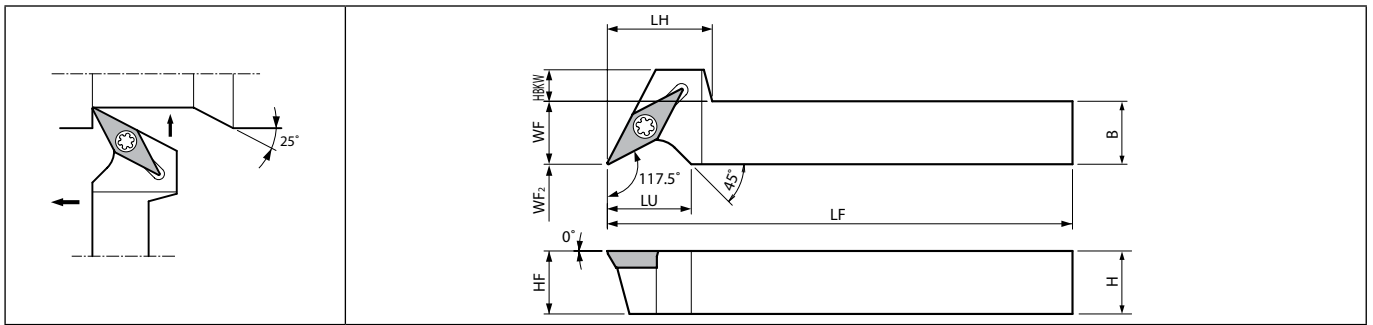
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts		Applicable inserts
	R	L	H	B	HF	LF	WF	WF ₂	Screw		Wrench		
SVLC% 1212F-11FF	●	●	12	12	12	85	12	0	0.2	SB-2570TR	FT-8	VC□T1103...	
1212JX-11FF	●	●				120							
1616JX-11FF	●	●				16							

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVPC-FF (External turning / External facing / External copying / Undercutting, Screw clamp, Without offset)



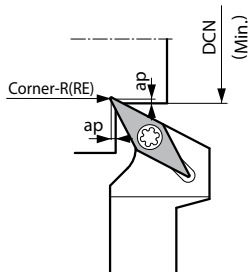
Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)										Standard corner-R(RE)	Spare parts		Applicable inserts
		R	H	B	LH	HF	HBKW	LF	LU	WF	WF ₂		Screw	Wrench	
SVPCR 1010JX-11FF	●	10	10		10	8	120		10			0.2	SB-2570TR	FT-8	VC□T1103...
1212F-11FF	●	12	12	20	12	6	85	16	12	0					
1212JX-11FF	●						120								
1616JX-11FF	●	16	16		16	2			20	16					



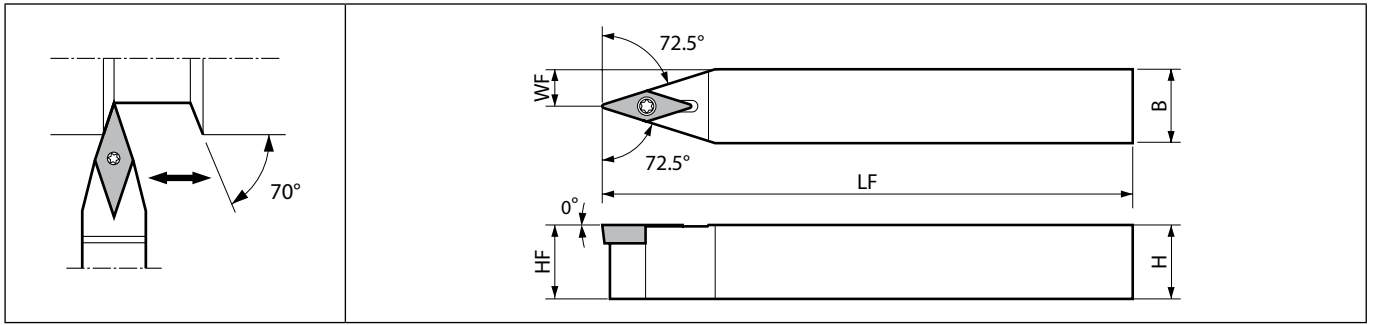
Undercutting diameter of SVPC-FF



Corner-R (RE)	ap (mm)	DCN (Min.)
0.2	0.5	ø20
	0.7	ø25

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVVC (External turning / External copying)





E




Small tools

Toolholder dimensions

Description	Availability		Dimension (mm)				Standard corner-R(RE)	Spare parts		Applicable inserts
	N	H	B	HF	LF	WF		Screw	Wrench	
										
SVVCN 1010JX-11	●	10	10	10		5	0.2	SB-2570TR	FT-8	VC□T1103...
1212JX-11	●	12	12	12	120	6				
1616JX-11	●	16	16	16		8				

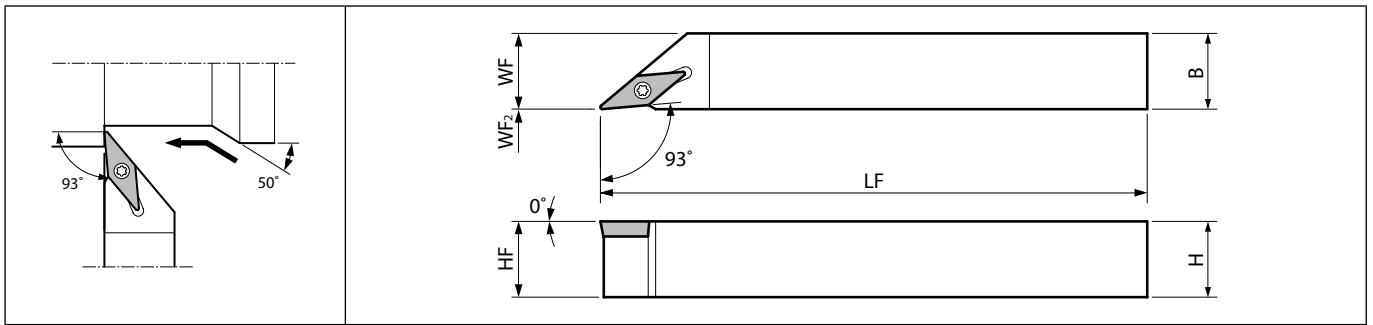
Applicable inserts (SVJC-FF / SVLC-FF / SVPC-FF / SVVC)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing - Medium
Insert					
Chipbreaker type	CF	GF	SKS	□/L-F	□/L-Y
Page	B100	B100	B100	B101	B101

Recommended cutting conditions  E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVJP-FF (External turning / External copying, Screw clamp, Without offset)



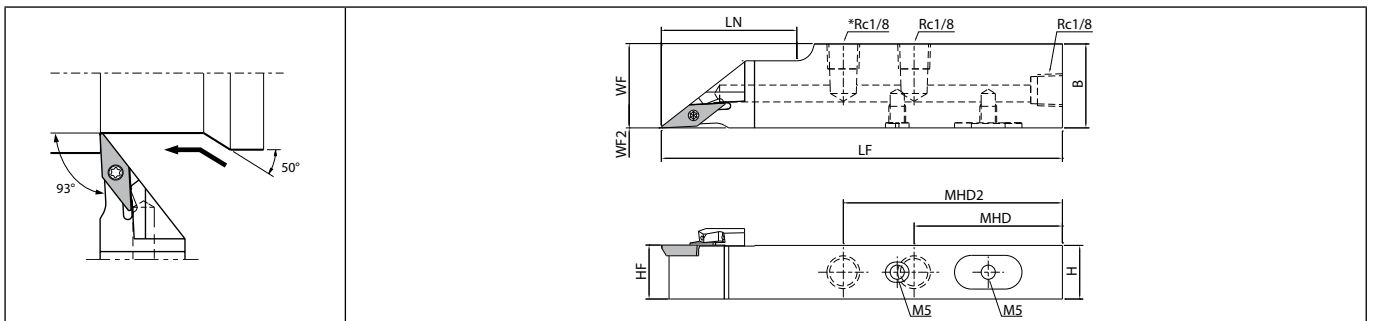
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts		Applicable inserts
	R	L	H	B	HF	LF	WF	WF ₂	Screw		Wrench		
	SVJP ^{R/L} 1212F-11FF 1212JX-11FF 1616JX-11FF 2020JX-11FF	●	●	12	12	12	85	12	0		0.2	SB-2570TR		FT-8	VP□T1103...



SVJP-FFJCTM (External turning / External copying, Screw clamp, Without offset, Coolant-through holder)



Right-hand shown | SVJPR12...: 2-Rc1/8

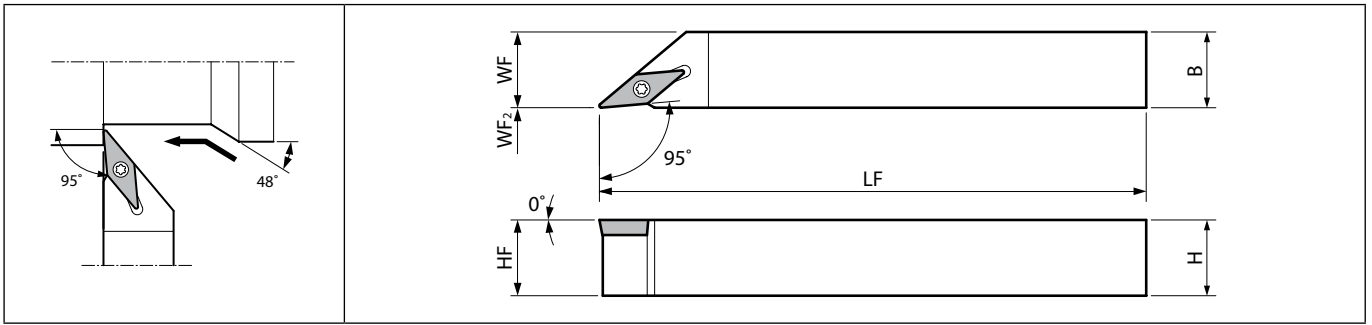
Toolholder dimensions

Description	Availability		Dimension (mm)										Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
	R	L	H	B	MHD	MHD2	HF	LF	LN	WF	WF ₂	Plug			Plug	Screw	Wrench		
	SVJPR 1218JX-11FFJCTM 1625JX-11FFJCTM 2025JX-11FFJCTM	●	●	12	18	54	-	12	28	18	0	0.2			Yes	GP-1	HS5X4LP	SB-2570TR		FT-8	VP□T1103...

Please see page H16 and H17 for piping parts of coolant-through holders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVLP-FF (External turning / External copying, Screw clamp, Without offset)





Right-hand shown

E



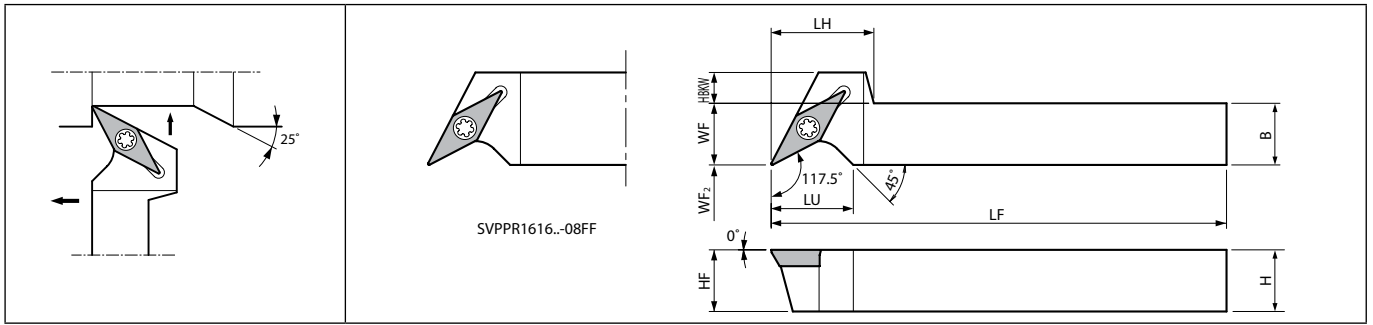
Small tools

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Spare parts		Applicable inserts		
											Screw	Wrench			
	R	L	H	B	HF	LF	WF	WF ₂							
SVLP ^{P/L} 1010JX-08FF 1212F-08FF 1212JX-08FF 1616JX-08FF	●	●	10	10	10	120	10	0	0.1	SB-2050TR	FT-6	VP□T0802...			
	●	●	12	12	12	85	12								
	●	●	16	16	16	120	16								
	●	●				16							16	16	
SVLP ^{P/L} 1212F-11FF 1212JX-11FF 1616JX-11FF	●	●	12	12	12	85	12	0	0.2	SB-2570TR	FT-8	VP□T1103...			
	●	●				120									
	●	●				16							16	16	16
	●	●													

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SVPP-FF (External turning / External facing / External copying / Undercutting, Screw clamp, Without offset)



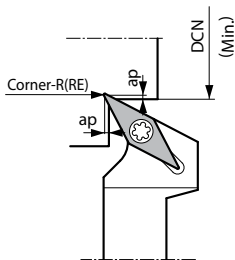
Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)										Standard corner-R(RE)	Spare parts		Applicable inserts
		R	H	B	LH	HF	HBKW	LF	LU	WF	WF ₂		Screw	Wrench	
SVPPR 1010JX-08FF 1212F-08FF 1212JX-08FF 1616JX-08FF	●	10	10		10	4	120		10			0.1	SB-2050TR	FT-6	VP□T0802...
	●	12	12	16	12	2	85	12	12	0					
	●	16	16	-	16	-	120		16						
	●	16	16		16		120		16						
SVPPR 1010JX-11FF 1212F-11FF 1212JX-11FF 1616JX-11FF	●	10	10		10	8	120		10		0.2	SB-2570TR	FT-8	VP□T1103...	
	●	12	12	20	12	6	85	16	12	0					
	●	16	16		16		120		16						
	●	16	16		16	2	120		16						



Undercutting diameter of SVPP-FF



Corner-R (RE)	ap (mm)	DCN (Min.)
0.2	0.5	ø20
	1	ø25

Applicable inserts (SVJP-FF / SVJP-FFJCTM / SVLP-FF / SVPP-FF)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Low feed	Low feed
Insert								
Chipbreaker type	CF	SKS	CK	GF	¾-F	¾-FSF	¾-U	¾-USF
Page	B102	B102	B102	B102	B103	B103	B104	B104
Applications	Low feed							
Insert								
Chipbreaker type	¾-J							
Page	B104							

Recommended cutting conditions E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

25° Insert profiling tools

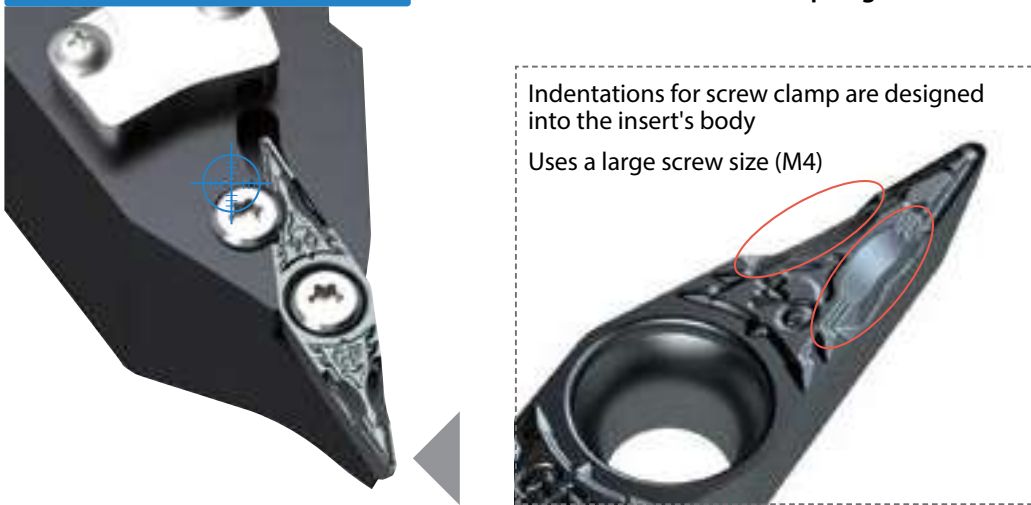
ZBMT Series

Unique clamping structure and a wide lineup of external toolholders and boring bars. High precision and stable machining in a wide range of applications including copying, undercutting, tapering, V-slotting, spherical machining, and more.

1 Newly developed unique-clamping mechanism achieves a higher rigidity

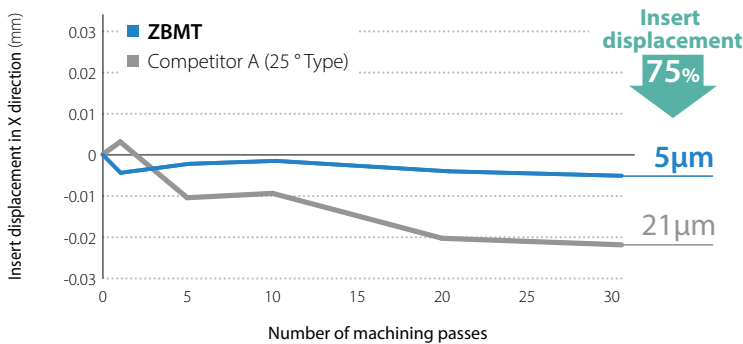
Side lock mechanism

Unique design holds insert at 2 points
Safe even for insert with small tip angle that is difficult to mount



Indentations for screw clamp are designed into the insert's body
Uses a large screw size (M4)

Insert displacement during facing comparison (Internal evaluation)



Cutting conditions : Vc = 230 m/min, ap = 0.3 mm, f = 0.15 mm/rev, Wet Workpiece material 34CrMo4

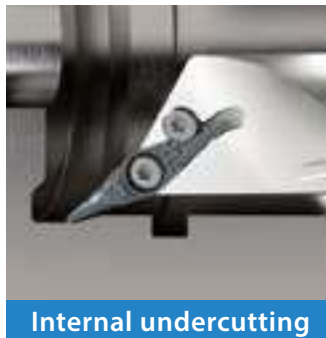
*The above figures are not guaranteed. It depends on cutting conditions.

Check

- By controlling insert displacement,
- Machining precision is stabilized and long tool life is enable
 - Reduces defect rate due to sudden dimensional deviation

Provides high quality and stable machining in various machining applications

Excellent performance in various machining applications including copying, undercutting, tapering, V-slotting, spherical machining, etc.



CG images

E

Small tools

2 Unique holder design to meet customers' needs

Both boring bars and external toolholders are compatible with internal coolant.

Uses a clamp with a small thickness that does not prevent chip flow

Unique double coolant hole design

Fine tuned and adjustable
± 4° Adjustable oscillation

Supplies coolant directly to the cutting edge and provides improved chip evacuation and long tool life (Coolant discharge direction: Fine adjustment possible)

*Though coolant stream hits side clamp screw, machining performance is not affected
*Pressure resistance: ~ 3 MPa

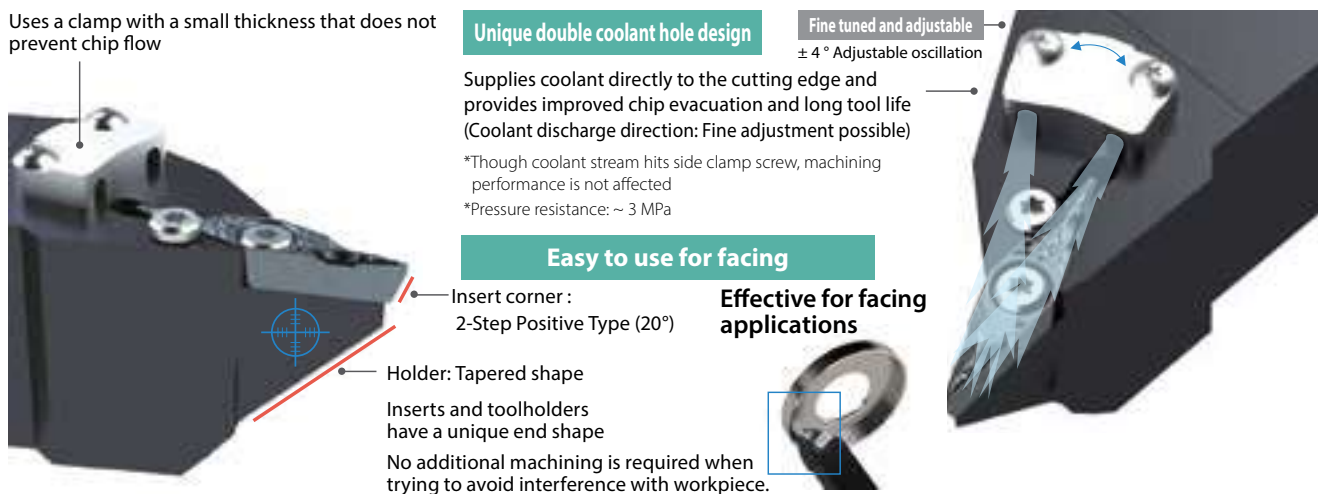
Easy to use for facing

Effective for facing applications

Insert corner:
2-Step Positive Type (20°)

Holder: Tapered shape
Inserts and toolholders have a unique end shape

No additional machining is required when trying to avoid interference with workpiece.



E



Small tools

3 New GF chipbreaker for ZBMT reduces chip control issues at minute D.O.C.

GF chipbreaker

Solving chip control issues leads to high-quality surface finishes

The thin molded chipbreaker extends near the corner and reliably controls chips even in narrow spaces

Two-step dot

Responds to chip fluctuation

Sloped cutting edge

Improved chip control at small D.O.C.

Mortar-shaped chipbreaker

Low resistance and excellent chip control even in ductile workpieces

Chip control comparison
(Internal evaluation)



GF chipbreaker

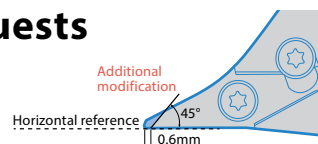


Competitor A (25° Type)

Cutting conditions: Vc = 230 m/min, f = 0.15 mm/rev, ap = 0.2 - 0.5 mm, Wet Workpiece material 34CrMo4 Facing

15° Inserts are also available upon customer requests

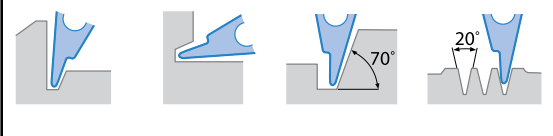
To avoid holder interference, additional modifications is required as shown in the figure on the right. Also, as shown in the figure below, special order for holders may be required depending on machining application.



Examples

When using the toolholder in reverse mounting position

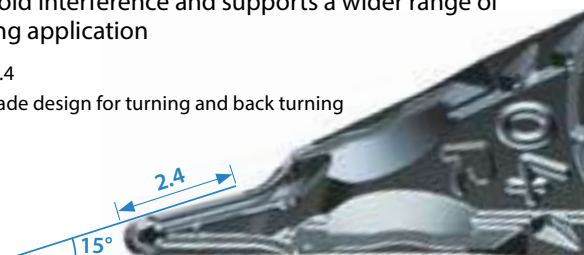
When using the toolholder in normal mounting position
* Holder: Special order specification



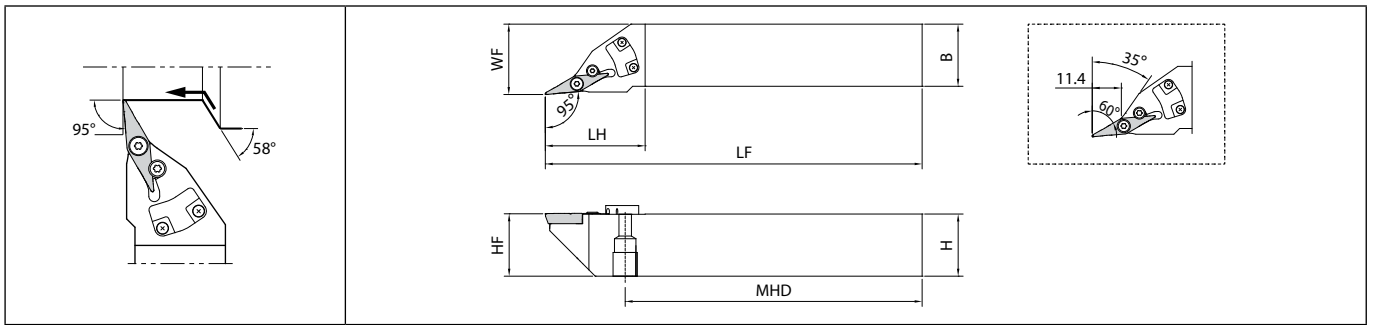
15° inserts are developed relative to 25° inserts
Helps avoid interference and supports a wider range of machining application

Corner-R 0.4

Double-blade design for turning and back turning



SZLB (External turning / External copying, Screw clamp, Coolant-through holder)



Right-hand shown | ZBMT13T304R-GF-15D is applicable to Right-hand Toolholder. | Applicable pressure : ~3MPa

E



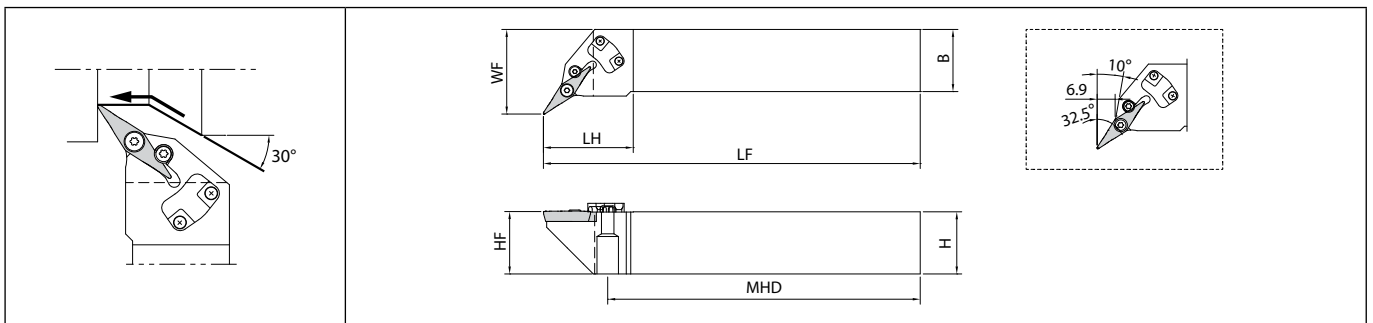
Small tools

Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-(R/RE)	Coolant hole	Spare parts				Applicable inserts
													Clamper screw	Clamper	Screw	Wrench	
	R	L	H	B	LH	MHD	HF	LF	WF								
SZLB% 2020K-13C 2525M-13C	●	●	20	20	40	92.6	20	125	23	0.4	Yes					ZBMT13T3...	

Please see page D12 for piping parts of coolant-through holders.

SZPB (External turning / External facing / External copying / Undercutting, Screw clamp, Coolant-through holder)



Right-hand shown | Applicable pressure : ~3MPa

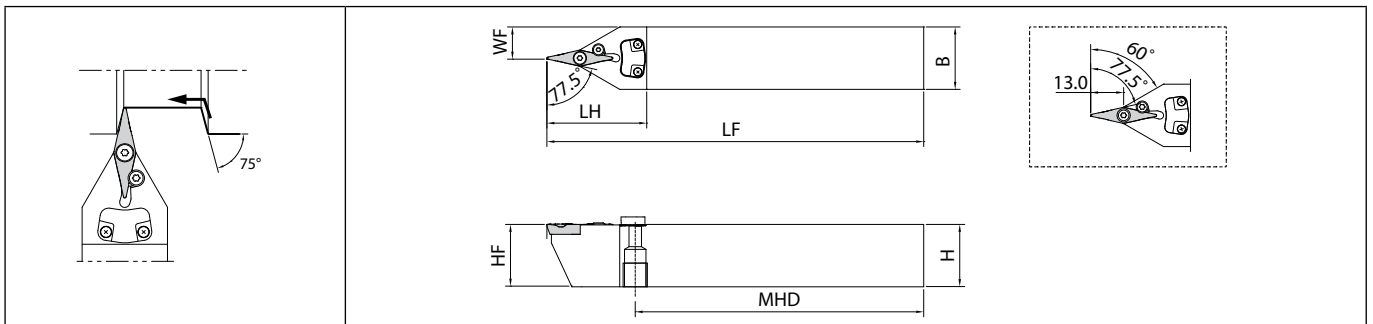
Toolholder dimensions

Description	Availability		Dimension (mm)								Standard corner-(R/RE)	Coolant hole	Spare parts				Applicable inserts
													Clamper screw	Clamper	Screw	Wrench	
	R	L	H	B	LH	MHD	HF	LF	WF								
SZPB% 2020K-13C 2525M-13C	●	●	20	20	37	95	20	125	27.2	0.4	Yes					ZBMT13T3...	

Please see page D12 for piping parts of coolant-through holders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SZVB (External turning / External copying, Screw clamp, Coolant-through holder)



Applicable pressure : ~3MPa

Toolholder dimensions

Description	Availability		Dimension (mm)							Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
	N	H	B	LH	MHD	HF	LF	WF	Clamper screw			Clamper	Screw	Wrench		
	SZVBN 2020K-13C 2525M-13C	● 20 ● 25	20 25	20	40	89.6 114.6	20 25	125 150	10 12.5			0.4	Yes	BH2X6	ZCP-13		SB-3079TR	FT-8	ZBMT13T3...

Please see page D12 for piping parts of coolant-through holders.

Applicable inserts

Applications	Finishing	Finishing	Non-ferrous metals
Insert			
Chipbreaker type	GF	R-GF-15D	NE
Page	B108	B108	C53

R-GF-15D inserts are only for the right-hand toolholders of SZLB.

Recommended cutting conditions [E68](#)

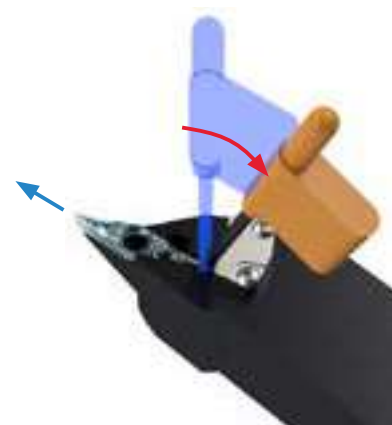
Instructions

When mounting the insert (Tightening torque: 1.2 N·m)



1. Tighten the main screw with the insert pressed against the contact surface with fingertips.
2. Tighten the side screw to complete the installation.

When removing the insert



Remove the two screws and put the wrench into the gap at the back end of the insert. It can be easily removed by pushing out the insert as shown above.

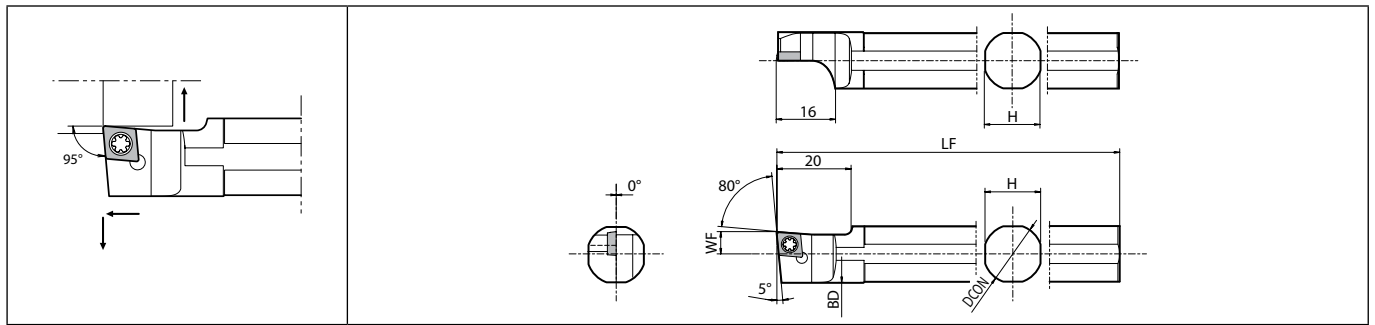
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E



Small tools

S-SCLC (External turning / External facing)



Left-hand shown | Right-hand Insert for Left-hand Toolholder.

E

Toolholder dimensions

Description	Availability	Dimension (mm)						Standard corner-R(RE)	Spare parts			Applicable inserts
		L	DCON	H	BD	LF	WF		Screw	Wrench	Wrench	
S12F- SCLC06	●	12	11	13.4	80	6	0.4	SB-2560TR		FT-8	CC-T0602... CC-W0602...	
S14H- SCLC06	●	14	13	100								
S15F- SCLC06	●	15.875	15	15.4	85							
S16F- SCLC06	●	16			90							
S19G- SCLC06	●	19.05	17	18.4	120							
S19K- SCLC06	●				120							
S20G- SCLC06	●	20	18	19.4	90							
S20K- SCLC06	●				120							
S19G- SCLC09	●	19.05	17	18.4	90	10	0.4	SB-4065TR	FT-15		CC-T09T3... CC-W09T3...	
S19K- SCLC09	●				120							
S20G- SCLC09	●	20	18	19.4	90							
S20K- SCLC09	●				120							
S25.0H- SCLC09	●	25	23	24.4	100							
S25K- SCLC09	●	25.4			120							

Applicable inserts

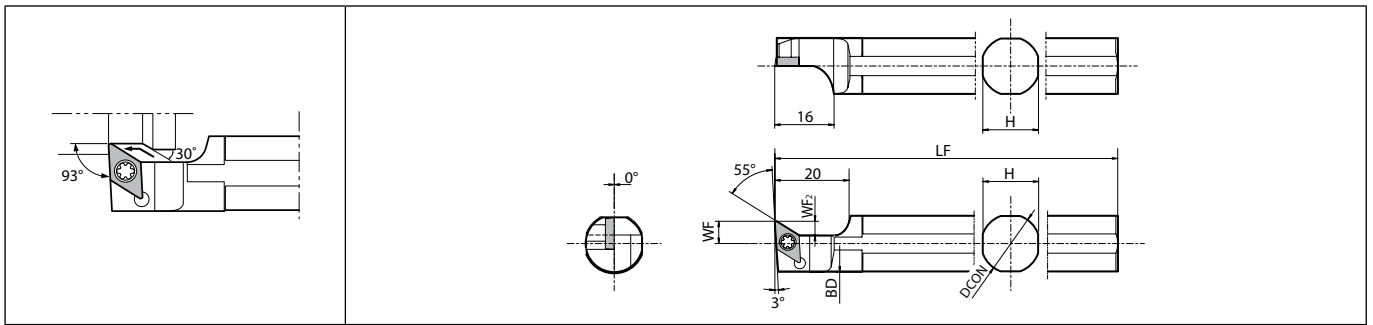
Applications	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	PF	GF	SKS	SK	CK	GQ	WP	PP
Page	B58	B58	B59	B59	B59	B59	B60	B60
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium	Low feed	Low feed	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	GK	HQ	STD	MF	R-U	R-J	MQ	No CB
Page	B60	B60	B60	B61	B63-B65	B65	B61	B66
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	R-A3	AH	PCD	APD	CBN		
Page	B66	B66	B66	C39	C40	C20		

Recommended cutting conditions E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Small tools

S-SDUC (External turning / External copying)



Left-hand shown | Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

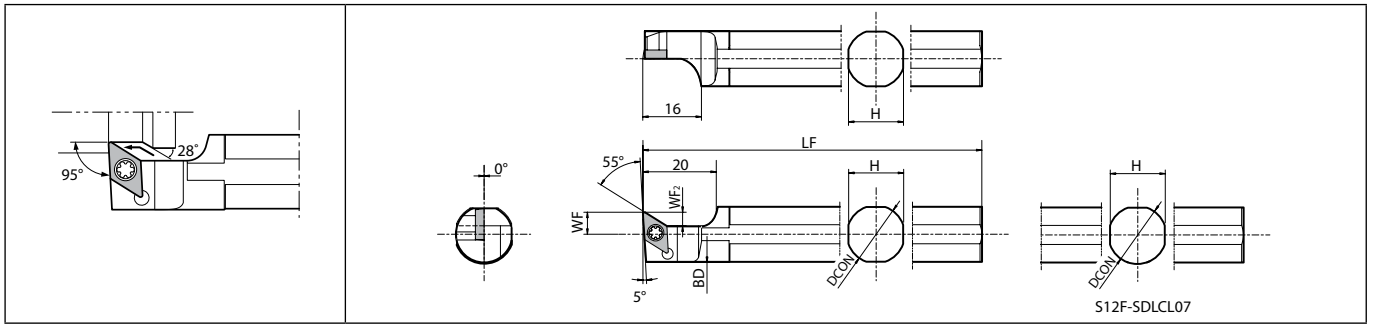
Description	Availability	Dimension (mm)						Standard corner-R(RE)	Spare parts			Applicable inserts	
		L	DCON	H	BD	LF	WF		WF ₂	Screw	Wrench		Wrench
S14H- SDUCL07	●	14	13	13.4	100							DC□T0702... DC□W0702... DC□X0702...	
S15F- SDUCL07	●	15.875	15	15.4	85								
S19G- SDUCL07	●	19.05	17	18.4	90	6	3.8	0.4	SB-2560TR	-	FT-8		
S19K- SDUCL07	●			120									
S20G- SDUCL07	●	20	18	19.4	90	10	5.8	0.4	SB-4085TR	FT-15	-		
S20K- SDUCL07	●			120									
S19G- SDUCL11	●	19.05	17	18.4	90	10	5.8	0.4	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...	
S19K- SDUCL11	●			120									
S20G- SDUCL11	●	20	18	19.4	90	10	5.8	0.4	SB-4085TR	FT-15	-		
S20K- SDUCL11	●			120									
S22K- SDUCL11	●	22	20	21.4	100								
S25.0H- SDUCL11	●	25	23	24.4	100								
S25K- SDUCL11	●	25.4		24.8	120								

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SDLC (External turning / External copying)






Left-hand shown | Right-hand Insert for Left-hand Toolholder.

E



Small tools

Toolholder dimensions


Description	Availability	Dimension (mm)							Standard corner-R(RE)	Spare parts			Applicable inserts					
		L	DCON	H	BD	LF	WF	WF ₂		Screw	Wrench	Wrench						
										  								
S12F- SDLCL07	●	12	11	13.4	80	6	3.8	0.4	SB-2560TR	-	FT-8	DC□T0702... DC□W0702...						
S14H- SDLCL07	●	14	13	100														
S15F- SDLCL07	●	15.875	15	85														
S16F- SDLCL07	●	16																
S19G- SDLCL07	●	19.05	17	90														
S19K- SDLCL07	●		18.4	120														
S20G- SDLCL07	●	20	18	90														
S20K- SDLCL07	●		19.4	120														
S19G- SDLCL11	●	19.05	17	90	10								5.8	0.4	SB-4085TR	FT-15	-	DC□T11T3... DC□W11T3...
S19K- SDLCL11	●		18.4	120														
S20G- SDLCL11	●	20	18	90														
S20K- SDLCL11	●		19.4	120														
S22K- SDLCL11	●	22	20	21.4														
S25.0H- SDLCL11	●	25	23	100														
S25K- SDLCL11	●	25.4	24.8	120														

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (S-SDUC / S-SDLC)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	WP*	R-WP*
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	PP	GP	GK	HQ	STD	MF	R-F	R-FSF
Page	B69	B69	B70	B70	B70	B70	B72, B73	B72
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	R-U	R-USF	R-J	R-JSF	XP	XQ	MQ	No CB
Page	B74~B76	B74	B77	B76	B71	B71	B71	B78
Applications	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Non-ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	R-A3	AH	PCD	APD	CBN		
Page	B78	B78	B78	C42	C42	C22		

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37. (S-SDLC cannot be used)

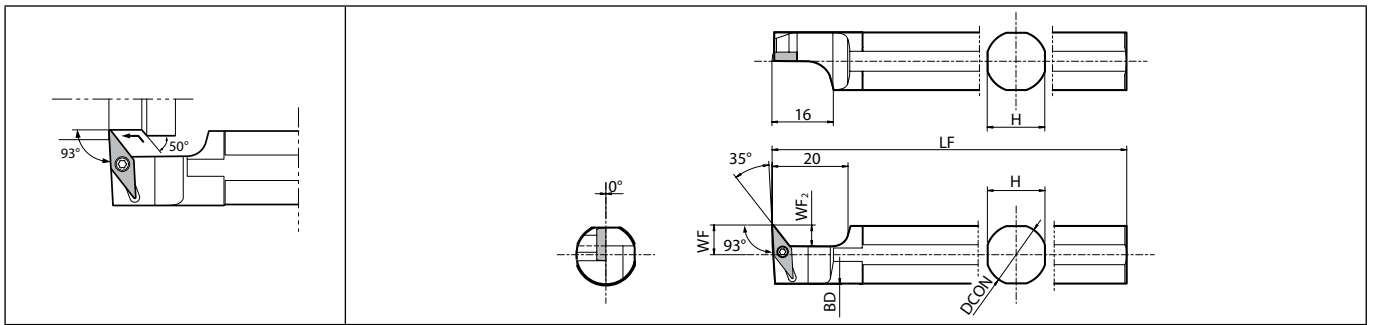
Recommended cutting conditions  E65, E66

E



Small tools



S-SVUB (External turning / External copying)



Left-hand shown | Right-hand Insert for Left-hand Toolholder.

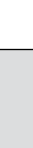
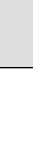
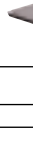


E

Toolholder dimensions

Description	Availability	Dimension (mm)							Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
		L	DCON	H	BD	LF	WF	WF ₂			Screw	Wrench	
													
S19G- SVUBL11	●	19.05	17	18.4	90	10.5	8	0.4	No	SB-2570TR	FT-8	VB-T1103... VB-W1103...	
S19K- SVUBL11	●												20	18	19.4	90
S20G- SVUBL11	●	25	23	24.4	100								
S20K- SVUBL11	●												25.4	24.8	120	120
S25.0H- SVUBL11	●	25.4	24.8	120	120								
S25K- SVUBL11	●												25.4	24.8	120	120

Small tools

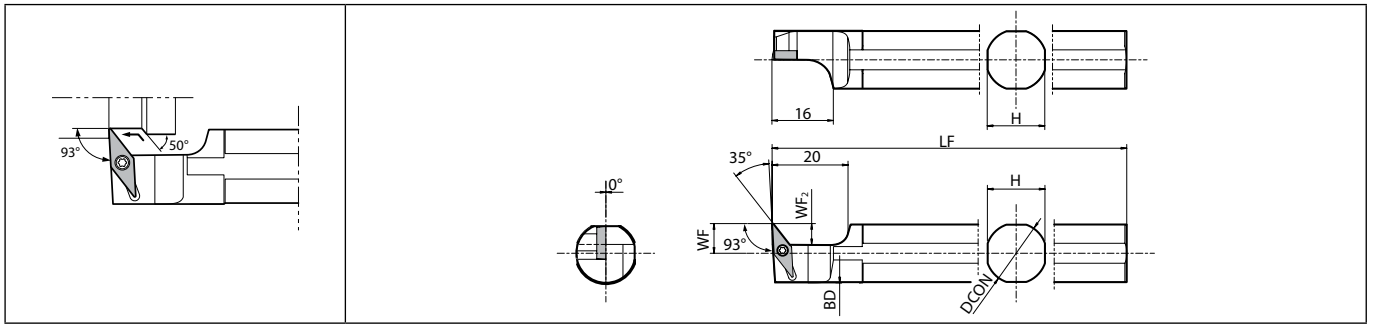
Applicable inserts

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-ferrous metals
Insert								
Chipbreaker type	PP	GP	VF	HQ	R-F	R-FSF	R-Y	PCD
Page	B97	B97	B97	B97	B98	B98	B99	C49
Applications	Hard materials							
Insert								
Chipbreaker type	CBN							
Page	C26							

Recommended cutting conditions → E65, E66



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SVUC (External turning / External copying)

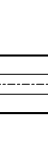


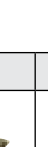







Left-hand shown | Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)							Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
		L	DCON	H	BD	LF	WF	WF ₂			Screw	Wrench	
													
S12F- SVUCL08	●	12	11	13.4	80	7.5	5.5	0.4	No	SB-2050TR	FT-6	VC□T0802... VC□W0802...	
S14H- SVUCL08	●	14	13	100									
S15F- SVUCL08	●	15.875	15	15.4	85								8
S16F- SVUCL08	●	16											
S19G- SVUCL11	●	19.05	17	18.4	90	10.5	8	0.2	No	SB-2570TR	FT-8	VC□T1103...	
S19K- SVUCL11	●			120									
S20G- SVUCL11	●	20	18	19.4	90								
S20K- SVUCL11	●			120									
S25.0H- SVUCL11	●	25	23	24.4	100								
S25K- SVUCL11	●	25.4		24.8	120								

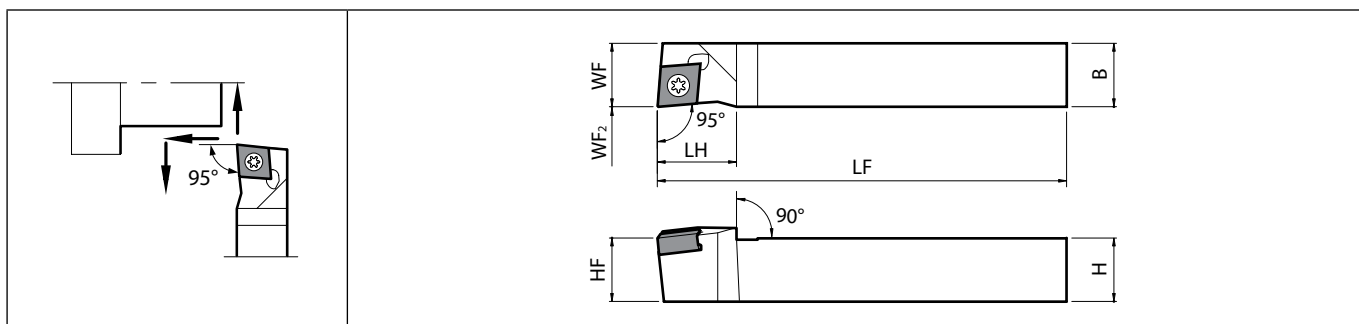
Applicable inserts

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing - Medium
Insert								
Chipbreaker type	CF	GF	SKS	PP	VF	HQ	R-F	R-Y
Page	B100	B100	B100	B100	B100	B100	B101	B101
Applications	Non-ferrous metals	Hard materials						
Insert								
Chipbreaker type	PCD	CBN						
Page	C50	C27						

Recommended cutting conditions  E65, E66

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SCLN-FF (External turning / External facing, Screw clamp, Without offset)



Right-hand shown

E

Toolholder dimensions

Description	Availability	Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts		Applicable inserts
		R	H	B	LH	HF	LF	WF	WF ₂				Screw	Wrench	
		SCLNR	1010K-07FF	●	10	10		10	120				10		
	1212F-07FF	●	12	12	15	12	85	12	0	0.2	-6	-6	SB-3080TR	LTW-10SS	
	1212K-07FF	●					120								
	1616K-07FF	●	16	16		16		16							

Applicable inserts

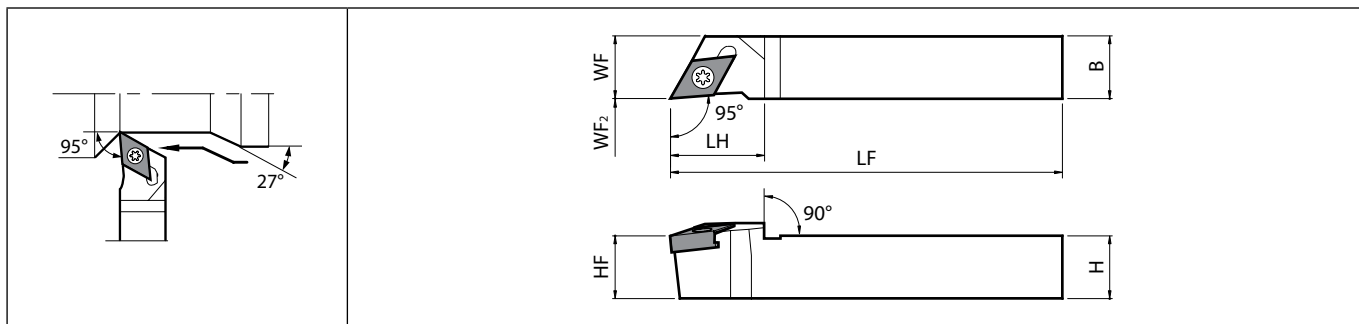
Applications	Finishing - Medium	Medium - Roughing	Finishing	Low feed
Insert				
Chipbreaker type	SK	GK	R-F	R-U
Page	B54	B54	B54	B54

Recommended cutting conditions E62

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Small tools

SDLN-FF (External turning / External copying, Screw clamp, Without offset)





Right-hand shown

Toolholder dimensions

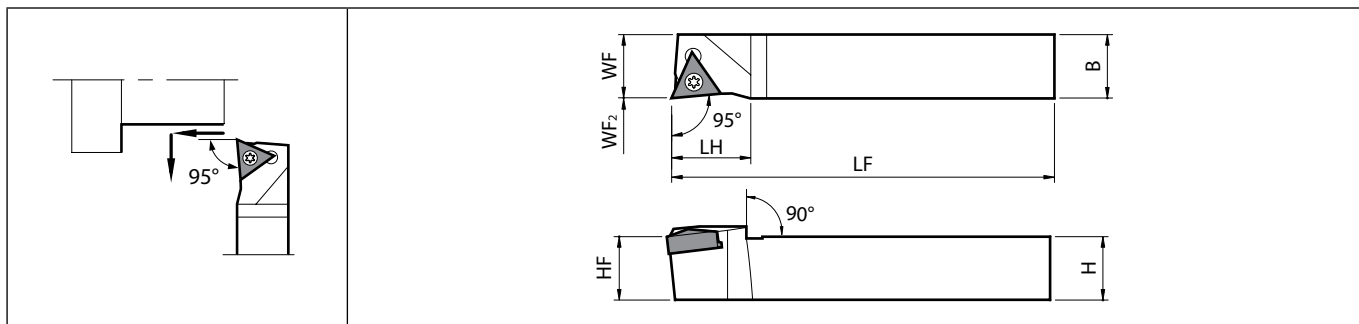
Description	Availability	Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts		Applicable inserts
		R	H	B	LH	HF	LF	WF	WF ₂				Screw	Wrench	
		 													
SDLNR 1010K-08FF 1212F-08FF 1212K-08FF 1616K-08FF	● ● ● ●	10 12 16	10 12 16	10 18 16	10 12 16	120 85 120	10 12 16	0 0 0	0.2 0 0	-6 -6 -6	-7 -7 -7	SB-3080TR SB-3080TR SB-3080TR	LTW-10SS LTW-10SS LTW-10SS	DN□U0803...	

Applicable inserts

Applications	Finishing - Medium	Medium - Roughing	Finishing	Low feed
Insert				
Chipbreaker type	SK	GK	R-F	R-U
Page	B55	B55	B55	B55

Recommended cutting conditions  E62

STLN-FF (External turning, Screw clamp, Without offset)



Right-hand shown

E

Toolholder dimensions

Description	Availability	Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts		Applicable inserts
		R	H	B	LH	HF	LF	WF	WF ₂				Screw	Wrench	
		10		12		15		16					10			12		16
STLNR 1010K-09FF	●	10	10		10	120	10		0.2	-6	-7	SB-2570TR	LTW-8SS	TNGU0903...	
1212F-09FF	●	12	12	15	12	85	12	0							
1212K-09FF	●														
1616K-09FF	●	16	16		16	120	16								

Applicable inserts

Applications	Finishing	Low feed
Insert		
Chipbreaker type	R-F	R-U
Page	B56	B56

Recommended cutting conditions

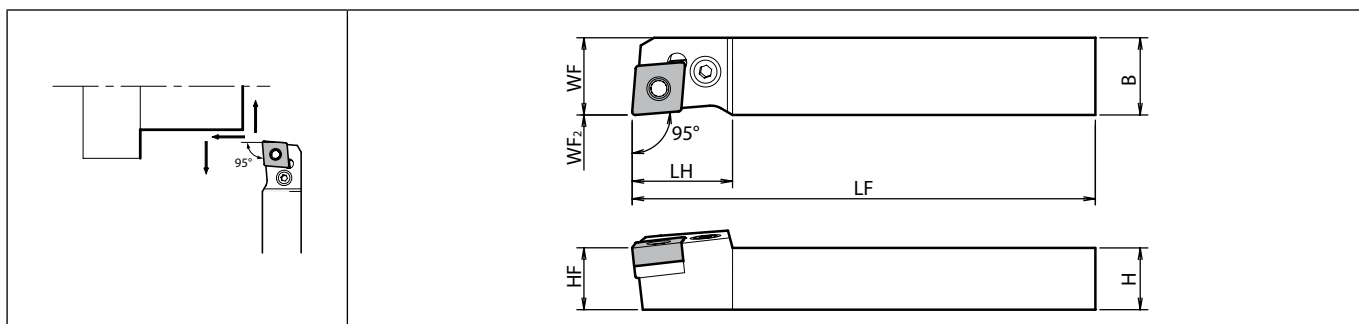
Workpiece material	PR1225	PR1535	PR1705	PR1725
Free-cutting steel	-	-	● Vc = 100 m/min 60 ~ 150	☺ Vc = 100 m/min 60 ~ 150
Carbon steel / Alloy steel	☺ Vc = 100 m/min 60 ~ 150	☺ Vc = 100 m/min 60 ~ 150	☺ Vc = 130 m/min 60 ~ 220	● Vc = 130 m/min 60 ~ 200
Stainless steel	☺ Vc = 80 m/min 50 ~ 150	● Vc = 100 m/min 60 ~ 180	-	☺ Vc = 100 m/min 80 ~ 150

● : Continuous to light interruption: 1st recommendation
 ☺ : Continuous to light interruption: 2nd recommendation

● : Standard item R : Right-hand only L : Left-hand only ☐ : Check availability

Small tools

PCLN-FF (External turning / External facing, Without offset)



Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
		R	H	B	LH	HF	LF	WF	WF ₂				Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
		PCLNR 1620JX-12FF 2020JX-12FF	● ●	16 20	20	26	16 20	120	20				0	0.8	-6	-6	LL-2N	LS-2N		PC-2	LSP-2	LC-42N	LW-3	CN□G1204...

Applicable inserts

Applications	Finishing - Medium	Medium - Roughing
Insert		
Chipbreaker type	SK	FP-TK
Page	B20	B20

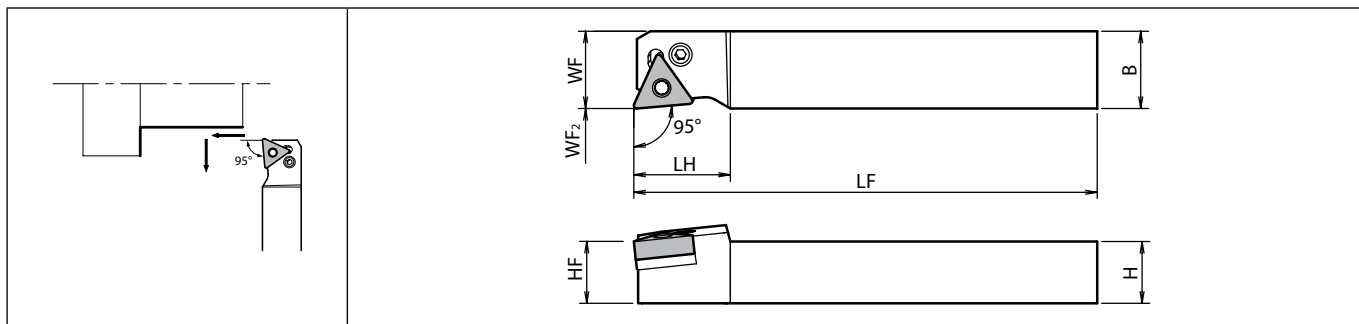
Recommended cutting conditions E62

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Small tools

PTLN-FF (External turning, Without offset)



Right-hand shown

E

Toolholder dimensions

Description	Availability	Dimension (mm)								Standard corner-R(RE)	Side rake angle (°)	Inclination angle (°)	Spare parts						Applicable inserts
		R	H	B	LH	HF	LF	WF	WF ₂				Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
		PTLNR 1620JX-16FF 2020JX-16FF	● ●	16 20	20	24	16 20	120	20				0	0.8	-6	-6	LL-1N	LS-1N		PC-1	LSP-1	LT-32N *LT-32N-20	FH-2.5	TN_G1604...

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.

Applicable inserts

Applications	Finishing - Medium	Medium - Roughing	Large ap
Insert			
Chipbreaker type	SK	FP-TK	R-LD
Page	B41	B41	B41

Recommended cutting conditions E62

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Small tools

External turning (positive insert) - cutting diameter under $\varnothing 16\text{mm}$

ISO classification	Workpiece material	Hardness	Cutting range	Applications	Chipbreaker	Insert grade	Corner-R (RE)	Lower limit - Recommendation - Upper limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
P *	Low carbon steel Low carbon alloy	HB \leq 300	Precision finishing	Continuous	F	PR1725	0.05	100 - 150 - 200	0.05 - 0.07 - 0.15	0.03 - 0.05 - 0.1
				Interruption		PR1725	0.2	80 - 120 - 160	0.05 - 0.1 - 0.2	0.03 - 0.1 - 0.15
			Precision finishing Molded chipbreaker	Continuous	CF	PR1725	0.2	100 - 150 - 200	0.02 - 0.05 - 0.1	0.02 - 0.05 - 0.12
				Interruption						
			Finishing	Continuous	SKS	PR1725	0.2	100 - 140 - 180	0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2
	Interruption			PR1725	0.4	80 - 120 - 160	0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2		
	Medium carbon steel Medium carbon alloy	HB \leq 330	Precision finishing	Continuous	F	PR1725	0.05	100 - 150 - 200	0.05 - 0.07 - 0.15	0.03 - 0.05 - 0.1
				Interruption		PR1725	0.2	80 - 120 - 160	0.05 - 0.1 - 0.2	0.03 - 0.1 - 0.15
			Precision finishing Molded chipbreaker	Continuous	CF	PR1725	0.2	100 - 150 - 200	0.02 - 0.05 - 0.1	0.02 - 0.05 - 0.12
				Interruption						
			Finishing	Continuous	SKS	PR1725	0.2	100 - 140 - 180	0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2
	Interruption			PR1725	0.4	80 - 120 - 160	0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2		
	High carbon alloy	HB \leq 280	Precision finishing	Continuous	F	PR1725	0.05	100 - 150 - 200	0.05 - 0.07 - 0.15	0.03 - 0.05 - 0.1
				Interruption		PR1725	0.2	80 - 120 - 160	0.05 - 0.1 - 0.2	0.03 - 0.1 - 0.15
			Precision finishing Molded chipbreaker	Continuous	CF	PR1725	0.2	100 - 150 - 200	0.02 - 0.05 - 0.1	0.02 - 0.05 - 0.12
Interruption										
Finishing			Continuous	SKS	PR1725	0.2	100 - 140 - 180	0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2	
	Interruption		PR1725	0.4	80 - 120 - 160	0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2			
M	Stainless steel (Austenitic related)	HB \leq 220	Finishing	Continuous	SKS	PR1725	0.2	80 - 100 - 120	0.1 - 0.3 - 0.5	0.03 - 0.05 - 0.1
				Interruption		PR1535	0.4	60 - 80 - 100	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.15
	Medium	Continuous	SK	PR1725	0.2	80 - 100 - 120	0.5 - 1.5 - 3.0	0.03 - 0.08 - 0.12		
		Interruption		PR1535	0.4	60 - 80 - 100	0.5 - 1.0 - 2.0	0.05 - 0.1 - 0.15		
		Interruption								
Stainless steel (Precipitation hardening)	HB \leq 300	Finishing	Continuous	SKS	PR1725	0.2	40 - 60 - 80	0.1 - 0.3 - 0.5	0.03 - 0.05 - 0.1	
			Interruption		PR1535	0.4	30 - 50 - 70	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.15	
Medium	Continuous	SK	PR1725	0.2	40 - 60 - 80	0.5 - 1.0 - 2.0	0.03 - 0.08 - 0.12			
	Interruption		PR1535	0.4	30 - 50 - 70	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.15			

* For machining free-cutting steels, such as SUM, etc. use PR1705 at Vc = 200 m/min or less.
For ap and f, refer to specs for low carbon steels.



Small tools

External turning (positive insert) - cutting diameter under $\phi 16\text{mm}$

ISO classification	Workpiece material	Hardness	Cutting range	Applications	Chipbreaker	Insert grade	Corner-R (RE)	Lower limit - Recommendation - Upper limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
K	Gray cast iron	$\text{HB} \leq 250$	Finishing	Continuous	Standard	CA310	0.4	100 - 120 - 150	0.2 - 0.5 - 1.0	0.1 - 0.15 - 0.2
				Interruption		CA315	0.4	80 - 100 - 120	0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.15
			Medium	Continuous	Standard	CA310	0.4	100 - 120 - 150	0.5 - 1.0 - 2.0	0.1 - 0.15 - 0.2
				Interruption		CA315	0.8	80 - 100 - 120	0.5 - 1.0 - 2.0	0.05 - 0.1 - 0.15
	Nodular cast iron	$\text{HB} \leq 270$	Finishing	Continuous	Standard	CA310	0.4	80 - 100 - 120	0.2 - 0.5 - 1.0	0.1 - 0.15 - 0.2
				Interruption		CA315	0.4	60 - 80 - 100	0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.15
Medium	Continuous	Standard	CA310	0.4	80 - 100 - 120	0.5 - 1.0 - 2.0	0.1 - 0.15 - 0.2			
	Interruption		CA315	0.8	60 - 80 - 100	0.5 - 1.0 - 2.0	0.05 - 0.1 - 0.15			
N	Non-ferrous metals Copper alloy Aluminum Aluminum alloys (Si10% or less) etc.	$\text{HB} \leq 100$	High speed machining (Rainbow surface gloss)	Continuous	Without chipbreaker	KPD001	0.2	150 - 250 - 350	0.05 - 0.1 - 0.3	0.05 - 0.1 - 0.15
			Finishing (Long tool life)	Continuous	F	PDL025	0.2	100 - 150 - 200	0.05 - 0.3 - 0.5	0.02 - 0.07 - 0.1
				Interruption		PDL025	0.4	100 - 150 - 200	0.05 - 0.3 - 0.5	0.02 - 0.07 - 0.1
			Finishing	Continuous	F	KW10	0.2	100 - 150 - 200	0.05 - 0.3 - 0.5	0.02 - 0.07 - 0.1
				Interruption		KW10	0.4	100 - 150 - 200	0.05 - 0.3 - 0.5	0.02 - 0.07 - 0.1
			Medium	Continuous	U	KW10	0.2	100 - 150 - 200	0.2 - 0.5 - 1.5	0.03 - 0.1 - 0.2
Interruption	KW10	0.4		100 - 150 - 200		0.2 - 0.5 - 1.5	0.03 - 0.1 - 0.2			
S	Titanium alloys	$\text{HB} \leq 400$	Precision finishing (Rainbow surface gloss)	Continuous	Without chipbreaker	KPD001	0.2	100 - 120 - 150	0.05 - 0.1 - 0.3	0.03 - 0.07 - 0.1
				Interruption	KPD001	0.4	70 - 100 - 120	0.05 - 0.1 - 0.3	0.03 - 0.07 - 0.1	
			Medium	Continuous	F, U	KW10	0.4	30 - 50 - 70	0.1 - 0.5 - 1.0	0.03 - 0.1 - 0.2
	Interruption	KW10	0.4	30 - 50 - 70		0.1 - 0.5 - 1.0	0.03 - 0.1 - 0.2			
	Heat-resistant alloys	$\text{HB} \leq 350$	Finishing	Continuous	F, U	KW10	0.4	10 - 30 - 50	0.1 - 0.3 - 0.5	0.03 - 0.05 - 0.1
				Interruption		Without chipbreaker	KW10	0.8	10 - 30 - 50	0.2 - 0.5 - 0.7	0.03 - 0.05 - 0.1
Finishing			Continuous	MQ	PR1535	0.4	40 - 60 - 80	0.1 - 0.3 - 0.5	0.03 - 0.05 - 0.1	
	Interruption	PR1535	0.8		40 - 60 - 80	0.1 - 0.3 - 0.5	0.03 - 0.05 - 0.1			
H	Hardened steel Hard materials	40 ~ 50 HRC	Finishing	Continuous	GK	PR1725	0.2	40 - 60 - 80	0.1 - 0.3 - 0.5	0.02 - 0.07 - 0.1
				Interruption		PR1725	0.4	40 - 60 - 80	0.1 - 0.3 - 0.5	0.02 - 0.07 - 0.1
		50 ~ 68 HRC	Finishing	Continuous	ME	KBN010	0.2	80 - 120 - 150	0.1 - 0.3 - 0.5	0.02 - 0.07 - 0.1
				Interruption		MET	KBN020	0.4	60 - 100 - 120	0.1 - 0.3 - 0.5	0.02 - 0.07 - 0.1

E

Small tools

Back Turning - cutting diameter under $\varnothing 16\text{mm}$

KTKF

Workpiece material		MEGACOAT NANO PLUS		MEGACOAT NANO		MEGACOAT		Remarks
		PR1725		PR1535		PR1225		
		Grooving	Turning	Grooving	Turning	Grooving	Turning	
Carbon steel / Alloy steel	Vc (m/min)	★ 60 ~ 200		☆ 60 ~ 150		☆ 60 ~ 150		Coolant
	f (mm/rev)	0.01 ~ 0.03	0.02 ~ 0.15	0.01 ~ 0.03	0.02 ~ 0.15	0.01 ~ 0.03	0.02 ~ 0.15	
Stainless steel	Vc (m/min)	☆ 60 ~ 150		★ 60 ~ 130		☆ 60 ~ 130		
	f (mm/rev)	0.01 ~ 0.02	0.02 ~ 0.1	0.01 ~ 0.02	0.02 ~ 0.1	0.01 ~ 0.02	0.02 ~ 0.1	

Workpiece material		Carbide		PCD		Remarks
		KW10		KPD001		
		Grooving	Turning	Grooving	Turning	
Cast iron	Vc (m/min)	50 ~ 100		-		Coolant
	f (mm/rev)	0.01 ~ 0.02	0.02 ~ 0.15	-		
Aluminum	Vc (m/min)	200 ~ 450		200 ~ 500		
	f (mm/rev)	0.01 ~ 0.03	0.02 ~ 0.15	0.01 ~ 0.03	0.02 ~ 0.12	
Brass	Vc (m/min)	100 ~ 200		100 ~ 350		
	f (mm/rev)	0.01 ~ 0.05	0.02 ~ 0.2	0.01 ~ 0.05	0.02 ~ 0.15	

KTKF (GTP chipbreaker)

Workpiece material		MEGACOAT NANO PLUS		MEGACOAT NANO		Remarks
		PR1725		PR1535		
		Grooving	Turning	Grooving	Turning	
Carbon steel / Alloy steel	Vc (m/min)	★ 60 ~ 200		☆ 60 ~ 150		Coolant
	f (mm/rev)	0.03 ~ 0.07	0.05 ~ 0.15	0.03 ~ 0.07	0.05 ~ 0.15	
Stainless steel	Vc (m/min)	☆ 60 ~ 150		★ 60 ~ 130		
	f (mm/rev)	0.02 ~ 0.05	0.03 ~ 0.10	0.02 ~ 0.05	0.03 ~ 0.10	

KTKF (GQ chipbreaker)

Workpiece material		MEGACOAT NANO PLUS		MEGACOAT NANO		MEGACOAT		Remarks
		PR1725		PR1535		PR1225		
		Grooving	Turning	Grooving	Turning	Grooving	Turning	
Carbon steel / Alloy steel	Vc (m/min)	★ 60 ~ 200		☆ 60 ~ 150		☆ 60 ~ 150		Coolant
	f (mm/rev)	0.01 ~ 0.04	0.02 ~ 0.15	0.01 ~ 0.04	0.02 ~ 0.15	0.01 ~ 0.04	0.02 ~ 0.15	
Stainless steel	Vc (m/min)	☆ 60 ~ 150		★ 60 ~ 130		☆ 60 ~ 130		
	f (mm/rev)	0.01 ~ 0.03	0.02 ~ 0.1	0.01 ~ 0.03	0.02 ~ 0.1	0.01 ~ 0.03	0.02 ~ 0.1	

KTKF (AGT chipbreaker)

Workpiece material		PCD		Remarks
		KPD001		
		Grooving	Turning	
Aluminum alloy	Vc (m/min)	200 ~ 500		Coolant
	f (mm/rev)	0.03 ~ 0.15	0.03 ~ 0.20	
Brass	Vc (m/min)	100 ~ 350		
	f (mm/rev)	0.03 ~ 0.15	0.03 ~ 0.20	

ABS15, ABW15, ABW23

Workpiece material		MEGACOAT NANO PLUS				MEGACOAT		PVD coated carbide		Remarks
		PR1725		PR1705		PR1225		PR930		
		Grooving	Turning	Grooving	Turning	Grooving	Turning	Grooving	Turning	
Carbon steel / Alloy steel	Vc (m/min)	★ 60 ~ 180		☆ 80 ~ 200		☆ 60 ~ 150		☆ 80 ~ 100		Coolant
	f (mm/rev)	0.02	0.02 ~ 0.07	0.02	0.02 ~ 0.07	0.02	0.02 ~ 0.07	0.02	0.02 ~ 0.07	
Stainless steel	Vc (m/min)	☆ 30 ~ 130		☆ 40 ~ 150		★ 40 ~ 120		☆ 30 ~ 50		
	f (mm/rev)	0.02	0.02 ~ 0.05	0.02	0.02 ~ 0.05	0.02	0.02 ~ 0.05	0.02	0.02 ~ 0.05	

Workpiece material		Carbide		Remarks
		KW10		
		Grooving	Turning	
Aluminum	Vc (m/min)	150 ~ 200		Coolant
	f (mm/rev)	0.02	0.02 ~ 0.10	
Brass	Vc (m/min)	100 ~ 160		
	f (mm/rev)	0.03	0.02 ~ 0.15	

★: 1st recommendation

☆: 2nd recommendation

E



Small tools

ZBMT

Workpiece material	Insert tip angle	Corner-R (RE)	Insert grade	Vc (m/min)	ap (mm)	f (mm/rev)
Carbon steel / Alloy steel	25°	0.2	PR1725	60 - 150 - 200	0.2 - 0.3 - 1.5	0.05 - 0.10 - 0.15
			PR1535	60 - 120 - 180	0.2 - 0.3 - 1.5	0.05 - 0.10 - 0.15
		0.4 / 0.8	PR1725	60 - 150 - 200	0.2 - 0.3 - 2.0	0.05 - 0.15 - 0.25
			PR1535	60 - 120 - 180	0.2 - 0.3 - 2.0	0.05 - 0.15 - 0.25
	15°	0.4	PR1725	60 - 150 - 200	0.2 - 0.3 - 1.0	0.05 - 0.10 - 0.15
			PR1535	60 - 120 - 180	0.2 - 0.3 - 1.0	0.05 - 0.10 - 0.15
Stainless steel	25°	0.2	PR1725	60 - 150 - 180	0.2 - 0.3 - 1.0	0.05 - 0.10 - 0.15
			PR1535	60 - 120 - 150	0.2 - 0.3 - 1.0	0.05 - 0.10 - 0.15
		0.4 / 0.8	PR1725	60 - 150 - 180	0.2 - 0.3 - 1.0	0.05 - 0.15 - 0.25
			PR1535	60 - 120 - 150	0.2 - 0.3 - 1.0	0.05 - 0.15 - 0.25
	15°	0.4	PR1725	60 - 150 - 180	0.2 - 0.3 - 1.0	0.05 - 0.10 - 0.15
			PR1535	60 - 120 - 150	0.2 - 0.3 - 1.0	0.05 - 0.10 - 0.15
Cast iron	25°	0.2	PR1725	60 - 150 - 180	0.2 - 0.3 - 1.5	0.05 - 0.10 - 0.15
		0.4 / 0.8	PR1725	60 - 150 - 180	0.2 - 0.3 - 2.0	0.05 - 0.15 - 0.25
	15°	0.4	PR1725	60 - 150 - 180	0.2 - 0.3 - 1.0	0.05 - 0.10 - 0.15

When using machining at ap 1.5 mm or more, reduce the feed by about 50%.

E

Small tools

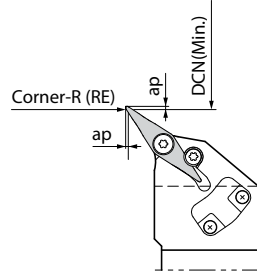
Boring/Facing available cutting diameter and maximum D.O.C.



Standard corner-R (RE) 0.4

Cutting Dia.	Depth (mm)
ø30	0.5
ø50	1.5
ø65	3.0
ø80	6.0
ø100	10.0
ø150	14.0

SZPB type cutting diameter for undercutting



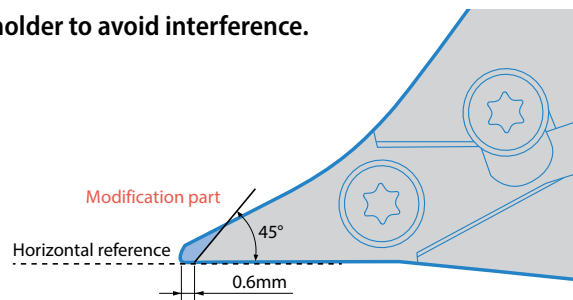
Corner-R (RE)	ap (mm)	DCN (Min.)
0.2	0.5	ø30
	1	ø35
0.4	0.5	ø30
	1	ø35
0.8	0.5	ø110
	1	ø150

How to modify toolholder when using 15° insert

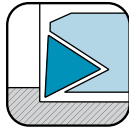
When using 15° insert, additional modification is required for the holder to avoid interference.

Recommended additional modification

- Set the edge of insert bearing surface at the end of the holder at horizontal reference shown below.
- Modify the holder to 0.6 mm from the tip at an angle of not less than 45 degrees from the horizontal.



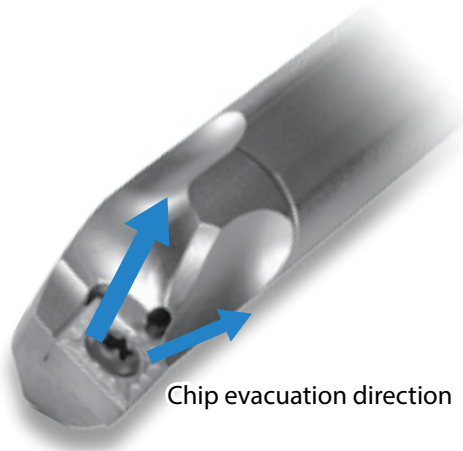
F



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Solid tip bars for micro boring		F16
EZ Bars		F16
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System Tip-Bars		F44
Twin-Bars		F56
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DC insert		F66
JC insert		F78
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CN insert		F131
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EN insert	S- CELN	F151
Boring bars for CBN inserts		F152
TN insert	S-CTUN-A	F152
Sleeves / Coolant joint		F153
Recommended cutting conditions		F158

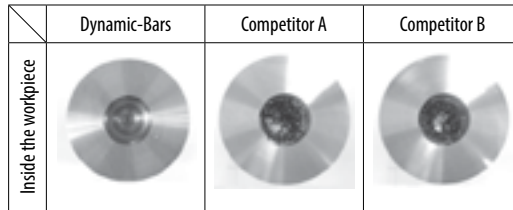
Dynamic-Bars

The Dynamic-Bars achieves superior chip evacuation



Chip evacuation direction

Superior chip evacuation (External coolant)

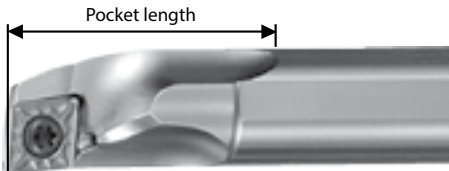


In the products of competitor A and B chips remain inside the workpiece, but chips from the Dynamic-Bars are all evacuated from the workpiece.

F

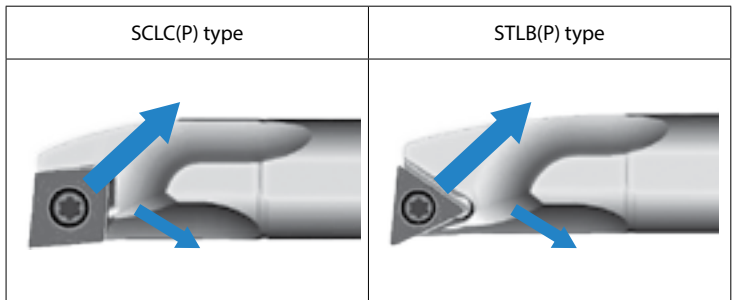
Boring

Comparison of pocket length



Description	Pocket length (mm)	
	Dynamic-Bars	Competitor A
A16-SCLPR09-18 type	37	29
A20-SCLCR09-22 type	48	32

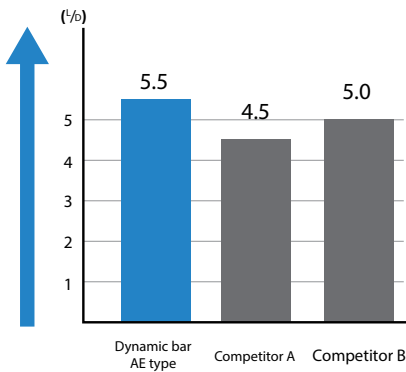
Chip evacuation direction



Better evacuation by backward chip flow

High rigidity and chattering resistance are ensured by using a special alloy and with help of stress analysis technology.

Comparison of vibration tendency

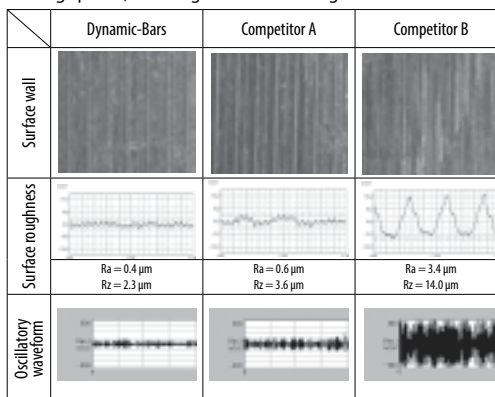


Maximum toolholder overhang length (L/D)

Cutting conditions	
15CrMo4	f = 0.1 mm/rev
Vc = 150 m/min	S16-SCLPR09 type
ap = 0.5 mm	CPMH090304L-Y

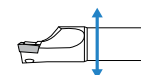
Comparison of surface finish

Vibration of the Dynamic-Bars was minimal even at high cutting speeds, enabling stable machining.



Cutting conditions	
15CrMo4	Vc=210m/min
ap=0.5mm	f=0.1mm/rev
A16Q-SCLPR09-18 type	CPMT090304XP(PV7020)
L/D=4	External coolant

Direction of vibration measurement



Interchangeable head boring bars with anti-vibration dampener system, KAV series

“Max L/D = 10” Solves deep-boring challenges
 Excellent anti-chatter performance due to unique anti-vibration design and available for a wide range of machining operations

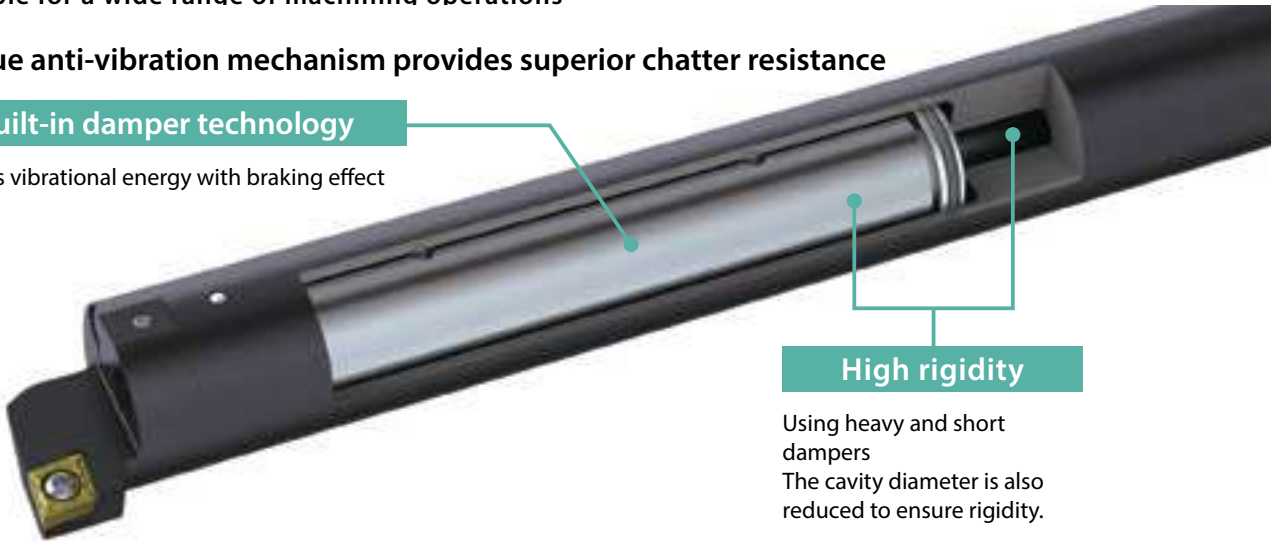
Unique anti-vibration mechanism provides superior chatter resistance

Built-in damper technology

Absorbs vibrational energy with braking effect

High rigidity

Using heavy and short dampers
 The cavity diameter is also reduced to ensure rigidity.



Interchangeable heads for a variety of machining applications Strong fastening with serrated joint structure

Serrated structure

Securely fastens head and shank



Shank lineup

Shank diameters, from 16mm to 40mm with L/D = 7 and 10, are available
 Carbide reinforced style also available

Shank diameter	Available overhang length range	Type
ø16 ø20	 L/D = 4 ~ 7	Steel
	 L/D = 7 ~ 10	Carbide reinforcement
ø25 ø32 ø40	 L/D = 4 ~ 7	Steel
	 L/D = 7 ~ 10	Steel

Head lineup

Shank diameter	Positive type (Screw clamp)				Negative type (Lever lock)		
	SCLC	SDUC	STLP	SVUB	PCLN	PDUN	PTFN
ø16	●	●	●				
ø20	●	●	●	●			
ø25	●	●	●	●			
ø32	●	●	●	●	●	●	●
ø40	●	●	●	●	●	●	●

Double clamp boring bars for negative inserts

Stable machining is realized in double clamp and direction adjustment mechanism coolant hole.

Improved clamping rigidity

Firmly clamp the insert in two directions with one action. Along with improving the accuracy of the insert position, long tool life can be achieved.



Direction adjustment mechanism coolant hole

Discharge direction of coolant is adjustment flexible focusing on coolant to edge reliably builds up
 Not applicable to high-pressure coolant



Nozzle setting

Wrench etc. that enters 2.5 or less holes are used, and adjust.



Small internal machining

EZ Bar series

Selecting the proper tool in a simple step. Easy adjustment and high precision
Four chipbreakers for a wide range of machining applications

1 Large tooling lineup. Select the proper tool in a simple step

F



Boring

Internal turning

Supports wide range of internal machining applications

Boring

EZB

45 degree chamfering

EZBC

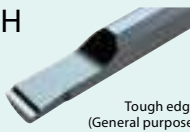
Copying

EZBP

APMX 0.3 ~ 1.0 mm
Compatible with
45 degree copying

Chipbreakers

H



Tough edge
(General purpose)

1st Recommendation /
General purpose
Extended reach
type available

PR1725

G



Chip control oriented

Excellent chip control
performance

PR1725

F

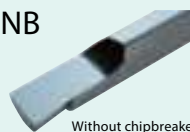


Low cutting force

Finishing /
Sharpness oriented

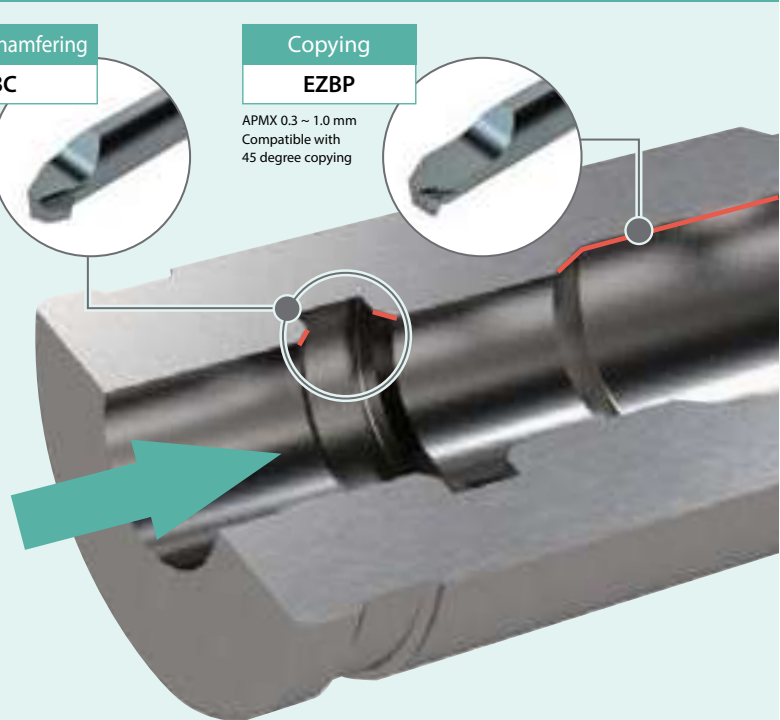
PR1725

NB

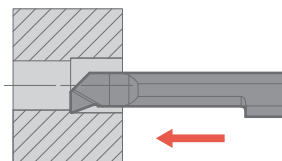


Without chipbreaker

GW05 insert grade for
aluminum machining
available



90 degree lead angle

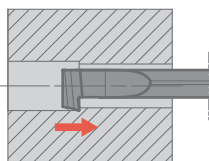


EZBF



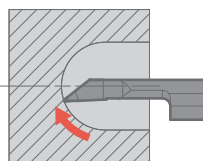
Back boring

EZBT



Internal facing • Internal profiling

EZVB



2 Easy adjustment and high precision

For CT sleeves with coolant holes and HP sleeves with positioning function, the overhang length can be set by moving adjustment pins

Check

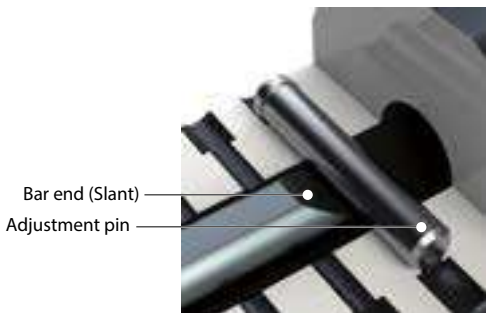
Smooth coolant flow due to special head design



Coolant-through : EZH-CT

Check

High precision design by contacting the bar end (Slant) with the adjustment pin



Bar end (Slant)

Adjustment pin

With EZ Adjust Structure : EZH-CT, EZH-HP

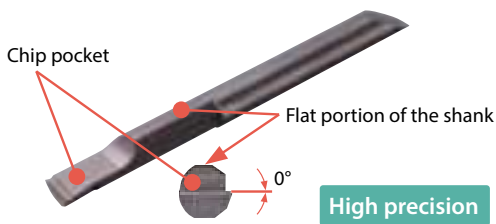


Overhang length

Adjustment pin is moveable

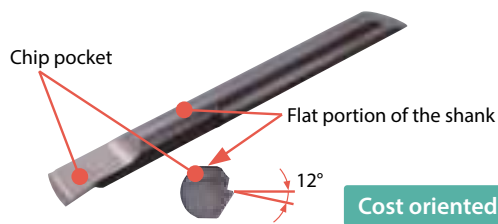
3 Select the HP bar for high precision and the ST bar for cost reduction for boring (tolerances are different)

HP (EZB-HP)



High precision

ST (EZB-ST)



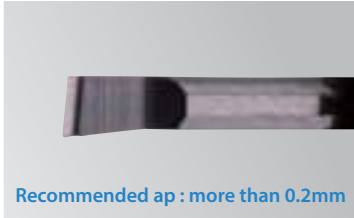
Cost oriented

Bar tolerance

	Bar tolerance	Offset (WF)	Longitudinal direction (L)	Cutting edge height (Y)	Min. bore dia.
	HP	± 0.025 mm	± 0.05 mm	+ 0.05 mm / 0 mm	Same as shank dia.
	ST	± 0.06 mm	± 0.1 mm	+ 0.06 mm / 0 mm	Different from shank dia.

4 chipbreakers and new PVD coating PR 1725 for a wide range of machining processes

H chipbreaker (without lead angle)
1st recommendation / General purpose



Recommended ap : more than 0.2mm

F chipbreaker (with lead angle)
Finishing / Sharpness oriented



Recommended ap : less than 0.2mm

NB chipbreaker (without chipbreaker)
Non-ferrous metal machining

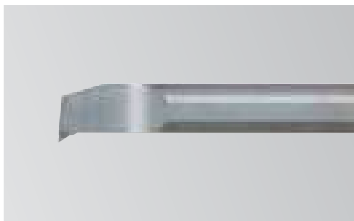


PR1725 Available
GW05 insert grade for aluminum machining available
Left-hand available (HP type)

PR1725 Available

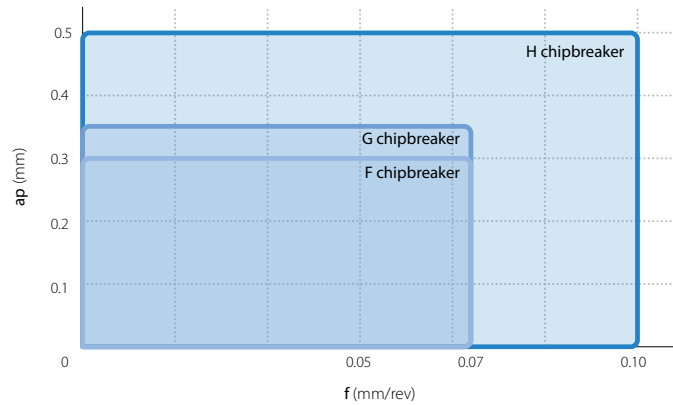
PCD.CBN inserts available
GW05 insert grade for aluminum machining available

G chipbreaker (with lead angle)
Chip control oriented



PR1725 Available

Applicable chipbreaker range

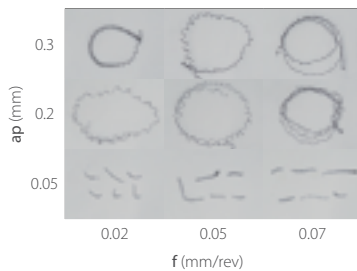


Check Cutting performance comparison

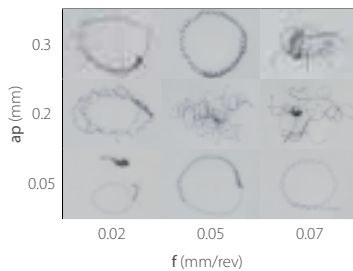
Chip control comparison

Stable chip curls and good chip breaking

G chipbreaker



Competitor (with lead angle)

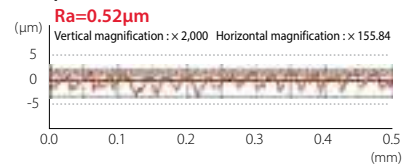


Cutting conditions: Vc = 80 m/min, Wet Workpiece material: C45 (Internal evaluation)

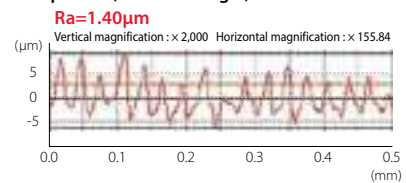
Surface finish comparison

Excellent surface finish

G chipbreaker



Competitor (with lead angle)



Using tool : RE = 0.05 mm, Shank diameter ø4 (Internal evaluation)

F

Boring

Sleeve

Point Large tooling lineup that can be customized for your machining demands

How to select sleeves

Select between three types of sleeves

EZH-CT

With EZ adjust structure
Coolant-through



EZH-HP

With EZ adjust structure



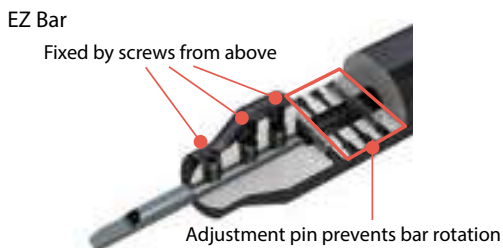
EZH-ST

Without EZ adjust structure

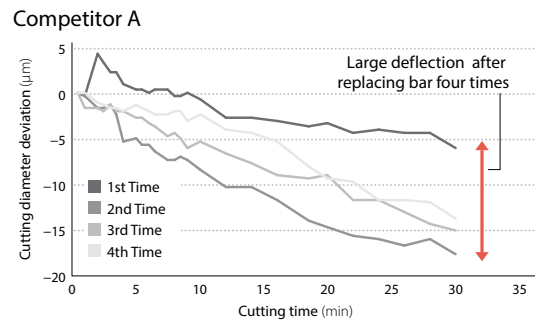
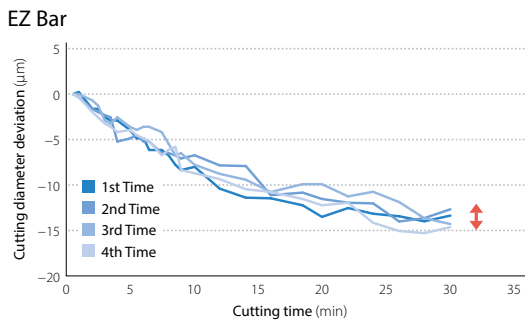


Point The EZ Bar prevents deviation with high-rigidity clamping

The adjustment pin prevents the bar from rotating during machining



Cutting diameter deviation comparison (Internal evaluation)



Cutting conditions : Vc = 66 m/min, ap = 0.1 mm, f = 0.02 mm/rev, Wet (Oil-based) Workpiece material : SK4

EZ Bar PLUS

High precision solid bar with convenience of indexable inserts reduce machining costs



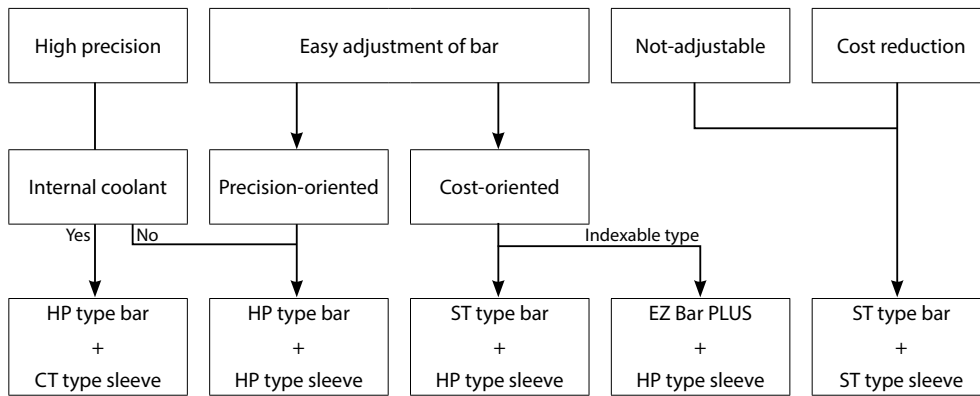
Point Minimum bore diameter 5 mm

Carbide or steel bars can be selected depending on the machining purpose

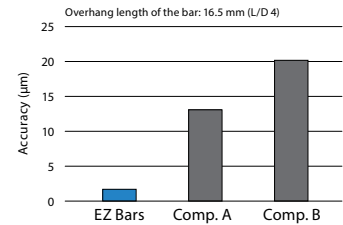
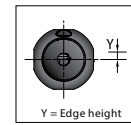
Point Reduces installing times by 1/3

The EZ adjust structure features much lower mounting times compared to conventional boring bars

How to select bars and sleeves for each application



Excellent repeat accuracy by the combination of HP bar + CT / HP sleeve



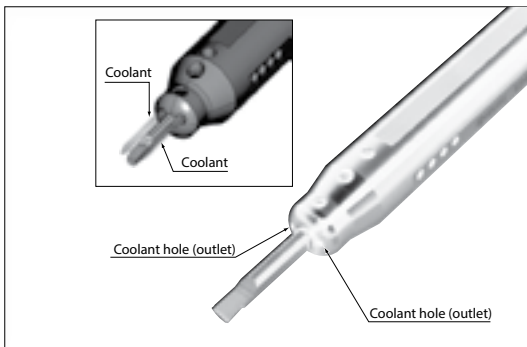
F

Boring

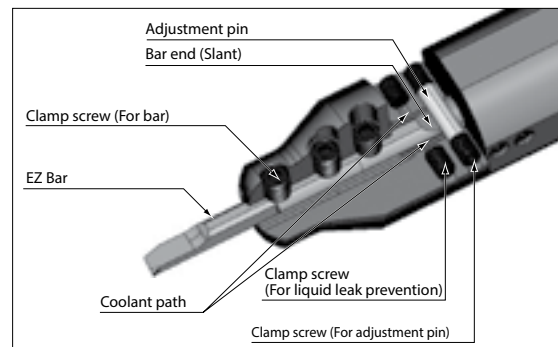
EZH-CT type sleeve (high precision / with coolant hole)

Kyocera's unique EZ adjust structure and internal coolant system improve dimensional accuracy and surface

Coolant discharge system of EZH-CT



Structure of EZH-CT



How to mount EZ Bars (EZH-CT sleeve)

How to use adjustment pin and prevent liquid leak (Fig. 1)

- Put the adjustment pin into the hole according to the overhang length. Push it into the sleeve, using the wrench (LW-1.5).
- Tighten the clamp screw for the adjustment pin "HS3x3P" or "HS3x4P" using the wrench "LW-1.5" from the both sides of the sleeve.
- Put the clamp screws "HS3x3P" or "HS3x4P" into the holes for liquid leak prevention, using the wrench "LW-1.5" and fix them from the both sides of the sleeve.

How to fix bar (Fig. 2)

- With the chip pocket upward, set the bar into the sleeve. Press the slant of the end of the bar with the adjustment pin. Make sure that the bar does not move (Fig. 3)
- Tighten the clamp screw with wrench (LW-2) and fix the bar. Use LW-1.5 if shank dia. is 3 mm or less

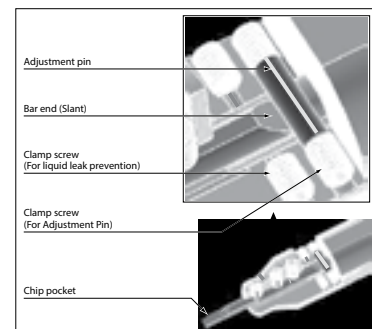
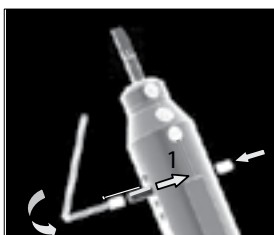


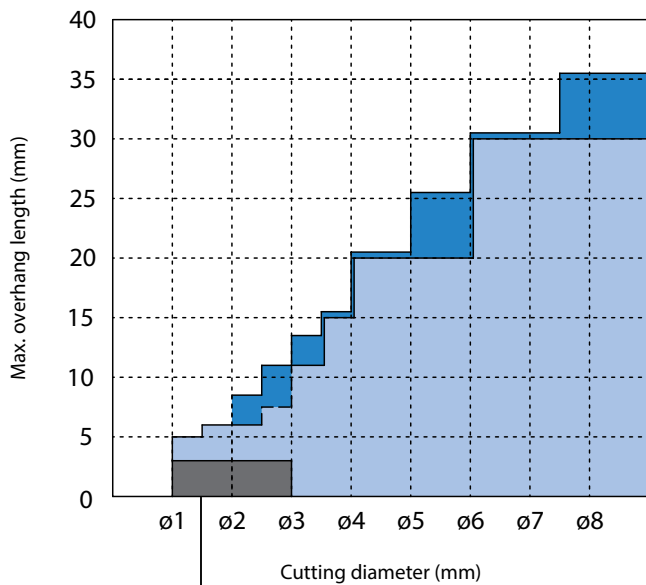
Fig. 1: How to use adjustment pin

Fig. 2: How to fix bar

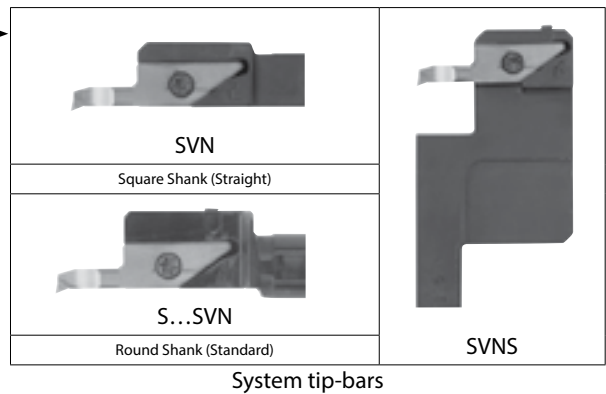
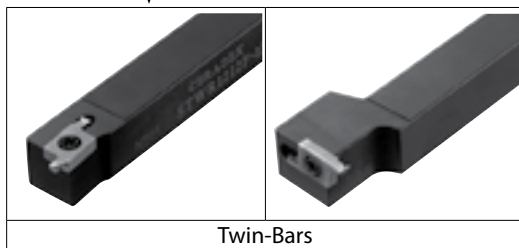
Fig. 3: Fixed bar

Guide for usage (Adjustable overhang type)

Solid tip-bars type: Min. bore diameter $\phi 1$ ~



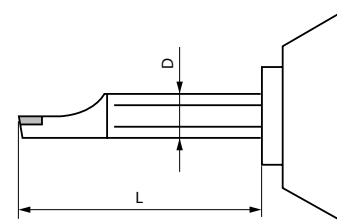
Easy adjustment and high precision - EZ Bars



F
Boring

Guide line for overhang length of boring bar - Workpiece material: C45

Overhang Length (L / D)	Shank Material
3	Steel
4	Steel (Dynamic-Bars)
5	Excellent
5.5	Excellent (Dynamic-Bars)
7	Carbide
7~10	KAV (with anti-vibration dampener system)



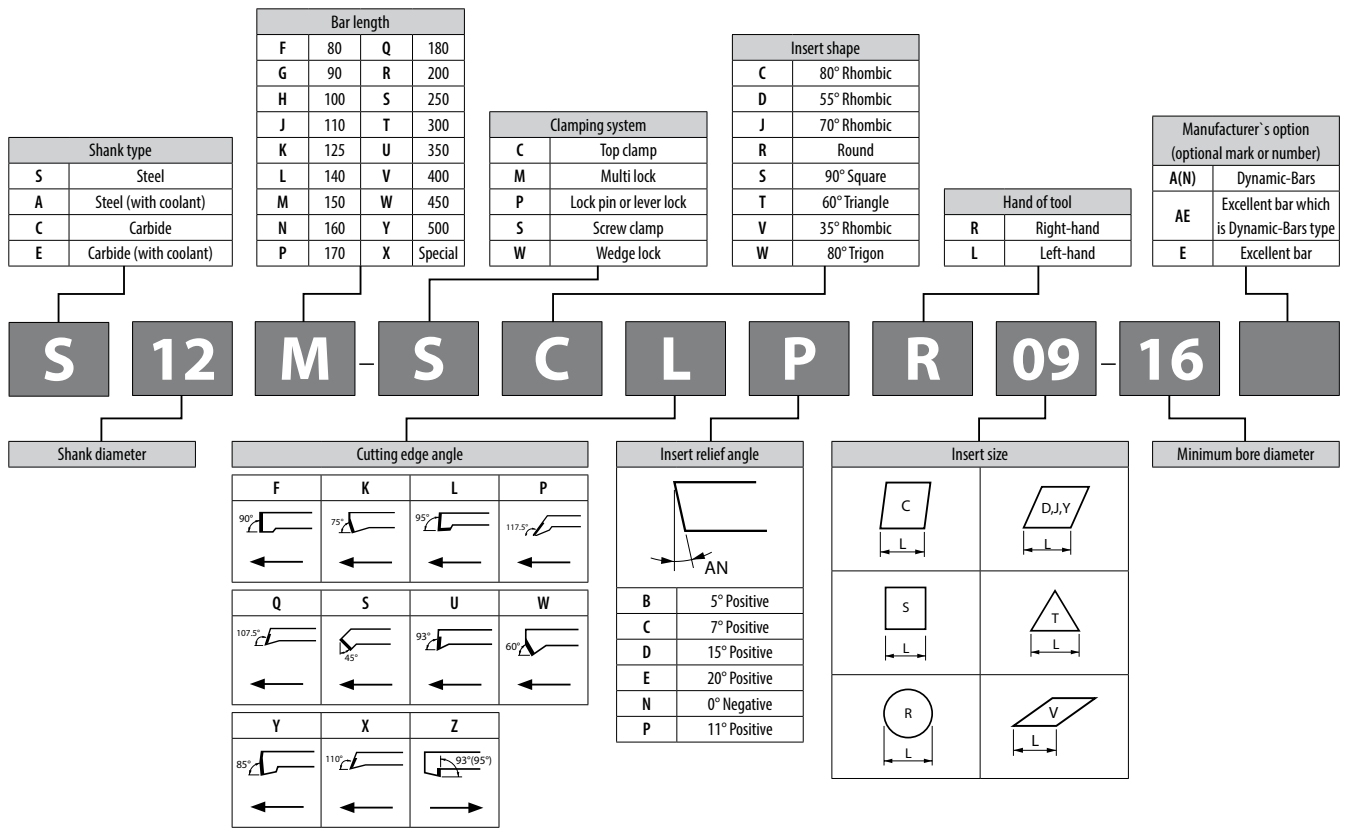
Carbide shank boring bar

Short shank series

Short shank types with length of 1/2 and 2/3 of standard type are available. (-1/2 or -2/3 is shown at the end of the description). When installing on machines, no additional machining (to change toolholder length) is required.



Boring bar identification system (round shank)



F



Boring

Solid Tip-Bars for Micro Boring

Applications	Solid Tip-Bars type	Shape	Shank type Max. Overhang Length (L/D)	Min. Bore Dia. DMIN													See Page for Toolholders	Summary				
				1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7			7.5	8		
Boring	EZB-HP EZ Bars ⊙ F16~F19		Solid L/D≈~5			●	●	●	●	●	●	●	●	●	●	●		F38~F43				
	EZB-HP-LT EZ Bars (Long Type) ⊙ F17		Solid			●	●	●	●	●	●	●	●	●	●	●						
	EZB-ST EZ Bars ⊙ F20, F21		Solid L/D≈~5			●	●	●	●	●	●	●	●	●	●	●						
	EZB-NB EZ Bars (PR1225 / GW05) ⊙ F22		Solid L/D≈~5			●	●	●	●	●	●	●	●	●	●	●						
	EZB-NB EZ Bars CBN PCD ⊙ F22		Solid L/D≈~5				●	●	●	●	●	●	●	●	●	●	●					
	TWB Twin-Bars ⊙ F56		Solid	●	●	●	●	●												F56, F57		
	TWBT Twin-Bars ⊙ F58		Solid	●	●	●	●	●												F59		
	VNB-S System Tip-Bars ⊙ F44		Solid	●	●	●	●	●	●												F48~F51	
	VNB System Tip-Bars ⊙ F45, F46		Solid		●	●	●	●	●	●	●	●	●	●	●	●	●				F48~F51	
	VNBX-S System Tip-Bars ⊙ F52		Solid	●	●	●	●	●	●												F53~F55	
90° Lead Angle	EZBF EZ Bars ⊙ F24		Solid			●	●	●	●	●	●	●	●	●	●	●		F38~F43				
Copying	EZBP EZ Bars ⊙ F26		Solid		●	●	●	●	●	●	●	●	●	●	●	●		F38~F43				
	EZVB EZ Bars ⊙ F28		Solid				●	●	●	●	●	●	●	●	●	●		F38~F43				
Back Boring	EZBT EZ Bars ⊙ F30		Solid					●	●	●	●	●	●	●	●	●		F39 F41 F43				
	VNBT System Tip-Bars ⊙ F47		Solid					●	●	●	●	●	●	●	●	●		F48~F51				
45° Chamfering	EZBC EZ Bars ⊙ F27		Solid							●	●	●	●	●	●	●		F39 F41 F43				



Dynamic-Bars

Applications	Shape	Boring bar type	Shank type Max. Overhang Length (L/D)	Coolant hole		Min. Bore Dia. DMIN																				See Page for Toolholders				
				Yes	No	5	6	7	8	10	12	13	14	16	18	20	22	23	25	26	27	30	31	32	34		40	50		
Copying		A...SDUC-AE	Excellent L/D~5.5	●									●	●		●	●			●			●					F66 F67 F68		
		S...SDUC-A	Steel L/D~4	○										●	●		●	●			●			●						
		E...SDUC-A	Carbide L/D~7	●										●	●		●	●			●			●						
		A...SZLB-AE	Excellent L/D~5.5	●																		●			●	●			F109	
		A...SDQC-AE	Excellent L/D~5.5	●										●	●		●	●				●								F70 F71 F72
		S...SDQC-A	Steel L/D~4	○										●	●		●	●				●								
	E...SDQC-A	Carbide L/D~7	●										●	●		●	●					●								
		A...SVJB(C)-AE	Excellent	●													●	●			●				●	●			F90 F91	
		A...SVJP-AE	L/D~5.5	●													●	●												
		S...SVJB(C)-A	Steel L/D~4	○													●	●				●				●	●			
	E...SVJP-A	Carbide L/D~4	○													●	●													
		A...SZJB-AE	Excellent L/D~5.5	●																		●	●			●			F106	
		A...SZXB-AE	Excellent L/D~5.5	●																		●				●				F107
		A...SZQB-AE	Excellent L/D~5.5	●																			●			●	●			
		A...SVPC(B)-AE	Excellent L/D~5.5	●													●	●			●			●		●			F94 F95	
		S...SVPC(B)-A	Steel L/D~4	○													●	●			●			●		●				
		E...SVPC(B)-A	Carbide L/D~7	●													●	●			●			●		●				
		A...SVUB(C)-AE	Excellent L/D~5.5	●													●	●			●				●	●			F96 F97	
		S...SVUB(C)-A	Steel L/D~4	○													●	●			●				●	●				
		E...SVUB(C)-A	Carbide L/D~7	●													●	●			●			●		●				
	Back copying		A...SDZC-AE	Excellent L/D~5.5	●												●	●			●			●		●			F74 F75 F76	
			S...SDZC-A	Steel L/D~4	○													●	●			●			●		●			
			E...SDZC-A	Carbide L/D~7	●													●	●			●			●		●			
			A...SVZB(C)-AE	Excellent L/D~5.5	●													●	●			●				●	●			F98 F99
S...SVZB(C)-A			Steel L/D~4	○													●	●			●				●	●				
		A...SZZB-AE	Excellent L/D~5.5	●																		●			●	●			F110	

For Min. Bore Dia. DMIN, the figure under ● may be applied depending on the toolholder type.



Boring

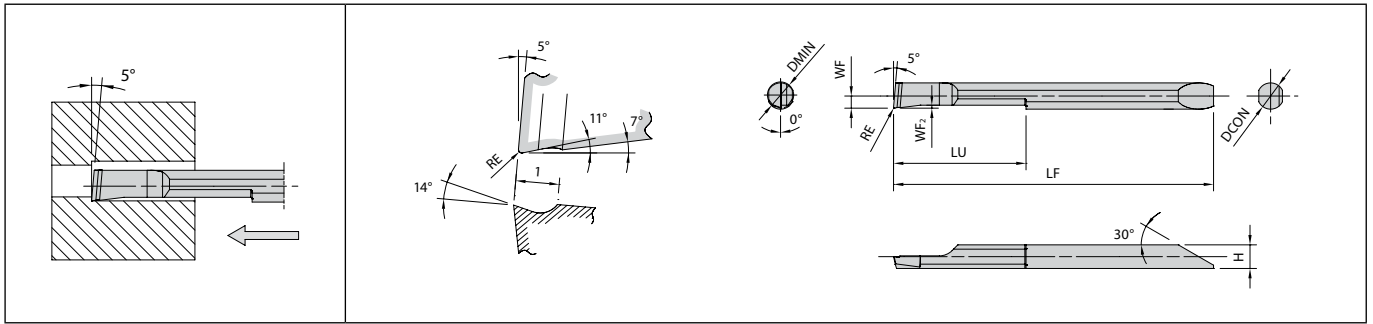
Boring bars

Applications	Boring bar type	Shape	Shank type Max. Overhang Length (L/D)	Coolant hole		Insert type	Min. Bore Dia. DMIN													See Page for Toolholders								
				Yes	No		5	6	7	8	10	12	14	16	18	20	25	30	32		40	50	63					
Boring / Internal Facing	A...DCLN12		Steel L/D~3	●		Negative																	●	●	●	F131		
	S...PCLN○○		Steel L/D~3		○	Negative																	●	●	●	F132		
	A...PCLN09		Steel L/D~3	●		Negative																	●	●	●			
	A...DWLN08		Steel L/D~3	●		Negative																		●	●	●	F148	
	S...PWLN○○		Steel L/D~3		○	Negative																		●	●	●	F146	
	A...PWLN06		Steel L/D~3	●		Negative																		●	●	●	F146	
	S...WWLN08-E		Excellent L/D~5		○	Negative																		●	●	●	F149	
	C...STXP(B)		Carbide L/D~7		○	Positive			●	●	●																F86	
	C...SJLC		Carbide L/D~7		○	Positive	●																				F78	
Copying	S...STWP-E		Excellent L/D~5		○	Positive					●	●	●	●									●			F84 F85		
	S...STWP		Steel L/D~3		○	Positive					●	●	●	●														
	A...DDUN15		Steel L/D~3	●		Negative																		●	●	●	F136	
	S...PDUN11		Steel L/D~3		○	Negative																		●	●		F134	
	A...PDUN11		Steel L/D~3	●		Negative																		●	●			
	S...PDUN15		Steel L/D~3		○	Negative																		●	●	●	F138	
	S...PDQN15		Steel L/D~3		○	Negative																		●	●	●	F139	
Back copying	C...STZB		Carbide L/D~7		○	Positive					●															F87		
	C...SJZC		Carbide L/D~7		○	Positive	●																			F79		
	S...PDZN15		Steel L/D~3		○	Negative																		●	●	●	F140	
Boring	S...CTUP		Steel L/D~3		○	Positive								●	●	●	●						●	●	●	F113		
	A...DTFN○○		Steel L/D~3	●		Negative																		●	●	●	F143	
	S...PTUN○○		Steel L/D~3		○	Negative																		●	●	●	F144	
	A...PTUN11		Steel L/D~3	●		Negative																		●	●	●		
	A...DSKN12		Steel L/D~3	●		Negative																			●	●	●	F142
	S...SSKP		Steel L/D~3		○	Positive																			●		F111 F112	
	S...CSKP		Steel L/D~3		○	Positive																		●	●	●		

For Min. Bore Dia. DMIN, the figure under ● may be applied depending on the toolholder type.



EZB-HP (H chipbreaker) (Boring)



Right-hand shown | Without lead angle | Tough edge (General purpose)

F

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)			Carbide				Applicable sleeve F38~F43
		DMIN	DCON	H	LF	LU	WF	WF ₂	RE	RE min.	RE max.	PVD		-					
												PR1225	PR1725	GW05					
												R	L	R	R				
EZB [°] L 020020HP-008H	1	2	2	1.8	32	8	0.85	0.25	0.08	-0.015	+0.015	●	●	●	●	EZH020...			
EZB [°] L 025025HP-008H 025025HP-015H	1	2.5	2.5	2.3	35	10.5	1.1	0.25	0.08 0.15	-0.015 -0.02	+0.015 +0.02	●	●	●	●	EZH025...			
EZB [°] L 030030HP-008H 030030HP-015H	1	3	3	2.7	38.9	13	1.35	0.3	0.08 0.15	-0.015 -0.02	+0.015 +0.02	●	●	●	●	EZH030...			
EZB [°] L 035035HP-008H 035035HP-015H	1	3.5	3.5	3.2	41.9	15	1.6	0.4	0.08 0.15	-0.015 -0.02	+0.015 +0.02	●	●	●	●	EZH035...			
EZB [°] L 040040HP-008H 040040HP-015H	1	4	4	3.6	48.8	20	1.85	0.4	0.08 0.15	-0.015 -0.02	+0.015 +0.02	●	●	●	●	EZH040...			
EZB [°] L 045045HP-008H 045045HP-015H	1	4.5	4.5	4.1	51.1	22.5	2.1	0.5	0.08 0.15	-0.015 -0.02	+0.015 +0.02	●	●	●	●	EZH045...			
EZB [°] L 050050HP-008H 050050HP-015H	1	5	5	4.6	58.1	25	2.35	0.5	0.08 0.15	-0.015 -0.02	+0.015 +0.02	●	●	●	●	EZH050...			
EZB [°] L 060060HP-008H 060060HP-015H	1	6	6	5.6	66.1	30	2.85	0.6	0.08 0.15	-0.015 -0.02	+0.015 +0.02	●	●	●	●	EZH060...			
EZB [°] L 070070HP-008H 070070HP-015H	1	7	7	6.3	73.8	35	3.3	0.7	0.08 0.15	-0.015 -0.02	+0.015 +0.02	●	●	●	●	EZH070...			
EZB [°] L 080080HP-008H 080080HP-015H	1	8	8	7.2	84.8	40	3.75	0.8	0.08 0.15	-0.015 -0.02	+0.015 +0.02	●	●	●	●	EZH080...			

Tolerance : Offset ±0.025 mm (of the reference pin), overall length ±0.05 mm, edge height +0.05/0 mm

Recommended cutting conditions F23

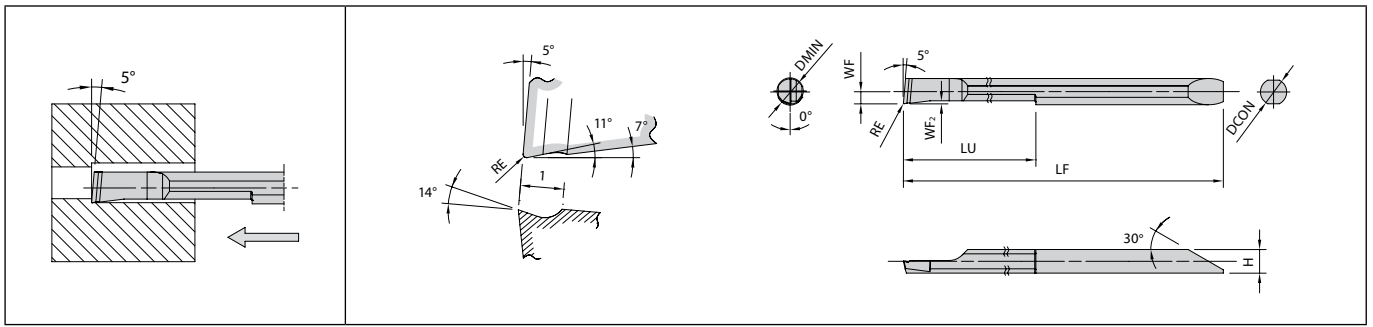
EZ Bars Identification System

EZ	B	R	020	020	HP	- 008	H
Symbol of EZ Bars	Applications B : Boring Bars	Insert Hand R : Right-hand L : Left-hand	Min. Bore Dia. 020 : 2mm 025 : 2.5mm ⋮	Shank Dia. 020 : 2mm 025 : 2.5mm ⋮	Symbol of Precision HP : High Precision ST : Standard	Corner-R(RE) 008 : 0.08mm 015 : 0.15mm ⋮	Name of Chipbreaker H : Without lead angle G : With lead angle F : With lead angle NB : Without chipbreaker

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZB-HP-LT (H chipbreaker) (Boring)



Right-hand shown | Without lead angle | Tough edge (General purpose)

Dimensions

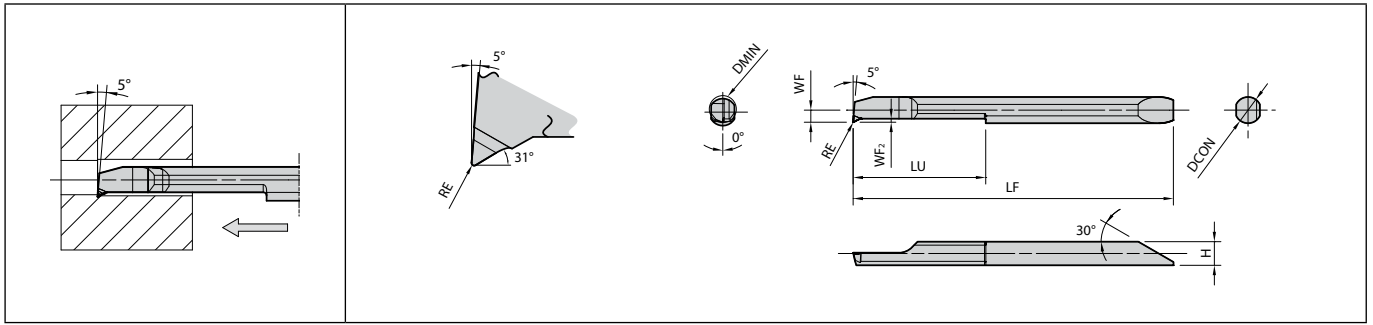
Description	No. of edges	Dimension (mm)								Overhang length (mm)				Tolerance (mm)		Carbide	Applicable sleeve ● F38~F43
		DMIN	DCON	H	LF	LU	WF	WF ₂	RE	#1	#2	#3	#4	RE min.	RE max.		
EZBR 020020HP-008H-LT 025025HP-008H-LT 030030HP-008H-LT 035035HP-008H-LT 040040HP-008H-LT 050050HP-008H-LT 060060HP-008H-LT	1	2	2	1.8	36	12	0.85	0.25	0.08	12.5	8.5	-	-	-0.015	+0.015	●	EZH020...
	1	2.5	2.5	2.3	39.5	15	1.1			15.5	11.5	-	-			●	EZH025...
	1	3	3	2.7	47.9	18	1.35	0.3		22.5	18.5	14.5	-			●	EZH030...
	1	3.5	3.5	3.2	51.9	21	1.6	0.4		25.5	21.5	17.5	-			●	EZH035...
	1	4	4	3.6	60.8	28	1.85			32.5	28.5	24.5	20.5			●	EZH040...
	1	5	5	4.6	73.1	35	2.35	0.5		40.5	35.5	30.5	25.5			●	EZH050...
	1	6	6	5.6	83.1	42	2.85	0.6		47.5	42.5	37.5	32.5			●	EZH060...

Tolerance : Offset ±0.025 mm (of the reference pin), overall length ±0.05 mm, edge height +0.05/0 mm
EZBR..H-LT : Inserts need to be modified for overhang length #1 in italics (DCON = 3 - 6 mm).

Recommended cutting conditions ● F23



EZB-HP (G chipbreaker) (Boring)



Right-hand shown | With lead angle | Chip control oriented

F

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)			Carbide	Applicable sleeve F38~F43
		DMIN	DCON	H	LF	LU	WF	WF ₂	RE	RE min.	RE max.	PR1725	R			
EZBR 020020HP-005G	1	2	2	1.65	31.8	8	0.55	0.25	0.05	-0.01	+0.01	●	EZH020...			
EZBR 025025HP-005G 025025HP-015G	1	2.5	2.5	2.15	34.8	10.5	0.8	0.3	0.05	-0.01	+0.01	●	EZH025...			
									0.15	-0.02	+0.02	●				
EZBR 030030HP-005G 030030HP-015G	1	3	3	2.5	38.7	13	1.05	0.4	0.05	-0.01	+0.01	●	EZH030...			
									0.15	-0.02	+0.02	●				
EZBR 035035HP-005G 035035HP-015G	1	3.5	3.5	3	41.7	15	1.3	0.5	0.05	-0.01	+0.01	●	EZH035...			
									0.15	-0.02	+0.02	●				
EZBR 040040HP-005G 040040HP-015G	1	4	4	3.45	48.7	20	1.55	0.5	0.05	-0.01	+0.01	●	EZH040...			
									0.15	-0.02	+0.02	●				
EZBR 045045HP-005G 045045HP-015G	1	4.5	4.5	3.95	50.9	22.5	1.8	0.7	0.05	-0.01	+0.01	●	EZH045...			
									0.15	-0.02	+0.02	●				
EZBR 050050HP-005G 050050HP-015G	1	5	5	4.3	57.8	25	2.05	0.7	0.05	-0.01	+0.01	●	EZH050...			
									0.15	-0.02	+0.02	●				
EZBR 060060HP-005G 060060HP-015G	1	6	6	5.15	65.7	30	2.55	0.9	0.05	-0.01	+0.01	●	EZH060...			
									0.15	-0.02	+0.02	●				
EZBR 070070HP-005G 070070HP-015G	1	7	7	6.15	73.7	35	3.05	1	0.05	-0.01	+0.01	●	EZH070...			
									0.15	-0.02	+0.02	●				
EZBR 080080HP-005G 080080HP-015G	1	8	8	7.1	84.8	40	3.55	1	0.05	-0.01	+0.01	●	EZH080...			
									0.15	-0.02	+0.02	●				

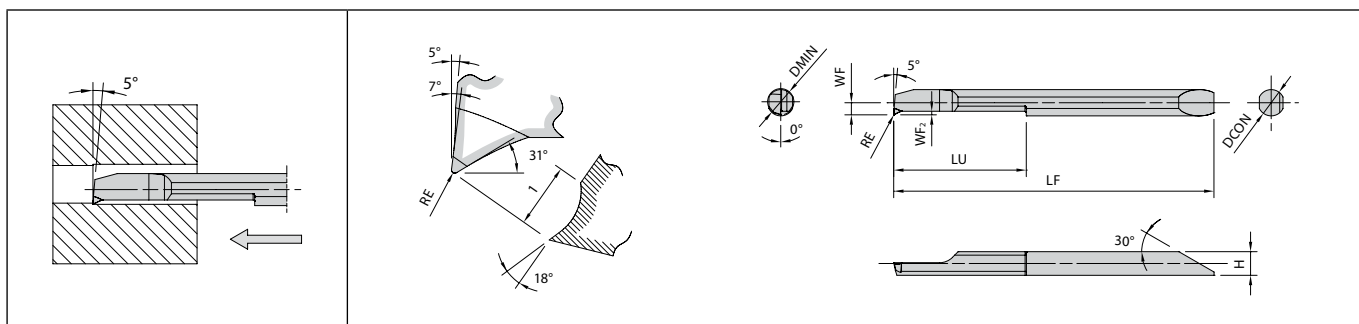
Tolerance : Offset ±0.025 mm (of the reference pin), overall length ±0.05 mm, edge height +0.05/0 mm

Recommended cutting conditions ● F23

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZB-HP (F chipbreaker) (Boring)



Right-hand shown | With lead angle | Sharp cutting (For finishing)

Dimensions

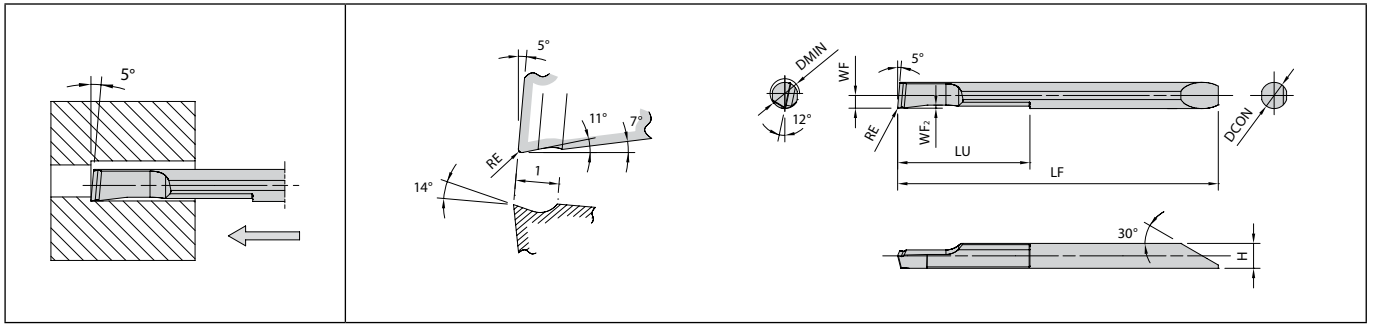
Description	No. of edges	Dimension (mm)									Tolerance (mm)			Carbide		Applicable sleeve ● F38~F43
		DMIN	DCON	H	LF	LU	WF	WF ₂	RE	RE min.	RE max.	PVD				
												PR1225	PR1725			
												R	R			
EZBR 020020HP-005F	1	2	2	1.8	32	8	0.85	0.25	0.05	-0.01	+0.01	●	●	EZH020...		
EZBR 025025HP-005F 025025HP-015F	1	2.5	2.5	2.3	35	10.5	1.1	0.3	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH025...		
EZBR 030030HP-005F 030030HP-015F	1	3	3	2.7	38.9	13	1.35	0.4	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH030...		
EZBR 035035HP-005F 035035HP-015F	1	3.5	3.5	3.2	41.9	15	1.6	0.5	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH035...		
EZBR 040040HP-005F 040040HP-015F	1	4	4	3.6	48.8	20	1.85	0.5	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH040...		
EZBR 045045HP-005F 045045HP-015F	1	4.5	4.5	4.1	51.1	22.5	2.1	0.7	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH045...		
EZBR 050050HP-005F 050050HP-015F	1	5	5	4.6	58.1	25	2.35	0.7	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH050...		
EZBR 060060HP-005F 060060HP-015F	1	6	6	5.6	66.1	30	2.85	0.9	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH060...		
EZBR 070070HP-005F 070070HP-015F	1	7	7	6.3	73.8	35	3.3	1	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH070...		
EZBR 080080HP-005F 080080HP-015F	1	8	8	7.2	84.8	40	3.75	1	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH080...		

Tolerance : Offset ±0.025 mm (of the reference pin), overall length ±0.05 mm, edge height +0.05/0 mm

Recommended cutting conditions ● F23



EZB-ST (H chipbreaker) (Boring)



Right-hand shown | Without lead angle | Tough edge (General purpose)

F

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)			Carbide		Applicable sleeve ● F38~F43
		DMIN	DCON	H	LF	LU	WF	WF ₂	RE	RE min.	RE max.	PVD					
												PR1225	PR1725				
												R	R				
EZBR 020017ST-008H	1	2	1.7	1.5	27.3	7	0.79	0.19	0.08	-0.015	+0.015	●	●	EZH017...			
EZBR 025020ST-008H 025020ST-015H	1	2.5	2	1.82	32	8	0.94	0.16	0.08 0.15	-0.015 -0.02	+0.015 +0.02	● ●	● ●	EZH020...			
EZBR 030025ST-008H 030025ST-015H	1	3	2.5	2.3	35	10.5	1.19	0.15	0.08 0.15	-0.015 -0.02	+0.015 +0.02	● ●	● ●	EZH025...			
EZBR 035030ST-008H 035030ST-015H	1	3.5	3	2.8	39	13	1.44	0.18	0.08 0.15	-0.015 -0.02	+0.015 +0.02	● ●	● ●	EZH030...			
EZBR 040035ST-008H 040035ST-015H	1	4	3.5	3.3	42	15	1.69	0.24	0.08 0.15	-0.015 -0.02	+0.015 +0.02	● ●	● ●	EZH035...			
EZBR 045040ST-008H 045040ST-015H	1	4.5	4	3.8	49	20	1.94	0.27	0.08 0.15	-0.015 -0.02	+0.015 +0.02	● ●	● ●	EZH040...			
EZBR 055050ST-008H 055050ST-015H	1	5.5	5	4.8	58.2	25	2.44	0.33	0.08 0.15	-0.015 -0.02	+0.015 +0.02	● ●	● ●	EZH050...			
EZBR 065060ST-008H 065060ST-015H	1	6.5	6	5.8	66.2	30	2.94	0.38	0.08 0.15	-0.015 -0.02	+0.015 +0.02	● ●	● ●	EZH060...			
EZBR 075070ST-008H 075070ST-015H	1	7.5	7	6.8	74.2	35	3.44	0.44	0.08 0.15	-0.015 -0.02	+0.015 +0.02	● ●	● ●	EZH070...			

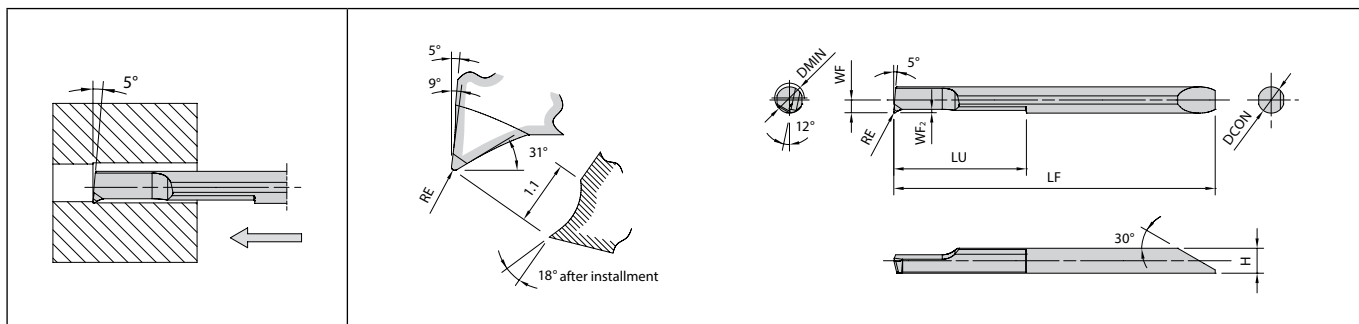
Tolerance : Offset ±0.06 mm , overall length ±0.1 mm, edge height +0.06/0 mm

Recommended cutting conditions ● F23

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZB-ST (F chipbreaker) (Boring)



Right-hand shown | With lead angle | Sharp cutting (For finishing)

Dimensions

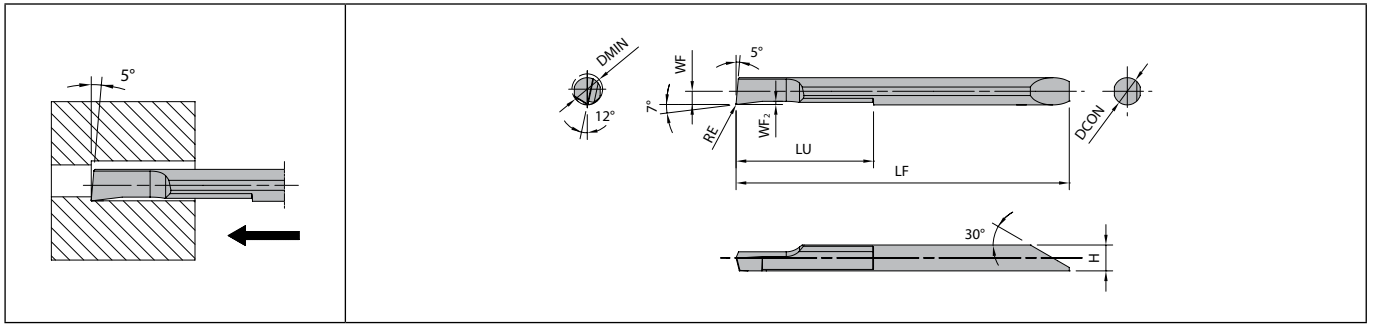
Description	No. of edges	Dimension (mm)									Tolerance (mm)			Carbide		Applicable sleeve ● F38~F43
		DMIN	DCON	H	LF	LU	WF	WF ₂	RE	RE min.	RE max.	PVD				
												PR1225	PR1725			
												R	R			
EZBR 020017ST-005F	1	2	1.7	1.5	27.3	7	0.79	0.2	0.05	-0.01	+0.01	●	●	EZH017...		
EZBR 025020ST-005F 025020ST-015F	1	2.5	2	1.82	32	8	0.94	0.16	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH020...		
EZBR 030025ST-005F 030025ST-015F	1	3	2.5	2.3	35	10.5	1.19	0.2	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH025...		
EZBR 035030ST-005F 035030ST-015F	1	3.5	3	2.8	39	13	1.44	0.26	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH030...		
EZBR 040035ST-005F 040035ST-015F	1	4	3.5	3.3	42	15	1.69	0.33	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH035...		
EZBR 045040ST-005F 045040ST-015F	1	4.5	4	3.8	49	20	1.94	0.31	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH040...		
EZBR 055050ST-005F 055050ST-015F	1	5.5	5	4.8	58.2	25	2.44	0.45	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH050...		
EZBR 065060ST-005F 065060ST-015F	1	6.5	6	5.8	66.2	30	2.94	0.59	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH060...		
EZBR 075070ST-005F 075070ST-015F	1	7.5	7	6.8	74.2	35	3.44	0.65	0.05 0.15	-0.01 -0.02	+0.01 +0.02	● ●	● ●	EZH070...		

Tolerance : Offset ±0.06 mm , overall length ±0.1 mm, edge height +0.06/0 mm

Recommended cutting conditions ● F23



EZB-NB (Boring)



Right-hand shown

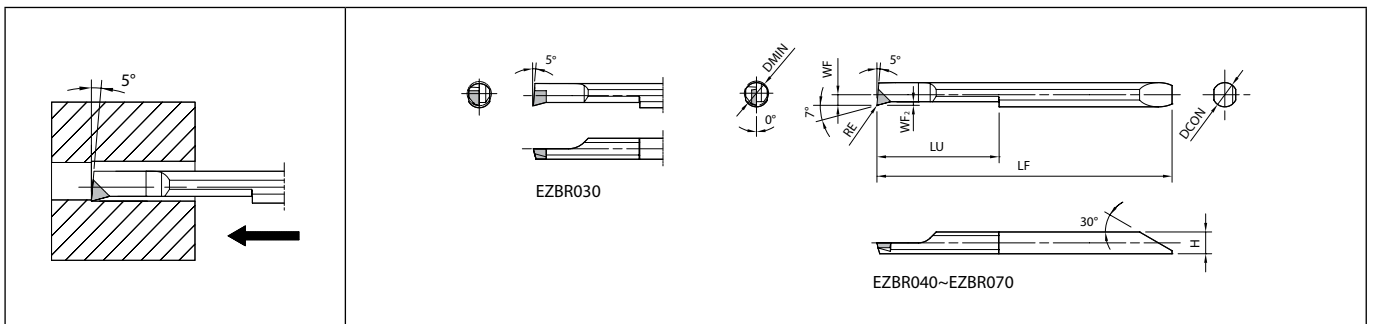
F

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)		Carbide		Applicable sleeve ● F38~F43
		DMIN	DCON	H	LF	LU	WF	WF ₂	RE	RE min.	RE max.	PVD				
												PR1225	GW05			
												R	R			
EZBR 020017-005NB	1	2	1.7	1.5	27.3	7	0.79	0.2	0.05	-0.015	+0.015	●	●	EZH017...		
EZBR 025020-005NB	1	2.5	2	1.82	32	8	0.94	0.16	0.05	-0.015	+0.015	●	●	EZH020...		
EZBR 030025-005NB	1	3	2.5	2.3	35	10.5	1.19	0.16	0.05	-0.015	+0.015	●	●	EZH025...		
EZBR 035030-005NB	1	3.5	3	2.8	39	13	1.44	0.19	0.05	-0.015	+0.015	●	●	EZH030...		
EZBR 040035-005NB	1	4	3.5	3.3	42	15	1.69	0.25	0.05	-0.015	+0.015	●	●	EZH035...		
EZBR 045040-005NB	1	4.5	4	3.8	49	20	1.94	0.28	0.05	-0.015	+0.015	●	●	EZH040...		
EZBR 055050-005NB	1	5.5	5	4.8	58.2	25	2.44	0.33	0.05	-0.015	+0.015	●	●	EZH050...		
EZBR 065060-005NB	1	6.5	6	5.8	66.2	30	2.94	0.39	0.05	-0.015	+0.015	●	●	EZH060...		
EZBR 075070-005NB	1	7.5	7	6.8	74.2	35	3.44	0.45	0.05	-0.015	+0.015	●	●	EZH070...		

Recommended cutting conditions ● F23

EZB-NB (Boring)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)		CBN	PCD	Applicable sleeve ● F38~F43
		DMIN	DCON	H	LF	LU	WF	WF ₂	RE	RE min.	RE max.	PVD				
												KBN05M	KPD001			
												R	R			
EZBR 030030-003NB	1	3	3	2.6	38.8	13	1.25	0.3	0.035	-0.015	+0.015	●		EZH030...		
EZBR 040040-003NB	1	4	4	3.6	48.8	20	1.75	0.5	0.035	-0.015	+0.015	●	●	EZH040...		
EZBR 050050-003NB	1	5	5	4.6	58.1	25	2.25	0.5	0.035	-0.015	+0.015	●	●	EZH050...		
EZBR 060060-003NB	1	6	6	5.6	66.1	30	2.75	0.5	0.035	-0.015	+0.015	●	●	EZH060...		
EZBR 070070-003NB	1	7	7	6.6	74.1	35	3.25	0.5	0.035	-0.015	+0.015	●	●	EZH070...		

KBN05M edge preparation : T00815 (0.08mm x 15° Chamfered cutting edge)

KPD001 edge preparation : F (Sharp edge)

Recommended cutting conditions ● F23

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

Recommended cutting conditions

H chipbreaker (EZB-HP-H type / EZB-ST-H type)

Workpiece material	Insert grades Vc: m/min			EZB020/025		EZB030/035		EZB040/045		EZB050/055/ 060/065/070/075/080		Remarks
	MEGACOAT NANO PLUS	MEGACOAT	Carbide	ap (mm), f (mm/rev)								
	PR1725	PR1225	GW05	ap	f	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~120	30~100	-	~0.3	~0.03	~0.4	~0.04	~0.45	~0.07	~0.5	~0.1	Coolant
Stainless steel	30~100	30~80	-	~0.2	~0.02	~0.3	~0.03	~0.35	~0.05	~0.4	~0.07	
Non-ferrous metals	-	-	~100	~0.3	~0.05	~0.4	~0.06	~0.45	~0.1	~0.5	~0.15	

H chipbreaker (EZB-HP-H-LT type (Long type))

Workpiece material	Insert grades Vc: m/min		EZB020/025/030/035				EZB040/050/060				Remarks
	MEGACOAT		ap (mm), f (mm/rev)								
	PR1225		ap		f		ap		f		
Carbon steel / Alloy steel	30~60		~0.3		~0.05		~0.4		~0.1		Coolant
Stainless steel	20~40		~0.25		~0.05		~0.3		~0.07		

G chipbreaker

Workpiece material	Insert grades Vc: m/min		EZB020/025		EZB030/035		EZB040/045/050/060/070/080				Remarks
	MEGACOAT NANO PLUS		ap (mm), f (mm/rev)								
	PR1725		ap	f	ap	f	ap		f		
Carbon steel / Alloy steel	30~120		~0.25	~0.03	~0.3	~0.05	~0.35		~0.07		Coolant
Stainless steel	30~100		~0.2	~0.02	~0.25	~0.03	~0.3		~0.05		

F chipbreaker (EZB-HP-F type / EZB-ST-F type)

Workpiece material	Insert grades Vc: m/min		EZB020/025		EZB030/035		EZB040/045		EZB050/055/060/ 065/070/075/080		Remarks
	MEGACOAT NANO PLUS	MEGACOAT	ap (mm), f (mm/rev)								
	PR1725	PR1225	ap	f	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~120	30~100	~0.2	~0.03	~0.2	~0.05	~0.3	~0.07	~0.3	~0.07	Coolant
Stainless steel	30~100	30~80	~0.2	~0.02	~0.2	~0.03	~0.25	~0.05	~0.25	~0.05	

NB (Without chipbreaker)

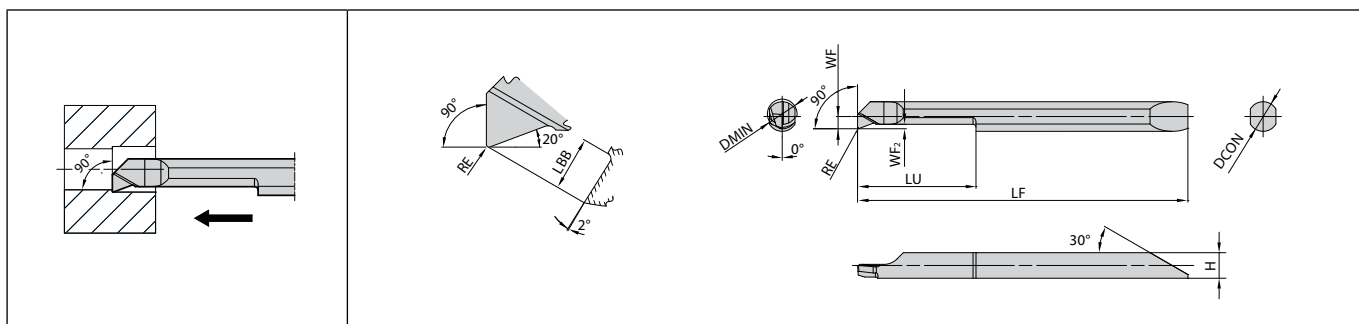
Workpiece material	Insert grades Vc: m/min		EZB020/025		EZB030/035		EZB040/045		EZB055/ 065/075		Remarks
	MEGACOAT	Carbide	ap (mm), f (mm/rev)								
	PR1225	GW05	ap	f	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~100	-	~0.3	~0.03	~0.4	~0.04	~0.45	~0.07	~0.5	~0.1	Coolant
Stainless steel	30~80	-	~0.2	~0.02	~0.3	~0.03	~0.35	~0.05	~0.4	~0.07	
Non-ferrous metals	-	~100	~0.3	~0.05	~0.4	~0.06	~0.45	~0.07	~0.5	~0.1	

Workpiece material	Insert grades Vc: m/min		EZB030		EZB040/045		EZB050/060/070				Remarks
	MEGACOAT CBN	PCD	ap (mm), f (mm/rev)								
	KBN05M	KPD001	ap	f	ap	f	ap	f	ap	f	
Non-ferrous metals	-	~300	-	-	~0.45	~0.1	~0.5	~0.15	~0.15	~0.15	Coolant
Hard materials	~100	-	~0.07	~0.03	~0.10	~0.05	~0.15	~0.07	~0.15	~0.07	



Boring

EZBF (Boring, 90° Lead angle)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)		Carbide	Applicable sleeve ● F38~F43
		DMIN	DCON	H	LBB	LF	LU	WF	WF ₂	RE	RE min.	RE max.	PVD		
													PR1225		
													R		
EZBFR 030030-008	1	3	3	2.5	1.5	37.7	12	1.2	0.45	0.08	-0.015	+0.015	●	EZH030...	
EZBFR 040040-008	1	4	4	3.45	2	44.6	16	1.65	0.55	0.08	-0.015	+0.015	●	EZH040...	
EZBFR 050050-015	1	5	5	4.3	2.4	52.7	20	2.15	0.7	0.15	-0.02	+0.02	●	EZH050...	
EZBFR 060060-015	1	6	6	5.15	2.8	59.6	24	2.55	0.85	0.15	-0.02	+0.02	●	EZH060...	

Recommended cutting conditions

Workpiece Material	Insert Grades (Cutting Speed Vc : m/min)	EZBFR030030-008		EZBFR040040-008		EZBFR050050/ 060060-015		Remarks
	MEGACOAT	ap (mm), f (mm/rev)						
	PR1225	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~100	~0.2	~0.05	~0.3	~0.05	~0.5	~0.05	Coolant
Stainless steel	30~80	~0.2	~0.05	~0.3	~0.05	~0.5	~0.05	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

F

Boring

Solid

Positive

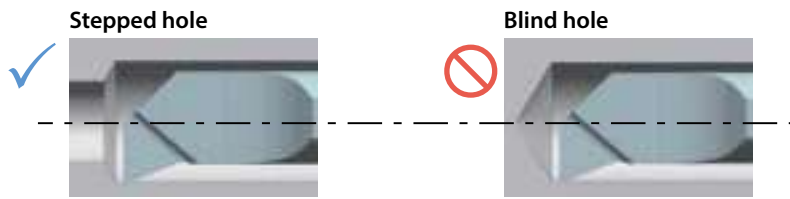
KAV

Negative

Precautions

✓ Recommended ✗ Not Recommended

1. Machining in blind hole is not recommended



2. If front cutting edge exceeds beyond workpiece center line, fracturing may occur



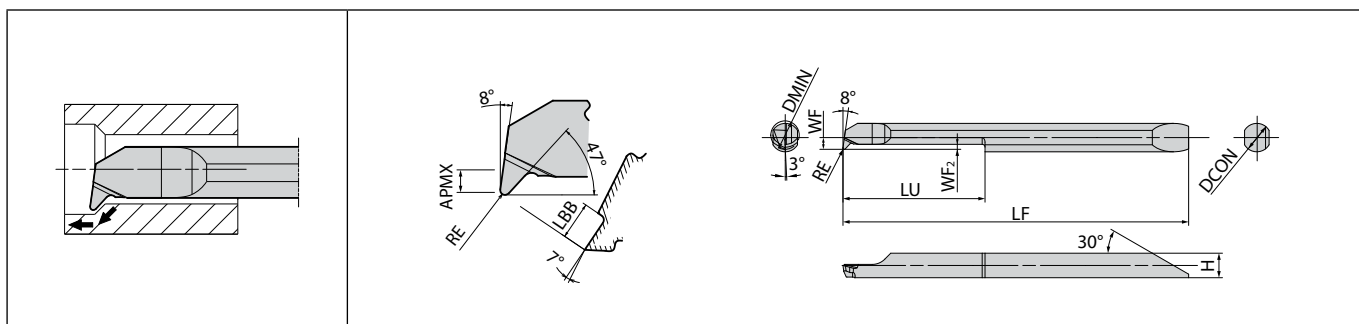
Min boring diameter of $\phi 4$: 1.9 mm front cutting edge length

Off-center Boring

3. Up facing is not recommended



EZBP (Internal copying)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)		Carbide	Applicable sleeve ● F38~F43
		DMIN	DCON	H	LBB	LF	LU	WF	WF ₂	APMX	RE	RE min.	RE max.	PVD	
														PR1225		R
EZBPR 020020-005-08 020020-005-10 020020-005-12	1	2	2	1.65	1	31.8 33.8 35.8	8 10 12	0.55	0.35	0.3	0.05	-0.01	+0.01	●	EZH020...
EZBPR 030030-005-12 030030-005-15	1	3	3	2.5	1.2	37.7 40.7	12 15	1.05	0.45	0.4	0.05	-0.01	+0.01	●	EZH030...
EZBPR 040040-015	1	4	4	3.45	1.5	48.7	20	1.65	0.65	0.6	0.15	-0.02	+0.02	●	EZH040...
EZBPR 050050-015	1	5	5	4.3	2.2	57.8	25	2	1.1	0.8	0.15	-0.02	+0.02	●	EZH050...
EZBPR 060060-015	1	6	6	5.15	2.5	65.7	30	2.45	1.35	1	0.15	-0.02	+0.02	●	EZH060...

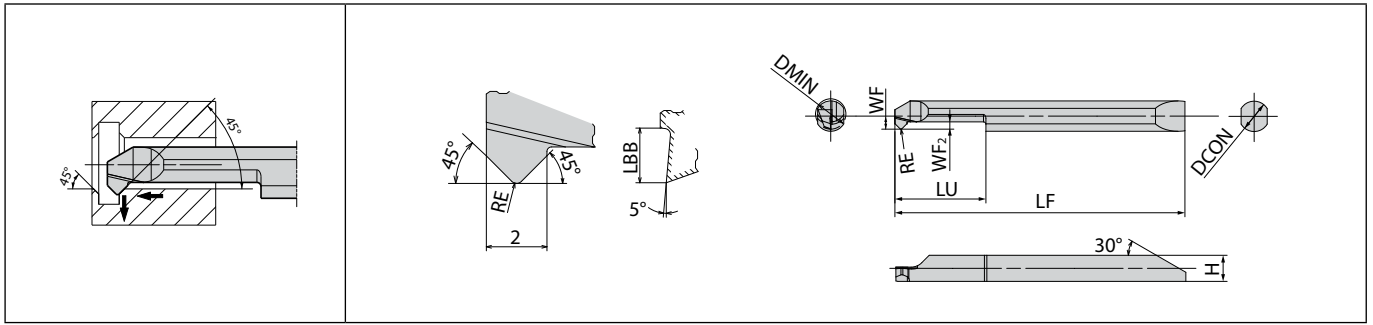
Recommended cutting conditions

Workpiece Material	Insert Grades (Cutting Speed V _c : m/min)	EZBPR020		EZBPR030		EZBPR040		EZBPR050		EZBPR060		Remarks
	MEGACOAT	ap (mm), f (mm/rev)										
	PR1225	ap	f	ap	f	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~100	~0.3	~0.05	~0.4	~0.05	~0.6	~0.05	~0.8	~0.05	~1.0	~0.05	Coolant
Stainless steel	30~80	~0.3	~0.05	~0.4	~0.05	~0.6	~0.05	~0.8	~0.05	~1.0	~0.05	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZBC (Internal chamfering)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)		Carbide	Applicable sleeve F39 F41 F43
		DMIN	DCON	H	LBB	LF	LU	WF	WF ₂	RE	RE min.	RE max.	PVD		
													PR1225		
													R		
EZBCR 050050-020-15 050050-020-20	1	5	5	4.3	1.8	47.8 52.8	15 20	2.15	1.2	0.2	-0.02	+0.02	●	EZH050...	
EZBCR 060060-020-18 060060-020-24	1	6	6	5.15	2.5	53.7 59.7	18 24	2.65	1.9	0.2	-0.02	+0.02	●	EZH060...	
EZBCR 070070-020-21 070070-020-42	1	7	7	6.2	3.1	59.7 80.7	21 42	3	2.5	0.2	-0.02	+0.02	●	EZH070...	



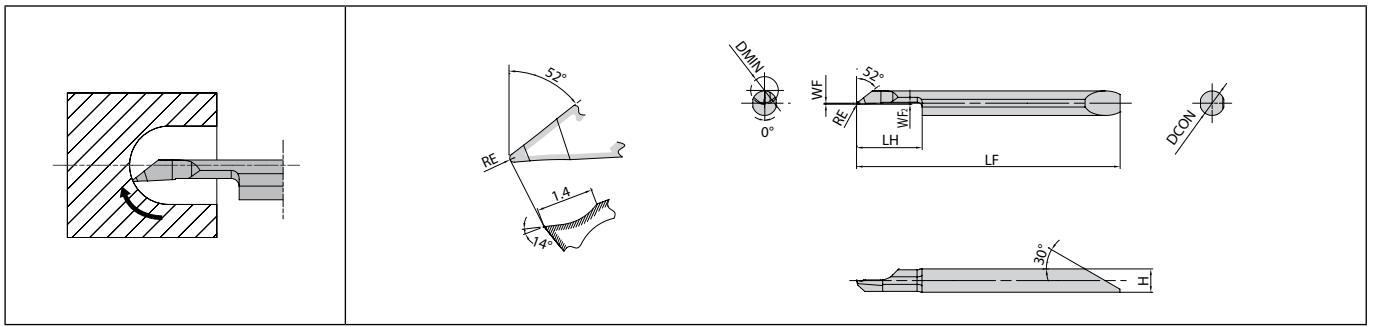
Recommended cutting conditions

Workpiece Material	Insert Grades (Cutting Speed Vc : m/min)	EZBCR050		EZBCR060		EZBCR070		Remarks
	MEGACOAT	ap (mm), f (mm/rev)						
	PR1225	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~100	~0.7	~0.06	~0.7	~0.06	~0.7	~0.06	Coolant
Stainless steel	30~80	~0.7	~0.06	~0.7	~0.06	~0.7	~0.06	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZVB (Boring / Internal facing / Internal copying)



Right-hand shown

F

Dimensions

Description	No. of edges	Dimension (mm)									Tolerance (mm)		Carbide	Applicable sleeve ● F38~F43
		DMIN	DCON	H	LH	H	LF	WF	WF ₂	RE	RE min.	RE max.	PVD	
													PR1225	
													R	
EZVBR 035030-010	1	3.5	3	2.8	8	2.8	38	0.17	0.22	0.1	-0.015	+0.015	●	EZH030...
EZVBR 045040-010	1	4.5	4	3.8	10	3.8	43						●	EZH040...
EZVBR 055050-010	1	5.5	5	4.8	12	4.8	50.2						●	EZH050...
EZVBR 065060-010	1	6.5	6	5.8	14	5.8	55.2						●	EZH060...

Boring

Solid

Positive

KAV

Negative

Recommended cutting conditions


Workpiece material	Insert grades	EZVBR035		EZVBR045		EZVBR055/065		Remarks
	Vc: m/min	ap (mm), f (mm/rev)						
	MEGACOAT							
	PR1225	ap	f	ap	f	ap	f	
Carbon steel / Alloy steel	30~100	~0.05	~0.04	~0.07	~0.07	~0.1	~0.07	Coolant
Stainless steel	30~80	~0.03	~0.03	~0.05	~0.05	~0.07	~0.05	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

Application of EZVB

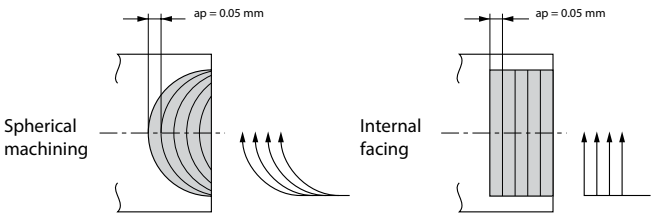
1. Application range



		(mm)		
Description		DMIN	R	LU
EZVBR	035030-010	3.5	1.75	8
EZVBR	045040-010	4.5	2.25	10
EZVBR	055050-010	5.5	2.75	12
EZVBR	065060-010	6.5	3.25	14

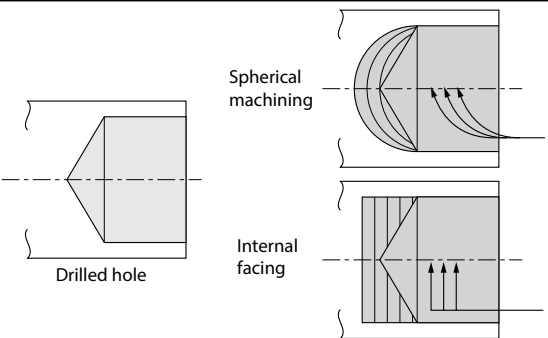
2. Application

Case with no existing hole



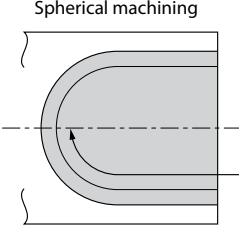
Note: f shall be under 0.03 mm/rev at internal facing.

Case with drilled hole

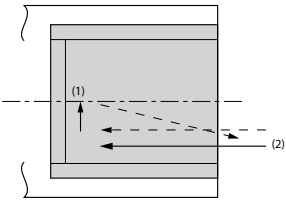


Note: f shall be under 0.03 mm/rev at internal facing.

Finishing



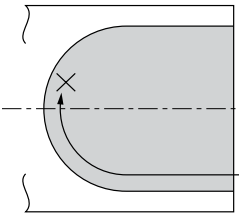
Spherical machining



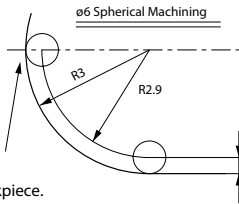
Internal facing

Machining process
 1. Finish the internal face first.
 2. Next, finish the internal diameter.

3. Caution

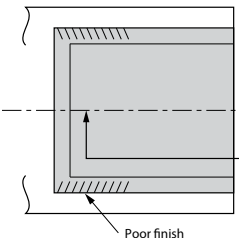


When machining past the center of the workpiece, insert may break.



Fix the insert edge at the center of the workpiece.

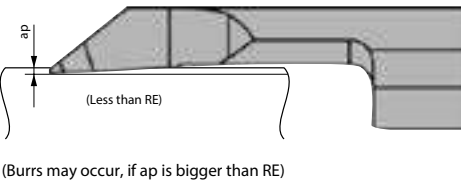
Adjust the machining program to radius minus the value of RE.



For internal profiling, ap should be less than the value of RE.

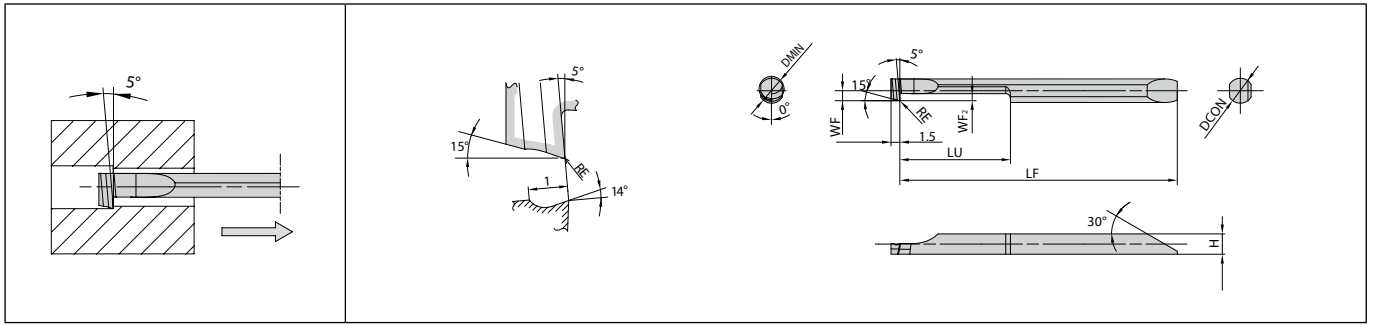
This type of machining is possible, but the chips might scratch the surface.

Poor finish



(Burrs may occur, if ap is bigger than RE)

EZBT (Back boring)



Right-hand shown

F

Dimensions

Description	No. of edges	Dimension (mm)								Tolerance (mm)			Carbide		Applicable sleeve ● F39 ● F41 ● F43
		DMIN	DCON	H	LF	LU	WF	WF ₂	RE	RE min.	RE max.	PVD	-		
												PR1225	GW05		
EZBTR 040040-005	1	4	4	3.45	47.2	18.5	1.7	1.2	0.05	-0.02	0	●	●	EZH040...	
EZBTR 050050-005	1	5	5	4.3	57.2	23.5	2.15	1.5				●	●	EZH050...	

Boring

Solid
Positive
KAV
Negative

Recommended cutting conditions

Workpiece Material	Insert Grades (Cutting Speed Vc: m/min)		EZBTR040040-005		EZBTR050050-005		Remarks
	MEGACOAT	Carbide	ap (mm), f (mm/rev)				
	PR1225	GW05	ap	f	ap	f	
Carbon steel / Alloy steel	★ 30-100	-	~0.45	~0.07	~0.5	~0.1	Coolant
Stainless steel	★ 30-80	-	~0.45	~0.05	~0.5	~0.07	
Non-Ferrous metals	-	★ 30-100	~0.45	~0.1	~0.5	~0.15	

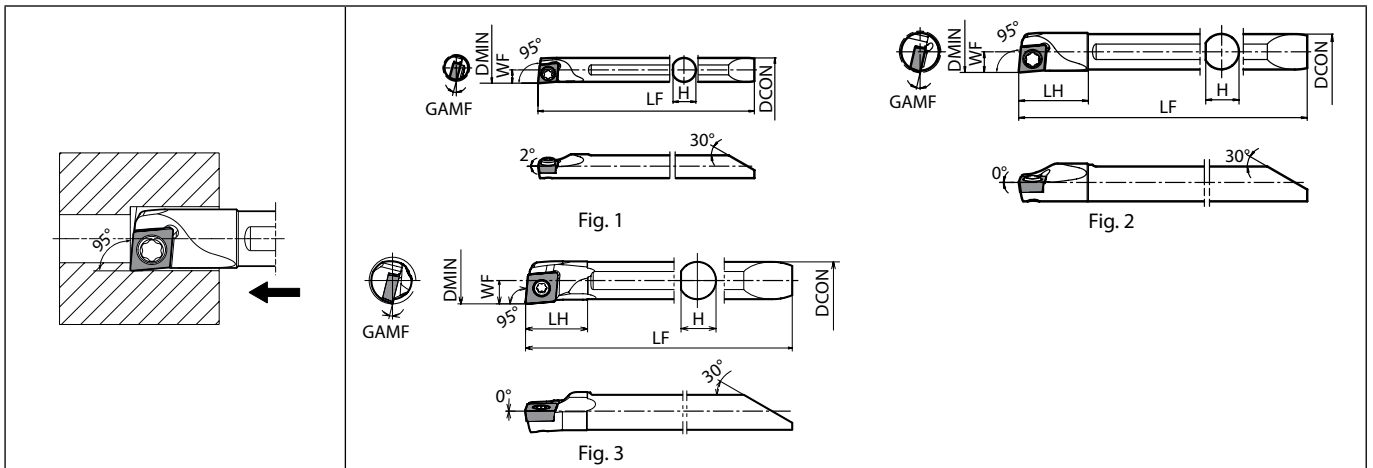
★ : 1st Recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

F30

S-SCLC-EZP Steel shank bar (Boring)



Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D~3

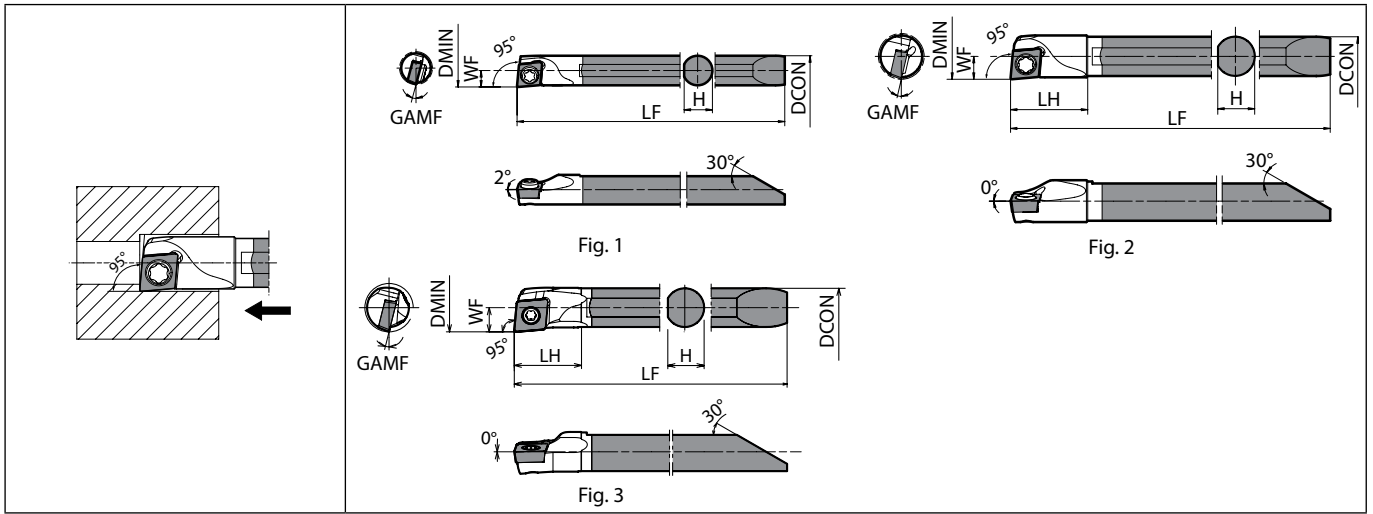


Toolholder dimensions

Description	Availability	Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts		Applicable inserts	Applicable sleeves ● F39 F41 F43
		R	DMIN	DCON	H	LH	LF	WF					Screw	Wrench		
S045X- SCLCR03-050EZP	●	5	4.5	4.3	-	42.4	2.5	15	0.2	No	1			CC□T0301... CC□W0301...	EZH045... EZH050...	
S050X- SCLCR03-060EZP	●	6	5	4.7	9	48.4	3	13	0.2	No	2	SB-1635TR	FT-6	CC□T0401... CC□W0401...	EZH060... EZH070...	
S060X- SCLCR04-070EZP	●	7	6	5.7	10	54.4	3.5	13	0.2	No	2	SB-2035TR	FT-6	CC□T0602... CC□W0602...	EZH080...	
S070X- SCLCR04-080EZP	●	8	7	6.7	10.3	60.4	4	11	0.2	No	2	SB-2035TR	FT-6	CC□T0602... CC□W0602...	EZH080...	
S080X- SCLCR06-100EZP	●	10	8	7.5	13.3	69.5	5	14	0.4	No	3	SB-2545TR	FT-8	CC□T0602... CC□W0602...	EZH080...	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C-SCLC-EZP Carbide shank bar (Boring)



Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D≈~5

F

Boring

Toolholder dimensions

Description	Availability	Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts		Applicable inserts	Applicable sleeves F39 F41 F43
		R	DMIN	DCON	H	LH	LF	WF					Screw	Wrench		
		Icon		Icon												
C045X- SCLCR03-050EZP	●	5	4.5	4.3	-	51.4	2.5	15	0.2	No	1	SB-1635TR	FT-6	CC□T0301... CC□W0301...	EZH045... EZH050...	
C050X SCLCR03-060EZP	●	6	5	4.7	9	58.4	3	13	0.2	No	2	SB-2035TR	FT-6	CC□T0401... CC□W0401...	EZH060... EZH070...	
C060X- SCLCR04-070EZP	●	7	6	5.7	10	66.4	3.5	13	0.2	No	2	SB-2545TR	FT-8	CC□T0602... CC□W0602...	EZH080...	
C070X SCLCR04-080EZP	●	8	7	6.7	10.3	74.4	4	11	0.4	No	3					
C080X- SCLCR06-100EZP	●	10	8	7.5	13.3	85.5	5	14	0.4	No	3					

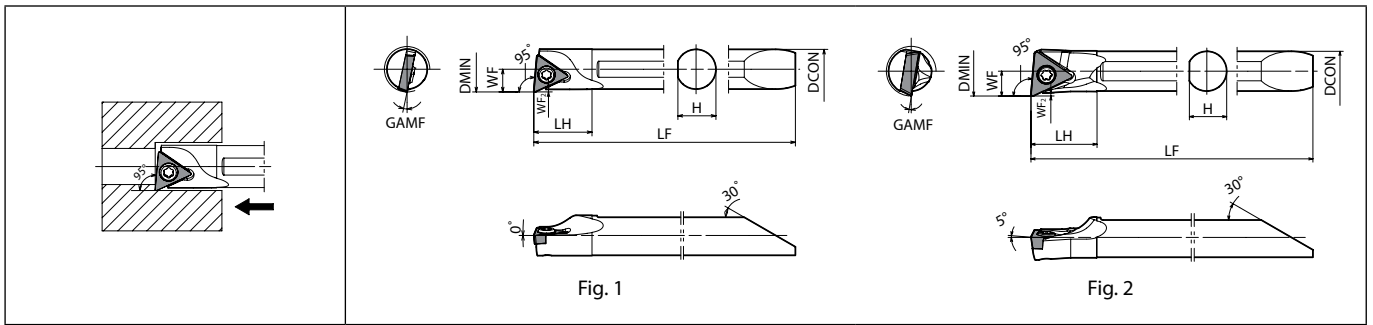
Applicable inserts (S-SCLC-EZP / C- SCLC-EZP)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing
Insert								
Chipbreaker type	CF	PF	GF	SKS	SK	CK	GQ	WP
Page	B58	B58	B58	B59	B59	B59	B59	B60
Applications	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing	Low feed
Insert								
Chipbreaker type	PP	GK	HQ	STD	MF	L-F	L-FSF	L-U
Page	B60	B60	B60	B60	B61	B62	B61	B63~B65
Applications	Low feed	Low feed	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Hard materials		
Insert								
Chipbreaker type	L-USF	L-J	No CB	AP	PCD	CBN		
Page	B63	B65	B66	B66	C39	C20		

Recommended cutting conditions F158, F159



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-STLB(P)-EZP Steel shank bar (Boring)



Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D≈~3

Toolholder dimensions

Description	Availability	Dimension (mm)										Spare parts		Applicable inserts	Applicable sleeves ● F39 F41 F43		
		R	DMIN	DCON	H	LH	LF	WF	WF ₂	GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.			Screw	Wrench
																	
S070X- STLBR06-080EZP	●	8	7	6.7	10.3	60.4	4	0.4	12	0.2	No	1	SB-2035TR	FT-6	TB□T0601... TB□W0601...	EZH070...	
S080X- STLPR09-100EZP	●	10	8	7.5	13.3	69.5	5	0.5	10	0.4	No	2	SB-2545TR	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...	EZH080...	

TB□□060108.. type inserts can not be used.

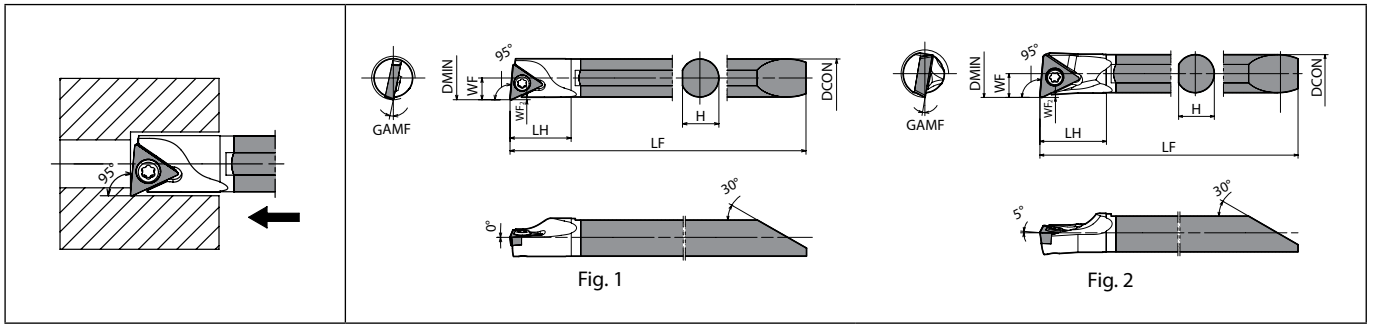
Use Right-handed P chipbreaker

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.



Boring

C-STLB(P)-EZP Carbide shank bar (Boring)



Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D≈5

F

Toolholder dimensions

Description	Availability	Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts		Applicable inserts	Applicable sleeves ● F39 F41 F43
		R	DMIN	DCON	H	LH	LF	WF	WF ₂					Screw	Wrench		
C070X- STLBR06-080EZP	●	8	7	6.7	11	74.4	4	0.4	12	0.2	No	1	SB-2035TR	FT-6	TB□T0601... TB□W0601...	EZH070...	
C080X- STLPR09-100EZP	●	10	8	7.5	14	85.5	5	0.5	10	0.4	No	2	SB-2545TR	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...	EZH080...	

TB□□060108.. type inserts can not be used.

Use Right-handed P chipbreaker

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.

Boring

Solid





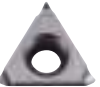










Positive


KAV

Negative

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (S-STLB(P)-EZP / C-STLB(P)-EZP)

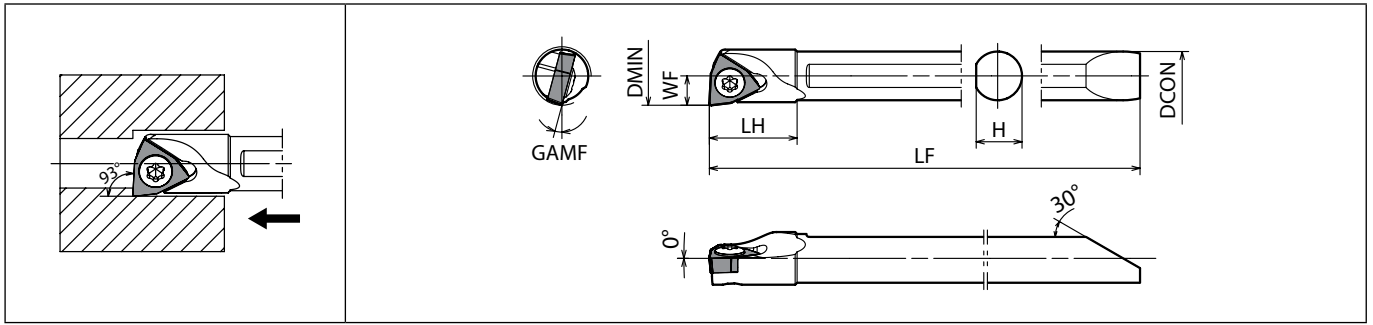
Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium
Insert								
Chipbreaker type	CF	PF	WP	PP	R-P	GP	DP	HQ
Page	B84, B88	B84, B88	B88	B88	B92	B89	B84	B89
Applications	Finishing	Medium	Low carbon steel	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Hard materials	
Insert								
Chipbreaker type	L	L-H	XP	No CB	AP	PCD	CBN	
Page	B84, B90, B91	B93	B89	B84, B94	B94	C44, C46, C47	C23	

Recommended cutting conditions  F158, F159



Boring

S-SWUB-EZP Steel shank bar (Boring)



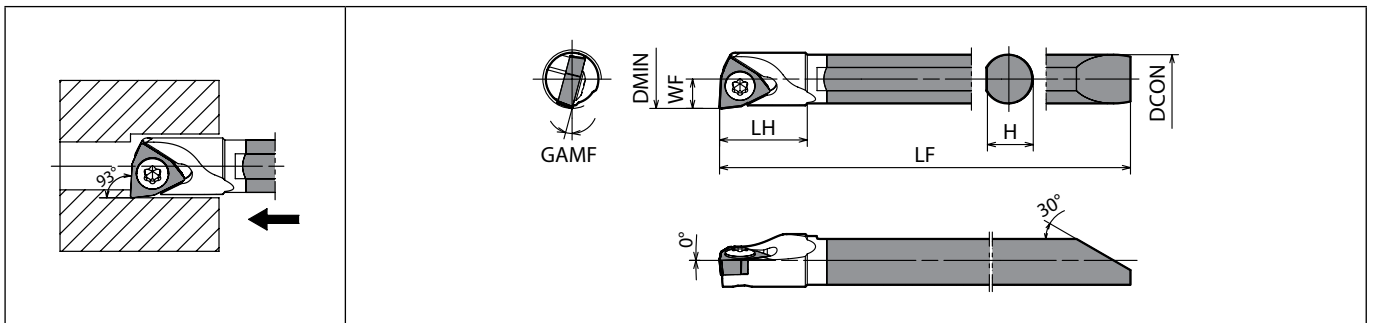
Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D≈3

F

Toolholder dimensions

Description	Availability	Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts	Applicable sleeves ● F39 F41 F43
		R	DMIN	DCON	H	LH	LF	WF				Screw	Wrench		
S050X- SWUBR06-060EZP	●	6	5	4.7	9	48.4	3	15	0.2	No	SB-2035TR	FT-6	WB-T0601... WB-W0601...	EZH050...	
S060X- SWUBR06-070EZP	●	7	6	5.7	10	54.4	3.5	13					WB-T0601... WB-W0601...	EZH060...	
S070X- SWUBR08-080EZP	●	8	7	6.7	10.3	60.4	4	15	0.2	No	SB-2035TR	FT-6	WB-T0802... WB-W0802...	EZH070...	

C-SWUB-EZP Carbide shank bar (Boring)



Right-hand shown | Left-hand Insert for Right-hand Toolholder. | Max. Overhang Length L/D≈5


Toolholder dimensions

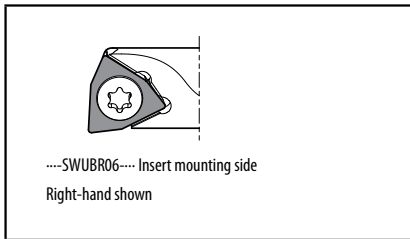
Description	Availability	Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts	Applicable sleeves ● F39 F41 F43
		R	DMIN	DCON	H	LH	LF	WF				Screw	Wrench		
C050X- SWUBR06-060EZP	●	6	5	4.7	9	58.4	3	15	0.2	No	SB-2035TR	FT-6	WB-T0601... WB-W0601...	EZH050...	
C060X- SWUBR06-070EZP	●	7	6	5.7	10	66.4	3.5	13					WB-T0601... WB-W0601...	EZH060...	
C070X- SWUBR08-080EZP	●	8	7	6.7	11	74.4	4	15	0.2	No	SB-2035TR	FT-6	WB-T0802... WB-W0802...	EZH070...	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (S-SWUB-EZP / C-SWUB-EZP)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Cast iron	Non-Ferrous metals	Hard materials
Insert								
Chipbreaker type	L-CF	L-PF	L-DP	L-P	L-F	No CB	PCD	CBN
Page	B105	B105	B105	B106	B106	B106	C51	C28

Recommended cutting conditions  F158, F159



How to mount EZ Bars

How to use adjustment pin (Fig. 1)

1. Put the adjustment pin into the hole.
2. Push it into the sleeve, using the wrench (LW-1.5).
3. Tightening the clamp screw (HS3X4P) with wrench (LW-1.5) to fix the adjustment pin.

How to fix bar (Fig. 2)

1. With the chip pocket upward, set the bar into the sleeve. Press the slant of the end of the bar with the adjustment pin. Make sure that the bar does not move (Fig. 3)
2. Tighten the clamp screw with wrench (LW-2) and fix the bar. Use LW-1.5 if shank dia. is 3 mm or less.

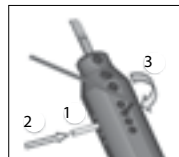


Fig. 5
How to use adjustment pin

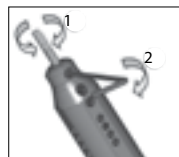


Fig. 6
How to fix bar

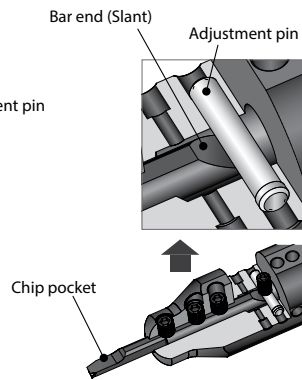
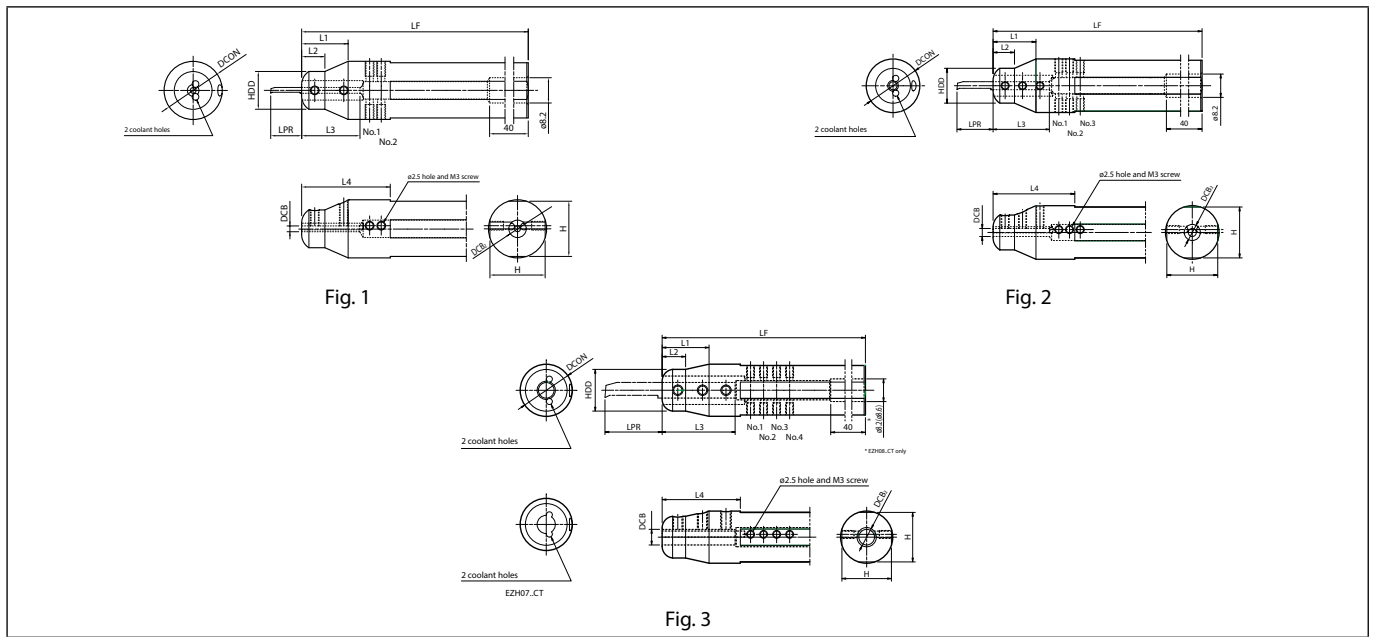


Fig. 7: Fixed bar

EZH-CT (Adjustable with coolant hole)



Sleeve dimensions

Description	Availability	Dimension (mm)											Fig.	Applicable EZ bars ● F16~F26, F28 ● G70 ● J40		
		DCB	DCB2	DCON	H	HDD	LF	L1	L2	L3	L4	LPR				
												No.1	No.2	No.3		
EZH 01719CT-120 01720CT-120 01722CT-135 01725.0CT-135 01725.4CT-120	●	1.7	6	19.05	18	13	120	16	8	16	30.5	7.5	3.5	-	1	EZBR...017...
	●			20	19		135				41.5					
	●			22	21		120				30.5					
	●			25	24		135				41.5					
	●			25.4	24.4		120				30.5					
EZH 02019CT-120 02020CT-120 02022CT-135 02025.0CT-135 02025.4CT-120	●	2	6	19.05	18	13	120	16	8	20	30.5	8.5	4.5	-	1	EZB%/L...020... EZBPR...020...
	●			20	19		135				41.5					
	●			22	21		120				30.5					
	●			25	24		135				41.5					
	●			25.4	24.4		120				30.5					
EZH 02519CT-120 02520CT-120 02522CT-135 02525.0CT-135 02525.4CT-120	●	2.5	6	19.05	18	13	120	16	8	20	30.5	11	7	-	1	EZB%/L...025... EZTR...025...
	●			20	19		135				41.5					
	●			22	21		120				30.5					
	●			25	24		135				41.5					
	●			25.4	24.4		120				30.5					
EZH 03019CT-120 03020CT-120 03022CT-135 03025.0CT-135 03025.4CT-120	●	3	6	19.05	18	13	120	16	8	21	30.5	13.5	9.5	5.5	2	EZB%/L...030... EZBFR...030... EZBPR...030... EZVBR...030... EZGR...030... EZTR...030...
	●			20	19		135				41.5					
	●			22	21		120				30.5					
	●			25	24		135				41.5					
	●			25.4	24.4		120				30.5					
EZH 03519CT-120 03520CT-120 03522CT-135 03525.0CT-135 03525.4CT-120	●	3.5	6	19.05	18	13	120	16	8	21	31.1	15.5	11.5	7.5	2	EZB%/L...035... EZTR...035...
	●			20	19		135				41.5					
	●			22	21		120				31.1					
	●			25	24		135				41.5					
	●			25.4	24.4		120				31.1					

L3 shows DCB length.

LPR shows overhang length of the EZB Bar when attached to sleeve.

Choose sleeves (DCB) to meet with DCON dimension of bar.

A hole on the rear end of sleeve is prepared hole for Rc1/8 threading. Please modify by additional processing if necessary. The body hardness is 42HRC.

For how to fix EZ Bars (EZH-CT sleeve), please refer to F8.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Sleeve dimensions

Description	Availability	Dimension (mm)												Fig.	Applicable EZ bars ● F16~F36 ● G70, G102 ● J40		
		DCB	DCB2	DCON	H	HDD	LF	L1	L2	L3	L4	LPR					
												No.1	No.2			No.3	No.4
EZH 04019CT-120 04020CT-120 04022CT-135 04025.0CT-135 04025.4CT-120	● ● ● ● ●	4	6	19.05 20 22 25 25.4	18 19 21 24 24.4	13	120 135 120	16	8	22	32.7 41.5 32.7	20.5	16.5	12.5	8.5	3	EZB%/...040..., EZBFR...040... EZBPR...040..., EZVBR...040... EZBTR...040..., EZG%/...040... EZFG%/...040..., EZTR...040...
EZH 04519CT-120 04520CT-120 04522CT-135 04525.0CT-135 04525.4CT-120	● ● ● ● ●	4.5	6	19.05 20 22 25 25.4	18 19 21 24 24.4	16	120 135 120	18	9	23	30 44 30	23 (14)	18.5 (9.5)	14 (-)	9.5 (-)	3	EZB%/...045... _045X...-050EZP
EZH 05019CT-120 05020CT-120 05022CT-135 05025.0CT-135 05025.4CT-120	● ● ● ● ●	5	6	19.05 20 22 25 25.4	18 19 21 24 24.4	16	120 135 120	18	9	26	30 44 30	25.5 (15.5)	20.5 (10.5)	15.5 (-)	10.5 (-)	3	EZB%/...050..., EZBFR...050... EZBPR...050..., EZBCR...050... EZVBR...050..., EZBTR...050... _050X...-060EZP, EZG%/...050... EZFG%/...050..., EZTR...050...
EZH 06019CT-120 06020CT-120 06022CT-135 06025.0CT-135 06025.4CT-120	● ● ● ● ●	6	7.4	19.05 20 22 25 25.4	18 19 21 24 24.4	16	120 135 120	18	9	28	30 41.5 30	30.5 (18.5)	25.5 (13.5)	20.5 (-)	15.5 (-)	3	EZB%/...060..., EZBFR...060... EZBPR...060..., EZBCR...060... EZVBR...060..., _060X...-070EZP EZG%/...060..., EZTR...060...
EZH 07019CT-120 07020CT-120 07022CT-135 07025.0CT-135 07025.4CT-120	● ● ● ● ●	7	7.4	19.05 20 22 25 25.4	18 19 21 24 24.4	16	120 135 120	18	9	29	30 44 30	35.5 (21.5)	30.5 (16.5)	25.5 (11.5)	20.5 (-)	3	EZB%/...070..., EZBCR...070... _070X...-080EZP, EZG%/...070... EZFG%/...070..., EZTR...070...
EZH 08019CT-120 08020CT-120 08022CT-135 08025.0CT-135 08025.4CT-120	● ● ● ● ●	8	8.6	19.05 20 22 25 25.4	18 19 21 24 24.4	16	120 135 120	18	9	33	34 44 34	40.5 (24.5)	35.5 (19.5)	30.5 (14.5)	25.5 (-)	3	EZB%/...080... _080X...-100EZP

L3 shows DCB length.

LPR shows overhang length of the EZB Bar when attached to sleeve. () value indicates the overhang length when installed the steel boring bar (EZ Bar PLUS).

Choose sleeves (DCB) to meet with DCON dimension of bar.

A hole on the rear end of sleeve is prepared hole for Rc1/8 threading. Please modify by additional processing if necessary. The body hardness is 42HRC.

For how to fix EZ Bars (EZH-CT sleeve), please refer to F8.

Spare parts description (for EZH-CT Sleeves)

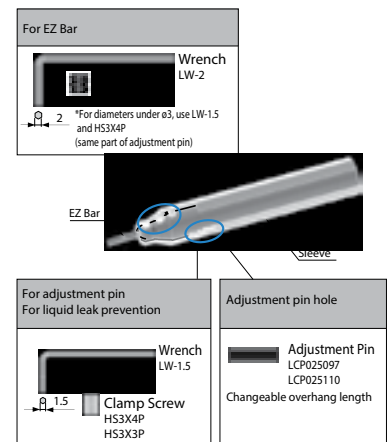
Description	Spare parts							
	Adjustment pin	Clamp screw (for adjustment pin)	Wrench	Clamp screw (for bar)	Wrench			
EZH 017...CT-... 020...CT-... 025...CT-... 030...CT-...	LCP025097	HS3X4P (for adjustment pin and liquid leak prevention)	LW-1.5 Tightening torque 1N-m	HS3X4P	LW-1.5 Tightening torque 1N-m			
EZH 035...CT-... 040...CT-... 045...CT-... 050...CT-... 060...CT-... 070...CT-...								
EZH 080...CT-...						HS3X3P (for adjustment pin and liquid leak prevention)	HS4X4P (for bar)	LW-2 Tightening torque 2N-m

1) If shank dia. is ø2.5mm or less, use clamp screw (HS3X4P)

2) If shank dia. is ø3mm, use clamp screw (HS3X4P)

- For adjustment pin 2 pcs
- For liquid leak prevention 2 pcs
- For EZ Bar 2 pcs

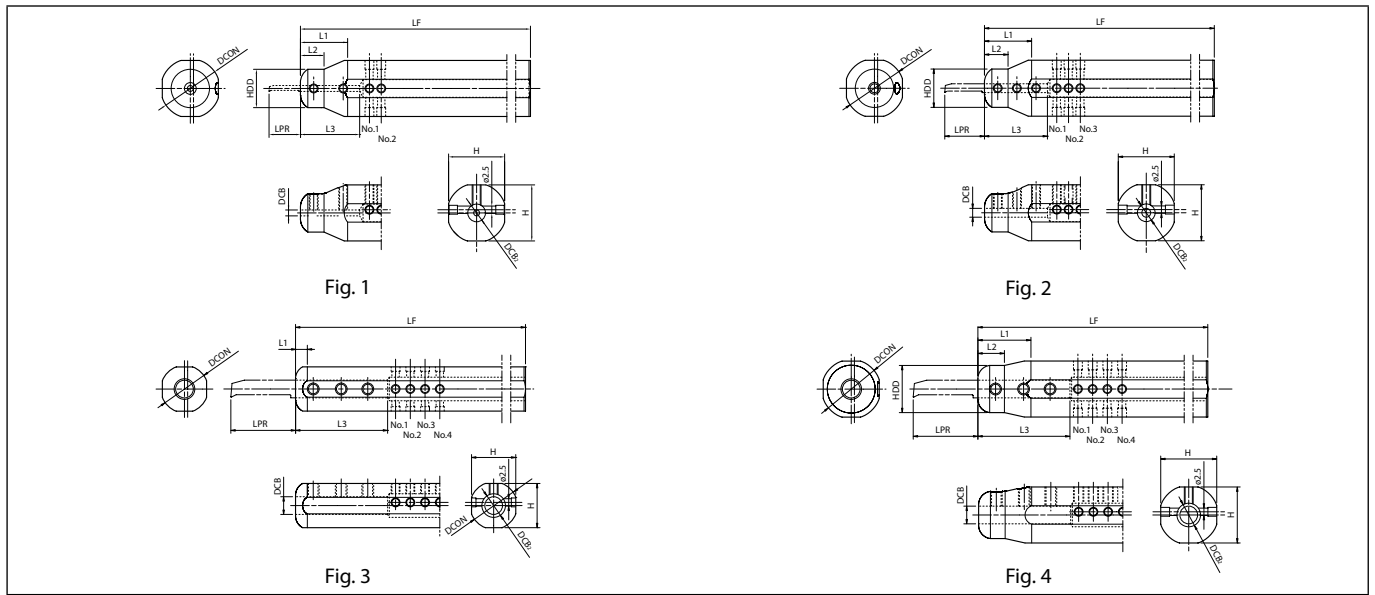
- For adjustment pin 2 pcs
- For liquid leak prevention 4 pcs
- For EZ Bar 3 pcs



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



EZH-HP (Adjustable)



Sleeve dimensions

Description	Availability	Dimension (mm)													Fig.	Applicable EZ bars ● F16~F26, F28 ● G70 ● J40
		DCB	DCB2	DCON	H	HDD	LF	L1	L2	L3	LPR					
											No.1	No.2	No.3	No.4		
EZH 01716HP-100 01719HP-120 01720HP-120 01722HP-135 01725.0HP-135 01725.4HP-120	● ● ● ● ● ●	1.7	6	16 15 19.05 18 20 19 22 21 25 24 25.4 24.4	13	100 120 135 120	16	8	16	7.5	3.5	-	-	1	EZBR...017...	
EZH 02016HP-100 02019HP-120 02020HP-120 02022HP-135 02025.0HP-135 02025.4HP-120	● ● ● ● ● ●	2	6	16 15 19.05 18 20 19 22 21 25 24 25.4 24.4	13	100 120 135 120	16	8	20	8.5	4.5	-	-	1	EZB%/...020... EZBPR...020...	
EZH 02516HP-100 02519HP-120 02520HP-120 02522HP-135 02525.0HP-135 02525.4HP-120	● ● ● ● ● ●	2.5	6	16 15 19.05 18 20 19 22 21 25 24 25.4 24.4	13	100 120 135 120	16	8	20	11	7	-	-	1	EZB%/...025... EZTR...025...	
EZH 03016HP-100 03019HP-120 03020HP-120 03022HP-135 03025.0HP-135 03025.4HP-120	● ● ● ● ● ●	3	6	16 15 19.05 18 20 19 22 21 25 24 25.4 24.4	13	100 120 135 120	16	8	21	13.5	9.5	5.5	-	2	EZB%/...030... EZBFR...030... EZBPR...030... EZVBR...030... EZGR...030... EZTR...030...	
EZH 03516HP-100 03519HP-120 03520HP-120 03522HP-135 03525.0HP-135 03525.4HP-120	● ● ● ● ● ●	3.5	6	16 15 19.05 18 20 19 22 21 25 24 25.4 24.4	13	100 120 135 120	16	8	22	15.5	11.5	7.5	-	2	EZB%/...035... EZTR...035...	

L3 shows DCB length.
LPR shows overhang length of the EZB Bar when attached to sleeve.
Choose sleeves (DCB) to meet with DCON dimension of bar.
For how to fix EZ Bars (EZH-HP sleeve), please refer to F37.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Sleeve dimensions

Description	Availability	Dimension (mm)												Fig.	Applicable EZ bars ● F16~F36 ● G70, G102 ● J40	
		DCB	DCB2	DCON	H	HDD	LF	L1	L2	L3	LPR					
											No.1	No.2	No.3			No.4
EZH 04016HP-100 04019HP-120 04020HP-120 04022HP-135 04025.0HP-135 04025.4HP-120	● ● ● ● ● ●	4	6	16 19.05 20 22 25 25.4	15 18 19 21 24 24.4	100 120 135 120	16	8	24	20.5	16.5	12.5	8.5	4	EZB [®] /L...040..., EZBFR...040... EZBPR...040..., EZVBR...040... EZBTR...040..., EZG [®] /L...040... EZFG [®] /L...040..., EZTR...040...	
EZH 04516HP-100 04519HP-120 04520HP-120 04522HP-135 04525.0HP-135 04525.4HP-120	● ● ● ● ● ●	4.5	6	16 19.05 20 22 25 25.4	15 18 19 21 24 24.4	100 120 135 120	4	-	25.3	23 (14)	18.5 (9.5)	14 (-)	9.5 (-)	3 4	EZB [®] /L...045... _045X...-050EZP	
EZH 05016HP-100 05019HP-120 05020HP-120 05022HP-135 05025.0HP-135 05025.4HP-120	● ● ● ● ● ●	5	6	16 19.05 20 22 25 25.4	15 18 19 21 24 24.4	100 120 135 120	4	-	29	25.5 (15.5)	20.5 (10.5)	15.5 (-)	10.5 (-)	3 4	EZB [®] /L...050..., EZBFR...050... EZBPR...050..., EZBCR...050... EZVBR...050..., EZBTR...050... _050X...-060EZP, EZG [®] /L...050... EZFG [®] /L...050..., EZTR...050...	
EZH 06016HP-100 06019HP-120 06020HP-120 06022HP-135 06025.0HP-135 06025.4HP-120	● ● ● ● ● ●	6	8	16 19.05 20 22 25 25.4	15 18 19 21 24 24.4	100 120 135 120	4	-	31	30.5 (18.5)	25.5 (13.5)	20.5 (-)	15.5 (-)	3 4	EZB [®] /L...060..., EZBFR...060... EZBPR...060..., EZBCR...060... EZVBR...060..., _060X...-070EZP EZG [®] /L...060..., EZTR...060...	
EZH 07016HP-100 07019HP-120 07020HP-120 07022HP-135 07025.0HP-135 07025.4HP-120	● ● ● ● ● ●	7	8	16 19.05 20 22 25 25.4	15 18 19 21 24 24.4	100 120 135 120	4	-	33	35.5 (21.5)	30.5 (16.5)	25.5 (11.5)	20.5 (-)	3 4	EZB [®] /L...070..., EZBCR...070... _070X...-080EZP, EZG [®] /L...070... EZFG [®] /L...070..., EZTR...070...	
EZH 08019HP-120 08020HP-120 08022HP-135 08025.0HP-135 08025.4HP-120	● ● ● ● ●	8	8.4	19.05 20 22 25 25.4	18 19 21 24 24.4	120 135 120	18	9	37	40.5 (24.5)	35.5 (19.5)	30.5 (14.5)	25.5 (-)	4	EZB [®] /L...080... _080X...-100EZP	

L3 shows DCB length.

LPR shows overhang length of the EZB Bar when attached to sleeve. () value indicates the overhang length when installed the steel boring bar (EZ Bar PLUS).

Choose sleeves (DCB) to meet with DCON dimension of bar.

For how to fix EZ Bars (EZH-HP sleeve), please refer to F37.

Spare parts description (for EZH-HP Sleeves)

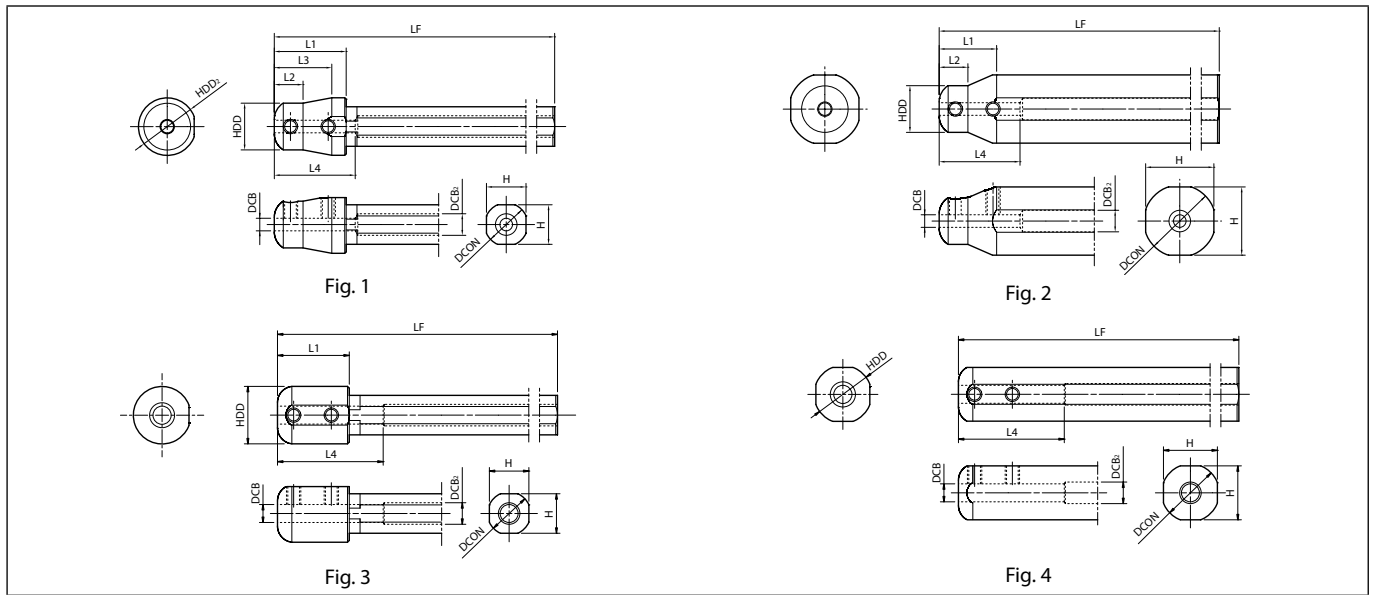
Description	Spare parts					Applicable EZ Bars EZ Bar PLUS
	Adjustment pin	Clamp screw (for Adjustment Pin)	Wrench	Clamp screw (for Bar)	Wrench	
EZH 017...HP-.. 020...HP-.. 025...HP-.. 030...HP-..	LCPO25140	HS3X4P (for both adjustment pin and bar)	LW-1.5 Tightening torque 1N·m	HS3X4P	LW-1.5 Tightening torque 1N·m	EZBR...017...
EZB [®] /L...020...						EZ_R...020-...
EZB [®] /L...025...						EZ_R...025-...
EZB [®] /L...030...						EZ_R...030-...
EZH 035...HP-.. 040...HP-.. 045...HP-.. 050...HP-.. 060...HP-.. 070...HP-.. 080...HP-..	LCPO25140	HS3X4P	LW-1.5 Tightening torque 1N·m	HS4X4P	LW-2 Tightening torque 2N·m	EZB [®] /L...035...
EZB [®] /L...040...						EZ [®] /L...040-...
EZB [®] /L...045...						_045X...-050EZP
EZB [®] /L...050...						EZ [®] /L...050-...
EZB [®] /L...060...						EZ [®] /L...060-...
EZB [®] /L...070...						EZ [®] /L...070-...
EZB [®] /L...080...						_080X...-100EZP

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

EZH-ST (Not-adjustable)



Sleeve dimensions

Description	Availability	Dimension (mm)											Fig.	Applicable EZ bars ● F16~F26, F28 ● G70 ● J40
		DCB	DCB2	DON	H	HDD	HDD2	LF	L1	L2	L3	L4		
EZH 01712ST-80	●			12	11	16	80	20					1	EZBR...017...
01716ST-100	●			16	15		100							
01719ST-120	●			19.05	18									
01720ST-120	●	1.7	6	20	19	13							2	
01722ST-135	●			22	21			16	8			16		
01725.0ST-135	●			25	24									
01725.4ST-120	●			25.4	24.4									
EZH 02012ST-80	●			12	11	16	80	20					1	EZB [®] ...020... EZBPR...020...
02016ST-100	●			16	15		100							
02019ST-120	●			19.05	18									
02020ST-120	●	2	6	20	19	13							2	
02022ST-135	●			22	21			16	8			20		
02025.0ST-135	●			25	24									
02025.4ST-120	●			25.4	24.4									
EZH 02512ST-80	●			12	11	16	80	20					1	EZB [®] ...025... EZTR...025...
02516ST-100	●			16	15		100							
02519ST-120	●			19.05	18									
02520ST-120	●	2.5	6	20	19	13							2	
02522ST-135	●			22	21			16	8			20		
02525.0ST-135	●			25	24									
02525.4ST-120	●			25.4	24.4									
EZH 03012ST-80	●			12	11	16	80	20					1	EZB [®] ...030... EZBFR...030... EZBPR...030... EZVBR...030... EZGR...030... EZTR...030...
03016ST-100	●			16	15		100							
03019ST-120	●			19.05	18									
03020ST-120	●	3	6	20	19	13							2	
03022ST-135	●			22	21			16	8			21		
03025.0ST-135	●			25	24									
03025.4ST-120	●			25.4	24.4									

L4 shows DCB length.
 Choose sleeves (DCB) to meet with DCON dimension of bar.
 Adjustment pin cannot be installed to EZH-ST sleeves. To adjust overhang of the bar, please use EZH-CT / HP sleeves.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Sleeve dimensions

Description	Availability	Dimension (mm)											Fig.	Applicable EZ bars ● F16~F36 ● G70, G102 ● J40	
		DCB	DCB2	DCON	H	HDD	HDD2	LF	L1	L2	L3	L4			
EZH 03512ST-80 03516ST-100 03519ST-120 03520ST-120 03522ST-135 03525.0ST-135 03525.4ST-120	●	3.5	6	12	11	13	-	16	80	20	16	-	22	1	EZB [®] /L...035... EZTR...035...
	●			16	15			100							
	●			19.05	18			120							
	●			20	19			16	8						
	●			22	21			135							
	●			25	24			120							
EZH 04012ST-80 04016ST-100 04019ST-120 04020ST-120 04022ST-135 04025.0ST-135 04025.4ST-120	●	4	6	12	11	13	-	16	80	20	16	-	24	2	EZB [®] /L...040..., EZBFR...040... EZBPR...040..., EZVBR...040... EZBTR...040..., EZG [®] /L...040... EZFG [®] /L...040..., EZTR...040...
	●			16	15			100							
	●			19.05	18			120							
	●			20	19			16	8						
	●			22	21			135							
	●			25	24			120							
EZH 05012ST-80 05016ST-100 05019ST-120 05020ST-120 05022ST-135 05025.0ST-135 05025.4ST-120	●	5	6	12	11	16	-	80	20	-	-	-	29	3	EZB [®] /L...050..., EZBFR...050... EZBPR...050..., EZBCR...050... EZVBR...050..., EZBTR...050... _050X...-060EZP, EZG [®] /L...050... EZFG [®] /L...050..., EZTR...050...
	●			16	15			100	-	4					
	●			19.05	18			120							
	●			20	19			18	9						
	●			22	21			135							
	●			25	24			120							
EZH 06012ST-80 06016ST-100 06019ST-120 06020ST-120 06022ST-135 06025.0ST-135 06025.4ST-120	●	6	8	12	11	16	-	80	20	-	-	-	31	3	EZB [®] /L...060..., EZBFR...060... EZBPR...060..., EZBCR...060... EZVBR...060..., _060X...-070EZP EZG [®] /L...060..., EZTR...060...
	●			16	15			100	-	4					
	●			19.05	18			120							
	●			20	19			18	9						
	●			22	21			135							
	●			25	24			120							
EZH 07012ST-80 07016ST-100 07019ST-120 07020ST-120 07022ST-135 07025.0ST-135 07025.4ST-120	●	7	8	12	11	16	-	80	20	-	-	-	33	3	EZB [®] /L...070..., EZBCR...070... _070X...-080EZP, EZG [®] /L...070... EZFG [®] /L...070..., EZTR...070...
	●			16	15			100	-	4					
	●			19.05	18			120							
	●			20	19			18	9						
	●			22	21			135							
	●			25	24			120							
EZH 08016ST-100 08019ST-120 08020ST-120 08022ST-135 08025.0ST-135 08025.4ST-120	●	8	8.4	16	15	16	-	100	-	-	-	-	37	4	EZB [®] /L...080... _080X...-100EZP
	●			19.05	18			120							
	●			20	19			18	9						
	●			22	21			135							
	●			25	24			120							
	●			25.4	24.4			120							

L4 shows DCB length.

Choose sleeves (DCB) to meet with DCON dimension of bar.

Adjustment pin cannot be installed to EZH-ST sleeves. To adjust overhang of the bar, please use EZH-CT / HP sleeves.

Spare parts description (for EZH-ST Sleeves)

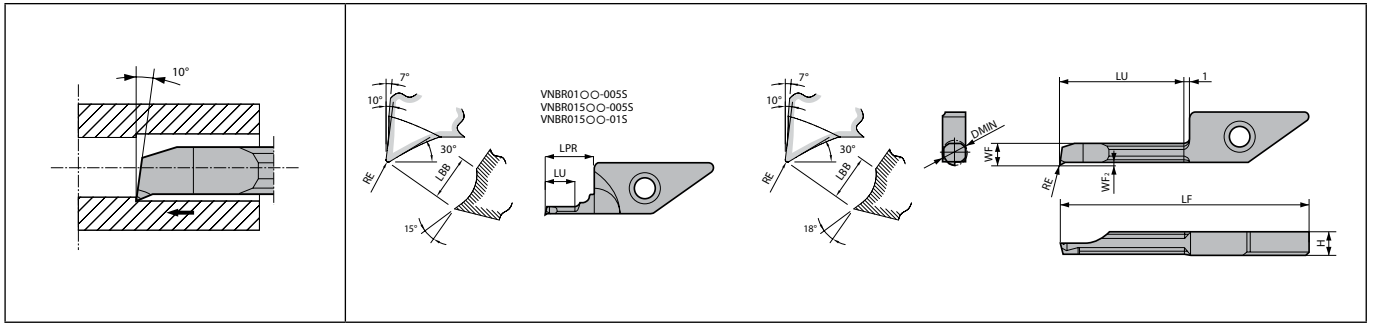
Description	Spare parts		Applicable EZ Bars		EZ Bar PLUS
	Clamp screw	Wrench	EZB-HP EZB-HP-LT EZB-ST EZB-NB	EZBT / EZBF EZBP / EZBC EZVB / EZG EZFG / EZT	S/C-SCLC S/C-STLB(P) S/C-SWUB
EZH 017...ST-... 020...ST-... 025...ST-... 030...ST-...	HS3X4P	LW-1.5 Tightening torque 1N·m	EZBR...017...	-	-
			EZB [®] /L...020...	EZ_R...020-...	-
			EZB [®] /L...025...	EZTR...025-...	-
			EZB [®] /L...030...	EZ_R...030-...	-
EZH 035...ST-... 040...ST-... 050...ST-... 060...ST-... 070...ST-... 080...ST-...	HS4X4P	LW-2 Tightening torque 2N·m	EZB [®] /L...035...	EZTR...035-...	-
			EZB [®] /L...040...	EZ [®] /L...040-...	-
			EZB [®] /L...050...	EZ [®] /L...050-...	_050X...-060EZP
			EZB [®] /L...060...	EZ [®] /L...060-...	_060X...-070EZP
			EZB [®] /L...070...	EZ [®] /L...070-...	_070X...-080EZP
			EZB [®] /L...080...	-	_080X...-100EZP

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

VNB-S (Boring)



Right-hand shown

F

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)			Carbide		Applicable toolholder F48~F51
		DMIN	H	LPR	LBB	LF	LU	WF	WF ₂	RE	RE min.	RE max.	PVD				
													PR1225	PR930			
VNBR 0103-005S	1	1	3.9	7	0.7	26.5	3	0.85	0.2	0.05	-0.02	0	●	●	SVNR...-12N S...-SVNR12N S...-SVNR12SN		
VNBR 0105-005S	1	1	3.9	7	0.7	26.5	5	0.85	0.2	0.05	-0.02	0	●	●			
VNBR 01503-005S 01503-01S 01505-005S 01505-01S	1	1.5	3.9	7	0.7	26.5	3 3 5 5	1.3	0.2	0.05 0.1 0.05 0.1	-0.02 -0.03 -0.02 -0.03	0	● ● ● ●	● ● ● ●			
VNBR 0206-005S 0206-01S	1	2	3.9	-	0.8	26.5	6	1.8	0.25	0.05 0.1	-0.02 -0.03	0	● ●	● ●		SVNR...-12N, SVNSR-12-06N S...-SVNR12N, S...-SVNR12SN	
VNBR 025075-005S 025075-01S	1	2.5	3.9	-	0.8	28.1	7.5	2.1	0.4	0.05 0.1	-0.02 -0.03	0	● ●	● ●	SVNR...-12NS..., -SVNR12N S...-SVNR12SN		
VNBR 0311-005S 0311-01S	1	3	3.9	-	0.8	30.8	11	2.6	0.4	0.05 0.1	-0.02 -0.03	0	● ●	● ●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN		
VNBR 03515-005S 03515-01S	1	3.5	3.9	-	0.8	34.8	15	3	0.5	0.05 0.1	-0.02 -0.03	0	● ●	● ●	SVNR...-12NS..., -SVNR12N S...-SVNR12SN		
VNBR 0411-005S 0411-01S 0411-02S	1	4	3.66	-	0.8	30.8	11	3.5	0.5	0.05 0.1 0.2	-0.02 -0.03 -0.04	0	● ● ●	● ● ●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN		
VNBR 0420-005S 0420-01S 0420-02S	1	4	3.66	-	0.8	39.8	20	3.5	0.5	0.05 0.1 0.2	-0.02 -0.03 -0.04	0	● ● ●	● ● ●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN		

Recommended cutting conditions (VNB-S)

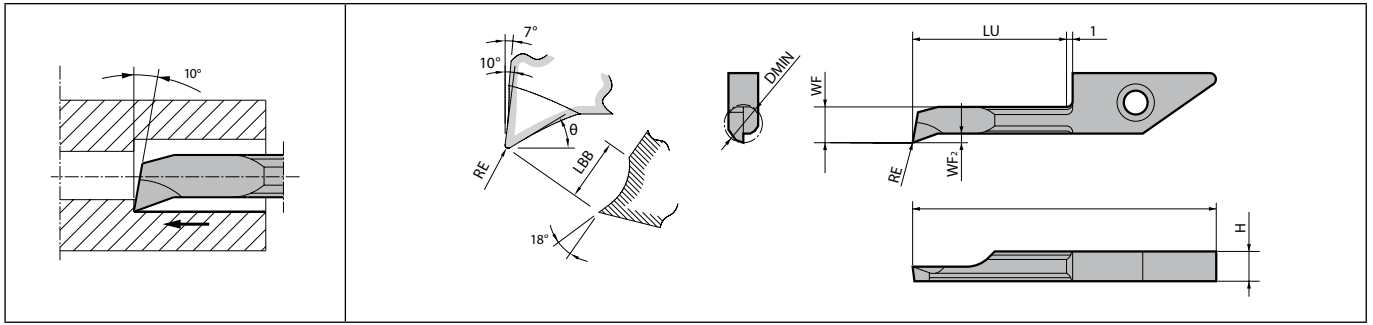
Workpiece material	Insert grades (Vc: m/min)		VNB01-S VNB015-S	VNB02-S VNB04-S		Remarks	
	MEGACOAT	PVD coated carbide					
	PR1225	PR930		ap (mm), f (mm/rev)			
	ap	f		ap	f		
Carbon steel / Alloy steel	★ 30~120	☆ 30~100	~0.1	~0.01	~0.2	~0.03	Coolant
Stainless steel	★ 30~100	☆ 30~80	~0.1	~0.01	~0.2	~0.02	

★1st recommendation ☆2nd recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

System tip-bars are 5 piece boxes

VNB (Boring)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)									Angle θ (°)	Carbide			Applicable toolholder F48~F51
		DMIN	H	LBB	LF	LU	WF	WF ₂	RE	PVD					
										PR1225		PR830	KW10		
VNBR 0206-003 0206-01 0206-02	1	2	3.9	1.2	26.5	6	1.8	0.25	0.03 0.1 0.2	24	●	●	●	SVNR...-12N, SVNSR-12-06N S...-SVNR12N, S...-SVNR12SN	
VNBR 0311-003 0311-01 0311-02	1	3	3.9	1.8	30.8	11	2.6	0.4	0.03 0.1 0.2	24	●	●	●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN	
VNBR 0411-003 0411-01 0411-02	1	4	3.66	2.7	30.8	11	3.5	0.5	0.03 0.1 0.2	23	●	●	●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN	
VNBR 0420-003 0420-01 0420-02	1	4	3.66	2.7	39.8	20	3.5	0.5	0.03 0.1 0.2	23	●	●	●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN	
VNBR 0511-003 0511-01 0511-02	1	5	3.9	3	30.8	11	4.5	0.7	0.03 0.1 0.2	23	●	●	●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN	
VNBR 0520-003 0520-01 0520-02	1	5	3.9	3	39.8	20	4.5	0.7	0.03 0.1 0.2	23	●	●	●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN	
VNBR 0620-003 0620-01 0620-02	1	6	3.9	3	39.8	20	5.3	1	0.03 0.1 0.2	24	●	●	●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN	
VNBR 0630-003 0630-01 0630-02	1	6	3.9	3	49.8	30	5.3	1	0.03 0.1 0.2	24	●	●	●	SVNR...-12N S...-SVNR12N S...-SVNR12SN	
VNBR 0720-003 0720-01 0720-02	1	7	3.9	3	39.8	20	6.2	1	0.03 0.1 0.2	24	●	●	●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN	
VNBR 0730-003 0730-01 0730-02	1	7	3.9	3	49.8	30	6.2	1	0.03 0.1 0.2	24	●	●	●	SVNR...-12N S...-SVNR12N S...-SVNR12SN	

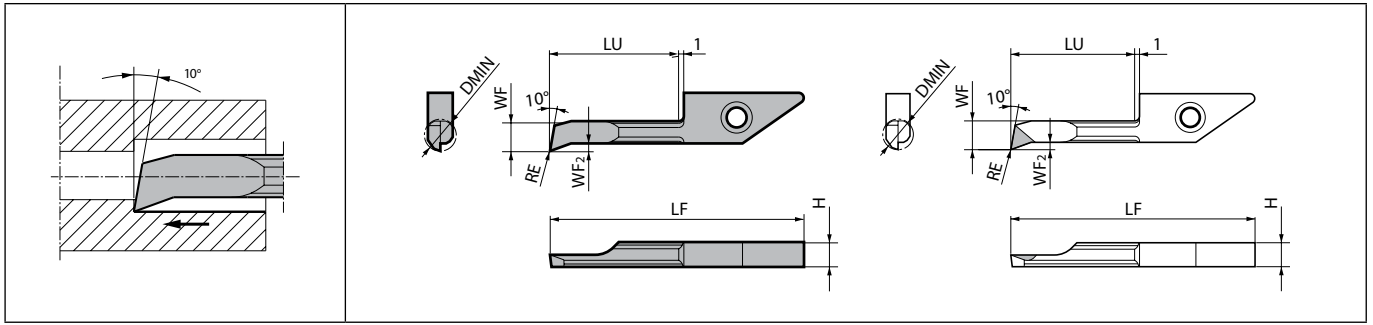
Recommended cutting conditions F47

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

System tip-bars are sold in 5 piece boxes



VNB-NB (Boring)



Right-hand shown

F

Dimensions

Description	No. of edges	Dimension (mm)								Angle θ (°)	Carbide			PCD	Applicable toolholder F48~F51
		DMIN	H	LF	LU	WF	WF ₂	RE	PVD		-	-			
									PB30		KW10	KPD001			
VNBR 0206-003NB 0206-02NB	1	2	3.9	26.5	6	1.8	0.25	0.03 0.2	15	●	●		SVNR...-12N, SVNSR-12-06N S...-SVNR12N, S...-SVNR12SN		
VNBR 0311-003NB 0311-02NB	1	3	3.9	30.8	11	2.6	0.4	0.03 0.2	15	●	●		SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN		
VNBR 0411-003NB 0411-02NB	1	4	3.66	30.8	11	3.5	0.5	0.03 0.2	15	●	●	●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN		
VNBR 0420-003NB 0420-02NB	1	4	3.66	39.8	20	3.5	0.5	0.03 0.2	15	●	●	●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN		
VNBR 0511-003NB 0511-02NB	1	5	3.9	30.8	11	4.5	0.7	0.03 0.2	15	●	●	●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN		
VNBR 0520-003NB 0520-02NB	1	5	3.9	39.8	20	4.5	0.7	0.03 0.2	15	●	●	●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN		
VNBR 0620-003NB 0620-02NB	1	6	3.9	39.8	20	5.3	1	0.03 0.2	15	●	●	●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN		
VNBR 0630-003NB 0630-02NB	1	6	3.9	49.8	30	5.3	1	0.03 0.2	15	●	●	●	SVNR...-12N, S...-SVNR12N S...-SVNR12SN		
VNBR 0720-003NB 0720-02NB	1	7	3.9	39.8	20	6.2	1	0.03 0.2	15	●	●	●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN		
VNBR 0730-003NB 0730-02NB	1	7	3.9	49.8	30	6.2	1	0.03 0.2	15	●	●	●	SVNR...-12N, S...-SVNR12N S...-SVNR12SN		

Recommended cutting conditions F47

Boring

Solid

Positive

KAV

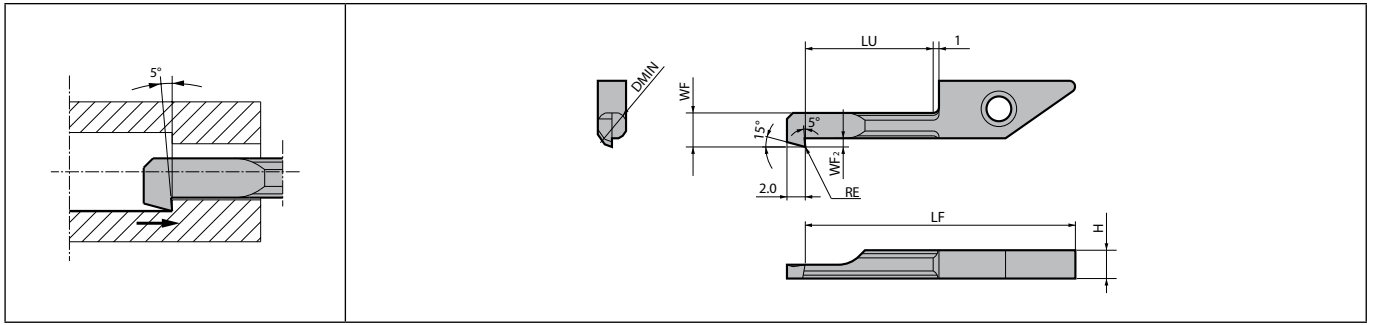
Negative

System tip-bars are sold in 5 piece boxes

CBN & PCD Inserts are sold in 1 piece boxes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

VNBT (Back boring)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)							Carbide			Applicable toolholder F48~F51
		DMIN	H	LF	LU	WF	WF ₂	RE	PVD			
									PR1225	PR930	KW10	
VNBTR 0411-003 0411-01	1	4	3.66	28.8	9	3.6	1	0.03 0.1	● ●	● ●	● ●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN
VNBTR 0420-003 0420-01	1	4	3.66	37.8	18	3.6	1	0.03 0.1	● ●	● ●	● ●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN
VNBTR 0511-003 0511-01	1	5	3.9	28.8	9	4.6	1.3	0.03 0.1	● ●	● ●	● ●	SVNR...-12N, SVNSR-12-11N S...-SVNR12N, S...-SVNR12SN
VNBTR 0520-003 0520-01	1	5	3.9	37.8	18	4.6	1.3	0.03 0.1	● ●	● ●	● ●	SVNR...-12N, SVNSR-12-20N S...-SVNR12N, S...-SVNR12SN

Recommended cutting conditions F47

Recommended cutting conditions (VNB / VNB-NB / VNBT)

Workpiece material	Insert grades (Vc: m/min)					VNB02		VNB03		VNB04 VNB04		VNB05 VNB06 VNB07 VNB05		Remarks
	MEGACOAT	PVD coated carbide	Carbide	PCD		ap	f	ap	f	ap	f	ap	f	
	PR1225	PR930	KW10	KPD001	KPD010										ap (mm), f (mm/rev)
Carbon steel / Alloy steel	★ 30~120	☆ 30~100				~0.3	~0.03	~0.4	~0.04	~0.45	~0.07	~0.5	~0.1	Coolant
Stainless steel	★ 30~100	☆ 30~80				~0.3	~0.02	~0.4	~0.03	~0.45	~0.05	~0.5	~0.07	
Non-ferrous metals			☆ ~100	★ ~300	☆ ~300	~0.3	~0.05	~0.4	~0.06	~0.45	~0.1	~0.5	~0.15	

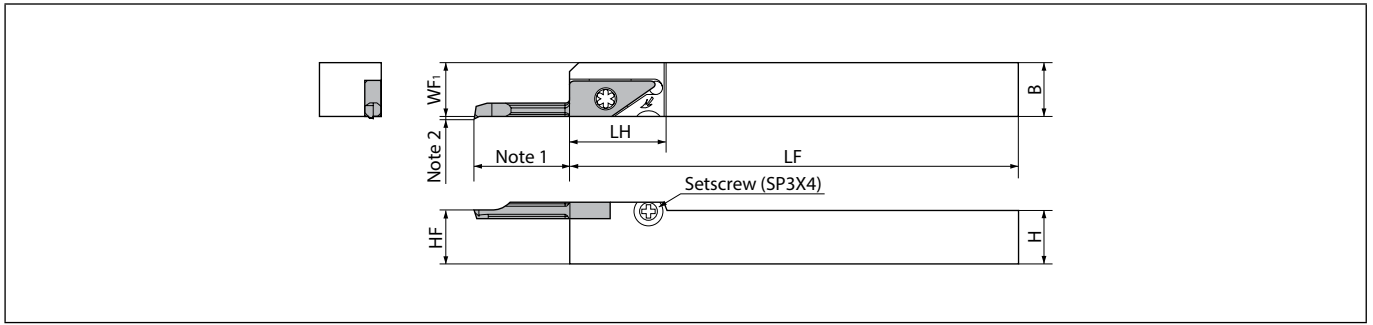
★ 1st recommendation ☆ 2nd recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

System tip-bars are sold in 5 piece boxes



SVN-N (without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
Note 1 & Note 2 (WF2) : For insert dimensions, see page (F44~F47)

F

Toolholder dimensions

Description	Availability	Dimension (mm)						Spare parts			Applicable inserts ● F44~F47 G72, G73 G104 J44
								Screw	Set screw	Wrench	
		R	H	B	LH	HF	LF	WF1			
SVNR 1010H-12N	●	10	10		10	100	10	SB-3080TR	SP3X4	FT-10	VNBR...-... VNBTR...-... VNGR...-... VNFR...-... VNTR...-...
1212K-12N	●	12	12		12	12					
1616K-12N	●	16	16	22	16	125	16				
2020K-12N	●	20	20		20	20					
2525M-12N	●	25	25		25	150	25				

SVN-N (without side stopper) retains high index accuracy by easy restraint.

SVN-N (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

Spare parts (Optional)

Screw (Side stopper)	Wrench
HS3X4	LW-1.5

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Boring

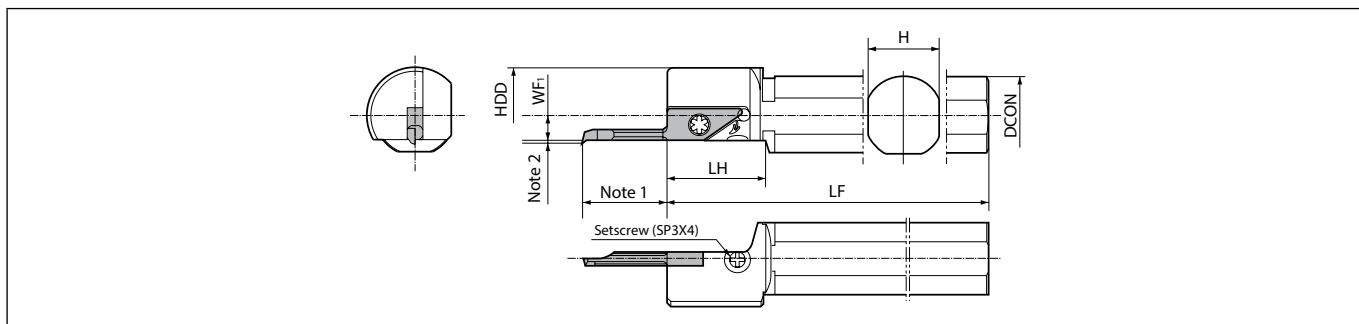
Solid

Positive

KAV

Negative

S-SVN-N (Round shank / Standard / without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
Note 1 & Note 2 (WF₂) : For insert dimensions, see page (F44~F47)

F

Toolholder dimensions

Description	Availability	Dimension (mm)						Spare parts			Applicable inserts ● F44~F47 G72, G73 G104 J44	
		R	DCON	H	LH	HDD	LF	WF ₁	Screw 	Set screw 		Wrench
		S12F- SVNR12N	●	12	11	23	20	80	4	SB-3080TR		SP3X4	FT-10	VNBR...-... VNBTR...-... VNGR...-... VNFR...-... VNTR...-...
S14G- SVNR12N	●	14	13	90								
S16H- SVNR12N	●	16	15	24	100	6						
S19H- SVNR12N	●	19.05	17				160					
S19N- SVNR12N	●			20	18	24	100					
S20H- SVNR12N	●	25.4	23					30	180			
S25H- SVNR12N	●			25.4	23	30	180					
S25Q- SVNR12N	●	25.4	23					30	180			

S-SVN-N (without side stopper) retains high index accuracy by easy restraint.

S-SVN-N (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

Spare parts (Optional)

Screw (Side stopper)	Wrench
HS3X4	LW-1.5

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Boring

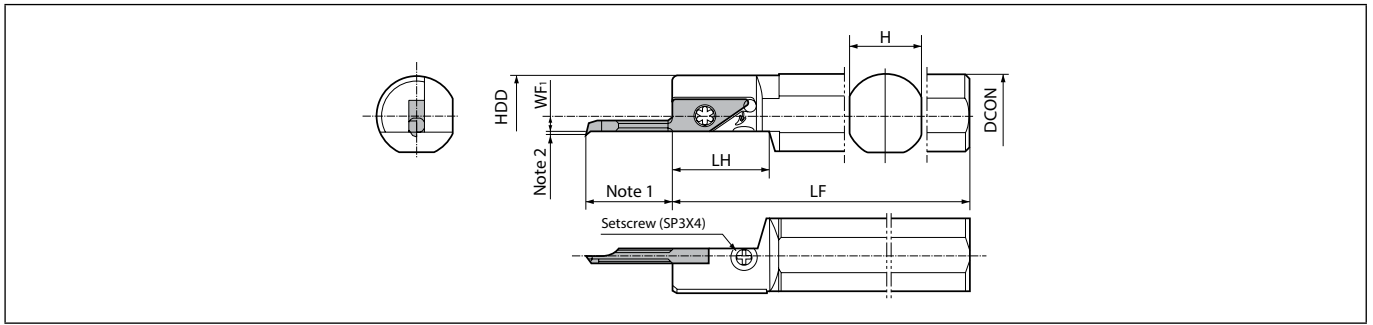
Solid

Positive

KAV

Negative

S-SVN-SN (Round shank / Straight / without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
Note 1 & Note 2 (WF₂) : For insert dimensions, see page (F44~F47)

Toolholder dimensions

Description	Availability	Dimension (mm)						Spare parts			Applicable inserts ● F44~F47 G72, G73 G104 J44
								Screw	Set screw	Wrench	
		R	DCON	H	LH	HDD	LF	WF ₁			
S19H- SVNR12SN	●	19.05	17	23	18.5	100	4				VNBR...-..., VNBTR...-... VNGR...-..., VNFRG...-... VNTR...-...
S20H- SVNR12SN	●	20	18		19.5						
S22K- SVNR12SN	●	22	20		21.5	125					
S25.0G- SVNR12SN	●	25	23		24.5	90					

Spare parts (Optional)

Screw (Side stopper)	Wrench
HS3X4	LW-1.5

S-SVN-SN (without side stopper) retains high index accuracy by easy restraint.

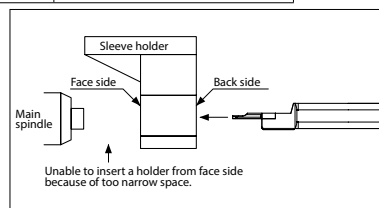
S-SVN-SN (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

Selection of system tip-bars

Gang-Type (Horizontal)	Gang-Type	Gang-Type Front loading sleeve type	Gang-Type Back loading sleeve type
Square shank (Straight)	Square shank (L-shape)	Square shank	Square shank
Round shank (Standard)		Round shank (Standard)	Round shank (Standard)
Round shank (Straight)		Round shank (Straight)	Round shank (Straight)

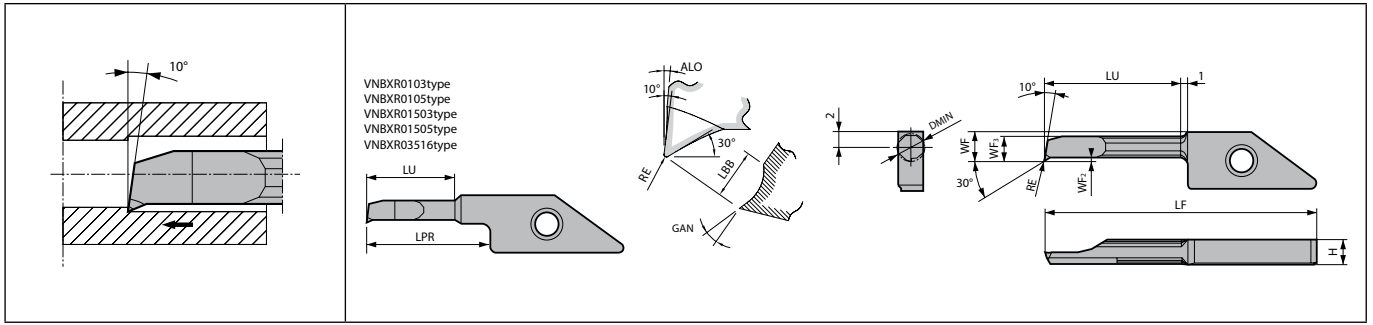
Q: There are standard types (head dia. is larger than shank) and straight types for round shanks. What is each one used for?

A: The straight type is used when it cannot be inserted from the face side of the sleeve holder and can be inserted only from the back side due to space limitation (Refer to fig. on the right). On the other hand, the standard type should be installed when it can be inserted from the face side, and the head end is used for positioning as stopper.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

VNBX-S (Boring)



Right-hand shown

F

Dimensions

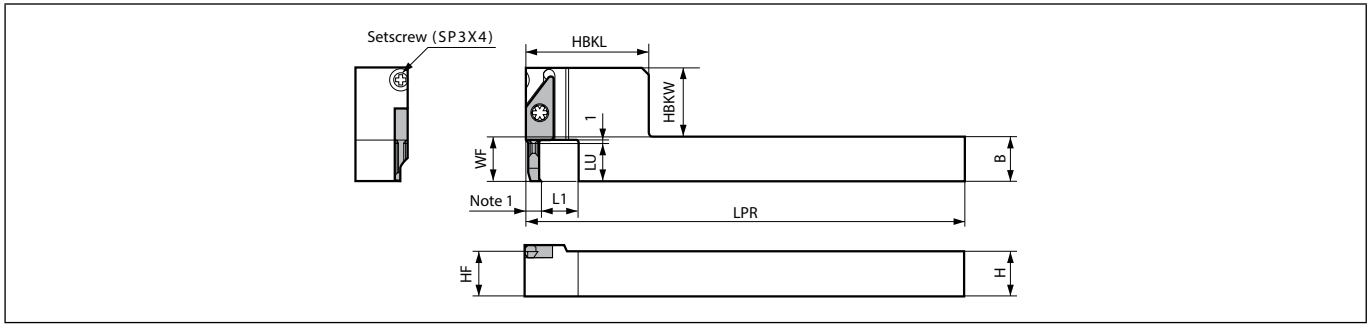
Description	No. of edges	Dimension (mm)											Angle (°)		Tolerance (mm)		Carbide		Applicable toolholder F53~F55
		DMIN	H	LPR	LBB	LF	LU	WF	WF ₂	WF ₃	RE	ALO	GAN	RE min.	RE max.	PVD	PR930		
VNBXR 0103-005S	1	1	3.9	7	0.7	26.5	3	2.95	0.2	0.85	0.05	7	15	-0.02	0	●		S...-SVNR12XN S...-SVNR12SXN	
VNBXR 0105-005S	1	1	3.9	7	0.7	26.5	5	2.95	0.2	0.85	0.05	7	15	-0.02	0	●		S...-SVNR12XN S...-SVNR12SXN	
VNBXR 01503-005S 01503-01S 01505-005S 01505-01S	1	1.5	3.9	7	0.7	26.5	3 3 5 5	2.95	0.2	1.3	0.05 0.1 0.05 0.1	7	15	-0.02 -0.03 -0.02 -0.03	0	● ● ● ●		S...-SVNR12XN S...-SVNR12SXN	
VNBXR 0206-005S 0206-01S	1	2	3.9	-	0.8	26.5	6	3	0.25	1.8	0.05 0.1	8	18	-0.02 -0.03	0	● ●		SVNSR...-12-06XN S...-SVNR12XN S...-SVNR12SXN	
VNBXR 0311-005S 0311-01S	1	3	3.9	-	0.8	30.8	11	3.5	0.4	2.6	0.05 0.1	8	18	-0.02 -0.03	0	● ●		SVNSR...-12-11XN S...-SVNR12XN S...-SVNR12SXN	
VNBXR 03511-005S 03511-01S 03516-005S 03516-01S	1	3.5	3.9	- - 21 21	0.8	30.8 30.8 39.8 39.8	11 11 16 16	3.75	0.45	3.1	0.05 0.1 0.05 0.1	8	18	-0.02 -0.03 -0.02 -0.03	0	● ● ● ●		SVNSR...-12-11XN, S...-SVNR12XN S...-SVNR12SXN S...-SVNR12XN S...-SVNR12SXN	
VNBXR 0411-005S 0411-01S 0411-02S	1	4	3.66	-	0.8	30.8	11	4	0.5	3.5	0.05 0.1 0.2	8	18	-0.02 -0.03 -0.04	0	● ● ●		SVNSR...-12-11XN S...-SVNR12XN S...-SVNR12SXN	
VNBXR 0420-005S 0420-01S 0420-02S	1	4	3.66	-	0.8	39.8	20	4	0.5	3.5	0.05 0.1 0.2	8	18	-0.02 -0.03 -0.04	0	● ● ●		SVNSR...-12-20XN S...-SVNR12XN S...-SVNR12SXN	

Recommended cutting conditions F55

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

System tip-bars are sold in 5 piece boxes

SVNS-XN (without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
 Note 1 : The dimension of Note 1 is same size as the applicable insert (VNBX) WF dimension.

Toolholder dimensions

Description	Availability	Dimension (mm)										Spare parts			Applicable inserts F52
		R	H	B	LPR	L1	HF	HBKW	HBKWL	LU	WF	Screw	Set screw	Wrench	
SVNSR 1010K-12-06XN 1212M-12-06XN 1616M-12-06XN	●	10	10	125	10	10	19	45	6	12	10	SB-3080TR	SP3X4	LTW-10S	VNBXR0206-...
●	12	12	150	12		17	12								
●	16	16	150	16	16	13	16	16							
SVNSR 1010K-12-11XN 1212M-12-11XN 1616M-12-11XN	●	10	10	125	10	10	23	45	11	12	10	SB-3080TR	SP3X4	LTW-10S	VNBXR...11-...
●	12	12	150	12		21	12								
●	16	16	150	16	16	17	16	16							
SVNSR 1212M-12-20XN 1616M-12-20XN	●	12	12	150	10	12	30	45	20	12	10	SB-3080TR	SP3X4	LTW-10S	VNBXR0420-...
●	16	16	150	16	16	26	16								

All VNBXR system Tip-Bars Inserts are used with a SVNS-XN Toolholder. However, when setting the cutting edge at the face level of the toolholder as shown in figure, use the applicable inserts described above.

SVNS-XN (without side stopper) retains high index accuracy by easy restraint.

SVNS-XN (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

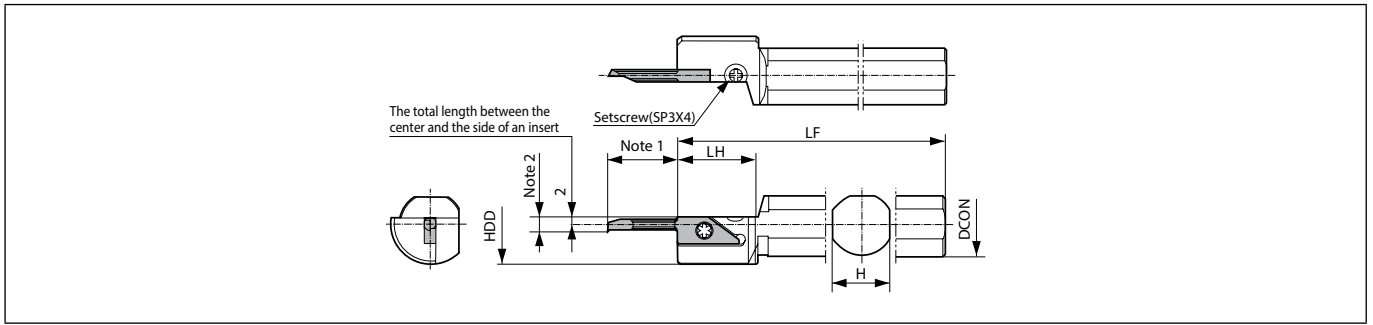
Spare parts (Optional)

Screw (Side stopper)	Wrench
HS3X4	LW-1.5

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



S-SVN-XN (Round shank / Standard / without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Note 1 : The dimension of Note 1 shows the applicable insert (VNBX) LU +1 mm.

Note 2 : The dimension of Note 2 is same size as the applicable insert (VNBX) WF dimension.

F

Toolholder dimensions

Description	Availability	Dimension (mm)						Spare parts			Applicable inserts F52
		R	DCON	H	LH	HDD	LF	Screw	Set screw	Wrench	
S12F- SVNR12XN	●	12	11	23	20	80	SB-3080TR	SP3X4	FT-10	VNBXR...	
S14G- SVNR12XN	●	14	13			90					
S16H- SVNR12XN	●	16	15	100							
S19H- SVNR12XN	●	19.05	17	24	160						
S19N- SVNR12XN	●				100						
S20H- SVNR12XN	●	20	18	24	30	180					
S25H- SVNR12XN	●	25.4	23			100					
S25Q- SVNR12XN	●			180							

S-SVN-XN (without side stopper) retains high index accuracy by easy restraint.

S-SVN-XN (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

Spare parts (Optional)

Screw (Side stopper)	Wrench
HS3X4	LW-1.5

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Boring

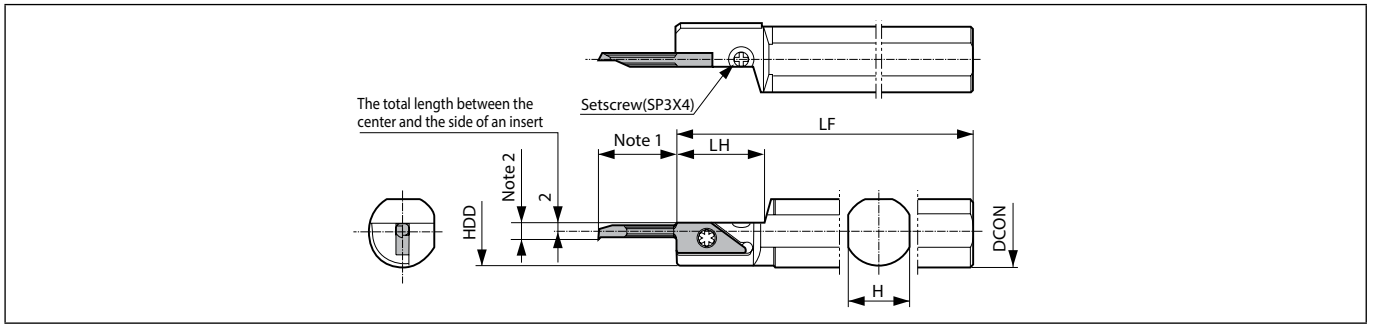
Solid

Positive

KAV

Negative

S-SVN-SXN (Round shank / Straight / without side stopper)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
 Note 1 : The dimension of Note 1 shows the applicable insert (VNBX) LU +1 mm.
 Note 2 : The dimension of Note 2 is same size as the applicable insert (VNBX) WF dimension.

Toolholder dimensions

Description	Availability	Dimension (mm)					Spare parts			Applicable inserts ● F52	
		R	DCON	H	LH	HDD	LF	Screw	Set screw		Wrench
S19H- SVNR12SXN	●	19.05	17	23	18.5	100	SB-3080TR	SP3X4	FT-10	VNBXR...	
S20H- SVNR12SXN	●	20	18		19.5						
S22K- SVNR12SXN	●	22	20	21.5	125						
S25.0G- SVNR12SXN	●	25	23	24.5	90						

S-SVN-SXN (without side stopper) retains high index accuracy by easy restraint.
 S-SVN-SXN (without side stopper) has a setscrew SP3X4. Changing the setscrew SP3X4 to a screw HS3X4 (sold separately) enables the toolholder to be used as a binding effect toolholder similar to the side stopper toolholder.

Spare parts (Optional)

Screw (Side stopper)	Wrench
HS3X4	LW-1.5

Recommended cutting conditions (VNBX-S)

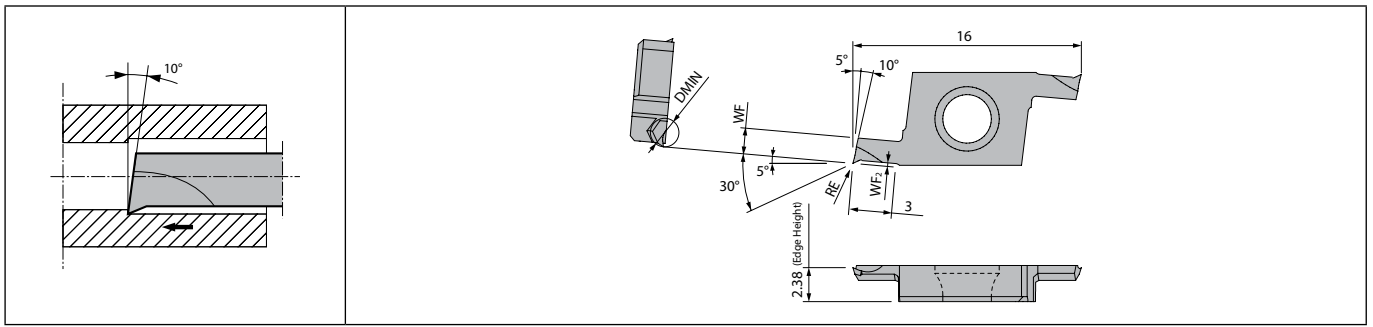
Workpiece material	Insert grades (Vc: m/min) PVD coated carbide PR930	VNBX01-S type VNBX015-S type		VNBX02-S type VNBX04-S type		Remarks
		ap (mm), f (mm/rev)				
		ap	f	ap	f	
		Carbon steel / Alloy steel	★ 30~100	~0.1	~0.01		~0.2	~0.03	Coolant
Stainless steel	★ 30~80	~0.1	~0.01	~0.2	~0.02	

★ 1st recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



TWB (Micro boring, Horizontal type)



Right-hand shown

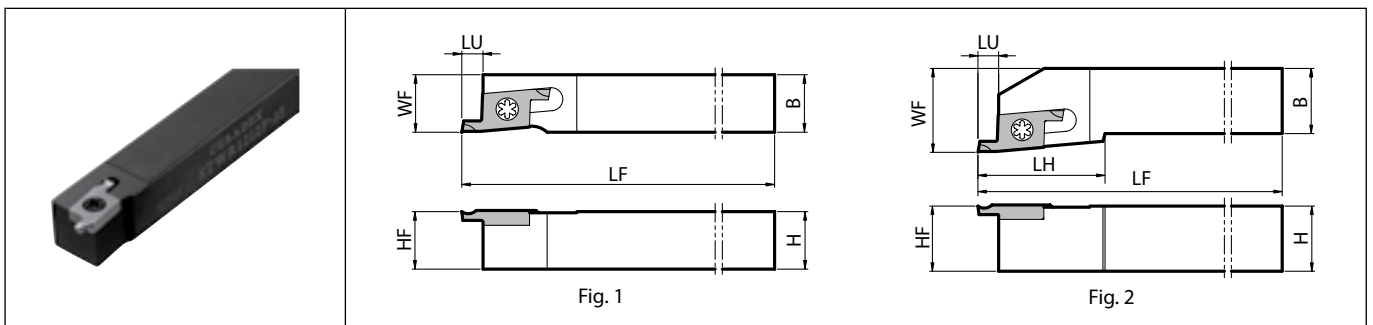
F

Dimensions

Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide		Applicable toolholder F56, F57
		DMIN	WF	WF ₂	RE	RE min.	RE max.	PVD		
								PR1025	PR1535	
TWBR 01003-005	2	1	0.85	0.2	0.05	-0.02	0	●	●	STWR...-15 S.-STWR15
TWBR 01503-005 01503-010	2	1.5	1.3	0.2	0.05 0.1	-0.02 -0.03	0	●	●	
TWBR 02003-005 02003-010	2	2	1.75	0.25	0.05 0.1	-0.02 -0.03	0	●	●	
TWBR 02503-005 02503-010	2	2.5	2.1	0.3	0.05 0.1	-0.02 -0.03	0	●	●	
TWBR 03003-005 03003-010	2	3	2.4	0.4	0.05 0.1	-0.02 -0.03	0	●	●	

Recommended cutting conditions F59

STW (Micro boring, Square shank for horizontal type insert)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
(For Left-hand toolholders for grooving, please see page G106.)

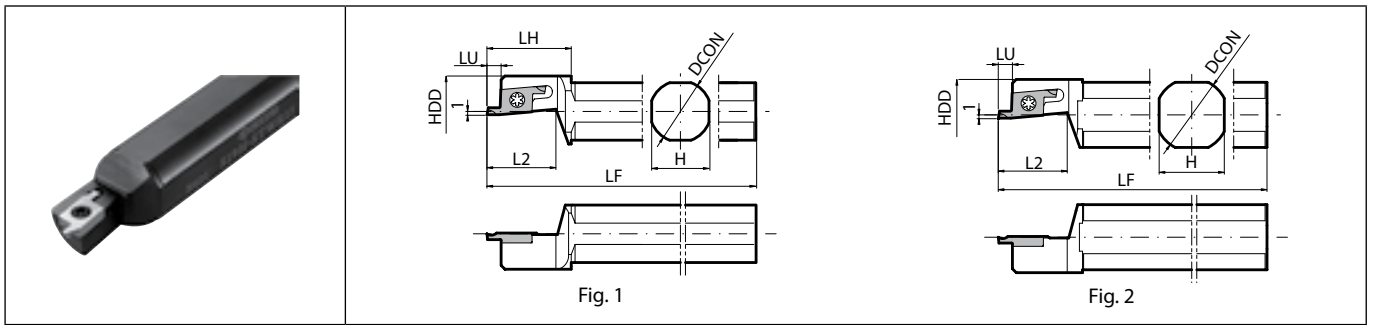
Toolholder dimensions

Description	Availability	Dimension (mm)							Coolant hole	Fig.	Spare parts		Applicable inserts F56	
		R	H	B	LH	HF	LF	LU			WF	Screw		Wrench
STWR 1212F-15	●	12	12	-	12	85	12	No	1	SB-3080TR	LTW-10S	TWBR...		
1212K-15	●	16	16	-	16	125	3	16	1					
1616K-15	●	20	20	-	20	150	3	25	2					
2020K-15	●	25	25	25	25	150	3	32	2					
2525M-15	●	25	25	25	25	150	3	32	2					

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Twin-bars are sold in 5 piece boxes

S-STW (Micro boring, Round shank for horizontal type insert)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.
(For Left-hand toolholders for grooving, please see page G107.)

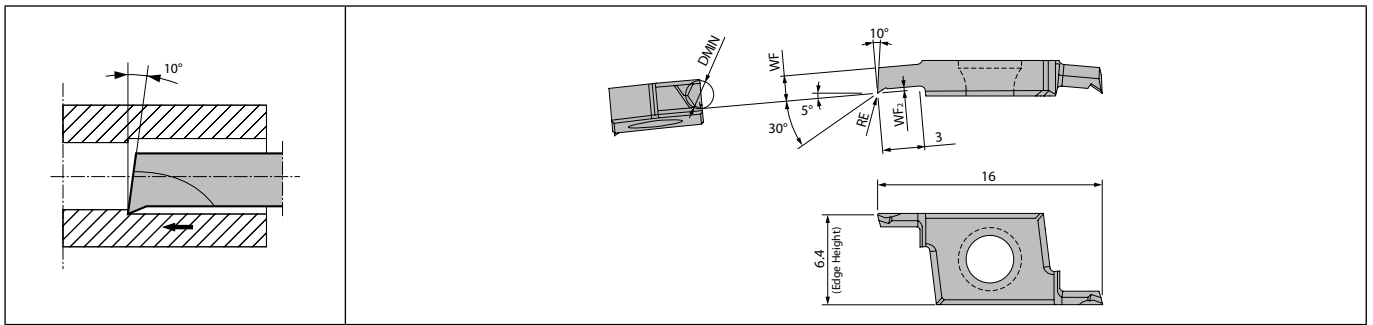
Toolholder dimensions

Description	Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts		Applicable inserts ● F56
		R	DCON	H	LH	HDD	L2	LF	LU			Screw	Wrench	
														
S12F- STWR15	●	12	11	22	20	18	80	3	No	1	SB-3080TR	LTW-10S	TWBR...	
S14H- STWR15	●	14	13											100	1
S15F- STWR15	●	15.875	15	85	1									
S16F- STWR15	●	16	18	90	2									
S19G- STWR15	●	19.05	17	18.5	2									
S19K- STWR15	●	20	18	19.5	2									
S20G- STWR15	●	20	18	19.5	2									
S20K- STWR15	●	20	18	19.5	2									
S22K- STWR15	●	22	20	21.5	22	125	2							
S25.0J- STWR15	●	25	23	24.5	22	110	2							
S25K- STWR15	●	25.4	23	25	22	120	2							



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

TWBT (Micro boring, Vertical type)



Right-hand shown

F

Dimensions

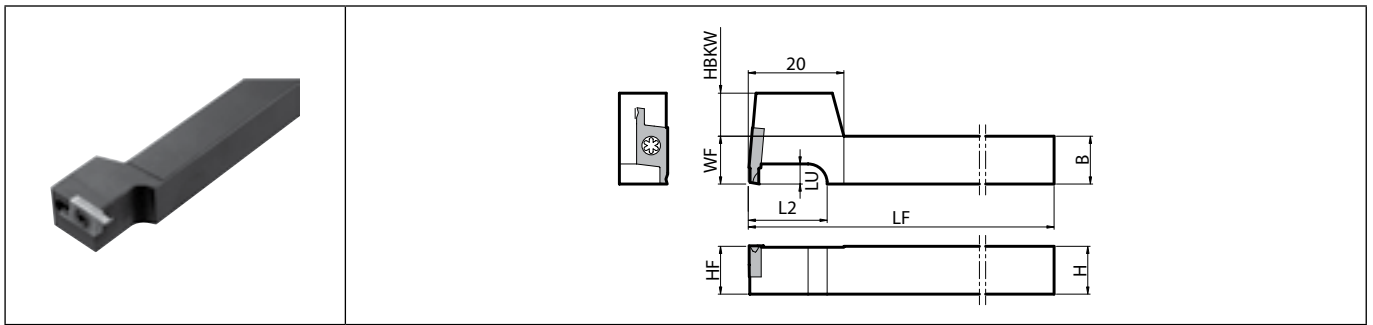
Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide		Applicable toolholder F59
		DMIN	WF	WF ₂	RE	RE min.	RE max.	PVD		
								PR1025	PR1535	
TWBTR 01003-005	2	1	0.85	0.2	0.05	-0.02	0	●	●	STWSR...-15T
TWBTR 01503-005 01503-010	2	1.5	1.3	0.2	0.05 0.1	-0.02 -0.03	0	● ●	● ●	
TWBTR 02003-005 02003-010	2	2	1.75	0.25	0.05 0.1	-0.02 -0.03	0	●	●	
TWBTR 02503-005 02503-010	2	2.5	2.1	0.3	0.05 0.1	-0.02 -0.03	0	● ●	● ●	
TWBTR 03003-005 03003-010	2	3	2.3	0.4	0.05 0.1	-0.02 -0.03	0	● ●	● ●	

Recommended cutting conditions F59

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Twin-bars are sold in 5 piece boxes

STWS (Micro boring, Square shank for vertical type insert)



Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)									Spare parts		Applicable inserts ➔ F58
		R	H	B	L2	HF	HBKW	LF	LU	WF	Screw	Wrench	
STWSR	1010F-15T	●	10	10	16	10	9	85	3	10	SB-3080TR	LTW-10S	TWBTR...
	1010JX-15T	●						120					
	1212F-15T	●	12	12	12	7	85	12					
	1212JX-15T	●					120						
	1616JX-15T	●	16	16	20	16	3	120	16				



Recommended cutting conditions (TWB / TWBT)

Workpiece material	Insert grades Vc: m/min		TWBR01003 TWBR01503 TWBTR01003 TWBTR01503		TWBR02003 TWBR02503 TWBR03003 TWBTR02003 TWBTR02503 TWBTR03003		Remarks
	MEGACOAT NANO	PVD coated carbide	ap (mm), f (mm/rev)				
	PR1535	PR1025	ap	f	ap	f	
	Carbon steel / Alloy steel	★ 30~100	☆ 30~100	~0.1	~0.01	~0.2		~0.03	Coolant
Stainless steel	★ 30~80	☆ 30~80	~0.1	~0.01	~0.2	~0.02	

★ 1st recommendation ☆ 2nd recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A/S-SCLC-AE Excellent bar (Boring / Internal facing)

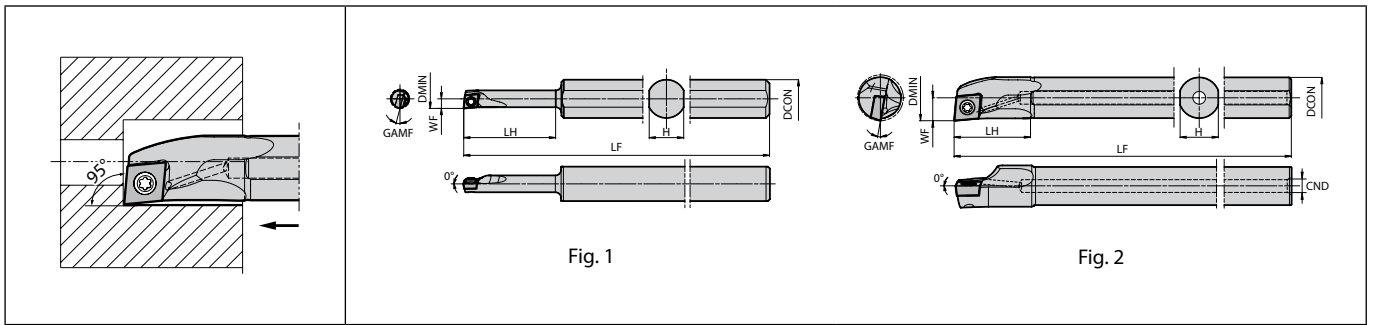


Fig. 1

Fig. 2

Max. Overhang Length L/D≈5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

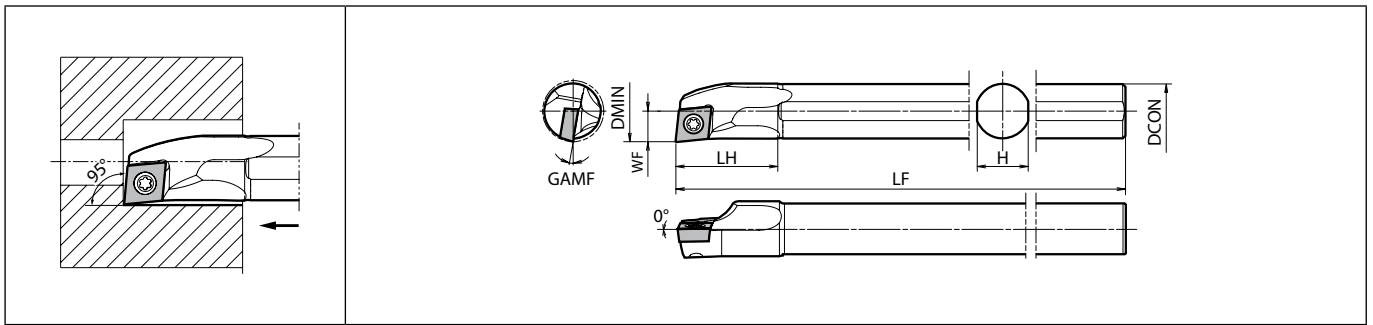
Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts		
			R	L	DMIN	DCON	CND	H	LH	LF					WF	Screw	Wrench		Wrench	
S10H- SCLC%03-05AE	●	●	5																CC□T0301... CC□W0301...	
S10H- SCLC%03-06AE	●	●	6	10	-	9	24	100	2.5	15	0.2	No	1	SB-1635TR	-	FT-6				
S10H- SCLC%04-07AE	●	●	7																CC□T0401... CC□W0401...	
S10H- SCLC%04-08AE	●	●	8	10	-	9	32	100	3.5	13	0.2	No	1	SB-2035TR	-	FT-6				
A08X- SCLC%06-10AE	●	●	10	8	2.5	7	16	120	5	14										
A10L- SCLC%06-12AE	●	●	12	10	3	9	20	140	6	12	0.4	Yes	2	SB-2545TR	-	FT-8			CC□T0602... CC□W0602...	
A12M- SCLC%06-14AE	●	●	14	12	4	11	24	150	7	10										
A16Q- SCLC%09-18AE	●	●	18	16			15	30	180	9	10									
A20R- SCLC%09-22AE	●	●	22	20	5		19	36	200	11	8	0.4	Yes	2	SB-4065TR	FT-15	-			CC□T09T3... CC□W09T3...
A25S- SCLC%09-27AE	●	●	27	25			24	46	250	13.5	6									

When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.




● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SCLC-A Steel shank bar (Boring / Internal facing)



Max. Overhang Length $L/D \approx 4$ | Right-hand shown
 Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

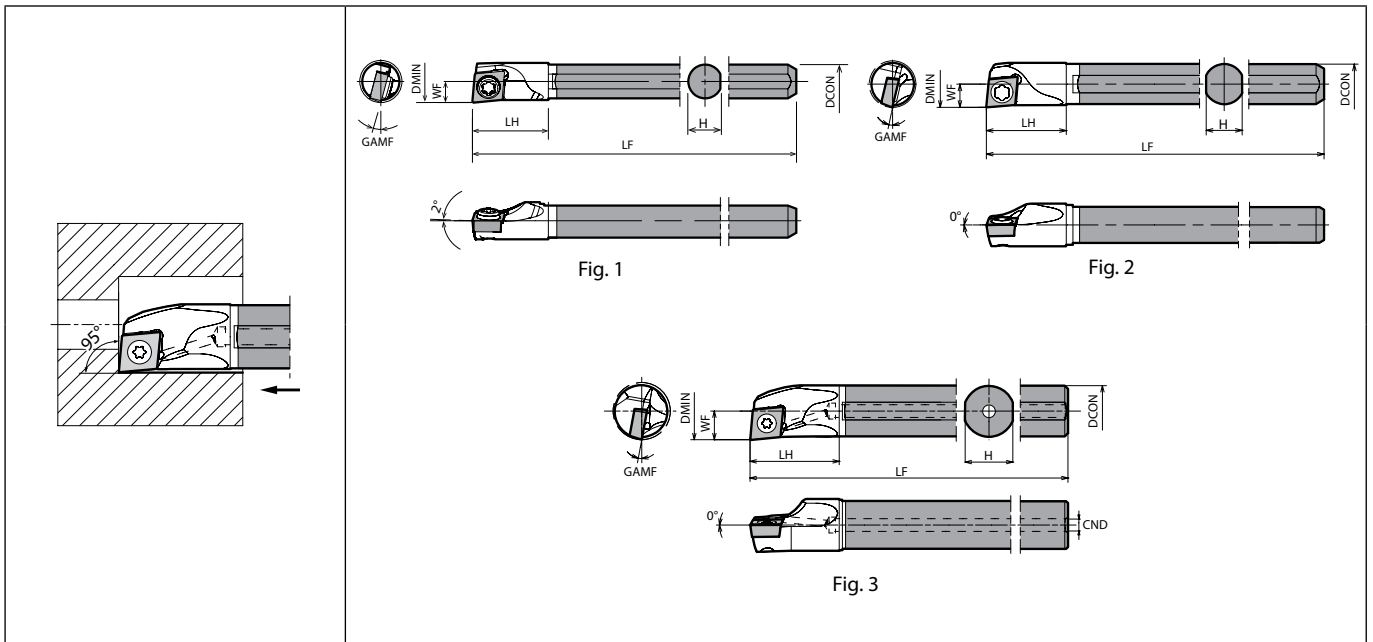
Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
													Screw	Wrench	Wrench	
	R	L	DMIN	DCON	H	LH	LF	WF								
S08X- SCLC%L06-10A	●	●	10	8	7	16	120	5	14	0.4	No	SB-2545TR	-	FT-8	CC...T0602... CC...W0602...	
S10L- SCLC%L06-12A	●	●	12	10	9	20	140	6	12							
S12M- SCLC%L06-14A	●	●	14	12	11	24	150	7	10							
S16Q- SCLC%L09-18A	●	●	18	16	15	30	180	9	10	0.4	No	SB-4065TR	FT-15	-	CC...T09T3... CC...W09T3...	
S20R- SCLC%L09-22A	●	●	22	20	19	36	200	11	8							
S25S- SCLC%L09-27A	●	●	27	25	24	46	250	13.5	6							

When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C/E-SCLC-A(N) Carbide shank bar (Boring / Internal facing)



Max. Overhang Length L/D≈~7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF					Screw	Wrench	Wrench	
C04G- SCLC%03-05AN	●	●	5	4	-	3.8	7	90	2.5	15	0.2	No	1	SB-1635TR	-	FT-6	CC□T0301... CC□W0301...
C05H- SCLC%03-06AN	●	●	6	5	-	4.4	9	100	3	13	0.2	No	2	SB-1635TR	-	FT-6	CC□T0301... CC□W0301...
C06J- SCLC%04-07AN	●	●	7	6	-	5.4	10	110	3.5	13	0.2	No	2	SB-2035TR	-	FT-6	CC□T0401... CC□W0401...
C07K- SCLC%04-08AN	●	●	8	7	-	6.4	11	125	4	11	0.2	No	2	SB-2035TR	-	FT-6	CC□T0401... CC□W0401...
E08L- SCLC%06-10AN	●	●	10	8	3	7	14	140	5	14	0.4	Yes	3	SB-2545TR	-	FT-8	CC□T0602... CC□W0602...
SCLCR06-10AN2/3	●	●				9	18	160	6	12								105
E10N- SCLC%06-12AN	●	●	12	10		9	18	160	6	12							
SCLCR06-12AN2/3	●	●					105										
E12Q- SCLC%06-14A	●	●	14	12	4	11	23	180	7	10							
SCLCR06-14A-2/3	●	●						120									
E16X- SCLC%09-18A	●	●	18	16				4	15	28							
SCLCR09-18A-2/3	●	●					145										
E20S- SCLC%09-22A	●	●	22	20	6	19	32	250	11	8	0.4	Yes	3	SB-4065TR	FT-15	-	CC□T09T3... CC□W09T3...
SCLCR09-22A-2/3	●	●						165									
E25T- SCLC%09-27A	●	●	27	25				24	38	300								13.5	6
SCLCR09-27A-2/3	●	●					200										

When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

F

Boring

Solid

Positive



KAV

Negative

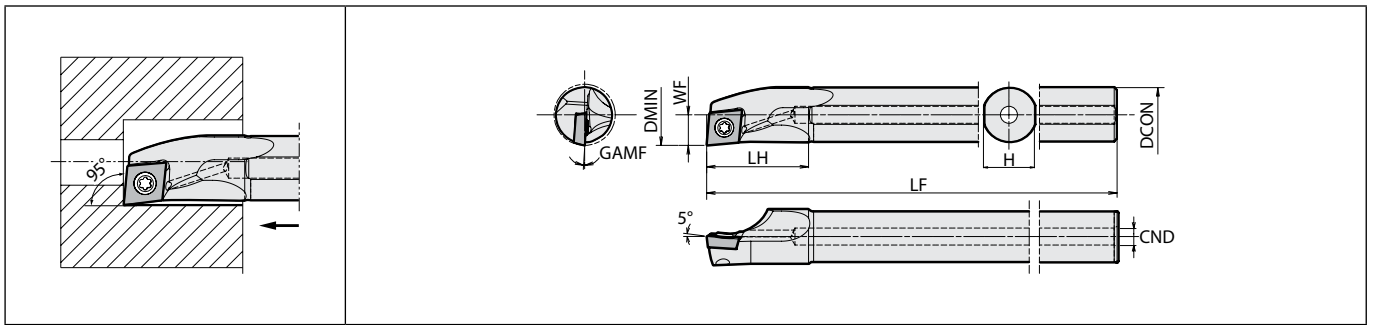
Applicable inserts (A/S-SCLC-AE / S-SCLC-A / C/E-SCLC-A(N))

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing
Insert								
Chipbreaker type	CF	PF	GF	SKS	SK	CK	GQ	WP
Page	B58	B58	B58	B59	B59	B59	B59	B60
Applications	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing	Finishing
Insert								
Chipbreaker type	PP	GK	HQ	STD	MF	³ / ₄ -F	³ / ₄ -FSF	³ / ₄ -P
Page	B60	B60	B60	B60	B61	B62	B61	B63
Applications	Low feed	Low feed	Low feed	Stainless steel / Heat-resistant alloys	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	³ / ₄ -U	³ / ₄ -USF	³ / ₄ -J	MQ	No CB	AP	³ / ₄ -A3	AH
Page	B63~B65	B63	B65	B61	B66	B66	B66	B66
Applications	Non-Ferrous metals	Non-Ferrous metals	Hard materials					
Insert								
Chipbreaker type	PCD	APD	CBN					
Page	C39	C40	C20					



Recommended cutting conditions  F158, F159
 Applicable sleeves  F154~F157

A-SCLP-AE Excellent bar (Boring / Internal facing)



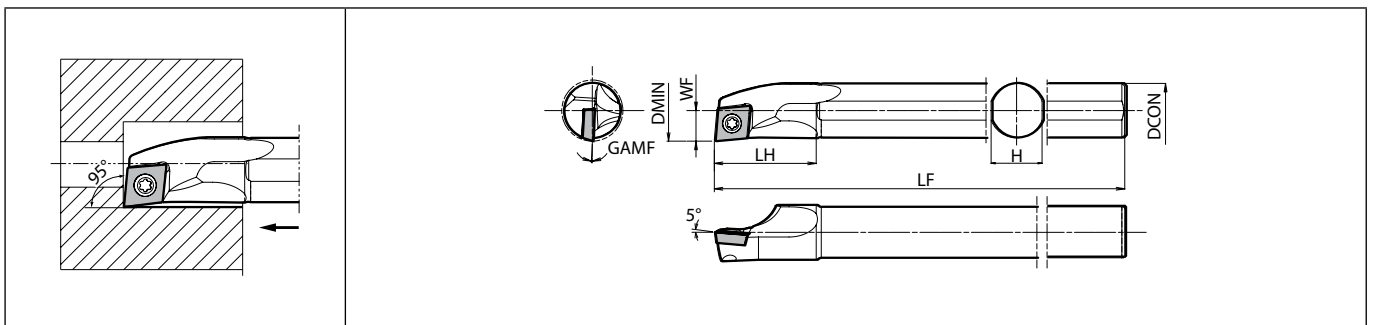
Max. Overhang Length L/D≈5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF				Screw	Wrench	Wrench	
A10L- SCLP%\.08-12AE	●	●	12	10	3	9	20	140	6	5	0.4	Yes	SB-3060TR	-	FT-10	CP□B0802... CP□H0802... CP□T0802...
A12M- SCLP%\.08-14AE	●	●	14	12	4	11	24	150	7	4	0.4	Yes	SB-4065TR	FT-15	-	CP□B0903... CP□H0903... CP□T0903...
A12M- SCLP%\.09-16AE	●	●	16	12	4	11	24	150	8	4						
A16Q- SCLP%\.09-18AE	●	●	18	16	5	15	30	180	9	3.5						
A20R- SCLP%\.09-22AE	●	●	22	20		19	36	200	11	2						
A25S- SCLP%\.09-27AE	●	●	27	25		24	46	250	13.5	0						

S-SCLP-A Steel shank bar (Boring / Internal facing)



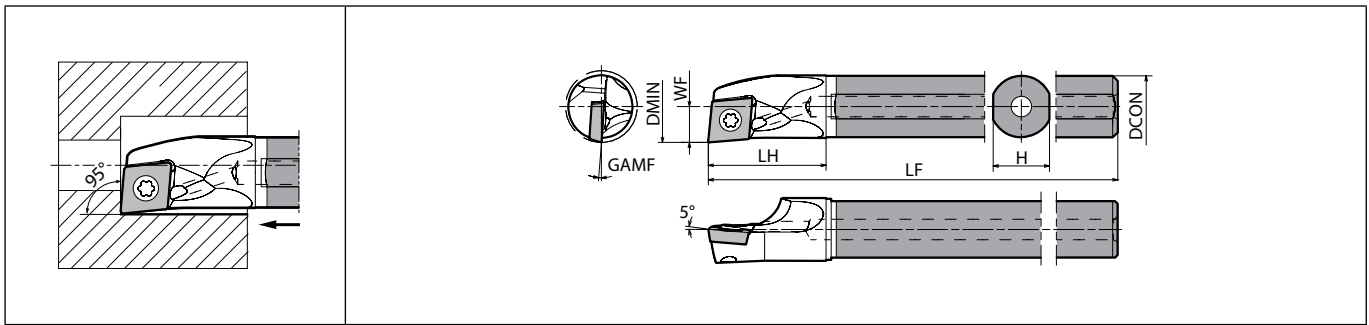
Max. Overhang Length L/D≈4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	Screw				Wrench	Wrench		
S10L- SCLP%\.08-12A	●	●	12	10	9	20	140	6	5	0.4	No	SB-3060TR	-	FT-10	CP□B0802... CP□H0802... CP□T0802...	
S12M- SCLP%\.08-14A	●	●	14	12	11	24	150	7	4	0.4	No	SB-4065TR	FT-15	-	CP□B0903... CP□H0903... CP□T0903...	
S12M- SCLP%\.09-16A	●	●	16	12	11	24	150	8	4							
S16Q- SCLP%\.09-18A	●	●	18	16	15	30	180	9	3.5							
S20R- SCLP%\.09-22A	●	●	22	20	19	36	200	11	2							
S25S- SCLP%\.09-27A	●	●	27	25	24	46	250	13.5	0							

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E-SCLP-A(N) Carbide shank bar (Boring / Internal facing)



Max. Overhang Length L/D≈7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner R(RE)	Coolant hole	Spare parts			Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF				Screw	Wrench	Wrench	
E10N- SCLP $\frac{1}{2}$ -08-12AN SCLPR08-12AN2/3 SCLPR08-12AN1/2	●	●	12	10	3	9	18	160	6	5	0.4	Yes	SB-3060TR	-	FT-10	CP□B0802... CP□H0802... CP□T0802...
	●							105								
	●							80								
E12Q- SCLP $\frac{1}{2}$ -08-14A SCLPR08-14A-2/3 SCLPR08-14A-1/2	●	●	14	12	4	11	23	180	7	4	0.4	Yes	SB-3060TR	-	FT-10	CP□B0802... CP□H0802... CP□T0802...
	●							120								
	●							90								
E12Q- SCLP $\frac{1}{2}$ -09-16A SCLPR09-16A-2/3 SCLPR09-16A-1/2	●	●	16	12	4	11	23	180	8	5	0.4	Yes	SB-4065TR	FT-15	-	CP□B0903... CP□H0903... CP□T0903...
	●							120								
	●							90								
E16X- SCLP $\frac{1}{2}$ -09-18A SCLPR09-18A-2/3 SCLPR09-18A-1/2	●	●	18	16	4	15	28	220	9	3.5	0.4	Yes	SB-4065TR	FT-15	-	CP□B0903... CP□H0903... CP□T0903...
	●							145								
	●							110								
E20S- SCLP $\frac{1}{2}$ -09-22A SCLPR09-22A-2/3 SCLPR09-22A-1/2	●	●	22	20	6	19	32	250	11	2	0.4	Yes	SB-4065TR	FT-15	-	CP□B0903... CP□H0903... CP□T0903...
	●							165								
	●							125								
E25T- SCLP $\frac{1}{2}$ -09-27A SCLPR09-27A-2/3	●	●	27	25	6	24	38	300	13.5	0	0.4	Yes	SB-4065TR	FT-15	-	CP□B0903... CP□H0903... CP□T0903...
	●							200								
	●															

Applicable inserts (A-SCLP-AE / S-SCLP-A / E-SCLP-A(N))

Applications	Finishing	Finishing	Finishing - Medium	Medium	Low carbon steel	Low carbon steel	Finishing - Medium	Cast iron
Insert								
Chipbreaker type	PP	GP	HQ	STD	XP	XQ	Y/-Y	No CB
Page	B67	B67	B67	B67	B67	B67	B67	B67
Applications	Non-Ferrous metals		Hard materials					
Insert								
Chipbreaker type	PCD	CBN						
Page	C41	C21						

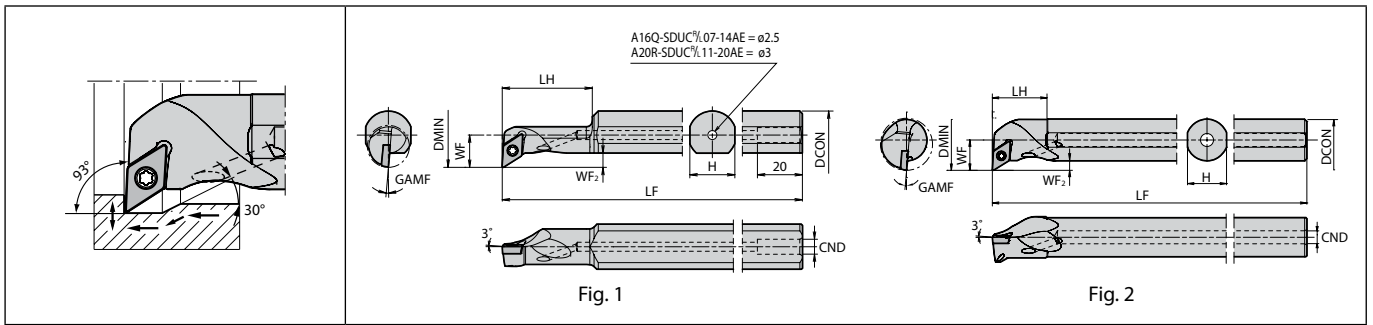
Recommended cutting conditions [F159](#)

Applicable sleeves [F155~F157](#)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



A-SDUC-AE Excellent bar (Internal copying)



Max. Overhang Length L/D≈5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)									GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF	WF2	Screw					Wrench	Wrench		
A10L- SDUC%.07-14AE	●	●	14	10	3	9	19	140	8.7	3.3	5	0.4	Yes	2	SB-2560TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...	
A12M- SDUC%.07-16AE	●	●	16	12	4	11	21	150	9.7										
A16Q- SDUC%.07-14AE	●	●	14	16	5	15	28	180	10.8	4.4									
A16Q- SDUC%.07-20AE	●	●	20			21	180	11.7	3.3										
A16Q- SDUC%.11-23AE	●	●	23	16	5	15	21	180	14.5	6.1	5	0.4	Yes	2	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...	
A20R- SDUC%.11-20AE	●	●	20	20		19	48	200	15.6										
A20R- SDUC%.11-27AE	●	●	27			23	200	16.5											
A25S- SDUC%.11-32AE	●	●	32	25		24	24	250	19					2					

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.

Boring

Solid

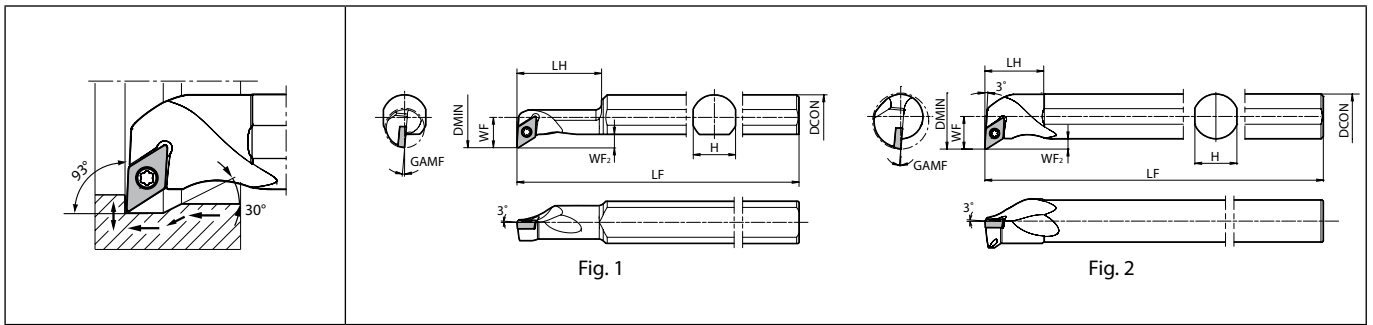
Positive

KAV

Negative




● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SDUC-A Steel shank bar (Internal copying)



Max. Overhang Length $L/D \approx 4$ | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

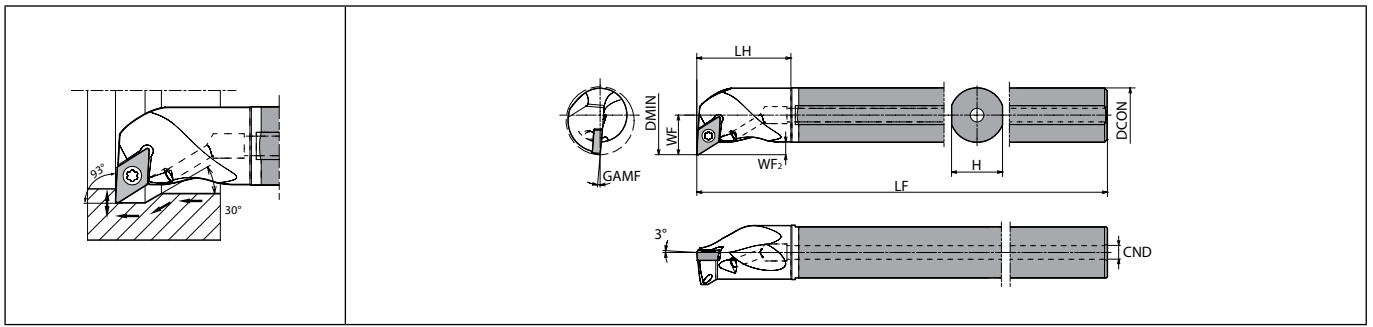
Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
	R	L	DMIN	DCON	H	LH	LF	WF	WF2									
S10L- SDUC ^{CP} .07-14A	●	●	14	10	9	19	140	8.7	3.3	5	0.4	No	2	SB-2560TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...	
S12M- SDUC ^{CP} .07-16A	●	●	16	12	11	21	150	9.7	2									
S16Q- SDUC ^{CP} .07-14A	●	●	14	16	15	28	180	10.8	4.4									1
S16Q- SDUC ^{CP} .07-20A	●	●	20		21	180	11.7	3.3	2									
S16Q- SDUC ^{CP} .11-23A	●	●	23	16	15	21	180	14.5	6.1	5	0.4	No	2	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...	
S20R- SDUC ^{CP} .11-20A	●	●	20	20	19	48	200	15.6										1
S20R- SDUC ^{CP} .11-27A	●	●	27		23	200	16.5	2										
S25S- SDUC ^{CP} .11-32A	●	●	32	25	24	24	250	19	2									

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.



E-SDUC-A Carbide shank bar (Internal copying)



Max. Overhang Length $L/D \approx 7$ | Right-hand shown
 Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)									GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts		
	R	L	DMIN	DCON	CND	H	LH	LF	WF	WF2	Screw				Wrench	Wrench				
E10N- SDUC ^{CP} 07-14A SDUCR07-14A-2/3	●	●	14	10	3	9	20	160 105	8.7											
E12Q- SDUC ^{CP} 07-16A SDUCR07-16A-2/3	●	●	16	12	4	11	23	180 120	9.7	3.3	5	0.4	Yes	SB-2560TR	-	FT-8			DC□T0702... DC□W0702... DC□X0702...	
E16X- SDUC ^{CP} 07-20A SDUCR07-20A-2/3	●	●	20	16		15	28	220 145	11.7											
E16X- SDUC ^{CP} 11-23A SDUCR11-23A-2/3	●	●	23	16	4	15	28	220 145	14.5											DC□T11T3... DC□W11T3... DC□X11T3...
E20S- SDUC ^{CP} 11-27A SDUCR11-27A-2/3	●	●	27	20	6	19	32	250 165	16.5	6.1	5	0.4	Yes	SB-4065TR	FT-15	-				
E25T- SDUC ^{CP} 11-32A SDUCR11-32A-2/3	●	●	32	25		24	38	300 200	19											

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

Solid


Positive


KAV

Negative

Applicable inserts (A-SDUC-AE / S-SDUC-A / E-SDUC-A)

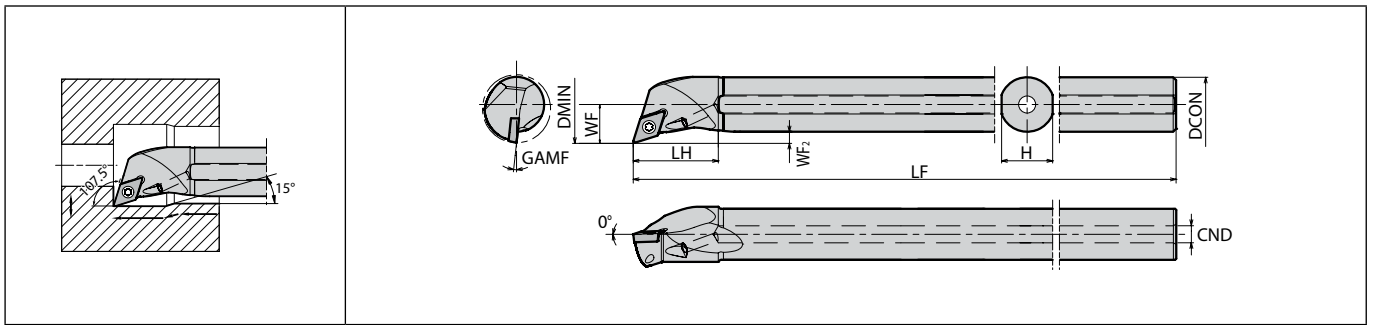
Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	WP	5/L-WP
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	PP	GP	GK	HQ	STD	MF	5/L-F	5/L-FSF
Page	B69	B69	B70	B70	B70	B70	B72, B73	B72
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	5/L-U	5/L-USF	5/L-J	5/L-JSF	XP	XQ	MQ	No CB
Page	B74~B76	B74	B77	B76	B71	B71	B71	B78
Applications	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	5/L-A3	AH	PCD	APD	CBN		
Page	B78	B78	B78	C42	C42	C22		

Recommended cutting conditions  F159

Applicable sleeves  F155~F157






A-SDQC-AE Excellent bar (Internal copying)



Max. Overhang Length L/D≈~5.5 | Right-hand shown
 Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

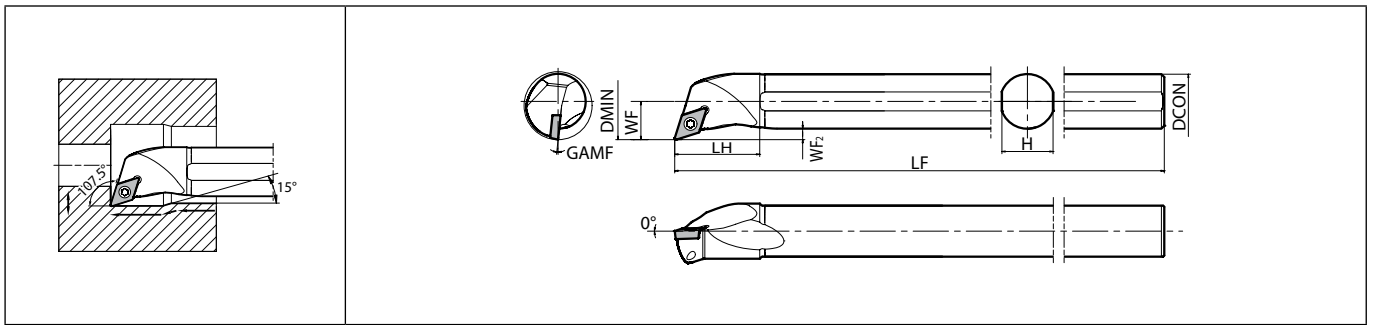
Toolholder dimensions

Description	Availability		Dimension (mm)									GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF	WF2	Screw				Wrench	Wrench		
																		
A10L- SDQC%07-13AE	●	●	13	10	3	9	19	140	7.5	2.1	10	0.4	Yes	SB-2560TR	-	FT-8	DC□T0702... DC□W0702...	
A12M- SDQC%07-16AE	●	●	16	12	4	11	22	150	9.25	2.6	8							
A16Q- SDQC%07-20AE	●	●	20	16	5	15	25	180	11.3	3.7	6	0.4	Yes	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3...	
A20R- SDQC%11-25AE	●	●	25	20	5	19	31	200	14.4	5	4							
A25S- SDQC%11-30AE	●	●	30	25		24	38	250	16.9	4								

WP chipbreaker (DCMX-WP : Wiper insert) is not applicable to A-SDQC-AE Toolholders.




● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SDQC-A Steel shank bar (Internal copying)



Max. Overhang Length L/D≈4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

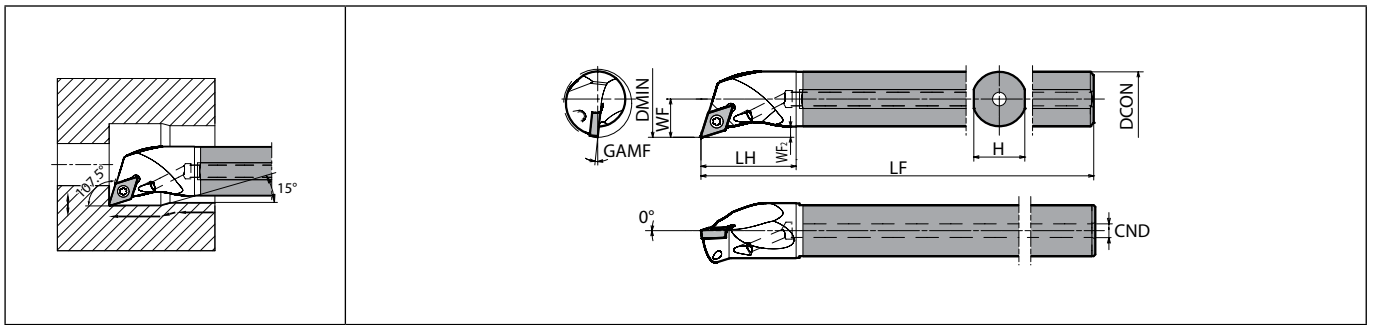
Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
														Screw	Wrench	Wrench	
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂								
S10L- SDQC%/07-13A	●	●	13	10	9	19	140	7.5	2.1	10	0.4	No	SB-2560TR	-	FT-8	DC□T0702... DC□W0702...	
S12M- SDQC%/07-16A	●	●	16	12	11	22	150	9.25	8								
S16Q- SDQC%/07-20A	●	●	20	16	15	25	180	11.3	6	6	0.4	No	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3...	
S20R- SDQC%/11-25A	●	●	25	20	19	31	200	14.4	5								
S25S- SDQC%/11-30A	●	●	30	25	24	38	250	16.9	4	4	0.4	No	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3...	

WP chipbreaker (DCMX-WP : Wiper insert) is not applicable to S-SDQC-A Toolholders.



E-SDQC-A Carbide shank bar (Internal copying)



Max. Overhang Length L/D≈7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions



Boring

- Solid
- Positive
- KAV
- Negative

Description	Availability		Dimension (mm)									GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
			R	L	DMIN	DCON	CND	H	LH	LF	WF				WF2	Screw	Wrench	
E10N- SDQC [®] /07-13A SDQCR07-13A-2/3	●	●	13	10	3	9	20	160 105	7.5	2.1	10							
E12Q- SDQC [®] /07-16A SDQCR07-16A-2/3	●	●	16	12	4	11	23	180 120	9.25	2.6	8	0.4	Yes	SB-2560TR	-	FT-8		DC□T0702... DC□W0702...
E16X- SDQC [®] /07-20A SDQCR07-20A-2/3	●	●	20	16		15	28	220 145	11.3		6							
E20S- SDQC [®] /11-25A SDQCR11-25A-2/3	●	●	25	20	6	19	32	250 165	14.4	3.7	5	0.4	Yes	SB-4065TR	FT-15	-		DC□T11T3... DC□W11T3...
E25T- SDQC [®] /11-30A SDQCR11-30A-2/3	●	●	30	25		24	38	300 200	16.9		4							

WP chipbreaker (DCMX-WP : Wiper insert) is not applicable to E-SDQC-A Toolholders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-SDQC-AE / S-SDQC-A / E-SDQC-A)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	PP	GP
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing	Low feed	Low feed
Insert								
Chipbreaker type	GK	HQ	STD	MF	%-F	%-FSF	%-U	%-USF
Page	B70	B70	B70	B70	B72, B73	B72	B74~B76	B74
Applications	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	%-J	%-JSF	XP	XQ	MQ	No CB	AP	%-A3
Page	B77	B76	B71	B71	B71	B78	B78	B78
Applications	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials				
Insert								
Chipbreaker type	AH	PCD	APD	CBN				
Page	B78	C42	C42	C22				



Recommended cutting conditions [F159](#)

Applicable sleeves [F155~F157](#)

A-SDZC-AE Excellent bar (Back boring)

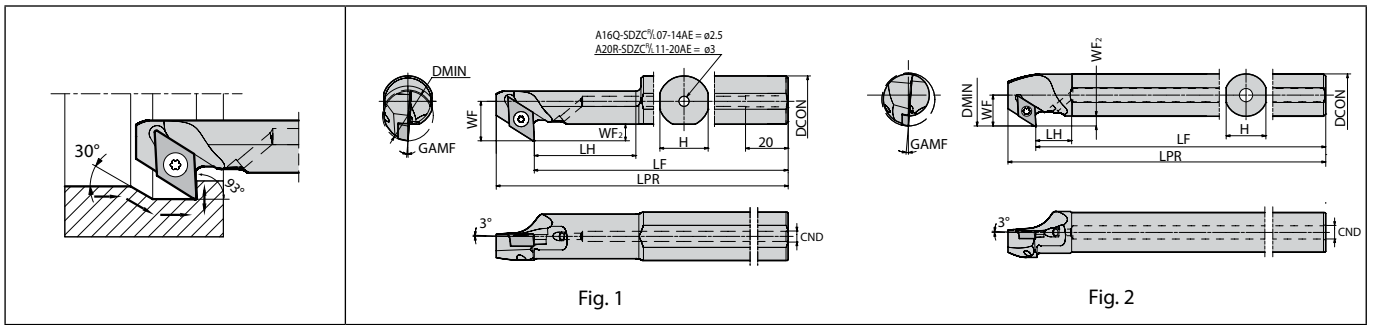


Fig. 1 Fig. 2
Max. Overhang Length L/D≈5.5 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

F

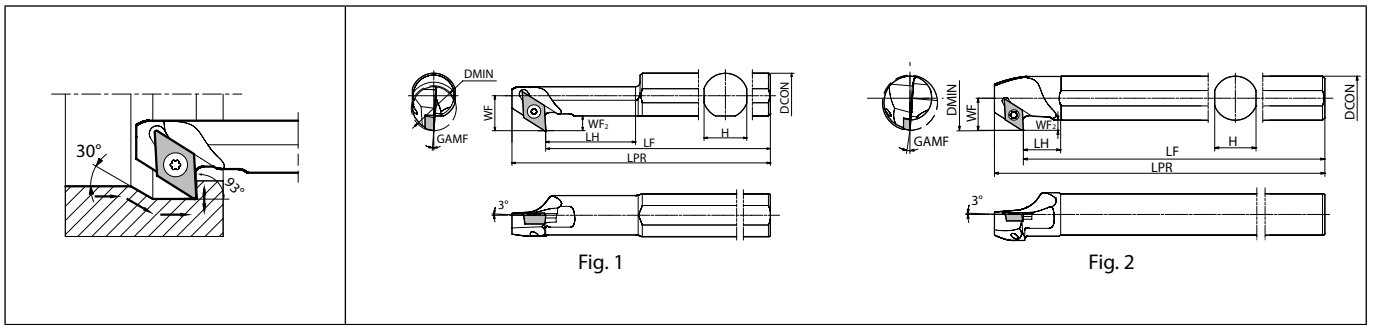
Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LPR	LF	WF	WF ₂	Screw					Wrench	Wrench		
A10L- SDZC%:07-14AE	●	●	14	10	3	9	14	140	130.5	8.7	3.3	5	0.4	Yes	2	SB-2545TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...	
A12M- SDZC%:07-16AE	●	●	16	12	4	11	150	139.5	9.7	2	SB-2560TR									
A16Q- SDZC%:07-14AE	●	●	14	16	5	15	30	180	170	10.8	4.4	6.1	5	0.4	Yes	1	SB-2545TR	-		FT-15
	SDZC%:07-20AE	●					●	20	14	180	169.5					11.7	3.3				2	SB-2560TR
A16Q- SDZC%:11-23AE	●	●	23	16	5	15	15	180	165	14.5	6.1	5	0.4	Yes	2	SB-4065TR	FT-15	-		DC□T11T3... DC□W11T3... DC□X11T3...
A20R- SDZC%:11-20AE	●	●	20	20		19	40	200	185	15.6					1						SB-4065TR
	SDZC%:11-27AE	●	●	27		15	250	235	19	2										
A25S- SDZC%:11-32AE	●	●	32	25	24	2														

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.




● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SDZC-A Steel shank bar (Back boring)



Max. Overhang Length L/D≈4 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

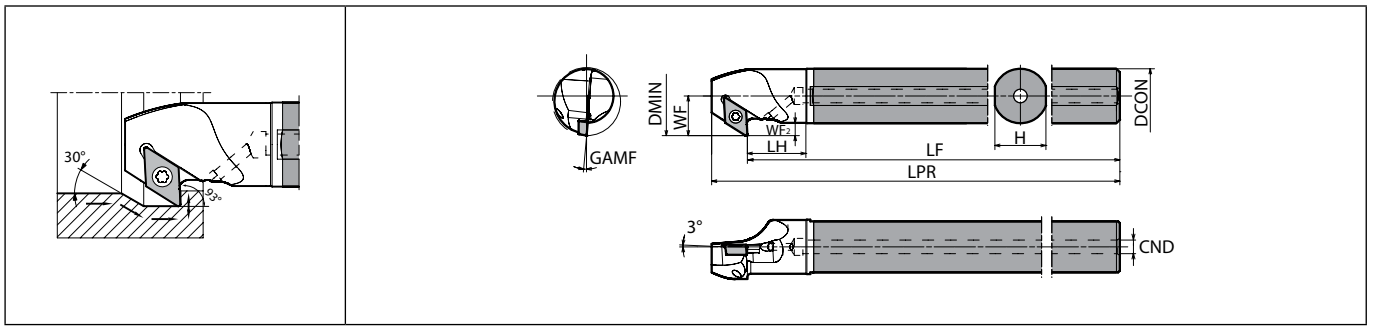
Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
	R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF2								
S10L- SDZC%07-14A	●	●	14	10	9	14	140	130.5	8.7	3.3	5	0.4	No	2	SB-2545TR	-	FT-8	DC□T0702... DC□W0702... DC□X0702...
S12M- SDZC%07-16A	●	●	16	12	11	14	150	139.5	9.7					2	SB-2560TR			
S16Q- SDZC%07-14A	●	●	14	16	15	30	180	170	10.8	4.4	5	0.4	No	1	SB-2545TR	-	FT-8	
S16Q- SDZC%07-20A	●	●	20		14	180	169.5	11.7	3.3	2				SB-2560TR				
S16Q- SDZC%11-23A	●	●	23	16	15	15	180	165	14.5	6.1	5	0.4	No	2	SB-4065TR	FT-15	-	DC□T11T3... DC□W11T3... DC□X11T3...
S20R- SDZC%11-20A	●	●	20	20	19	40	200	185	15.6					1				
S20R- SDZC%11-27A	●	●	27		15	250	235	19	2	2								
S25S- SDZC%11-32A	●	●	32	25	24	15	250	235	19	2	2	2	2	2				

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.



E-SDZC-A Carbide shank bar (Back boring)



Max. Overhang Length L/D≈7 | Right-hand shown
Right-hand Insert for Right-hand Toolholder.

F

Toolholder dimensions



Boring


Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
	R	DMIN	DCON	CND	H	LH	LPR	LF	WF	WF ₂	Screw	Wrench				Wrench			
E10N- SDZCR07-14A	●	14	10	3	9	10.5	160	150.5	8.7										DC□T0702... DC□W0702... DC□X0702...
E12Q- SDZCR07-16A	●	16	12	4	11	12.5	180	169.5	9.7	3.3	5	0.4	Yes	SB-2545TR	-	FT-8			
E16X- SDZCR07-20A	●	20	16		15	17.5	220	209.5	11.7					SB-2560TR					
E16X- SDZCR11-23A	●	23	16	4	15	13	220	205	14.5	6.1	5	0.4	Yes	SB-4065TR	FT-15	-		DC□T11T3... DC□W11T3... DC□X11T3...	
E20S- SDZCR11-27A	●	27	20	6	19	17	250	235	16.5										


For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-SDZC-AE / S-SDZC-A / E-SDZC-A)

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	WP	5/L-WP
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	PP	GP	GK	HQ	STD	MF	5/L-F	5/L-FSF
Page	B69	B69	B70	B70	B70	B70	B72, B73	B72
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	5/L-U	5/L-USF	5/L-J	5/L-JSF	XP	XQ	MQ	No CB
Page	B74~B76	B74	B77	B76	B71	B71	B71	B78
Applications	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	5/L-A3	AH	PCD	APD	CBN		
Page	B78	B78	B78	C42	C42	C22		

Recommended cutting conditions  F159

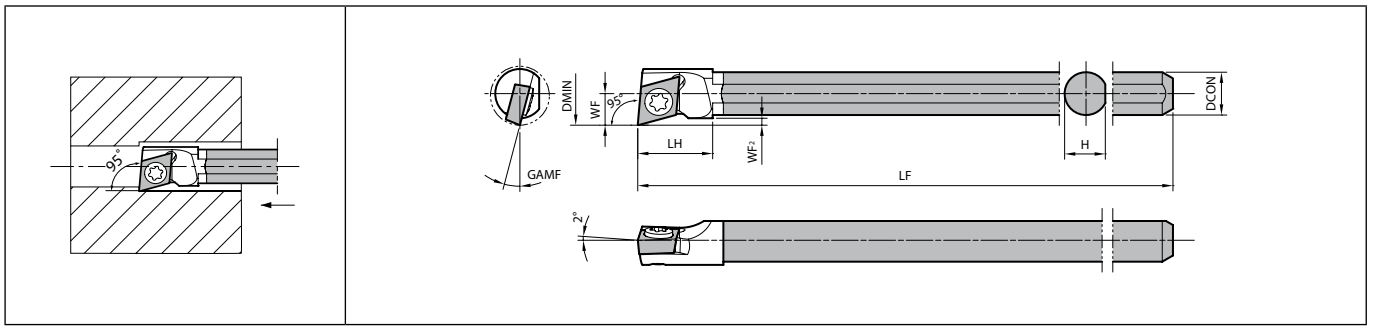
Applicable sleeves  F155~F157

F



Boring

C-SJLC Carbide shank bar (Boring / Internal facing)



Max. Overhang Length $L/D \approx 7$ | Right-hand shown
 Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂				Screw	Wrench	
	C04X- SJLC [®] L03-055	●	●	5.5	4	3.8	7	91	2.95				0.65	15		0.03	No	SB-1635TR	FT-6	JC T0301...

Applicable inserts

Applications	Finishing	Finishing
Insert		
Chipbreaker type	[®] /L-F	[®] /L-FSF
Page	B80	B80

Recommended cutting conditions [F158](#), [F159](#)

Applicable sleeves [F154](#), [F156](#), [F157](#)

• Features of C-SJLC

1. Specially designed for minimized bore dia.
2. A relief angle of 15° ensures high flexibility of the tool pass during necking.
3. Retaining front relief angle 5° and good surface roughness during internal facing.

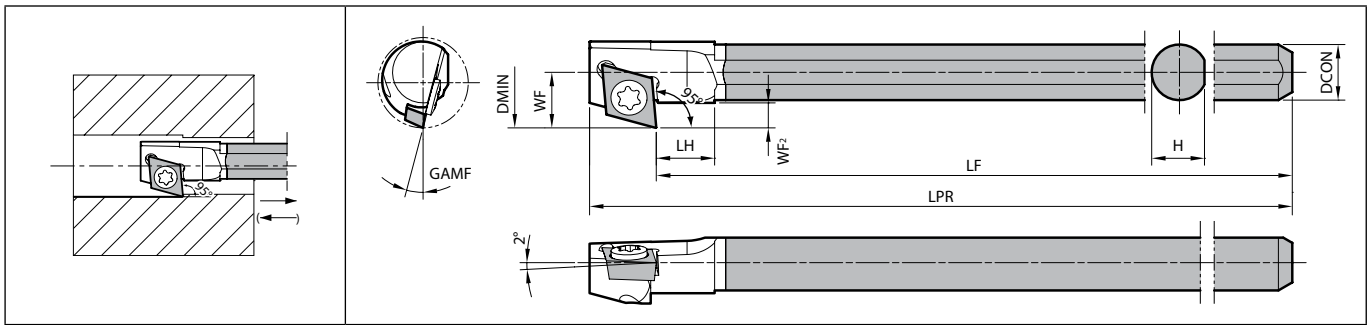
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

- Solid
- Positive
- KAV
- Negative

C-SJZC Carbide shank bar (Back boring)





Max. Overhang Length $L/D \approx 7$ | Right-hand shown
 Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.
 When using Right-hand Toolholder, use Right-hand insert if machining from back to front in this direction (\rightarrow).
 Use Left-hand insert if machining from front to back in this direction (\leftarrow).

Toolholder dimensions

Description	Availability		Dimension (mm)									GPMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
	R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF ₂	Screw				Wrench		
	C04X- SJZC [®] /L03-065	●	●	6.5	4	3.8	4	93	88.1	4	1.8				15	0.03		No			JC-T0301...

Applicable inserts

Applications	Finishing	Finishing
Insert		
Chipbreaker type	$\frac{R}{L}$ -F	$\frac{R}{L}$ -FSF
Page	B80	B80

Recommended cutting conditions [F158](#), [F159](#)

Applicable sleeves [F154](#), [F156](#), [F157](#)

• Features of C-SJZC

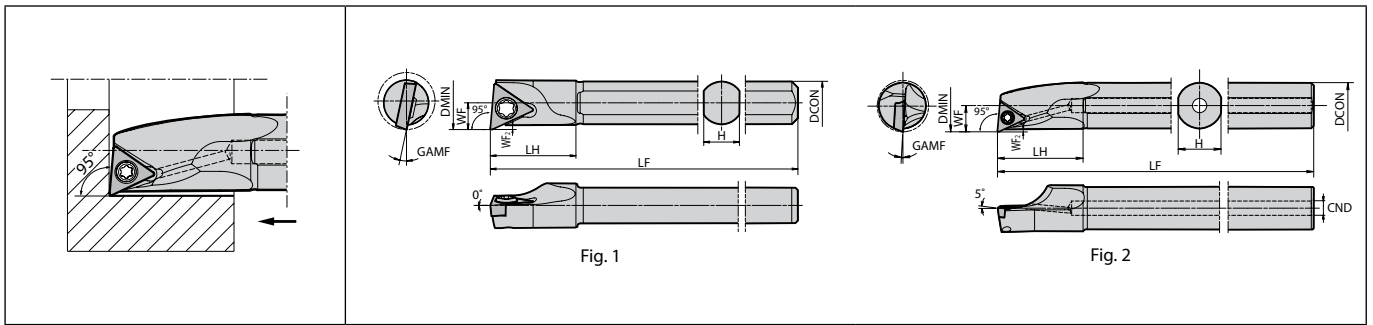
1. Back boring bars for workpiece that require high concentric circle accuracy and when a change of chuck is not possible.
2. Available for back boring and necking.
3. Despite the small size of minimum boring dia. as $\phi 6.5$, the edge gap is retained as large as 1.8 mm.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

A/S-STLB(P)-AE Excellent bar (Boring / Internal facing)



Max. Overhang Length L/D≈5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

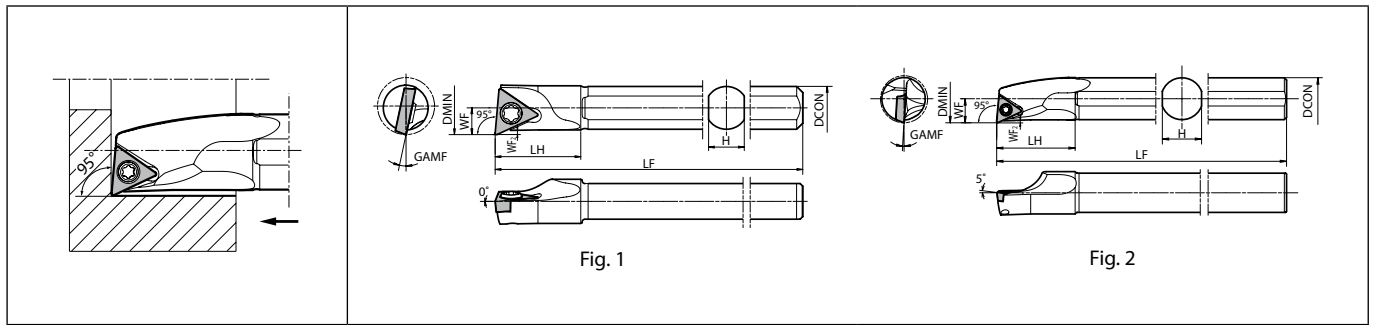
Toolholder dimensions

Description	Availability		Dimension (mm)									GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF	WF2	Screw					Wrench	Wrench		
S06H- STLB%06-08AE	●	●	8	6	-	5	12	100	3.8	0.5	12	0.2	No	1	SB-2035TR		FT-6	TB□T0601... TB□W0601...	
A08X- STLP%08-10AE	●	●	10	8	2.5	7	16	120	5	0.5	10	0.4	Yes	2	SB-1TR	-	FT-6	TP□B0802... TP□H0802... TP□T0802...	
A08X- STLP%09-10AE	●	●	10	8	2.5	7	16	120	5	0.5	10	0.4	Yes	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...	
A10L- STLP%09-12AE	●	●	12	10	3	9	20	140	6.2	0.9	8								
A12M- STLP%09-16AE	●	●	16	12	4	11	24	150	8	0.6	5								
A10L- STLP%11-12AE	●	●	12	10	3	9	20	140	6	0.7	10	0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...	
A12M- STLP%11-14AE	●	●	14	12	4	11	24	150	7.2	0.8	7								
A16Q- STLP%11-18AE	●	●	18	16	5	15	30	180	9.2	0.7	3.5								
A20R- STLP%11-22AE	●	●	22	20		19	36	200	11.2		2								
A20R- STLP%16-25AE	●	●	25	20	5	19	36	200	13	0.7	0	0.4	Yes	2	SB-4065TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...	
A25S- STLP%16-27AE	●	●	27	25		24	46	250	13.7										

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.
When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.




● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-STLB(P)-A Steel shank bar (Boring / Internal facing)



Max. Overhang Length L/D≈4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
															Screw	Wrench	Wrench	
	R	L	DMIN	DCON	H	LH	LF	WF	WF2									
S06H- STLB%L06-08A	●	●	8	6	5	12	100	3.8	0.5	12	0.2	No	1	SB-2035TR		FT-6	TB□T0601... TB□W0601...	
S08X- STLP%L08-10A	●	●	10	8	7	16	120	5	0.5	10	0.4	No	2	SB-1TR	-	FT-6	TP□B0802... TP□H0802... TP□T0802...	
S08X- STLP%L09-10A	●	●	10	8	7	16	120	5	0.5	10	0.4	No	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...	
S10L- STLP%L09-12A	●	●	12	10	9	20	140	6.2	0.9	8								
S12M- STLP%L09-16A	●	●	16	12	11	24	150	8	0.6	5								
S10L- STLP%L11-12A	●	●	12	10	9	20	140	6	0.7	10	0.4	No	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...	
S12M- STLP%L11-14A	●	●	14	12	11	24	150	7.2	0.8	7								
S16Q- STLP%L11-18A	●	●	18	16	15	30	180	9.2	0.7	3.5								
S20R- STLP%L11-22A	●	●	22	20	19	36	200	11.2	2	2	0.4	No	2	SB-4065TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...	
S25S- STLP%L16-27A	●	●	27	25	24	46	250	13.7	0.7	0								

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.
When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



C/E-STLB(P)-A(N) Carbide shank bar (Boring / Internal facing)

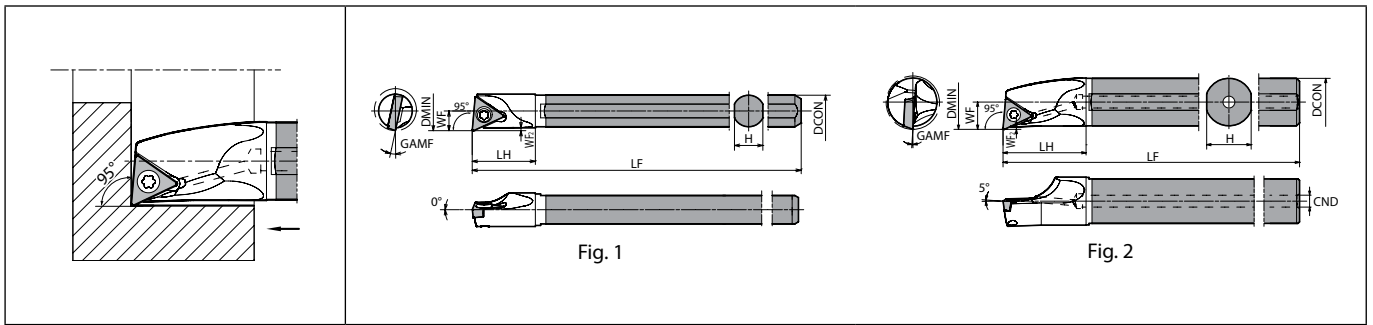


Fig. 1

Fig. 2

Max. Overhang Length L/D≈7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F


Toolholder dimensions


Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF	WF2	Screw	Wrench					Wrench			
C06J- STLB%L06-08AN	●	●	8	6	-	5.4	10	110	3.8	0.5	12	0.2	No	1	SB-2035TR	-	FT-6	TB□T0601... TB□W0601...		
E08L- STLP%L08-10AN	●	●	10	8	3	7	14	140	5	0.5	10	0.4	Yes	2	SB-1TR	-	FT-6	TP□B0802... TP□H0802... TP□T0802...		
E08L- STLP%L09-10AN	●	●	10	8		7	14	140	5	0.5	10									
E10N- STLP%L09-12AN	●	●						160												
STLPR09-12AN2/3	●		12	10	3	9	18	105	6.2	0.9	8	0.4	Yes	2	SB-2545TR	-	FT-8	TP□B0902... TP□H0902... TP□T0902... TP□X0902...		
STLPR09-12AN1/2	●							80												
E12Q- STLP%L09-16A	●	●						180												
STLPR09-16A-2/3	●		16	12	4	11	23	120	8	0.6	5									
STLPR09-16A-1/2	●							90												
E10N- STLP%L11-12AN	●	●						160												
STLPR11-12AN2/3	●		12	10	3	9	18	105	6	0.7	10									
STLPR11-12AN1/2	●							80												
E12Q- STLP%L11-14A	●	●						180												
STLPR11-14A-2/3	●		14	12		11	23	120	7.2	0.8	7									
STLPR11-14A-1/2	●							90												
E16X- STLP%L11-18A	●	●						220				0.4	Yes	2	SB-3060TR	-	FT-10	TP□B1103... TP□H1103... TP□T1103... TP□X1103...		
STLPR11-18A-2/3	●		18	16	4	15	28	145	9.2	3.5										
STLPR11-18A-1/2	●							110												
E20S- STLP%L11-22A	●	●						250												
STLPR11-22A-2/3	●		22	20	6	19	32	165	11.2	2										
STLPR11-22A-1/2	●							125												
E20S- STLP%L16-25A	●	●						250												
STLPR16-25A-2/3	●		25	20		19	32	165	13											
STLPR16-25A-1/2	●				6			125		0.7	0	0.4	Yes	2	SB-4065TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...		
E25T- STLP%L16-27A	●	●						300												
STLPR16-27A-2/3	●		27	25		24	38	200	13.7											

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.
When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A/S-STLB(P)-AE / S-STLB(P)-A / C/E-STLB(P)-A(N))

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium
Insert								
Chipbreaker type	CF	PF	WP	1/2-WP	PP	GP	DP	HQ
Page	B84, B88	B84, B88	B88	B88	B88	B89	B84	B89
Applications	Finishing	Finishing	Finishing	Medium	Low feed	Low carbon steel	Low carbon steel	Cast iron
Insert								
Chipbreaker type	R/L	1/2-FSF	1/2-P	1/2-H	1/2-USF	XP	XQ	No CB
Page	B84, B90, B91	B92	B92	B93	B94	B89	B89	B84, B94
Applications	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials				
Insert								
Chipbreaker type	AP	PCD	APD	CBN				
Page	B94	C44, C46, C47	C47	C23				

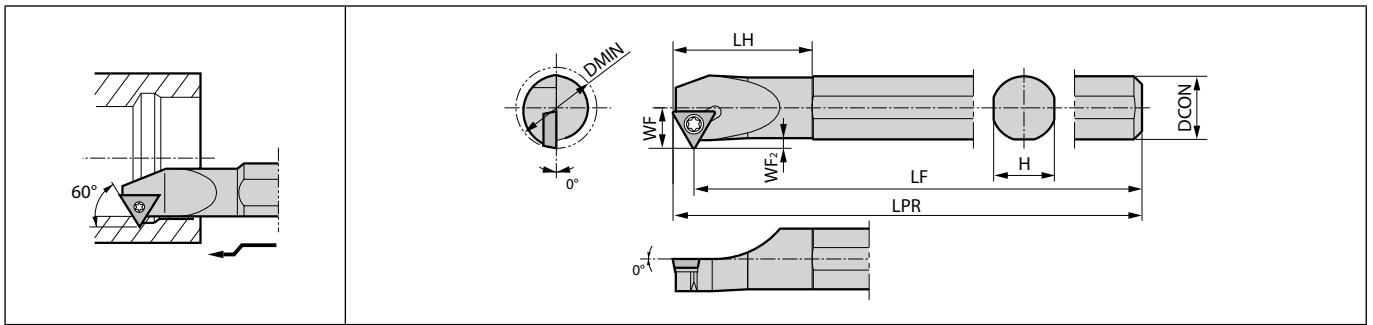
Recommended cutting conditions  F158, F159

Applicable sleeves  F154~F157



Boring

S-STWP-E Excellent bar (Internal copying)



Max. Overhang Length L/D≈5 | This toolholder is also available for threading. | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

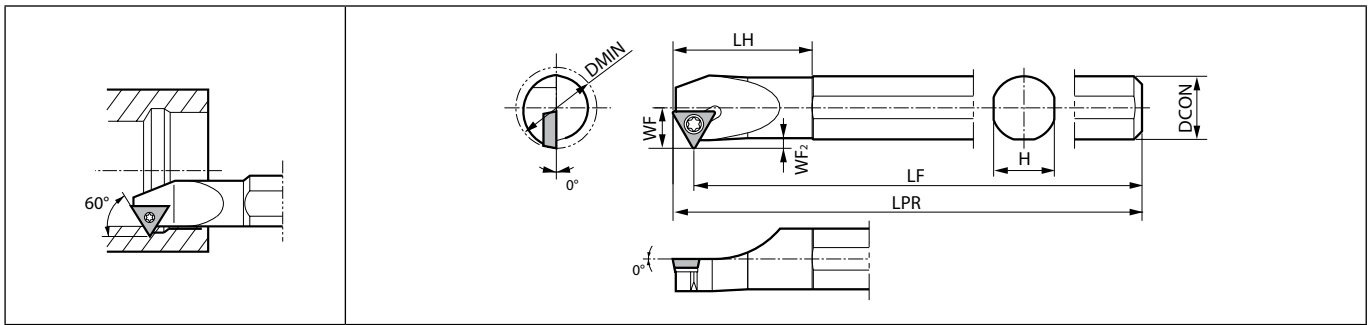
Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts	
	R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF ₂				Screw	Wrench	Wrench		
S10M- STWP ^{PL} 11-12E	●	●	12	10	9.2	23	150	144.5	6	1	0	0.1	No	SB-3STR	-	FT-10	TP□B1102... TP□H1102...	
S12M- STWP ^{PL} 11-16E	●	●	16	12	11	30		8	1.5	SB-3TR						TP□B1103... TP□H1103... TP□T1103...		
S16R- STWP ^{PL} 11-20E	●	●	20	16	15	35	200	194.5	10	2	0	0.8	No	SB-4TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...	
S20X- STWP ^{PL} 11-25E	●	●	25	20	19	40	220	214.5	12.5	2.5				4	0	0.8	No	SB-4TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...
S20X- STWP ^{PL} 16-25E	●	●	25	20	19	40	220	212.3	14	4	0	0.8	No	SB-4TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...	
S25X- STWP ^{PL} 16-32E	●	●	32	25	24	42	270	262.3	16.5	4	0	0.8	No	SB-4TR	FT-15	-	TP□B1603... TP□H1603... TP□T1603...	

WP chipbreaker (TPMX-WP : Wiper insert) is not applicable to S-STWP-E Toolholders.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-STWP Steel shank bar (Internal copying)



Max. Overhang Length $L/D \approx 3$ | This toolholder is also available for threading. | Right-hand shown
Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
	R	DMIN	DCON	H	LH	LPR	LF	WF	WF ₂	Screw				Wrench		
S10M- STWPR11-12	●	12	10	9.2	23	150	144.5	6	1	0	0.1	No			TP□B1102... TP□H1102...	
S12M- STWPR11-16	●	16	12	11	30			8	1.5						TP□B1103... TP□H1103...	
S16Q- STWPR11-20	●	20	16	15	35	180	174.5	10	2						TP□T1103...	
S20R- STWPR11-25	●	25	20	19	40	200	194.5	12.5	2.5							

WP chipbreaker (TPMX-WP : Wiper insert) is not applicable to S-STWP Toolholders.

Applicable inserts (S-STWP-E / S-STWP)

Applications	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Medium	Low feed	Low carbon steel
Insert								
Chipbreaker type	PP	GP	HQ	R/L	F/L-FSF	F/L-H	F/L-USF	XP
Page	B88	B89	B89	B90, B91	B92	B93	B94	B89
Applications	Low carbon steel	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials		
Insert								
Chipbreaker type	XQ	No CB	AP	PCD	APD	CBN		
Page	B89	B94	B94	C46, C47	C47	C23		

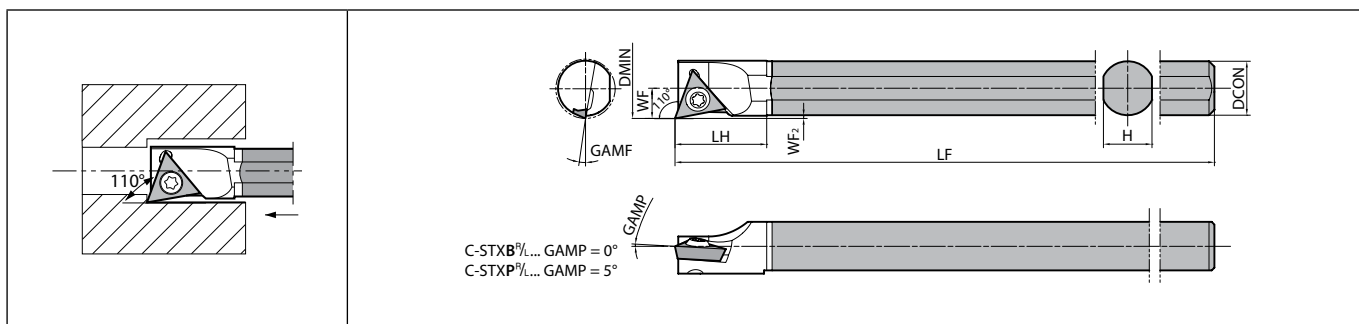
Recommended cutting conditions F159

Applicable sleeves F155~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



C-STXB(P) Carbide shank bar (Boring / Internal facing)



Max. Overhang Length $L/D \approx 7$ | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂	Screw				Wrench		
C06J- STXB%/L-06-075	●	●	7.5	6	5.4	11	110	3.75	0.5	10	0.03	No	SB-1STR	FT-6	TB□T0601... TB□W0601...	
C08X- STXP%/L-08-09	●	●	9	8	7	14	143	4.6	0.5	10	0.03	No	SB-1TR	FT-6	TP□B0802... TP□H0802... TP□T0802...	
C10X- STXP%/L-09-11	●	●	11	10	9	17	164	5.6	0.5	10	0.03	No	SB-2TR	FT-8	TP□B0902... TP□H0902... TP□T0902...	

WP chipbreaker (TPMX-WP : Wiper insert) is not applicable to C-STXP Toolholders.

Applicable inserts

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	PF	PP	GP	DP	HQ	R/L	%/L-FSF
Page	B84, B88	B84, B88	B88	B89	B84	B89	B84, B90, B91	B92
Applications	Medium	Low feed	Low carbon steel	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Hard materials	
Insert								
Chipbreaker type	%/L-H	%/L-USF	XP	No CB	AP	PCD	CBN	
Page	B93	B94	B89	B84, B94	B94	C44, C46, C47	C23	

Recommended cutting conditions F158, F159

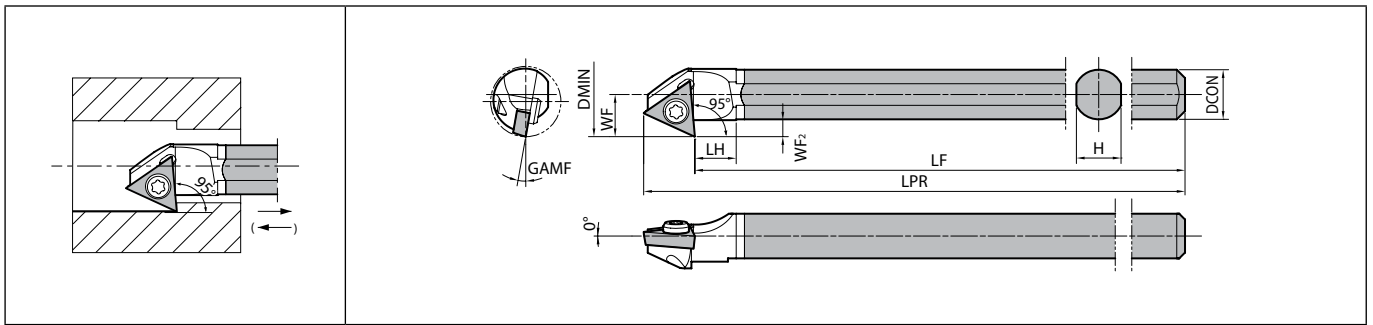
Applicable sleeves F154, F155, F157

C-STXP(B) Boring bar cutting conditions (Workpiece material : 34CrMo4)

Toolholder description	Insert description (Grades)	Vc (m/min)	ap (mm)	f (mm/rev)	Coolant
C06J-STXB%/L-06-075	TBGT0601003 1/8 (PR930)	30~100	0.02~0.1	0.02~0.04	Yes
C08X-STXP%/L-08-09	TPGH080201 1/8 (PR930)	30~100	0.05~0.15	0.03~0.08	Yes
C10X-STXP%/L-09-11	TPGH090201 1/8 (PR930)	30~100	0.05~0.15	0.03~0.08	Yes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

C-STZB Carbide shank bar (Back boring)





Max. Overhang Length $L/D \approx 7$ | Right-hand shown
 Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.
 When using Right-hand Toolholder, use Right-hand insert if machining from back to front in this direction (→).
 Use Left-hand insert if machining from front to back in this direction (←).

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
	R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF ₂				Screw	Wrench	
	C06J- STZB%.06-085	●	●	8.5	6	5.4	5	110	104.3	5.1				1.8	10		0.03	No			TB□T0601... TB□W0601...

Applicable inserts

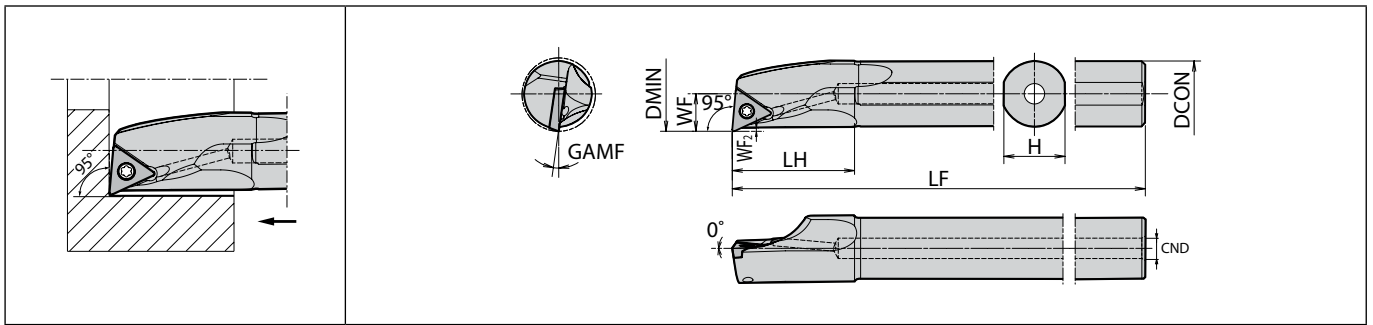
Applications	Minute ap	Finishing	Finishing	Finishing	Cast iron	Non-Ferrous metals
Insert						
Chipbreaker type	CF	PF	DP	R/L	No CB	PCD
Page	B84	B84	B84	B84	B84	C44

Recommended cutting conditions  F158, F159
 Applicable sleeves  F154, F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



A-STLC-AE Excellent bar (Boring / Internal facing)



Max. Overhang Length L/D≈~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF	WF ₂	Screw	Wrench						
											SB-2250TR	FT-7						
A08X- STLC%L09-10AE	●	●	10	8	2.5	7	16	120	5	0.5	14	0.4	Yes	SB-2250TR	FT-7	TCMT0902... TCMX0902...		
A10L- STLC%L09-12AE	●	●	12	10	3	9	20	140	6.2	0.9	12							
A10L- STLC%L11-12AE	●	●	12	10	3	9	20	140	6.2	0.9	12	0.4	Yes	SB-2560TR	FT-8	TCMT1102... TCMX1102...		
A12M- STLC%L11-14AE	●	●	14	12	4	11	24	150	7.2	10								
A16Q- STLC%L11-18AE	●	●	18	16	5	15	30	180	9.2	0.7	8	0.4	Yes	SB-2560TR	FT-8	TCMT1102... TCMX1102...		
A20R- STLC%L11-22AE	●	●	22	20		19	36	200	11.2	6								

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.

Applicable inserts

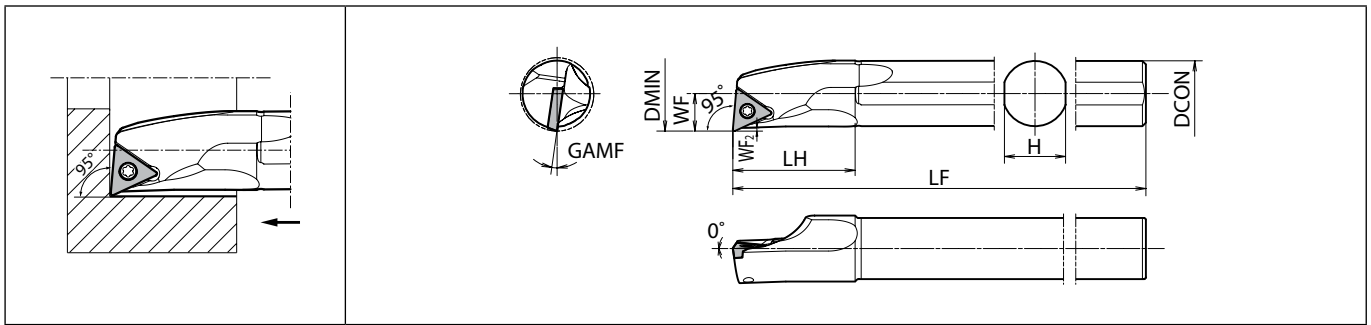
Applications	Finishing	Finishing - Medium
Insert		
Chipbreaker type	WP	HQ
Page	B85	B85

Recommended cutting conditions [F158](#), [F159](#)

Applicable sleeves [F154~F157](#)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-STLC-A Steel shank bar (Boring / Internal facing)





Max. Overhang Length L/D≈4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.


Toolholder dimensions


Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
														Screw	Wrench	
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂							
S08X- STLC [®] L09-10A	●	●	10	8	7	16	120	5	0.5	14	0.4	No	SB-2250TR	FT-7	TCMT0902... TCMX0902...	
S10L- STLC [®] L09-12A	●	●	12	10	9	20	140	6.2	0.9	12						
S10L- STLC [®] L11-12A	●	●	12	10	9	20	140	6.2	0.9	12	0.4	No	SB-2560TR	FT-8	TCMT1102... TCMX1102...	
S12M- STLC [®] L11-14A	●	●	14	12	11	24	150	7.2	0.7	10						
S16Q- STLC [®] L11-18A	●	●	18	16	15	30	180	9.2	0.7	8	0.4	No	SB-2560TR	FT-8	TCMT1102... TCMX1102...	
S20R- STLC [®] L11-22A	●	●	22	20	19	36	200	11.2	0.7	6						

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.

Applicable inserts

Applications	Finishing	Finishing - Medium
Insert		
Chipbreaker type	WP	HQ
Page	B85	B85

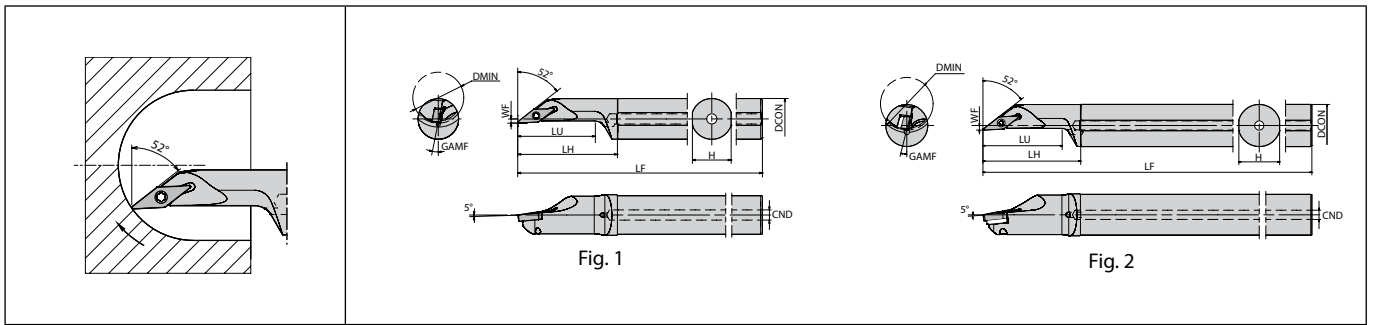
Recommended cutting conditions  F158, F159

Applicable sleeves  F154~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



A-SVJP(C)(B)-AE Excellent bar (Spherical machining / Internal facing / Internal copying)



Max. Overhang Length L/D≈~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

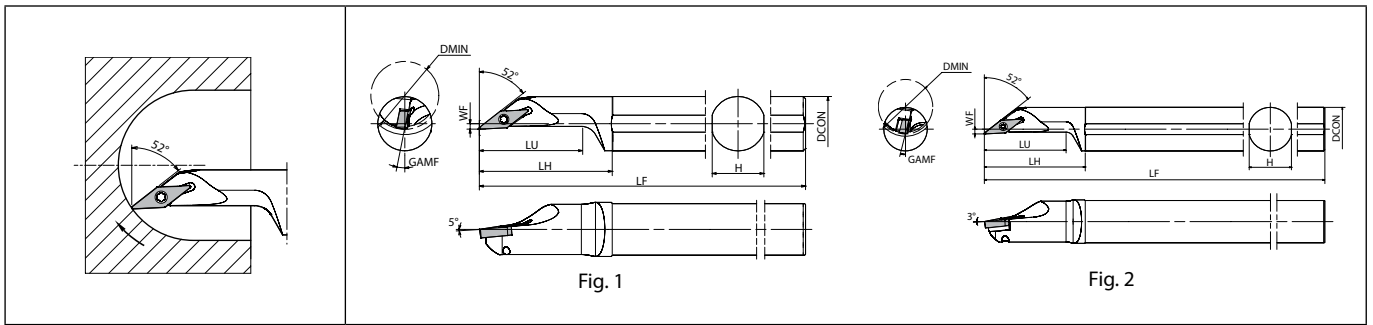
Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
																	Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
A12M- SVJP%L08-16AE	●	●	16	12	4	11	33	150	26	2	5	0.2	Yes	1	SB-2050TR	-	FT-6	-	-	-	VP□T0802...		
A12M- SVJC%L08-16AE	●	●	16	12	4	11	33	150	26	2	5	0.4	Yes	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...		
A16Q- SVJC%L08-20AE	●	●	20	16	4	15	43	180	36	2	5	0.4	Yes	1	SB-2050TR	-	FT-6	-	-	-	VC□W0802...		
A20R- SVJB%L11-25AE	●	●	25	20	5	19	48	200	37.5	2	5	0.4	Yes	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...		
A25S- SVJB%L11-30AE	●	●	30	25	7	24	58	250	45	3.5	8	0.4	Yes	2	SB-4012STRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...		
A32S- SVJB%L16-40AE	●	●	40	32	7	31	74	250	60	3.5	8	0.4	Yes	2	SB-4012STRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...		
A40T- SVJB%L16-50AE	●	●	50	40	9	39	91	300	75	4.5	7	0.4	Yes	2	SB-4012STRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...		

Use of VB□T1103...-Y / VB□T1604...-Y with A-SVJB-AE is not recommended.
When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).







● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SVJP(C)(B)-A Steel shank bar (Spherical machining / Internal facing / Internal copying)



Max. Overhang Length L/D≈4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

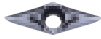











Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
															Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
	R	L	DMIN	DCON	H	LH	LF	LU	WF												
S12M- SVJP%L08-16A	●	●	16	12	11	33	150	26	2	5	0.2	No	1	SB-2050TR	-	FT-6	-	-	-	VP□T0802...	
S12M- SVJC%L08-16A	●	●	16	12	11	33	150	26	2	5	0.4	No	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...	
S16Q- SVJC%L08-20A	●	●	20	16	15	43	180	36	2	5	0.4	No	1	SB-2050TR	-	FT-6	-	-	-	VC□W0802...	
S20R- SVJB%L11-25A	●	●	25	20	19	48	200	37.5	2	5	0.4	No	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...	
S25S- SVJB%L11-30A	●	●	30	25	24	58	250	45	3.5	5	0.4	No	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...	
S32S- SVJB%L16-40A	●	●	40	32	31	74	250	60	3.5	8	0.4	No	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...	
S40T- SVJB%L16-50A	●	●	50	40	39	91	300	75	4.5	7	0.4	No	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...	


Use of VB□T1103...Y / VB□T1604...Y with S-SVJB-A is not recommended.
When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-SVJP(C)(B)-AE / S-SVJP(C)(B)-A)

Applications	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Low feed
Insert								
Chipbreaker type	CK	VF	PP	GP	HQ	%L-F	%L-FSF	%L-U
Page	B102	B97, B100	B97, B100	B97	B97, B100	B98, B103	B98, B103	B104
Applications	Low feed	Finishing - Medium	Non-Ferrous metals	Hard materials				
Insert								
Chipbreaker type	%L-USF	%L-Y	PCD	CBN				
Page	B104	B99	C49, C50	C26, C27				

Recommended cutting conditions  **F159**

Applicable sleeves  **F155~F157**

F



Boring

Solid

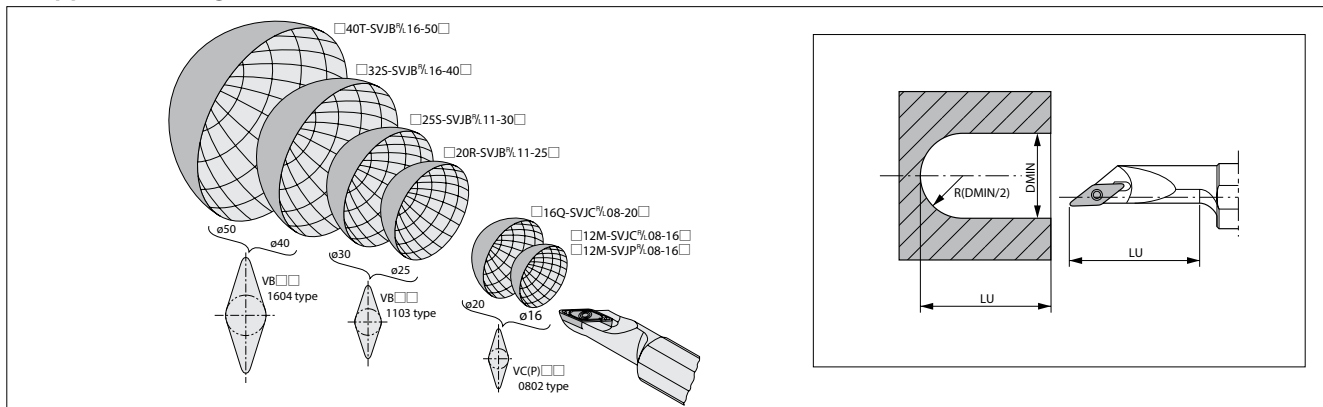
Positive

KAV

Negative

Application of □-SVJP(C)(B)-□ / A-SZJB-AE

1. Application range



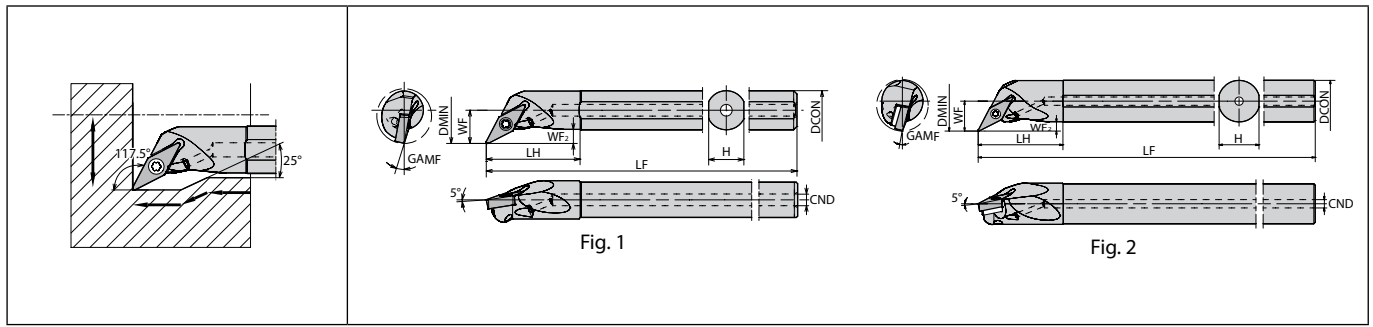
2. Application

Case with no existing hole		Finishing
<p>Spherical machining</p> <p>Internal facing</p> <p>(Note) f shall be 0.05 mm/rev or less at internal facing.</p>		<p>Spherical machining</p>
Case with drilled hole		Finishing
<p>Spherical machining</p> <p>Internal facing</p> <p>Drilled hole</p> <p>(Note) f shall be 0.05mm/rev or less at internal facing.</p>		<p>Internal facing</p> <p>Machining process (1) Finish the internal face first. (2) Next, finish the internal diameter.</p>

3. Caution



A-SVPC(B)-AE Excellent bar (Internal copying / Undercutting)



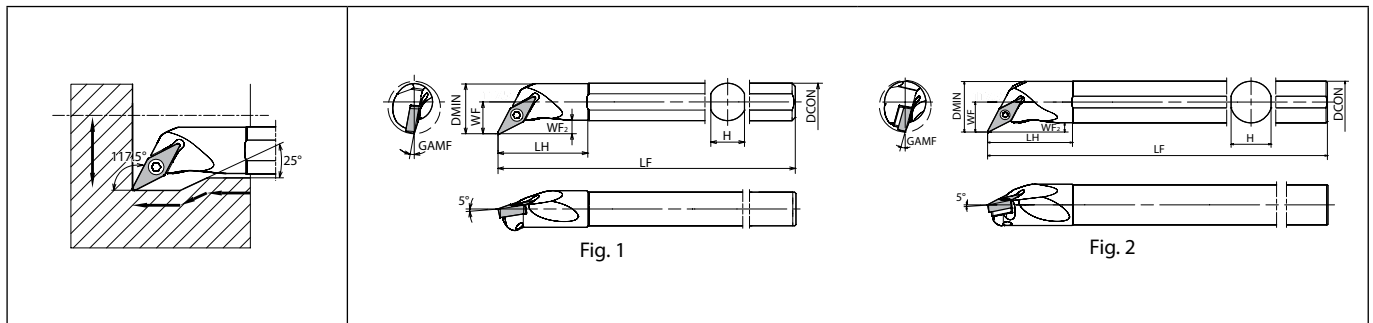
Max. Overhang Length L/D≈5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF	WF ₂	Screw	Wrench					Wrench	Shim	Shim screw	Wrench			
A10L- SVPC%08-14AE	●	●	14	10	3	9	24	140	8.5	3	8	0.4	Yes	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...		
A12M- SVPB%11-18AE	●	●	18	12	4	11	29	150	11	4.5	8	0.4	Yes	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...		
A16Q- SVPB%11-22AE	●	●	22	16	5	15	35	180	13.5	5	5												
A20R- SVPB%11-26AE	●	●	26	20	5	19	41	200	15.5	18	5	13	0.4	Yes	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...	
A25S- SVPB%16-31AE	●	●	31	25		24	51	250	23														6.5	9
A32S- SVPB%16-40AE	●	●	40	32	31	54	250	23	6.5	9	9	0.4	Yes	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...		

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

S-SVPC(B)-A Steel shank bar (Internal copying / Undercutting)



Max. Overhang Length L/D≈4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

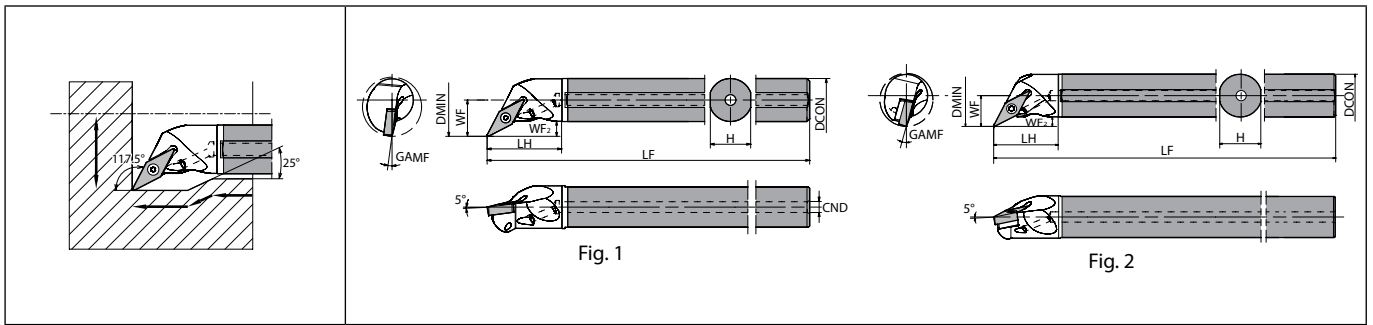
Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂	Screw	Wrench	Wrench					Shim	Shim screw	Wrench				
S10L- SVPC%08-14A	●	●	14	10	9	24	140	8.5	3	8	0.4	No	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...			
S12M- SVPB%11-18A	●	●	18	12	11	29	150	11	4.5	8	0.4	No	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...			
S16Q- SVPB%11-22A	●	●	22	16	15	35	180	13.5	5	5													
S20R- SVPB%11-26A	●	●	26	20	19	41	200	15.5	18	5	13	0.4	No	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...		
S25S- SVPB%16-31A	●	●	31	25	24	51	250	23														6.5	9
S32S- SVPB%16-40A	●	●	40	32	31	54	250	23	6.5	9	9	0.4	No	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...		

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

E-SVPC(B)-A Carbide shank bar (Internal copying / Undercutting)



Max. Overhang Length L/D≈~7 | Right-hand shown | Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
		R	DMIN	DCON	CND	H	LH	LF	WF	WF ₂	Screw					Wrench	Wrench	Shim	Shim screw	Wrench		
E10N- SVPCR08-14A	●	14	10	3	9	20	160	8.5	3	8	0.4	Yes	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...		
E12Q- SVPBR11-18A	●	18	12	4	11	23	180	11	4.5	8	0.4	Yes	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...		
E16X- SVPBR11-22A	●	22	16		15	28	220	13.5	5	5												
E20S- SVPBR11-26A	●	26	20	6	19	32	250	15.5														
E25T- SVPBR16-31A	●	31	25	6	24	38	300	18	5	13	0.4	Yes	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...		

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

Applicable inserts (A-SVPC(B)-AE / S-SVPC(B)-A / E-SVPC(B)-A)

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-Ferrous metals
Insert								
Chipbreaker type	VF	PP	GP	HQ	%/F	%/FSF	%/Y	PCD
Page	B97, B100	B97, B100	B97	B97, B100	B98	B98	B99	C49, C50
Applications	Hard materials							
Insert								
Chipbreaker type	CBN							
Page	C26, C27							

Recommended cutting conditions ● F159

Applicable sleeves ● F155~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



A-SVUC(B)-AE Excellent bar (Internal copying)

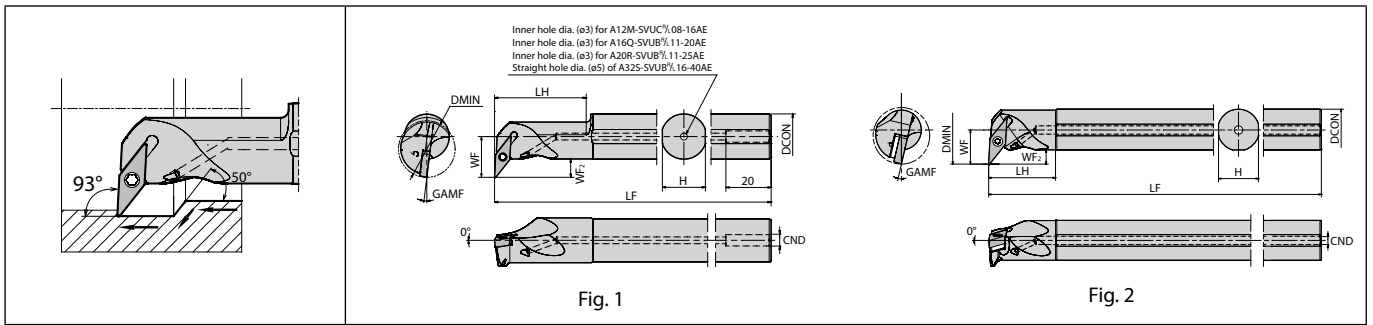


Fig. 1

Fig. 2

Max. Overhang Length L/D≈~5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF	WF ₂	Wrench	Wrench					Shim	Shim screw	Wrench				
A12M- SVUC%/08-16AE	●	●	16	12	4	11	25.5	150	11.5	5.5	8	0.4	Yes	1	SB-2050TR	-	FT-6	-	-	-	-	VC□T0802... VC□W0802...	
A16Q- SVUB%/11-20AE	●	●	20	16	5	15	32.5	180	16	8	0.4	Yes	1	SB-2570TR	-	FT-8	-	-	-	-	VB□T1103... VB□W1103...		
A20R- SVUB%/11-25AE	●	●	25	20	19	40.5	200	18	8	7	0.4	Yes	1	SB-2570TR	-	FT-8	-	-	-	-	VB□T1103... VB□W1103...		
A25S- SVUB%/16-34AE	●	●	34	25	5	24	40	250	20.5	8.5	13	0.4	Yes	2	SB-4012STRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...		
A32S- SVUB%/16-40AE	●	●	40	32	5	31	84	250	28	12	9	0.4	Yes	1	SB-4012STRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...		

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

S-SVUC(B)-A Steel shank bar (Internal copying)

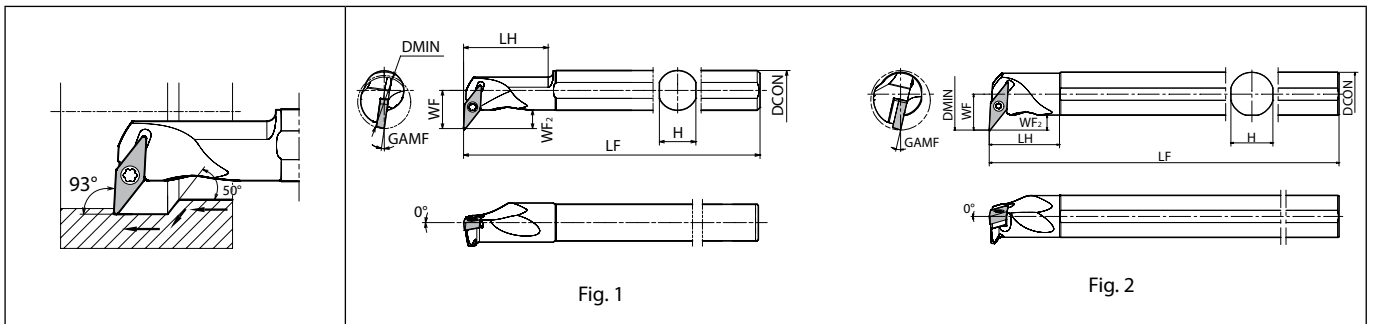


Fig. 1

Fig. 2

Max. Overhang Length L/D≈~4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂	Wrench	Wrench	Shim					Shim screw	Wrench					
S12M- SVUC%/08-16A	●	●	16	12	11	25.5	150	11.5	5.5	8	0.4	No	1	SB-2050TR	-	FT-6	-	-	-	-	VC□T0802... VC□W0802...		
S16Q- SVUB%/11-20A	●	●	20	16	15	32.5	180	16	8	8	0.4	No	1	SB-2570TR	-	FT-8	-	-	-	-	VB□T1103... VB□W1103...		
S20R- SVUB%/11-25A	●	●	25	20	19	40.5	200	18	8	7	0.4	No	1	SB-2570TR	-	FT-8	-	-	-	-	VB□T1103... VB□W1103...		
S25S- SVUB%/16-34A	●	●	34	25	24	40	250	20.5	8.5	13	0.4	No	2	SB-4012STRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...			
S32S- SVUB%/16-40A	●	●	40	32	31	84	250	28	12	9	0.4	No	1	SB-4012STRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...			

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

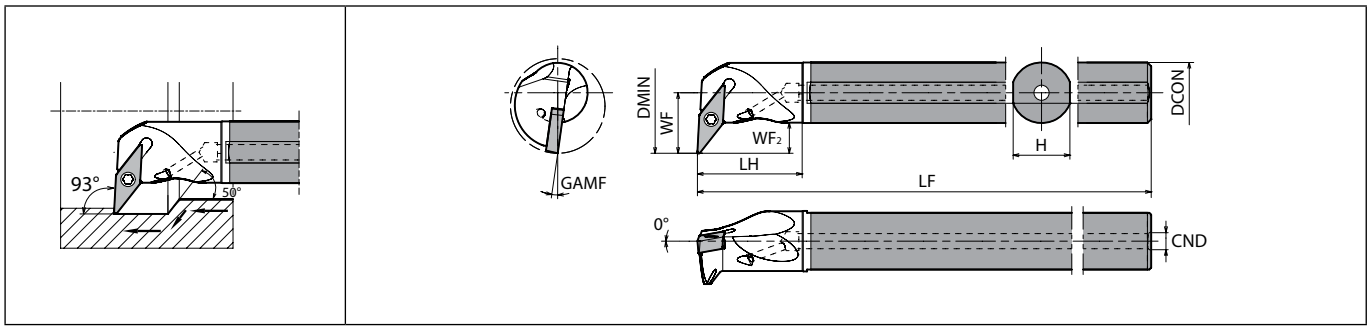
Solid

Positive

KAV

Negative

E-SVUC(B)-A Carbide shank bar (Internal copying)



Max. Overhang Length L/D≈7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts						Applicable inserts
		R	DMIN	DCON	CND	H	LH	LF	WF	WF ₂	Screw				Wrench	Wrench	Shim	Shim screw	Wrench		
E12Q- SVUCR08-18A	●	18	12	4	11	23	180	11.5	5.5	8	0.4	Yes	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...		
E16X- SVUBR11-25A	●	25	16	4	15	28	220	16	8	8	0.4	Yes	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...		
E20S- SVUBR11-29A	●	29	20	6	19	32	250	18	8	7	0.4	Yes	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...		
E25T- SVUBR16-34A	●	34	25	6	24	38	300	21	8.5	13	0.4	Yes	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...		

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

Applicable inserts (A-SVUC(B)-AE / S-SVUC(B)-A / E-SVUC(B)-A)

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-Ferrous metals
Insert								
Chipbreaker type	VF	PP	GP	HQ	Y/F	Y/FSF	Y	PCD
Page	B97, B100	B97, B100	B97	B97, B100	B98	B98	B99	C49, C50
Applications	Hard materials							
Insert								
Chipbreaker type	CBN							
Page	C26, C27							

Recommended cutting conditions ● F159

Applicable sleeves ● F155~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



A-SVZC(B)-AE Excellent bar (Back boring)

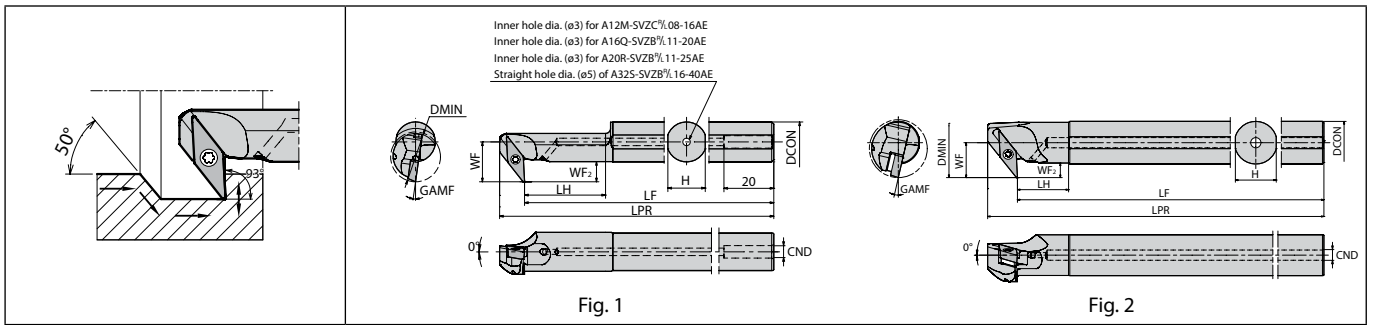


Fig. 1 Fig. 2
Max. Overhang Length L/D≈5.5 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

F

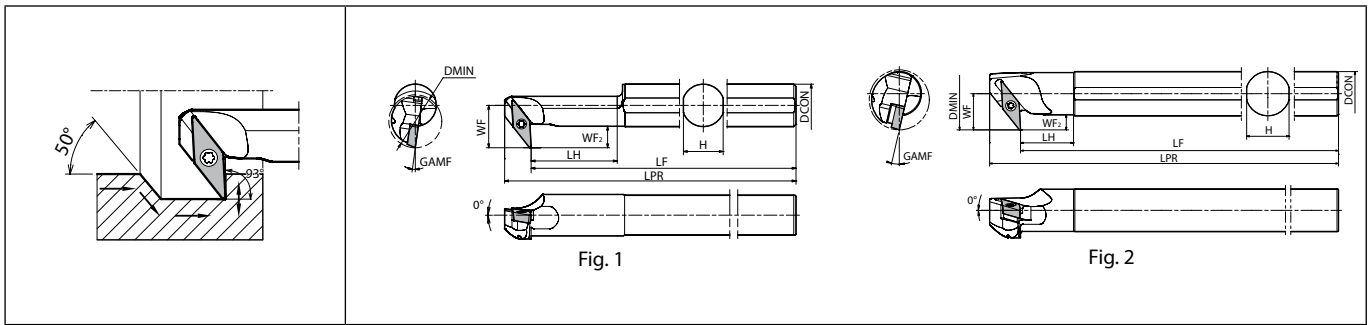
Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LPR	LF	WF	WF ₂	Screw					Wrench	Wrench	Shim	Shim screw	Wrench		
A12M- SVZC%08-16AE	●	●	16	12	4	11	25.5	150	142.5	11.5	5.5	8	0.4	Yes	1	SB-2050TR	-	FT-6	-	-	-	VC□T0802... VC□W0802...	
A16Q- SVZB%11-20AE	●	●	20	16	5	15	32.5	180	170	16	8	8	0.4	Yes	1	SB-2570TR	-	FT-8	-	-	-	VB□T1103... VB□W1103...	
A20R- SVZB%11-25AE	●	●	25	20		19	40.5	200	190	18		7											
A25S- SVZB%16-34AE	●	●	34	25	5	24	30	250	232.5	20.5	8.5	13	0.4	Yes	2	SB-4012STRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB□T1604... VB□W1604... VC□T1604...	
A32S- SVZB%16-40AE	●	●	40	32	5	31	72.5	250	232.5	28	12	9	0.4	Yes	1								

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SVZC(B)-A Steel shank bar (Back boring)



Max. Overhang Length L/D≈4 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts						Applicable inserts
																	Screw	Wrench	Wrench	Shim	Shim screw	Wrench	
S12M- SVZC%0.08-16A	●	●	16	12	11	25.5	150	142.5	11.5	5.5	8	0.4	No	1	SB-2050TR	-	FT-6	-	-	-	VC...T0802... VC...W0802...		
S16Q- SVZB%1.11-20A	●	●	20	16	15	32.5	180	170	16	8	8	0.4	No	1	SB-2570TR	-	FT-8	-	-	-	VB...T1103... VB...W1103...		
S20R- SVZB%1.11-25A	●	●	25	20	19	40.5	200	190	18	8	7	0.4	No	1	SB-2570TR	-	FT-8	-	-	-	VB...T1103... VB...W1103...		
S25S- SVZB%1.16-34A	●	●	34	25	24	30	250	232.5	20.5	8.5	13	0.4	No	2	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB...T1604... VB...W1604... VC...T1604...		
S32S- SVZB%1.16-40A	●	●	40	32	31	72.5	250	232.5	28	12	9	0.4	No	1	SB-40125TRN	FT-15	-	SVN-32N (SVN-32S*)	SS-4N	LW-4	VB...T1604... VB...W1604... VC...T1604...		

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

Applicable inserts (A-SVZC(B)-AE / S-SVZC(B)-A)

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-Ferrous metals
Insert								
Chipbreaker type	VF	PP	GP	HQ	%L-F	%L-FSF	%L-Y	PCD
Page	B97, B100	B97, B100	B97	B97, B100	B98	B98	B99	C49, C50
Applications	Hard materials							
Insert								
Chipbreaker type	CBN							
Page	C26, C27							

Recommended cutting conditions F159
Applicable sleeves F155~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



A/S-SWUB(P)-AE Excellent bar (Boring)

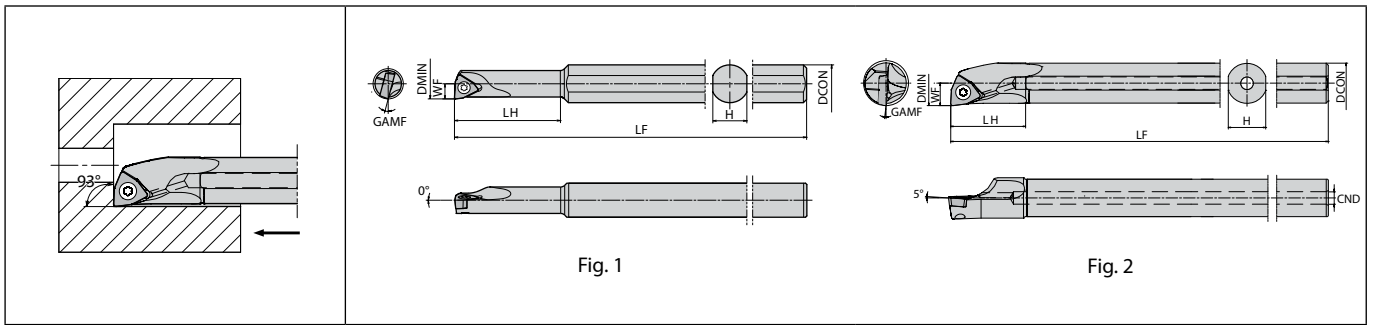


Fig. 1

Fig. 2

Max. Overhang Length L/D≈5.5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

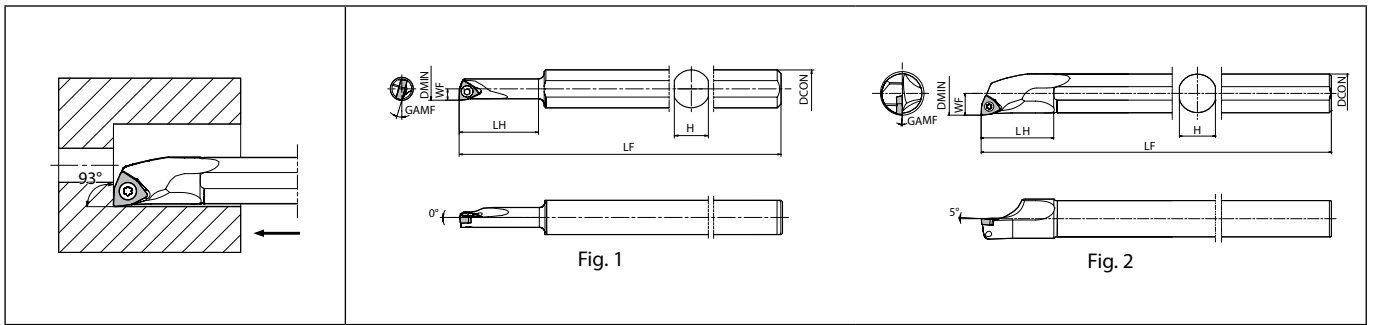
F

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
			R	L	DMIN	DCON	CND	H	LH	LF					WF	Screw	Wrench	
S10H- SWUB%L.06-06AE	●	●	6	10	-	9	21	3	15	0.2	No	1	SB-2035TR	-	FT-6	WB□T0601... WB□W0601...		
S10H- SWUB%L.06-07AE	●	●	7	10	-	9	25	3.5	13									
S10H- SWUB%L.08-08AE	●	●	8	10	-	9	28	4	15	0.2	No	1	SB-2035TR	-	FT-6	WB□T0802... WB□W0802...		
A08X- SWUB%L.08-10AE	●	●	10	8	2.5	7	16	120	5	0.2	Yes	2	SB-2050TR	-	FT-6			
A10L- SWUB%L.08-12AE	●	●	12	10	3	9	20	140	6	10								
A12M- SWUP%L.11-14AE	●	●	14	12	4	11	24	150	7	4	0.4	Yes	2	SB-2545TR	-	FT-8	WP□T1102... WP□W1102...	
A16Q- SWUP%L.11-18AE	●	●	18	16	5	15	30	180	9	1								
A16Q- SWUP%L.16-18AE	●	●	18	16	5	15	30	180	9	3.5	0.8	Yes	2	SB-4065TR	FT-15	-	WP□T1603... WP□W1603...	
A20R- SWUP%L.16-22AE	●	●	22	20		19	36	200	11	2								

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SWUB(P)-A Steel shank bar (Boring)



Max. Overhang Length L/D≈4 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

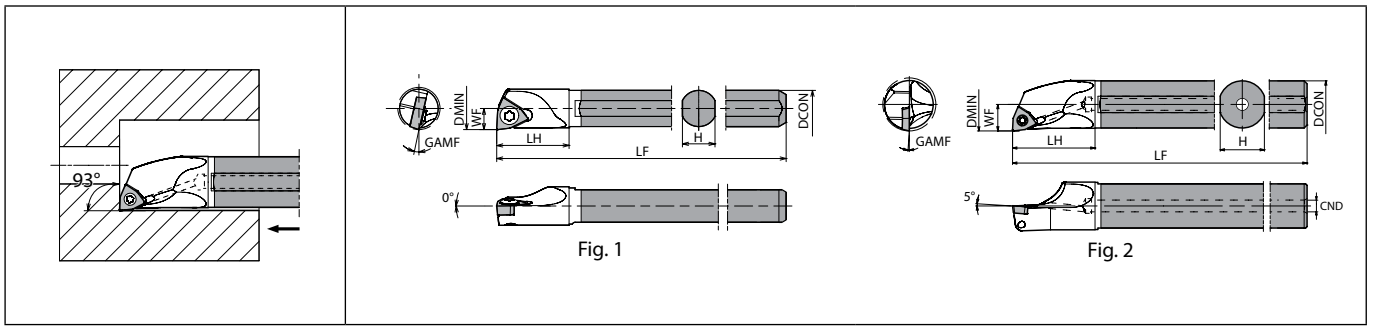
Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
			R	L	DMIN	DCON	H	LH	LF					WF	Screw	Wrench	
S10H- SWUB%L.06-06A	●	●	6	10	9	21	100	3	15	0.2	No	1	SB-2035TR	-	FT-6	WB□T0601... WB□W0601...	
S10H- SWUB%L.06-07A	●	●	7			25		3.5	13								
S10H- SWUB%L.08-08A	●	●	8	10	9	28	100	4	15	0.2	No	1	SB-2035TR	-	FT-6	WB□T0802... WB□W0802...	
S08X- SWUB%L.08-10A	●	●	10	8	7	16	120	5	13	0.2	No	2	SB-2050TR				
S10L- SWUB%L.08-12A	●	●	12	10	9	20	140	6	10								
S12M- SWUP%L.11-14A	●	●	14	12	11	24	150	7	4	0.4	No	2	SB-2545TR	-	FT-8	WP□T1102... WP□W1102...	
S16Q- SWUP%L.11-18A	●	●	18	16	15	30	180	9	1								
S16Q- SWUP%L.16-18A	●	●	18	16	15	30	180	9	3.5	0.8	No	2	SB-4065TR	FT-15	-	WP□T1603... WP□W1603...	
S20R- SWUP%L.16-22A	●	●	22	20	19	36	200	11	2								

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



C/E-SWUB(P)-A(N) Carbide shank bar (Boring)



Max. Overhang Length L/D≈~7 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.


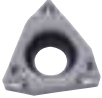







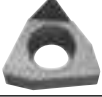

F


Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Spare parts			Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF	Screw					Wrench	Wrench		
C05H- SWUB%L06-06AN	●	●	6	5	-	4.4	9	100	3	15	0.2	No	1	SB-2035TR	-	FT-6	WB□T0601... WB□W0601...	
C06J- SWUB%L06-07AN	●	●	7	6	-	5.4	10	110	3.5	13								
C07K- SWUB%L08-08AN	●	●	8	7	-	6.4	11	125	4	15	0.2	No	1	SB-2035TR				
E08L- SWUB%L08-10AN	●	●	10	8		7	14	140	5	13								
E10N- SWUB%L08-12AN SWUBR08-12AN2/3 SWUBR08-12AN1/2	●	●	12	10	3	9	18	160	6	10	0.2	Yes	2	SB-2050TR	-	FT-6	WB□T0802... WB□W0802...	
	●	105																
	●	80																
E12Q- SWUP%L11-14A SWUPR11-14A-2/3 SWUPR11-14A-1/2	●	●	14	12	4	11	23	180	7	4	0.4	Yes	2	SB-2545TR	-	FT-8	WP□T1102... WP□W1102...	
	●	120																
	●	90																
E16X- SWUP%L11-18A SWUPR11-18A-2/3 SWUPR11-18A-1/2	●	●	18	16	4	15	28	220	9	1	0.8	Yes	2	SB-4065TR	FT-15	-	WP□T1603... WP□W1603...	
	●	145																
	●	110																
E16X- SWUP%L16-18A SWUPR16-18A-2/3 SWUPR16-18A-1/2	●	●	18	16	4	15	28	220	9	3.5	0.8	Yes	2	SB-4065TR	FT-15	-	WP□T1603... WP□W1603...	
	●	145																
	●	110																
E20S- SWUP%L16-22A SWUPR16-22A-2/3 SWUPR16-22A-1/2	●	●	22	20	6	19	32	250	11	2	0.8	Yes	2	SB-4065TR	FT-15	-	WP□T1603... WP□W1603...	
	●	165																
	●	125																

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

Applications	Minute ap	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium
Insert								
Chipbreaker type	W/L-CF	W/L-PF	GP	W/L-DP	HQ	W/L-F	W/L-P	W/L-Y
Page	B105	B105	B107	B105	B107	B105, B106	B106	B107
Applications	Cast iron	Non-Ferrous metals	Hard materials					
Insert								
Chipbreaker type	No CB	PCD	CBN					
Page	B107	C51, C52	C28					

Recommended cutting conditions  F158, F159



Boring

25° insert profiling tools

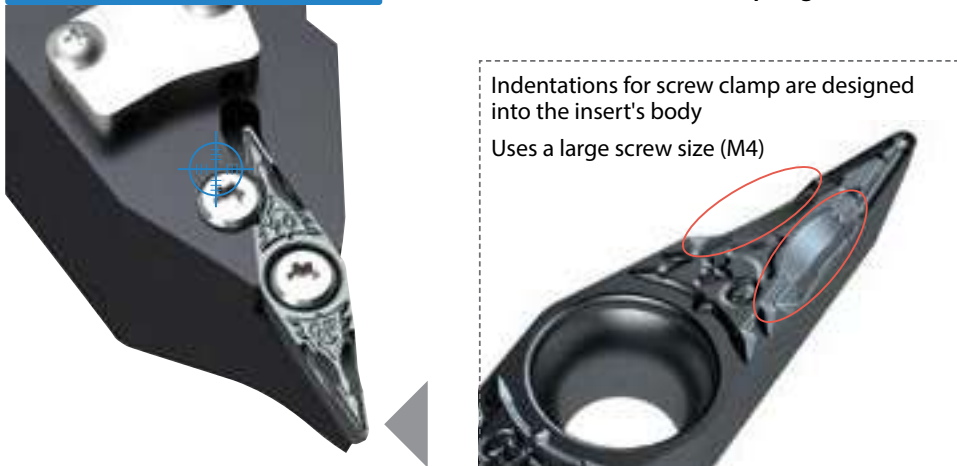
ZBMT series

Unique clamping structure and a wide lineup of external toolholders and boring bars. High precision and stable machining in a wide range of applications including copying, undercutting, tapering, V-slotting, spherical machining, and more.

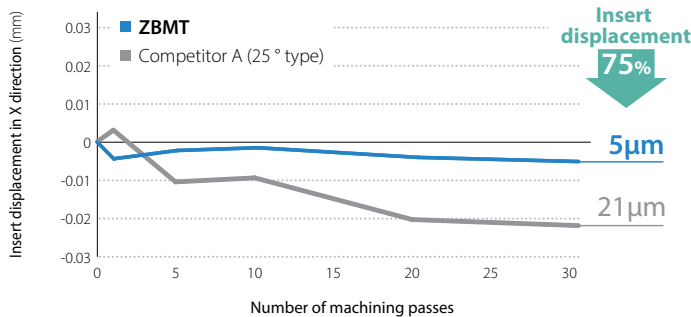
1 Newly developed unique-clamping mechanism achieves a higher rigidity

Side lock mechanism

Unique design holds insert at 2 points
Safe even for insert with small tip angle that is difficult to mount



Insert displacement during facing comparison (Internal evaluation)



Cutting conditions : Vc = 230 m/min, ap = 0.3 mm, f = 0.15 mm/rev, Wet Workpiece material 34CrMo4

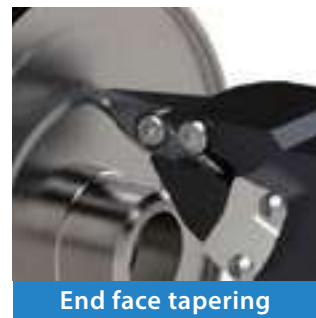
*The above figures are not guaranteed. It depends on cutting conditions.

Check

- By controlling insert displacement,
- Machining precision is stabilized and long tool life is enable
 - Reduces defect rate due to sudden dimensional deviation

Provides high quality and stable machining in various machining applications

Excellent performance in various machining applications including copying, undercutting, tapering, V-slotting, spherical machining, etc.



CG images

F



Boring

Solid

Positive

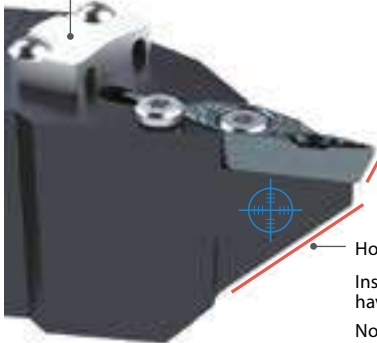
KAV

Negative

2 Unique holder design to meet customers' needs

Both boring bars and external toolholders are compatible with internal coolant.

Uses a clamp with a small thickness that does not prevent chip flow



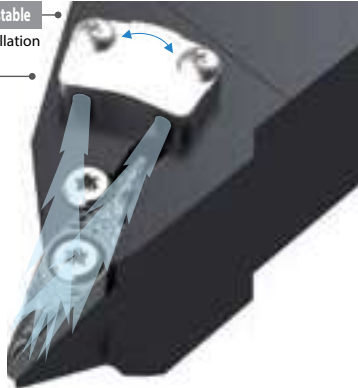
Unique double coolant hole design

Supplies coolant directly to the cutting edge and provides improved chip evacuation and long tool life (Coolant discharge direction: Fine adjustment possible)

*Though coolant stream hits side clamp screw, machining performance is not affected

*Pressure resistance: ~ 3 MPa

Fine tuned and adjustable
± 4 ° Adjustable oscillation




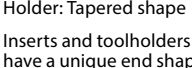
Easy to use for facing

Insert corner : 2-step positive type (20°)


Holder: Tapered shape

Inserts and toolholders have a unique end shape

No additional machining is required when trying to avoid interference with workpiece.

Effective for facing applications



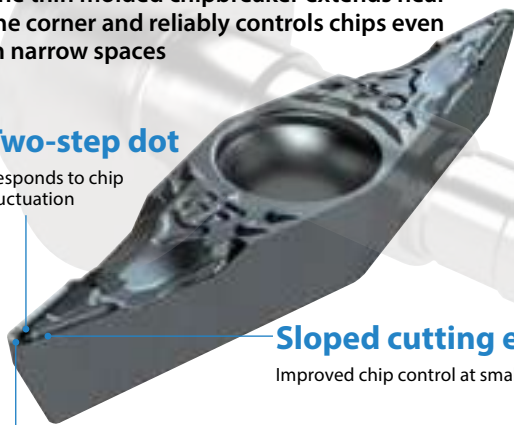
3 New GF chipbreaker for ZBMT reduces chip control issues at minute D.O.C.

GF chipbreaker Solving chip control issues leads to high-quality surface finishes

The thin molded chipbreaker extends near the corner and reliably controls chips even in narrow spaces

Two-step dot

Responds to chip fluctuation



Sloped cutting edge

Improved chip control at small D.O.C.

Mortar-shaped chipbreaker

Low resistance and excellent chip control even in ductile workpieces

Chip control comparison
(Internal evaluation)



GF chipbreaker

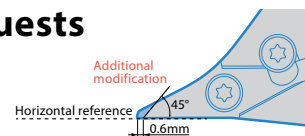


Competitor A (25° type)

Cutting conditions : Vc = 230 m/min, f = 0.15 mm/rev, ap = 0.2 - 0.5 mm, Wet Workpiece material 34CrMo4 Facing

15° Inserts are also available upon customer requests

To avoid holder interference, additional modifications is required as shown in the figure on the right. Also, as shown in the figure below, special order for holders may be required depending on machining application.



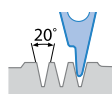
Examples

When using the toolholder in reverse mounting position



When using the toolholder in normal mounting position

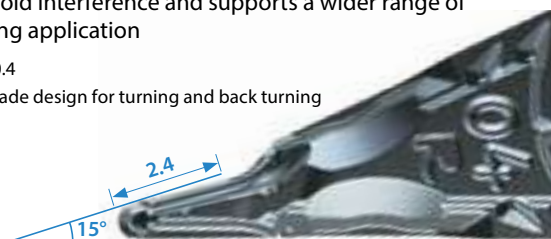
* Holder: Special order specification



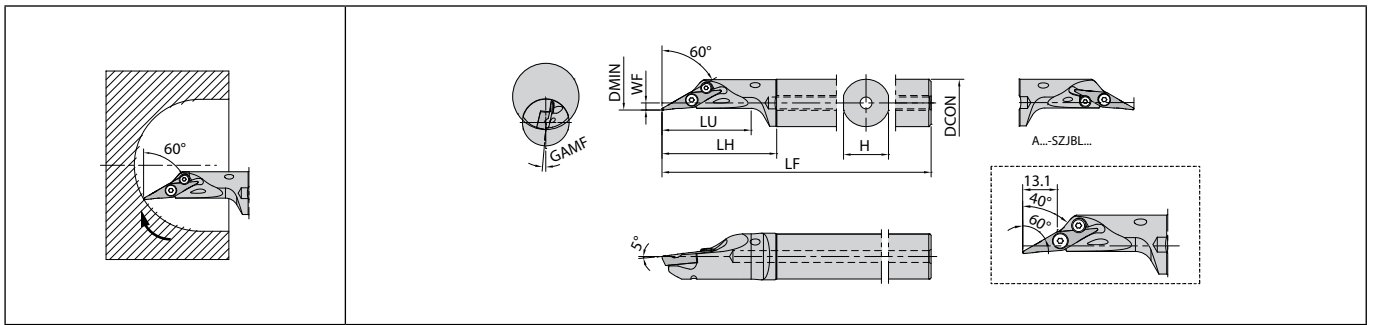
15° inserts are developed relative to 25° inserts
Helps avoid interference and supports a wider range of machining application

Corner-R 0.4

Double-blade design for turning and back turning



A-SZJB-AE Excellent bar (Spherical machining / Internal facing / Internal copying)



Max. Overhang Length L/D≈5.5 | Right-hand shown | ZBMT13T304R-GF-15D is applicable to Right-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	LU	WF	Screw	Wrench						
A20R- SZJB% 13-28AE	●	●	28	20		19	48	200	37.5	3	5	0.4	Yes	SB-3079TR	FT-8	ZBMT13T3...		
A25S- SZJB% 13-30AE	●	●	30	25	5	24	58	250	47	3.5								
A32S- SZJB% 13-40AE	●	●	40	32		31	72		61.5									

For application of A-SZJB-AE, please refer to F93.

Applicable inserts

Applications	Finishing	Finishing	Non-ferrous metals
Insert			
Chipbreaker type	GF	R-GF-15D	NE
Page	B108	B108	C53

R-GF-15D inserts are only for the right-hand toolholders of A-SZJB-AE.

Recommended cutting conditions [F159](#)

Applicable sleeves [F156](#)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

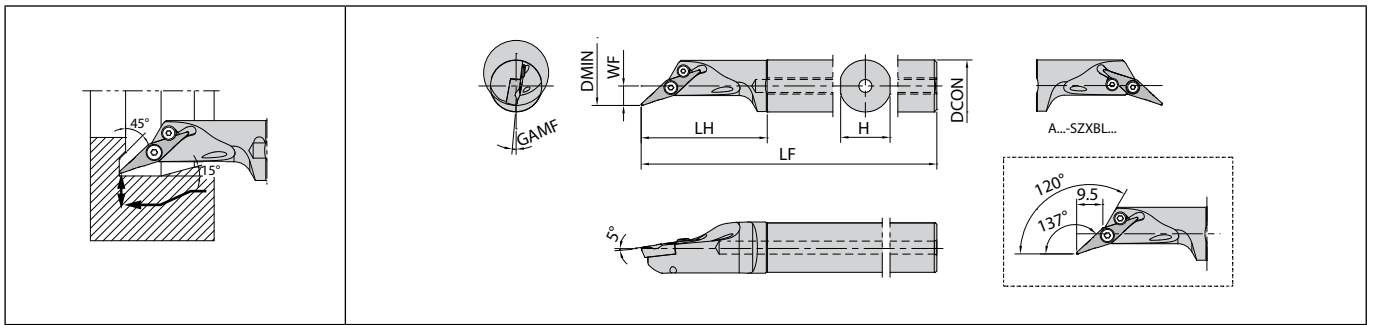
Solid

Positive

KAV



Negative

A-SZXB-AE Excellent bar (Internal facing / Internal copying / Undercutting)



Max. Overhang Length L/D≈5.5 | Right-hand shown



Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	LU	WF				Screw	Wrench	
																
A20R- SZXB%13-25AE	●	●	25	20		19	48	200	37.5	7.5	5	0.4	Yes	SB-3079TR	FT-8	ZBMT13T3...
A25S- SZXB%13-30AE	●	●	30	25	5	24	58	250	45.2	7						
A32S- SZXB%13-40AE	●	●	40	32		31	74		60.2							



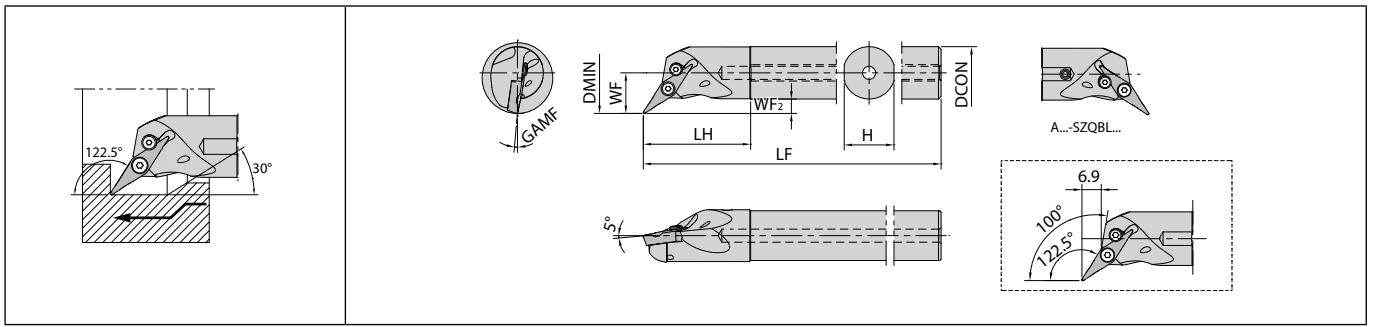
Applicable inserts

Applications	Finishing	Non-ferrous metals
Insert		
Chipbreaker type	GF	NE
Page	B108	C53

Recommended cutting conditions  **F159**
 Applicable sleeves  **F156**

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-SZQB-AE Excellent bar (Internal copying / Undercutting)



Max. Overhang Length L/D≈5.5 | Right-hand shown

F

Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF	WF2	Screw	Wrench						
A20R- SZQB [®] /L 13-27AE	●	●	27	20		19	41	200	15.5	5.5	5	0.4	Yes	SB-3079TR	FT-8	ZBMT13T3...		
A25S- SZQB [®] /L 13-32AE	●	●	32	25	5	24	51	250	18									
A32S- SZQB [®] /L 13-40AE	●	●	40	32		31	54		22.5	6.5								

Applicable inserts

Applications	Finishing	Non-ferrous metals
Insert		
Chipbreaker type	GF	NE
Page	B108	C53

Recommended cutting conditions F159

Applicable sleeves F156

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Boring

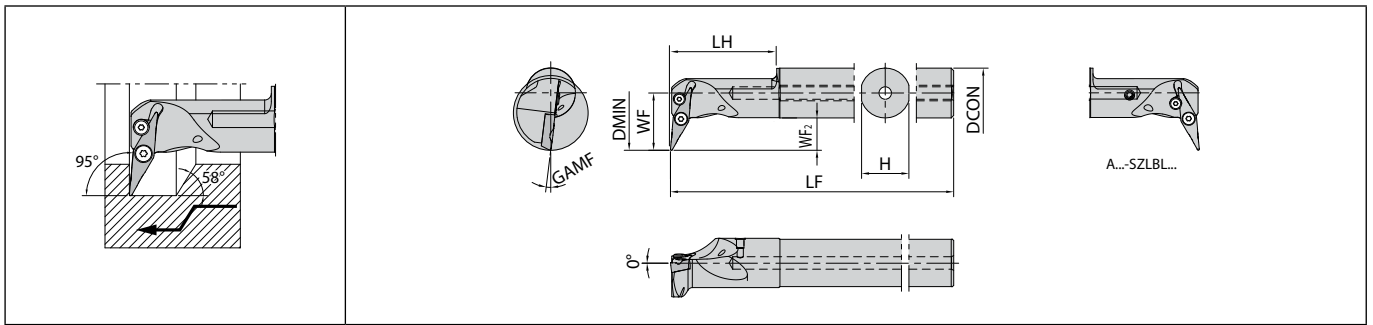
Solid

Positive

KAV

Negative

A-SZLB-AE Excellent bar (Internal copying)



Max. Overhang Length $L/D \approx 5.5$ | Right-hand shown | ZBMT13T304R-GF-15D is applicable to Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
	R	L	DMIN	DCON	CND	H	LH	LF	WF	WF ₂	Screw	Wrench						
	A20R- SZLB%13-30AE	●	●	30	20		19	42	200	23								
A25S- SZLB%13-34AE	●	●	34	25	5	24	64	250	25.5	13	7	0.4	Yes	SB-3079TR	FT-8		ZBMT13T3...	
A32S- SZLB%13-40AE	●	●	40	32		31	86		29									

Applicable inserts

Applications	Finishing	Finishing	Non-ferrous metals
Insert			
Chipbreaker type	GF	R-GF-15D	NE
Page	B108	B108	C53

R-GF-15D inserts are only for the left-hand toolholders of A-SZLB-AE.

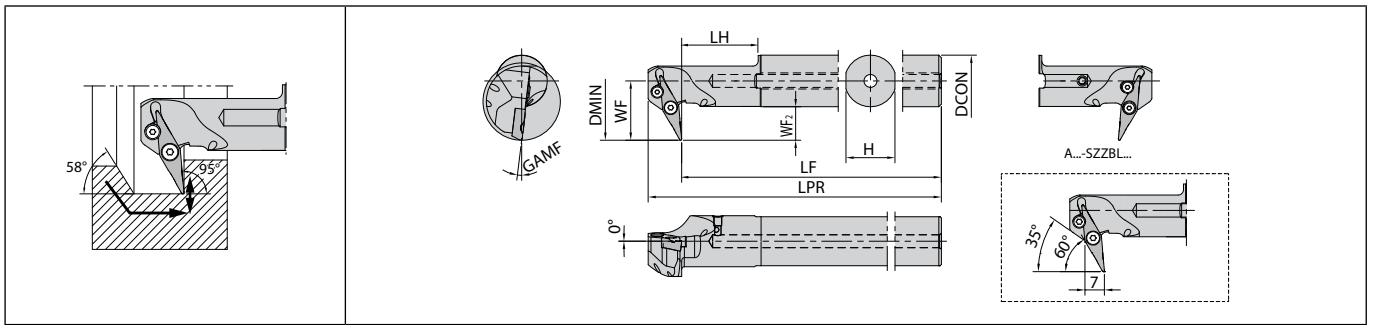
Recommended cutting conditions [F159](#)

Applicable sleeves [F156](#)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-SZZB-AE Excellent bar (Back boring)



Max. Overhang Length L/D≈5.5 | Right-hand shown | ZBMT13T304R-GF-15D is applicable to Right-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)										GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts	
	R	L	DMIN	DCON	CND	H	LH	LPR	LF	WF	WF2	Screw				Wrench			
A20R- SZZB%13-30AE	●	●	30	20		19	42	200	187	23									ZBMT13T3...
A25S- SZZB%13-34AE	●	●	34	25	5	24	58	250	237	25.5	13	7	0.4	Yes	SB-3079TR	FT-8			
A32S- SZZB%13-40AE	●	●	40	32		31	74			29									

Applicable inserts

Applications	Finishing	Finishing	Non-ferrous metals
Insert			
Chipbreaker type	GF	R-GF-15D	NE
Page	B108	B108	C53

R-GF-15D inserts are only for the right-hand toolholders of A-SZZB-AE.

Recommended cutting conditions F159

Applicable sleeves F156

Instructions

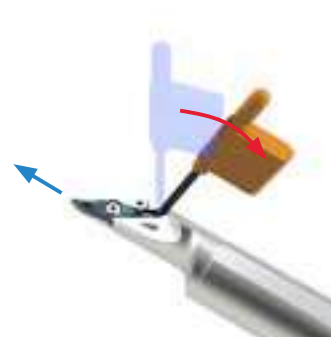
When mounting the insert (Tightening torque: 1.2 N·m)



1. Tighten the main screw with the insert pressed against the contact surface with fingertips.

2. Tighten the side screw to complete the installation.

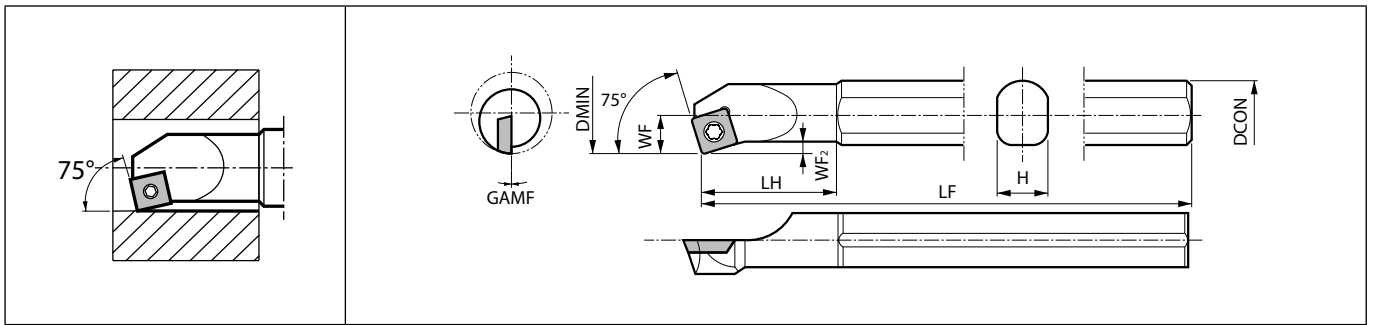
When removing the insert



Remove the two screws and put the wrench into the gap at the back end of the insert. It can be easily removed by pushing out the insert as shown above.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-SSKP Steel shank bar (Boring)




Max. Overhang Length L/D≈~3 | Right-hand shown | Left-hand Insert for Right-hand Toolholder.


Toolholder dimensions

Description	Availability	Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts		Applicable inserts
		R	DMIN	DCON	H	LH	LF	WF	WF ₂				Screw	Wrench	
		●	20	16	14	30	180	10	2				-3	0.8		No			SPGH0903...

Applicable inserts

Applications	Finishing
Insert	
Chipbreaker type	L
Page	B82

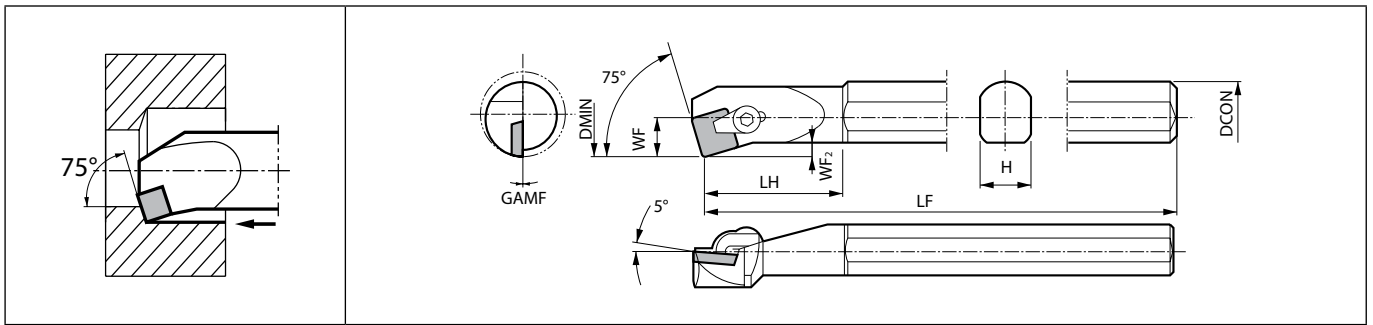
Recommended cutting conditions  F159

Applicable sleeves  F156, F157



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-CSKP Steel shank bar (Boring)



Max. Overhang Length L/D≈~3 | Right-hand shown | Left-hand Insert for Right-hand Toolholder.

F

Toolholder dimensions

Description	Availability	Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts			Applicable inserts
		R	DMIN	DCON	H	LH	LF	WF	WF2				Clamp set	Wrench	Wrench	
S16N- CSKPR09-20	●	20	16	14	40	160	10	2	0	0.8	No	CPS-2	-	FH-2.5	SP□N0903... SP□R0903...	
S20Q- CSKPR09-27	●	27	20	18	45	180	13.5	3.5	0	0.8	No	CPS-3	LW-3	-	SP□N1203... SP□R1203...	
S25X- CSKPR12-34	●	34	25	23	60	220	17	4.5	0	0.8	No	CPS-3	LW-3	-	SP□N1203... SP□R1203...	

Applicable inserts

Applications	Medium	Medium	Finishing - Medium	Cast iron	Cast iron	Non-Ferrous metals
Insert						
Chipbreaker type	G	STD	L	No CB	Ceramic	PCD
Page	B83	B83	B83	B83	B121	C43

Recommended cutting conditions F159

Applicable sleeves F156, F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

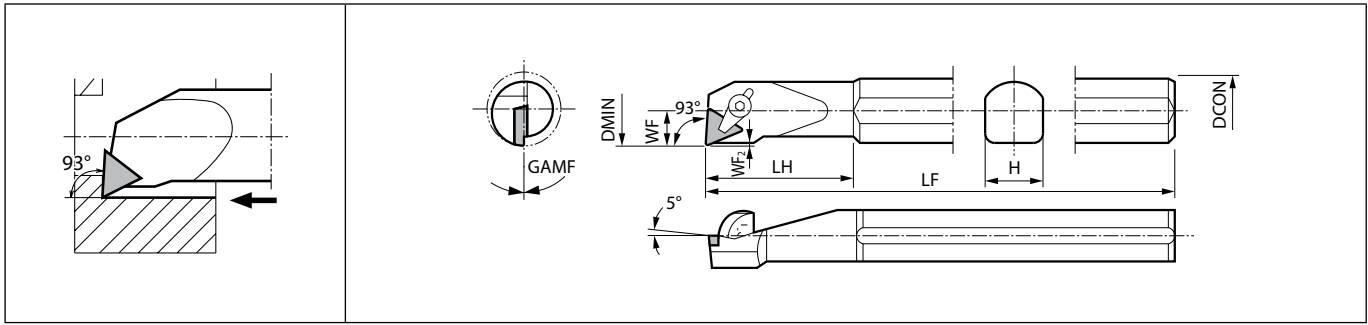
Solid

Positive

KAV

Negative

S-CTUP Steel shank bar (Boring)



Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts						Applicable inserts
														Clamp set	Clamp set	Shim screw	Shim	Wrench	Wrench	
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂											
S12L- CTUPR09-16	●		16	12	11	32	140	8	0.5	0	0.4	No	CPS-1	-	-	-	-	FH-2	TP□N0902... TP□R0902...	
S16N- CTUP ^{1/2} 11-20	●	●	20	16	15	30	160	10	0.5	0	0.4	No	-	CPS-2	-	-	-	FH-2.5	TP□N1103... TP□R1103...	
S20Q- CTUP ^{1/2} 11-27	●	●	27	20	18	40	180	13.5	1.3	0	0.4	No	-	CPS-2	-	-	-	FH-2.5	TP□N1103... TP□R1103...	
S25X- CTUP ^{1/2} 16-34	●	●	34	25	23	60	220	17		0	0.8	No	-	CPS-3	-	-	-	-	TP□N1603... TP□R1603...	
S32S- CTUP ^{1/2} 16-43	●	●	43	32	30	70	250	21.5	1	0	0.8	No	-	CPS-3	SP3X10	KPT-32	LW-3	-	TP□N1603... TP□R1603...	
S40X- CTUP ^{1/2} 16-50	●	●	50	40	37	80	315	25		0	0.8	No	-	CPS-3	SP3X10	KPT-32	LW-3	-	TP□N1603... TP□R1603...	

Applicable inserts

Applications	Finishing	Finishing	Finishing - Medium	Medium	Medium	Finishing	Finishing	Finishing - Medium
Insert								
Chipbreaker type	DP	GP	HQ	G	STD	^{1/2} -F	^{1/2} -A	^{1/2} -B
Page	B95	B95	B95	B95	B95	B96	B96	B96
Applications	Medium	Cast iron	Cast iron	Non-Ferrous metals	Hard materials			
Insert								
Chipbreaker type	^{1/2} -C	No CB	Ceramic	PCD	CBN			
Page	B96	B96	B122	C48	C25			

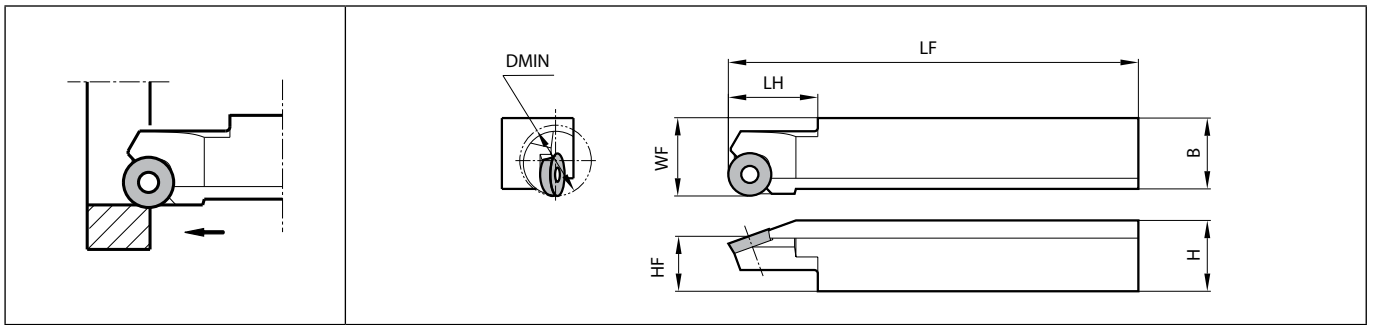
Recommended cutting conditions F159

Applicable sleeves F155~F157

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability






SRCP-B (Boring)



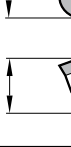
Right-hand shown

F

Toolholder dimensions

Description	Availability		Dimension (mm)									Spare parts			Applicable inserts
												Screw	Wrench	Wrench	
	R	L	DMIN	H	B	LH	HF	LF	WF						
SRCP ^{PL} 2020B-12-A20	●	●	20	20	20	25	15.5	125	22	SB-4TR	FT-15	-	RPMT1203M0-BB		
SRCP ^R 2525B-16-A32	●		32	25	25	31	20	150	27	SB-5090TR	-	LTW-20	RPMT1604M0-BB		

Applicable inserts

Applications	Bearing machining
Insert	
Chipbreaker type	BB
Page	B109

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Boring



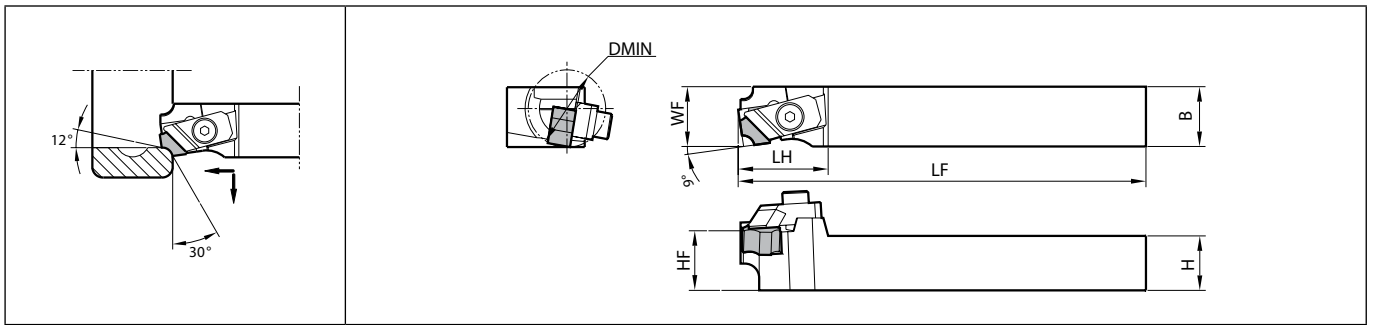
Solid

Positive

KAV



Negative

CBSN-B (Internal round chamfering)




Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)							Spare parts		Applicable inserts	
		R	DMIN	H	B	LH	HF	LF	WF	Clamp set (R)		Wrench
												
CBSNR 2020B-12-A20	●	20	20	20	32	21	125	20	CP-RCR	LW-5	SNMF1204..-21	
2525B-12-A20	●	25	25	32	26	150	25					

Applicable inserts

Applications	Bearing machining
Insert	
Chipbreaker type	21
Page	B109



Boring

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Interchangeable head boring bars with anti-vibration dampener system

KAV series

“Max L/D = 10” Solves deep-boring challenges
 Excellent anti-chatter performance due to unique anti-vibration design and available for a wide range of machining operations

1 Unique anti-vibration mechanism provides superior chatter resistance

F

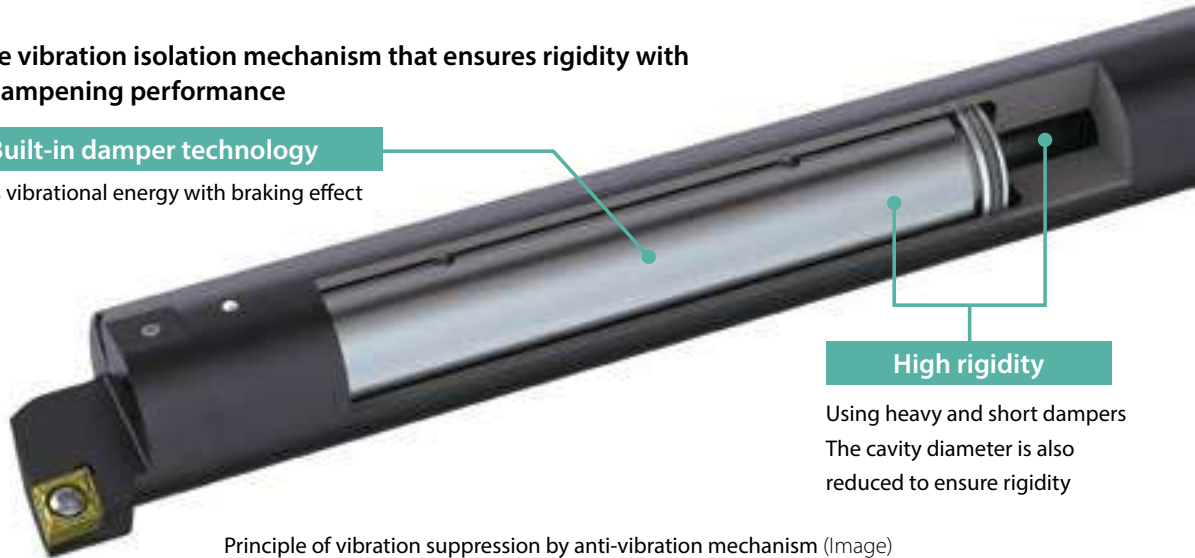
Unique vibration isolation mechanism that ensures rigidity with high dampening performance

Built-in damper technology

Absorbs vibrational energy with braking effect

High rigidity

Using heavy and short dampers
 The cavity diameter is also reduced to ensure rigidity



Principle of vibration suppression by anti-vibration mechanism (Image)

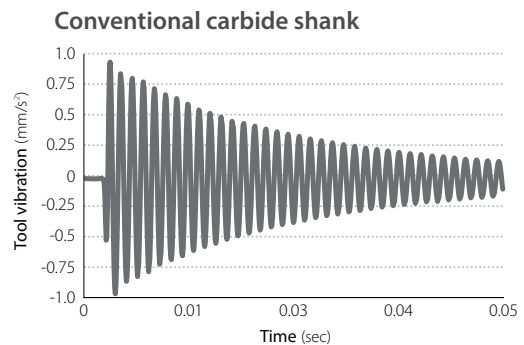
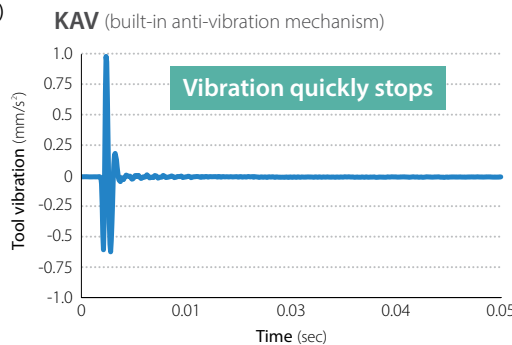


The damper vibrates late against the shank. Effective for vibration damping

Available up to L/D = 10. Excellent anti-vibration performance over conventional carbide shanks

Hammering test (Internal evaluation)

Hammer impacts to the head of the tool (ø20, Overhang length 10D)



**2 Interchangeable heads for a variety of machining applications
Strong fastening with serrated joint structure**

Serrated structure

Securely fastens head and shank



Internal coolant recommended

Internal coolant recommended to prevent damage to anti-vibration mechanism

When using our plumbing parts:
Supports pressures up to 7 MPa
(some items are only recommended up to 1 MPa)

ø16 ~ ø25

ø32
ø40

Coolant pipe connections F129



**3 Easy cutting edge adjustment with E-Sleeve
Smooth machining setup**

E-Sleeve (Sold separately)

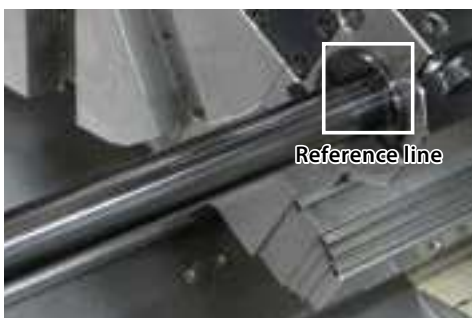
Separated structure with printed reference lines
Easy adjustment reduces setup time



Adjusting the cutting edge position

Exclusive Sleeve (E-Sleeve)

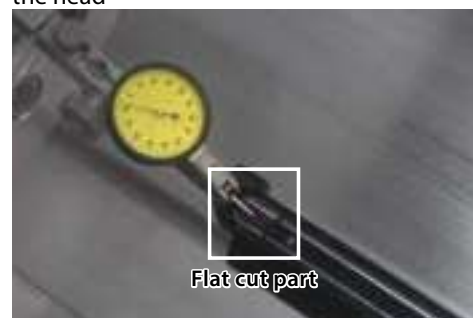
Adjusting the cutting edge position with a reference line



Adjusting the cutting edge position is easy by simply aligning the reference line between the shank and the sleeve.

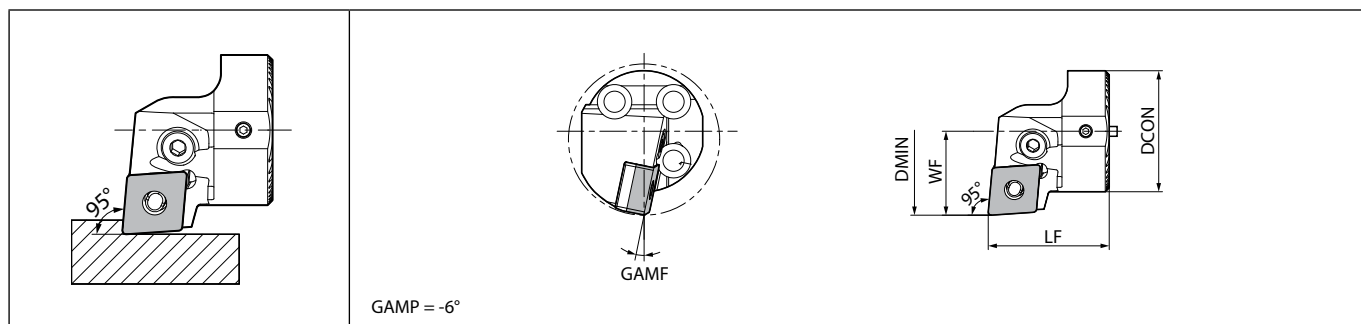
Conventional Sleeve

Adjusting the cutting edge position with the flat cut part of the head



Adjust the flat cut part of the head by moving the tool while applying a dial gauge, etc.

KAVH-PCLN



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

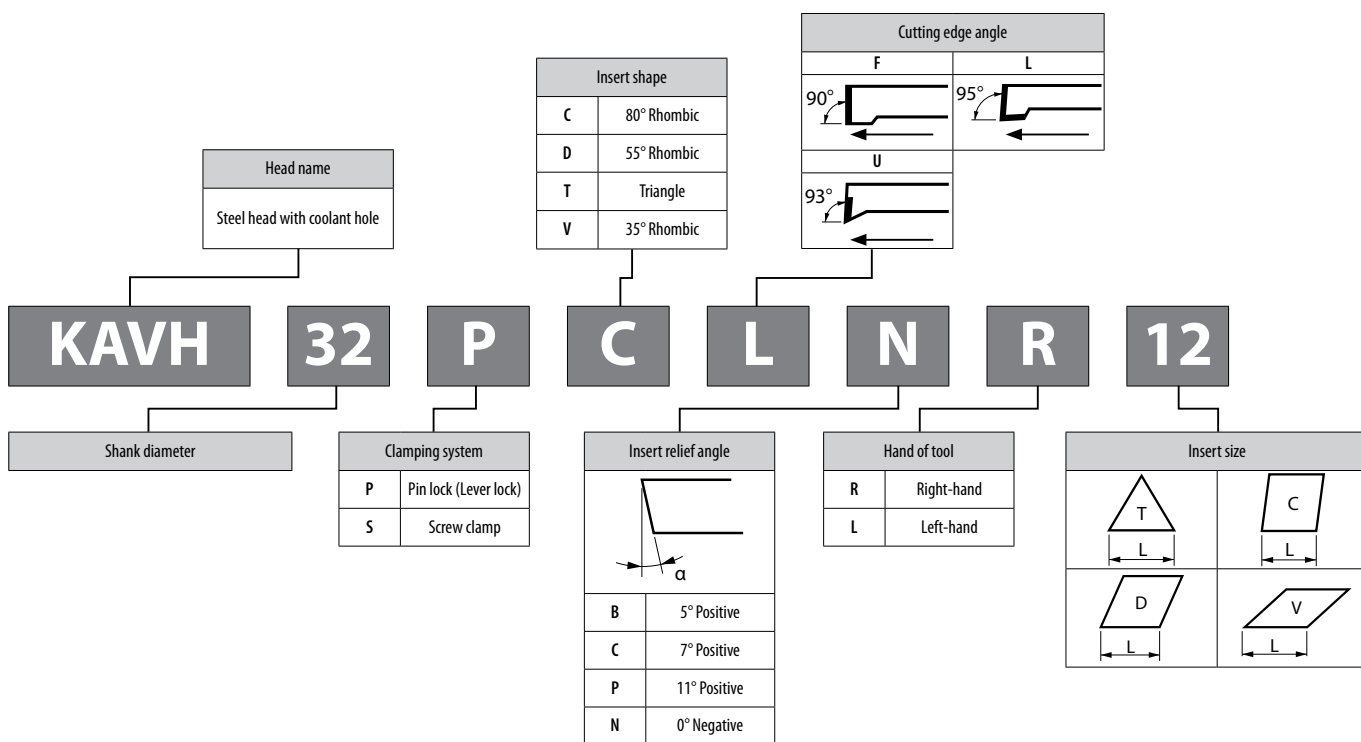
F

Toolholder dimensions

Description	Availability		Dimension (mm)				Standard corner-R(RE)	GAMF (°)	Spare parts						Applicable shank	Applicable inserts
	R	L	DMIN	DCON	LF	WF			Lever	Lock screw	Punch	Shim pin	Shim	Wrench		
KAVH 32-PCLN%12 40-PCLN%12	●	●	40	32	32	22.2	0.8	-11.5	LL-2N	LS-2N	PC-2	LSP-2	LC-42N%L	LW-3	KAV-D32... KAV-D40...	CN□A1204... CN□G1204... CN□M1204...



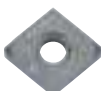
LC-42NR for Right-hand Toolholder, LC-42NL for Left-hand Toolholder.

KAV - Identification system for interchangeable heads




● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

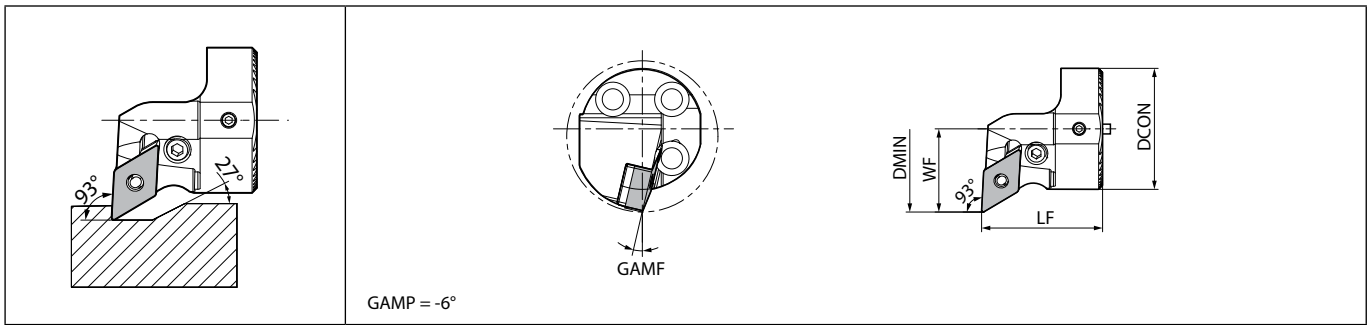
Applicable inserts

Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B16	B16	B16	B16	B16	B16	B16	B17
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	TN-V	PMG	GS	PG	PS	PT
Page	B17	B17	B17	B17	B17	B18	B18	B18
Applications	Medium - Roughing	Roughing	Roughing	Roughing	Medium	Medium - Roughing	Medium - Roughing	Low carbon steel
Insert								
Chipbreaker type	GT	STD	PH	PX	R/L	P/L-25R	Z	XF
Page	B18	B18	B19	B19	B23	B23	B23	B19
Applications	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	XP	XQ	XS	SK	FP-TK	TK	MQ	MS
Page	B19	B19	B20	B20	B20	B20	B20	B21
Applications	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MU	KQ	KG	KH	C	ZS	GC	No CB
Page	B21	B22	B22	B22	B22	B22	B22	B22
Applications	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Heat-resistant alloys	Hard materials	Hard materials
Insert								
Chipbreaker type	Ceramic	P/L-A3	AH	PCD	SQ	SG	HH	HL
Page	B113	B23	B23	C34	B20	B21	C9	C9
Applications	Hard materials	Hard materials / Cast iron						
Insert								
Chipbreaker type	HD	CBN						
Page	C9	C8						



Recommended cutting conditions  F159

KAVH-PDUN



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)				Standard corner-R(RE)	GAMP (°)	Spare parts						Applicable shank	Applicable inserts
									Lever	Lock screw	Punch	Shim pin	Shim	Wrench		
	R	L	DMIN	DCON	LF	WF	LL-1DN	LS-1SN	PC-1	LSP-1	LD-32N	FH-2.5				
KAVH 32-PDUN%L.11	●	●	40	32	32	22	0.4	-13							KAV-D32..	DN□G1104...

Description	Availability		Dimension (mm)				Standard corner-R(RE)	GAMP (°)	Spare parts					Applicable shank	Applicable inserts
									Lock pin	Screw	Shim	Wrench	Wrench		
	R	L	DMIN	DCON	LF	WF	PP-4	SB-2050TR	PD-42	LW-3	FT-6				
KAVH 32-PDUN%L.15	●	●	40	32	32	22	0.8	-12.5						KAV-D32.. KAV-D40...	DN□A1504... DN□G1504...
KAVH 40-PDUN%L.15	●	●	50	40	32	27			DN□M1504... DN□X1504...						

When using inserts whose corner-R(RE) is greater than 1.6 mm, additional modifications to the shim are necessary in order to prevent workpiece and shim from interfering each other.
 For WF chipbreaker, cutting edge offsets or program corrections are required on R34 and R35.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

Solid

Positive


KAV

Negative

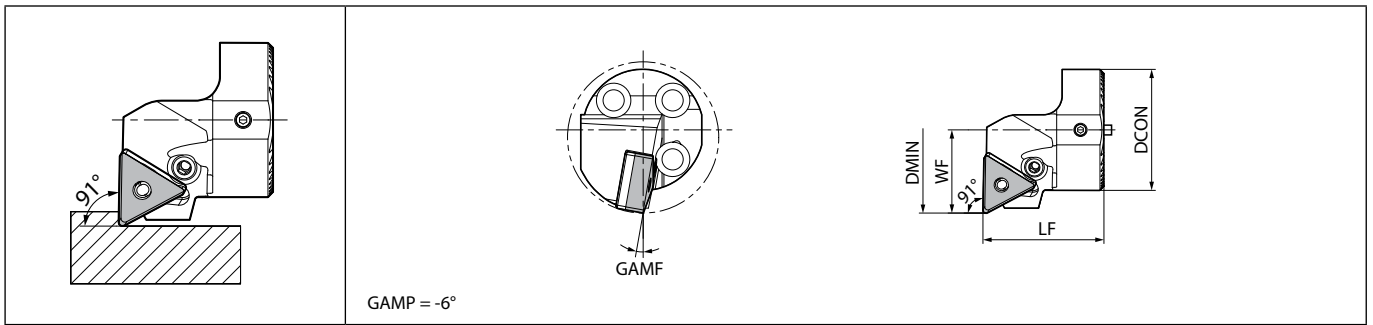
Applicable inserts

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium
Insert								
Chipbreaker type	WF	PP	GP	PQ	HQ	CQ	CJ	TN-V
Page	B24	B24	B24	B24	B25	B25	B25	B25
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PMG	GS	PG	PS	PT	GT	STD	PH
Page	B25	B25	B26	B26	B26	B26	B27	B27
Applications	Roughing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Large ap
Insert								
Chipbreaker type	PX	R/L	XF	XP	XQ	XS	SK	R-LD
Page	B27	B31	B27	B27	B27	B27	B28	B28
Applications	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	FP-TK	TK	MQ	MS	MU	KQ	KG	KH
Page	B28	B28	B28	B29	B29	B30	B30	B30
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	C	ZS	GC	No CB	Ceramic	P/L-A3	AH	PCD
Page	B30	B30	B30	B31	B114	B31	B31	C35
Applications	Heat-resistant alloys	Heat-resistant alloys	Hard materials	Hard materials	Hard materials	Hard materials / Cast iron		
Insert								
Chipbreaker type	SQ	SG	HH	HL	HD	CBN		
Page	B29	B29	C11	C11	C11	C10		



Recommended cutting conditions  F159

KAVH-PTFN



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)				Standard corner-R(RE)	GAMP (°)		Spare parts						Applicable shank	Applicable inserts
										Lever	Lock screw	Punch	Shim pin	Shim	Wrench		
	R	L	DMIN	DCON	LF	WF	LL-1N	LS-1N	PC-1	LSP-1	LT-32N (LT-32N-20*)	FH-2.5					
KAVH 32-PTFN%16 40-PTFN%16	●	●	40	32	32	22	0.8	-10	LL-1N	LS-1N	PC-1	LSP-1	LT-32N (LT-32N-20*)	FH-2.5	KAV-D32..	TN□A1604... TN□G1604...	
	●	●	50	40	32	27	-9	KAV-D40..							TN□M1604... TN□X1604...		

When using inserts whose corner-R(RE) is greater than 1.2 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
For WF chipbreaker, cutting edge offsets or program corrections are required on **R34** and **R35**.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring













Solid


Positive

KAV

Negative

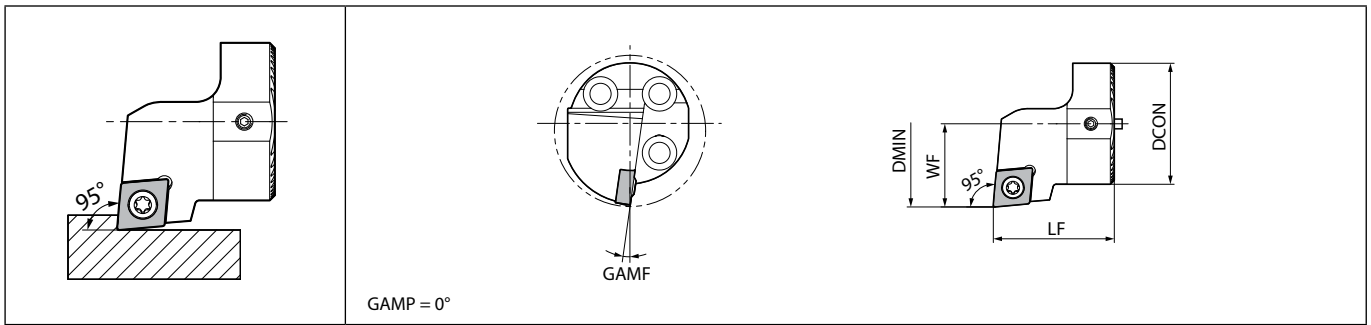
Applicable inserts

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	WF	PP	GP	PQ	HQ	CQ	PMG	GS
Page	B38	B38	B38	B38	B38	B38	B39	B39
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing	Roughing	Finishing
Insert								
Chipbreaker type	PG	PS	PT	GT	STD	PH	PX	1/2-SSF
Page	B39	B39	B39	B39	B40	B40	B40	B44
Applications	Finishing - Medium	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium
Insert								
Chipbreaker type	1/2-B	1/2-C	1/2-25R	XF	XP	XQ	XS	SK
Page	B44	B45	B45	B40	B41	B41	B41	B41
Applications	Large ap	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel	Cast iron
Insert								
Chipbreaker type	R-LD	FP-TK	TK	MQ	M5	MU	1/2-ST	KQ
Page	B41	B41	B41	B42	B42	B42	B42	B42
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Non-Ferrous metals
Insert								
Chipbreaker type	KG	KH	C	ZS	GC	No CB	Ceramic	1/2-A3
Page	B42	B42	B43	B43	B43	B43	B118	B43
Applications	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Hard materials / Cast iron				
Insert								
Chipbreaker type	AH	PCD	SG	CBN				
Page	B43	C36	B42	C13				

Recommended cutting conditions  F159



KAVH-SCLC



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	GAMP (°)	Spare parts			Applicable shank	Applicable inserts
	R	L	DMIN	DCON	LF	WF	Screw	Wrench			Wrench				
KAVH 16-SCLC ^{0.06}	●	●	20	16	20	11	0.4	-7	SB-2545TR	FT-8	-	KAV-D16.. / G16..	CC ⁰ T0602... CC ⁰ W0602...		
KAVH 20-SCLC ^{0.09}	●	●	25	20	20	13	0.4	-8	SB-4065TR	-	FT-15	KAV-D20.. / G20..	CC ⁰ T09T3... CC ⁰ W09T3...		
KAVH 25-SCLC ^{0.09}	●	●	32	25		17									
KAVH 32-SCLC ^{0.09}	●	●	40	32		22									
KAVH 40-SCLC ^{0.09}	●	●	50	40		27									

When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Applicable inserts

Applications	Finishing	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	PF	GF	SKS	SK	CK	GQ	WP	PP
Page	B58	B58	B59	B59	B59	B59	B60	B60
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Low feed	Low feed	Low feed
Insert								
Chipbreaker type	GK	HQ	STD	MF	1/2-L-P	1/2-L-U	1/2-L-USF	1/2-L-J
Page	B60	B60	B60	B61	B63	B63~B65	B63	B65
Applications	Stainless steel / Heat-resistant alloys	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials
Insert								
Chipbreaker type	MQ	No CB	AP	1/2-L-A3	AH	PCD	APD	CBN
Page	B61	B66	B66	B66	B66	C39	C40	C20

Recommended cutting conditions F159

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

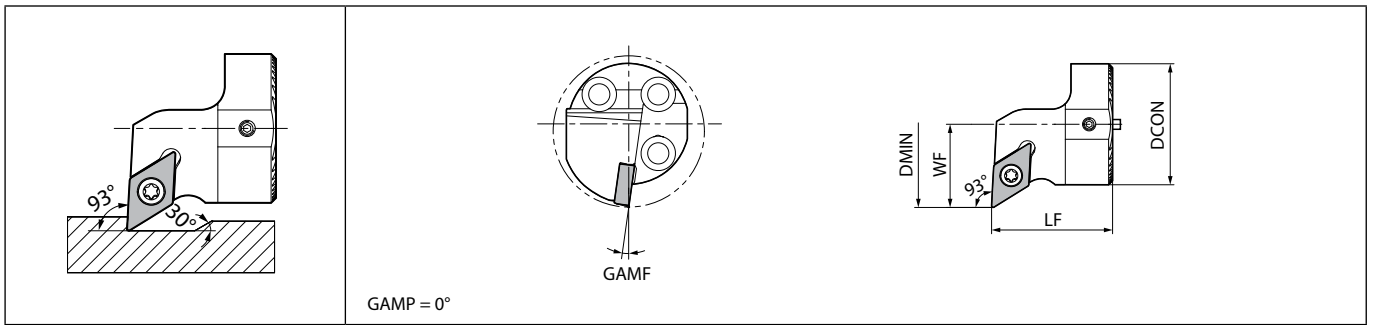
Solid

Positive

KAV

Negative

KAVH-SDUC



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)						Standard corner-R(RE)	GAMF (°)	Spare parts			Applicable shank	Applicable inserts
	R	L	DMIN	DCON	LF	WF	Screw	Wrench			Wrench				
KAVH 16-SDUC%07	●	●	20	16	20	11	0.4	-7	SB-2545TR	FT-8	-	KAV-D16.. / G16..	DC□T0702... DC□W0702... DC□X0702...		
KAVH 20-SDUC%11	●	●	25	20	20	13	0.4	-9	SB-4065TR	-	FT-15	KAV-D20.. / G20..	DC□T11T3... DC□W11T3... DC□X11T3...		
KAVH 25-SDUC%11	●	●	32	25		17		-8							
KAVH 32-SDUC%11	●	●	40	32		22		-7							
KAVH 40-SDUC%11	●	●	50	40		27									

For WP chipbreaker, cutting edge offsets or program corrections are required on R36 and R37.

Applicable inserts

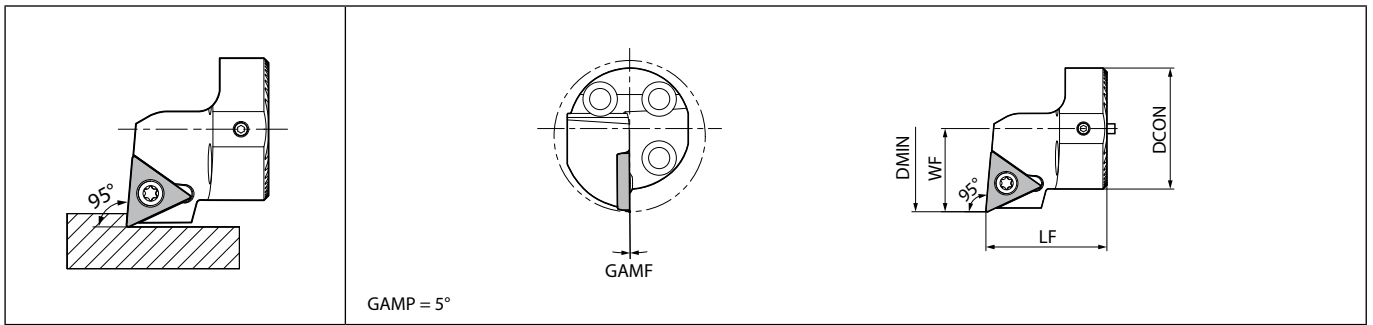
Applications	Minute ap	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing
Insert								
Chipbreaker type	CF	GF	SKS	SK	CK	GQ	WP	1/2-WP
Page	B68	B68	B68	B68	B68	B69	B69	B69
Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Medium	Medium	Finishing	Finishing
Insert								
Chipbreaker type	PP	GP	GK	HQ	STD	MF	1/2-F	1/2-FSF
Page	B69	B69	B70	B70	B70	B70	B72, B73	B72
Applications	Low feed	Low feed	Low feed	Low feed	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Cast iron
Insert								
Chipbreaker type	1/2-U	1/2-USF	1/2-J	1/2-JSF	XP	XQ	MQ	No CB
Page	B74~B76	B74	B77	B76	B71	B71	B71	B78
Applications	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Hard materials		
Insert								
Chipbreaker type	AP	1/2-A3	AH	PCD	APD	CBN		
Page	B78	B78	B78	C42	C42	C22		

Recommended cutting conditions F159

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

F
Boring

KAVH-STLP



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)				Standard corner-R(RE)	GAMF (°)	Spare parts			Applicable shank	Applicable inserts
	R	L	DMIN	DCON	LF	WF			Screw	Wrench	Wrench		
	KAVH 16-STLP ^{90°} 11	●	●	20	16				11	-3.5	SB-3060TR			FT-10	-	KAV-D16.. / G16..	TP□B1103... TP□H1103... TP□T1103... TP□X1103...
20-STLP ^{90°} 11	●	●	25	20	20	13	-2	SB-3080TR	KAV-D20.. / G20..				
25-STLP ^{90°} 11	●	●	32	25		17	0		KAV-D25..				
KAVH 32-STLP ^{90°} 16	●	●	40	32		32	0.4	0	SB-4065TR	-	FT-15	KAV-D32..	TP□B1603... TP□H1603... TP□T1603...
40-STLP ^{90°} 16	●	●	50	40		27					KAV-D40...		

For WP chipbreaker, cutting edge offsets or program corrections are required on **R36** and **R37**.
When using P chipbreaker : Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Applicable inserts

Applications	Finishing	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing
Insert								
Chipbreaker type	WP	^{90°} L-WP	PP	GP	HQ	R/L	^{90°} L-FSF	^{90°} L-P
Page	B88	B88	B88	B89	B89	B90, B91	B92	B92
Applications	Medium	Low feed	Low carbon steel	Low carbon steel	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	^{90°} L-H	^{90°} L-USF	XP	XQ	No CB	AP	PCD	APD
Page	B93	B94	B89	B89	B94	B94	C46, C47	C47
Applications	Hard materials							
Insert								
Chipbreaker type	CBN							
Page	C23							

Recommended cutting conditions F159

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

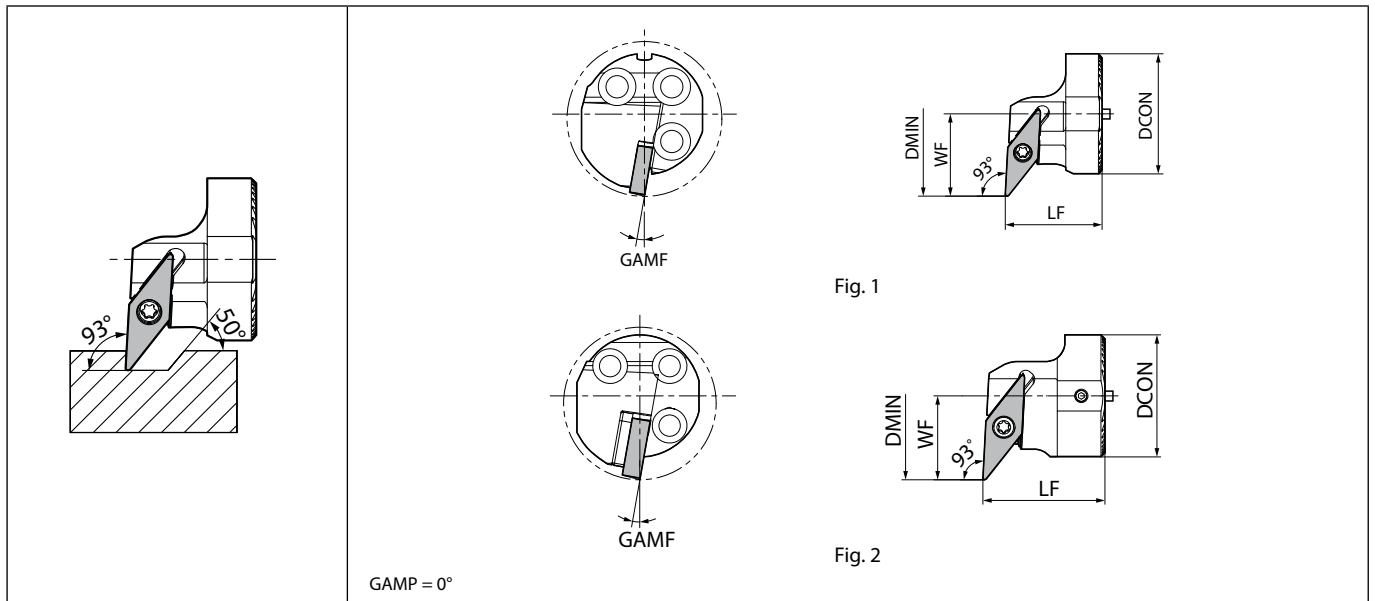
Solid

Positive

KAV

Negative

KAVH-SVUB



GAMP = 0°

Fig. 1

Fig. 2

Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.



Toolholder dimensions

Description	Availability		Dimension (mm)				Standard corner-R(RE)	GAMP (°)	Fig.	Spare parts							Applicable shank	Applicable inserts
										Screw	Screw	Shim screw	Shim	Wrench	Wrench	Wrench		
	R	L	DMIN	DCON	LF	WF												
KAVH 20-SVUB%11 25-SVUB%11	●	●	25	20	20	13	0.4	-10	1		-	-	-	FT-8	-	-	KAV-D20.. / G20.. KAV-D25..	VB□T1103... VB□W1103...
	●	●	32	25		17												
KAVH 32-SVUB%16 40-SVUB%16	●	●	40	32	32	22	0.4	-10	2	-	SB-4012STRN	SS-4N	SVN-32N (SVN-32S*)	-	FT-15	LW-4	KAV-D32.. KAV-D40...	VB□T1604... VB□W1604... VC□T1604...
	●	●	50	40		27				-9								

When using inserts whose corner-R(RE) is 0.2 or 0.4mm, shim (SVN-32S) is recommended (sold separately).

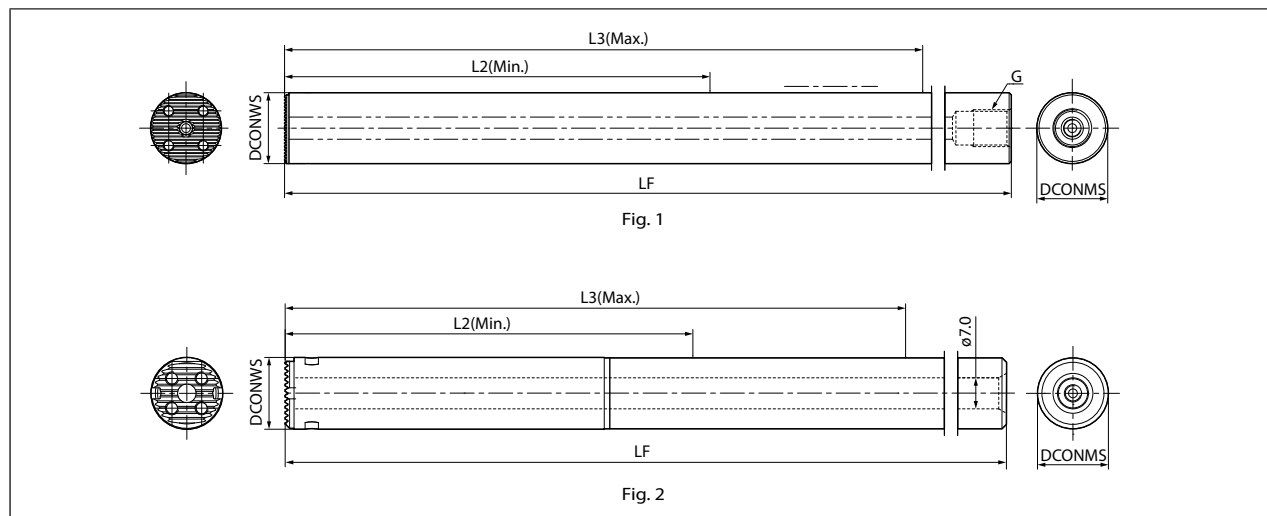
Applicable inserts

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Non-Ferrous metals
Insert								
Chipbreaker type	VF	PP	GP	HQ	%L-F	%L-FSF	%L-Y	PCD
Page	B97	B97	B97	B97	B98	B98	B99	C49
Applications	Hard materials							
Insert								
Chipbreaker type	CBN							
Page	C26							

Recommended cutting conditions [F159](#)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Shank for KAV



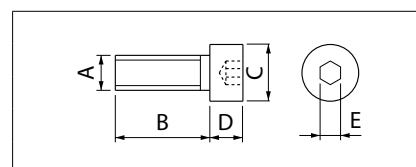
Boring

Toolholder dimensions

Description	Availability	Dimension (mm)						Fig.	Spare parts		
		DCONWS	DCONMS	G	LF	L2 (Min.)	L3 (Max.)		Head fastening bolts (3)	Wrench	O-ring
Standard	KAV- D16-7D	● 16	16	G1/8	157.5	44	92	1	HH3X10S	LW-2.5	GR-006-2
	D20-7D	● 20	20		201.5	60	120		HH3.5X10S		
	D25-7D	● 25	25	G1/4	256.5	80	155		HH4X12S	LW-3	
	D25-10D	●			331.5	155	230				
	D32-7D	●			321.5	96	192		HH5X12	LW-4	
	D32-10D	● 32	32	G3/8	417.5	192	288				
	D40-7D	●			409.5	128	248		HH6X12	LW-5	
	D40-10D	● 40	40	G1/2	529.5	248	368				
Carbide reinforced	KAV- G16-10D	● 16.2	16	-	205.5	92	140	2	HH3X10S	LW-2.5	-
	G20-10D	● 20.2	20		261.5	120	180		HH3.5X10S		

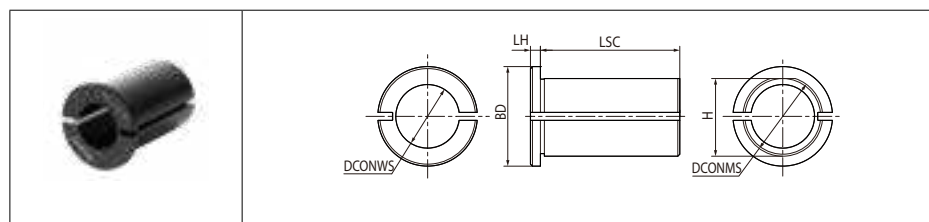
When cutting the back end, consider the length of the shank grip in addition to the amount of overhang length **F130**

Head fastening bolt



Description	Dimension (mm)					Tightening torque (N-m)
	A	B	C	D	E	
HH 3X10S	M3X0.5	10.0	5.0	3.0	2.5	2.2
HH 3.5X10S	M3.5X0.6	10.0	5.5	3.0	2.5	2.2
HH 4X12S	M4X0.7	12.0	7.0	4.0	3.0	3.0
HH 5X12	M5X0.8	12.0	8.5	5.0	4.0	5.0
HH 6X12	M6X1.0	12.0	10.0	6.0	5.0	8.5

Sleeve for KAV (E-Sleeve)



Sleeve dimensions

Description	Availability	Dimension (mm)						Applicable shank
		DCONWS	DCONMS	BD	LH	LSC	H	
SHS 1640-75	● 16	40	50	5	70	39	KAV-D16-7D, KAV-G16-10D	
	● 20						KAV-D20-7D, KAV-G20-10D	
	● 25						KAV-D25-7D/10D	
	● 32						KAV-D32-7D/10D	
SHS 2550-85	● 25	50	60	5	80	48.5	KAV-D25-7D/10D	
	● 32						KAV-D32-7D/10D	
	● 40						KAV-D40-7D/10D	

Choose the sleeve DCONWS together with the shank DCONMS





● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Internal coolant: Piping connections

1 Screw standard for shank back end (pipe connection)


- The thread standard depends on the description. Please refer to the dimension chart "G" on page F128 when using commercially available piping parts.
- When using our piping components, they must be converted to "UNF3/8" or "G1/8."
- Check the table below and select the required joint parts (sold separately).

●Steel shank (Pressure ~ 7MPa)


Type	Thread standards and conversion joints
ø16-7D	G1/8 
ø20-7D ø25-7D/10D	G1/8 ← G1/4 J-ST-G1/4-G1/8 
ø32-7D/10D	G1/8 ← G1/4 ← G3/8 J-ST-G3/8-G1/4 J-ST-G1/4-G1/8 
ø40-7D/10D	G1/8 ← G1/4 ← G3/8 ← G1/2 J-ST-G1/2-G3/8 J-ST-G3/8-G1/4 J-ST-G1/4-G1/8 

If a leak occurs, use a commercially available washer.


Joint

Shape	Description	Availability	M1	M2	L1	L2
	J-ST-G1/4-G1/8	●	G1/8	G1/4	27	12
	J-ST-G3/8-G1/4	●	G1/4	G3/8	33	13
	J-ST-G1/2-G3/8	●	G3/8	G1/2	37	17

●Carbide reinforced shank (Pressure ~ 1MPa)

Type	Thread standards and conversion joints
ø16-10D ø20-10D	 UNF3/8 ← ø7 Straight hole <small>*The shank side is not threaded.</small>

Resin joint (with O-ring)

Shape	Description	Availability	Thread standard
	PR07-ST-UNF3/8	●	UNF3/8

You can order only the included O-ring (GR-004-2).

2 How to connect when using our plumbing parts

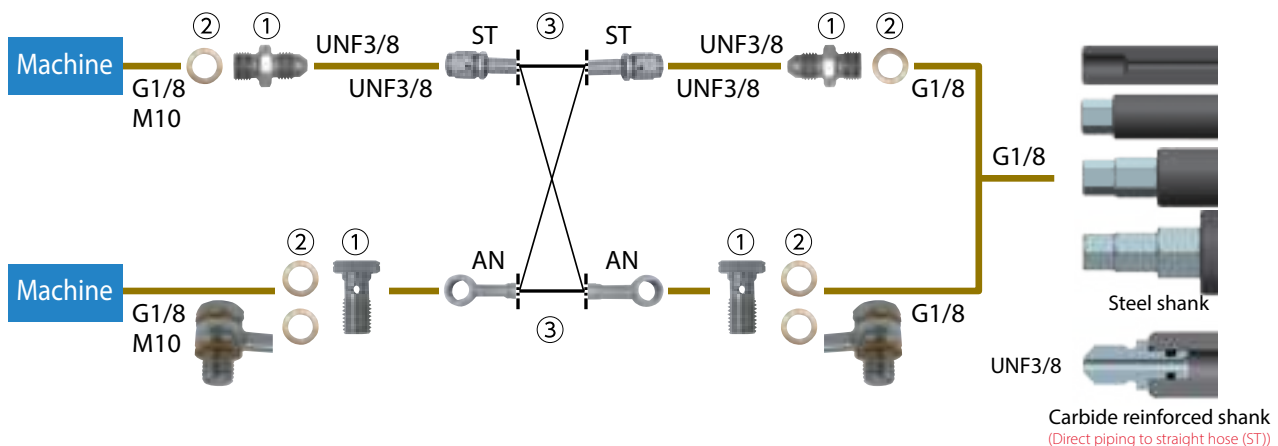
Easy to use with high pressure capable hoses and joints

- Can be used as internal coolant at normal pressure without a high-pressure pump unit
- Banjo bolts for angle hoses available. Supports a wide variety of machines

< Piping installation guide >

- ① Joint/Banjo bolt ③ Hose
② Washer

- ① Joint/Banjo bolt
② Washer



Optional piping parts available (Sold separately) ● D12

Precautions

About the dedicated E-Sleeve

The shank does not have a flat cut. In order to ensure vibration-proof performance, we recommend using a special sleeve (SHS ****-.**) that is sold separately.

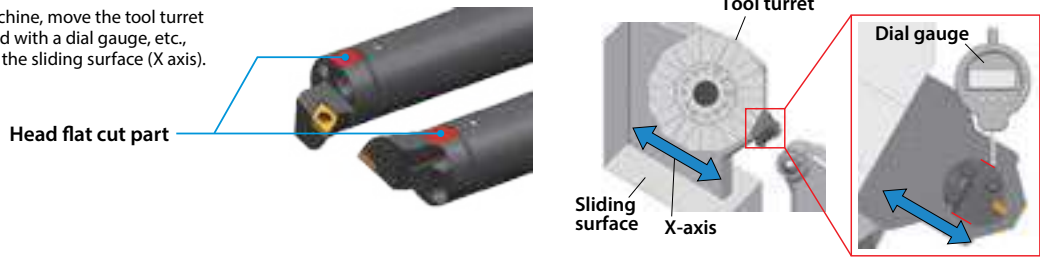


Use the entire sleeve to grasp the shank area.

How to adjust cutting edge position

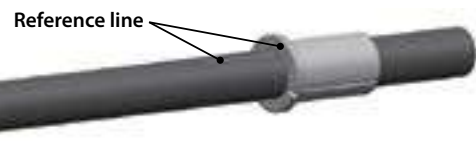
When using a head flat cut part

After attaching the tool to the machine, move the tool turret against the flat cut part of the head with a dial gauge, etc., and make sure that it is parallel to the sliding surface (X axis).



When using the reference lines of the shank/dedicated sleeve (E-Sleeve)

Align the reference lines printed on the shank and the dedicated sleeve (SHS ****-.**). It is possible to more easily adjust the cutting edge position than using the head flat cut part.



Recommendations for internal coolant

Under high temperatures, the anti-vibration mechanism may deteriorate or be damaged. Please use with **internal coolant**.

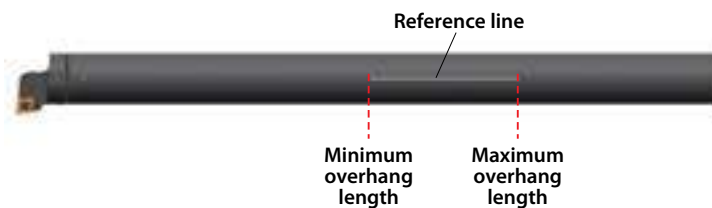
The coolant pressure resistance of the shank is 7 MPa. However, when using coolant parts (PR07-ST-UNF 3/8) for internal coolant in the carbide reinforced shank (KAV-G ***), the coolant pressure is 1 MPa. Please be careful.



Available overhang length range

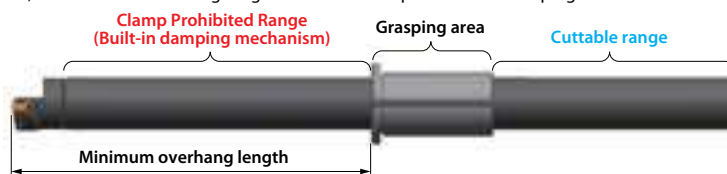
Available overhang length is set for this tool
To adjust the overhang length, please use the reference line printed on the shank.

Available overhang length range		
Description	Minimum overhang length	Maximum overhang length
KAV-***-10D	Shank diameter × 7	Shank diameter × 10
KAV-***-7D	Shank diameter × 4	Shank diameter × 7



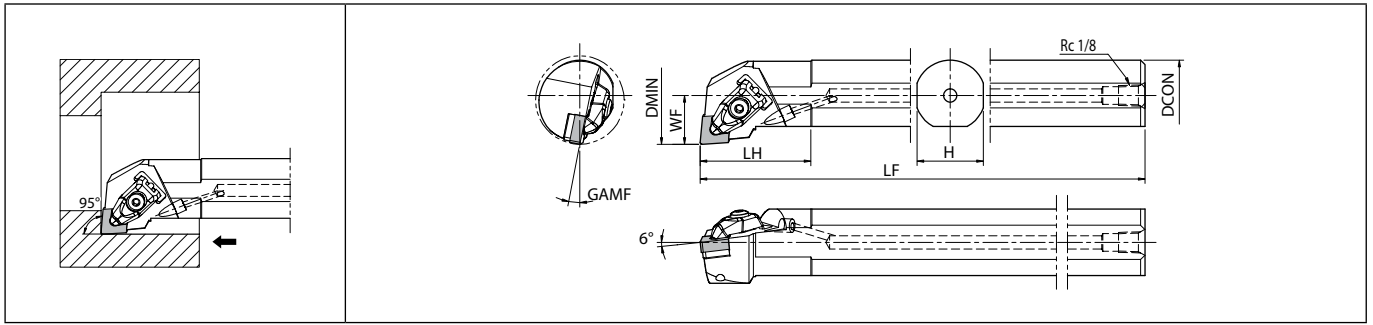
Shank cut

If the shank needs to be cut or modified, do so within the cutting range and do not clamp the built-in damping mechanism.



- Use the appropriate inserts and parts. Use of damaged parts may result in tool breakage and injury.
- Do not touch the cutting edge of the insert directly with your bare hands. There is a risk of injury.
- Make sure that there are no foreign materials such as chips in the insert seating area, serrated area, or shank grip area before mounting.
- Do not use the product under chattering conditions. This can lead to damage of the built-in damping mechanism.
- If tool falls or hits the part while machining, do not use it. The impact can cause tool damage and lead to large chattering.
- Avoid high humidity and store at room temperature (about 20°C).

A-DCLN (Boring / Internal facing)



Max. Overhang Length L/D≈3 | Right-hand shown
 Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts							Applicable inserts
													Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)		Nozzle
	R	L	DMIN	DCON	H	LH	LF	WF												
A25R- DCLN [®] /L 12-32	●	●	32	25	23	42	200	17	11	0.8	Yes									CN□A1204... CN□G1204... CN□M1204...
A32S- DCLN [®] /L 12-40	●	●	40	32	30	50	250	22												
A40T- DCLN [®] /L 12-50	●	●	50	40	37	60	300	27													14	DN10 DN20

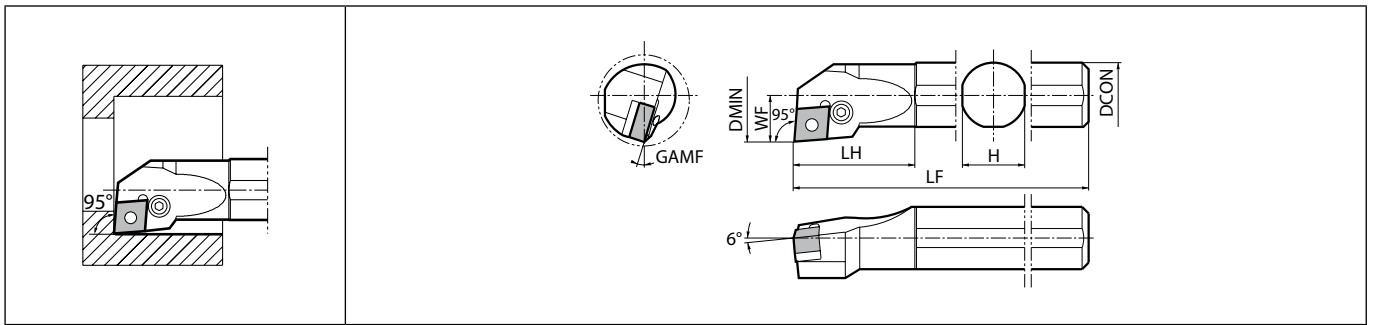
Not applicable to high-pressure coolant
 Wrench (FT-15) is sold separately.



Boring

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-PCLN (Boring / Internal facing)



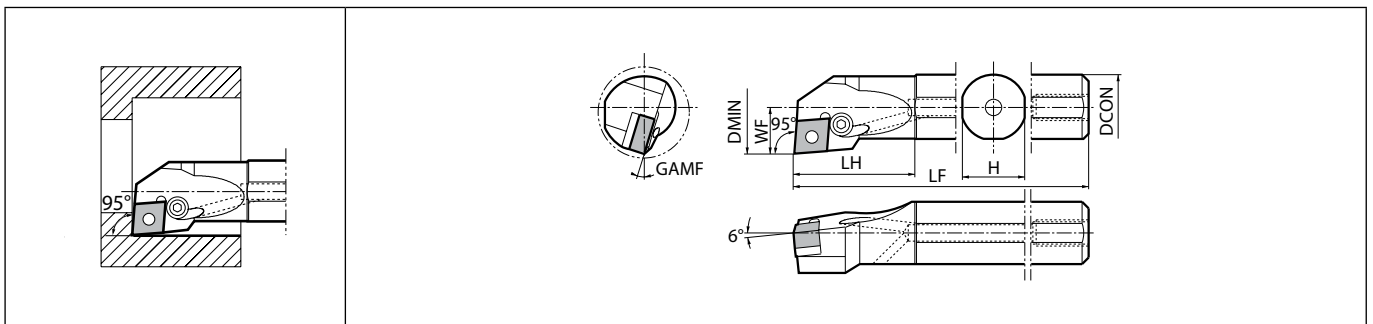
Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F Toolholder dimensions

Description	Availability		Dimension (mm)							GAME (°)	Standard corner-R(RE)	Coolant hole	Spare parts							Applicable inserts	
	R	L	DMIN	DCON	H	LH	LF	WF	Lever				Lock screw	Punch	Shim pin	Shim pin	Shim	Wrench	Wrench		
	S16M- PCLN%09-20	●	●	20	16	15	34	150	11				16	0.8	No			-	-		P-03S	-	-	FH-2.5	CN□G0904...
S20Q- PCLN%09-27	●	●	27	20	19	37	180	14.2	17	LL-03SN	LS-03SN	-	-			-	LC-32N	-			
S25R- PCLN%09-32	●	●	32	25	24	42	200	15.7	15	LL-1N	LS-1SN	PC-1	LSP-1			-	LC-32N	-			
S25R- PCLN%12-32	●	●	32	25	24	42	200	16.3	16	0.8	No			-	-	P-03S	-	-	-	CN□A1204... CN□G1204... CN□M1204...	
S32S- PCLN%12-40	●	●	40	32	30	50	250	21	10			LL-2N	LS-2N	PC-2	LSP-2	-	LC-42N%L				LW-3
S40T- PCLN%12-50	●	●	50	40	37	60	300	25	10			LL-2N	LS-2N	PC-2	LSP-2	-	LC-42N%L				LW-3

LC-42NR for Right-hand Toolholder, LC-42NL for Left-hand Toolholder.

A-PCLN (Boring / Internal facing)



Max. Overhang Length L/D≈3 | Right-hand shown | Left-hand Insert for Right-hand Toolholder.

F Toolholder dimensions

Description	Availability		Dimension (mm)							GAME (°)	Standard corner-R(RE)	Coolant hole	Spare parts							Applicable inserts	
	R	L	DMIN	DCON	H	LH	LF	WF	Lever				Lock screw	Punch	Shim pin	Shim pin	Shim	Wrench			
	A16M- PCLNR09-20	●		20	16	15	34	150	11				16	0.8	Yes			-	-		P-03S	-	-	FH-2.5	CN□G0904...
A20Q- PCLNR09-27	●		27	20	19	37	180	14.2	17	LL-03SN	LS-03SN	-	-			-	LC-32N	-			
A25R- PCLNR09-32	●		32	25	24	42	200	15.7	15	LL-1N	LS-1SN	PC-1	LSP-1			-	LC-32N	-			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-DCLN / S-PCLN / A-PCLN)

Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B16	B16	B16	B16	B16	B16	B16	B17
Applications	Finishing - Medium	Finishing - Medium	Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	TN-V	PMG	GS	PG	PS	PT
Page	B17	B17	B17	B17	B17	B18	B18	B18
Applications	Medium - Roughing	Roughing	Roughing	Roughing	Finishing	Medium	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	GT	STD	PH	PX	%L-S	R/L	%L-25R	Z
Page	B18	B18	B19	B19	B23	B23	B23	B23
Applications	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	XF	XP	XQ	XS	SK	FP-TK	TK	MQ
Page	B19	B19	B19	B20	B20	B20	B20	B20
Applications	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MS	MU	KQ	KG	KH	C	ZS	GC
Page	B21	B21	B22	B22	B22	B22	B22	B22
Applications	Cast iron	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Heat-resistant alloys	Hard materials
Insert								
Chipbreaker type	No CB	Ceramic	%L-A3	AH	PCD	SQ	SG	HH
Page	B22	B113	B23	B23	C34	B20	B21	C9
Applications	Hard materials	Hard materials	Hard materials / Cast iron					
Insert								
Chipbreaker type	HL	HD	CBN					
Page	C9	C9	C8					



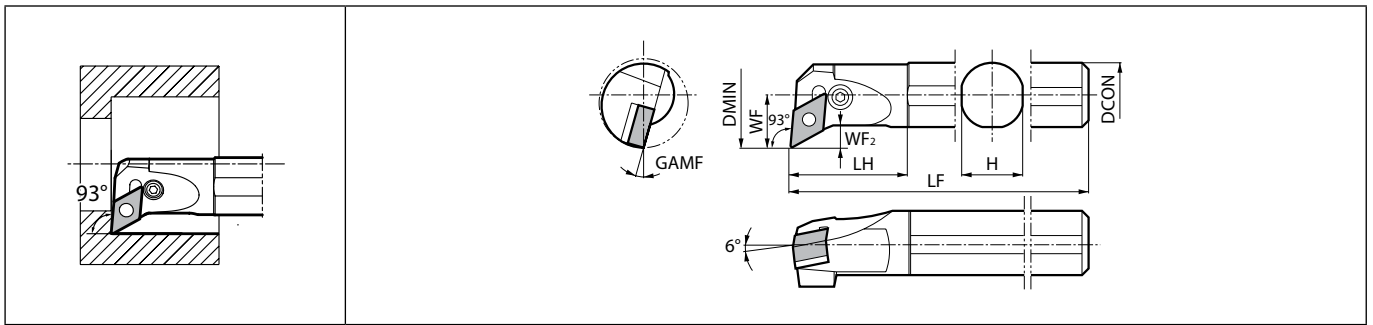
Recommended cutting conditions  F159

Applicable Coolant Sleeve / Joint

Toolholder description	Applicable Coolant Sleeve	Applicable Coolant Joint
A16M -PCLN [®] /L.09-20	SHC1640-70, SHC1650-95	SJS-8
A20Q -PCLN [®] /L.09-27	SHC2040-70, SHC2050-95	
A25R -PCLN [®] /L.09-32	SHC2540-70, SHC2550-95	

For Coolant Sleeve, Coolant Joint See Page  F156, F157

S-PDUN11 (Boring / Internal facing)



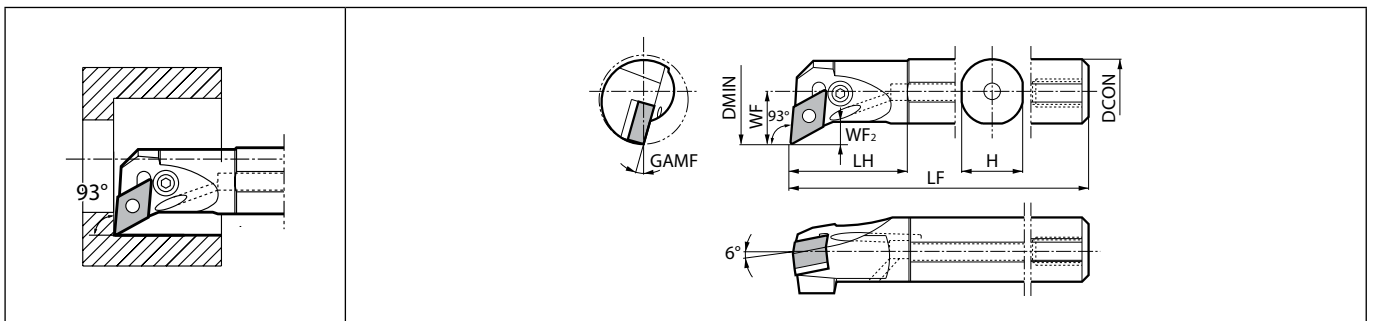
Max. Overhang Length $L/D \approx 3$ | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts						Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂				Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
S20Q- PDUN%11-27	●	●	27	20	19	35	180	16	7.6	17		No	LL-1DN	LS-1SN	PC-1	LSP-1	LD-32N	FH-2.5	DN□G1104...
S25R- PDUN%11-32	●	●	32	25	24	40	200	17	7.6	15	0.4	No	LL-1DN	LS-1SN	PC-1	LSP-1	LD-32N	FH-2.5	DN□G1104...
S32S- PDUN%11-40	●	●	40	32	31	45	250	22	8.5	12									

A-PDUN11 (Boring / Internal facing)







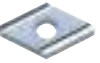
Max. Overhang Length $L/D \approx 3$ | Right-hand shown | Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts						Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂				Lever	Lock screw	Punch	Shim pin	Shim	Wrench	
A20Q- PDUNR11-27	●		27	20	19	35	180	16	7.6	17		No	LL-1DN	LS-1SN	PC-1	LSP-1	LD-32N	FH-2.5	DN□G1104...
A25R- PDUNR11-32	●		32	25	24	40	200	17	7.6	15	0.4	Yes	LL-1DN	LS-1SN	PC-1	LSP-1	LD-32N	FH-2.5	DN□G1104...
A32S- PDUNR11-40	●		40	32	31	45	250	22	8.5	12									

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (S-PDUN / A-PDUN)

Applications	Finishing	Finishing - Medium	Medium - Roughing	Finishing	Medium
Insert					
Chipbreaker type	GP	HQ	GS	R/L-S	R/L
Page	B24	B25	B25	B31	B31

Recommended cutting conditions [F159](#)

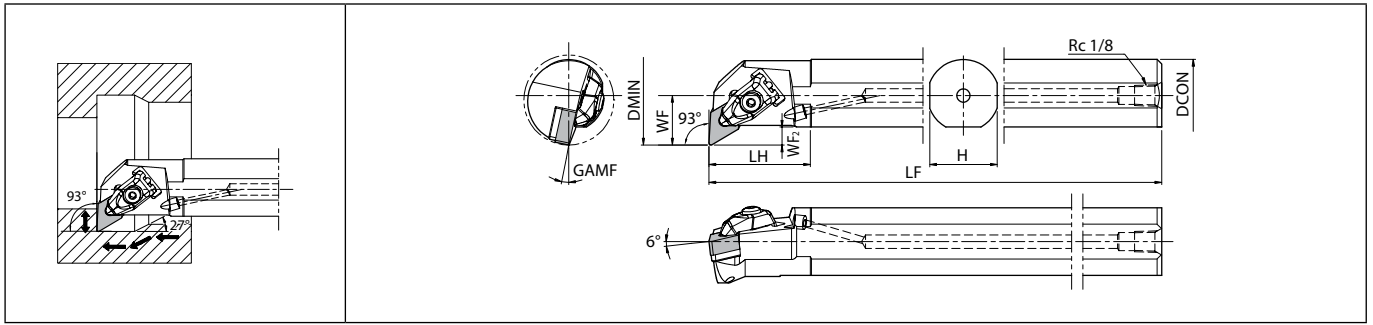
Applicable Coolant Sleeve / Joint

Toolholder description	Applicable coolant sleeve	Applicable coolant joint
A20Q-PDUNR11-27	SHC2040-70, SHC2050-95	SJS-8
A25R-PDUNR11-32	SHC2540-70, SHC2550-95	
A32S-PDUNR11-40	-	

For coolant sleeve, coolant joint See page [F156](#), [F157](#)



A-DDUN (Boring / Internal copying)



Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts							Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂	Clamp				Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	Nozzle	
A32S- DDUN%L 15-40	●	●	40	32	30	45	250	22	8	12	0.8	Yes	CP-3D	CS-3D	SP-3D	LW-3	DD-42 (DD-42-16*)	SB-4085TR	FT-15	DN10	DN□A1504...
A40T- DDUN%L 15-50	●	●	50	40	37	55	300	27	8.5												DN□G1504...
A50U- DDUN%L 15-63	●	●	63	50	47	65	350	35	10.5											DN□M1504...	DN□X1504...

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.

Not applicable to high-pressure coolant


When using the insert with WF chipbreaker, tool edge offset or program corrections are required on R34 and R35.

Wrench (FT-15) is sold separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

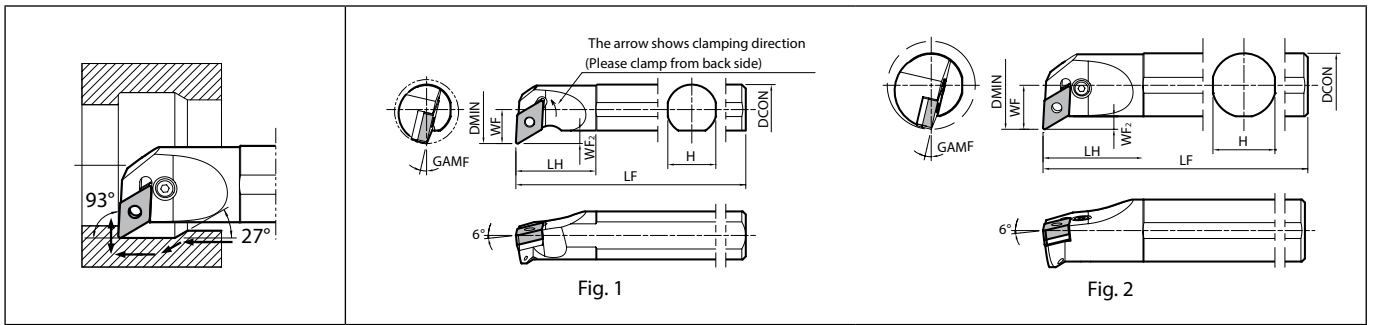
Applicable inserts

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium
Insert								
Chipbreaker type	WF	PP	GP	PQ	HQ	CQ	CJ	TN-V
Page	B24	B24	B24	B24	B25	B25	B25	B25
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PMG	GS	PG	PS	PT	GT	STD	PH
Page	B25	B25	B26	B26	B26	B26	B27	B27
Applications	Roughing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Large ap
Insert								
Chipbreaker type	PX	R/L	XF	XP	XQ	XS	SK	R-LD
Page	B27	B31	B27	B27	B27	B27	B28	B28
Applications	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	FP-TK	TK	MQ	MS	MU	KQ	KG	KH
Page	B28	B28	B28	B29	B29	B30	B30	B30
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	C	ZS	GC	No CB	Ceramic	P/L-A3	AH	PCD
Page	B30	B30	B30	B31	B114	B31	B31	C35
Applications	Heat-resistant alloys	Heat-resistant alloys	Hard materials	Hard materials	Hard materials	Hard materials / Cast iron		
Insert								
Chipbreaker type	SQ	SG	HH	HL	HD	CBN		
Page	B29	B29	C11	C11	C11	C10		

Recommended cutting conditions  F159



S-PDUN15 (Internal copying)



Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂					
S25R- PDUN [®] /15-32	●	●	32	25	24	40	200	17	6.5	13	0.8	No	1	DN□A1504... DN□G1504... DN□M1504... DN□X1504...
S32S- PDUN [®] /15-44	●	●	44	32	31	50	250	22						
S40T- PDUN [®] /15-54	●	●	54	40	39	65	300	27	7.5	12					2

Description	Spare parts									
	Lever	Lock pin	Lock screw	Wrench	Shim	Shim	Screw	Wrench	Shim pin	Punch
	S25R- PDUN [®] /15-32		PP-4	-		-	PD-42	SB-2050TR	FT-6	-
S32S- PDUN [®] /15-44	-	-	LS-2N	LD-42		-	-	-	LSP-2	PC-2
S40T- PDUN [®] /15-54	LL-3N	-	LS-2N	LW-3		(LD-42-20*)	-	-	-	LSP-2	PC-2

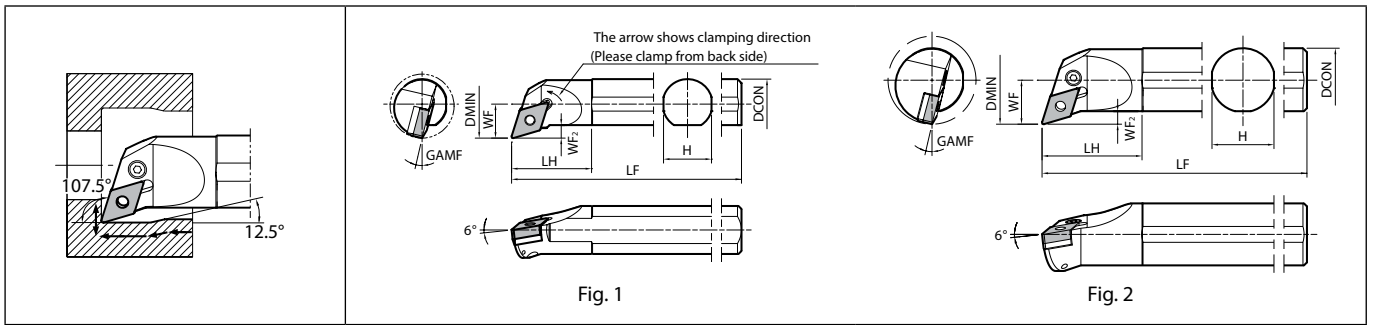
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on R34 and R35.

When using inserts whose corner-R(RE) is greater than 1.6 mm for S25R-PDUN[®]/15-32, use shim modified by additional processing in order to prevent workpiece and shim from interfering each other.

When using inserts whose corner-R(RE) is greater than 1.6 mm for S32S-PDUN[®]/15-44 and S40T-PDUN[®]/15-54, please purchase a shim with* mark and use it in order to prevent workpiece and shim from interfering each other.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-PDQN15 (Internal copying)



Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF2					
S25R- PDQN% 15-32	●	●	32	25	24	40	200	17	6.5	13	0.8	No	1	DN□A1504... DN□G1504... DN□M1504...
S32S- PDQN% 15-44	●	●	44	32	31	50	250	22						
S40T- PDQN% 15-54	●	●	54	40	39	65	300	27	7.5	12					2

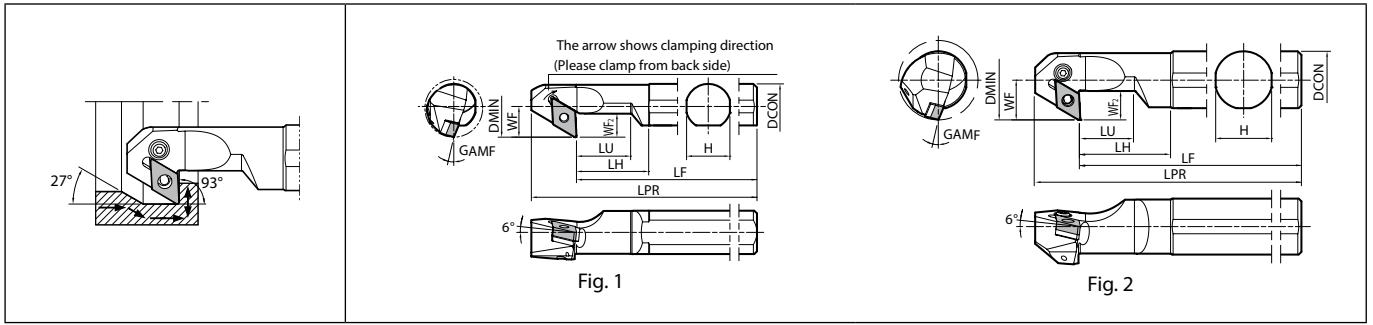
Description	Spare parts									
	Lever	Lock pin	Lock screw	Wrench	Shim	Shim	Screw	Wrench	Shim pin	Punch
	S25R- PDQN% 15-32	-	PP-4	-	LW-3	-	PD-42	SB-2050TR	FT-6	-
S32S- PDQN% 15-44	LL-3N	-	LS-2N	LD-42 (LD-42-20*)		-	-	-	LSP-2	PC-2
S40T- PDQN% 15-54										

When using inserts whose corner-R(RE) is greater than 1.6 mm for S25R-PDQN% 15-32, use shim modified by additional processing in order to prevent workpiece and shim from interfering each other.
When using inserts whose corner-R(RE) is greater than 1.6 mm for S32S-PDQN% 15-44 and S40T-PDQN% 15-54, please purchase a shim with* mark and use it in order to prevent workpiece and shim from interfering each other.
WF chipbreaker can not be used for S-PDQN15 toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



S-PDZN15 (Back boring)



Max. Overhang Length L/D≈3 | Right-hand shown
Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Fig.	Applicable inserts
	R	L	DMIN	DCON	H	LH	LPR	LU	WF	WF ₂					
S25R- PDZN%15-32	●	●	32	25	24	40	225	17	13	13	0.8	No	1	DN□A1504... DN□G1504...	
S325- PDZN%15-44	●	●	44	32	31	50	275	22	16	12	-	-	2	DN□M1504... DN□X1504...	
S40T- PDZN%15-54	●	●	54	40	39	65	325	50	27	12	-	-	2	DN□M1504... DN□X1504...	

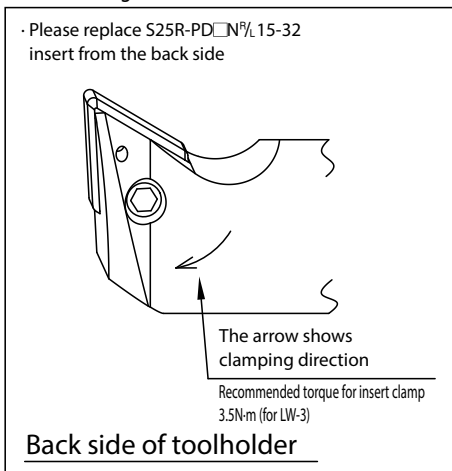
Description	Spare parts									
	Lever	Lock pin	Lock screw	Wrench	Shim	Shim	Screw	Wrench	Shim pin	Punch
S25R- PDZN%15-32	-	PP-4	-	LW-3	-	PD-42	SB-2050TR	FT-6	-	-
S325- PDZN%15-44	-	-	-		LD-42 (LD-42-20*)	-	-	-	LSP-2	PC-2
S40T- PDZN%15-54	LL-3N	-	LS-2N	-	-	-	-	-	-	-

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.

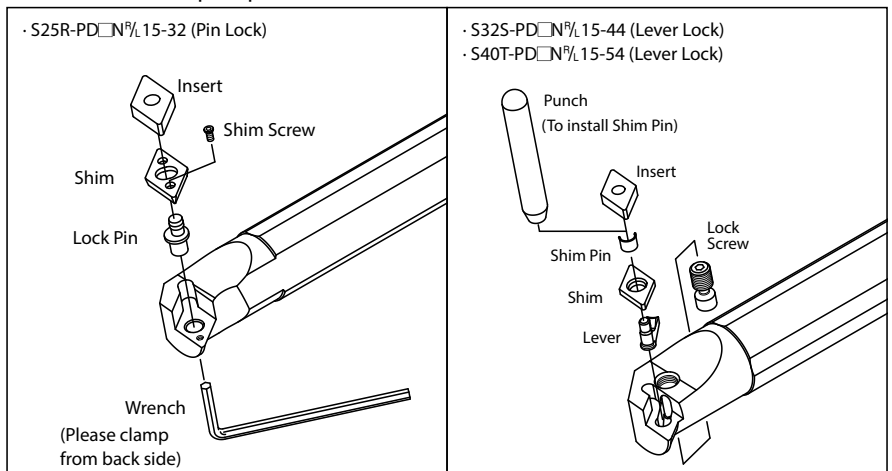
When using inserts whose corner-R(RE) is greater than 1.6 mm for S25R-PDZN%15-32, use shim modified by additional processing in order to prevent workpiece and shim from interfering each other.

When using inserts whose corner-R(RE) is greater than 1.6 mm for S325-PDZN%15-44 and S40T-PDZN%15-54, please purchase a shim with* mark and use it in order to prevent workpiece and shim from interfering each other.

How to change S25R-PD□%15-32 inserts



How to assemble spare parts




● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (S-PDUN15 / S-PDQN15 / S-PDZN15)

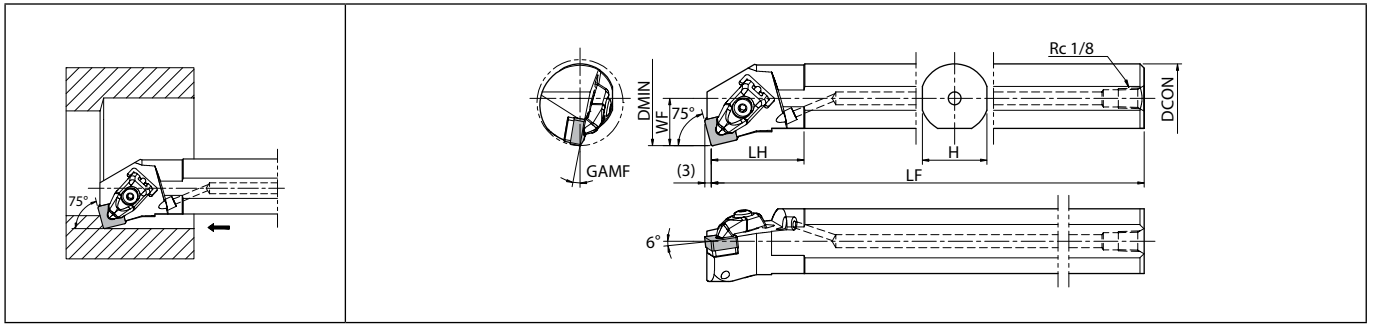
Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium
Insert								
Chipbreaker type	WF*	PP	GP	PQ	HQ	CQ	CJ	TN-V
Page	B24	B24	B24	B24	B25	B25	B25	B25
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PMG	GS	PG	PS	PT	GT	STD	PH
Page	B25	B25	B26	B26	B26	B26	B27	B27
Applications	Roughing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Low carbon steel	Finishing - Medium	Large ap
Insert								
Chipbreaker type	PX	R/L	XF	XP	XQ	XS	SK	R-LD
Page	B27	B31	B27	B27	B27	B27	B28	B28
Applications	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	FP-TK	TK	MQ	MS	MU	KQ	KG	KH
Page	B28	B28	B28	B29	B29	B30	B30	B30
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals
Insert								
Chipbreaker type	C	ZS	GC	No CB	Ceramic	P/L-A3	AH	PCD
Page	B30	B30	B30	B31	B114	B31	B31	C35
Applications	Heat-resistant alloys	Heat-resistant alloys	Hard materials	Hard materials	Hard materials	Hard materials / Cast iron		
Insert								
Chipbreaker type	SQ	SG	HH	HL	HD	CBN		
Page	B29	B29	C11	C11	C11	C10		

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on R34 and R35.
The insert with WF chipbreaker is not applicable for S-PDQN15 type toolholder.

Recommended cutting conditions  **F159**



A-DSKN (Boring)



Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts							Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	Clamp				Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	Nozzle	
	A25R- DSKN [®] L 12-32	●	●	32	25	23	43	200	17				11	0.8	Yes	CP-3D	CS-3D	SP-3D	LW-3		DS-42	SB-4085TR	FT-15	DN10 DN20	SN□A1204... SN□G1204... SN□M1204...
A32S- DSKN [®] L 12-40	●	●	40	32	30		250	22												
A40T- DSKN [®] L 12-50	●	●	50	40	37	53	300	27												

Not applicable to high-pressure coolant
Wrench (FT-15) is sold separately.

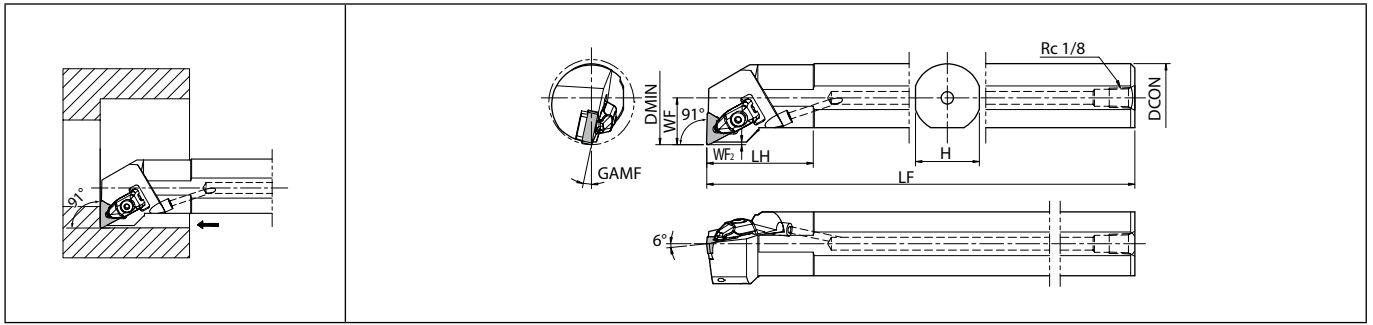
Applicable inserts

Applications	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing
Insert								
Chipbreaker type	PQ	HQ	PMG	PG	PS	PT	STD	PH
Page	B33	B33	B33	B33	B33	B33	B33	B34
Applications	Roughing	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	PX	F/L-C	F/L-25R	XP	XQ	XS	MQ	MS
Page	B34	B36	B36	B34	B34	B34	B35	B35
Applications	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron / Hard materials	Heat-resistant alloys
Insert								
Chipbreaker type	KG	KH	C	ZS	GC	No CB	Ceramic	SG
Page	B35	B35	B35	B36	B36	B36	B117	B35
Applications	Hard materials / Cast iron							
Insert								
Chipbreaker type	CBN							
Page	C12							

Recommended cutting conditions F159

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

A-DTFN (Boring)



Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂				
A25R- DTFN%L16-32	●	●	32	25	23	42	200	17	0.8	12	0.8	Yes	TN□A1604... TN□G1604...
A32S- DTFN%L16-40	●	●	40	32	30	50	250	22	1.2				TN□M1604... TN□X1604...
A40T- DTFN%L22-50	●	●	50	40	37	60	300	27	1.5	12	0.8	Yes	TN□G2204... TN□M2204...

Description	Spare parts								
	Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	Wrench* (for shim)	Nozzle
A25R- DTFN%L16-32									
A32S- DTFN%L16-40	CP-2D	CS-2D	SP-2D	LW-2.5	DT-32	SB-3080TR	FT-10	-	DN10
A40T- DTFN%L22-50	CP-3D	CS-3D	SP-3D	LW-3	DT-42	SB-4085TR	-	FT-15	DN20

Not applicable to high-pressure coolant

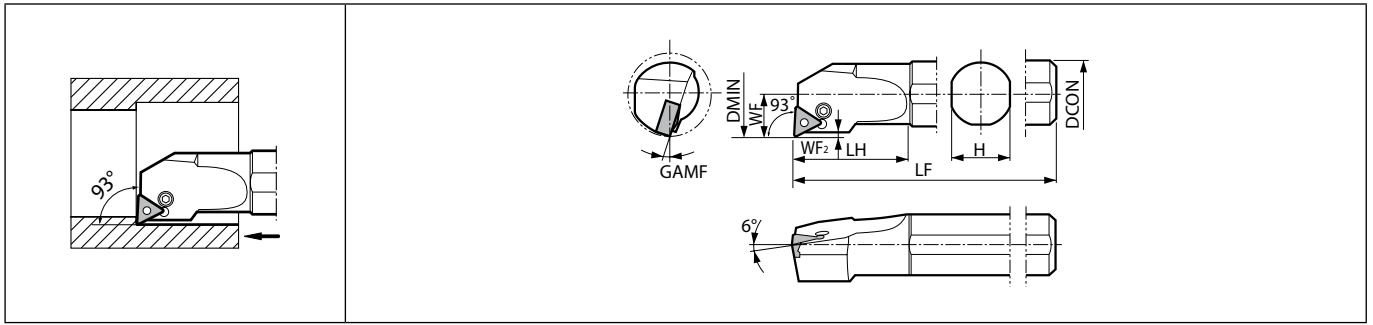
When using the insert with WF chipbreaker, tool edge offset or program corrections are required on R34 and R35.

Wrench (FT-10 or FT-15) is sold separately

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



S-PTUN (Boring)



Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

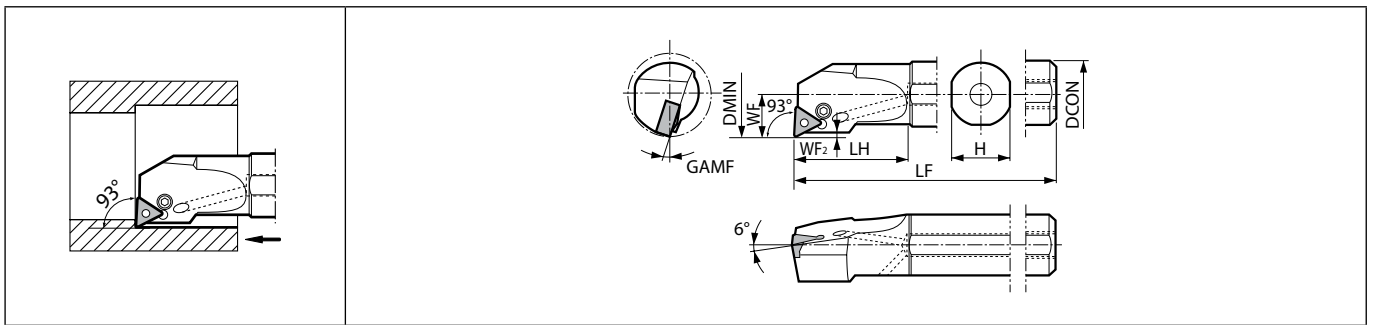
F

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts							Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂	Lever				Lock screw	Punch	Shim	Shim pin	Shim pin	Wrench		
	S16M- PTUN%L 11-20	●	●	20	16	15	34	150	11	0.3				18	0.8	No	LL-03TN	LS-03SN	-	-	
S20Q- PTUN%L 11-25	●	●	25	20	19	37	180	13.2	0.2	17											
S25R- PTUN%L 11-32	●	●	32	25	24	42	200	15.7	0.3	16	0.8	No	LL-03SN	LS-03SN	-	-	-	P-03S	FH-2.5	TN□A1604... TN□G1604... TN□M1604...	
S16M- PTUN%L 16-20	●	●	20	16	15	34	150	11	18												
S20Q- PTUN%L 16-25	●	●	25	20	19	37	180	13.2	1.3	17											
S25R- PTUN%L 16-30	●	●	30	25	24	42	200	15.5	13	13											
S32S- PTUN%L 16-40	●	●	40	32	30	50	250	22	0.7	11	0.8	No	LL-1N	LS-1N	PC-1	LT-32N (LT-32N-20*)	LSP-1	-	FH-2.5	TN□A1604... TN□G1604... TN□M1604...	
S40T- PTUN%L 16-50	●	●	50	40	37	60	300	27	0.6												

When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.

A-PTUN (Boring)



Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder.

Toolholder dimensions


Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts				Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF	WF ₂	Lever				Lock screw	Shim pin	Wrench		
	A16M- PTUNR11-20	●		20	16	15	34	150	11	0.3				18	0.8	Yes	LL-03TN		LS-03SN	P-03S	FH-2.5	TN□G1104...
A20Q- PTUNR11-25	●		25	20	19	37	180	13.2	0.2	17								
A25R- PTUNR11-32	●		32	25	24	42	200	15.7	0.3	16								

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-DTFN / S-PTUN / A-PTUN)

Applications	Finishing	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	WF*	PP	GP	PQ	HQ	CQ	PMG	GS
Page	B38	B38	B38	B38	B38	B38	B39	B39
Applications	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Roughing	Roughing	Roughing	Finishing
Insert								
Chipbreaker type	PG	PS	PT	GT	STD	PH	PX	P/L-SSF
Page	B39	B39	B39	B39	B40	B40	B40	B44
Applications	Finishing	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Low carbon steel	Low carbon steel	Low carbon steel
Insert								
Chipbreaker type	P/L-S	P/L-B	P/L-C	R/L	P/L-25R	XF	XP	XQ
Page	B44	B44	B45	B45	B45	B40	B41	B41
Applications	Low carbon steel	Finishing - Medium	Large ap	Medium - Roughing	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	XS	SK	R-LD	FP-TK	TK	MQ	MS	MU
Page	B41	B41	B41	B41	B41	B42	B42	B42
Applications	Stainless steel	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	P/L-ST	KQ	KG	KH	C	ZS	GC	No CB
Page	B42	B42	B42	B42	B43	B43	B43	B43
Applications	Cast iron / Hard materials	Non-Ferrous metals	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Hard materials / Cast iron		
Insert								
Chipbreaker type	Ceramic	P/L-A3	AH	PCD	SG	CBN		
Page	B118	B43	B43	C36	B42	C13		

When using the insert with WF chipbreaker, tool edge offset or program corrections are required on **R34** and **R35**.
The insert with WF chipbreaker is not applicable for S-PTUN type and A-PTUN type toolholder.

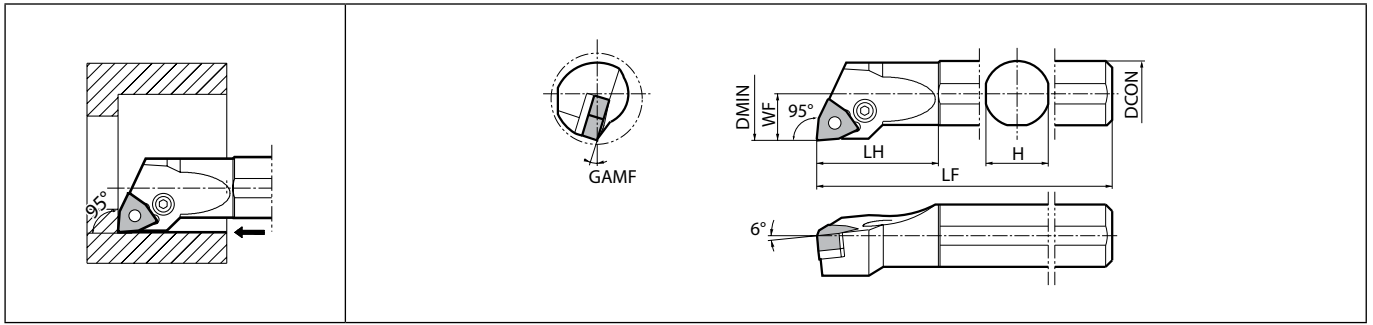
Recommended cutting conditions  **F159**

Applicable Coolant Sleeve / Joint

Toolholder description	Applicable coolant sleeve	Applicable coolant joint
A16M-PTUN ^{P/L} 11-20	SHC1640-70, SHC1650-95	SJS-8
A20Q-PTUN ^{P/L} 11-25	SHC2040-70, SHC2050-95	
A25R-PTUN ^{P/L} 11-32	SHC2540-70, SHC2550-95	

For coolant sleeve, coolant joint See page  **F156, F157**

S-PWLN (Boring / Internal facing)



Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

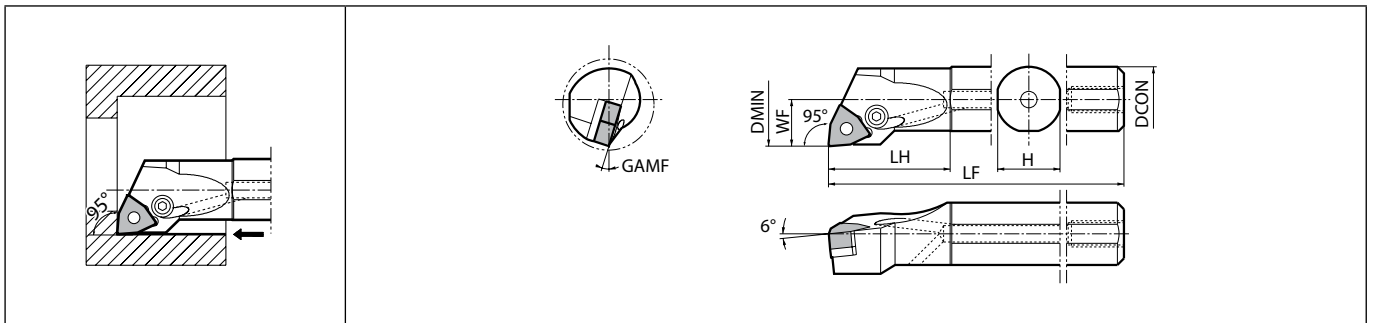
F

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts							Applicable inserts	
	R	L	DMIN	DCON	H	LH	LF	WF	Lever				Lock screw	Punch	Shim	Shim pin	Shim pin	Wrench	Wrench		
S16M- PWLN%06-20	●	●	20	16	15	34	150	11	16	0.8	No	LL-03SN	LS-03SN	-	-	-	P-03S	-	FH-2.5	WN□G0604...	
S20Q- PWLN%06-27	●	●	27	20	19	37	180	14.2	17			LL-1N	LS-1SN	PC-1	LW-32N	LSP-1	-	-	-	-	-
S25R- PWLN%06-32	●	●	32	25	24	42	200	15.7	15	10	0.8	No	LL-2N	LS-2N	PC-2	LW-42N%	LSP-2	-	LW-3	-	WN□A0804...
S32S- PWLN%08-40	●	●	40	32	30	50	250	22	22												WN□G0804...
S40T- PWLN%08-50	●	●	50	40	37	60	300	27	27												WN□M0804...

Shim : LW-42NR for Right-hand Toolholder, LW-42NL for Left-hand Toolholder.

A-PWLN (Boring / Internal facing)

















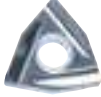













Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder.


Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts							Applicable inserts		
	R	L	DMIN	DCON	H	LH	LF	WF	Lever				Lock screw	Punch	Shim	Shim pin	Shim pin	Wrench	Wrench			
A16M- PWLN06-20	●		20	16	15	34	150	11	16	0.8	Yes	LL-03SN	LS-03SN	-	-	-	P-03S	-	FH-2.5	WN□G0604...		
A20Q- PWLN06-27	●		27	20	19	37	180	14.2	17			LL-1N	LS-1SN	PC-1	LW-32N	LSP-1	-	-	-	-	-	-
A25R- PWLN06-32	●		32	25	24	42	200	15.7	15													

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability


Applicable inserts (S-PWLN / A-PWLN)

Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B49	B49	B49	B49	B49	B49	B49	B50
Applications	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	PMG	GS	PG	PS	PT	GT
Page	B50	B50	B50	B50	B50	B50	B51	B51
Applications	Roughing	Roughing	Finishing	Medium	Low carbon steel	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	STD	PH	1/2-S	R/L	XP	XQ	XS	TK
Page	B51	B51	B53	B53	B51	B51	B51	B51
Applications	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MQ	MS	MU	KQ	KG	KH	C	ZS
Page	B52	B52	B52	B52	B52	B52	B53	B53
Applications	Cast iron	Cast iron	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Hard materials / Cast iron		
Insert								
Chipbreaker type	GC	No CB	AH	PCD	SG	CBN		
Page	B53	B53	B53	C38	B52	C15		

Recommended cutting conditions  **F159**

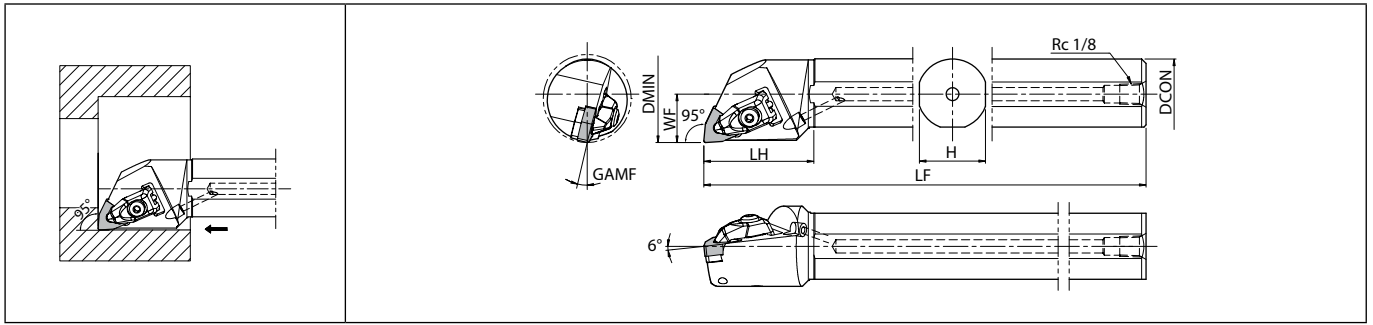
Applicable Coolant Sleeve / Joint

Toolholder description	Applicable coolant sleeve	Applicable coolant joint
A16M-PWLNRO6-20	SHC1640-70, SHC1650-95	SJS-8
A20M-PWLNRO6-27	SHC2040-70, SHC2050-95	
A25R-PWLNRO6-32	SHC2540-70, SHC2550-95	

For coolant sleeve, coolant joint See page  **F156, F157**



A-DWLN (Boring / Internal facing)



Max. Overhang Length L/D≈3 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

F

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Applicable inserts
	R	L	DMIN	DCON	H	LH	LF	WF					
A25R- DWLN [®] L.08-32	●	●	32	25	23	50	200	17	13	0.8	Yes	WN□A0804... WN□G0804... WN□M0804...	
A32S- DWLN [®] L.08-40	●	●	40	32	30	50	250	22					
A40T- DWLN [®] L.08-50	●	●	50	40	37	60	300	27					

Description	Spare parts							
	Clamp	Screw (for clamp)	Spring	Wrench (for clamp)	Shim	Screw (for shim)	Wrench* (for shim)	Nozzle
A25R- DWLN [®] L.08-32	CP-3D	CS-3D	SP-3D	LW-3	DW-42	SB-4085TR	FT-15	DN10
A32S- DWLN [®] L.08-40								DN20
A40T- DWLN [®] L.08-50								DN20

Not applicable to high-pressure coolant
Wrench (FT-15) is sold separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

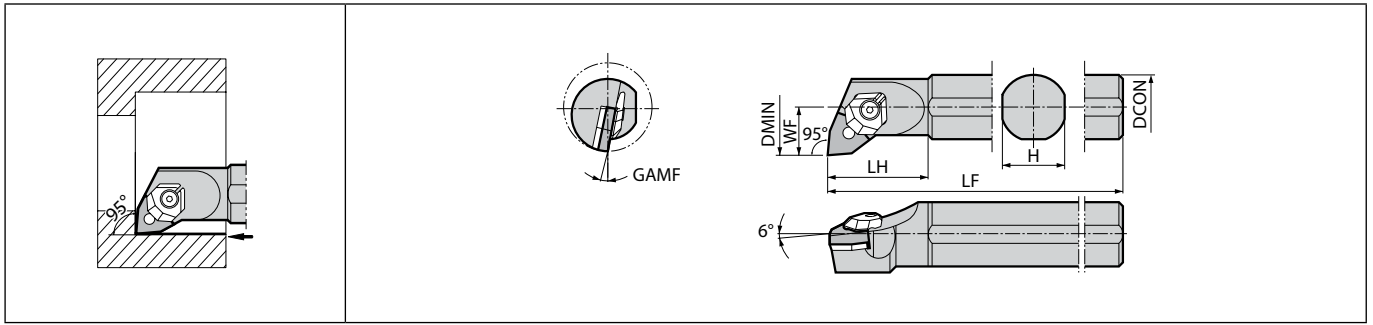
Solid

Positive

KAV

Negative

S-WWLN-E Excellent bar (Boring / Internal facing)



Max. Overhang Length L/D≈5 | Right-hand shown
Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions































Description	Availability		Dimension (mm)								GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts					Applicable inserts
			R	L	DMIN	DCON	H	LH	LF	WF				Clamp set	Wrench	Shim	Shim pin	Wrench	
	S25S- WWLN%08-28E	●	●	28	25	24	36	14	13	1.2				No	WCS-8	LW-3	WWP-42 (WWP-42-16*)	WP5X11		LW-2	WN□A0804... WN□G0804... WN□M0804...
S25S- WWLN%08-34E	●	●	34		40	250	17	11											
S32S- WWLN%08-40E	●	●	40	32	30	50	20	10											


When using inserts whose corner-R(RE) is greater than 1.6 mm, please purchase a shim* and use it in order to prevent workpiece and shim from interfering each other.
In wedge lock, use of ceramic insert other than silicon nitride insert is not recommended due to strong restrain force.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts (A-DWLN / S-WWLN-E)

Applications	Finishing	Finishing	Finishing - Medium	Finishing - Medium	Finishing	Finishing	Finishing - Medium	Finishing - Medium
Insert								
Chipbreaker type	WF	WP	WE	WQ	PP	GP	PQ	HQ
Page	B49	B49	B49	B49	B49	B49	B49	B50
Applications	Finishing - Medium	Finishing - Medium	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing	Medium - Roughing
Insert								
Chipbreaker type	CQ	CJ	PMG	GS	PG	PS	PT	GT
Page	B50	B50	B50	B50	B50	B50	B51	B51
Applications	Roughing	Roughing	Low carbon steel	Low carbon steel	Low carbon steel	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys	Stainless steel / Heat-resistant alloys
Insert								
Chipbreaker type	STD	PH	XP	XQ	XS	TK	MQ	MS
Page	B51	B51	B51	B51	B51	B51	B52	B52
Applications	Stainless steel / Heat-resistant alloys	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Insert								
Chipbreaker type	MU	KQ	KG	KH	C	ZS	GC	No CB
Page	B52	B52	B52	B52	B53	B53	B53	B53
Applications	Non-Ferrous metals	Non-Ferrous metals	Heat-resistant alloys	Hard materials / Cast iron				
Insert								
Chipbreaker type	AH	PCD	SG	CBN				
Page	B53	C38	B52	C15				

Recommended cutting conditions  F159

F

Boring

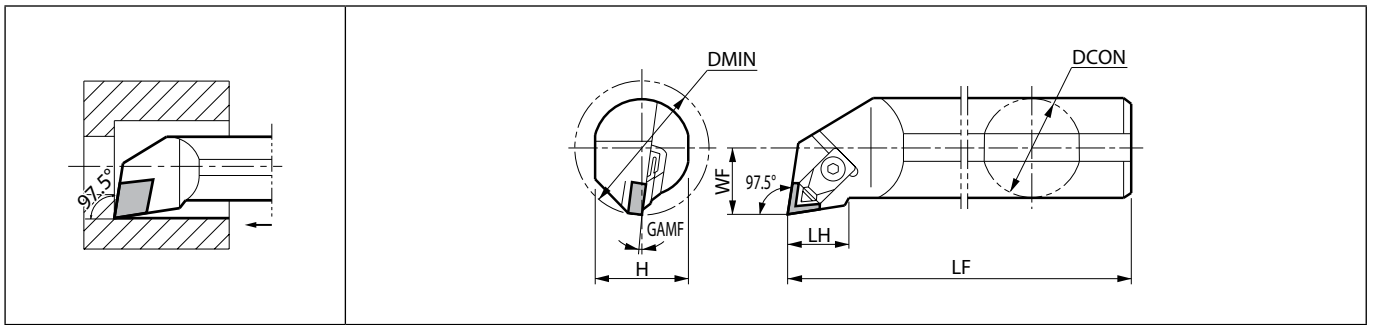
Solid

Positive

KAV

Negative

S-CELN (Boring / Internal facing)



Max. Overhang Length L/D≈3 | Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Coolant hole	Spare parts					Applicable inserts
		R	DMIN	DCON	H	LH	LF	WF				Chipbreaker	Clamp set	Wrench	Shim	Shim screw	
		●	50	40	37	32	300	27				12	0.8	No			

Applicable inserts

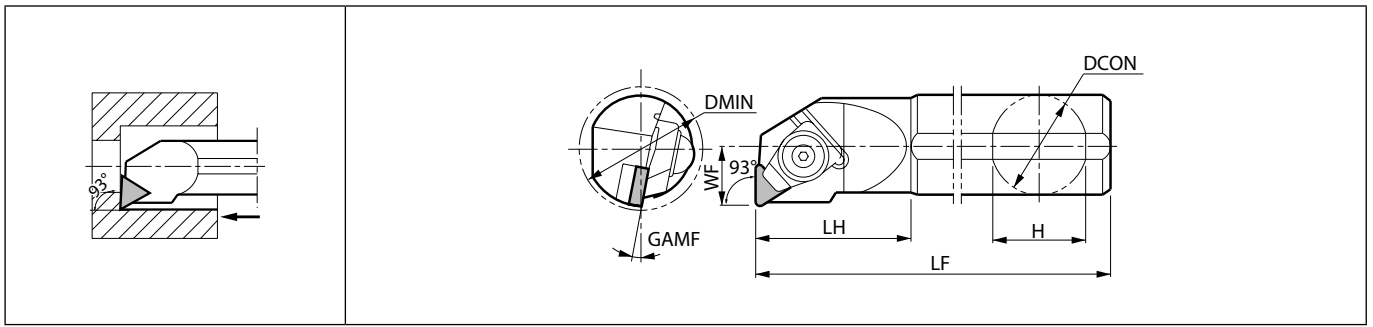
Applications	Cast iron / Hard materials
Insert	
Type	Ceramic
Page	B115

Recommended cutting conditions [F159](#)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



S-CTUN-A (Boring)



Right-hand shown

F

Toolholder dimensions

Description	Availability		Dimension (mm)							GAMF (°)	Standard corner-R(RE)	Spare parts				Applicable inserts
	R	DMIN	DCON	H	LH	LF	WF	Clamp set	Shim screw			Shim	Wrench			
	S25X- CTUNR11-30A	●	30	25	24	40	220	15	10			0.8				

Applicable inserts

Applications	Hard materials / Cast iron	Cast iron / Hard materials
Insert		
Type	CBN	Ceramic
Page	C19	B118

Recommended cutting conditions F159

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring

Solid

Positive

KAV

Negative

EZH sleeves

Sleeve description				Applicable inserts				Applicable machine manufacturer
EZH-CT (Adjustable overhang length with coolant hole)	EZH-HP (Adjustable overhang length)	EZH-ST	Sleeve shank dia. DCON (mm)	EZB	EZBT/EZBF EZBP/EZBC EZVB/EZG EZFG/EZT	EZ Bar PLUS	Shank dia. DCON (mm)	
-	-	EZH 01712ST-80 02012ST-80 02512ST-80 03012ST-80 03512ST-80 04012ST-80 05012ST-80 06012ST-80 07012ST-80	12	EZB ...017... EZB ...020... EZB ...025... EZB ...030... EZB ...035... EZB ...040... EZB ...050... EZB ...060... EZB ...070...	- EZ ...020... EZ ...025... EZ ...030... EZ ...035... EZ ...040... EZ ...050... EZ ...060... EZ ...070...	-	1.7 2 2.5 3 3.5 4 5 6 7	(General purpose)
-	EZH 01716HP-100 02016HP-100 02516HP-100 03016HP-100 03516HP-100 04016HP-100 04516HP-100 05016HP-100 06016HP-100 07016HP-100 -	EZH 01716ST-100 02016ST-100 02516ST-100 03016ST-100 03516ST-100 04016ST-100 -	16	EZB ...017... EZB ...020... EZB ...025... EZB ...030... EZB ...035... EZB ...040... EZB ...045... EZB ...050... EZB ...060... EZB ...070... EZB ...080...	- EZ ...020... EZ ...025... EZ ...030... EZ ...035... EZ ...040... -	- - - - - - 045X- ...-050EZP 050X- ...-060EZP 060X- ...-070EZP 070X- ...-080EZP 080X- ...-100EZP	1.7 2 2.5 3 3.5 4 4.5 5 6 7 8	(General purpose)
EZH 01719CT-120 02019CT-120 02519CT-120 03019CT-120 03519CT-120 04019CT-120 04519CT-120 05019CT-120 06019CT-120 07019CT-120 08019CT-120	EZH 01719HP-120 02019HP-120 02519HP-120 03019HP-120 03519HP-120 04019HP-120 04519HP-120 05019HP-120 06019HP-120 07019HP-120 08019HP-120	EZH 01719ST-120 02019ST-120 02519ST-120 03019ST-120 03519ST-120 04019ST-120 -	19.05	EZB ...017... EZB ...020... EZB ...025... EZB ...030... EZB ...035... EZB ...040... EZB ...045... EZB ...050... EZB ...060... EZB ...070... EZB ...080...	- EZ ...020... EZ ...025... EZ ...030... EZ ...035... EZ ...040... -	- - - - - - 045X- ...-050EZP 050X- ...-060EZP 060X- ...-070EZP 070X- ...-080EZP 080X- ...-100EZP	1.7 2 2.5 3 3.5 4 4.5 5 6 7 8	Citizen Machinery
EZH 01720CT-120 02020CT-120 02520CT-120 03020CT-120 03520CT-120 04020CT-120 04520CT-120 05020CT-120 06020CT-120 07020CT-120 08020CT-120	EZH 01720HP-120 02020HP-120 02520HP-120 03020HP-120 03520HP-120 04020HP-120 04520HP-120 05020HP-120 06020HP-120 07020HP-120 08020HP-120	EZH 01720ST-120 02020ST-120 02520ST-120 03020ST-120 03520ST-120 04020ST-120 -	20	EZB ...017... EZB ...020... EZB ...025... EZB ...030... EZB ...035... EZB ...040... EZB ...045... EZB ...050... EZB ...060... EZB ...070... EZB ...080...	- EZ ...020... EZ ...025... EZ ...030... EZ ...035... EZ ...040... -	- - - - - - 045X- ...-050EZP 050X- ...-060EZP 060X- ...-070EZP 070X- ...-080EZP 080X- ...-100EZP	1.7 2 2.5 3 3.5 4 4.5 5 6 7 8	Eguro Tsunami Citizen Machinery (General purpose)
EZH 01722CT-135 02022CT-135 02522CT-135 03022CT-135 03522CT-135 04022CT-135 04522CT-135 05022CT-135 06022CT-135 07022CT-135 08022CT-135	EZH 01722HP-135 02022HP-135 02522HP-135 03022HP-135 03522HP-135 04022HP-135 04522HP-135 05022HP-135 06022HP-135 07022HP-135 08022HP-135	EZH 01722ST-135 02022ST-135 02522ST-135 03022ST-135 03522ST-135 04022ST-135 -	22	EZB ...017... EZB ...020... EZB ...025... EZB ...030... EZB ...035... EZB ...040... EZB ...045... EZB ...050... EZB ...060... EZB ...070... EZB ...080...	- EZ ...020... EZ ...025... EZ ...030... EZ ...035... EZ ...040... -	- - - - - - 045X- ...-050EZP 050X- ...-060EZP 060X- ...-070EZP 070X- ...-080EZP 080X- ...-100EZP	1.7 2 2.5 3 3.5 4 4.5 5 6 7 8	Star Micronics Nomura DS Tsunami
EZH 01725.0CT-135 02025.0CT-135 02525.0CT-135 03025.0CT-135 03525.0CT-135 04025.0CT-135 04525.0CT-135 05025.0CT-135 06025.0CT-135 07025.0CT-135 08025.0CT-135	EZH 01725.0HP-135 02025.0HP-135 02525.0HP-135 03025.0HP-135 03525.0HP-135 04025.0HP-135 04525.0HP-135 05025.0HP-135 06025.0HP-135 07025.0HP-135 08025.0HP-135	EZH 01725.0ST-135 02025.0ST-135 02525.0ST-135 03025.0ST-135 03525.0ST-135 04025.0ST-135 -	25	EZB ...017... EZB ...020... EZB ...025... EZB ...030... EZB ...035... EZB ...040... EZB ...045... EZB ...050... EZB ...060... EZB ...070... EZB ...080...	- EZ ...020... EZ ...025... EZ ...030... EZ ...035... EZ ...040... -	- - - - - - 045X- ...-050EZP 050X- ...-060EZP 060X- ...-070EZP 070X- ...-080EZP 080X- ...-100EZP	1.7 2 2.5 3 3.5 4 4.5 5 6 7 8	Eguro Tsunami Citizen Machinery (General purpose)
EZH 01725.4CT-120 02025.4CT-120 02525.4CT-120 03025.4CT-120 03525.4CT-120 04025.4CT-120 04525.4CT-120 05025.4CT-120 06025.4CT-120 07025.4CT-120 08025.4CT-120	EZH 01725.4HP-120 02025.4HP-120 02525.4HP-120 03025.4HP-120 03525.4HP-120 04025.4HP-120 04525.4HP-120 05025.4HP-120 06025.4HP-120 07025.4HP-120 08025.4HP-120	EZH 01725.4ST-120 02025.4ST-120 02525.4ST-120 03025.4ST-120 03525.4ST-120 04025.4ST-120 -	25.4	EZB ...017... EZB ...020... EZB ...025... EZB ...030... EZB ...035... EZB ...040... EZB ...045... EZB ...050... EZB ...060... EZB ...070... EZB ...080...	- EZ ...020... EZ ...025... EZ ...030... EZ ...035... EZ ...040... -	- - - - - - 045X- ...-050EZP 050X- ...-060EZP 060X- ...-070EZP 070X- ...-080EZP 080X- ...-100EZP	1.7 2 2.5 3 3.5 4 4.5 5 6 7 8	Citizen Machinery

• Choose sleeves (DCB) to meet with DCON dimension of bar.
 • Adjustment Pin cannot be installed to EZH-ST sleeves. To adjust overhang of the bar, please use EZH-CT / HP sleeves.
 • Machine manufacturers in random order.



EZH sleeves and applicable inserts / toolholders

Shank size (Hole dia.: mm)		017 (1.7mm)	020 (2mm)	025 (2.5mm)	03 (3mm)	035 (3.5mm)
EZH-CT sleeve (Internal coolant)	EZH	01716HP-100	EZH 02016HP-100	EZH 02516HP-100	EZH 03016HP-100	EZH 03516HP-100
		01719CT/HP-120	02019CT/HP-120	02519CT/HP-120	03019CT/HP-120	03519CT/HP-120
		01720CT/HP-120	02020CT/HP-120	02520CT/HP-120	03020CT/HP-120	03520CT/HP-120
	EZH-HP	01722CT/HP-135	02022CT/HP-135	02522CT/HP-135	03022CT/HP-135	03522CT/HP-135
	sleeve description (Adjustable overhang length)	01725.0CT/HP-135	02025.0CT/HP-135	02525.0CT/HP-135	03025.0CT/HP-135	03525.0CT/HP-135
	01725.4CT/HP-120	02025.4CT/HP-120	02525.4CT/HP-120	03025.4CT/HP-120	03525.4CT/HP-120	
EZH-ST sleeve description	EZH	01712ST-80	EZH 02012ST-80	EZH 02512ST-80	EZH 03012ST-80	EZH 03512ST-80
		01716ST-100	02016ST-100	02516ST-100	03016ST-100	03516ST-100
		01719ST-120	02019ST-120	02519ST-120	03019ST-120	03519ST-120
		01720ST-120	02020ST-120	02520ST-120	03020ST-120	03520ST-120
		01722ST-135	02022ST-135	02522ST-135	03022ST-135	03522ST-135
		01725.0ST-135	02025.0ST-135	02525.0ST-135	03025.0ST-135	03525.0ST-135
		01725.4ST-120	02025.4ST-120	02525.4ST-120	03025.4ST-120	03525.4ST-120
EZ Bars	Boring	EZBR 020017ST-	EZB [®] /L 020020HP-	EZB [®] /L 025025HP-	EZB [®] /L 030030HP-	EZB [®] /L 035035HP-
		EZBR 020017-...NB	EZBR 025020ST-	EZBR 030025ST-	EZBR ...030-...NB	EZBR 040035ST-
			EZBR 025020-...NB	EZBR 030025-...NB	EZBR ...030-...NB	EZBR 040035-...NB
			EZBPR 020020-		EZBFR 030030-008	
	Internal grooving			EZBPR 030030-		
	Face grooving			EZVBR 035030-		
	Internal threading			EZTR 030025-	EZTR 035030-	EZTR 040035-
EZ Bar PLUS						

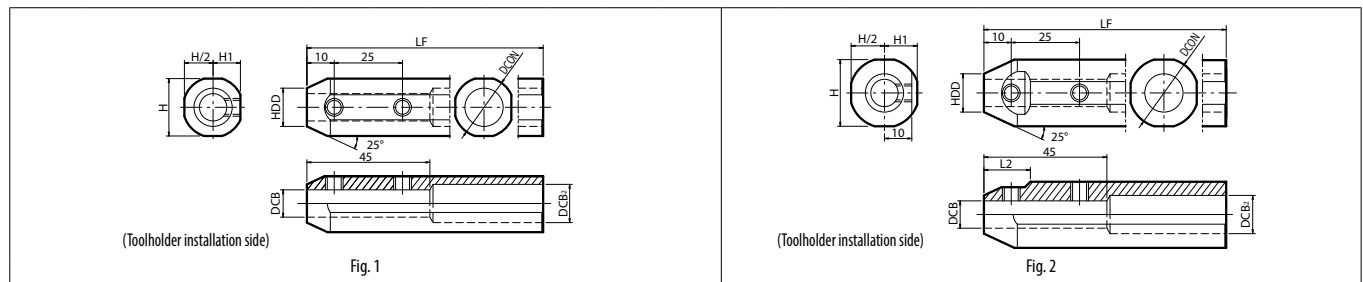
F

Boring

Shank size (Hole dia.: mm)		04 (4mm)	045 (4.5mm)	05 (5mm)	06 (6mm)	07 (7mm)	08 (8mm)
EZH-CT sleeve (Internal coolant)	EZH	04016HP-100	EZH 04516HP-100	EZH 05016HP-100	EZH 06016HP-100	EZH 07016HP-100	EZH 08016HP-100
		04019CT/HP-120	04519CT/HP-120	05019CT/HP-120	06019CT/HP-120	07019CT/HP-120	08019CT/HP-120
		04020CT/HP-120	04520CT/HP-120	05020CT/HP-120	06020CT/HP-120	07020CT/HP-120	08020CT/HP-120
	EZH-HP	04022CT/HP-135	04522CT/HP-135	05022CT/HP-135	06022CT/HP-135	07022CT/HP-135	08022CT/HP-135
	sleeve description (Adjustable overhang length)	04025.0CT/HP-135	04525.0CT/HP-135	05025.0CT/HP-135	06025.0CT/HP-135	07025.0CT/HP-135	08025.0CT/HP-135
	04025.4CT/HP-120	04525.4CT/HP-120	05025.4CT/HP-120	06025.4CT/HP-120	07025.4CT/HP-120	08025.4CT/HP-120	
EZH-ST sleeve description	EZH	04012ST-80		EZH 05012ST-80	EZH 06012ST-80	EZH 07012ST-80	EZH 08012ST-80
		04016ST-100		05016ST-100	06016ST-100	07016ST-100	08016ST-100
		04019ST-120		05019ST-120	06019ST-120	07019ST-120	08019ST-120
		04020ST-120		05020ST-120	06020ST-120	07020ST-120	08020ST-120
		04022ST-135		05022ST-135	06022ST-135	07022ST-135	08022ST-135
		04025.0ST-135		05025.0ST-135	06025.0ST-135	07025.0ST-135	08025.0ST-135
		04025.4ST-120		05025.4ST-120	06025.4ST-120	07025.4ST-120	08025.4ST-120
EZ Bars	Boring	EZB [®] /L 040040HP-	EZB [®] /L 045045HP-	EZB [®] /L 050050HP-	EZB [®] /L 060060HP-	EZB [®] /L 070070HP-	EZB [®] /L 080080HP-
		EZBR 045040ST-		EZBR 055050ST-	EZBR 065060ST-	EZBR 075070ST-	
		EZBR ...040-...NB		EZBR ...050-...NB	EZBR ...060-...NB	EZBR ...070-...NB	
		EZBFR 040040-008		EZBFR 050050-015	EZBFR 060060-015		
		EZBPR 040040-015		EZBPR 050050-015	EZBPR 060060-015		
				EZBCR 050050-	EZBCR 060060-	EZBCR 070070-	
	EZVBR 045040-		EZVBR 055050-	EZVBR 065060-			
Internal grooving	EZG [®] /L 040040-		EZG [®] /L 050050-	EZG [®] /L 060060-	EZG [®] /L ...070-...		
Face grooving	EZFG [®] /L 050040-		EZFG [®] /L 060050-		EZFG [®] /L 080070-		
Internal threading	EZTR 050040-		EZTR 060050-	EZTR 070060-	EZTR 080070-		
EZ Bar PLUS			S/C045X-SCLCR03-050EZP	S/C050X-SCLCR03-060EZP	S/C060X-SCLCR04-070EZP	S/C070X-SCLCR04-080EZP	S/C080X-SCLCR06-100EZP
				S/C050X-SWUBR06-060EZP	S/C060X-SWUBR06-070EZP	S/C070X-STLBR06-080EZP	S/C080X-STLPR09-100EZP
Boring Bars		C04-....		C05-....	C06-....	C07-....	C/E08-....
					S06-....		A/S08-....

Note 1) When attaching boring bars to EZH-CT/HP sleeve (Adjustable overhang length), detach adjustable pin.
Overhang length of bar is not adjustable.

SHA sleeves (Applicable toolholders F157)



Description	Availability	Dimension (mm)								Drawing	Spare parts		Applicable machine manufacturer
		DCB	DCON	HDD	DCB ₂	H	H1	LF	L2		Screw	Wrench	
SHA 0820-120	●	8	20	14	12	19	9.25	120	-	Fig. 1	HS6X4P	LW-3	Eguro Tsumami Citizen Machinery
SHA 1020-120	●	10		14	14	24	11.5	135	17					Fig. 2
SHA 0825.0-135	●	8	25.4	14	14	24.4	12	120	17	Fig. 2	HS6X4P	LW-3	
SHA 1025.0-135	●	10		16									
SHA 1225.0-135	●	12		16									
SHA 0819-120	●	8	19.05	14	12	18	8.75	120	-	Fig. 1	HS6X4P	LW-3		Citizen Machinery
SHA 1019-120	●	10		14	14	21	10	125	-				Fig. 1
SHA 0820-120	●	8	20	14	12	19	9.25	120	-	Fig. 1	HS6X4P	LW-3	
SHA 1020-120	●	10		14	14	21	10	125	-				Fig. 1
SHA 0825.4-120	●	8	25.4	14	14	24.4	12	120	17	Fig. 2	HS6X4P	LW-3	
SHA 1025.4-120	●	10		16									
SHA 1225.4-120	●	12		16									
SHA 0822-125	●	8	22	14	14	21	10	125	-	Fig. 1	HS6X4P	LW-3	Star Micronics Nomura DS
SHA 1022-125	●	10		16									
SHA 1222-125	●	12		16									
SHA 0823-120	●	8	23	14	14	22	10.5	120	16	Fig. 2	HS6X4P	LW-3	Nomura DS
SHA 1023-120	●	10		16									
SHA 1223-120	●	12		16									

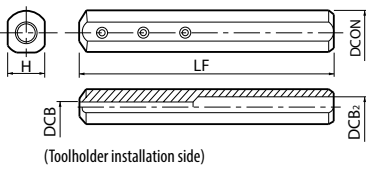
* Length of DCB→45mm (All of SHA sleeves)
 Choose sleeves (DCB) to meet with DCON dimension of toolholder.
 Machine manufacturers in random order.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

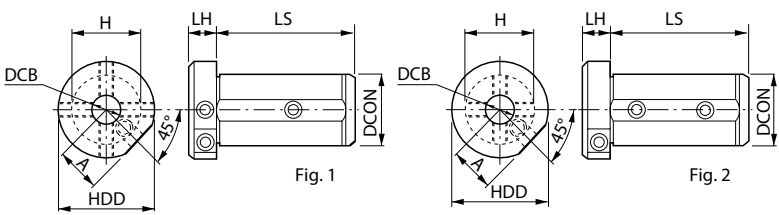


Boring

Sleeves for Boring bars

Shape	Description	Availability	Dimension (mm)					Spare parts	
			DCON	DCB	DCB ₂	H	LF	Screw	Wrench
	SH 0416-100	●	16	4	5	14	100	HS4X4	LW-2
	0516-100	●		5	6				
	0616-100	●		6	7				
	0716-100	●		7	8				
	SH 0820-120	●	20	8	9	18	120	HS4X4	LW-2
	1020-120	●	20	10	11	18	120	HS4X4	LW-2
	1225-150	●	25	12	13	23	150	HS5X5	LW-2.5
	1632-180	●	32	16	18	30	180		
	2032-180	●		20	22				

Coolant sleeve dimensions



Accessories

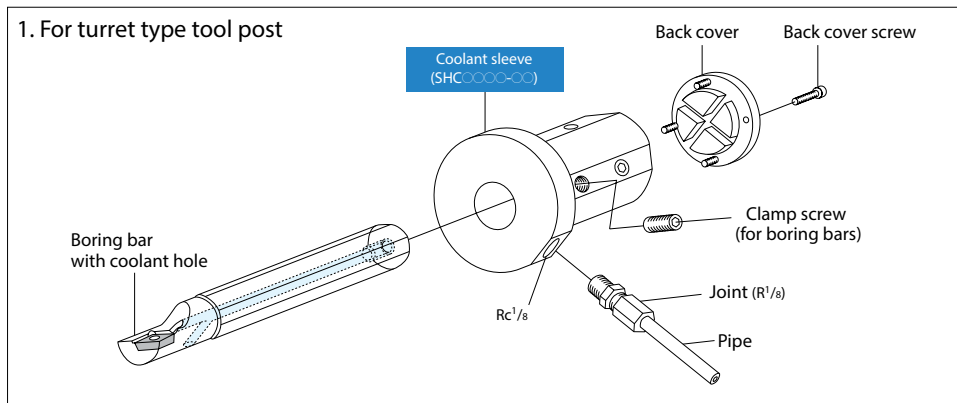
Back cover / SHL-4...SHC○○○40-70
SHL-5...SHC○○○50-95

Back cover screw
Shank clamp screw

(Note) To stabilize the toolholder and to prevent coolant leaks, tighten all 4 screws of coolant sleeve securely.

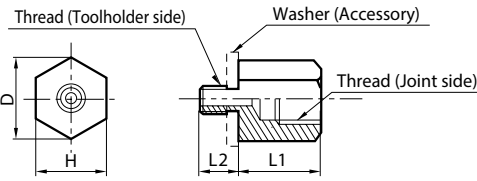
Description	Availability	Dimension (mm)							Drawing	Spare parts						
		DCON	HDD	DCB	LS	LH	H	A		Front screw	Wrench	Back screw	Wrench	Back cover	Back cover screw	Wrench
SHC 0840-70	●	40	56	8	70	16	38	27	Fig. 1	HS6X22	LW-3	HS6X14	LW-3	SHL-4	HH3X6	LW-2.5
1040-70	●			10												
1240-70	●			12												
1640-70	●			16												
2040-70	●			20												
2540-70	●			25												
SHC 0850-95	●	50	65	8	95	16	47	30.5	Fig. 1	HS6X22	LW-3	HS6X14	LW-3	SHL-5	HH3X12	LW-2.5
1050-95	●			10												
1250-95	●			12												
1650-95	●			16												
2050-95	●			20												
2550-95	●			25												

How to install



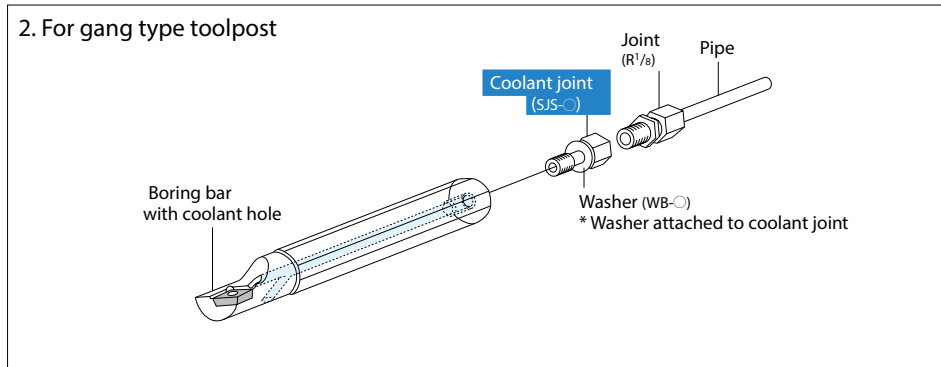
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Coolant joint dimensions *This Coolant joint is not applicable for Dynamic-Bars



Description	Availability	Dimension (mm)				Thread (Toolholder side)	Thread (Joint side)	Spare parts
		D	L1	L2	H			Washer
SJS-5	●	15	15	7	13	M5XP0.8	Rc1/8 (PT1/8)	WB-5
SJS-6	●			9		WB-6		
SJS-8	●			13		WB-8		

2. For gang type toolpost



List of toolholders and applicable joints

Toolholder description	Applicable coolant joint
A08-...-○○E	SJS-5
A10-...-○○E	
A12-...-○○E	
A16-...-○○E	SJS-8
A20-...-○○E	
A25-...-○○E	
E08-...-○○	SJS-5
E10-...-○○	
E12-...-○○	SJS-6
E16-...-○○	
E20-...-○○	SJS-8

*This Coolant Joint is not applicable for Dynamic-Bars

SHA / SH / SHC sleeves and applicable toolholders

Shank size (Hole dia.: mm)	04 (4mm)	05 (5mm)	06 (6mm)	07 (7mm)	08 (8mm)	10 (10mm)	12 (12mm)	16 (16mm)	20 (20mm)	25 (25mm)
Sleeve description	SH0416-100	SH0516-100	SH0616-100	SH0716-100	SH0820-120	SH1020-120	SH1225-150	SH1632-180	SH2032-180	
					SHA0819-120	SHA1019-120				
					SHA0820-120	SHA1020-120				
					SHA0822-125	SHA1022-125	SHA1222-125			
					SHA0823-120	SHA1023-120	SHA1223-120			
					SHA0825.0-135	SHA1025.0-135	SHA1225.0-135			
					SHA0825.4-120	SHA1025.4-120	SHA1225.4-120			
					SHC0840-70	SHC1040-70	SHC1240-70	SHC1640-70	SHC2040-70	SHC2540-70
				SHC0850-95	SHC1050-95	SHC1250-95	SHC1650-95	SHC2050-95	SHC2550-95	
Boring Bar description	C04-...	C05-...	C06-...	C07-...	A08-...	A10-...	A12-...	A16-...	A20-...	A25-...
					E08-...	E10-...	E12-...	E16-...	E20-...	E25-...
			S06-...		S08-...	S10-...	S12-...	S16-...	S20-...	S25-...
Internal grooving toolholder description			SIGC [®] /L0806-WH		SIGC [®] /L1008-WH-L85	SIGCR1210-WH-L95	SIGC [®] /L0812-EH	SIGC [®] /L1016-EH		
					SIGCR1008-WH-L100	SIGC [®] /L1210-WH-L110		SIGC [®] /L1216-EH		
					SIGE [®] /L0808A-EH	SIGE [®] /L1010B-EH	SIGE [®] /L1412C-EH	SIGE [®] /L1616C-EH	SIGE [®] /L2020D-EH	SIGE [®] /L2525E-EH
						SIGE [®] /L1210B-EH	SIGE [®] /L1612C-EH			KIGBA [®] /L3525-16
					SIGE [®] /L0808A-WH	SIGE [®] /L1010B-WH	SIGE [®] /L1412C-WH	KGDI [®] /L...16B-	KGDI [®] /L2520B-	KGDI [®] /L3225B-
						SIGE [®] /L1210B-WH	SIGE [®] /L1612C-WH			
					SIGER1008B-WH-90	SIGER1210B-WH-90	SIGER1412C-WH-90			
							GIV [®] /L1412-1SE	GIV [®] /L1216-1SS	GIV [®] /L1420-1S	GIV [®] /L2025-1B
							GIV [®] /L1612-1AE	GIV [®] /L2016-1BE	GIV [®] /L1620-1A	GIV [®] /L2025-2B
								GIV [®] /L2016-2BE	GIV [®] /L2520-1CE	GIV [®] /L3225-1CE
Internal threading toolholder description							SINR0612S-06E	SINR0816S-08E	SIN [®] /L2420S-16	CIN [®] /L3025S-16
								SIN [®] /L1216S-11E	SINR2420S-22	CINR3025S-22
								SIN [®] /L1516S-11		
								SIN [®] /L1616S-16		
							SIN [®] /L2016S-16			

* For SHA sleeves, please see page F155. For SH / SHC sleeves, please see page F156.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Boring: Positive insert (Cutting diameter under 10 mm)

ISO classification	Workpiece material	Hardness	Cutting range	Applications	Chipbreaker	Insert grades	Corner-R (RE)	Lower limit - Recommendation - Upper limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
P*	Low-carbon steel Low-carbon alloy	HB ≤ 300	Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - 70 - 110 30 - 60 - 90	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.01 - 0.04 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continuous Interruption	F	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 100	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 100	0.05 - 0.15 - 0.25 0.05 - 0.15 - 0.25	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - 70 - 110 30 - 60 - 90	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.01 - 0.04 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continuous Interruption	F	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 120	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 100	0.05 - 0.15 - 0.25 0.05 - 0.15 - 0.25	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
	Medium-carbon steel Medium-carbon alloy	HB ≤ 300	Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - 70 - 110 30 - 60 - 90	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.01 - 0.04 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continuous Interruption	F	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 120	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 100	0.05 - 0.15 - 0.25 0.05 - 0.15 - 0.25	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - 70 - 110 30 - 60 - 90	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.01 - 0.04 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continuous Interruption	F	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 100	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 100	0.05 - 0.15 - 0.25 0.05 - 0.15 - 0.25	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
High-carbon alloy	HB ≤ 280	Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - 70 - 110 30 - 60 - 90	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.01 - 0.04 - 0.07 0.03 - 0.07 - 0.1	
		Finishing	Continuous Interruption	F	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 100	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1	
		Finishing-Medium	Continuous Interruption	CF	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 100	0.05 - 0.15 - 0.25 0.05 - 0.15 - 0.25	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1	
		Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - 70 - 110 30 - 60 - 90	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.01 - 0.04 - 0.07 0.03 - 0.07 - 0.1	
		Finishing	Continuous Interruption	F	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 100	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1	
		Finishing-Medium	Continuous Interruption	CF	PR1725	0.1 0.2	40 - 80 - 120 40 - 70 - 100	0.05 - 0.15 - 0.25 0.05 - 0.15 - 0.25	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1	
M	Stainless steel	HB ≤ 220	Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - 60 - 80 30 - 60 - 80	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.01 - 0.03 - 0.05 0.02 - 0.05 - 0.07
			Finishing	Continuous Interruption	F	PR1225 PR1535	0.1 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1225 PR1535	0.1 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.15 - 0.25 0.05 - 0.15 - 0.25	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - 60 - 80 30 - 60 - 80	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.01 - 0.03 - 0.05 0.02 - 0.05 - 0.07
			Finishing	Continuous Interruption	F	PR1225 PR1535	0.1 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1225 PR1535	0.1 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.15 - 0.25 0.05 - 0.15 - 0.25	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
	Stainless steel	HB ≤ 300	Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - 60 - 80 30 - 60 - 80	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.01 - 0.03 - 0.05 0.02 - 0.05 - 0.07
			Finishing	Continuous Interruption	F	PR1225 PR1535	0.1 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1225 PR1535	0.1 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.15 - 0.25 0.05 - 0.15 - 0.25	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing Solid type	Continuous Interruption	EZB-F EZB-H	PR1725	0.05 0.15	30 - 60 - 80 30 - 60 - 80	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.01 - 0.03 - 0.05 0.02 - 0.05 - 0.07
			Finishing	Continuous Interruption	F	PR1225 PR1535	0.1 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continuous Interruption	CF	PR1225 PR1535	0.1 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.15 - 0.25 0.05 - 0.15 - 0.25	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
K	Gray cast iron	HB ≤ 250	Finishing Solid type	Continuous Interruption	(VNB) (VNB-NB)	KW10	0.03 0.2	30 - 60 - 100 30 - 60 - 100	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continuous Interruption	F	KW10	0.1 0.2	30 - 60 - 100 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continuous Interruption	Without chipbreaker	KW10	0.2 0.4	30 - 60 - 100 30 - 60 - 80	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing Solid type	Continuous Interruption	(VNB) (VNB-NB)	KW10	0.03 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continuous Interruption	F,U	KW10	0.1 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continuous Interruption	Without chipbreaker	KW10	0.2 0.4	30 - 60 - 100 30 - 60 - 80	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
	Nodular cast iron	HB ≤ 270	Finishing Solid type	Continuous Interruption	(VNB) (VNB-NB)	KW10	0.03 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing	Continuous Interruption	F,U	KW10	0.1 0.2	30 - 60 - 80 30 - 60 - 80	0.05 - 0.08 - 0.1 0.05 - 0.1 - 0.15	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			Finishing-Medium	Continuous Interruption	Without chipbreaker	KW10	0.2 0.4	30 - 60 - 100 30 - 60 - 80	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.03 - 0.05 - 0.07 0.03 - 0.07 - 0.1
			High Speed Finishing Rainbow surface gloss	Continuous	Without chipbreaker	KPD001	0.05	150 - 200 - 300	0.05 - 0.1 - 0.3	0.05 - 0.1 - 0.15
			Finishing Long tool life	Continuous Interruption	F, U	PDL025	0.1 0.2	100 - 150 - 200 100 - 150 - 200	0.05 - 0.3 - 0.5 0.05 - 0.3 - 0.5	0.03 - 0.1 - 0.2 0.03 - 0.1 - 0.2
			Finishing	Continuous Interruption	F, U	KW10	0.1 0.2	100 - 150 - 200 100 - 150 - 200	0.05 - 0.3 - 0.5 0.05 - 0.3 - 0.5	0.03 - 0.1 - 0.2 0.03 - 0.1 - 0.2
S	Titanium alloys	HB ≤ 400	Precision Finishing Rainbow surface gloss	Continuous Interruption	Without chipbreaker	KPD001	0.1 0.2	100 - 120 - 150 70 - 100 - 120	0.05 - 0.1 - 0.3 0.05 - 0.1 - 0.3	0.03 - 0.07 - 0.1 0.03 - 0.07 - 0.1
			Finishing	Continuous Interruption	F, U	KW10	0.1 0.2	20 - 40 - 60 20 - 40 - 60	0.05 - 0.2 - 0.5 0.05 - 0.2 - 0.5	0.03 - 0.1 - 0.2 0.03 - 0.1 - 0.2
			Finishing Solid type	Continuous Interruption	(VNB)	KW10	0.2 0.2	10 - 30 - 50 10 - 30 - 50	0.05 - 0.1 - 0.3 0.05 - 0.1 - 0.3	0.03 - 0.05 - 0.1 0.03 - 0.05 - 0.08
			Finishing	Continuous Interruption	F,U	KW10	0.2 0.2	10 - 30 - 50 10 - 30 - 50	0.05 - 0.2 - 0.4 0.05 - 0.2 - 0.4	0.03 - 0.05 - 0.1 0.03 - 0.05 - 0.1
	Heat-resistant alloys	HB ≤ 350	Finishing Solid type	Continuous Interruption	(VNB)	KW10	0.2 0.2	10 - 30 - 50 10 - 30 - 50	0.05 - 0.1 - 0.3 0.05 - 0.1 - 0.3	0.03 - 0.05 - 0.1 0.03 - 0.05 - 0.08
			Finishing	Continuous Interruption	F,U	KW10	0.2 0.2	10 - 30 - 50 10 - 30 - 50	0.05 - 0.2 - 0.4 0.05 - 0.2 - 0.4	0.03 - 0.05 - 0.1 0.03 - 0.05 - 0.1
H	Hardened steel Hard materials	40~50 HRC	Finishing	Continuous Interruption	(VNB)	PR930	0.2 0.2	30 - 50 - 70 30 - 50 - 70	0.05 - 0.1 - 0.4 0.05 - 0.1 - 0.2	0.01 - 0.02 - 0.05 0.01 - 0.02 - 0.03
			Finishing	Continuous Interruption	ME MES	KBNO10 KBNO20	0.2 0.4	60 - 100 - 140 60 - 80 - 120	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2	0.02 - 0.05 - 0.1 0.02 - 0.05 - 0.1

* Please use it with PR1725 set to Vc = 150 m/min or below, for machining of free-cutting steel such as small size SUM. For ap and f, refer to specs for low carbon steels.
 • ap indicates radius

Boring: Positive insert (Cutting diameter over 10 mm)

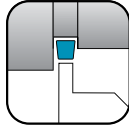
ISO classification	Workpiece material	Hardness	Cutting range	Applications	Chipbreaker	Insert grades	Corner-R (RE)	Lower limit - Recommendation - Upper limit		
								Vc (m/min)	ap (mm)	f (mm/rev)
P*	Low-carbon steel Low-carbon alloy	HB ≤ 300	Precision finishing	Continuous Interruption	F, U	TN620 PR1725	0.1 0.2	250 - 300 - 350 120 - 170 - 220	0.05 - 0.3 - 0.5 0.05 - 0.3 - 0.5	0.03 - 0.1 - 0.15 0.03 - 0.1 - 0.15
			Finishing	Continuous Interruption	XP	PV710 CA125P	0.4 0.4	200 - 250 - 300 150 - 200 - 250	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Finishing-Medium	Continuous Interruption	XQ	PV710 CA125P	0.4 0.4	150 - 200 - 250 100 - 150 - 200	0.5 - 1.0 - 2.0 0.5 - 1.0 - 1.5	0.1 - 0.15 - 0.25 0.1 - 0.15 - 0.2
			Medium	Continuous Interruption	Standard	PV720 CA125P	0.8 0.8	100 - 150 - 200 80 - 120 - 150	1.0 - 1.5 - 2.5 1.0 - 1.5 - 2.0	0.1 - 0.15 - 0.3 0.1 - 0.15 - 0.2
	Medium-carbon steel Medium-carbon alloy	HB ≤ 300	Precision finishing	Continuous Interruption	F, U	TN620 PR1725	0.2 0.4	150 - 200 - 250 120 - 140 - 170	0.05 - 0.3 - 0.5 0.05 - 0.3 - 0.5	0.03 - 0.1 - 0.15 0.03 - 0.1 - 0.15
			Finishing	Continuous Interruption	PP	PV710 CA125P	0.4 0.4	150 - 200 - 250 120 - 180 - 200	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Finishing-Medium	Continuous Interruption	HQ	PV710 CA125P	0.4 0.4	120 - 180 - 220 100 - 150 - 200	0.5 - 1.0 - 2.0 0.5 - 1.0 - 1.5	0.1 - 0.15 - 0.25 0.1 - 0.15 - 0.2
			Medium	Continuous Interruption	Standard	PV720 CA125P	0.8 0.8	100 - 150 - 200 80 - 120 - 150	1.0 - 1.5 - 2.5 1.0 - 1.5 - 2.0	0.1 - 0.15 - 0.3 0.1 - 0.15 - 0.2
	High-carbon alloy	HB ≤ 280	Precision finishing	Continuous Interruption	F, U	TN620 PR1725	0.2 0.4	120 - 150 - 180 110 - 130 - 160	0.05 - 0.3 - 0.5 0.05 - 0.3 - 0.5	0.03 - 0.1 - 0.15 0.03 - 0.1 - 0.15
			Finishing	Continuous Interruption	PP	PV710 CA125P	0.4 0.4	120 - 150 - 180 100 - 120 - 150	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Finishing-Medium	Continuous Interruption	HQ	PV710 CA125P	0.4 0.4	120 - 150 - 180 100 - 120 - 150	0.5 - 1.0 - 2.0 0.5 - 1.0 - 1.5	0.1 - 0.15 - 0.25 0.1 - 0.15 - 0.2
			Medium	Continuous Interruption	Standard	CA515 CA125P	0.8 0.8	100 - 120 - 150 80 - 100 - 120	1.0 - 1.5 - 2.5 1.0 - 1.5 - 2.0	0.1 - 0.15 - 0.3 0.1 - 0.15 - 0.2
M	Stainless steel	HB ≤ 220	Finishing	Continuous Interruption	MQ	CA6525 PR1535	0.4 0.8	120 - 150 - 180 100 - 120 - 150	0.2 - 0.5 - 0.8 0.2 - 0.5 - 0.8	0.05 - 0.08 - 0.1 0.05 - 0.08 - 0.1
			Medium	Continuous Interruption	Standard	CA6525 PR1535	0.4 0.8	120 - 150 - 180 100 - 120 - 150	0.5 - 1.0 - 1.5 0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
	Stainless steel	HB ≤ 300	Finishing	Continuous Interruption	MQ	CA6525 PR1535	0.4 0.8	80 - 100 - 120 60 - 80 - 100	0.2 - 0.7 - 1.0 0.2 - 0.7 - 1.0	0.05 - 0.1 - 0.15 0.05 - 0.1 - 0.15
			Medium	Continuous Interruption	Standard	CA6525 PR1535	0.4 0.8	80 - 100 - 120 60 - 80 - 100	0.5 - 1.0 - 1.5 0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
K	Gray cast iron	HB ≤ 250	High speed finishing	Continuous Interruption	Without chipbreaker	KBN475 PT600M	0.4 0.8	400 - 500 - 600 200 - 250 - 350	0.05 - 0.2 - 0.5 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.15 0.05 - 0.1 - 0.15
			Finishing	Continuous Interruption	Standard	PV7005 TN620	0.8 0.8	200 - 250 - 300 120 - 180 - 230	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Finishing	Continuous Interruption	Standard	CA310 CA315	0.4 0.8	150 - 180 - 200 100 - 150 - 180	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Medium	Continuous Interruption	Standard	CA310 CA315	0.8 0.8	100 - 150 - 200 80 - 120 - 150	0.5 - 1.0 - 2.0 0.5 - 1.0 - 2.0	0.1 - 0.15 - 0.2 0.05 - 0.1 - 0.15
	Nodular cast iron	HB ≤ 270	High speed finishing	Continuous Interruption	Without chipbreaker	KBN60M PT600M	0.4 0.8	200 - 300 - 400 150 - 200 - 250	0.05 - 0.2 - 0.5 0.2 - 0.5 - 1.0	0.03 - 0.05 - 0.1 0.05 - 0.1 - 0.15
			Finishing	Continuous Interruption	Standard	PV7005 TN620	0.8 0.8	150 - 200 - 250 120 - 150 - 200	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Finishing	Continuous Interruption	Standard	CA310 CA315	0.4 0.8	120 - 150 - 180 100 - 120 - 150	0.2 - 0.5 - 1.0 0.2 - 0.5 - 1.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.2
			Medium	Continuous Interruption	Standard	CA315 CA320	0.8 0.8	100 - 120 - 150 80 - 100 - 120	0.5 - 1.0 - 2.0 0.5 - 1.0 - 2.0	0.05 - 0.1 - 0.2 0.05 - 0.1 - 0.15
N	Non-ferrous metals Copper alloy Aluminum Aluminum alloys	HB ≤ 100	High speed finishing Rainbow surface gloss	Continuous	Without chipbreaker	KPD001	0.2	200 - 400 - 1,000	0.05 - 0.1 - 0.3	0.05 - 0.1 - 0.15
			Finishing	Continuous Interruption	F, U	PDL025	0.4	100 - 200 - 400	0.05 - 0.5 - 1.0	0.03 - 0.1 - 0.2
			Long tool life	Continuous Interruption	F, U	KW10	0.4	100 - 200 - 400	0.05 - 0.5 - 1.0	0.03 - 0.1 - 0.2
S	Titanium alloys	HB ≤ 400	Precision finishing Rainbow surface gloss	Continuous Interruption	Without chipbreaker	KPD001	0.2	100 - 120 - 150 70 - 100 - 120	0.05 - 0.1 - 0.3 0.05 - 0.1 - 0.3	0.03 - 0.07 - 0.1 0.03 - 0.07 - 0.1
			Finishing	Continuous Interruption	F, U	KW10	0.2 0.4	30 - 50 - 70 30 - 50 - 70	0.05 - 0.5 - 1.0 0.05 - 0.5 - 1.0	0.03 - 0.1 - 0.2 0.03 - 0.1 - 0.2
	Heat-resistant alloys	HB ≤ 350	Finishing	Continuous Interruption	F, U	KW10	0.4 0.4	10 - 30 - 50 10 - 30 - 50	0.05 - 0.5 - 1.0 0.05 - 0.5 - 1.0	0.03 - 0.1 - 0.2 0.03 - 0.1 - 0.2
			Finishing	Continuous Interruption	MQ	PR1155	0.4 0.8	40 - 60 - 80 40 - 60 - 80	0.1 - 0.3 - 0.5 0.1 - 0.3 - 0.5	0.03 - 0.05 - 0.1 0.03 - 0.05 - 0.1
H	Hardened steel Hard materials	40~50 HRC	Finishing	Continuous Interruption	HQ Standard	CA115P	0.8 0.8	60 - 80 - 100 30 - 50 - 70	0.05 - 0.3 - 0.5 0.05 - 0.3 - 0.5	0.05 - 0.08 - 0.1 0.05 - 0.08 - 0.1
			Finishing	Continuous Interruption	ME MET	KBN010 KBN020	0.4 0.8	100 - 140 - 180 90 - 120 - 160	0.1 - 0.2 - 0.3 0.1 - 0.2 - 0.3	0.02 - 0.07 - 0.1 0.02 - 0.07 - 0.1
		Medium	Continuous	Without chipbreaker Negative	KBN900	0.8	60 - 80 - 100	0.3 - 0.7 - 1.0	0.03 - 0.1 - 0.15	

* When machining free-cutting steel such as SUM, please use PR1725 for Vc = 200 m/min or under or use PV720 / CA115P, etc.
 - ap indicates radius



Boring

G



External grooving		G2
GBA type	KGBA/KGBAS/KGBA-JCT	G13
	KGB/KGBS	G16
GBF type	KGBF-F/KGBF-JCTM/KGBFS	G23
	S-KGBF	G26
GDM/GDMS/GDGS type	KGD (Integral type)	G34
	KGD (Integral type for automatic lathe)	G35
	KGD-JCT (Integral type)	G36
	KGD-JCTM (Integral type for automatic lathe)	G38
	KGD (Polygon taper shank)	G40
	KGD-S (0° separate type)	G41
GM/GMN/GMM/GMG/GMGA/FGG type	KGM/KGM-T/KGMM/KGMS	G55
	KGMU	G60
GH/GHU/GA type	KGH/KGHS/KGA	G62
GMGW type	KGMW	G67
Internal grooving		G68
EZG type	EZG	G70
VNG type	VNG	G72
GC type	SIGC	G76
GE/GER type	SIGE-EH / WH / WH-90	G81
GV type	GIV/GIV-E/GIV-W	G86
GBA type	KIGBA	G89
GDM/GDG type	KGDI	G91
GH/GHU type	KIGH	G93
GMM/GMG/GMGA type	KIGM-8/KIGMU-8	G95
GIA type	KGIA	G97
Face grooving		G98
EZFG type	EZFG	G102
VNFG type	VNFG	G104
TWFG/TWFGT small diameter face grooving (Twin-Bars)	TWFG	G106
	TWFGT	G108
GDFM/GDFMS type	KGDF 0°	G114
	KGDF-Z (Integral type)	G118
	KGDF 90°	G121
GVF type	GFV (A/B/C)	G127
	GIFV (A/B/C)	G133
FMM/FMN type	KFMS	G135
GMM/GMG/GMGA type	KFMS	G138
FTK type	KFTB-S	G140
Recommended cutting conditions		G141

KGD Grooving (External grooving & turning)

Integral type

Type	KGD
Edge width (mm)	2.0 ~ 8.0
Max. grooving depth (mm)	6 ~ 30
See Page	G34

Integral type (Coolant-through holders)

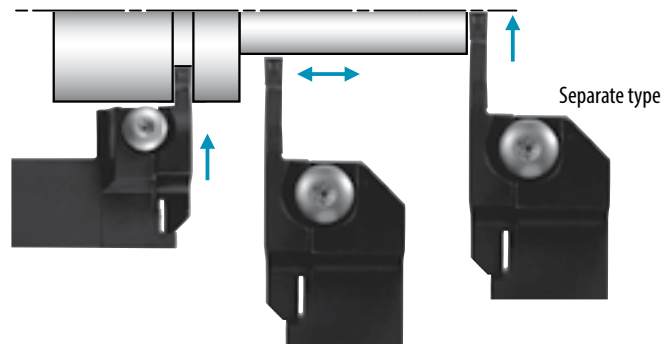
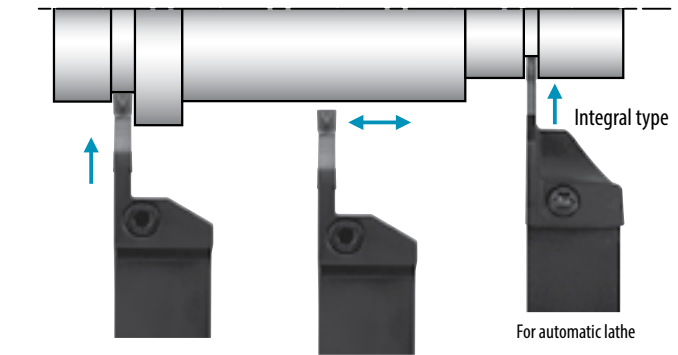
Type	KGD-JCT
Edge width (mm)	3.0 ~ 5.0
Max. grooving depth (mm)	6 ~ 25
See Page	G36

Integral type for automatic lathe

Type	KGD
Edge width (mm)	2.0 ~ 4.0
Max. grooving depth (mm)	10 ~ 25.5
See Page	G35

Integral type for automatic lathe (Coolant-through holders)

Type	KGD-JCTM
Edge width (mm)	2.0 ~ 4.0
Max. grooving depth (mm)	12 ~ 16
See Page	G39



Separate type

Type	*KGD-S-S
Edge width (mm)	3.0
Max. grooving depth (mm)	10
See Page	G42

* The separate type toolholders can accept all the blades if their hand is matching.

Separate type

Type	*KGD-S
Edge width (mm)	2.0 ~ 5.0
Max. grooving depth (mm)	10 ~ 25
See Page	G41

* The separate type toolholders can accept all the blades if their hand is matching.

G



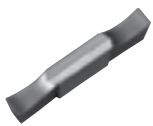
Grooving

External

Internal

Face

Low cutting force
GS



Low feed
GL



General purpose
GM



High feed
PH



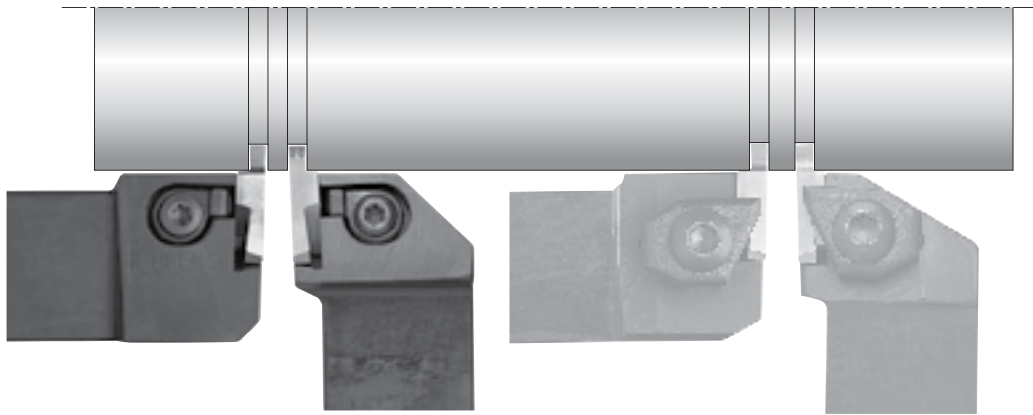
Copying
CM



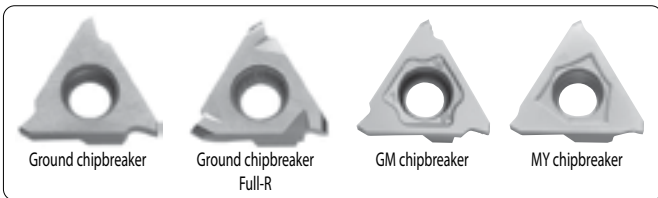
Non-ferrous Metals
AM



Shallow grooving (Grooving depth: ~5 mm)



Type	KGBAS	KGBA (-JCT)	KGBS	KGB
Edge width (mm)	0.33 ~ 4.8	0.33 ~ 4.8	0.33 ~ 4.8	0.33 ~ 4.8
Max. grooving depth (mm)	0.8 ~ 5.0	0.8 ~ 5.0	0.8 ~ 5.0	0.8 ~ 5.0
See Page	G14	G13,G15	G17	G16

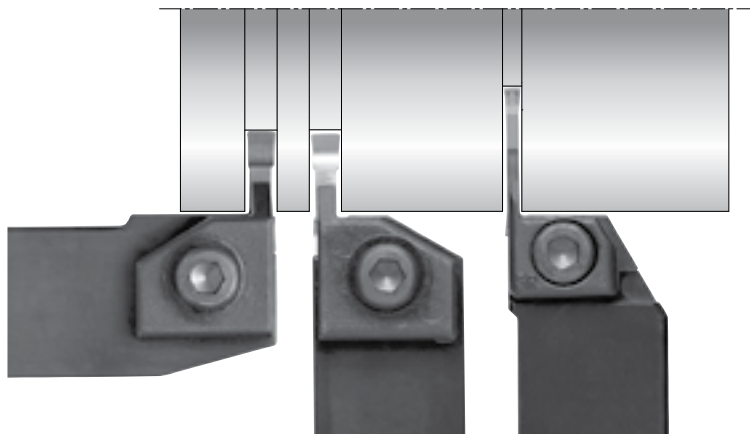


* These shallow groove types of the previous system will be switched to the system on the left.

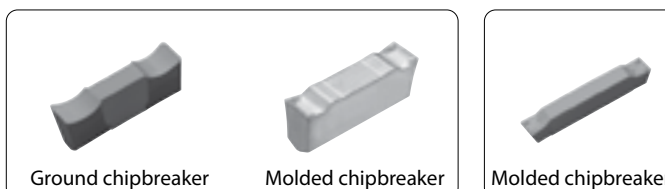
KGBS → **KGBAS**
KGB → **KGBA**

Edge shape	General (Square)	Full-R (Round)	GM chipbreaker	MY chipbreaker

Deep grooving (Grooving depth : ~25 mm)



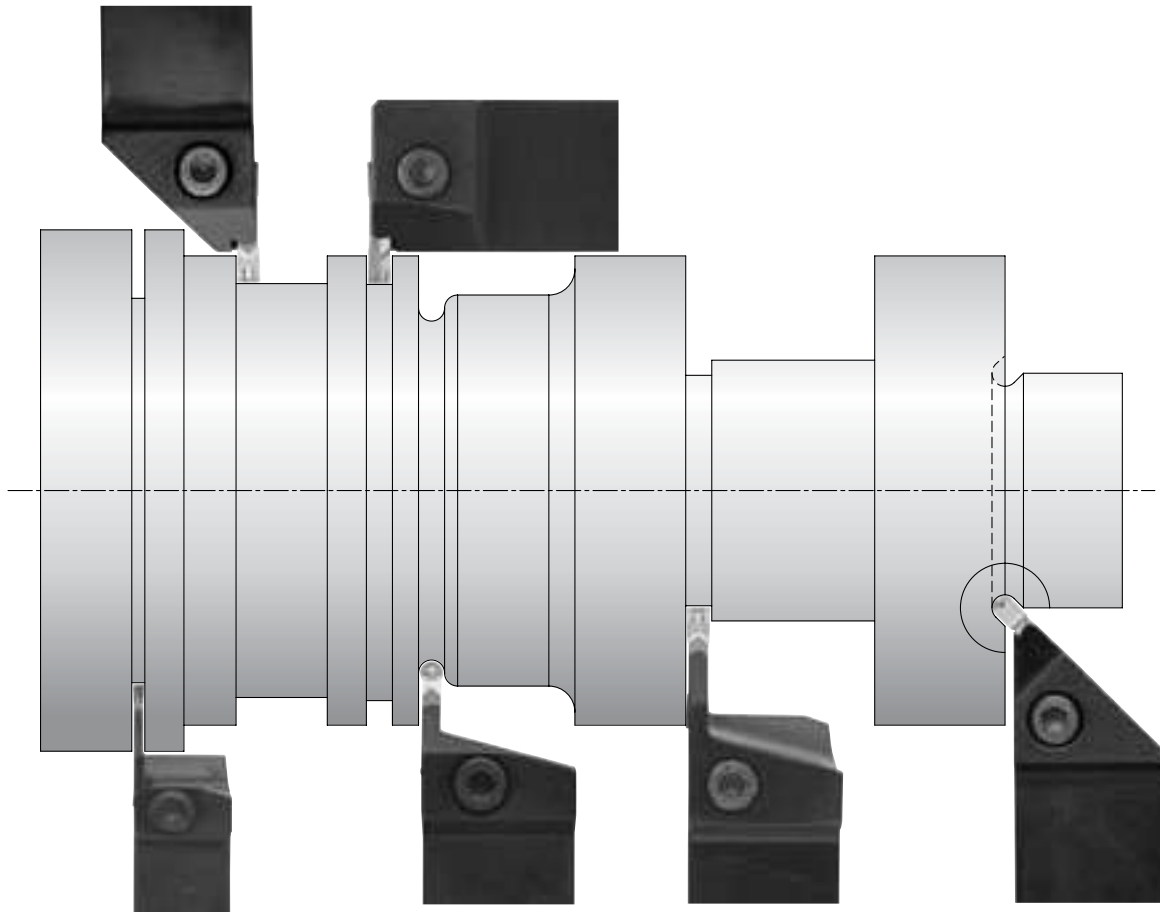
Type	KGHS	KGH	KGA
Edge Width (mm)	4.0 ~ 8.0	4.0 ~ 12.0	3.0 ~ 5.0
Max. grooving depth (mm)	13	13 ~ 17	20 ~ 25
See Page	G63	G62	G64



KGM Grooving (External grooving & turning)

Type	KGMM
Edge width (mm)	3.0 ~ 5.0
Max. grooving depth (mm)	4.8
See Page	G58

KGMS
3.0 ~ 5.0
4.8
G58

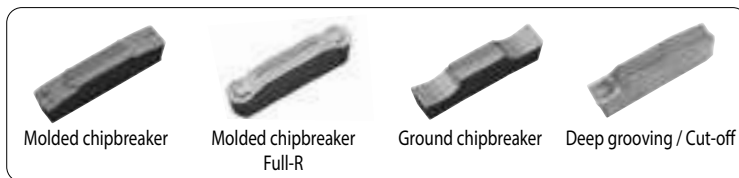


Type	KGM
Edge width (mm)	1.5 ~ 4.0
Max. grooving depth (mm)	10 ~ 16
See Page	G55

KGM
3.0 ~ 8.0
9 ~ 25
G56

KGM-T
2.0 ~ 6.0
17 ~ 30
G57

KGMU
3.0 ~ 5.0
3.5 ~ 4.5
G60



G

Grooving

External

Internal

Face

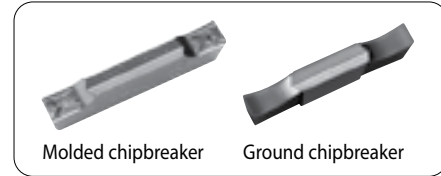
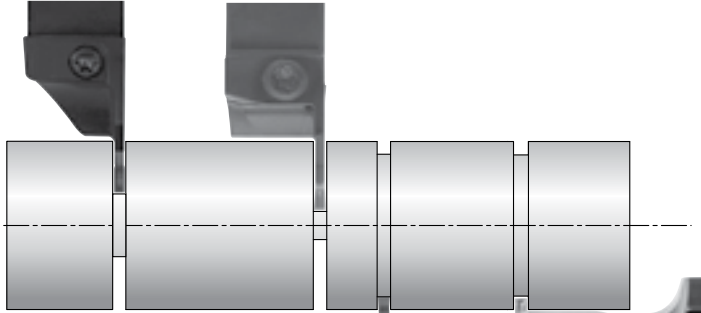
External grooving of precision parts for automatic lathe

Coolant-through holders

Type	KGD
Edge width (mm)	2.0 ~ 4.0
Max. grooving depth (mm)	10 ~ 25.5
See Page	G35

Type	KGD-JCTM
Edge width (mm)	2.0 ~ 4.0
Max. grooving depth (mm)	12 ~ 16
See Page	G39

Type	KGM
Edge width (mm)	1.5 ~ 4.0
Max. grooving depth (mm)	10 ~ 16
See Page	G55

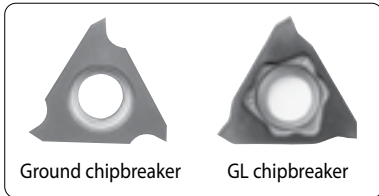


Type	KGBF-F
Edge width (mm)	0.25 ~ 3.0
Max. grooving depth (mm)	0.6 ~ 3.0
See Page	G23

Type	KGBF-JCTM	S-KGBF
Edge width (mm)	0.25 ~ 3.0	0.25 ~ 3.0
Max. grooving depth (mm)	0.6 ~ 3.0	0.6 ~ 3.0
See Page	G24	G26

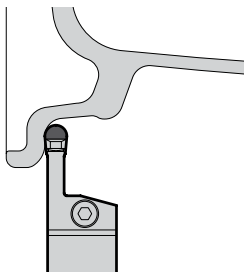
Coolant-through holders

Type	KGBFS	KGBF-JCTM	S-KGBF
Edge width (mm)	0.25 ~ 3.0	0.25 ~ 3.0	0.25 ~ 3.0
Max. grooving depth (mm)	0.6 ~ 3.0	0.6 ~ 3.0	0.6 ~ 3.0
See Page	G25	G24	G26



For aluminum wheel external grooving


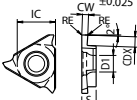
(External / Facing / Copying)




Type	KGMW
Edge width (mm)	6.0 ~ 8.0
Max. grooving depth (mm)	25
See Page	G67



GBA32

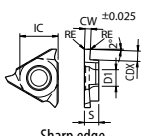
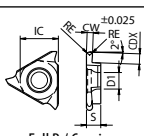
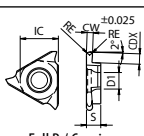
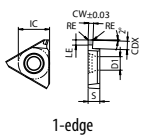
		Material compatibility											P														
		Carbon steel / Alloy steel											●														
		Stainless steel											●														
		Cast iron											●														
		Non-ferrous metals											●														
		Titanium alloy											●														
		Hard materials (~ 40HRC)											●														
		Hard materials (40HRC ~)											●														
Insert	Description	No. of edges	Dimension (mm)					Tolerance (mm)		Carbide					Cermet	Applicable toolholder G13~G17 G89											
			CW	CDX	IC	S	D1	RE	CW min.	CW max.	PVD																
											PR1215	PR1625	PR2015	PR2025			PR905	PR930	KW10	PV7040	TN90						
 	GBA32R 033-005	3	0.33	0.8	9.525	3.18	4.4	0.05	-0.03	+0.02	●	●	●	●	●	●	●	●	●	●	●	KGBAR...16 KGBAR...16JCT KGBASL...16 KIGBAL...16					
	050-005		0.5	1.2				0.05	0	+0.05	●	●	●	●	●	●	●	●	●	●	●		●	●			
	075-005		0.75	2				0.05	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●		
	095-005		0.95	2				0.05	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●		
	100-005		1	2				0.05	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●		
	110-005		1.1	2				0.05	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	120-005		1.2	2				0.05	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	125-020		1.25	2				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	130-020		1.3	2				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	140-020		1.4	2.5				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	145-020		1.45	2				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	150-020		1.5	2				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	160-020		1.6	2.5				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	170-020		1.7	2.5				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	175-020		1.75	2				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	200-020		2	2.5				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	225-020		2.25	2.5				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	250-020		2.5	2.5				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	300-020		3	2.5				0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	GBA32L 033-005		0.33	0.8				0.05	-0.03	+0.02	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	KGBAL...16 KGBAL...16JCT KGBASR...16 KIGBAR...16
	050-005		0.5	1.2				0.05	0	+0.05	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	075-005		0.75	2				0.05	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	095-005		0.95	2				0.05	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	100-005		1	2				0.05	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
	110-005		1.1	2				0.05	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	
120-005	1.2	2	0.05	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
125-020	1.25	2	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
130-020	1.3	2	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
140-020	1.4	2.5	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
145-020	1.45	2	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
150-020	1.5	2	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
160-020	1.6	2.5	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
170-020	1.7	2.5	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
175-020	1.75	2	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
200-020	2	2.5	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
225-020	2.25	2.5	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
250-020	2.5	2.5	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							
300-020	3	2.5	0.2	-0.025	+0.025	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●							

Right-hand shown
CDX shows available grooving depth.

Recommended cutting conditions  G141

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GBA32

		Material										Applicable toolholder							
		Carbon steel / Alloy steel Stainless steel Cast iron Non-ferrous metals Titanium alloy Hard materials (~ 40HRC) Hard materials (40HRC ~)										P M K N S H							
Insert	Description	No. of edges	Dimension (mm)							Tolerance (mm)		Carbide		Cermet	PCD	Applicable toolholder G13~G17 G89			
			CW	CDX	IC	S	D1	RE	LE	CW min.	CW max.	PVD							
													PR1215	PR1625	PR2015		PR2025	TNG20	KPD001	KPD010
 <p>Sharp edge</p>	GBA32R 050-005F	3	0.5	1					0.05			0	+ 0.05						KGBAR...16 KGBAR...16JCT KGBASL...16 KIGBAL...16
	075-005F		0.75	2					0.05			-0.025	+ 0.025						
	095-005F		0.95	2					0.05			-0.025	+ 0.025						
	100-005F		1	2					0.05			-0.025	+ 0.025						
	125-020F		1.25	2					0.2			-0.025	+ 0.025						
	145-020F		1.45	2					0.2			-0.025	+ 0.025						
	150-020F		1.5	2					0.2			-0.025	+ 0.025						
	175-020F		1.75	2					0.2			-0.025	+ 0.025						
	200-020F		2	2.5					0.2			-0.025	+ 0.025						
	250-020F		2.5	2.5	9.525	3.18	4.4		0.2			-0.025	+ 0.025						
 <p>Full R / Copying</p>	GBA32L 050-005F	3	0.5	1				0.05			0	+ 0.05						KGBAL...16 KGBAL...16JCT KGBASR...16 KIGBAL...16	
	075-005F		0.75	2					0.05			-0.025	+ 0.025						
	095-005F		0.95	2					0.05			-0.025	+ 0.025						
	100-005F		1	2					0.05			-0.025	+ 0.025						
	125-020F		1.25	2					0.2			-0.025	+ 0.025						
	145-020F		1.45	2					0.2			-0.025	+ 0.025						
	150-020F		1.5	2					0.2			-0.025	+ 0.025						
	175-020F		1.75	2					0.2			-0.025	+ 0.025						
	200-020F		2	2.5					0.2			-0.025	+ 0.025						
	250-020F		2.5	2.5					0.2			-0.025	+ 0.025						
 <p>Full R / Copying</p>	GBA32R 200-100R	3	2															KGBAR...16 KGBAR...16JCT KGBASL...16 KIGBAL...16	
	300-150R		3	2.5	9.525	3.18	4.4	1	1.5	-	-0.025	+ 0.025							
 <p>1-edge</p>	GBA32R 125-010	1	1.25	2														KGBAR...16 KGBAR...16JCT KGBASL...16 KIGBAL...16	
	150-010		1.5	2	9.525	3.18	4.4	0.1	1.7	-0.03	+ 0.03								
	200-010		2	2.5															

Right-hand shown
 CDX shows available grooving depth.

Recommended cutting conditions G141



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

GBA43

Insert		Description	No. of edges	Dimension (mm)						Tolerance (mm)		Cement	Applicable toolholder G13~G17 G89			
				CW	CDX	IC	S	D1	RE	LE	CW min.			CW max.		
				Carbon steel / Alloy steel									P			
				Stainless steel									M			
				Cast iron									K			
				Non-ferrous metals									N			
				Titanium alloy									S			
				Hard materials (~ 40HRC)									H			
				Hard materials (40HRC ~)												
		GBA43R	125-020F	1.25	2		4.76		0.2						●	KGBAR...22-15 KGBAR...22-15JCT KGBASL...22-15 KIGBAL...22
		145-020F	1.45	2		4.76		0.2					●			
		150-020F	1.5	3.5		4.76		0.2					●			
		175-020F	1.75	3.5		4.76		0.2					●			
		185-020F	1.85	3.5		4.76		0.2					●			
		200-020F	2	3.5		4.76		0.2					●			
		230-020F	2.3	3.5		4.76		0.2					●			
		250-030F	2.5	4		4.76		0.3					●			
		265-030F	2.65	4		4.76		0.3					●			
		280-030F	2.8	4		4.76		0.3					●			
		300-030F	3	4		4.76		0.3					●			
		330-030F	3.3	4		4.76		0.3					●			
		350-030F	3.5	5		4.76		0.3					●			
		400-040F	4	5		4.76		0.4					●			
		430-040F	4.3	5		4.76		0.4					●			
		450-040F	4.5	5	12.7	4.76	5.5	0.4	-	-0.025	+0.025		●			
		480-040F	4.8	5		5		0.4					●			
		GBA43L	125-020F	1.25	2				0.2					●	KGBAL...22-15 KGBAL...22-15JCT KGBASR...22-15 KIGBAR...22	
		145-020F	1.45	2				0.2						●		
		150-020F	1.5	3.5				0.2						●		
		175-020F	1.75	3.5				0.2						●		
		185-020F	1.85	3.5				0.2						●		
		200-020F	2	3.5				0.2						●		
		230-020F	2.3	3.5		4.76		0.2						●		
		250-030F	2.5	4				0.3						●		
		265-030F	2.65	4				0.3						●		
		280-030F	2.8	4				0.3						●		
		300-030F	3	4				0.3						●		
330-030F	3.3	4				0.3						●				
350-030F	3.5	5				0.3						●				
400-040F	4	5				0.4						●				

Right-hand shown

Recommended cutting conditions G141

CDX shows available grooving depth.

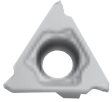
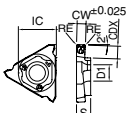
*2 : KGBAR...22-25, KGBAR...22-25T5, KGBAR...22-25JCT, KGBASL...22-25, KGBASL...22-25T5, KIGBAL...22

*4 : KGBAL...22-25, KGBAL...22-25T5, KGBAL...22-25JCT, KGBASR...22-25, KGBASR...22-25T5, KIGBAR...22

*6 : KGBAL...22-35, KGBAL...22-35JCT, KGBASR...22-35, KIGBAR...22

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GBA43

Insert		Description		No. of edges	Dimension (mm)						Tolerance (mm)		Carbide			Cement	Applicable toolholder ➔ G13~G17 G89
					CW	CDX	IC	S	D1	RE	CW min.	CW max.	PVD				
													PR1215	PR1625	PR2015			PR2025	TN620
					Carbon steel / Alloy steel						○	○	●	●	●	P	
					Stainless steel						○	○	●	●	●	M	
					Cast iron						○	○	●	●	●	K	
					Non-ferrous metals						○	○	○	○	○	N	
					Titanium alloy						○	○	○	○	○	S	
					Hard materials (~ 40HRC)						○	○	○	○	○	H	
					Hard materials (40HRC ~)						○	○	○	○	○		
  <p>Molded Chipbreaker</p>		GBA43R	140-010GM	1.4	3.5					0.1			●	●	●	●	KGBAR...22-15 KGBAR...22-15JCT KGBASL...22-15 KIGBAL...22
			150-020GM	1.5	3.5					0.2			●	●	●	●	
			175-020GM	1.75	3.5					0.2			●	●	●	●	
			185-020GM	1.85	3.5					0.2			●	●	●	●	
			200-020GM	2	3.5					0.2			●	●	●	●	
			230-020GM	2.3	3.5					0.2			●	●	●	●	
			250-030GM	2.5	5					0.3			●	●	●	●	
			265-030GM	2.65	5					0.3			●	●	●	●	
			300-030GM	3	5					0.3			●	●	●	●	
			330-030GM	3.3	5					0.3			●	●	●	●	
		350-030GM	3.5	5					0.3			●	●	●	●		
		400-040GM	4	5					0.4			●	●	●	●	*5	
		GBA43L	140-010GM	1.4	3.5	12.7	4.76	5.5	0.1	-0.025	+0.025	●	●	●	●	●	KGBAL...22-15 KGBAL...22-15JCT KGBASR...22-15 KIGBAL...22
			150-020GM	1.5	3.5				0.2			●	●	●	●	●	
			175-020GM	1.75	3.5				0.2			●	●	●	●	●	
			185-020GM	1.85	3.5				0.2			●	●	●	●	●	
			200-020GM	2	3.5				0.2			●	●	●	●	●	
			230-020GM	2.3	3.5				0.2			●	●	●	●	●	
			250-030GM	2.5	5				0.3			●	●	●	●	●	
			265-030GM	2.65	5				0.3			●	●	●	●	●	
300-030GM	3		5				0.3			●	●	●	●	●			
330-030GM	3.3		5				0.3			●	●	●	●	●			
350-030GM	3.5	5				0.3			●	●	●	●	●				
400-040GM	4	5				0.4			●	●	●	●	●	*6			

Right-hand shown

CDX shows available grooving depth.

*1 : KGBAR...22-25T5, KGBAR...22-25JCT, KGBASL...22-25T5, KIGBAL...22

*3 : KGBAL...22-25T5, KGBAL...22-25JCT, KGBASR...22-25T5, KIGBAR...22

*5 : KGBAR...22-35, KGBAR...22-35JCT, KGBASL...22-35, KIGBAL...22

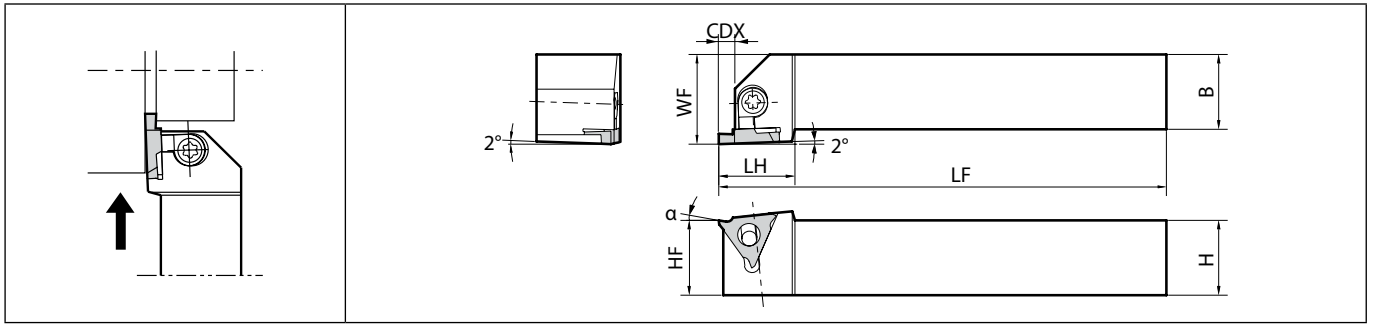
*6 : KGBAL...22-35, KGBAL...22-35JCT, KGBASR...22-35, KIGBAR...22

Recommended cutting conditions ➔ G141



Grooving

KGBA (External grooving / Shallow grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts		Applicable inserts G6~G12			
											Clamp set	Wrench				
	R	L	CDX	H	B	LH	HF	LF	WF							
KGBA [®] /L 2020K-16 2525M-16	●	●	2.5	20	20	24	20	125	25	25	25	150	30	LGBA-16 [®] /LS	FT-15	GBA32 [®] /L type
KGBA [®] /L 2020H22-15 2020H22-25 2020H22-35	●	●	4	20	20	25.5	20	125	25	25	150	30	LGBA-22RS	FT-15	GBA43 [®] /L type	
2020K22-15 2020K22-25 2020K22-25T5 2020K22-35	●	●	4.5													25
2525M22-15 2525M22-25 2525M22-25T5 2525M22-35	●	●	5.5	25	25	25	150	30	LGBA-22 [®] /LS							
	●	●	4							25	25	25	150	30		LGBA-22 [®] /LS
	●	●	4.5	25	25	25	150	30	LGBA-22 [®] /LS							
	●	●	5.5							25	25	25	150	30		LGBA-22 [®] /LS
	●	●	4	25	25	25	150	30	LGBA-22 [®] /LS							
	●	●	4.5							25	25	25	150	30		LGBA-22 [®] /LS
	●	●	5.5	25	25	25	150	30	LGBA-22 [®] /LS							
	●	●	4							25	25	25	150	30		LGBA-22 [®] /LS
	●	●	4.5	25	25	25	150	30	LGBA-22 [®] /LS							
	●	●	5.5							25	25	25	150	30	LGBA-22 [®] /LS	

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX“ of Insert.
Clamp Set : LGBA-○○RS for Right-hand Toolholder and LGBA-○○LS for Left-hand Toolholder.

Rake Angle (α) after Installment of GBA insert

GBA32 [®] /L ○○○○-○○○		GBA43 [®] /L ○○○○-○○○		GBA43 [®] /L ○○○○-○○○R (Full-R)		
α	Insert grades	α	Insert grades	α	Insert grades	Full-R Description
10°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930 KPD001, KPD010	0°	KBN510, KBN525	10°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930	050R~150R
		10°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930 KPD001, KPD010		TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930	200R
20°	KW10	20°	KW10	14°	KW10	050R~200R

Rake Angle (α) after Installment of GBA-GM insert

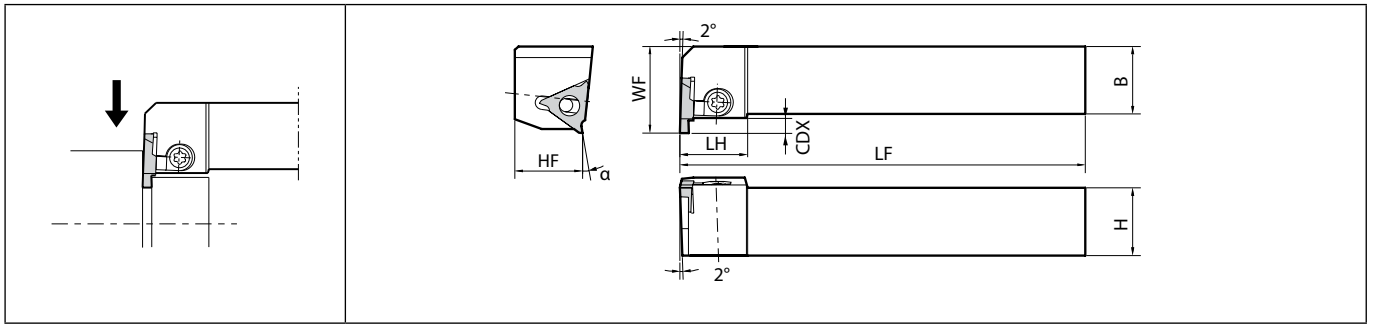
α	Insert description
10°	GBA43 [®] /L 150-020GM
15°	GBA43 [®] /L 175-020GM
	GBA43 [®] /L 265-030GM
12°	GBA43 [®] /L 300-030GM
	GBA43 [®] /L 400-040GM

α indicates the rake angle at the center of the edge width, after installing insert.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



KGBAS (External grooving / Shallow grooving)



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts		Applicable inserts G6~G12
	R	L	CDX	H	B	LH	HF	LF	WF	Clamp set	Wrench		
KGBAS [°] /L 2020K-16	●	●	2.5	20	20	25	20	125	25	LGBA-16 ¹ / ₈ S	FT-15	GBA32 ¹ / ₈ type	
2525M-16	●	●		25	25		25	150	30				
KGBAS [°] /L 2020K22-15	●	●	4	20	20	25	20	125	27	LGBA-22 ¹ / ₈ S	FT-15	GBA43 ¹ / ₈ type	
2020K22-25	●	●	4.5										
2020K22-25T5	●	●	5.5										
2020K22-35	●	●	5.5										
2525M22-15	●	●	4	25	25	25	150	32					
2525M22-25	●	●	4.5										
2525M22-25T5	●	●	5.5										
2525M22-35	●	●	5.5										

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX“ of Insert.

See Page G13 for Rake Angle (α) after Installment of Insert.

Clamp Set : LGBA-○○LS for Right-hand Toolholder and LGBA-○○RS for Left-hand Toolholder.

G

Grooving

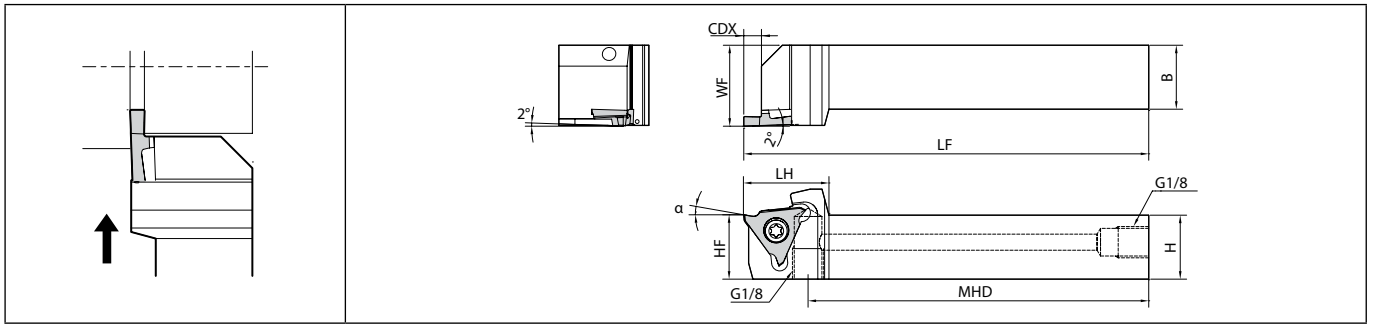
External

Internal

Face

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGBA-JCT (External grooving / Shallow grooving, Coolant-through holder)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)									Coolant hole	Spare parts				Applicable inserts ➔ G6~G12
	R	L	CDX	H	B	LH	MHD	HF	LF	WF	Plug		Screw	Wrench	Wrench		
KGBA%L 2020K-16JCT 2525K-16JCT	●	●	2.5	20	20	24	107.5	20	125	25	Yes	HSG1/8X8.0	SB-4085TR	FT-15	-	GBA32%L type	
KGBA%L 2020K22-15JCT 2020K22-25JCT 2020K22-35JCT 2525K22-15JCT 2525K22-25JCT 2525K22-35JCT	●	●	4	20	20			20	25							GBA43%L type	
	●	●	5.5			26.5	105		125		Yes	HSG1/8X8.0	SB-5085TR	-	LTW-20		
	●	●	4														
	●	●	5.5	25	25			25	30								
	●	●															
	●	●															

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX“ of Insert.

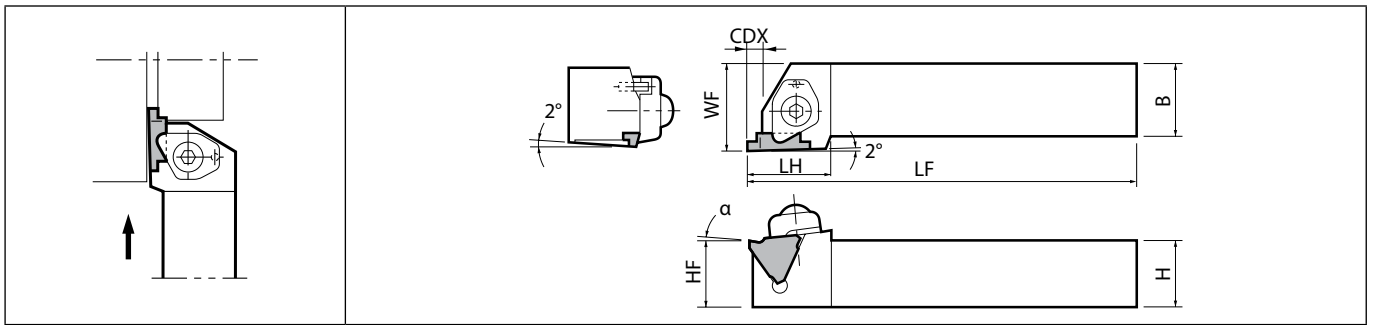
See Page G13 for Rake Angle (α) after Installment of Insert.

KGBA-JCT toolholder is screw clamp type.

Please see page H16 and H17 for piping parts of coolant-through holders.



KGB (External grooving / Shallow grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts				Applicable inserts G6~G12			
											Clamp	Clamp bolt	Spring	Wrench				
	R	L	CDX	H	B	LH	HF	LF	WF									
KGB ^{R/L} 2020K-16 2525M-16	●	●	2.5	20	20	24	20	125	25	25	25	150	30	CGB ^{R/L}	BH6X25	SP-6	LW-4	GBA32 ^{R/L} type
KGB ^{R/L} 2020K22-15 2020K22-25 2020K22-35	●	●	4	20	20	25.5	20	125	25	CGB ^{R/L}	BH6X25	SP-6	LW-4	GBA43 ^{R/L} type				
2525M22-15 2525M22-25 2525M22-35	●	●	4.5												5.5	25	25	25	150	30

KGB will be switched to KGBA=> G13

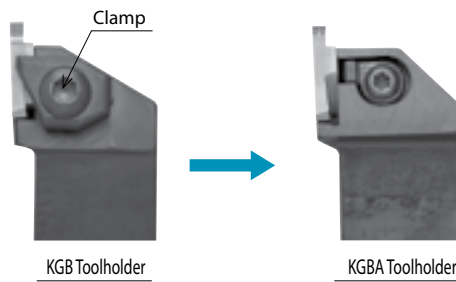
CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX“ of Insert.

KGB Clamp : CGBR for Right-hand Toolholder and CGBL for Left-hand Toolholder.

Alternative Toolholder Reference Table

KGBA	←	(KGB)
KGBA ^{R/L} ...22-15		KGB ^{R/L} ...22-15
KGBA ^{R/L} ...22-25		KGB ^{R/L} ...22-25
KGBA ^{R/L} ...22-35		KGB ^{R/L} ...22-35
KGBA ^{R/L} ...22-25T5		KGB ^{R/L} ...22-25 (Available grooving depth has a limit)

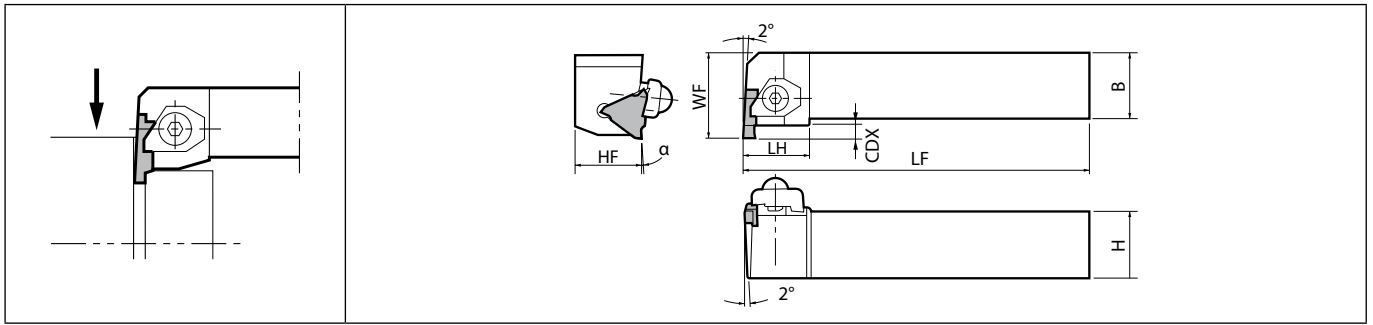
· Short shank type is not available for KGB / KGBS.



* KGB / KGBS toolholder will be switched to KGBA / KGBAS.
Better Chip flow.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGBS (External grooving / Shallow grooving)



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts				Applicable inserts G6~G12
											Clamp	Clamp bolt	Spring	Wrench	
	R	L	CDX	H	B	LH	HF	LF	WF						
KGBS ^{R/L} 2020K-16 2525M-16	●	●	2.5	20	20	25	20	125	25	CGB ^{R/L}	BH6X25	SP-6	LW-4	GBA32 ^{R/L} type	
	●	●		25	25		25	150	30						
KGBS ^{R/L} 2020K22-15 2020K22-25 2020K22-35 2525M22-15 2525M22-25 2525M22-35	●	●	4	20	20	25	20	125	27	CGB ^{R/L}	BH6X25	SP-6	LW-4	GBA43 ^{R/L} type	
	●	●													4.5
	●	●	5.5												
	●	●	4												
	●	●	4.5												
	●	●	5.5												

KGBS will be switched to KGBAS=> G14

KGBS Clamp : CGBL for Right-hand Toolholder and CGBR for Left-hand Toolholder.

Alternative Toolholder Reference Table

KGBAS	←	(KGBS)
KGBAS ^{R/L} ...22-15		KGBS ^{R/L} ...22-15
KGBAS ^{R/L} ...22-25		KGBS ^{R/L} ...22-25
KGBAS ^{R/L} ...22-35		KGBS ^{R/L} ...22-35
KGBAS ^{R/L} ...22-25T5		KGBS ^{R/L} ...22-25 (Available grooving depth has a limit)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



GBF (for automatic lathe)

High precision with edge width tolerance of ± 0.02 mm
 High efficiency MEGACOAT coating technology for long tool life

1 Stable chip control with GL chipbreaker

GL Chipbreaker controls chips stable at both grooving and turning.
 (Turning is not recommended for GBF32R075-005GL)

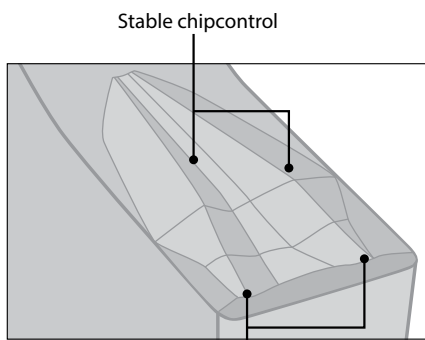
G

Grooving

External

Internal

Face



Chips are short, curled and break evenly in low feed machining.
 Prevents chip clogging.

Chip control comparison (internal evaluation)

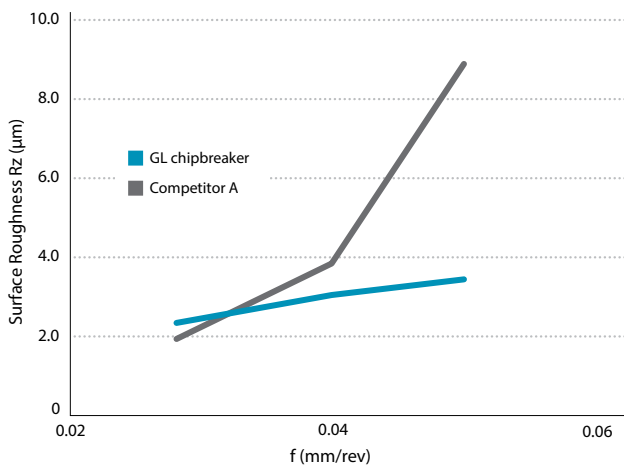
	GL chipbreaker	Competitor A
Grooving f = 0.05 mm/rev d = 1.5 mm		
Turning f = 0.04 mm/rev ap = 0.2 mm		

Cutting conditions: $V_c = 80$ m/min, edge width 1 mm
 Workpiece material : X5CrNi18 10

2 Good surface finish

GL chipbreaker controls chips stable at high feed machining,
 Good surface finish of side wall

Surface roughness comparison (internal evaluation)



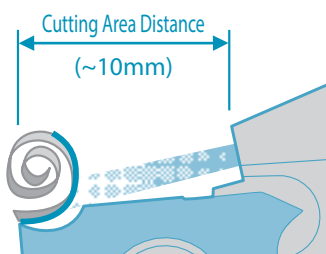
Cutting conditions: $V_c = 80$ m/min, $d = 1.5$ mm, $f = 0.03\sim 0.05$ mm/rev, edge width 1 mm
 Workpiece material : 15CrMo4

Chip control comparison (internal evaluation)

	f = 0.03	f = 0.04	f = 0.05
GL chipbreaker			
Competitor A (Molded chipbreaker)			

KGBF-JCTM (for automatic lathe)

Discharges coolant from the top of the insert



Coolant hole

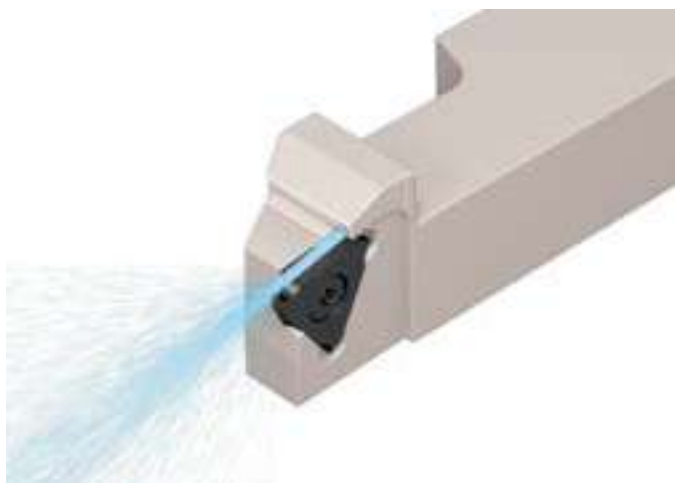
Ample supply of coolant to the cutting edge.
Prevents coolant stream spreading which slows the coolant flow.

Direction of supply

Sufficient coolant between the chipbreaker and the chips
Stable chip curls and sufficient cooling of the insert

- 1 Excellent chip control provide long tool life
- 2 Superior cooling action improves tool life

External Grooving KGBF-JCTM



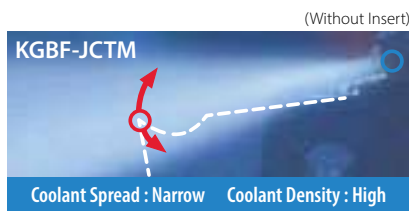
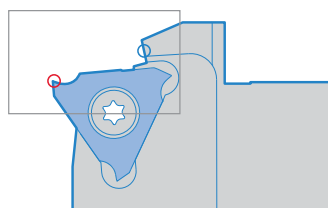
- Provides Coolant toward the Rake Surface of Insert
- Specification

Edge Width : 0.25 -3 mm
Ground Chipbreaker/Molded GL Chipbreaker
Maximum groove depth : 3 mm


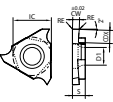
Coolant Discharging Comparison (Internal evaluation)

Small chips and better cooling of the insert leads to longer tool life

- Cutting Edge
- Coolant Hole



GBF

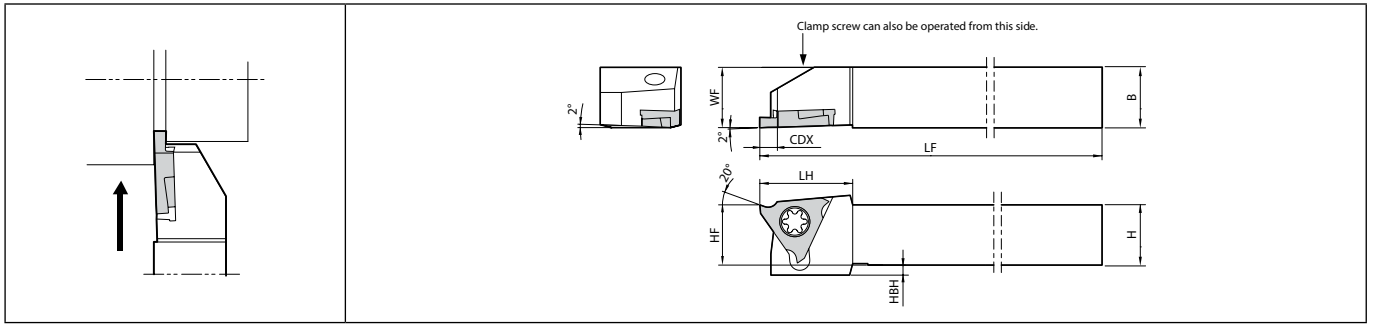
		Material										PVD		Applicable toolholder			
		Carbon steel / Alloy steel										●	○	P			
		Stainless steel										○	●	M			
		Cast iron										●	○	K			
		Non-ferrous metals										○	●	N			
		Titanium alloy										○	●	S			
		Hard materials (~ 40HRC)										○	●	H			
		Hard materials (40HRC ~)										○	●	H			
Insert	Description	No. of edges	Dimension (mm)						Tolerance (mm)		Carbide		Applicable toolholder ● G23,G25				
			CW	CDX	IC	S	D1	RE	CW min.	CW max.	PVD	-					
 	GBF32L																
	025-005	0.25	0.6					0.05	-0.02	+0.02	●	●					
	030-005	0.3	0.8					0.05	-0.02	+0.02	●	●					
	033-005	0.33	0.8					0.05	-0.025	+0.015	●	●					
	043-005	0.43	1					0.05	-0.025	+0.015	●	●					
	050-005	0.5	1.2					0.05	-0.02	+0.02	●	●					
	053-005	0.53	1.2					0.05	-0.025	+0.015	●	●					
	065-005	0.65	1.2					0.05	-0.02	+0.02	●	●					
	075-005	0.75	2					0.05	-0.02	+0.02	●	●					
	075-010	0.75	2					0.1	-0.02	+0.02	●	●					
	080-005	0.8	2					0.05	-0.02	+0.02	●	●					
	080-010	0.8	2					0.1	-0.02	+0.02	●	●					
	095-005	0.95	2					0.05	-0.02	+0.02	●	●					
	095-010	0.95	2					0.1	-0.02	+0.02	●	●					
	100-005	1	2					0.05	-0.02	+0.02	●	●					
	100-010	1	2					0.1	-0.02	+0.02	●	●					
	110-005	1.1	2					0.05	-0.02	+0.02	●	●					
	110-010	1.1	2					0.1	-0.02	+0.02	●	●					
	120-005	1.2	2					0.05	-0.02	+0.02	●	●					
	120-010	1.2	2					0.1	-0.02	+0.02	●	●					
	125-005	1.25	2					0.05	-0.02	+0.02	●	●					
	125-010	1.25	2					0.1	-0.02	+0.02	●	●					
	130-005	1.3	2	3	9.525	3.18	4.4	0.05	-0.02	+0.02	●	●					KGBFL...-16F
	130-010	1.3	2					0.1	-0.02	+0.02	●	●					KGBFSR...-16
	140-005	1.4	2.7					0.05	-0.02	+0.02	●	●					
	140-010	1.4	2.7					0.1	-0.02	+0.02	●	●					
	145-005	1.45	2.7					0.05	-0.02	+0.02	●	●					
	145-010	1.45	2.7					0.1	-0.02	+0.02	●	●					
	150-005	1.5	2.7					0.05	-0.02	+0.02	●	●					
	150-010	1.5	2.7					0.1	-0.02	+0.02	●	●					
	165-005	1.65	2.7					0.05	-0.02	+0.02	●	●					
	165-010	1.65	2.7					0.1	-0.02	+0.02	●	●					
	170-005	1.7	3					0.05	-0.02	+0.02	●	●					
	170-010	1.7	3					0.1	-0.02	+0.02	●	●					
	175-005	1.75	3					0.05	-0.02	+0.02	●	●					
	175-010	1.75	3					0.1	-0.02	+0.02	●	●					
200-005	2	3					0.05	-0.02	+0.02	●	●						
200-010	2	3					0.1	-0.02	+0.02	●	●						
225-005	2.25	3					0.05	-0.02	+0.02	●	●						
225-010	2.25	3					0.1	-0.02	+0.02	●	●						
250-005	2.5	3					0.05	-0.02	+0.02	●	●						
250-010	2.5	3					0.1	-0.02	+0.02	●	●						
300-005	3	3					0.05	-0.02	+0.02	●	●						
300-010	3	3					0.1	-0.02	+0.02	●	●						

Right-hand shown
Max. Cutting Dia. : See Page G27

Recommended cutting conditions ● G142

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGBF-F (External grooving / Shallow grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts		Applicable inserts G20~G22
											Screw	Wrench	
	R	L	CDX	H	B	LH	HF	HBH	LF	WF			
KGBF [®] /L 1010JX-16F	●	●	3	10	10	18.5	10	4	120	10	SB-4070TRW	FT-8	GBF32 [®] /L type
1212JX-16F	●	●		12	12		12	2		12			
1616JX-16F	●	●		16	16		16	-		16			
2020JX-16F	●	●		20	20		20	-		20			

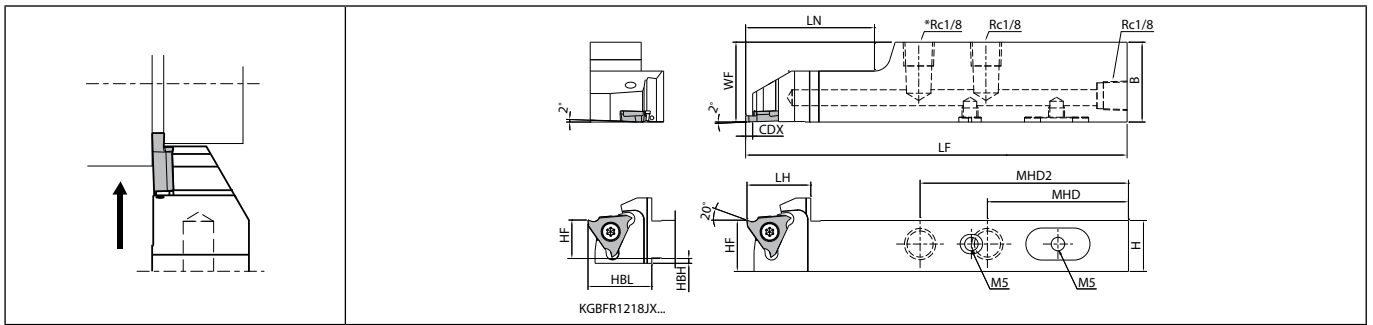
CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX“ of Insert.



Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGBF-JCTM (External grooving / Shallow grooving, Coolant-through holder)



Right-hand shown | Right-hand Insert for Right-hand Toolholder. | KGBFR1218JX-16FJCTM : 2-Rc1/8

Toolholder dimensions

Description	Availability		Dimension (mm)											Coolant hole	Spare parts				Applicable inserts G20,G21
	R	CDX	H	B	LH	MHD	MHD2	HF	HBH	HBL	LF	LN	WF		Plug	Plug	Screw	Wrench	
	KGBFR 1218JX-16FJCTM	●		12	18		54	-	12	1.5	20		28		12	Yes	GP-1	HSSX4LP		SB-4070TRW	FT-8	GBF32R type
1625JX-16FJCTM	●	3	16	25	20	44	65	16	-	-	120	40	16						
2025JX-16FJCTM	●		20					20					20						

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX“ of Insert.
Please see page H16 and H17 for piping parts of coolant-through holders.

G

Grooving

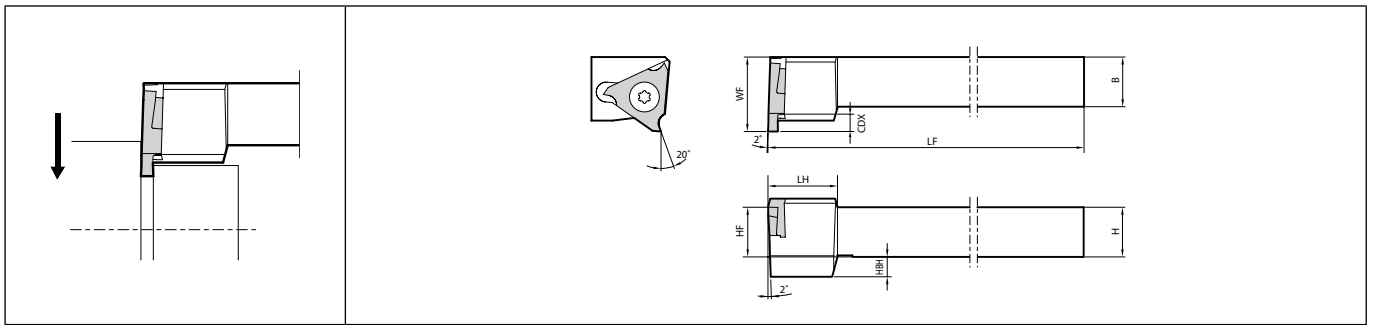
External

Internal

Face

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGBFS (External grooving / Shallow grooving)



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)									Spare parts		Applicable inserts G20~G22
												Screw	Wrench	
	R	L	CDX	H	B	LH	HF	HBH	LF	WF				
KGBFS% 1010JX-16 1212JX-16 1616JX-16	●	●		10	10		10	4		15	SB-4070TRW	FT-8	GBF32 ¹ / ₈ type	
	●	●	3	12	12	14	12	2	120	16				
	●	●		16	16		16	-		20				

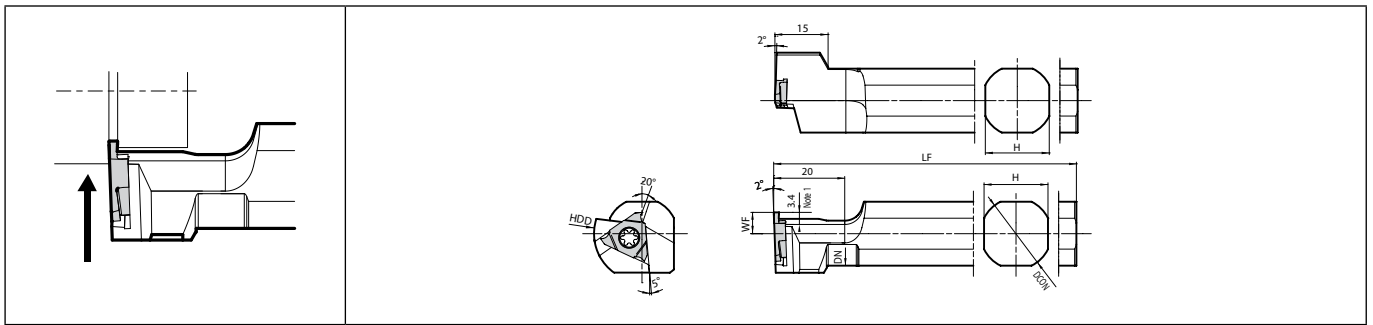
CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX“ of Insert.



Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-KGBF (External grooving / Shallow grooving)



Left-hand shown | Right-hand Insert for Left-hand Toolholder. | Note 1) CDX shows available grooving depth.

Toolholder dimensions

Description	Availability	Dimension (mm)							Spare parts		Applicable inserts G20,G21
		L	DCON	H	DN	HDD	LF	WF	Screw	Wrench	
S12F- KGBFL16	●	12	11	11		80		SB-4070TRW	FT-8	GBF32R type	
S14H- KGBFL16	●	14	13	13		100					
S15F- KGBFL16	●	15.875	15	15		85					
S16F- KGBFL16	●	16									
S19G- KGBFL16	●	19.05	17	18	27	90	6				
S19K- KGBFL16	●					120					
S20G- KGBFL16	●					90					
S20K- KGBFL16	●	20	18	19		120					
S22K- KGBFL16	●	22	20	21							
S25.0H- KGBFL16	●	25	23	24	32	100	10				
S25K- KGBFL16	●	25.4									

G

Grooving

External

Internal

Face

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Compatibility with GBF and GBA

1. GBF will fit KGBA / KGBAS toolholders.
 - Caution: The maximum groove depth for KGBA / KGBAS toolholders is 2.5 mm
2. GBA inserts will also fit KGBF-F toolholders
 - Caution: The rake angle after installation in the toolholder is 11°

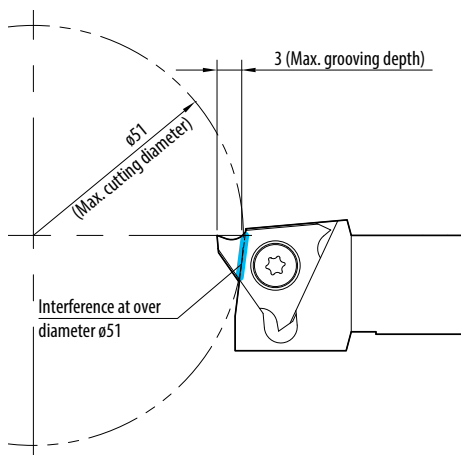
KGBF-F toolholder with GBF insert maximum machining diameter

- 3 mm groove depth is available on workpiece diameters up to $\varnothing 51$ mm.
- 2.7 mm groove depth is available on workpiece diameters up to $\varnothing 100$ mm.
- 2.5 mm or less groove depth is available on workpiece diameters up to $\varnothing 200$ mm

The workpiece will interfere with the holder at maximum diameter or larger

Max. cutting diameter

Max. cutting diameter at 3 mm grooving depth



G



Grooving

KGD External grooving

Various insert lineup for KGD toolholder

Smooth chip control

» Newly-introduced chipbreakers designed to cover a variety of workpiece materials.

High precision edge preparation

» High precision molding technology with tolerance ± 0.03 mm (Edge width 2, 3, 4 mm types)

Highly-reputed MEGACOAT technology

» Long tool life and high efficiency machining achieved by superior oxidation resistance and wear resistance.

G

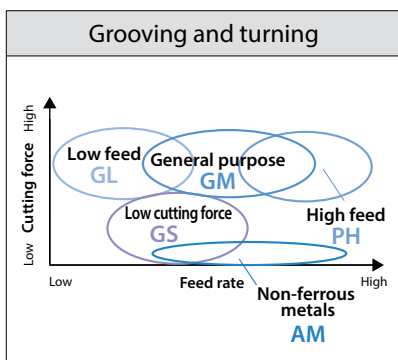
Grooving

External

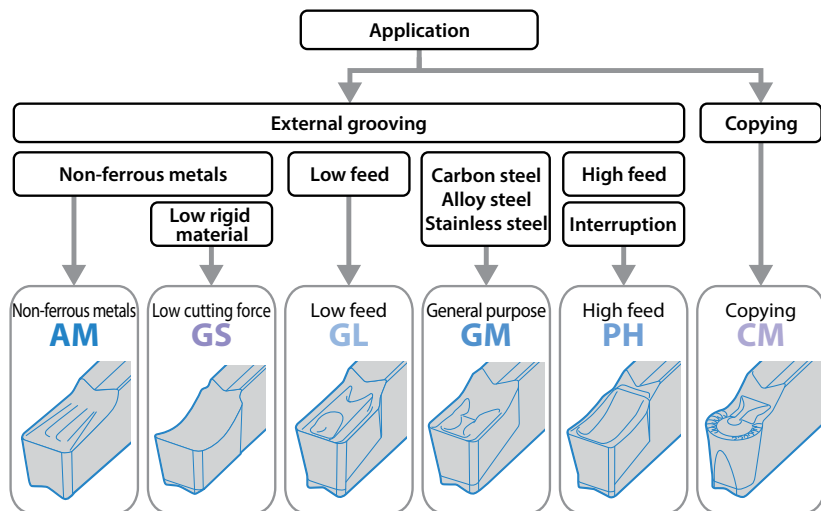
Internal

Face

Application map



Chipbreaker selection



Comparison of chip control (15CrMo4, $V_c = 150$ m/min, $f = 0.15$ mm/rev)



GM chipbreaker



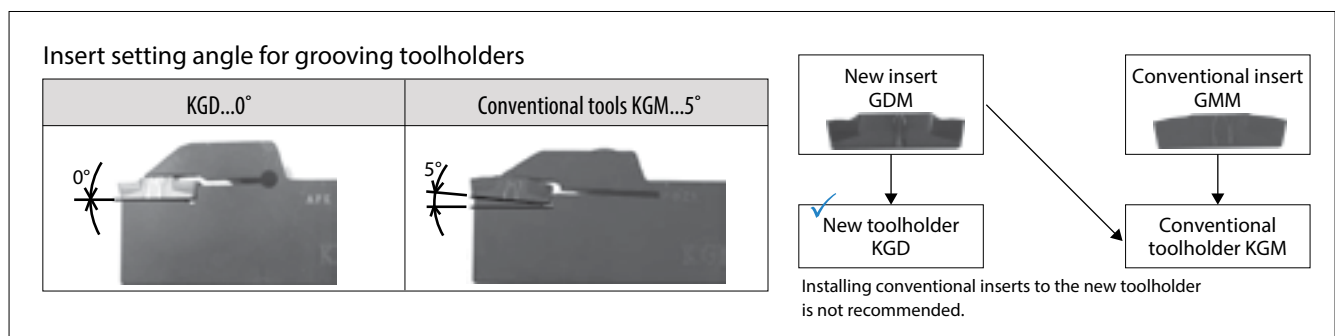
Competitor A



Competitor B

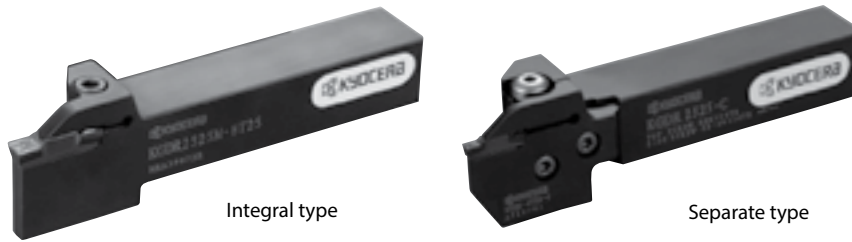
Smooth chip control
» Less chip biting troubles

Toolholder and insert combination of KGD type (new) and KGM type (conventional)



KGD grooving toolholder

Integral type and separate type (toolholder + blade) are available

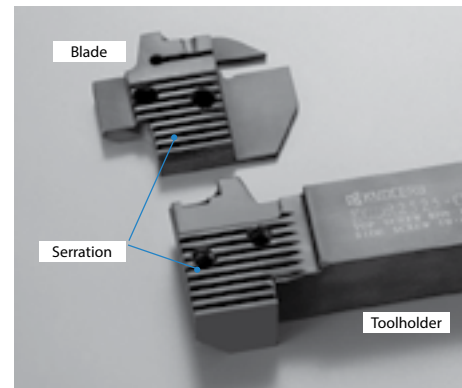


High rigidity separate type toolholder

- Adaptable to wide applications by changing blades.
- Deals with various edge widths and cutting depths by changing the blade and toolholder combination.
- Even if the blade is broken, you only need to replace the broken part.

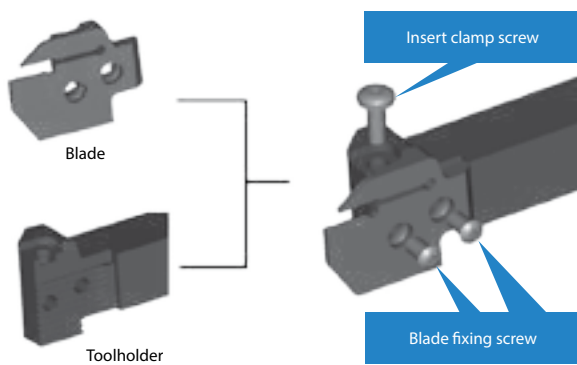
Toolholders for High Pressure Coolant

- Added coolant-through holder KGD-JCT/-JCTM with superior chip control and long tool life



Structure of toolholder unit (toolholder + blade)

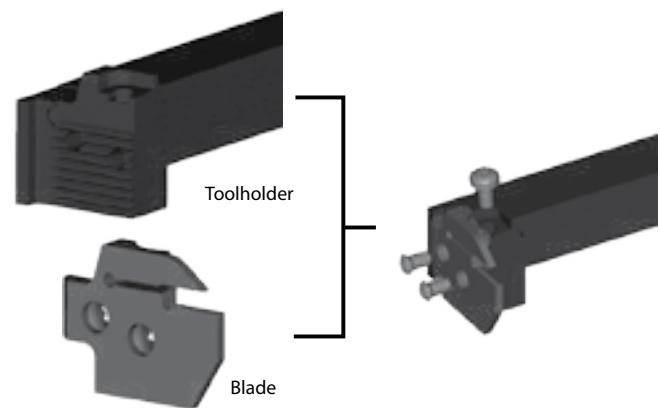
KGD-S (0° separate type)



Note for the toolholder and blade combination of 0° separate type
 Toolholder (KGD[°]/L○○○○-C)
 +
 Blade (KGD[°]/L-○○○○-C)

Right-hand blade for right-hand toolholder,
 Left-hand blade for left-hand toolholder.


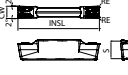

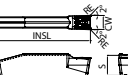
KGDS-S (90° separate type)



Note for the toolholder and blade combination of 90° separate type
 Toolholder (KGDS[°]/L○○○○-C)
 +
 Blade (KGD^{1/4}/r-○○○○-C)

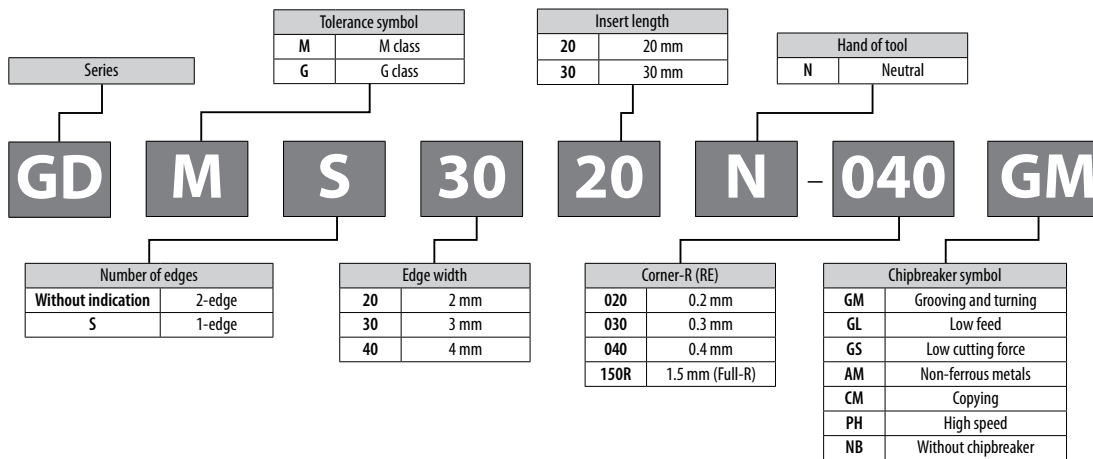
Left-hand blade for right-hand toolholder,
 Right-hand blade for left-hand toolholder.

GDM/GDMS/GDG

Insert		Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide		Cermet	Applicable toolholder G34~G42
				CW	S	RE	INSL	CW min.	CW max.	PVD		-	
										PR1215	PR1225			PR1335	TN620	TN90
  General purpose	GDM 2420N-020GM	2	2.4	4.3	0.2	20	-0.03	+0.03	●	●	●	●	KGD [°] /L...2.4... KGD [°] /L...2...
	GDM 3020N-020GM 3020N-040GM	2	3	4.3	0.2 0.4	20	-0.03	+0.03	●	●	●	●	KGD [°] /L...3... KGD [°] /L...2.4... KGD [°] /L...2...
	GDM 4020N-020GM 4020N-040GM 4020N-080GM	2	4	4.3	0.2 0.4 0.8	20	-0.03	+0.03	●	●	●	●	KGD [°] /L...4... KGD [°] /L...3...
	GDM 5020N-040GM 5020N-080GM	2	5	4.3	0.4 0.8	20	-0.04	+0.04	●	●	●	●	KGD [°] /L...5... KGD [°] /L...4...
	GDM 6020N-040GM 6020N-080GM	2	6	4.3	0.4 0.8	20	-0.04	+0.04	●	●	●	●	KGD [°] /L...6... KGD [°] /L...5...
	GDM 8030N-080GM	2	8	5.5	0.8	30	-0.05	+0.05	●	●	●	●	KGD [°] /L...-8T25
  1-edge / General purpose	GDMS 2220N-020GM	1	2.2	4.3	0.2	20	-0.03	+0.03	●	●	●	●	KGD [°] /L...2...
	GDMS 3020N-040GM	1	3	4.3	0.4	20	-0.03	+0.03	●	●	●	●	KGD [°] /L...3... KGD [°] /L...2.4... KGD [°] /L...2...
	GDMS 4020N-040GM	1	4	4.3	0.4	20	-0.03	+0.03	●	●	●	●	KGD [°] /L...4... KGD [°] /L...3...
	GDMS 5020N-080GM	1	5	4.3	0.8	20	-0.04	+0.04	●	●	●	●	KGD [°] /L...5... KGD [°] /L...4...
	GDMS 6020N-080GM	1	6	4.3	0.8	20	-0.04	+0.04	●	●	●	●	KGD [°] /L...6... KGD [°] /L...5...




Recommended cutting conditions G45

Inserts identification system



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GDM/GDMS/GDG


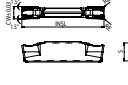

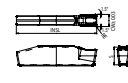

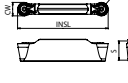
		Carbon steel / Alloy steel		Stainless steel		Cast iron		Non-ferrous metals		Titanium alloy		Hard materials (~ 40HRC)		Hard materials (40HRC ~)		P		M		K		N		S		H				
Insert	Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide				Cermet		Applicable toolholder G34~G42															
			CW	S	RE	INSL	CW min.	CW max.	PVD		DLC	-	-	-																
									PR1215	PR1225						PR1335	PDI015	GM15	TN620	TN90										
 <p>Low cutting force</p>	GDG 2520N-020GS	2	2.5	4.3	0.2	20	-0.02	+0.02	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...2.4... KGD [°] /L...2...
	GDG 3020N-020GS	2	3	4.3	0.2	20	-0.02	+0.02	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...3... KGD [°] /L...2.4... KGD [°] /L...2...	
	GDG 3520N-020GS	2	3.5	4.3	0.2	20	-0.02	+0.02	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...3...	
	GDG 4020N-040GS	2	4	4.3	0.4	20	-0.02	+0.02	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...4... KGD [°] /L...3...
	GDG 5020N-040GS	2	5	4.3	0.4	20	-0.02	+0.02	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...5... KGD [°] /L...4...
	GDG 6020N-040GS	2	6	4.3	0.4	20	-0.02	+0.02	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...6... KGD [°] /L...5...
	GDG 8030N-040GS	2	8	5.5	0.4	30	-0.02	+0.02	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...-8T25	
 <p>Low feed</p>	GDM 2420N-020GL	2	2.4	4.3	0.2	20	-0.03	+0.03	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...2.4... KGD [°] /L...2...	
	GDM 3020N-020GL 3020N-040GL	2	3	4.3	0.2 0.4	20	-0.03	+0.03	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...3... KGD [°] /L...2.4... KGD [°] /L...2...
	GDM 4020N-020GL 4020N-040GL	2	4	4.3	0.2 0.4	20	-0.03	+0.03	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...4... KGD [°] /L...3...
	GDM 5020N-040GL	2	5	4.3	0.4	20	-0.04	+0.04	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...5... KGD [°] /L...4...
	GDM 6020N-040GL	2	6	4.3	0.4	20	-0.04	+0.04	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	KGD [°] /L...6... KGD [°] /L...5...
 <p>Non-ferrous metals</p>	GDG 3020N-020AM	2	3	4.3	0.2	20	-0.02	+0.02						●	●														KGD [°] /L...3... KGD [°] /L...2.4... KGD [°] /L...2...	
	GDG 4020N-040AM	2	4	4.3	0.4	20	-0.02	+0.02						●	●														KGD [°] /L...4... KGD [°] /L...3...	
	GDG 5020N-040AM	2	5	4.3	0.4	20	-0.02	+0.02						●	●														KGD [°] /L...5... KGD [°] /L...4...	
	GDG 6020N-040AM	2	6	4.3	0.4	20	-0.02	+0.02						●	●														KGD [°] /L...6... KGD [°] /L...5...	

Recommended cutting conditions G45


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



GDM/GDMS/GDG


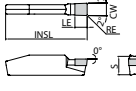

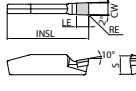
Insert		Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide			Cermet	Applicable toolholder G34~G42	
				CW	S	RE	INSL	CW min.	CW max.	PVD	-				
										PRI215	PRI225	PRI335	TN620	TN900	
  High feed	GDM	2020N-020PH	2	2	4.3	0.2	20	-0.03	+0.03	●	●	●			KGD [®] /L...2...
	GDM	3020N-030PH	2	3	4.3	0.3	20	-0.03	+0.03	●	●	●			KGD [®] /L...3... KGD [®] /L...2.4... KGD [®] /L...2...
	GDM	4020N-030PH	2	4	4.3	0.3	20	-0.03	+0.03	●	●	●			KGD [®] /L...4... KGD [®] /L...3...
  1-edge / High feed	GDMS	2020N-020PH	1	2	4.3	0.2	20	-0.03	+0.03	●	●	●			KGD [®] /L...2...
	GDMS	3020N-030PH	1	3	4.3	0.3	20	-0.03	+0.03	●	●	●			KGD [®] /L...3... KGD [®] /L...2.4... KGD [®] /L...2...
	GDMS	4020N-030PH	1	4	4.3	0.3	20	-0.03	+0.03	●	●	●			KGD [®] /L...4... KGD [®] /L...3...
  Full R / Copying	GDM	3020N-150R-CM	2	3	4.3	1.5	20	-0.03	+0.03	●	●	●	●		KGD [®] /L...3... KGD [®] /L...2.4... KGD [®] /L...2...
	GDM	4020N-200R-CM	2	4	4.3	2	20	-0.03	+0.03	●	●	●	●		KGD [®] /L...4... KGD [®] /L...3...
	GDM	5020N-250R-CM	2	5	4.3	2.5	21	-0.04	+0.04	●	●	●	●		KGD [®] /L...5... KGD [®] /L...4...
	GDM	6020N-300R-CM	2	6	4.3	3	21	-0.04	+0.04	●	●	●	●		KGD [®] /L...6... KGD [®] /L...5...

GDM50/60-CM differs from other descriptions in length (INSL) to avoid interference of a toolholder with workpiece.

Recommended cutting conditions  G45

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GDGS

Insert		Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		CBN			PCD			Applicable toolholder G34~G42
					CW	S	RE	INSL	LE	CW min.	CW max.	KBN05M	KBN570	KPD001	-	-	-	
  1-edge		GDGS 2020N-020NB	E008	1	2	4.3	0.2	20	2.9	-0.03	+0.03	●	●					KGD [®] /L...2...
		GDGS 3020N-040NB	E008	1	3	4.3	0.4	20	2.9	-0.03	+0.03	●	●					KGD [®] /L...3... KGD [®] /L...2.4... KGD [®] /L...2...
		GDGS 4020N-040NB	E008	1	4	4.3	0.4	20	2.9	-0.03	+0.03	●	●					KGD [®] /L...4... KGD [®] /L...3...
		GDGS 5020N-040NB	E008	1	5	4.3	0.4	20	2.9	-0.03	+0.03	●	●					KGD [®] /L...5... KGD [®] /L...4...
		GDGS 6020N-040NB	E008	1	6	4.3	0.4	20	2.9	-0.03	+0.03	●	●					KGD [®] /L...6... KGD [®] /L...5...
  1-edge		GDGS 2020N-020NB	F	1	2	4.3	0.2	20	2.9	-0.03	+0.03					●	KGD [®] /L...2...	
		GDGS 3020N-020NB	F	1	3	4.3	0.2	20	2.9	-0.03	+0.03					●	KGD [®] /L...3... KGD [®] /L...2.4... KGD [®] /L...2...	
		GDGS 4020N-020NB	F	1	4	4.3	0.2	20	2.9	-0.03	+0.03					●	KGD [®] /L...4... KGD [®] /L...3...	
		GDGS 5020N-020NB	F	1	5	4.3	0.2	20	2.9	-0.03	+0.03					●	KGD [®] /L...5... KGD [®] /L...4...	
		GDGS 6020N-020NB	F	1	6	4.3	0.2	20	2.9	-0.03	+0.03					●	KGD [®] /L...6... KGD [®] /L...5...	

Recommended cutting conditions G45

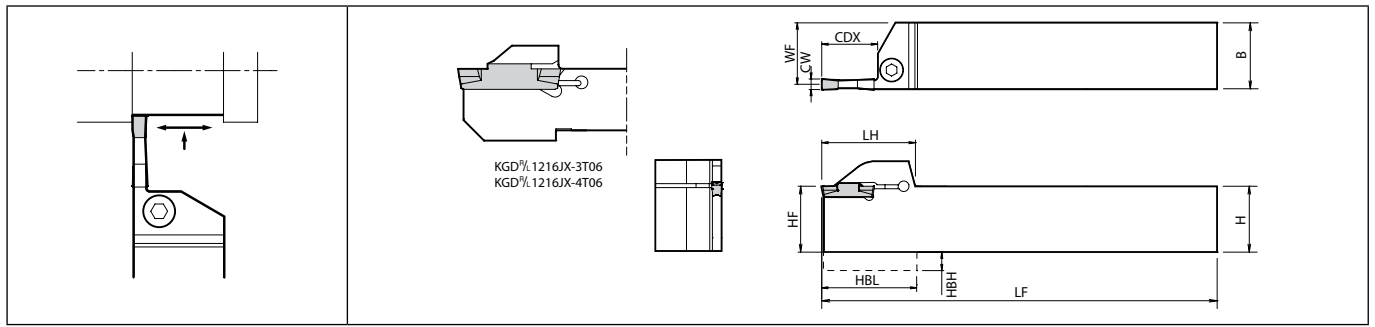


Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

KGD (External grooving)



Right-hand shown

Toolholder dimensions

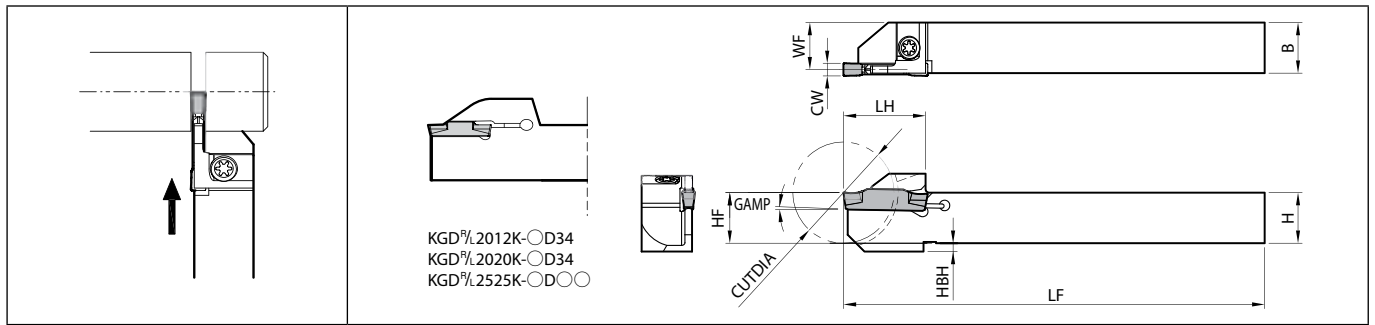
Description	Availability		Dimension (mm)											Spare parts				Applicable inserts G30~G33				
	R	L	CDX	H	B	LH	HF	HBH	HBL	LF	WF	CW min.	CW max.	Clamp bolt	Screw	Wrench	Wrench					
																			Clamp bolt		Screw		Wrench
KGD% 1616H-2T06 1616H-2T10 1616H-2T17 2012K-2T17 2020K-2T06 2020K-2T10 2020K-2T17 2525M-2T06 2525M-2T10 2525M-2T17	●	●	6			27.7			28					HH5X16	-	LW-4	-	GD..2020... GD..2220... GD..2420... GD..2520... GD..3020...				
	●	●	10	16	16	30.2	16	4	30.5	100	15.2											
	●	●	17			31.2			31.5													
	●	●	6		12	32.5					11.2											
	●	●	10	20	20	28	20			125	19.2	2	3									
	●	●	17			30.5																
	●	●	6			28																
	●	●	10	25	25	30.5	25			150	24.2											
	●	●	17			32.5																
KGD% 2012K-2.4T17 2020K-2.4T17	●	●	17	20	12	32.5	20	-	-	125	11	2.4	3	HH5X16	-	LW-4	-	GD..2420... , GD..2520... GD..3020...				
	●	●	17	20	20	32.5	20	-	-	125	19											
KGD% 1216JX-3T06 1616H-3T06 1616H-3T10 1616H-3T20 2012K-3T20 2020K-3T06 2020K-3T10 2020K-3T20 2525M-3T06 2525M-3T10 2525M-3T20	●	●	6	12	16	19.5	12	2	19	120				-	SE-50125TR	-	LTW-20	GD..3020... GD..3520... GD..4020...				
	●	●	10		16	27.7	16	4	28	100	14.8			HH5X16	-	LW-4	-					
	●	●	10		16	30.2	16	4	30.5	100												
	●	●	20			34.2			34.5													
	●	●	20		12	34.5					10.8											
	●	●	6			28						3	4									
	●	●	10	20	20	30.5	20			125	18.8											
	●	●	20			34.5																
	●	●	6			28																
	●	●	10	25	25	30.5	25			150	23.8											
	●	●	20			35.5																
	KGD% 1216JX-4T06 2020K-4T10 2020K-4T20 2525M-4T10 2525M-4T20 2525M-4T25	●	●	6	12	16	19.5	12	2	19	120	14.3								-	SE-50125TR	-	LTW-20	GD..4020... GD..5020...
●		●	10		20	30.5	20			125	18.3							HH5X16	-	LW-4	-	
●		●	20		20	34.5																
●		●	10			30.5																
●		●	20	25	25	35.5	25			150	23.3											
●		●	25			40.5																
KGD% 2020K-5T10 2020K-5T17 2525M-5T10 2525M-5T17 2525M-5T25	●	●	10	20	20	30.5	20			125	17.8			HH5X16	-	LW-4	-					GD..5020... GD..6020...
	●	●	17			37.5																
	●	●	10			30.5						5	6									
	●	●	17	25	25	37.5	25			150	22.8											
	●	●	25			40.5																
KGD% 2525M-6T15 2525M-6T30	●	●	15	25	25	32.5	25	-	-	150	22.4	6	6	HH5X25	-	LW-4	-	GD..6020...				
	●	●	30			45.5																
KGD% 2525M-8T25 3232P-8T25	●	●	25	25	25	43.3	25	7	44.2	150	22			HH6X25	-	LW-5	-	GD..8030...				
	●	●	25	32	32	32	-	-	170	29		8	8									

CDX : Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)

Recommended tightening torque of clamp bolt : 6.5N·m (HH5X16), 8.0N·m (HH6X25), 2.5N·m (SE-50125TR)

Above toolholders are applicable to Cut-off, too.

KGD (External grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)										Angle (°)	Spare parts					Applicable inserts ➔ G30~G33
														Clamp bolt	Screw	Screw	Wrench	Wrench	
	R	L	CUTDIA	H	B	LH	HF	HBH	LF	WF min.	WF max.	GAMP							
KGD% 1010JX-2 1212F-2 1212JX-2 1616JX-2 2012K-2D34 2020K-2D34 2525K-2D34	●	●	20	10	10	18	10	2	120	9.2	2	3	1	-	SB-40120TR	-	-	LTW-15S	GD..2020... GD..2220... GD..2420... GD..2520... GD..3020...
	●	●	24	12	12	19.5	12		85	11.2										120	15.2
	●	●	32	16	16	24.5	16	120	15.2	120	15.2	0	HH5X16	-	-	LW-4	-		
	●	●	34	20	12	20	-	125	19.2	125	19.2	0	HH5X16	-	-	LW-4	-		
	●	●	34	20	20	32.5	20	125	19.2	125	19.2	0	HH5X16	-	-	LW-4	-		
	●	●	25	25	25	25	25	24.2	24.2	24.2	24.2	0	HH5X16	-	-	LW-4	-		
KGD% 1010JX-2.4 1212F-2.4 1212JX-2.4 1616JX-2.4 2012K-2.4D34 2020K-2.4D34 2525K-2.4D34	●	●	20	10	10	18	10	2	120	9	2.4	3	1	-	SB-40120TR	-	-	LTW-15S	GD..2420... GD..2520... GD..3020...
	●	●	24	12	12	19.5	12		85	11										120	15
	●	●	32	16	16	24.5	16	120	15	120	15	0	HH5X16	-	-	LW-4	-		
	●	●	34	20	12	20	-	125	19	125	19	0	HH5X16	-	-	LW-4	-		
	●	●	34	20	20	32.5	20	125	19	125	19	0	HH5X16	-	-	LW-4	-		
	●	●	25	25	25	25	25	24	24	24	24	0	HH5X16	-	-	LW-4	-		
KGD% 1212JX-3	●	●	24	12	12	19.5	12	2	120	10.8	3	3	1	-	SB-40120TR	-	-	LTW-15S	GD..3020...
KGD% 1616JX-3 1616JX-3D38 1913K-3D38 2012JX-3D42 2012JX-3D51 2020JX-3D42 2020JX-3D51 2525K-3D51	●	●	32	16	16	24.5	16	-	120	14.8	3	4	1	-	SB-40120TR	-	-	LTW-15S	GD..3020... GD..3520... GD..4020...
	●	●	38	19	13	29	19		125	11.8									
	●	●	42	20	12	31	20	120	10.8	120	10.8	0	HH5X16	-	SE-50125TR	-	LTW-20		
	●	●	51		36	18.8			120	18.8	0	HH5X16	-	SE-50125TR	-	LTW-20			
	●	●	42	20	31	18.8	120	18.8	0	HH5X16	-	SE-50125TR	-	LTW-20					
	●	●	42	20	31	18.8	120	18.8	0	HH5X16	-	SE-50125TR	-	LTW-20					
	●	●	51	20	31	18.8	120	18.8	0	HH5X16	-	SE-50125TR	-	LTW-20					
	●	●	51	25	25	41.5	25	125	23.8	125	23.8	0	HH5X16	-	LW-4	-			

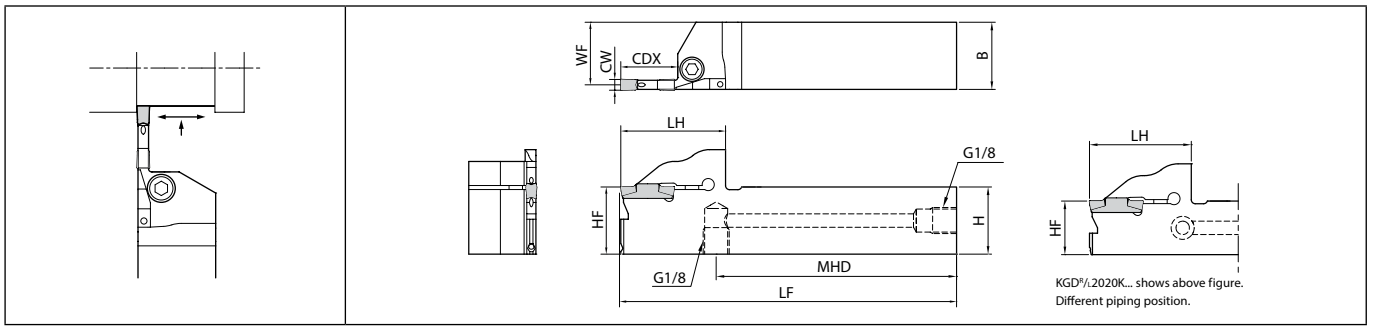
4mm width Insert cannot be installed in KGD% 1212JX-3

Recommended tightening torque of clamp screw : 2.0N·m (SB-40120TR), 2.5N·m (SE-50125TR), 6.5N·m (HH5X16)

When machining the material greater than ø36 mm with KGD%L...-3D38, KGD%L...-3D42 and KGD%L...-3D51 toolholders, please use 1-edge inserts.

Maximum cutting diameter for 2-edge inserts is ø36 mm.

KGD-JCT (External grooving, Coolant-through holder)

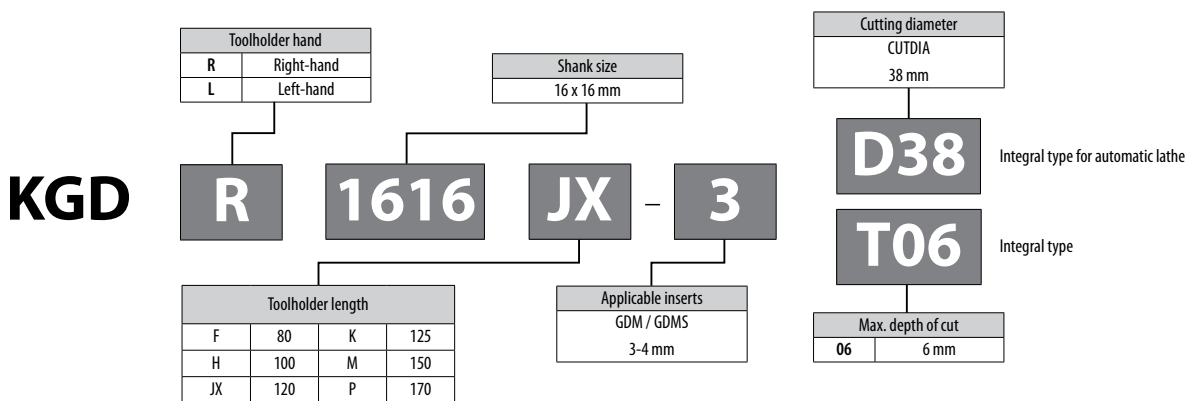


Right-hand shown | Pressure Resistance : ~15MPa

Toolholder dimensions

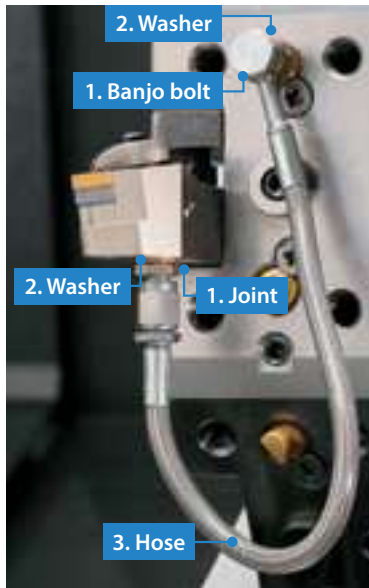
Description	Availability		Dimension (mm)										Coolant hole	Spare parts			Applicable inserts G30~G33
	R	L	CDX	H	B	LH	MHD	HF	LF	WF	CW min.	CW max.		Clamp bolt	Plug	Wrench	
KGD [®] /L 2020K-3T06JCT 2525K-3T06JCT	●	●	6	20	20	31.5	96.2	20	125	18.8	3	4	Yes	HH5X16	HSG1/8X8.0	LW-4	GD..3020... GD..3520... GD..4020...
	●	●		25	25		96.5	25		23.8				HH5X25			
KGD [®] /L 2020K-3T10JCT 2525K-3T10JCT	●	●	10	20	20	34	94.2	20	125	18.8	3	4	Yes	HH5X16	HSG1/8X8.0	LW-4	
	●	●		25	25		94.5	25		23.8				HH5X25			
KGD [®] /L 2020K-3T20JCT 2525K-3T20JCT	●	●	20	20	20	38	90.2	20	125	18.8	3	4	Yes	HH5X16	HSG1/8X8.0	LW-4	
	●	●		25	25	39	89.5	25		23.8				HH5X25			
KGD [®] /L 2020K-4T10JCT 2525K-4T10JCT	●	●	10	20	20	34	94.2	20	125	18.3	4	5	Yes	HH5X16	HSG1/8X8.0	LW-4	GD..4020... GD..5020...
	●	●		25	25		94.5	25		23.3				HH5X25			
KGD [®] /L 2020K-4T20JCT 2525K-4T20JCT	●	●	20	20	20	38	90.2	20	125	18.3	4	5	Yes	HH5X16	HSG1/8X8.0	LW-4	
	●	●		25	25	39	89.5	25		23.3				HH5X25			
KGD [®] /L 2525K-4T25JCT	●	●	25	25	25	44	84.5	25	125	23.3	4	5	Yes	HH5X25	HSG1/8X8.0	LW-4	

Toolholder identification system



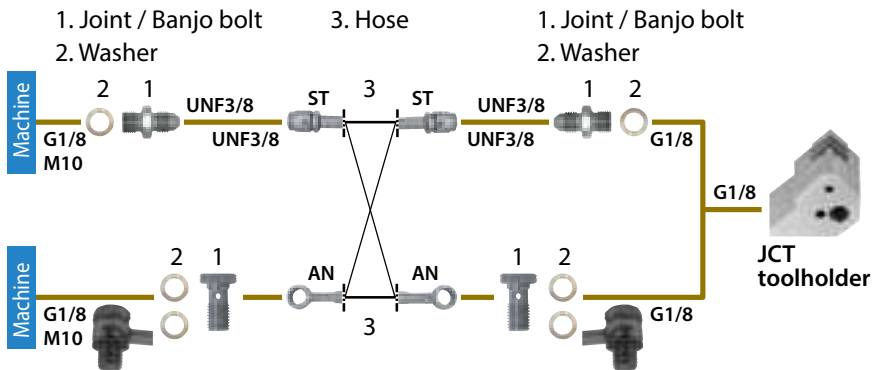
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Easy connection with high pressure hose and joint



- Even without a high pressure pump, internal coolant can be used at a normal pressure
- Banjo bolt available for angled hose connection. Can be used in a variety of machines

Piping installation guide



Piping parts

Optional piping parts available (sold separately)
Choose from parts below to match your machine specifications

1. Joint / Banjo bolt × 2 2. Washer × 2-4 3. Hose × 1

1. Joint / Banjo bolt

Applicable pressure: ~ 30 MPa

Shape	Description	Availability	Thread standard	
			Thread connection to the machine	
	J-G1/8-UNF3/8	●	G1/8	UNF3/8
	J-M10X1.5-UNF3/8	●	M10X1.5	UNF3/8
Banjo bolt (For the angle hose)	BB-G1/8	●	G1/8	AN
	BB-M10X1.5	●	M10X1.5	AN

2. Washer

Applicable pressure: ~ 30 MPa

Shape	Description	Availability
	WS-10	●

* Use 2 washers for a banjo bolt

3. Hose

Applicable pressure: ~ 30 MPa

Shape	Description	Availability	Thread standard		Dimensions (mm)
					L
	HS-ST-ST-200	●	UNF3/8	UNF3/8	200
	HS-ST-ST-250	●			250
	HS-ST-AN-200	●	UNF3/8	Banjo bolt	200
	HS-ST-AN-250	●			250
	HS-AN-AN-200	●	Banjo bolt	Banjo bolt	200
	HS-AN-AN-250	●			250

Precautions

1. Make sure machine door is completely closed before use of these parts.
2. Use appropriate seal for the male thread of the piping parts and make sure the connection is secure. Use plugs to seal off unused coolant holes.
3. Connect and fasten the coolant hose firmly.
4. The use of copper washers may cause leakage but will have no effect on the performance.
5. Commercial piping parts can be used if the thread standards are same. Check the applicable pressure before use.
6. Regularly changing the coolant filter is recommended.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



KGD-JCTM (for automatic lathe)

Cut-off holders for high pressure coolant with long tool life
The optimized coolant hole position effectively cools the cutting edge

- 1 Optimized coolant hole position
- 2 Discharge coolant towards the flank face of the insert

G

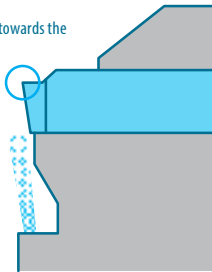


Grooving

Coolant discharging

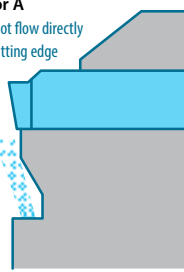
KGD-JCTM

Sufficient cooling towards the cutting edge



Competitor A

Coolant does not flow directly towards the cutting edge



Effective cooling of the cutting edge

Applicable to Different Supply Styles. 2 Supports Internal Coolant with/without Piping System

Internal Coolant without Piping

***When the tool turret supports direct coolant**

Coolant is supplied directly from tool turret into the holder. No need for piping just by installing tools

Applicable to Wide Range of Machines

The tool turret is optional. Please contact our company sales representative for details.

CITIZEN MACHINERY CO., LTD. (L20, D25, M32)
STAR MICRONICS CO., LTD. (SB-R series, SR series, SV series)
TSUGAMI CORPORATION (S205/206-II □ 16 type, S205A/206A-II □ 16 type)

Compatible with various machine including the above. Toolholders can be customized as well.

(Random order)
Based on Kyocera Survey in January 2021

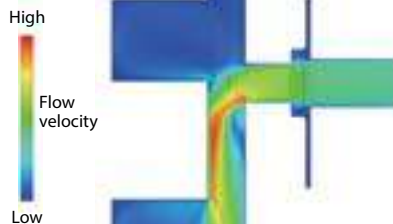


Coolant Channel

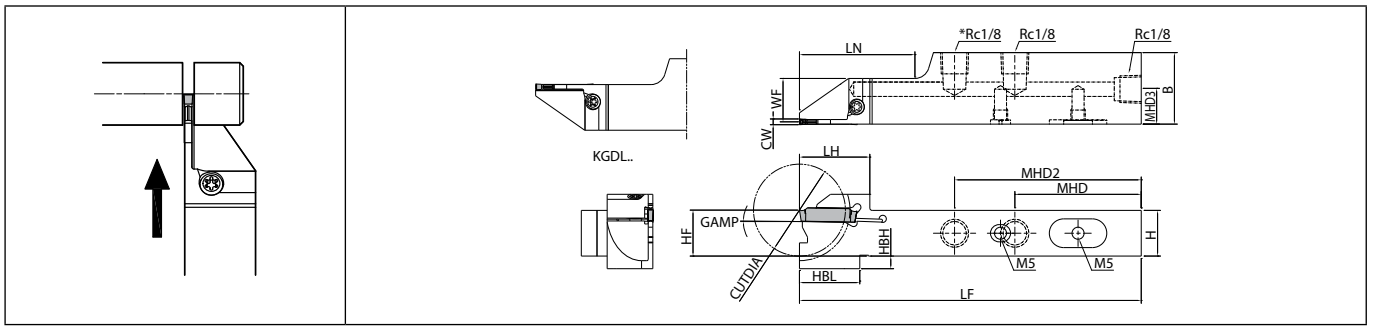
Point

Appropriate hole design to reduce energy loss based on deep analysis

Analysis Image (Internal evaluation)







KGD-JCTM (External grooving, Coolant-through holder)



Right-hand shown | KGD%L12-JCTM : 2-Rc1/8

Toolholder dimensions

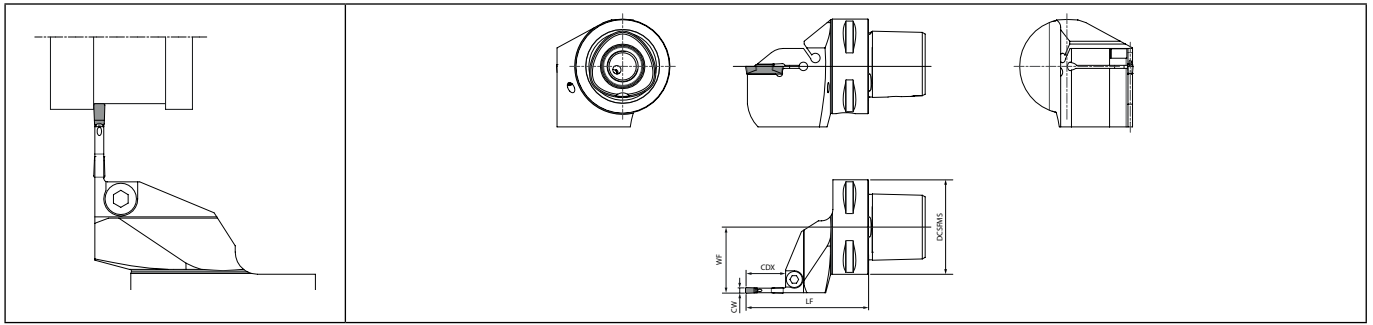
Description	Availability		Dimension (mm)														Angle (°)	Coolant hole	Applicable inserts G30~G33	
	R	L	CUTDIA	H	B	LH	MHD	MHD2	MHD3	HF	HBH	HBL	LF	LN	WF	CW min.				CW max.	GAMP
KGDR 1218JX-2JCTM	●		24	12	18	19.5	54	-	8.4	12	8.5	21	120	44	11.2	2	3	1	Yes	GD..2020... GD..2220... GD..2420... GD..2520... GD..3020...
KGDL 1218JX-2JCTM		●							7.7		21.5	40		15.2						
KGDR 1625JX-2JCTM	●		32	16	25	24.5	44	65	12.2	16	4.5	21	40	15.2	2.4	3	1	Yes		
KGDL 1625JX-2JCTM		●							7.7			40	15							
KGDR 1218JX-2.4JCTM	●		24	12	18	19.5	54	-	8.4	12	8.5	21	120	44	11	2.4	3	1	Yes	GD..2420... GD..2520... GD..3020...
KGDL 1218JX-2.4JCTM		●							7.7		21.5	40		15						
KGDR 1625JX-2.4JCTM	●		32	16	25	24.5	44	65	12.2	16	4.5	21	40	15	3	4	1	Yes		
KGDL 1625JX-2.4JCTM		●							7.7			40	14.8							
KGDR 1218JX-3JCTM	●		24	12	18	19.5	54	-	8.6	12	8.5	21	120	44	10.8	3	1	Yes	GD..3020... GD..3520... GD..4020...	
KGDL 1218JX-3JCTM		●							7.7		21.5	40		14.8						
KGDR 1625JX-3JCTM	●		32	16	25	24.5	44	65	12.2	16	4.5	21	40	14.8	3	4	1	Yes		
KGDL 1625JX-3JCTM		●							7.7			40	14.8							

Description	Spare parts			
	Plug	Plug	Screw	Wrench
				
KGDR 1218JX-2JCTM	GP-1	HS5X4LP	SB-40120TR	LTW-15S
KGDL 1218JX-2JCTM				
KGDR 1625JX-2JCTM	GP-1	HS5X4LP	SB-40120TR	LTW-15S
KGDL 1625JX-2JCTM				
KGDR 1218JX-2.4JCTM	GP-1	HS5X4LP	SB-40120TR	LTW-15S
KGDL 1218JX-2.4JCTM				
KGDR 1625JX-2.4JCTM	GP-1	HS5X4LP	SB-40120TR	LTW-15S
KGDL 1625JX-2.4JCTM				
KGDR 1218JX-3JCTM	GP-1	HS5X4LP	SB-40120TR	LTW-15S
KGDL 1218JX-3JCTM				
KGDR 1625JX-3JCTM	GP-1	HS5X4LP	SB-40120TR	LTW-15S
KGDL 1625JX-3JCTM				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



KGD polygon taper shank (External grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Polygon size	Dimension (mm)						Coolant hole	Spare parts	
	R	L		DCSFMS	LF	WF	CDX	CW min.	CW max.		Clamp bolt	Applicable inserts G30~G33
KUA-KPC4-KGD [®] /L 2T17	●	●	C4	40	60	27	17	2.0	3.0	Yes	HH5X16	GDG2020N-... - GDMS3020R-...
KUA-KPC5-KGD [®] /L 2T17	●	●	C5	50	60	35	17					GDG2020N-... - GDMS3020R-...
KUA-KPC4-KGD [®] /L 3T20	●	●	C4	40	65	27	20	3.0	4.0			GDG3020N-... - GDMS4020R-...
KUA-KPC5-KGD [®] /L 3T20	●	●	C5	50	65	35	20					GDG3020N-... - GDMS4020R-...
KUA-KPC6-KGD [®] /L 3T20	●	●	C6	60	65	45	20	4.0	5.0			GDG3020N-... - GDMS4020R-...
KUA-KPC4-KGDR 4T25	●		C4	40	70	27	25					GDG4020N-... - GDMS5020N-...
KUA-KPC5-KGDR 4T25	●		C5	50	70	35	25	5.0	6.0			GDG4020N-... - GDMS5020N-...
KUA-KPC6-KGD 4T25	●		C6	60	70	45	25					GDG4020N-... - GDMS5020N-...
KUA-KPC4-KGD 5T25	●		C4	40	70	27	25	5.0	6.0			GDG5020N-... - GDMS6020N-...
KUA-KPC5-KGD 5T25	●		C5	50	70	35	25					GDG5020N-... - GDMS6020N-...
KUA-KPC6-KGD 5T25	●		C6	60	70	45	25					GDG5020N-... - GDMS6020N-...

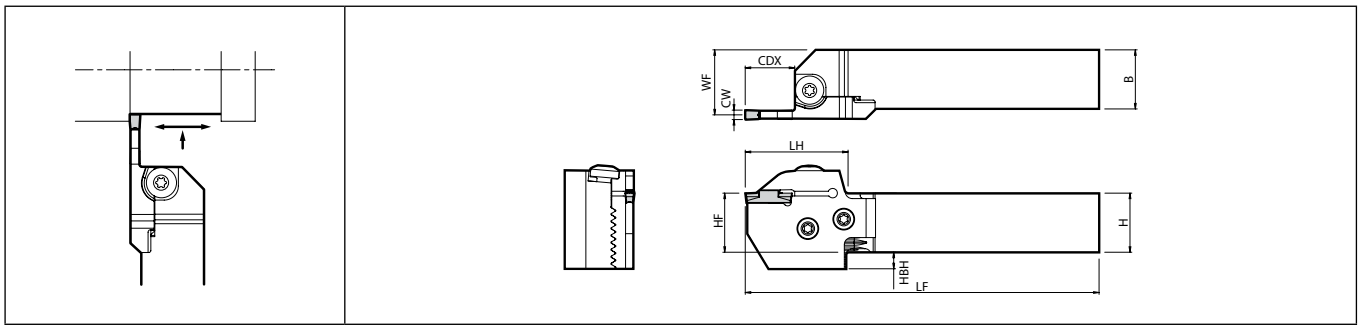
Applicable Pressure : ~7MPa

Recommended tightening torque : 6.5 N·m

CDX : Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD-S (External grooving / 0° separate type)



Right-hand shown (Right-hand blade and right-hand toolholder)

Toolholder dimensions (Blade and toolholder)

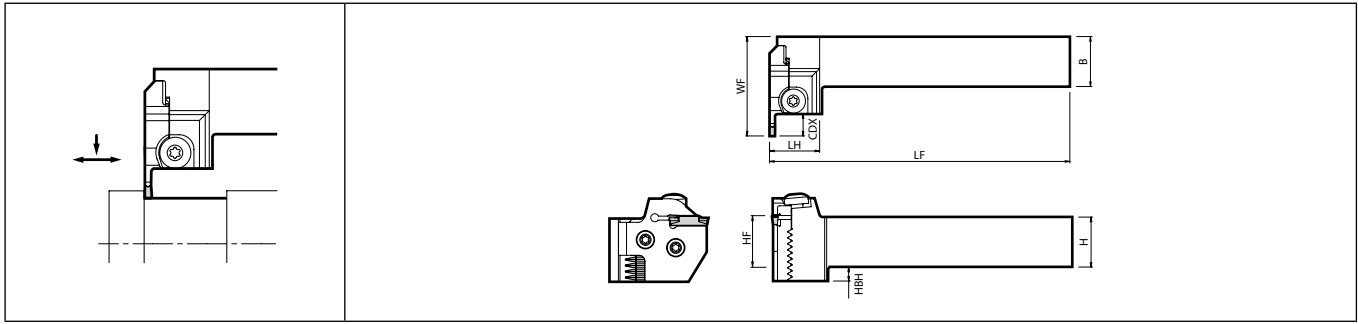
Shank angle	Width (mm)	Max. depth of cut (mm)	Shank size (mm)	Unit description	Availability		Blade description G43	Toolholder description G43	Dimension (mm)										Spare parts					
					R	L			CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.	Clamp bolt (for insert clamp)	Screw (for blade)	Wrench			
0°	2	17	□20	KGD%L 2020X-2T17S	●		KGD%L-2T17-C	KGD%L.2020-C	17	20	20	20	12	122	23.4	2	3	BH6X10TR	SB-60120TR	LTW-25				
			□25	2525X-2T17S	●	●				KGD%L.2525-C	25	25	40	25	7						147	28.4		
			□32	No unit description ⇔						KGD%L.3232-C	32	32	32	-	167						35.4			
	3	10	3	□20	KGD%L 2020X-3T10S	●		KGD%L-3T10-C	KGD%L.2020-C	10	20	20	20	12	115	23	3				4			
				□25	2525X-3T10S	●	●				KGD%L.2525-C	25	25	33	25	7						140	28	
				□32	No unit description ⇔						KGD%L.3232-C	32	32	32	-	160						35		
	20	3	20	□20	KGD%L 2020X-3T20S	●	●	KGD%L-3T20-C	KGD%L.2020-C	20	20	20	20	12	125	23	3				4			
				□25	2525X-3T20S	●	●				KGD%L.2525-C	25	25	43	25	7						150	28	
				□32	3232X-3T20S	●					KGD%L.3232-C	32	32	32	-	170						35		
	10	4	10	□20	KGD%L 2020X-4T10S	●		KGD%L-4T10-C	KGD%L.2020-C	10	20	20	20	12	115	22.5	4				5			
				□25	2525X-4T10S	●	●				KGD%L.2525-C	25	25	33	25	7						140	27.5	
				□32	No unit description ⇔						KGD%L.3232-C	32	32	32	-	160						34.5		
		20	4	20	□20	KGD%L 2020X-4T20S	●		KGD%L-4T20-C	KGD%L.2020-C	20	20	20	20	12	125	22.5				4	5		
					□25	2525X-4T20S	●	●				KGD%L.2525-C	25	25	43	25	7						150	27.5
					□32	3232X-4T20S	●					KGD%L.3232-C	32	32	32	-	170						34.5	
	25	4	25	□20	KGD%L 2020X-4T25S	●	●	KGD%L-4T25-C	KGD%L.2020-C	25	20	20	20	12	130	22.5	4				5			
				□25	2525X-4T25S	●	●				KGD%L.2525-C	25	25	48	25	7						155	27.5	
				□32	3232X-4T25S	●					KGD%L.3232-C	32	32	32	-	175						34.5		
5	10	10	□20	KGD%L 2020X-5T10S	●	●	KGD%L-5T10-C	KGD%L.2020-C	10	20	20	20	12	115	22	5	6							
			□25	2525X-5T10S	●	●				KGD%L.2525-C	25	25	33	25	7			140	27					
			□32	No unit description ⇔						KGD%L.3232-C	32	32	32	-	160			34						
	25	5	25	□20	No unit description ⇔			KGD%L.2020-C	KGD%L.2020-C	25	20	20	20	12	130	22	5	6						
□25				KGD%L 2525X-5T25S	●	●	KGD%L.2525-C				25	25	48	25	7	155			27					
□32	3232X-5T25S	●		KGD%L.3232-C	32	32	32	-	175	34														

- When using the toolholder in normal mounting position, the lower jaw of toolholder may interfere with the tool presetter. Applicable inserts G30~G33
- The toolholder and blade descriptions are printed on the toolholder body. (Unit description is not printed.)
KGD-S: Right-hand blade for right-hand toolholder, left-hand blade for left-hand toolholder.
The toolholder is applicable for all blade with suitable hand.
- When the unit description is not available (No unit description) and/or if stock status is blank, please purchase toolholder and blade separately.
- CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)
Above toolholders are applicable to Cut-off, too.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



KGDS-S (External grooving / 90° separate type)



Right-hand shown (Left-hand blade and right-hand toolholder)

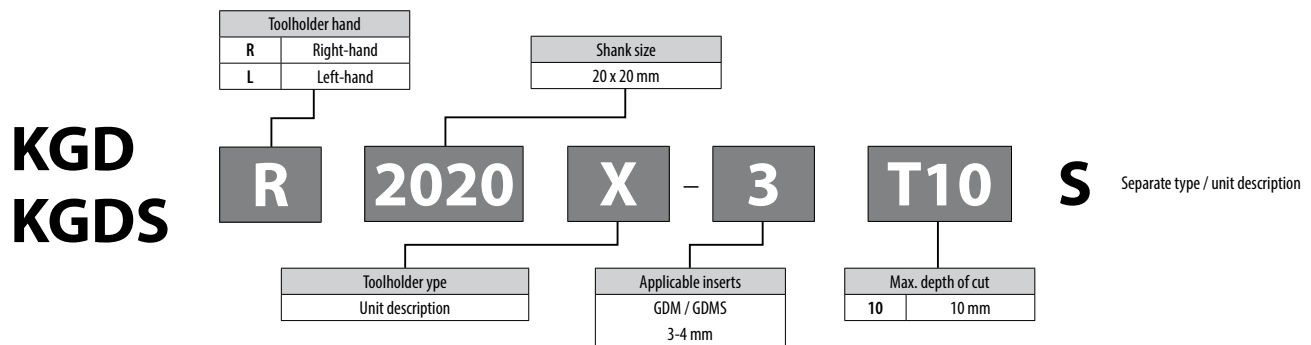
Toolholder dimensions (Blade and toolholder)

Shank angle	Width (mm)	Max. depth of cut (mm)	Shank size (mm)	Blade description G43	Toolholder description G43	Unit description	Availability		Dimension (mm)										Spare parts		
							R	L	CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.	Clamp bolt (for insert clamp)	Screw (for blade)	Wrench
90°	2	17	<input type="checkbox"/> 20	KGDI _{/R} -2T17-C	KGDS ^{5%} L.2020-C	-			17	20	20		20	12	125	56.7	2	3	BH6X10TR	SB-60120TR	LTW-25
			<input type="checkbox"/> 25	KGDS ^{5%} L.2525-C	-																
	3	10	<input type="checkbox"/> 20	KGDI _{/R} -3T10-C	KGDS ^{5%} L.2020-C	KGDS ^{5%} L. 2020X-3T10S	● ●	● ●	10	20	20		20	12	125	49.7	3	4			
			<input type="checkbox"/> 25	KGDS ^{5%} L.2525-C	2525X-3T10S	● ●	● ●														
	20	20	<input type="checkbox"/> 20	KGDI _{/R} -3T20-C	KGDS ^{5%} L.2020-C	-			20	20	20		20	12	125	59.7	4	5			
			<input type="checkbox"/> 25	KGDS ^{5%} L.2525-C	-																
	10	20	<input type="checkbox"/> 20	KGDI _{/R} -4T10-C	KGDS ^{5%} L.2020-C	-			10	20	20		20	12	125	49.7	5	6			
			<input type="checkbox"/> 25	KGDS ^{5%} L.2525-C	-																
	20	25	<input type="checkbox"/> 20	KGDI _{/R} -4T20-C	KGDS ^{5%} L.2020-C	-			20	20	20	27.7	20	12	125	59.7	6	7			
			<input type="checkbox"/> 25	KGDS ^{5%} L.2525-C	-																
	25	25	<input type="checkbox"/> 20	KGDI _{/R} -4T25-C	KGDS ^{5%} L.2020-C	-			25	20	20		20	12	125	64.7	7	8			
			<input type="checkbox"/> 25	KGDS ^{5%} L.2525-C	-																
10	25	<input type="checkbox"/> 20	KGDI _{/R} -5T10-C	KGDS ^{5%} L.2020-C	-			10	20	20		20	12	125	49.7	8	9				
		<input type="checkbox"/> 25	KGDS ^{5%} L.2525-C	-																	
25	25	<input type="checkbox"/> 20	KGDI _{/R} -5T25-C	KGDS ^{5%} L.2020-C	-			25	20	20		20	12	125	64.7	9	10				
		<input type="checkbox"/> 25	KGDS ^{5%} L.2525-C	-																	

- When using the toolholder in normal mounting position, the lower jaw of toolholder may interfere with the tool presetter.
- The toolholder and blade descriptions are printed on the toolholder body. (Unit description is not printed.)
KGDS-S : Left-hand Blade for Right-hand Toolholder, Right-hand Blade for Left-hand Toolholder.
The toolholder is applicable for all blade with suitable hand.
- CDX : Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)

Applicable inserts **G30~G33**

Toolholder identification system



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions (Blade and toolholder)

KGD-C (0° Separate Type)

Drawing of 0° type Right-hand shown	Toolholder description	Availability		Dimension (mm)		
		R	L	L	B	H
	KGD%L 2020-C	●	●	104	20	20
	2525-C	●	●	129	25	25
	3232-C	●	●	149	32	32

KGDS-C (90° Separate Type)

Drawing of 90° type Right-hand shown	Toolholder description	Availability		Dimension (mm)		
		R	L	L	B	H
	KGDS%L 2020-C	●	●	122	20	20
	2525-C	●	●	147	25	25

Blade

Drawing of blade Right-hand shown	Blade description	Availability		Dimension (mm)		
		R	L	L	T	A
	KGD%L -2T17-C	●	●	51.2	17.2	1.7
	-3T10-C	●	●	44.2	10.2	2.4
	-3T20-C	●	●	53.2	20.2	
	-4T10-C	●	●	44.2	10.2	3.4
	-4T20-C	●	●	54.2	20.2	
	-4T25-C	●	●	59.2	25.2	4.4
	-5T10-C	●	●	44.2	10.2	
	-5T25-C	●	●	59.2	25.2	

Spare parts

Unit description	Spare parts		
	Clamp bolt (for insert clamp)	Screw (for blade)	Wrench
KGD%L ...S KGDS%L ...S	BH6X10TR	SB-60120TR	LTW-25

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Setting the inserts

1. Use compressed air or other measures to remove chips from the insert mounting part (Ref. to Fig. 1).
2. Put the insert into the toolholder and push it makes contact with the back end of toolholder's surface (Ref. to Fig. 1 and 2).
3. Keeping the insert fit to the surface, tighten the insert clamp screw at an appropriate torque.
4. Make sure that there is no gap between the insert and the back end of the toolholder's surface and that the insert is set straight (Ref. to Fig. 2 and 3).

Clamp screw for automatic lathe	Recommended tightening torque: 2.0N-m (SB-40120TR) 2.5N-m (SE-50125TR)
Clamp bolt	Recommended tightening torque: 6.5N-m (Width 2~6 mm) 8.0N-m (Width 8 mm)

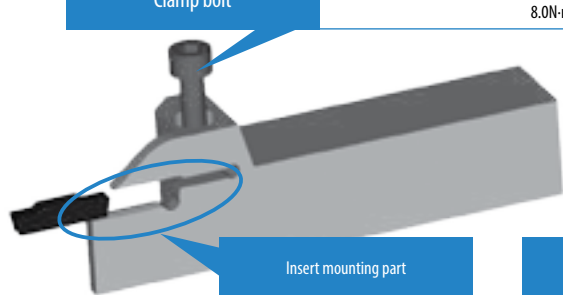


Fig. 1

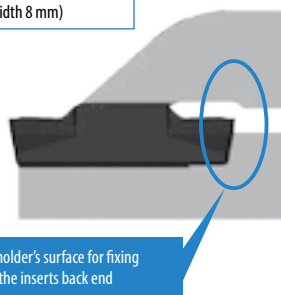


Fig. 2

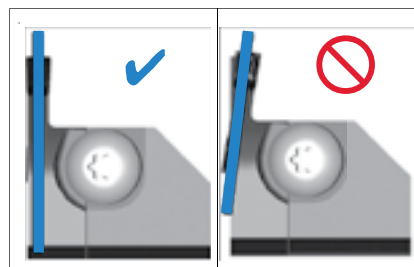


Fig. 3

Setting the blade (Separate type toolholder)

1. Use compressed air or other measures to remove chips and dust from the serration part (Ref. to Fig. 1).
 2. Mate and fit the serrations of the blade and toolholder, and also fit the blade end to the toolholder. (Ref. to Fig. 2)
 3. Tighten the blade fixing screws at an appropriate torque. You can tighten them in any order. (Ref. to Fig. 2)
- Recommended tightening torque : 8N-m
4. Set the insert after setting the blade.

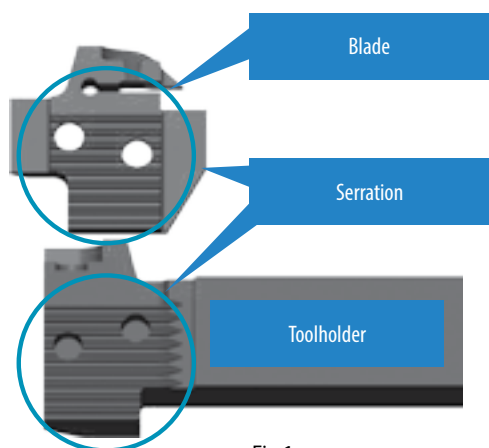


Fig.1

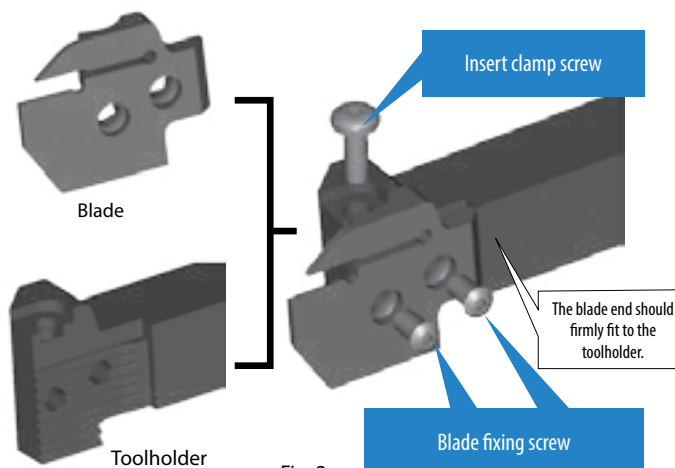
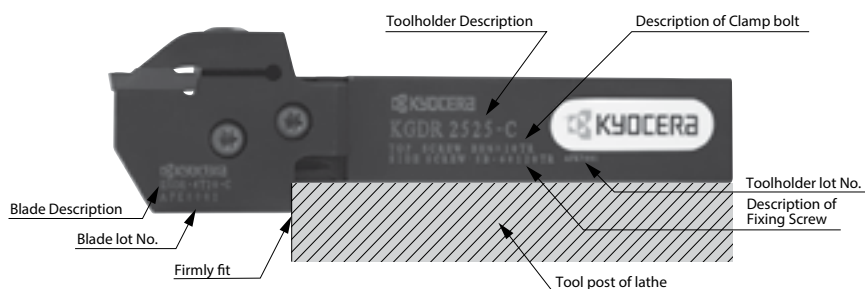


Fig. 2

Separate type toolholder identification system and their setting to lathe

Firmly fit the lower jaw to the tool post of the lathe.



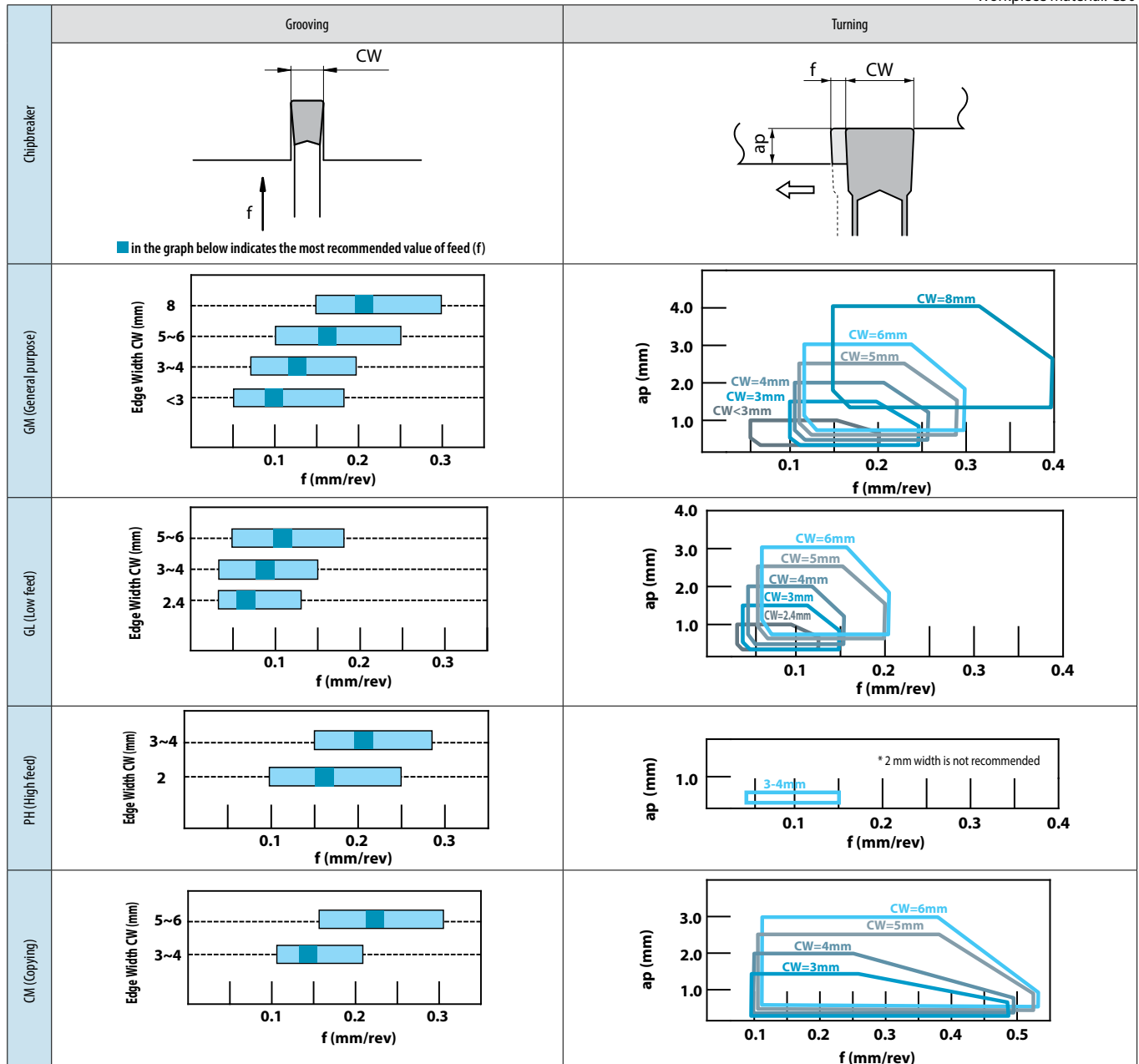
Recommended cutting conditions (cutting speed Vc)

Workpiece material	Chipbreaker	Recommended insert grades (Vc: m/min)										Remarks
		Cermet		MEGACOAT NANO	MEGACOAT		DLC	Carbide	MEGACOAT CBN	CBN	PCD	
		TN620	TN90	PR1535	PR1225	PR1215	PDL015	GW15	KBN05M	KBN570	KPD001	
Carbon steel	GM	☆ 80~220	☆ 100~220	☆ 80~200	★ 80~200	☆ 100~200	-	-	-	-	-	
Alloy steel	GL	☆ 70~200	☆ 80~200	☆ 70~180	★ 70~180	☆ 80~180	-	-	-	-	-	
Stainless steel	CM	-	-	★ 60~150	☆ 60~150	☆ 60~150	-	-	-	-	-	
Cast iron	PH	-	-	-	-	☆ 100~200	-	-	-	-	-	
Aluminum	GS	-	-	-	-	-	★ 200~500	☆ 200~450	-	-	★ 150~2,000	
Brass	AM	-	-	-	-	-	-	☆ 100~200	-	-	★ 200~800	
Hard materials	NB	-	-	-	-	-	-	-	★ 80~150	-	-	
Sintered steel	NB	-	-	-	-	-	-	-	-	★ 100~250	-	

★:1st recommendation ☆:2nd recommendation

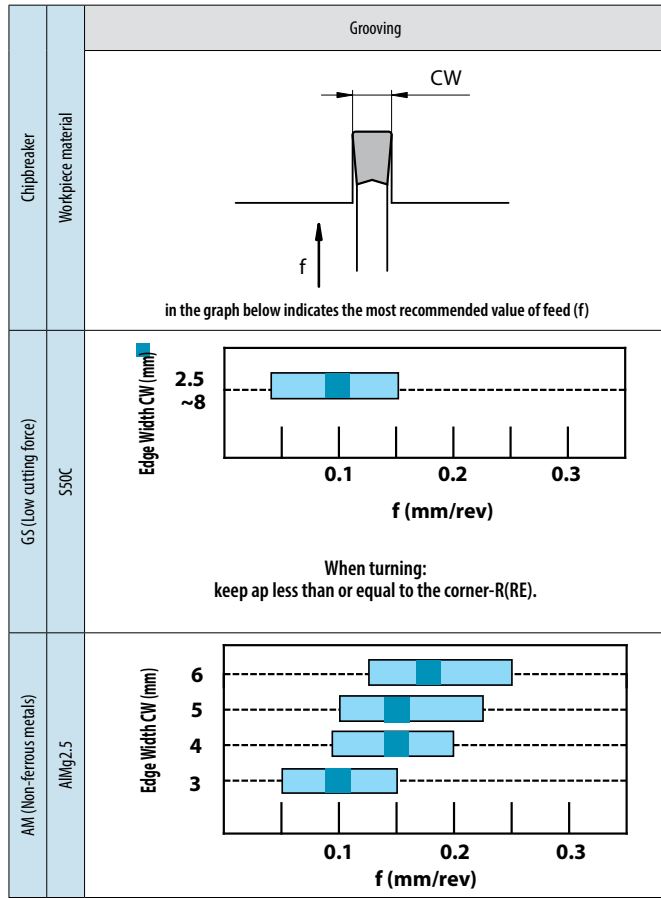
Recommended cutting conditions (feed rate / ap)

Workpiece material: C50

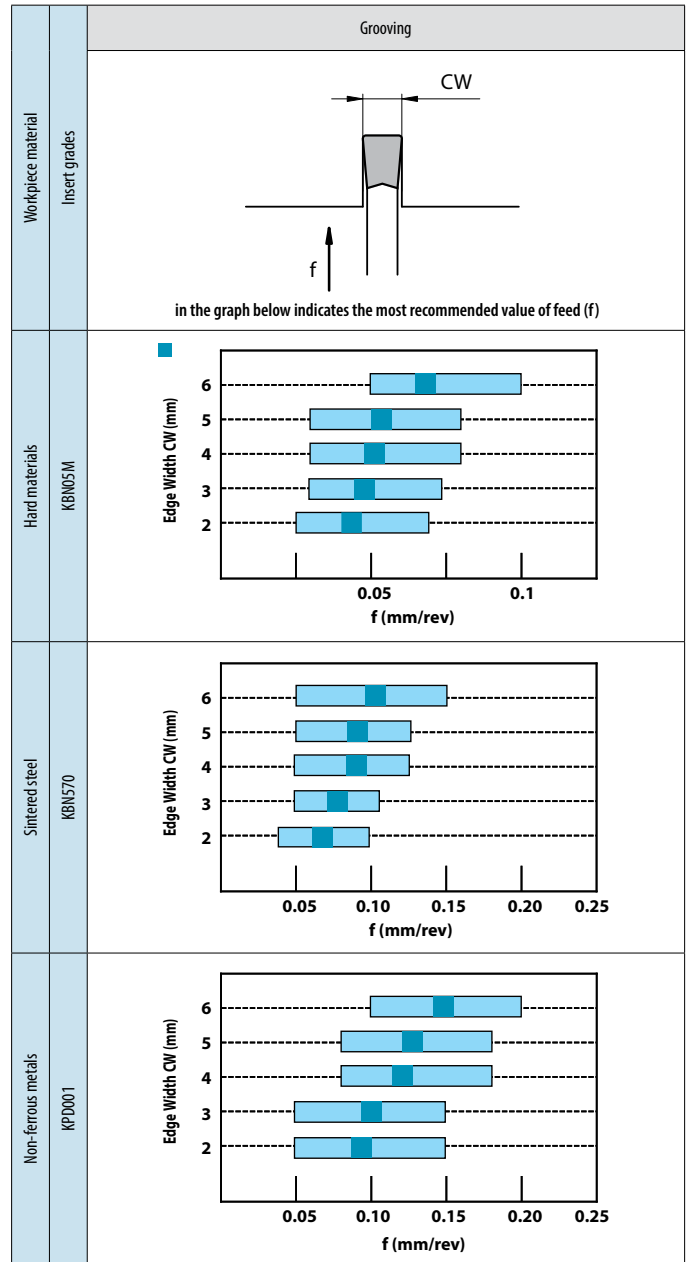
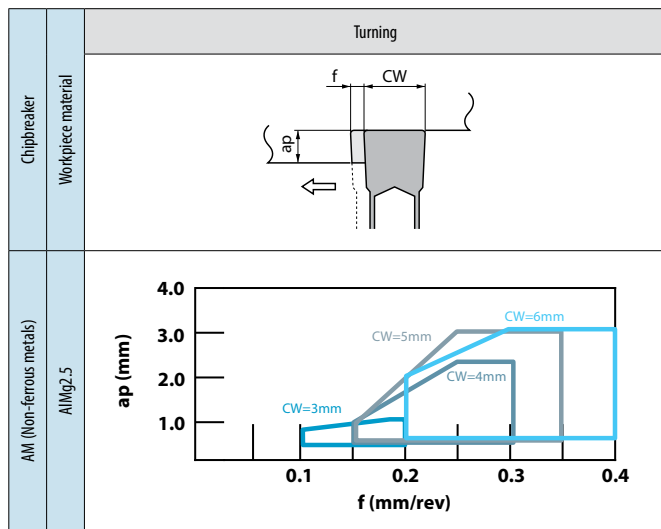


Grooving

Recommended cutting conditions (feed rate / ap)



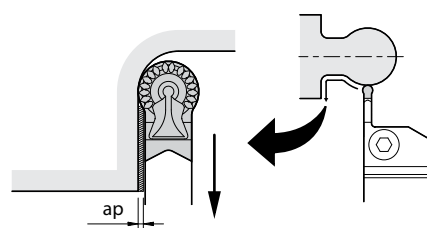
Note 1. The above values are based on the condition that CDX of toolholder is 17 mm or less.



CM chipbreaker [Cutting amount (ap) in back copying]

Maximum ap in back copying

Description	Maximum ap (mm)				
	Toolholder description				
	KGD...-2T...	KGD...-3T...	KGD...-4T...	KGD...-5T...	KGD...-6T...
GDM 3020N-150R-CM	0.24	0.20	-	-	-
4020N-200R-CM	-	0.24	0.20	-	-
5020N-250R-CM	-	-	0.30	0.20	-
6020N-300R-CM	-	-	-	0.30	0.25



Guide for external grooving

Point 1 - Turning after grooving

1. Grooving depth over 0.5 mm: For roughing - refer to fig. 1

Before turning, pull the tool back about 0.1mm after grooving, instead of turning subsequent to grooving.

Failure to pull the tool back before traverse machining will result in an unbalanced load applied on only one side of the cutting edge.

2. Grooving depth under 0.5 mm: For finishing - refer to fig. 2

Turning subsequent to grooving is possible because shallow groove depths relate a small load on the cutting edge.

Retention time is not necessary.

Point 2

1. When widening the groove width (Refer to Fig.3), apply the "Step Turning."

2. The widened groove and side walls should be finished last. For better chip control, ap over 0.5 mm is recommended. Note: If the workpiece is not supported at the center, reduce the feed rate when grooving towards center.

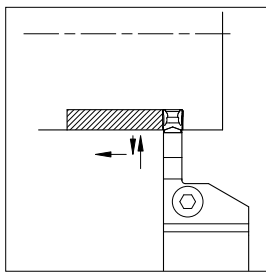


Fig.1

Before turning, pull the tool back about 0.1 mm after grooving.
Grooving depth over 0.5 mm: At roughing

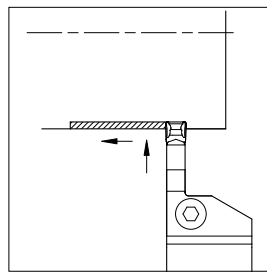


Fig. 2

Turning subsequent to grooving.
Grooving depth under 0.5 mm: At finishing

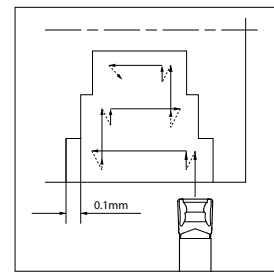


Fig. 3

Case Studies


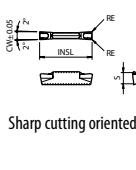

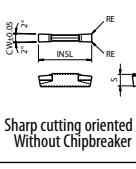

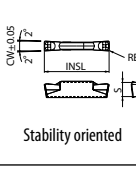

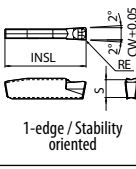

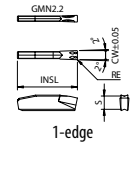
17Cr3 (Grooving)		20CrMo5 (Grooving / Turning)	
Gear $V_c = 113 \sim 164 \text{ m/min}$ $f = 0.06 \text{ mm/rev}$ Wet GDM4020N-040GM (PR1225) KGDL2525X-3T10S		Gear $V_c = 170 \text{ m/min}$ $f = 0.15 \text{ mm/rev}$ (Roughing) 0.10 mm/rev (Finishing) $a_p = 0.2 \text{ mm}$ (Finishing) Wet GDM4020N-040GM (PR1215) KGDR2525X-4T20S	
GM chipbreaker (PR1225)	1,500 pcs/c	GM chipbreaker (PR1215)	250 pcs/c
Competitor K (PVD coated carbide)	250 pcs/c	Competitor L (Roughing: PVD coated carbide; Finishing: cermet)	200 pcs/c
<ul style="list-style-type: none"> GM chipbreaker (PR1225) showed 6 times longer tool life than that of Competitor K. Good chip control without burned chips. 		<ul style="list-style-type: none"> GM chipbreaker reduced occurrence rate of tangle of chips (occurrence rate 80% to 10%). The problem was persistent with Competitor L. Machining productivity is improved. 	

Evaluation by the user

Evaluation by the user



GM/GMN/GMM/GMG/GMGA/FGG

Insert		Description		Dimension (mm)				Tolerance (mm)		Carbide					Applicable toolholder G55~G58		
				No. of edges	CW	S	RE	INSL	CW min.	CW max.	Cement						
											C9025	PR905	PR915	PR930		KW10	TN90
				Carbon steel / Alloy steel											P		
				Stainless steel											M		
				Cast iron											K		
				Non-ferrous metals											N		
				Titanium alloy											S		
				Hard materials (~ 40HRC)											H		
				Hard materials (40HRC ~)													
 Sharp cutting oriented		GMM 1520-MT	2	1.5	4.3	0 0.05	20	-0.05	+0.05							KGM...1.5(...)	
		GMM 2020-MT	2	2	4.3	0 0.05	20	-0.05	+0.05								KGM...2(...) KGM...1.5(...)
		GMM 2520-MT	2	2.5	4.3	0 0.05	20	-0.05	+0.05								KGM...2.5(...) KGM...2(...)
		GMM 3020-MT	2	3	4.3	0 0.05	20	-0.05	+0.05								KGM...3(...) KGM...2.5(...) KGM...2(...)
 Sharp cutting oriented / Without Chipbreaker		GMM 1520-NB	2	1.5	4.3	0	20	-0.05	+0.05							KGM...1.5(...)	
		GMM 2020-NB	2	2	4.3	0	20	-0.05	+0.05								KGM...2(...) KGM...1.5(...)
		GMM 3020-NB	2	3	4.3	0	20	-0.05	+0.05								KGM...3(...) KGM...2.5(...) KGM...2(...)
 Stability oriented		GMM 2020-TK	2	2	4.3	0.2	20	-0.05	+0.05							KGM...2(...) KGM...1.5(...)	
		GMM 2520-TK	2	2.5	4.3	0.2	20	-0.05	+0.05								KGM...2.5(...) KGM...2(...)
		GMM 3020-TK	2	3	4.3	0.25	20	-0.05	+0.05								KGM...3(...) KGM...2.5(...) KGM...2(...)
 1-edge / Stability oriented		GMN 2-TK	1	2	4.3	0.2	20	-0.05	+0.05							KGM...2(...) KGM...1.5(...)	
		GMN 3-TK	1	3	4.3	0.25	20	-0.05	+0.05								KGM...3(...) KGM...2.5(...) KGM...2(...)
		GMN 4-TK	1	4	4.3	0.3	20	-0.05	+0.05								KGM...4(...) KGM...3(...)
 1-edge		GMN 2.2	1	2.2	4.3	0.17	20	-0.05	+0.05							KGM...2(...)	
		GMN 3	1	3	4.3	0.2	20	-0.05	+0.05								KGM...3(...) KGM...2.5(...) KGM...2(...)
		GMN 4	1	4	4.3	0.25	20	-0.05	+0.05								KGM...4(...) KGM...3(...)
		GMN 5	1	5	4.3	0.8	20	-0.05	+0.05								KGM...5(...) KGM...4(...)
		GMN 6	1	6	4.3	0.8	20	-0.05	+0.05								KGMR...6T30 KGM...5(...)

Handed insert shows Right-hand


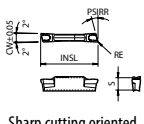

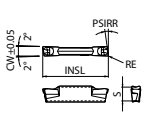

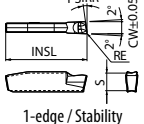

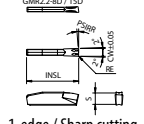
Recommended cutting conditions G143

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Grooving

GM/GMN/GMM/GMG/GMGA/FGG

Insert		Description		Dimension (mm)						Angle (°)	Tolerance (mm)		Carbide					Applicable toolholder G55~G58
				No. of edges	CW	S	RE	INSL	PSIR°/L		CW min.	CW max.	CVD	PVD			Cermet	
														CB9025	PR905	PR915			PR930	KW10	TN90
				Carbon steel / Alloy steel													P	
				Stainless steel													M	
				Cast iron													K	
				Non-ferrous metals													N	
				Titanium alloy													S	
				Hard materials (~ 40HRC)													H	
				Hard materials (40HRC ~)														
 <p>Sharp cutting oriented</p>		GMM 1520R-MT-15D	2	1.5	4.3	0 0.05	20	15	-0.05	+0.05							KGM...1.5(...)	
		GMM 2020R-MT-15D 2020R-MT-15D 2020L-MT-15D	2	2	4.3	0 0.05 0	20	15	-0.05	+0.05								KGM...2(...) KGM...1.5(...)
		GMM 2520R-MT-15D	2	2.5	4.3	0 0.05	20	15	-0.05	+0.05								KGM...2.5(...) KGM...2(...)
		GMM 3020R-MT-15D 3020R-MT-15D 3020L-MT-15D	2	3	4.3	0 0.05 0	20	15	-0.05	+0.05								KGM...3(...) KGM...2.5(...) KGM...2(...)
 <p>Stability oriented</p>		GMM 2020R-TK-8D	2	2	4.3	0.2	20	8	-0.05	+0.05							KGM...2(...) KGM...1.5(...)	
		GMM 2520R-TK-8D	2	2.5	4.3	0.2	20	8	-0.05	+0.05								KGM...2.5(...) KGM...2(...)
		GMM 3020R-TK-8D	2	3	4.3	0.25	20	8	-0.05	+0.05								KGM...3(...) KGM...2.5(...) KGM...2(...)
 <p>1-edge / Stability oriented</p>		GMR 2-TK-8D	1	2	4.3	0.2	20	8	-0.05	+0.05							KGM...2(...) KGM...1.5(...)	
		GMR 3-TK-8D	1	3	4.3	0.25	20	8	-0.05	+0.05								KGM...3(...) KGM...2.5(...) KGM...2(...)
		GMR 4-TK-8D	1	4	4.3	0.3	20	8	-0.05	+0.05								KGM...4(...) KGM...3(...)
 <p>1-edge / Sharp cutting oriented</p>		GMR 2.2-8D GML 2.2-8D	1	2.2	4.3	0.17	20	8	-0.05	+0.05							KGM...2(...)	
		GMR 2.2-15D	1	2.2	4.3	0	20	15	-0.05	+0.05								
		GMR 3-4D GML 3-4D	1	3	4.3	0.2	20	4	-0.05	+0.05								KGM...3(...) KGM...2.5(...) KGM...2(...)
		GMR 4-4D GML 4-4D	1	4	4.3	0.25	20	4	-0.05	+0.05								KGM...4(...) KGM...3(...)

Handed insert shows Right-hand

Recommended cutting conditions G143

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GM/GMN/GMM/GMG/GMGA/FGG

Cutting edge preparation				Material										Applicable toolholder	
Symbol	Specification	Example												G55~G58	
F	Sharp edge	F	Sharp edge												
E	R-honed	E008	R0.08mm honed												
				Carbon steel / Alloy steel										P	
				Stainless steel										M	
				Cast iron										K	
				Non-ferrous metals										N	
				Titanium alloy										S	
				Hard materials (~ 40HRC)										H	
				Hard materials (40HRC ~)											
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)					Tolerance (mm)		CBN		PCD		Applicable toolholder
				CW	S	RE	INSL	LE	CW min.	CW max.	KBN510	KBN525	KPD000	KPD010	
	GMN 2	E008	1	2	4.3	0.2	20	2.9	-0.05	+0.05	●	●			KGM...2(...) KGM...1.5(...)
	GMN 2	F	1	2	4.3	0.2	20	2.9	-0.05	+0.05			●	●	
	GMN 3	E008	1	3	4.3	0.4	20	2.9	-0.05	+0.05	●	●			KGM...3(...) KGM...2.5(...) KGM...2(...)
	GMN 3	F	1	3	4.3	0.2	20	2.9	-0.05	+0.05			●	●	
	GMN 4	E008	1	4	4.3	0.4	20	2.9	-0.05	+0.05	●	●			KGM...4(...) KGM...3(...)
	GMN 4	F	1	4	4.3	0.2	20	2.9	-0.05	+0.05			●	●	
	GMN 5	F	1	5	4.3	0.2	20	2.9	-0.05	+0.05			●	●	KGM...5(...) KGM...4(...)
	GMN 6	F	1	6	4.3	0.2	20	2.9	-0.05	+0.05			●	●	KGMR...GT30 KGM...5(...)

Recommended cutting conditions G146



Features of Chipbreaker

Series	Insert	Features
GMM MW		Excellent chip evacuation at Grooving, Turning, Cut-off
GMG MG		Low cutting force with ground chipbreaker
GMG MS GMM MS		Grooving / Turning / Cut-off operations are minimum cutting force at Positive Edge
GMM MT		Small corner-R(RE) and minimize the core which remains in the center of the face
GMM TK		Large corner-R(RE) and stable performance at cut-off
GMM NB		Flat rake face and non-chipbreak It works well for brass

Edge Preparation

Edge Prep.	Chamfered + R-honed	Chamfered + R-honed
	Corner-R(RE) = 0.05	Sharp Corner
MT Chipbreaker	CR9025 / PR915	PR930 / KW10
Edge Prep.	Chamfered + R-honed	Sharp Edge
	Corner-R(RE) = 0.2 ~ 0.3	Corner-R(RE) = 0.2 ~ 0.3
TK Chipbreaker	CR9025 / PR915	PR930 / KW10
Edge Prep.	R-honed	Sharp Edge
	Corner-R(RE) = 0.05	Sharp Corner
Without Chipbreaker (-NB)	CR9025	PR930 / KW10

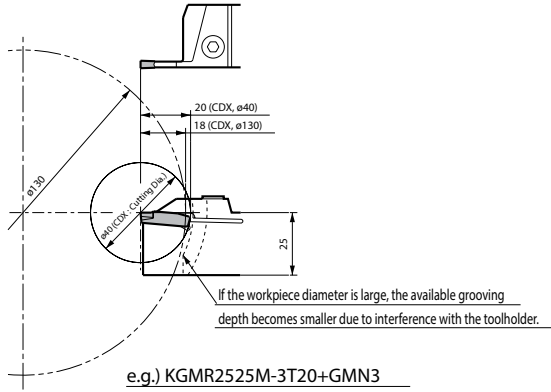
· Sharp Edge Spec. can reduce cutting force by 40% less than that of chamfer edge.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

Available Cutting Diameter of KGM (for automatic lathe) / KGM-T

· There is a limit to available grooving depth depending on the workpiece diameter.



G

Grooving

External

Internal

Face

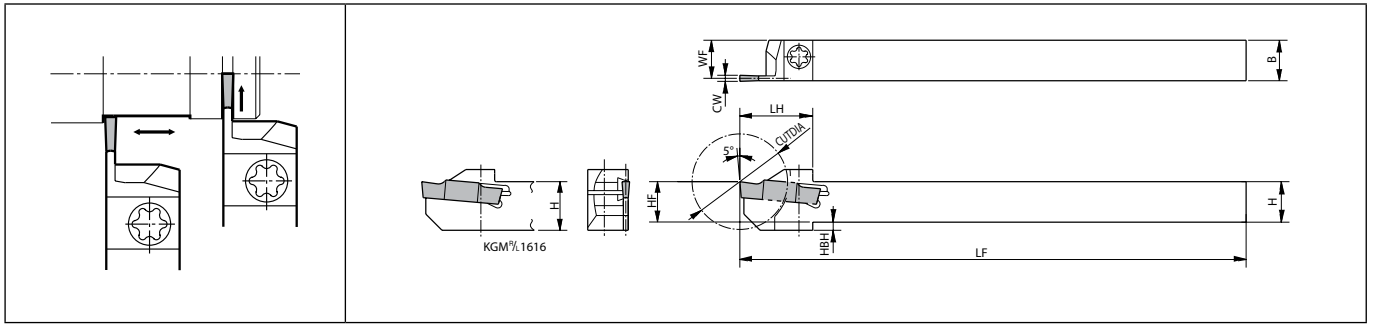
KGM (for automatic lathe) Possible Cutting Diameter and Available Grooving Depth Table

Toolholder Description		DCX (Cutting Dia.)															
KGM [®] /L	1010 □ -1.5...	-	-	-	-	-	-	-	18	21	26	38	76	∞			
	1212 □ -1.5...	-	-	-	-	23	27	37	71	∞	∞	∞	∞				
	1010 □ -2...	-	-	-	-	-	-	-	18	21	26	38	76				
	1212 □ -2...	-	-	-	-	23	27	37	71	∞							
	1616 □ -2...	30	37	47	68	89	131	∞	∞								
	1212 □ -2.5...	-	-	-	-	23	27	37	71								
	1616 □ -2.5...	30	37	47	68	89	131	∞	∞								
	1616 □ -3...	30	37	47	68	89	131	∞	∞	∞							
Available Grooving Depth CDX (mm)	15	14	13	12	11.5	11	10	9	8					7	6	5	4	3	2	1

KGM-T Possible Cutting Diameter and Available Grooving Depth Table (GMN, GM[®]/L when using 1-edge insert)

Toolholder Description		DCX (Cutting Dia.)																		
KGM [®] /L	2012K-2T17	∞																		
	2020K-2T17		-	-	-	-	-	-	-	-	66	80	130	260						
	2525M-2T17																			
	1616H-3T20		-	-	-	-	-	40	54	70	100	180	∞							
	2012K-3T20																			
	2020K-3T20																			
	2525M-3T20		-	-	-	-	-	40	90	130	240									
	2020K-4T20																			
	2525M-4T20																			
	2525M-4T25																			
	2525M-5T25		-	-	50	140	240	∞				∞								
	3232P-5T25					280	600													
	2525M-6T30		100	300	∞	∞	∞	∞				∞								
Available Grooving Depth CDX (mm)	30	27	25	23	22	20	19									18	17	16	15	14	13 or under

KGM (External grooving)



Right-hand shown

Toolholder dimensions

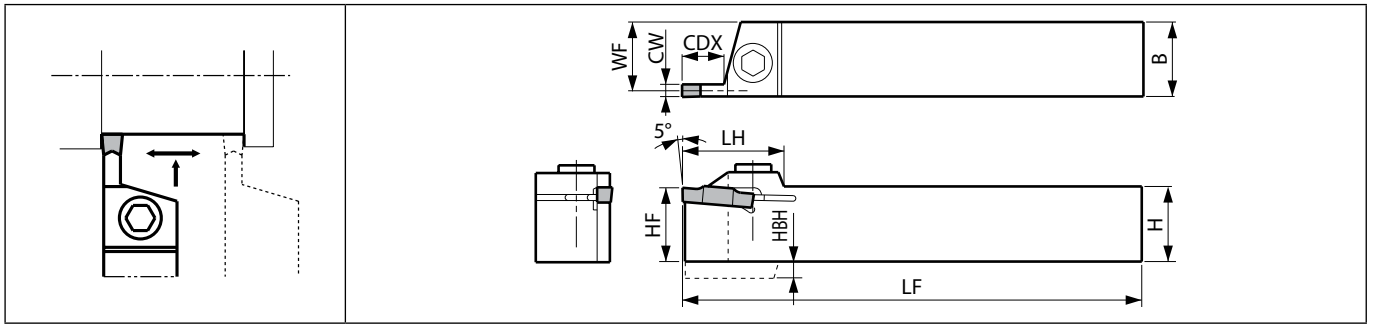
Description	Availability		Dimension (mm)											Spare parts		Applicable inserts G48, G49 G51~G53
														Screw	Wrench	
	R	L	C/D DIA	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.				
KGM%L 1010JX-1.5 1212F-1.5-85 1212JX-1.5	●	●	18	10	10	18	10		120	9.4	1.5	2	SE-40120TR	LTW-15S	GMM1520... GM.2 GM.20...	
	●		23	12	12	19	12	2	85	11.4						
	●	●							120							
KGM%L 1010JX-2 1212F-2-85 1212JX-2 1616JX-2	●	●	18	10	10	18	10		120	9.15	2	3	SE-40120TR	LTW-15S	GM.2 GM.20... GM.24... GM.25... GM.3 GM.30...	
	●	●	23	12	12	19	12	2	85	11.15						
	●	●							120							
	●	●	30	16	16	24.5	16	-	15.15				SE-50125TR	LTW-20		
KGM%L 1212F-2.5-85 1212JX-2.5 1616JX-2.5	●		23	12	12	19	12	2	85	11	2.4	3	SE-40120TR	LTW-15S	GM.24... GM.25... GM.3 GM.30...	
	●	●							120							15	SE-50125TR	LTW-20
	●	●							30				16	16		24.5	16	-	120	15	SE-50125TR	LTW-20
KGM%L 1616JX-3	●	●	30	16	16	24.5	16	-	120	14.8	3	4	SE-50125TR	LTW-20	GM.3, GM.30..., GM.35..., GM.4, GM.40...	

If using a full-R insert, you need to modify the corner of insert adapter part of toolholder.
KGM will be switched to KGD=> G35



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGM (External grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)										Spare parts				Applicable inserts G48~G53	
													Clamp bolt	Clamp screw (Torx)	Wrench	Wrench		
	R	L	CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.						
KGM [®] /L 1212H-3 1616H-3 2020K-3 2525M-3	●		9	12	12	27	12	4	100	10.8	3	3	-	SB-5TR	-	LTW-20	GM.3	GM.30...
	●			16	16		16	14.8	HH5X16	-			LW-4	-	GM.3	GM.30...		
	●	●		20	20	20	125	18.8	HH5X25	-			LW-4	-	GM.4	GM.40...		
	●	●		25	25	25	150	23.8	HH5X25	-			LW-4	-	GM.5	GM.50...		
KGM [®] /L 2020K-4 2525M-4	●		10	20	20	27	20	-	125	18.3	4	5	HH5X16	-	LW-4	-	GM.4	GM.40...
	●	●		25	25		25	150	23.3	HH5X25			-	LW-4	-	GM.5	GM.50...	
KGMR 2020K-5 2525M-5	●		10	20	20	27	20	-	125	17.8	5	6	HH5X16	-	LW-4	-	GM.5	GM.50...
	●			25	25		25	150	22.8	HH5X25			-	LW-4	-	GM.6	GM.60...	
KGM [®] /L 2525M-8	●	●	25	25	25	40	25	7.5	150	22	8	8	HH6X25	-	LW-5	-	GM.8030...	

CDX shows available grooving depth.

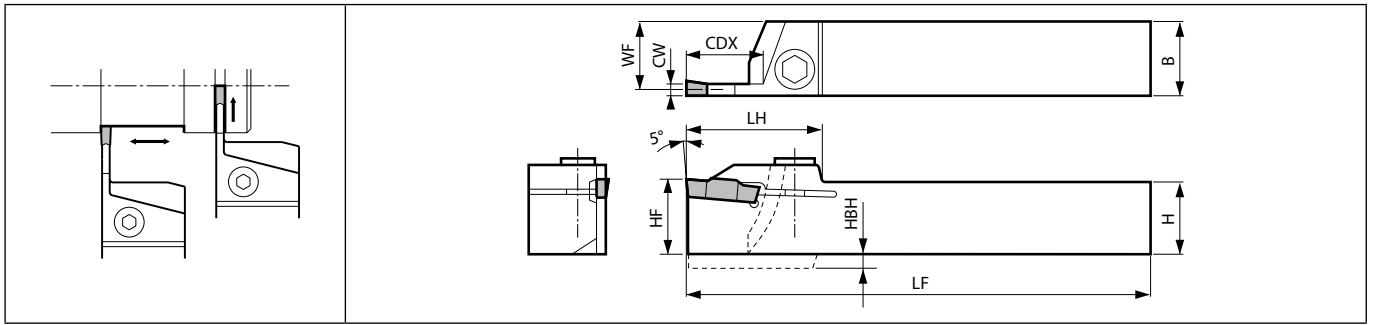
4mm width Insert can be installed in KGM[®]/L 1212H-3, but is not recommended due to the toolholder's rigidity.

If using a full-R insert, you need to modify the corner of insert adapter part of toolholder.

KGM will be switched to KGD=> G34

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGM-T (External grooving / Deep grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)										Spare parts				Applicable inserts G48~G53		
													Clamp bolt	Clamp screw (Torx)	Wrench	Wrench			
	R	L	CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.							
KGM%L 2012K-2T17 2020K-2T17 2525M-2T17		●	17	20	12	33	20	-	125	11.15	2	3	-	SB-5TR	-	LW-20	GM.2 GM.20... GM.24... GM.25... GM.3 GM.30...		
	●	●			20				19.15	HH5X16			-	-					
	●	●		25	25	25	150	24.15	HH5X25	-			LW-4	-					
KGM%L 1616H-3T20 2012K-3T20 2020K-3T20 2525M-3T20	●		20	16	16	36	20	4	100	14.8	3	4	HH5X16	-	LW-4	-	GM.3 GM.30... GM.35... GM.4 GM.40...		
		●		20	12				10.8	-			SB-5TR	-	LW-20				
	●	●		20	20				18.8	-			HH5X16	-	LW-4	-			
	●	●		25	25				25	150			23.8	HH5X25	-	LW-4		-	
KGM%L 2020K-4T20 2525M-4T20 2525M-4T25	●		20	20	20	36	20	-	125	18.3	4	5	HH5X16	-	LW-4	-	GM.4 GM.40... GM.5 GM.50...		
	●								25	25			41	25	150	23.3		HH5X25	-	LW-4	-
	●	●		25	25				41	25			150	23.3	HH5X25	-		LW-4	-
KGM%L 2525M-5T25 3232P-5T25	●	●	25	25	25	42	25	-	150	22.8	5	6	HH5X25	-	LW-4	-	GM.5 GM.50... GM.6 GM.60...		
	●			32	32				32	170			29.8	HH5X25	-	LW-4		-	
KGMR 2525M-6T30	●		30	25	25	45	25	-	150	22.4	6	6	HH5X25	-	LW-4	-	GM.6 GM.60...		

If using a full-R insert, you need to modify the corner of insert adapter part of toolholder.

CDX shows the distance from the toolholder to the cutting edge. Ref. to the Table (G54) for the relationship between the available grooving depth and the cutting dia.

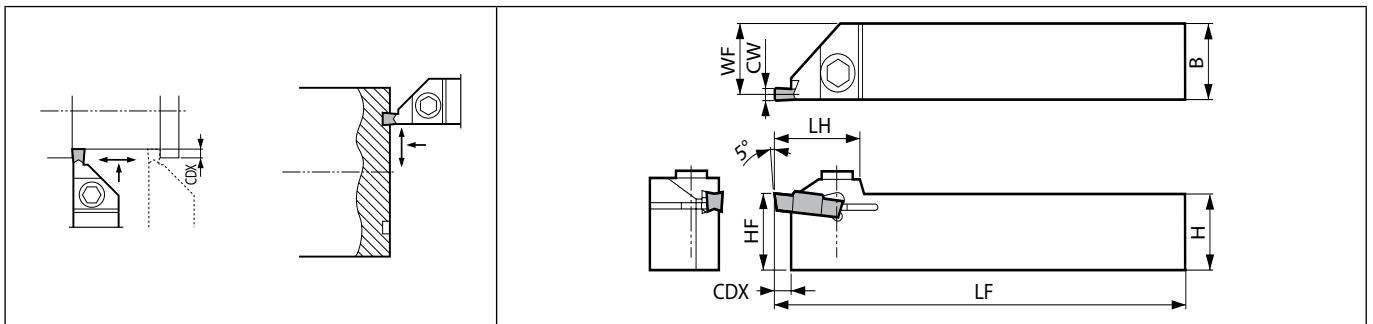
When using GMG / GMM (2-edge) insert, set the groove depth under 15 mm.

KGM will be switched to KGD=> G34

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability





KGMM (External grooving / Face grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts		Applicable inserts ● G48~G53
	R	CDX	H	B	LH	HF	LF	WF	CW min.	CW max.			
KGMMR 2525M-3	●	4.8	25	25	25	25	150	23.8	3	5	HH5X25	LW-4	FGG..., GM.3(...), GM.4(...), GM.5(...)

CDX shows available grooving depth. (Ref. to the table G59 for Face Grooving)

G

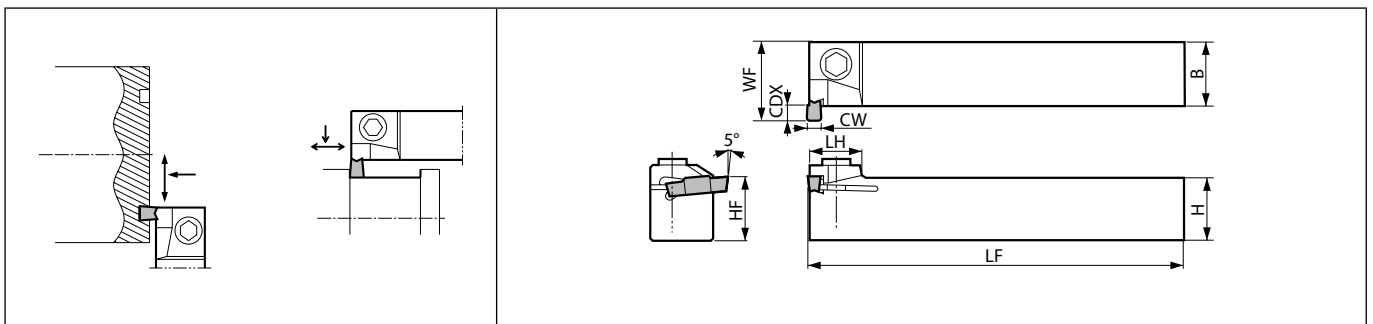
Grooving

External

Internal



Face

KGMS (External grooving / Face grooving)



Right-hand shown

Toolholder dimensions

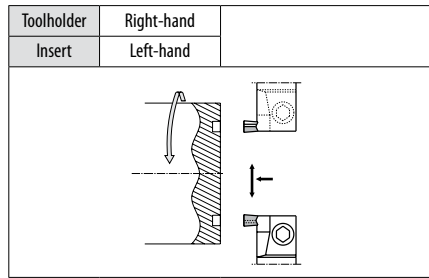
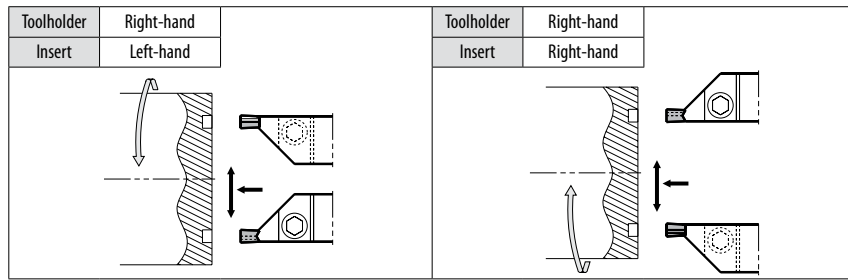
Description	Availability		Dimension (mm)								Spare parts		Applicable inserts ● G48~G53
	R	CDX	H	B	LH	HF	LF	WF	CW min.	CW max.			
KGMSR 2525M-3	●	4.8	25	25	17	25	150	30	3	5	HH5X25	LW-4	FGG..., GM.3(...), GM.4(...), GM.5(...)

CDX shows available grooving depth. (Ref. to the table G59 for Face Grooving)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

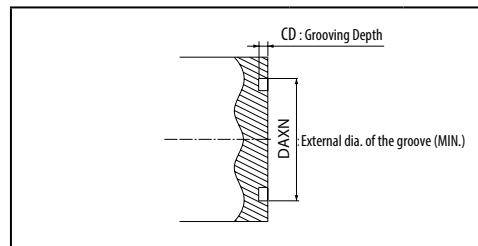
Selection of Insert & Toolholder (Face Grooving)

Case of KGMM



External dia. of the groove (min.) & Grooving Depth (Face Grooving)

KGMM / KGMS (Common) (mm)

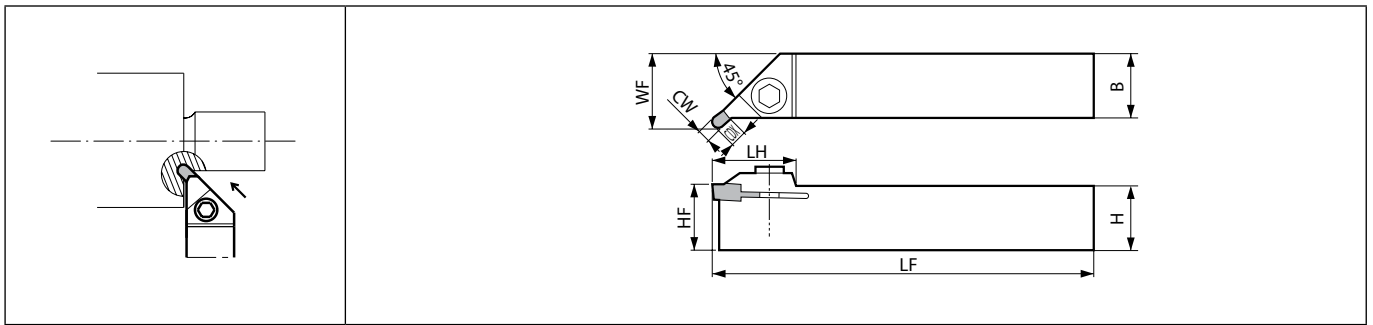


Description	DAXN	CD
GMG/GMM3020-○○○□□	ø100	4.8
GMG/GMM4020-○○○□□		
GMG/GMM5020-○○○□□		
FGG [®] /L 3020-02	ø22	4.3
FGG [®] /L 4020-04	ø28	4.8
FGG [®] /L 5020-04	ø30	
GMG3020-150RU	ø22	4.3
GMG4020-200RU	ø28	4.8







Grooving

KGMU (External grooving / Undercut grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts		Applicable inserts G49
	R	CDX	H	B	LH	HF	LF	WF	CW min.	CW max.			
KGMUR 2525M	●	4.8	25	25	28.5	25	150	28.6	3	5 (6)			GMG3020..RU, GMG4020..RU

CDX shows the distance from the toolholder to the cutting edge. Ref. to the table below for the available grooving depth.

WF shows at GMM5020-RU. () indicates external grooving inserts when installed.

External grooving inserts (grooving width 3 mm~6 mm) will be attached. (In case of using GMG○20-○○○○□□, GMM○20-○○○○□□, GMN○ insert)


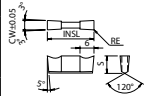

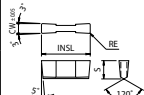

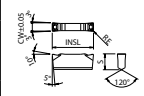

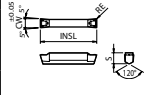
Undercut Depth CD

Description	Undercut Depth	Distance from the face of the workpiece
	CD (mm)	ap (mm)
GMG3020-150RU	3.5	1.8
GMG4020-200RU	4.0	1.9

* In case of undercutting for the diameter 100mm or over, Inserts for External Grooving GMG○20-○○○○□□, GMM○20-○○○○□□, GMN○ are also available.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GH/GHU/GA

Cutting edge preparation			Material compatibility										Applicable toolholder			
Symbol	Specification	Example	Carbon steel / Alloy steel	Stainless steel	Cast iron	Non-ferrous metals	Titanium alloy	Hard materials (~40HRC)	Hard materials (40HRC ~)	P	M	K	N	S	H	
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide		Ceramic		Cermet	G62~G64	
				CW	S	RE	INSL	CW min.	CW max.	CVD CB9025	PVD PR930 KW10	PVD AG6N PT600M	TC40 TN60			
		GH 4020-02 4020-05	-	2	4	7.5	0.2 0.5	20	-0.05	+0.05	●	●		●	●	KGH%L ...4 KGHS%L ...4
		GH 4520-02 4520-05	-	2	4.5	7.5	0.2 0.5	20	-0.05	+0.05				●	●	
		GH 5020-02 5020-05	-	2	5	7.5	0.2 0.5	20	-0.05	+0.05	●	●		●	●	KGH%L ...5 KGHS%L ...5
		GH 5520-02 5520-05	-	2	5.5	7.5	0.2 0.5	20	-0.05	+0.05				●	●	
		GH 6020-02 6020-05	-	2	6	7.5	0.2 0.5	20	-0.05	+0.05	●	●		●	●	KGH%L ...7
		GH 6520-02 6520-05	-	2	6.5	7.5	0.2 0.5	20	-0.05	+0.05				●	●	
		GH 7020-02 7020-05	-	2	7	7.5	0.2 0.5	20	-0.05	+0.05	●	●		●	●	KGH%L ...7
		GH 7520-02 7520-05	-	2	7.5	7.5	0.2 0.5	20	-0.05	+0.05				●	●	
		GH 8020-02 8020-05	-	2	8	7.5	0.2 0.5	20	-0.05	+0.05	●	●		●	●	KGH%L ...10
		GH 10025-05	-	2	10	7.5	0.5	25	-0.05	+0.05	●	●				
		GH 12025-05	-	2	12	7.5	0.5	25	-0.05	+0.05	●	●				
				GH 4020-05	S01020 T01020	2	4	7.5	0.5	20	-0.05	+0.05		●	●	●
GH 5020-05	S01020 T01020			2	5	7.5	0.5	20	-0.05	+0.05		●	●	●	●	
GH 6020-05	T01020			2	6	7.5	0.5	20	-0.05	+0.05				●	●	KGH%L ...5 KGHS%L ...5
GH 7020-05	T01020			2	7	7.5	0.5	20	-0.05	+0.05				●	●	
		GHU 40-20		-	2	4	7.5	0.25	20	-0.05	+0.05	●			●	KGH%L ...4 KGHS%L ...4
		GHU 50-20		-	2	5	7.5	0.3	20	-0.05	+0.05	●			●		KGH%L ...5 KGHS%L ...5
		GHU 60-20		-	2	6	7.5	0.3	20	-0.05	+0.05	●			●	
		GA 30		-	2	3	5	0.2	25	-0.05	+0.05	●			●	KGAL ...3
		GA 40		-	2	4	5	0.25	25	-0.05	+0.05	●			●	KGAL ...4
		GA 50		-	2	5	5	0.3	30	-0.05	+0.05	●			●	KGAL ...5

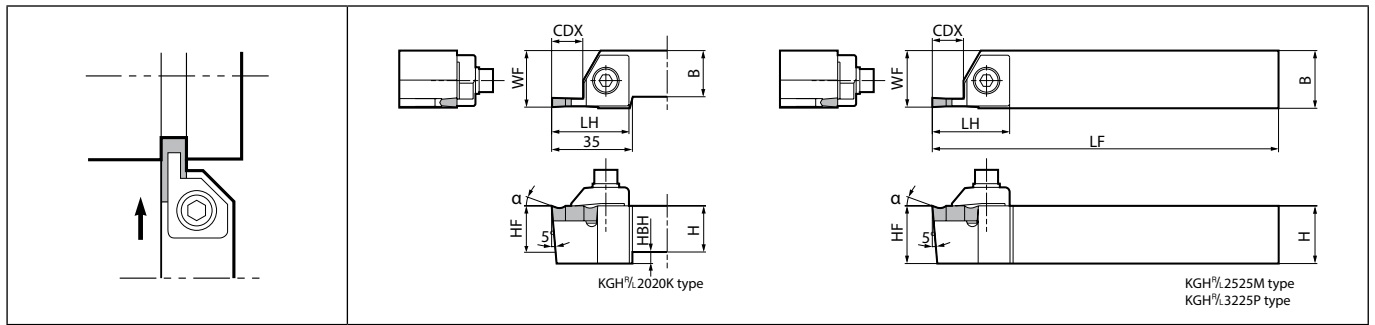
Recommended cutting conditions ● G65

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Grooving

KGH (External grooving / Deep grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)										Clamp	Clamp bolt	Spring	Washer	Wrench	Applicable inserts G61
	R	L	CDX	H	B	LH	HF	HBH	LF	WF (min.)	WF (max.)							
KGH% 2020K-4 2525M-4	●	●	13	20	20	33.5	20	5	125	24.5	24.8	CGH-1%L	HH6X25	SP-6	W-6	LW-5	GH4.20-..., GHU40-20	
KGH% 2020K-5 2525M-5 3225P-5	●	●	13	20	20	33.5	25	5	125	25	25.8	CGH-1%L	HH6X25	SP-6	W-6	LW-5	GH5.20-..., GHU50-20 GH6.20-..., GHU60-20	
KGH% 2020K-7 2525M-7	●	●	13	20	20	33.5	20	7	125	24.5	25	CGH-2%L	HH6X25	SP-6	W-6	LW-5	GH7.20-.. GH8020-..	
KGH% 2525M-10 3225P-10	●	●	17	25	25	41	25	-	150	25.5	26.5	CGH-3%L	HH6X25	SP-6	W-6	LW-5	GH10025-05 GH12025-05	

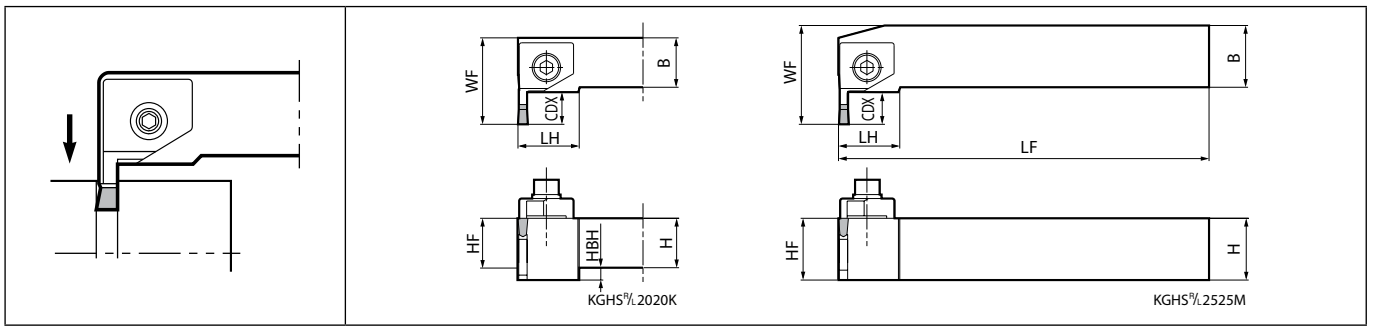
CDX shows available grooving depth.

WF of KGH% Toolholder depends on the insert's edge width.

Clamp : CGH-○R for Right-hand Toolholder and CGH-○L for Left-hand Toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGHS (External grooving / Deep grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts					Applicable inserts ➔ G61
											Clamp	Clamp bolt	Spring	Washer	Wrench	
	R	L	CDX	H	B	LH	HF	HBH	LF	WF						
KGHS%. 2020K-4	●	●	13	20	20	25	20	5	125	35	CGH-1 $\frac{1}{2}$ R	HH6X25	SP-6	W-6	LW-5	GH4.20-..., GHU40-20
2525M-4	●	●		25	25		25	-	150	40						
KGHS%. 2020K-5	●	●	13	20	20	25	20	5	125	35	CGH-1 $\frac{1}{2}$ R	HH6X25	SP-6	W-6	LW-5	GH5.20-..., GHU50-20 GH6.20-..., GHU60-20
2525M-5	●	●		25	25		25	-	150	40						

CDX shows available grooving depth.

Clamp : CGH-○L for Right-hand Toolholder and CGH-○R for Left-hand Toolholder.

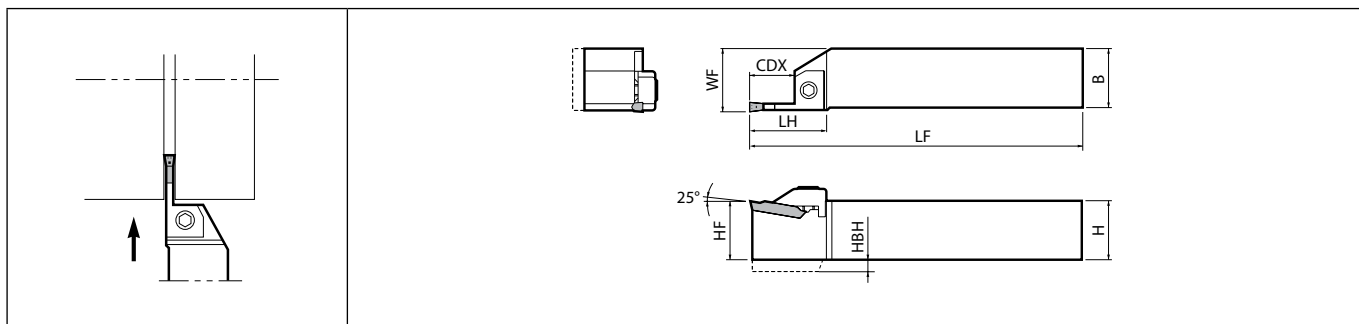
Rake Angle (α) after Installment of GH / GHU insert

When using GH○○-○○		When using GHU○○-○○	
α	Insert Grades	α	Insert Grades
0°	A65, A66N, PT600M	10°	TN60 CR9025
10°	TC40		
20°	TN90, TC60 PR930 KW10		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



KGA (External grooving / Deep grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)									Spare parts				Applicable inserts G61
												Clamp bolt	Clamp	Spring	Wrench	
	R	L	CDX	H	B	LH	HF	HBH	LF	WF						
KGA ^{R/L} 2020K-3 2525M-3	●	●	20	20	20	37	20	5	125	21.5	HH6X20	CGA-3 ^{R/L}	SP-6	LW-5	GA30	
	●	●		25	25		25	-	150	26.5						
KGAR 2020K-4 2525M-4	●		20	20	20	37	20	5	125	21.5	HH6X20	CGA-4R	SP-6	LW-5	GA40	
	●			25	25		25	-	150	26.5						
KGAR 2020K-5 2525M-5	●		25	20	20	42	20	5	125	21.5	HH6X20	CGA-5R	SP-6	LW-5	GA50	
	●			25	25		25	-	150	26.5						

CDX shows available grooving depth.

Clamp : CGA-○R for Right-hand Toolholder and CGA-○L for Left-hand Toolholder.

G

Grooving

External

Internal

Face

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

GH inserts - ground chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)							(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)				Remarks
	Cermet		PVD coated carbide	Carbide	Ceramic			GH 40~50...	GH 55~70...	GH 75~80...	GH 100~120...	
	TC40	TC60	PR930	KW10	A65	A66N	PT600M					
Carbon steel	☆ 150~220	☆ 100~150	★ 80~180	-	-	-	-	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.1~0.25 (2) 0.1~0.2 (3) Max. 1.5	(1) 0.15~0.3 (2) 0.15~0.25 (3) Max. 2.0	Coolant
Alloy steel	☆ 130~200	☆ 80~130	★ 80~160	-	-	-	-	(1) 0.07~0.18 (2) 0.07~0.13 (3) Max. 1.0	(1) 0.07~0.18 (2) 0.07~0.13 (3) Max. 1.0	(1) 0.1~0.23 (2) 0.1~0.18 (3) Max. 1.5	(1) 0.15~0.27 (2) 0.15~0.22 (3) Max. 2.0	
Stainless steel	-	☆ 60~100	★ 60~130	-	-	-	-	(1) 0.07~0.16 (2) 0.07~0.13 (3) Max. 1.0	(1) 0.07~0.16 (2) 0.07~0.13 (3) Max. 1.0	(1) 0.1~0.21 (2) 0.1~0.18 (3) Max. 1.5	(1) 0.15~0.25 (2) 0.15~0.22 (3) Max. 2.0	
Cast iron	-	-	-	★ 60~100	☆ 150~300	☆ 150~300	☆ 150~300	KW10 (1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0 A65/A66N (1) 0.03~0.07 (2) Not recom. (3) Not recom.	KW10 (1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0 A65/A66N (1) 0.03~0.07 (2) Not recom. (3) Not recom.	KW10 (1) 0.1~0.25 (2) 0.1~0.2 (3) Max. 1.5 A65/A66N (1) 0.05~0.09 (2) Not recom. (3) Not recom.	KW10 (1) 0.15~0.3 (2) 0.15~0.25 (3) Max. 2.0 A65/A66N (1) 0.05~0.09 (2) Not recom. (3) Not recom.	
Aluminum alloys	-	-	-	★ 150~400	-	-	-	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.1~0.25 (2) 0.1~0.2 (3) Max. 1.5	(1) 0.15~0.3 (2) 0.15~0.25 (3) Max. 2.0	
Brass	-	-	-	★ 150~300	-	-	-	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.07~0.2 (2) 0.07~0.15 (3) Max. 1.0	(1) 0.1~0.25 (2) 0.1~0.2 (3) Max. 1.5	(1) 0.15~0.3 (2) 0.15~0.25 (3) Max. 2.0	
Hard materials	-	-	-	-	☆ 40~80	☆ 40~80	☆ 40~80	(1) 0.02~0.05 (2) 0.01~0.03 (3) Max. 0.1	(1) 0.02~0.05 (2) 0.01~0.03 (3) Max. 0.2	(1) 0.02~0.05 (2) 0.01~0.04 (3) Max. 0.2		

* Above cutting condition is for external grooving. Set both cutting speed and feed 10% lower for internal grooving.

★:1st recommendation ☆:2nd recommendation

GHU Inserts - molded chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)		(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)			Remarks
	Cermet	CVD coated carbide	GHU 40-20	GHU 50-20	GHU 60-20	
	TN60	CR9025				
Carbon steel	☆ 130~200	☆ 80~180	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.0	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.0	(1) 0.06~0.15 (2) 0.05~0.12 (3) Max. 1.5	Coolant
Alloy steel	☆ 100~180	☆ 80~160	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.0	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.0	(1) 0.06~0.15 (2) 0.05~0.12 (3) Max. 1.5	
Stainless steel	-	☆ 60~130	(1) 0.06~0.1 (2) 0.05~0.08 (3) Max. 0.8	(1) 0.06~0.1 (2) 0.05~0.08 (3) Max. 0.8	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.2	

* Above cutting condition is for external grooving. Set both cutting speed and feed 10% lower for internal grooving.

★:1st recommendation ☆:2nd recommendation

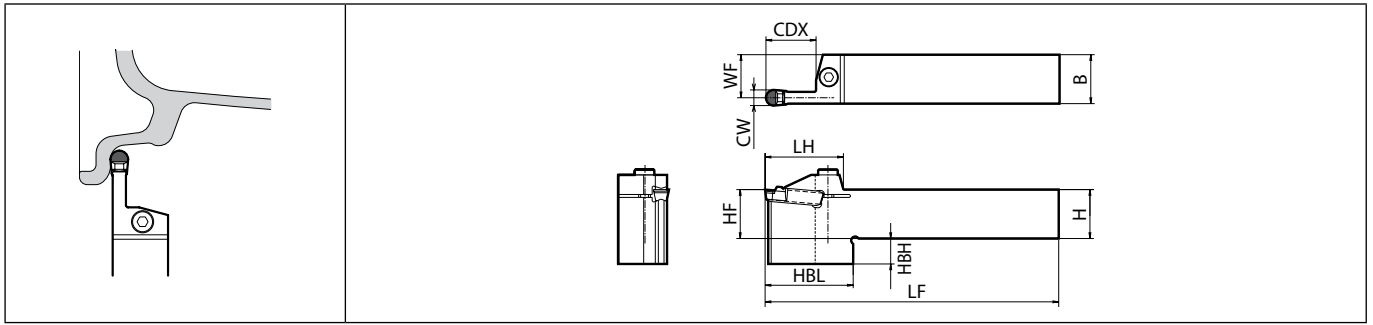
GA inserts - molded chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)		(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)			Remarks
	Cermet	CVD coated carbide	GA 30	GA 40	GA 50	
	TN60	CR9025				
Carbon steel	☆ 130~200	★ 80~180	(1) 0.06~0.18 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.06~0.21 (2) 0.05~0.17 (3) Max. 1.0	(1) 0.06~0.25 (2) 0.05~0.2 (3) Max. 1.3	Coolant
Alloy steel	☆ 100~180	★ 80~160	(1) 0.06~0.15 (2) 0.05~0.12 (3) Max. 0.3	(1) 0.06~0.18 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.06~0.22 (2) 0.05~0.18 (3) Max. 0.8	
Stainless steel	-	★ 60~130	(1) 0.06~0.1 (2) 0.05~0.08 (3) Max. 0.8	(1) 0.06~0.1 (2) 0.05~0.08 (3) Max. 0.8	(1) 0.06~0.12 (2) 0.05~0.1 (3) Max. 1.2	

★:1st recommendation ☆:2nd recommendation





KGMW (External grooving / Face grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)										Spare parts		Applicable inserts G66
													Clamp bolt	Wrench	
	R	L	CDX	H	B	LH	HF	HBH	HBL	LF	WF				
KGMW ^{R/L} 2525M-6	●	●	25	25	25	40	25	13	55	150	22.8	HH6X25	LW-5	GMGW6030-30R	
KGMW ^{R/L} 2525M-8	●	●	25	25	25	40	25	13	55	150	22	HH6X25	LW-5	GMGW8030-40R (-HR)	



Recommended cutting conditions

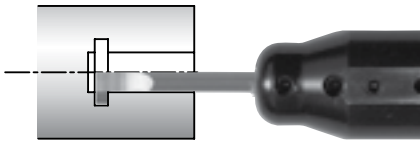
Workpiece material	Recommended insert grades (Vc: m/min)		(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)
	PCD		
	KPD001		
Aluminum	★ 150~2,700		(1) 0.05 ~ 0.3 (2) 0.2 ~ 0.8 (3) Max. 3

★ :1st recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Small diameter internal grooving

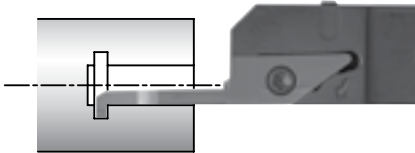
EZ bar and system tip-bars



Type	EZG
Min. bore diameter	ø3~ø8
Edge width (mm)	0.5~2.0
Grooving depth (mm)	1.0~2.0
See Page	G70



EZ bars



Type	VNG
Min. bore diameter	ø4~ø7
Edge width (mm)	1.0~2.0
Grooving depth (mm)	0.8~2.0
See Page	G72



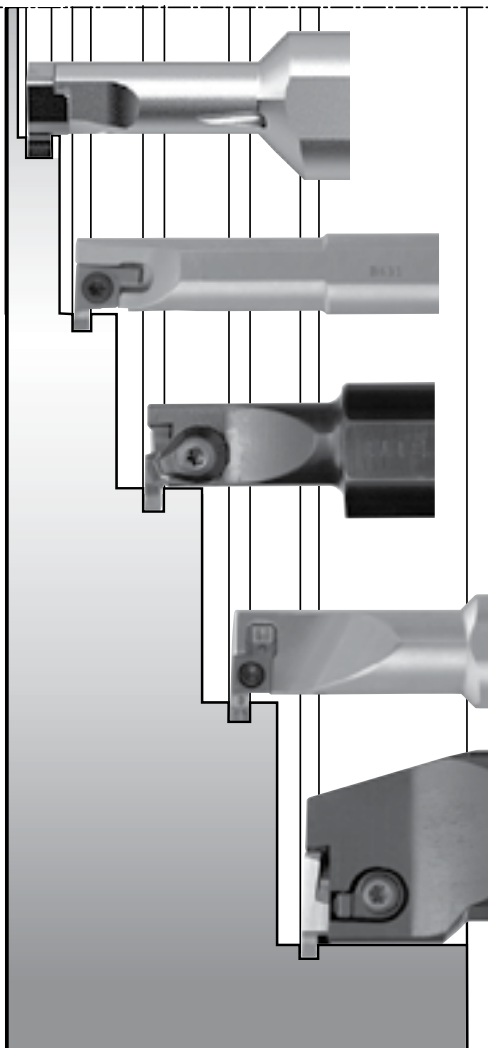
System tip-bars

G

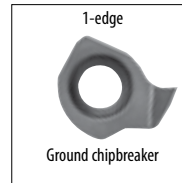


Grooving

Internal Grooving ø8~ - shallow grooving

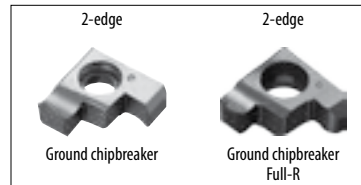


Type	SIGC
Min. bore diameter	ø8~ø12
Edge width (mm)	1.0~3.0
Grooving depth (mm)	1.5~2.2
See Page	G76,G77



Ground chipbreaker

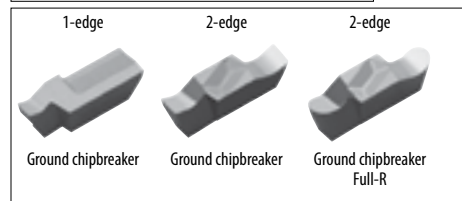
Type	SIGE
Min. bore diameter	ø8~ø12
Edge width (mm)	1.0~3.0
Grooving depth (mm)	1.5~2.2
See Page	G81~G83



Ground chipbreaker

Ground chipbreaker Full-R

Type	GIV
Min. bore diameter	ø12~ø40
Edge width (mm)	1.0~5.0
Grooving depth (mm)	1.7~6.3
See Page	G86~G88

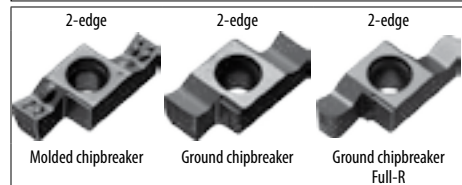


Ground chipbreaker

Ground chipbreaker

Ground chipbreaker Full-R

Type	SIGE
Min. bore diameter	ø14~ø40
Edge width (mm)	1.0~5.0
Grooving depth (mm)	2.5~6.5
See Page	G81~G83

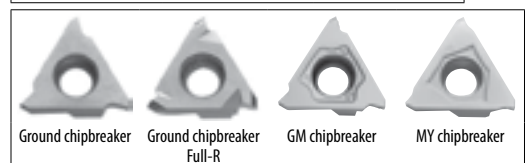


Molded chipbreaker

Ground chipbreaker

Ground chipbreaker Full-R

Type	KIGBA
Min. bore diameter	ø35~ø40
Edge width (mm)	0.33~4.8
Grooving depth (mm)	0.8~2.8
See Page	G89



Ground chipbreaker

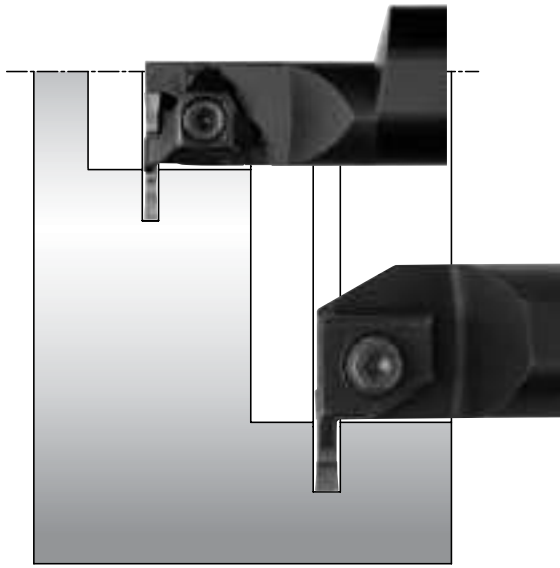
Ground chipbreaker Full-R

GM chipbreaker

MY chipbreaker

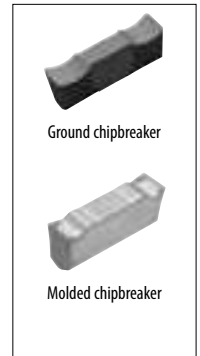
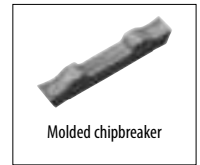
External
Internal
Face

Summary deep grooving

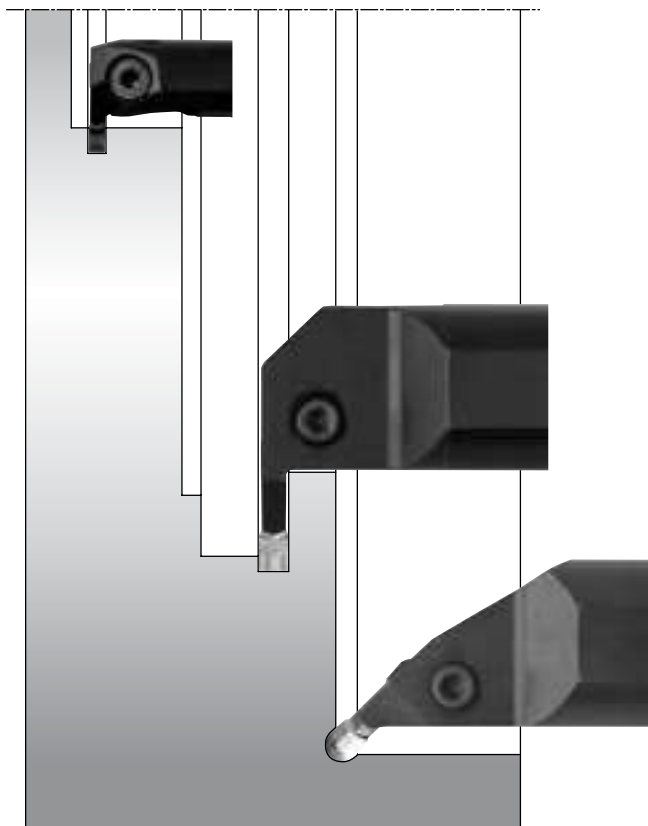


Type	KGIA
Min. bore diameter	ø32~ø66
Edge width (mm)	3.0~5.0
Grooving depth (mm)	10~15
See Page	G97

Type	KIGH
Min. bore diameter	ø45~ø65
Edge width (mm)	4.0~8.0
Grooving depth (mm)	12
See Page	G93



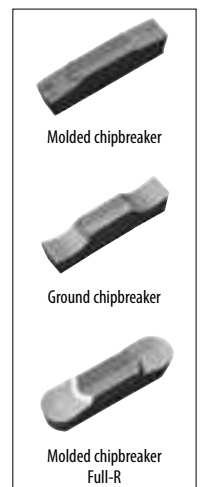
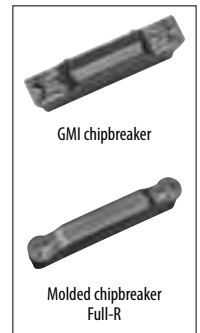
Summary internal grooving & turning ø20~



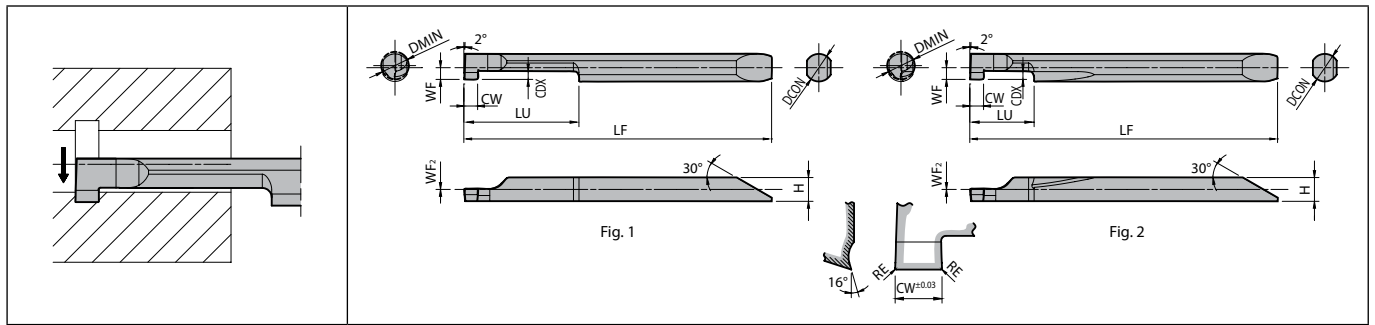
Type	KGDI
Min. bore diameter	ø18~ø40
Edge width (mm)	2.0~5.0
Grooving depth (mm)	4.5~11.0
See Page	G91

Type	KIGM-8
Min. bore diameter	ø65
Edge width (mm)	8.0
Grooving depth (mm)	20
See Page	G95

Type	KIGMU-8
Min. bore diameter	ø65
Edge width (mm)	8.0
Grooving depth (mm)	2.2
See Page	G95



EZG (Internal grooving)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)				Carbide		Applicable sleeve F38~F43	
		DMIN	CW	CDX	RE	DCON	H	LF	LU	WF	WF ₂	Fig.	CW min.	CW max.	RE min.	RE max.	PVD		-
																	PR1225		GW05
EZGR 040040-050 040040-100 040040-150 040040-200	1	4	0.5 1 1.5 2	1	0.05	4	3.45	44.7	12	1.7	0	2	-0.03	+0.03	-0.013	+0.013	●	●	EZH040...
EZGR 050050-100 050050-150 050050-200	1	5	1 1.5 2	1.5	0.05	5	4.3	52.8	20	2.15	0	1	-0.03	+0.03	-0.013	+0.013	●	●	EZH050...
EZGR 060060-100 060060-150 060060-200	1	6	1 1.5 2	2	0.05	6	5.15	60.7	20	2.65	0	1	-0.03	+0.03	-0.013	+0.013	●	●	EZH060...
EZGR 070070-100 070070-150 070070-200	1	7	1 1.5 2	2	0.05	7	6.2	63.7	25	3.05	0	1	-0.03	+0.03	-0.013	+0.013	●	●	EZH070...
EZGR 080070-100 080070-150 080070-200	1	8	1 1.5 2	2	0.05	7	6.2	63.7	25	3.45	0	1	-0.03	+0.03	-0.013	+0.013	●	●	EZH070...
EZGR 030030-050S 030030-100S	1	3	0.5 1	0.8	0.05	3	2.5	38.7	5	1.25	0	2	-0.03	+0.03	-0.013	+0.013	●	●	EZH030...
EZGR 040040-050S 040040-100S 040040-150S 040040-200S	1	4	0.5 1 1.5 2	1	0.05	4	3.45	44.7	8	1.7	0	2	-0.03	+0.03	-0.013	+0.013	●	●	EZH040...
EZGR 050050-100S 050050-150S 050050-200S	1	5	1 1.5 2	1.5	0.05	5	4.3	52.8	10	2.15	0	2	-0.03	+0.03	-0.013	+0.013	●	●	EZH050...
EZGR 060060-100S 060060-150S 060060-200S	1	6	1 1.5 2	2	0.05	6	5.15	60.7	10	2.65	0	2	-0.03	+0.03	-0.013	+0.013	●	●	EZH060...
EZGR 070070-100S 070070-150S 070070-200S	1	7	1 1.5 2	2	0.05	7	6.2	63.7	10	3.05	0	2	-0.03	+0.03	-0.013	+0.013	●	●	EZH070...
EZGR 080070-100S 080070-150S 080070-200S	1	8	1 1.5 2	2	0.05	7	6.2	63.7	10	3.45	0	2	-0.03	+0.03	-0.013	+0.013	●	●	EZH070...

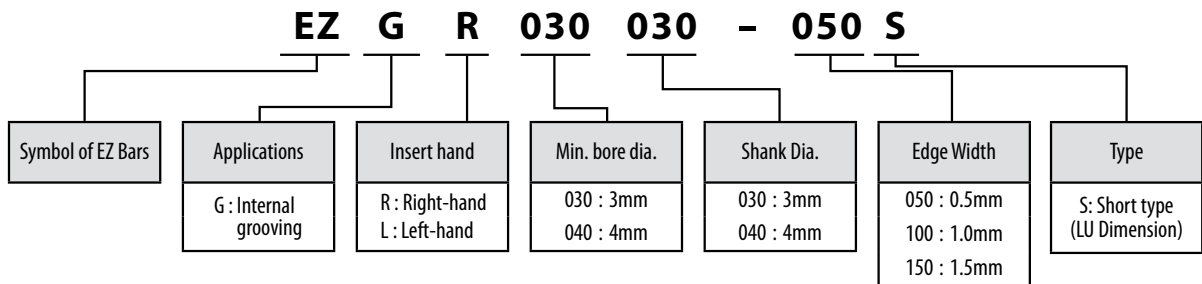
CDX shows available grooving depth.

Recommended cutting conditions G144

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

EZ Bars Identification System



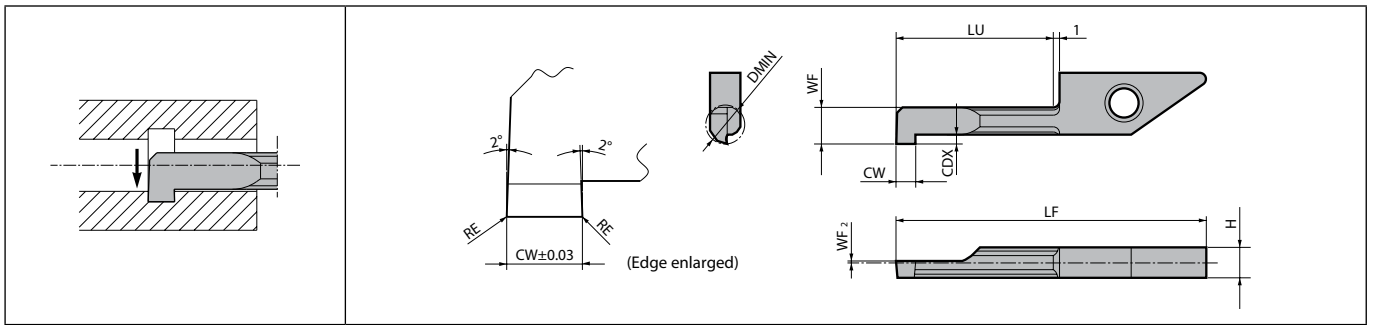
Applicable Sleeves

Sleeve				Applicable Insert for Small Dia. Internal Grooving		Applicable Machine Manufacturer
EZH-CT (Adjustable overhang length with coolant hole) F38, F39	EZH-HP (Adjustable overhang length) F40, F41	EZH-ST F42, F43	Sleeve Shank Dia. DCON(mm)	EZG	Shank Dia. DCON(mm)	
-	-	EZH 03012ST-80 04012ST-80 05012ST-80 06012ST-80 07012ST-80	12	EZG_ 030030-... EZG_ 040040-... EZG_ 050050-... EZG_ 060060-... EZG_ 070070-... EZG_ 080070-...	3 4 5 6 7 8	(General purpose)
-	EZH 03016HP-100 04016HP-100 05016HP-100 06016HP-100 07016HP-100	EZH 03016ST-100 04016ST-100 05016ST-100 06016ST-100 07016ST-100	16	EZG_ 030030-... EZG_ 040040-... EZG_ 050050-... EZG_ 060060-... EZG_ 070070-... EZG_ 080070-...	3 4 5 6 7 8	(General purpose)
EZH 03019CT-120 04019CT-120 05019CT-120 06019CT-120 07019CT-120	EZH 03019HP-120 04019HP-120 05019HP-120 06019HP-120 07019HP-120	EZH 03019ST-120 04019ST-120 05019ST-120 06019ST-120 07019ST-120	19.05	EZG_ 030030-... EZG_ 040040-... EZG_ 050050-... EZG_ 060060-... EZG_ 070070-... EZG_ 080070-...	3 4 5 6 7 8	Citizen Machinery
EZH 03020CT-120 04020CT-120 05020CT-120 06020CT-120 07020CT-120	EZH 03020HP-120 04020HP-120 05020HP-120 06020HP-120 07020HP-120	EZH 03020ST-120 04020ST-120 05020ST-120 06020ST-120 07020ST-120	20	EZG_ 030030-... EZG_ 040040-... EZG_ 050050-... EZG_ 060060-... EZG_ 070070-... EZG_ 080070-...	3 4 5 6 7 8	Eguro Tsugami Citizen Machinery (General purpose)
EZH 03022CT-135 04022CT-135 05022CT-135 06022CT-135 07022CT-135	EZH 03022HP-135 04022HP-135 05022HP-135 06022HP-135 07022HP-135	EZH 03022ST-135 04022ST-135 05022ST-135 06022ST-135 07022ST-135	22	EZG_ 030030-... EZG_ 040040-... EZG_ 050050-... EZG_ 060060-... EZG_ 070070-... EZG_ 080070-...	3 4 5 6 7 8	Star Micronics Nomura DS Tsugami
EZH 03025.0CT-135 04025.0CT-135 05025.0CT-135 06025.0CT-135 07025.0CT-135	EZH 03025.0HP-135 04025.0HP-135 05025.0HP-135 06025.0HP-135 07025.0HP-135	EZH 03025.0ST-135 04025.0ST-135 05025.0ST-135 06025.0ST-135 07025.0ST-135	25	EZG_ 030030-... EZG_ 040040-... EZG_ 050050-... EZG_ 060060-... EZG_ 070070-... EZG_ 080070-...	3 4 5 6 7 8	Eguro Tsugami Citizen Machinery (General purpose)
EZH 03025.4CT-120 04025.4CT-120 05025.4CT-120 06025.4CT-120 07025.4CT-120	EZH 03025.4HP-120 04025.4HP-120 05025.4HP-120 06025.4HP-120 07025.4HP-120	EZH 03025.4ST-120 04025.4ST-120 05025.4ST-120 06025.4ST-120 07025.4ST-120	25.4	EZG_ 030030-... EZG_ 040040-... EZG_ 050050-... EZG_ 060060-... EZG_ 070070-... EZG_ 080070-...	3 4 5 6 7 8	Citizen Machinery

- Choose sleeves (DCB) to meet with DCON dimension of Internal Grooving Inserts.
 - Adjustment Pin cannot be installed to EZH-ST sleeves.
 To adjust overhang of the bar, please use EZH-CT / HP Sleeves.
 - Machine manufacturers in random order.



VNG



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)		Carbide			Applicable toolholder F48~F51
		DMIN	CW	CDX	RE	H	LF	LU	WF	WF ₂	CW min.	CW max.	PR1225	PVD	-		
													PR930	KW10			
VNGR 0410-11 0420-11	1	4	1/2	0.8	0.05	3.9	30.8	11	3.5	0.1	-0.03	+0.03	●	●	●		
VNGR 0510-11 0520-11	1	5	1/2	1	0.05	3.9	30.8	11	4.4	0.1	-0.03	+0.03	●	●	●		
VNGR 0610-20 0620-20	1	6	1/2	1.8	0.05	3.9	39.8	20	5.2	0.3	-0.03	+0.03	●	●	●		
VNGR 0710-20 0720-20	1	7	1/2	2	0.05	3.9	39.8	20	6.2	0.3	-0.03	+0.03	●	●	●		

CDX shows available grooving depth.

WF₂ indicates the cutting edge is above the Tool's Center Position.

Recommended cutting conditions G144

G

Grooving

External

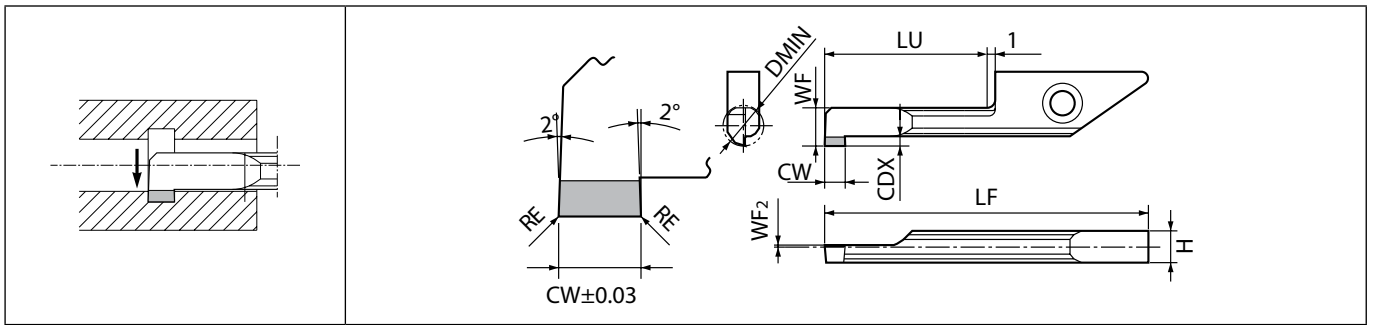
Internal

Face

System tip-bars are sold in 5 piece boxes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MT0 : Made to order

VNG



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)		PCD	Applicable toolholder F48~F51
		DMIN	CW	CDX	RE	H	LF	LU	WF	WF ₂	CW min.	CW max.	KPD001		
VNGR 0410-11NB 0420-11NB	1	4	1 2	0.8	0.05	3.9	30.8	11	3.5	0.1	-0.03	+0.03	MTO MTO	SVNR...-12N SVNSR...-12-11N	
VNGR 0510-11NB 0520-11NB	1	5	1 2	1	0.05	3.9	30.8	11	4.4	0.1	-0.03	+0.03	MTO MTO	S...-SVNR12N S...-SVNR12SN	
VNGR 0610-20NB 0620-20NB	1	6	1 2	1.8	0.05	3.9	39.8	20	5.2	0.3	-0.03	+0.03	MTO MTO	SVNR...-12N SVNSR...-12-20N	
VNGR 0710-20NB 0720-20NB	1	7	1 2	2	0.05	3.9	39.8	20	6.2	0.3	-0.03	+0.03	MTO MTO	S...-SVNR12N S...-SVNR12SN	

CDX shows available grooving depth.

WF₂ indicates the cutting edge is above the Tool's Center Position.



Grooving

SIGC

Newly developed clamping system ensures a firm insert hold to provide high-precision machining. Excellent chip evacuation with double coolant holes and optimized flute shape with a $\varnothing 8$ mm minimum cutting diameter.

1 Firm insert clamping system provides high-precision machining

Firm clamping action by pulling the bottom surface of the insert in axial direction
Precise machining is achieved by ensuring a firm clamp on the insert

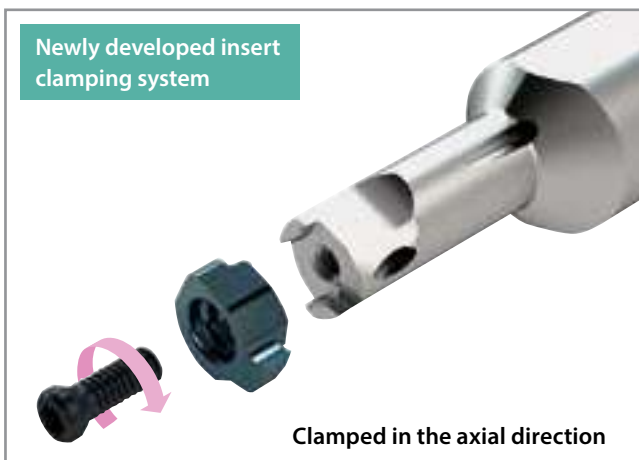
G

Grooving

External

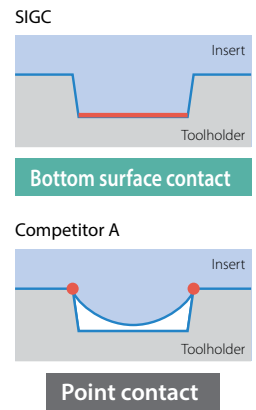
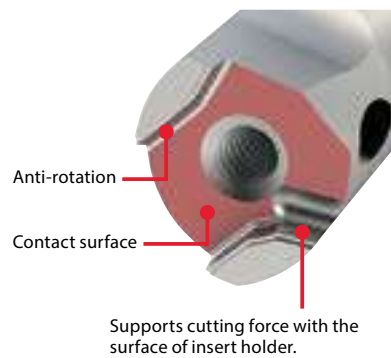
Internal

Face



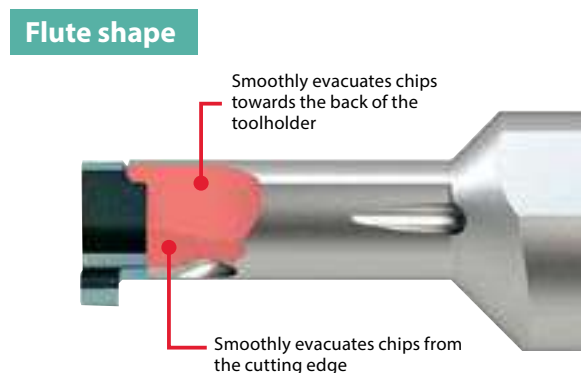
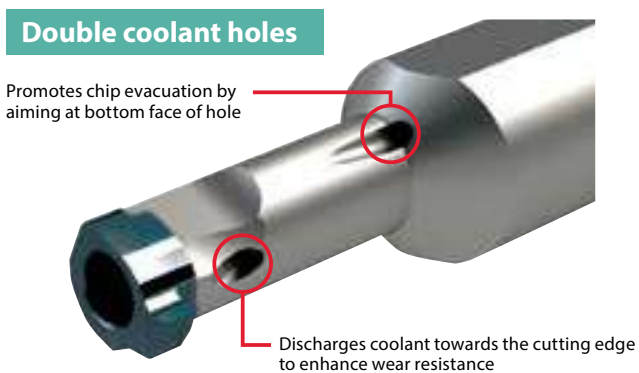
Clamping part (image)

Firm clamping is available due to large contact surface




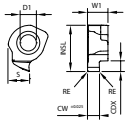

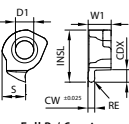
2 Excellent chip evacuation

Excellent chip evacuation with double coolant holes and optimized flute shape




Provides a better solution when facing chip evacuation difficulties in small internal grooving.
Prevents chip crunching.

GC

		Carbon steel / Alloy steel		Stainless steel		Cast iron		Non-ferrous metals		Titanium alloy		Hard materials (~ 40HRC)		Hard materials (40HRC ~)		
		Dimension (mm)										Tolerance (mm)		Carbide		Applicable toolholder
Insert	Description	No. of edges	CW	CDX	S	D1	RE	INSL	W1	CW min.	CW max.	PVD		G76,G77		
												PRT135	PRT125			
 	GC08R 100-005	1	1	1.5	3.5	2.7	0.05	7.7	3.4	-0.025	+0.025	●	●	SIGCR08...		
	120-005		1.2				0.05					●	●			
	125-005		1.25				0.05					●	●			
	150-010		1.5				0.1					●	●			
	200-010		2				0.1					●	●			
	GC08L 100-005	1	1	1.5	3.5	2.7	0.05	7.7	3.4	-0.025	+0.025	●	●	SIGCL08...		
	120-005		1.2				0.05					●	●			
	125-005		1.25				0.05					●	●			
	150-010		1.5				0.1					●	●			
	200-010		2				0.1					●	●			
	GC10R 100-005	1	1	2.2	4.4	3.5	0.05	9.6	4.7	-0.025	+0.025	●	●	SIGCR10...		
	120-005		1.2				0.05					●	●			
	125-005		1.25				0.05					●	●			
	145-010		1.45				0.1					●	●			
	150-010		1.5				0.1					●	●			
	200-010		2				0.1					●	●			
	250-020		2.5				0.2					●	●			
	300-020	3	0.2	●	●											
	GC10L 100-005	1	1	2.2	4.4	3.5	0.05	9.6	4.7	-0.025	+0.025	●	●	SIGCL10...		
	120-005		1.2				0.05					●	●			
	125-005		1.25				0.05					●	●			
	145-010		1.45				0.1					●	●			
	150-010		1.5				0.1					●	●			
	200-010		2				0.1					●	●			
250-020	2.5		0.2				●					●				
300-020	3	0.2	●	●												
GC12R 100-005	1	1	2.2	5.4	3.5	0.05	11.6	4.7	-0.025	+0.025	●	●	SIGCR12...			
120-005		1.2				0.05					●	●				
125-005		1.25				0.05					●	●				
145-010		1.45				0.1					●	●				
150-010		1.5				0.1					●	●				
200-010		2				0.1					●	●				
250-020		2.5				0.2					●	●				
300-020	3	0.2	●	●												
GC12L 100-005	1	1	2.2	5.4	3.5	0.05	11.6	4.7	-0.025	+0.025	●	●	SIGCL12...			
120-005		1.2				0.05					●	●				
125-005		1.25				0.05					●	●				
145-010		1.45				0.1					●	●				
150-010		1.5				0.1					●	●				
200-010		2				0.1					●	●				
250-020		2.5				0.2					●	●				
300-020	3	0.2	●	●												
  <p>Full R / Copying</p>	GC08R 100-050R	1	1	1.5	3.5	2.7	0.5	7.7	3.4	-0.025	+0.025	●	●	SIGCR08...		
	200-100R		2				1					●	●			
	GC10R 100-050R	1	1	2.2	4.4	3.5	0.5	9.6	4.7	-0.025	+0.025	●	●	SIGCR10...		
	200-100R		2				1					●	●			
	GC12R 100-050R	1	1	2.2	5.4	3.5	0.5	11.6	4.7	-0.025	+0.025	●	●	SIGCR12...		
	200-100R		2				1					●	●			

Right-hand shown
CDX shows available grooving depth.

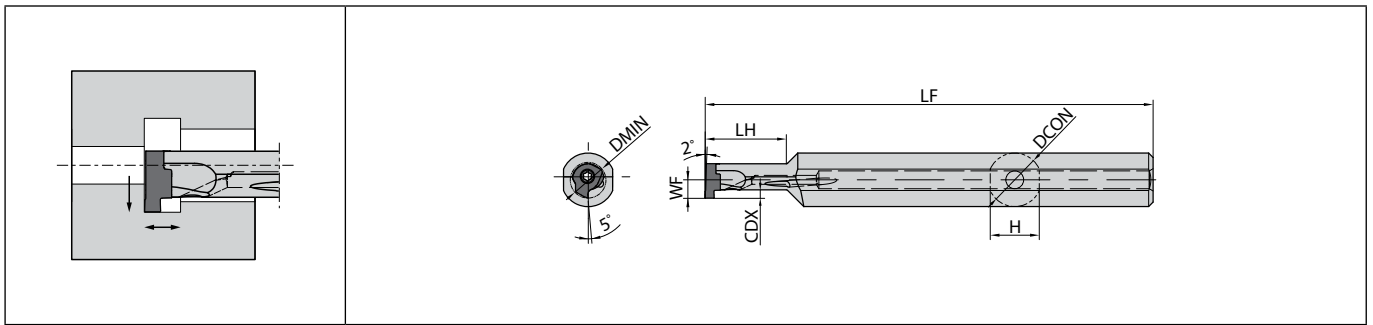
Recommended cutting conditions  G144

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GC type inserts are sold in 5 piece boxes





SIGC Excellent bar (Internal grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)							Coolant hole	Spare parts		Applicable inserts G75
	R	L	DMIN	DCON	CDX	H	LH	LF	WF		Screw	Wrench	
	 												
SIGC [®] /L 0812-EH	●	●	8	12	1.5	11	18	100	4.1	Yes	SB-2270T [®] /L	FT-7	GC08 [®] /L...
SIGC [®] /L 1016-EH	●	●	10	16	2.2	15	21	100	5	Yes	SB-3070T [®] /L	FT-8	GC10 [®] /L...
SIGC [®] /L 1216-EH	●	●	12	16	2.2	15	25	110	6	Yes	SB-3070T [®] /L	FT-8	GC12 [®] /L...

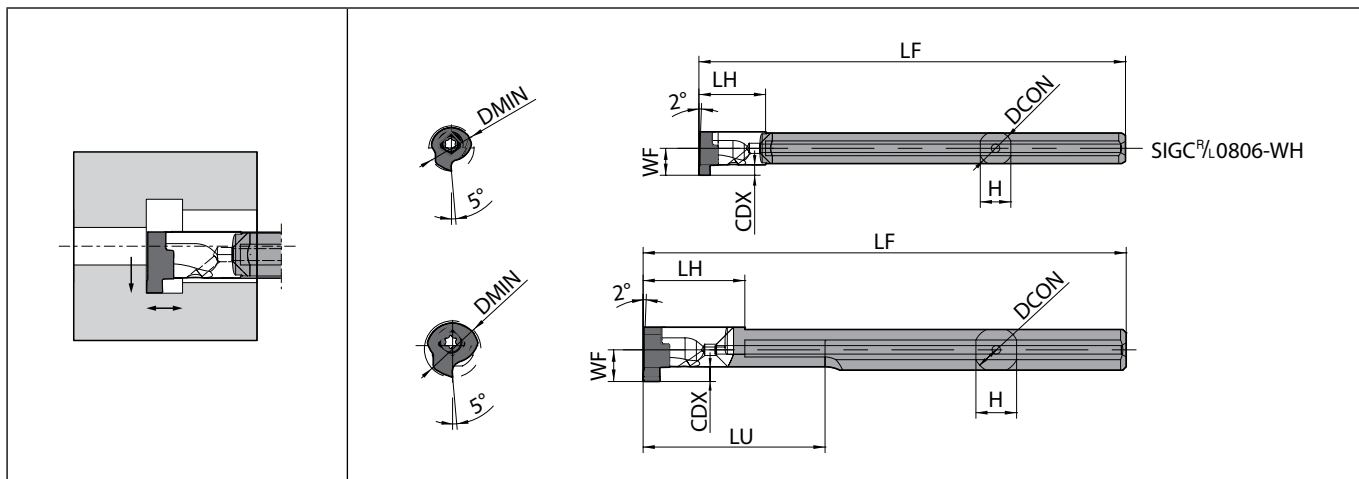
Setting the insert

Use compressed air or other measures to remove chips from the insert pocket.
 Mount the insert into the toolholder ensure the bottom makes contact with the end of the toolholder's surface.
 Keeping the insert seated, tighten the insert clamp screw at an appropriate torque.
 Recommended tightening torque : 0.8 N·m (SB-2270T[®]/L), 1.2 N·m (SB-3070T[®]/L)
 L-hand clamp screw for L-hand toolholder

GC**R-***	GC**L-***
 Right-hand screw Toolholder : SIGCR..... Clamp Screw : SB-....TR	 Left-hand screw Toolholder : SIGCL..... Clamp Screw : SB-....TL

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SIGC Carbide shank bar (Internal grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								Coolant hole	Spare parts		Applicable inserts ➔ G75
	R	L	DMIN	DCON	CDX	H	LH	LF	LU	WF		Screw	Wrench	
SIGC [®] /L 0806-WH	●	●	8	6	1.5	5.4	12	75	-	4.8	Yes	SB-2270T [®] /L	FT-7	GC08 [®] /L...
SIGC [®] /L 1008-WH-L85	●	●	10	8	2.2	7.2	18	85	32	5.6	Yes	SB-3070T [®] /L	FT-8	GC10 [®] /L...
SIGC [®] /L 1008-WH-L100	●	●						100	45					
SIGC [®] /L 1210-WH-L95	●	●	12	10	2.2	9.2	18	95	32	6.6	Yes	SB-3070T [®] /L	FT-8	GC12 [®] /L...
SIGC [®] /L 1210-WH-L110	●	●						110	45					

Setting the insert

Use compressed air or other measures to remove chips from the insert pocket.
 Mount the insert into the toolholder ensure the bottom makes contact with the end of the toolholder's surface.
 Keeping the insert seated, tighten the insert clamp screw at an appropriate torque.
 Recommended tightening torque : 0.8 N·m (SB-2270T[®]/L), 1.2 N·m (SB-3070T[®]/L)
 L-hand clamp screw for L-hand toolholder



Applicable Sleeves


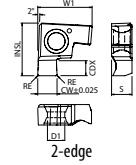

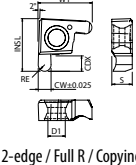

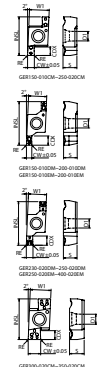
Shank Size (Hole Dia.: mm)	06 (6 mm)	08 (8 mm)	10 (10 mm)	12 (12 mm)	16 (16 mm)
Toolholder Description	SIGC [®] /L 0806-WH	SIGC [®] /L 1008-WH-L85 SIGCR 1008-WH-L100	SIGCR 1210-WH-L95 SIGC [®] /L 1210-WH-L110	SIGC [®] /L 0812-EH	SIGC [®] /L 1016-EH SIGC [®] /L 1216-EH
SH Sleeves (For Boring Bars)	SH 06...	SH 08...	SH 10...	SH 12...	SH 16...
SHC Sleeves (Coolant Sleeve)	-	SHC 08...	SHC 10...	SHC 12...	SHC 16...
SHA Sleeves	-	SHA 08...	SHA 10...	SHA 12...	-
EZH Sleeves (For EZ Bars)	EZH 06...ST/CT/HP...	EZH 08...ST/CT/HP...	-	-	-

* Remove the positioning pin when mounting SIGC to the EZH-CT/HP Sleeve
 Positioning function is not available

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



GE

				Carbon steel / Alloy steel												P	
				Stainless steel												M	
				Cast iron												K	
				Non-ferrous metals												N	
				Titanium alloy												S	
				Hard materials (~ 40HRC)												H	
				Hard materials (40HRC ~)													
Insert	Description	No. of edges	Dimension (mm)							Tolerance (mm)		Carbide				Applicable toolholder G81~G83	
			CW	CDX	S	D1	RE	INSL	W1	CW min.	CW max.	PVD		Cemtec			
												PR1Z25	PR2025	KW10	TiN6020		
  2-edge	GER 100-005A 120-005A 125-005A 150-010A 200-010A	2	1 1.2 1.25 1.5 2	1.5	2.58	2.5	0.05 0.05 0.05 0.1 0.1	6.5	6.69	-0.025	+0.025	●	●	●	●	SIGER0808A-EH SIGER0808A-WH	
	GEL 100-005A 120-005A 125-005A 150-010A 200-010A	2	1 1.2 1.25 1.5 2									●	●	●	●	SIGEL0808A-EH SIGEL0808A-WH	
	GER 100-005B 120-005B 125-005B 145-010B 150-010B 200-010B 250-020B 300-020B	2	1 1.2 1.25 1.45 1.5 2 2.5 3	2.2	3.18	2.7	0.05 0.05 0.05 0.1 0.1 0.2 0.2	8.2	8.46	-0.025	+0.025	●	●	●	●	SIGER...B-EH SIGER...B-WH SIGER...B-WH-90	
	GEL 100-005B 120-005B 125-005B 145-010B 150-010B 200-010B 250-020B 300-020B	2	1 1.2 1.25 1.45 1.5 2 2.5 3									●	●	●	●	SIGEL...B-EH SIGEL...B-WH	
	  2-edge / Full R / Copying	GER 100-050AR 200-100AR	2	1 2	1.5	2.58	2.5	0.5 1	6.5	6.69	-0.025	+0.025	●	●	●	●	SIGER0808A-EH SIGER0808A-WH
		GER 100-050BR 200-100BR	2	1 2									●	●	●	●	SIGER...B-EH SIGER...B-WH SIGER...B-WH-90
	  2-edge / Molded Chipbreaker	GER 150-010CM 200-010CM 250-020CM 300-020CM 350-020CM	2	1.5 2 2.5 3 3.5	2.5	4.05	2.8	0.1 0.1 0.2 0.2 0.2	11.48	5.8	-0.05	+0.05	●	●	●	●	SIGER...C-EH SIGER...C-WH SIGER...C-WH-90
		GER 150-010DM 200-010DM 230-020DM 250-020DM 300-020DM 350-020DM 400-020DM	2	1.5 2 2.3 2.5 3 3.5 4									5.05	3.4	0.1 0.1 0.2 0.2 0.2 0.2	16.44	6.8

Right-hand shown
CDX shows available grooving depth.

Recommended cutting conditions G145

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

G

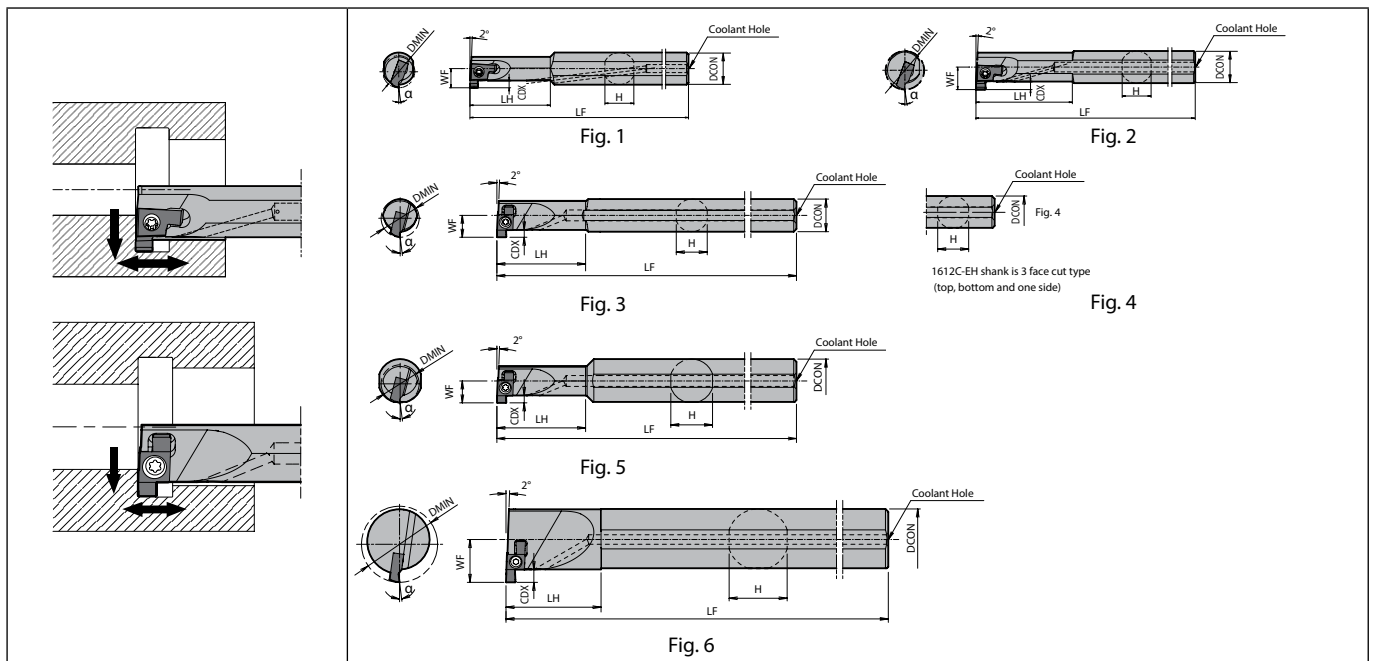
Grooving

External

Internal

Face

SIGE Excellent bar (Internal grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								Coolant hole	Fig.	Spare parts				Applicable inserts ➔ G78~G80
													Screw	Wrench	Wrench	Wrench	
	R	L	DMIN	DCON	CDX	H	LH	LF	WF								
SIGE [®] /L 0808A-EH	●	●	8	8	1.5	7.2	20	100	4.8	Yes	1	SB-2045TRN	-	-	FT-6	GE [®] /...A / AR	
SIGE [®] /L 1010B-EH	●	●	10	10	2.2	9	25	125	6.2	Yes	1	SB-2255TR	-	DT-7	-	GE [®] /...B GE [®] /...BR	
SIGE [®] /L 1210B-EH	●	●	12	12	2.5	11.4	30	150	7	Yes	2	SB-2570TR	-	-	FT-8	GE [®] /...C GE [®] /...CM GE [®] /...CR	
SIGE [®] /L 1412C-EH	●	●	14	14	2.5	11.4	33	150	8	Yes	3	SB-2570TR	-	-	FT-8	GE [®] /...C GE [®] /...CM GE [®] /...CR	
SIGE [®] /L 1612C-EH	●	●	16	16	2.5	11.4	20	150	8.5	Yes	4	SB-2570TR	-	-	FT-8	GE [®] /...C GE [®] /...CM GE [®] /...CR	
SIGE [®] /L 1616C-EH	●	●	16	16	2.5	11.4	15	160	9	Yes	5	SB-2570TR	-	-	FT-8	GE [®] /...C GE [®] /...CM GE [®] /...CR	
SIGE [®] /L 2020D-EH	●	●	20	20	4.5	19	40	180	12.1	Yes	5	SB-3080TR	-	-	FT-10	GE [®] /...D / DM / DR	
SIGE [®] /L 2525E-EH	●	●	25	25	6.5	24	45	200	15.6	Yes	5	SB-4085TR	FT-15	-	-	GE [®] /...E GE [®] /...EM	
SIGE [®] /L 3232E-EH	●	●	32	32	6.5	30.4	55	220	19	Yes	5	SB-4085TR	FT-15	-	-	GE [®] /...E GE [®] /...EM	
SIGE [®] /L 4032E-EH	●	●	40	40	6.5	30.4	45	250	23	Yes	6	SB-4085TR	FT-15	-	-	GE [®] /...E GE [®] /...EM	

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX“ of Insert.

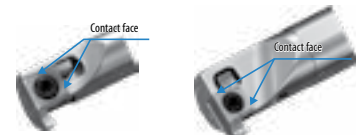
Applicable sleeve ➔ F155, F156

Features

Large chip pocket screw clamp toolholder design enables excellent chip evacuation



Cutting edge is free from contact face



An 8mm minimum bore diameter with a 2-edge design

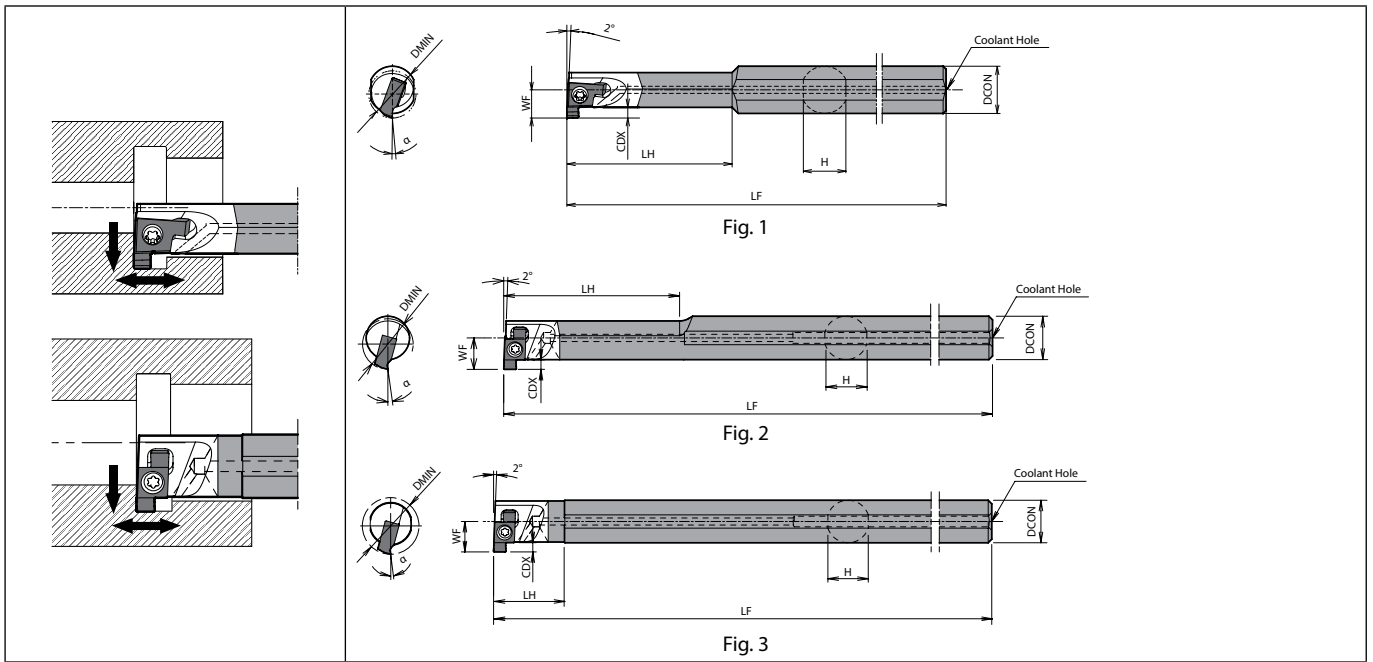
Cost effective chip control from a molded chipbreaker



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

G
Grooving

SIGE Carbide shank bar (Internal grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

G

Grooving

Toolholder dimensions

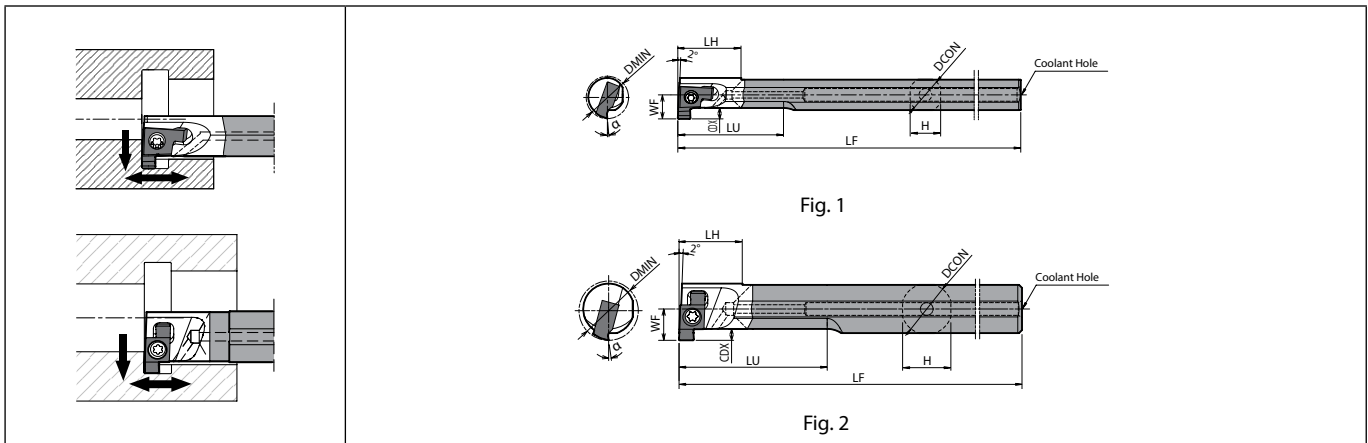
Description	Availability		Dimension (mm)							Coolant hole	Fig.	Spare parts			Applicable inserts G78,G79
												Screw	Wrench	Wrench	
	R	L	DMIN	DCON	CDX	H	LH	LF	WF						
SIGE%L 0808A-WH	●	●	8	8	1.5	7.2	28	125	4.8	Yes	1	SB-2045TRN	-	FT-6	GE%L...A / AR
SIGE%L 1010B-WH 1210B-WH	●	●	10	10	2.2	9	35	125	6.2	Yes	1	SB-2255TR	DT-7	-	GE%L...B GE%L...BR
	●	●	12				45	140	7						
SIGE%L 1412C-WH 1612C-WH	●	●	14	12	2.5	11.4	50	150	8.7	Yes	2 3	SB-2570TR	-	FT-8	GE%L...C GE%L...CM GE%L...CR
	●	●	16				20	180	8.5						

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX“ of Insert.

Applicable sleeve F155, F156



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SIGE Carbide shank bar (Internal grooving / for automatic lathe)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts		Applicable inserts ➔ G78,G79	
		R	DMIN	DCON	CDX	H	LH	LF	LU			WF	Screw		Wrench
		 													
SIGER 1008B-WH-90 1210B-WH-90	●	10	8	2.2	7.2	15	90	25	5.6	Yes	1	SB-225STR	FT-7	GER...B GER...BR	
SIGER 1412C-WH-90	●	14	12	2.5	11.4	15	90	35	7.4	Yes	2	SB-257OTR	FT-8	GER...C / CM/ CR	

CDX shows the distance from the toolholder to the cutting edge.
LH shows minimum overhang length.

Applicable sleeve ➔ F155, F156

Applicable Insert & Rake Angle (α) after Installment of Insert


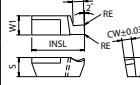

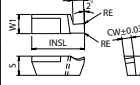

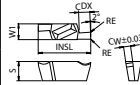
Toolholder Description	Applicable Insert & Rake Angle (α) after Installment of Insert				
	Ground Chipbreaker	α	Molded Chipbreaker	α	
SIGE [®] /L 0808A-EH 1010B-EH 1210B-EH 1412C-EH 1612C-EH 1616C-EH 2020D-EH 2525E-EH 3232E-EH 4032E-EH	GE [®] /L100-005A~GE [®] /L200-010A GER100-050AR~GER200-100AR	5°	-	-	
	GE [®] /L100-005B~GE [®] /L300-020B GER100-050BR~GER200-100BR	5°	-	-	
	GE [®] /L100-005C~GE [®] /L350-020C GER200-100CR~GER300-150CR	8°	GER150-010CM~GER350-020CM	10°	
	GE [®] /L100-005D~GE [®] /L400-020D GER200-100DR~GER300-150DR	9°	GER150-010DM~GER400-020DM	10°	
	GE [®] /L100-005E~GE [®] /L500-020E	10°	GER150-010EM~GER500-020EM	10°	
	SIGE [®] /L 0808A-WH 1010B-WH 1210B-WH 1008B-WH-90 1210B-WH-90 1412C-WH 1612C-WH 1412C-WH-90	GE [®] /L100-005A~GE [®] /L200-010A GER100-050AR~GER200-100AR	5°	-	-
		GE [®] /L100-005B~GE [®] /L300-020B GER100-050BR~GER200-100BR	5°	-	-
		GE [®] /L100-005C~GE [®] /L350-020C GER200-100CR~GER300-150CR	8°	GER150-010CM~GER350-020CM	10°

α indicates the rake angle at the center of the edge width after installing insert.


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



GV

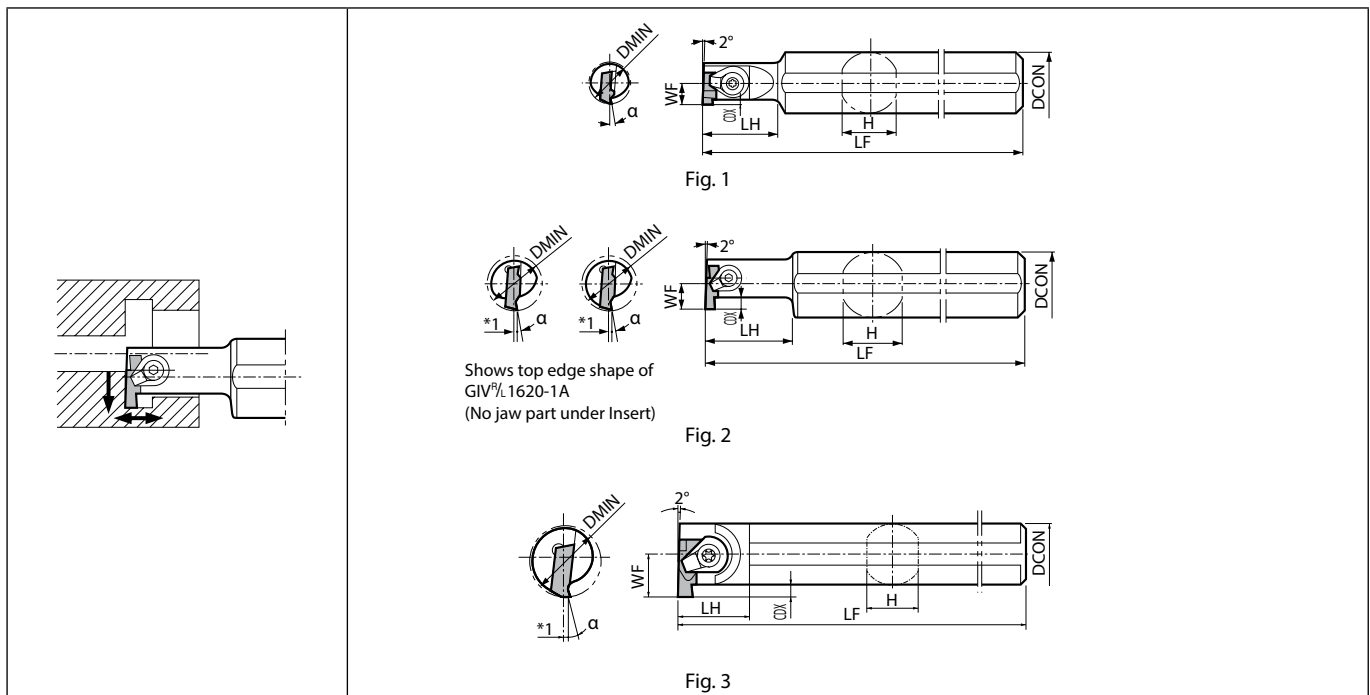
Insert		Description	No. of edges	Dimension (mm)						Tolerance (mm)		Carbide				Cemmet	Applicable toolholder G86~G88
				CW	CDX	S	RE	INSL	W1	CW min.	CW max.	PVD	-	-	TiCo		
													PR125	PR930	KW10		
				Carbon steel / Alloy steel						●	●					P	
				Stainless steel						●	●					M	
				Cast iron								●				K	
				Non-ferrous metals								●				N	
				Titanium alloy								●				S	
				Hard materials (~ 40HRC)												H	
				Hard materials (40HRC ~)													
  1-edge	GVR	100-020SS 125-020SS 145-020SS 200-020SS 250-020SS 300-020SS	1														GIVR1216-1SS
	GVL	100-020SS 125-020SS 145-020SS 200-020SS 250-020SS 300-020SS	1	2.3	3	0.2	9	3.6	-0.03	+0.03	●	●	●	●	●	●	
  1-edge	GVR	100-020S 125-020S 145-020S 185-020S 200-020S 250-020S 340-020S	1														GIVR1420-1S GIVR1412-1SE
	GVL	100-020S 125-020S 145-020S 185-020S 200-020S 250-020S 340-020S	1	2.3	4	0.2	11	4	-0.03	+0.03	●	●	●	●	●	●	
  2-edge	GVR	100-020A 125-020A 145-020A 185-020A 200-020A 250-020A 300-020A 340-020A	2														GIVR1620-1A GIVR1612-1AE GIVR1616-1AW
	GVL	100-020A 125-020A 145-020A 185-020A 200-020A 250-020A 300-020A 340-020A	2	2.3	5	0.2	12	4	-0.03	+0.03	●	●	●	●	●	●	

Right-hand shown
CDX shows available grooving depth.

Recommended cutting conditions  G146

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GIV Steel shank bar (Internal grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.



Toolholder dimensions

Description	Availability		Dimension (mm)								Fig.	Spare parts					Applicable inserts ➔ G84,G85
												Clamp set	Clamp set	Wrench	Wrench	Wrench	
	R	L	DMIN	DCON	CDX	H	LH	LF	WF								
GIV%L 1216-1SS	●	●	12	16	2.2	15	20	150	6	1	CPS-4V	-	-	-	FT-10	GV%L...-020SS	
GIV%L 1420-1S	●	●	14	20	2.2	19	24	150	7	1	CPS-5F	-	-	FT-15	-	GV%L...-020S	
GIV%L 1620-1A	●	●	16	20	2.2	19	28	160	8	2	CPS-5V	-	-	FT-15	-	GV%L...-A(R)	
GIV%L 2025-1B	●	●	20	25	*1 2.8	23	35	180	10	2	CPS-5V	-	-	FT-15	-	GV%L 145 ~ 250...B(R)	
GIV%L 2025-2B	●	●			*2 3.2											GV%L 280 ~ 400...B(R)	
GIV%L 2532-1C	●	●	25	32	*3 4.5	30	43	200	12.5	2	-	CPS-6V	LW-3	-	-	GV%L 280 ~ 340-020C	
GIV%L 2532-2C	●	●			*4 5.5											GV%L 400 ~ 500-020C	
GIV%L 3232-1C	●	●	32	32	*3 4.5	52	220	16								GV%L 280 ~ 340-020C	
GIV%L 3232-2C	●	●			*4 5.5											GV%L 400 ~ 500-020C	
GIV%L 4032-1C	●	●	40	32	*3 4.5	30	43	250	21	3	-	CPS-6V	LW-3	-	-	GV%L 280 ~ 340-020C	
GIV%L 4032-2C	●	●			*4 5.5											GV%L 400 ~ 500-020C	

GIV are designed to set the cutting edge height 1mm above the center height.

CDX shows available grooving depth.

*1. GV%L 200~250-020B Insert can be used up to a Groove Depth 3.2mm.

*2. GV%L 300~400-020B Insert can be used up to a Groove Depth 4.2mm.

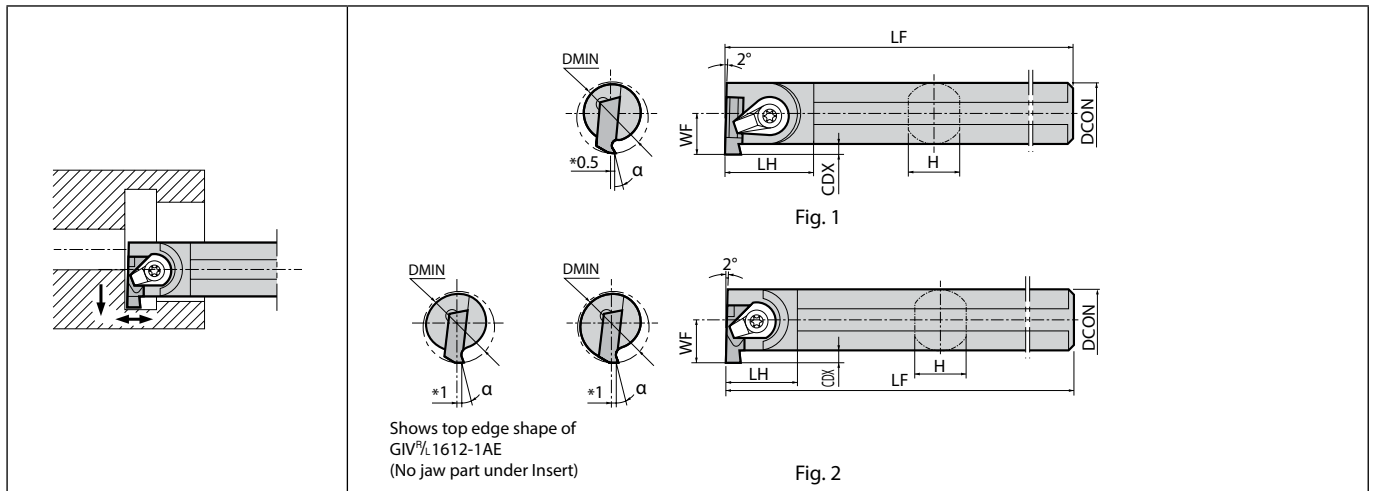
*3. GV%L 340-020C Insert can be used up to a Groove Depth 5.5mm.

*4. GV%L 430~500-020C Insert can be used up to a Groove Depth 6.3mm.

If you need any of insert groove depth specified in *1 to *4, modify the dimension CDX of toolholder.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GIV-E Excellent bar (Internal grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								Fig.	Spare parts				Applicable inserts ➔ G84,G85
												Clamp set	Clamp set	Wrench	Wrench	
	R	L	DMIN	DCIN	CDX	H	LH	LF	WF							
GIV%L 1412-1SE	●	●	14	12	1.7	11.4	18	150	7.7	1	CPS-5F	-	-	FT-15	GV%L...-020S	
GIV%L 1612-1AE	●	●	16	12	2.2	11.4	19	150	8.2	2	CPS-5V	-	-	FT-15	GV%L...-...A(R)	
GIV%L 2016-1BE	●	●	20	16	*1 2.8	15.2	20	180	11.2	2	CPS-5V	-	-	FT-15	GV%L145 ~ 250-...B(R)	
GIV%L 2016-2BE	●	●			*5 3.2										19	11.7	GV%L280 ~ 400-...B(R)
GIV%L 2520-1CE	●	●	25	20	*6 4.5	19	25	200	14.5	2	-	CPS-6V	LW-3	-	GV%L280 ~ 340-020C	
GIV%L 2720-2CE	●	●	27	*4 5.5	16.2										GV%L400 ~ 500-020C	
GIV%L 3225-1CE	●	●	32	25	*7 4.5	24	24	220	17.5	2	-	CPS-6V	LW-3	-	GV%L280 ~ 340-020C	
GIV%L 3225-2CE	●	●			*4 5.5										18.7	GV%L400 ~ 500-020C
GIV%L 4032-1CE	●	●	40	32	*7 4.5	31	29	240	21	2	-	CPS-6V	LW-3	-	GV%L280 ~ 340-020C	
GIV%L 4032-2CE	●	●			*4 5.5										22.2	GV%L400 ~ 500-020C

GIV-E are designed to set the cutting edge height 1mm above the center height. (0.5mm for GIV%L 1612-1AE)
CDX shows available grooving depth.

*1. GV%L 200~250-020B Insert can be used up to a Groove Depth 3.2mm.

*4. GV%L 430~500-020C Insert can be used up to a Groove Depth 6.3mm.

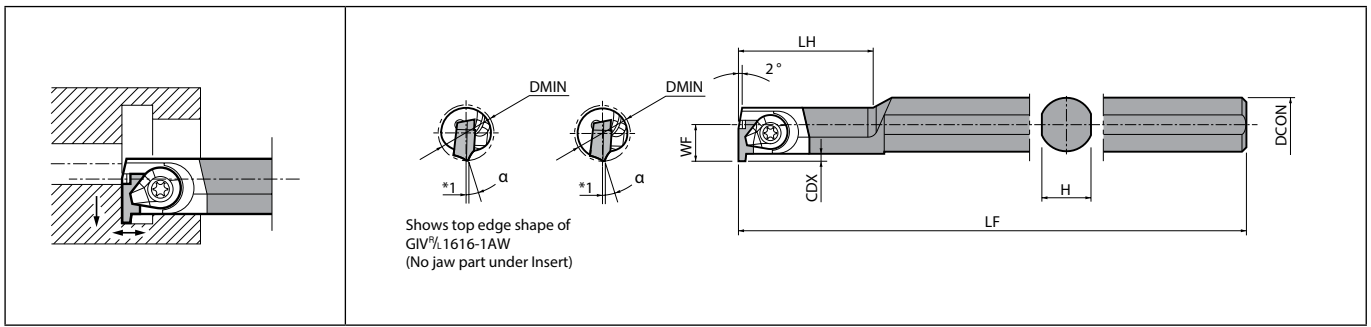
*5. GV%L 300~400-020B Insert can be used up to a Groove Depth 3.8mm. (When using GIV%L 2016-2BE)

*6. GV%L 340-020C Insert can be used up to a Groove Depth 4.7mm. (When using GIV%L 2520-1CE)

*7. GV%L 340-020C Insert can be used up to a Groove Depth 5.3mm. (When using GIV%L 3225-1CE, GIV%L 4032-1CE)

If you need any of insert groove depth specified in *1 to *7, modify the dimension CDX of toolholder.

GIV-W Carbide shank bar (Internal grooving)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)							Spare parts				Applicable inserts G84, G85
										Clamp set	Clamp set	Wrench	Wrench	
	R	L	DMIN	DCON	CDX	H	LH	LF	WF					
GIV [®] /L 1616-1AW	●	●	16	16	2.2	15	48	175	10.6	CPS-5V	-	-	FT-15	GV [®] /L...A(R)
GIV [®] /L 2020-1BW	●	●	20	20	*1 2.8	19	60	220	14.6	CPS-5V	-	-	FT-15	GV [®] /L 145 ~ 250...B(R)
GIV [®] /L 2020-2BW	●	●			*2 3.2									GV [®] /L 280 ~ 400...B(R)
GIV [®] /L 2525-1CW	●	●	25	25	*3 4.5	24	70	260	19.1	-	CPS-6V	LW-3	-	GV [®] /L 280 ~ 340-020C
GIV [®] /L 2525-2CW	●	●			*4 5.5									GV [®] /L 400 ~ 500-020C

GIV-W are designed to set the cutting edge height 1mm above the center height.

CDX shows available grooving depth.

*1. GV[®]/L 200~250-020B Insert can be used up to a Groove Depth 3.2mm.

*2. GV[®]/L 300~400-020B Insert can be used up to a Groove Depth 4.2mm.

*3. GV[®]/L 340-020C Insert can be used up to a Groove Depth 5.5mm.

*4. GV[®]/L 430~500-020C Insert can be used up to a Groove Depth 6.3mm.

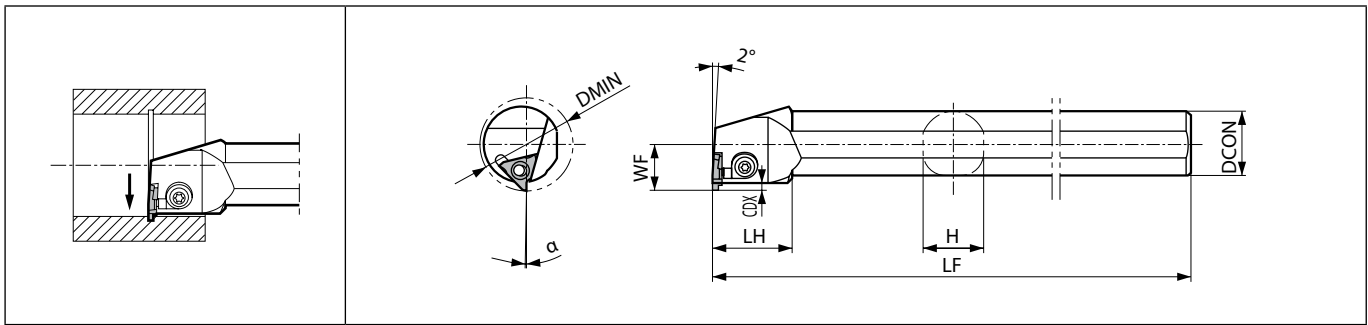
If you need any of insert groove depth specified in *1 to *4, modify the dimension CDX of toolholder.

Applicable Insert & Rake Angle (α) after Installment of Insert

Toolholder Description	Insert Description G84, G85		Rake Angle (α)	
	General Grooving (Square)	Full-R Grooving (Round)	TC40	TN90, TC60 PR930, PR1225 KW10
GV [®] /L...1SS	GV [®] /L 100~300-020SS	-	10°	15°
GV [®] /L...1S	GV [®] /L 100~340-020S	-	10°	15°
GV [®] /L...1SE	GV [®] /L 100~340-020S	-	3°	8°
GV [®] /L...1A(□)	GV [®] /L 100~340-020A	GV [®] /L 200-100AR~300-150AR	3°	8°
GV [®] /L...1B(□)	GV [®] /L 145~250-020B	GV [®] /L 200-100BR	4°	9°
GV [®] /L...2B(□)	GV [®] /L 280~400-020B	GV [®] /L 300-150BR		
GV [®] /L...1C(□)	GV [®] /L 280~340-020C	-	5°	10°
GV [®] /L...2C(□)	GV [®] /L 400~500-020C	-		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KIGBA (Internal grooving / Shallow grooving)



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts		Applicable inserts G6~G12
											Clamp set	Wrench	
	R	L	DMIN	DCON	CDX	H	LH	LF	WF				
KIGBA [®] /L 3525-16	●	●	35	25	2.8	23	30	220	17.5	LGBA-16 ¹ / ₈ S	FT-15	GBA32 ¹ / ₈ type	
KIGBA [®] /L 4032-22	●	●	40	32	3	30	30	250	23	LGBA-22 ¹ / ₈ S	FT-15	GBA43 ¹ / ₈ type	

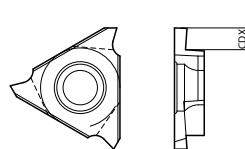
CDX shows the distance from the toolholder to the cutting edge.

Available Grooving Depth depends on the insert.

KIGBA[®]/L 3525-16 : CDX of the applicable insert (GBA32)

4032-22 : CDX of the applicable insert (GBA43) (1) 2.0 mm (CDX < 3.0 mm) (2) 3.0 mm (CDX ≥ 3.0 mm)

Clamp Set : LGBA-○○LS for Right-hand Toolholder, and LGBA-○○RS for Left-hand Toolholder.



Rake Angle (α) after Installment of GBA insert

GBA32 [®] /L○○○-○○○		GBA43 [®] /L○○○-○○○		GBA43 [®] /L○○○-○○○R (Full-R)		
α	Insert Grades	α	Insert Grades	α	Insert Grades	Full-R Description
+1°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930 KPD001, KPD010	-9°	KBN510, KBN525	+1°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930	050R~150R
		+1°	TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930 KPD001, KPD010		TN620, TN90, PV7040 PR1215, PR1625, PR2015, PR2025 PR905, PR930	200R
+11°	KW10	+11°	KW10	+5°	KW10	050R~200R

Rake Angle (α) after Installment of GBA-GM insert


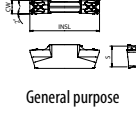

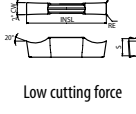

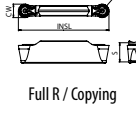
α	Insert Description
+1°	GBA43 [®] /L 150-020GM
+6°	GBA43 [®] /L 175-020GM
	GBA43 [®] /L 265-030GM
+3°	GBA43 [®] /L 300-030GM
	GBA43 [®] /L 400-040GM

α indicates the rake angle at the center of the edge width, after installing insert.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



GDM/GDG

Insert		Description		Dimension (mm)				Tolerance (mm)		Carbide			Cermet	Applicable toolholder G91	
				No. of edges	CW	S	RE	INSL	CW min.	CW max.	PVD	-	-		
											PR1215 PR1225 PR1335	GW15	TN60 TN90		
				Carbon steel / Alloy steel				☺	☺	☺	☺	☺	☺	P	
				Stainless steel				☺	☺	☺	☺	☺	☺	M	
				Cast iron				☺	☺	☺	☺	☺	☺	K	
				Non-ferrous metals				☺	☺	☺	☺	☺	☺	N	
				Titanium alloy				☺	☺	☺	☺	☺	☺	S	
				Hard materials (~ 40HRC)				☺	☺	☺	☺	☺	☺	H	
				Hard materials (40HRC ~)				☺	☺	☺	☺	☺	☺	H	
 	GDM	2013N-020GMI	2	2	4.3	0.2	13.5	-0.03	+0.03	●	●	●	●	●	KGDI [®] /L...-2
	GDM	3015N-040GMI	2	3	4.6	0.4	15.5	-0.03	+0.03	●	●	●	●	●	KGDI [®] /L...-3
	GDM	4020N-040GMI	2	4	4.3	0.4	20	-0.03	+0.03	●	●	●	●	●	KGDI [®] /L...-4
	GDM	5020N-040GMI 5020N-080GMI	2	5	4.3	0.4 0.8	20	-0.04	+0.04	●	●	●	●	●	KGDI [®] /L...-4 KGDI [®] /L...-5
 	GDG	3015N-020GS	2	3	4.6	0.2	15.6	-0.02	+0.02	●	●	●	●	●	KGDI [®] /L...-3
	GDG	4020N-040GS	2	4	4.3	0.4	20	-0.02	+0.02	●	●	●	●	●	KGDI [®] /L...-4
	GDG	5020N-040GS	2	5	4.3	0.4	20	-0.02	+0.02	●	●	●	●	●	KGDI [®] /L...-4 KGDI [®] /L...-5
 	GDM	3015N-150R-CM	2	3	4.6	1.5	16.3	-0.03	+0.03	●	●	●	●	●	KGDI [®] /L...-3
	GDM	4020N-200R-CM	2	4	4.3	2	20	-0.03	+0.03	●	●	●	●	●	KGDI [®] /L...-4
	GDM	5020N-250R-CM	2	5	4.3	2.5	21	-0.04	+0.04	●	●	●	●	●	KGDI [®] /L...-4 KGDI [®] /L...-5

Recommended cutting conditions G147

● : Standard item R : Right-hand only L : Left-hand only ☐ : Check availability

G

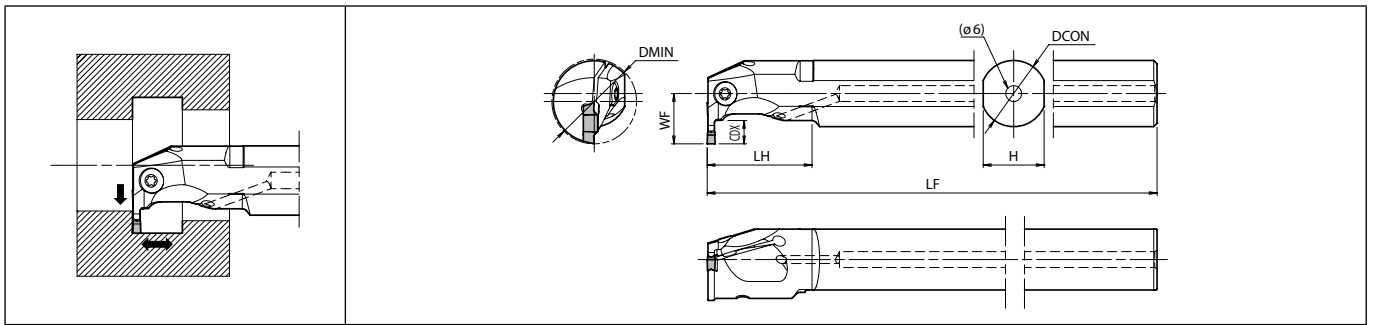
Grooving

External

Internal

Face

KGDI (Internal grooving)



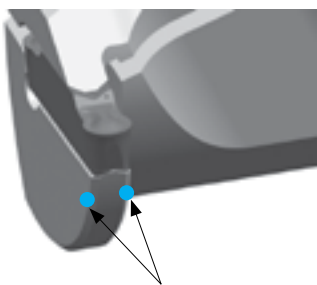
Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)											Coolant hole	Spare parts				Applicable inserts G90
			R	L	DMIN			DCON	CDX	H	LH	LF	WF		CW min.	CW max.	Clamp screw (Torx)	Screw		Wrench	Wrench
	with GMI/GS	with CM			*with CM	SB-STR	GS-50										LW-3	LTW-20	
KGDI ^{1/2} 1816B-2 2520B-2 3225B-2	●	●	18			16	4.5	15	25	150	9.5	2	2	Yes	-	GS-50	LW-3	-	GDM2013N-020GMI
	●	●	25	-	-	20	6	18	30	180	14.5				SB-STR	-	-	LTW-20	
	●	●	32			25	7	23	40	200	19								
KGDI ^{1/2} 2016B-3 2520B-3 3225B-3	●	●	20	21		16	5.5	15	25	150	11.5	3	3	Yes	-	GS-50	LW-3	-	GDM3015N-... GDG3015N-...
	●	●	25	26	-	20	6	18	30	180	14.5				SB-STR	-	-	LTW-20	
	●	●	32	33		25	8	23	40	200	19								
KGDI ^{1/2} 3225B-4 4032B-4	●	●	32	40	34	25	8.5	23	40	200	19	4	5	Yes	SB-STR	-	-	LTW-20	GDM4020N-... GDG4020N-...
	●	●	40	48	42	32	11	29	50	220	23.5								
KGDI ^{1/2} 3225B-5 4032B-5	●	●	32	37	34	25	8.5	23	40	200	19	5	5	Yes	SB-STR	-	-	LTW-20	GDM5020N-... GDG5020N-...
	●	●	40	45	42	32	11	29	50	220	23.5								

* Possible by slightly chamfering toolholder's tip about 0.5 mm

Additional processing of toolholder tip when CM chipbreaker is installed






* By slightly chamfering the holder tip of about 0.5 mm, the cutting diameter can be minimized.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Grooving

GH/GHU

Cutting edge preparation			Material										Applicable toolholder			
Symbol	Specification	Example	Carbon steel / Alloy steel										P			
S	Chamfered and R-honed	S01020 0.10mm × 20° chamfered and R-honed	Stainless steel										M			
T	Chamfered	T01020 0.10mm × 20° chamfered	Cast iron										K			
			Non-ferrous metals										N			
			Titanium alloy										S			
			Hard materials (~ 40HRC)										H			
			Hard materials (40HRC ~)													
Insert	Description	Edge preparation type	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide		Ceramic		Cermert		Applicable toolholder G93
				CW	S	RE	INSL	CW min.	CW max.	CVD CB9025	PVD PR930 KW10	PVD AG6N PT600M	- A65	- TC40 TC60	- TN60	
	GH 4020-02 4020-05	-	2	4	7.5	0.2 0.5	20	-0.05	+0.05	●	●			●	●	KIGHR4532B-4 KIGHR5540B-4 KIGHR6550B-4 KIGHR4532B-5 KIGHR5540B-5 KIGHR6550B-5 KIGHR5540B-7 KIGHR6550B-7
	GH 4520-02 4520-05	-	2	4.5	7.5	0.2 0.5	20	-0.05	+0.05					●	●	
	GH 5020-02 5020-05	-	2	5	7.5	0.2 0.5	20	-0.05	+0.05	●	●			●	●	
	GH 5520-02 5520-05	-	2	5.5	7.5	0.2 0.5	20	-0.05	+0.05					●	●	
	GH 6020-02 6020-05	-	2	6	7.5	0.2 0.5	20	-0.05	+0.05	●	●			●	●	
	GH 6520-02 6520-05	-	2	6.5	7.5	0.2 0.5	20	-0.05	+0.05					●	●	
	GH 7020-02 7020-05	-	2	7	7.5	0.2 0.5	20	-0.05	+0.05	●	●			●	●	
	GH 7520-02 7520-05	-	2	7.5	7.5	0.2 0.5	20	-0.05	+0.05					●	●	
	GH 4020-05	S01020 T01020	2	4	7.5	0.5	20	-0.05	+0.05			●	●			KIGHR4532B-4 KIGHR5540B-4 KIGHR6550B-4 KIGHR4532B-5 KIGHR5540B-5 KIGHR6550B-5 KIGHR5540B-7 KIGHR6550B-7
	GH 5020-05	S01020 T01020	2	5	7.5	0.5	20	-0.05	+0.05			●	●			
	GH 6020-05	T01020	2	6	7.5	0.5	20	-0.05	+0.05					●	●	
	GH 7020-05	T01020	2	7	7.5	0.5	20	-0.05	+0.05					●	●	
	GHU 40-20	-	2	4	7.5	0.25	20	-0.05	+0.05	●					●	KIGHR4532B-4 KIGHR5540B-4 KIGHR6550B-4 KIGHR4532B-5 KIGHR5540B-5 KIGHR6550B-5
	GHU 50-20	-	2	5	7.5	0.3	20	-0.05	+0.05	●					●	
	GHU 60-20	-	2	6	7.5	0.3	20	-0.05	+0.05	●					●	

Recommended cutting conditions G65

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

G

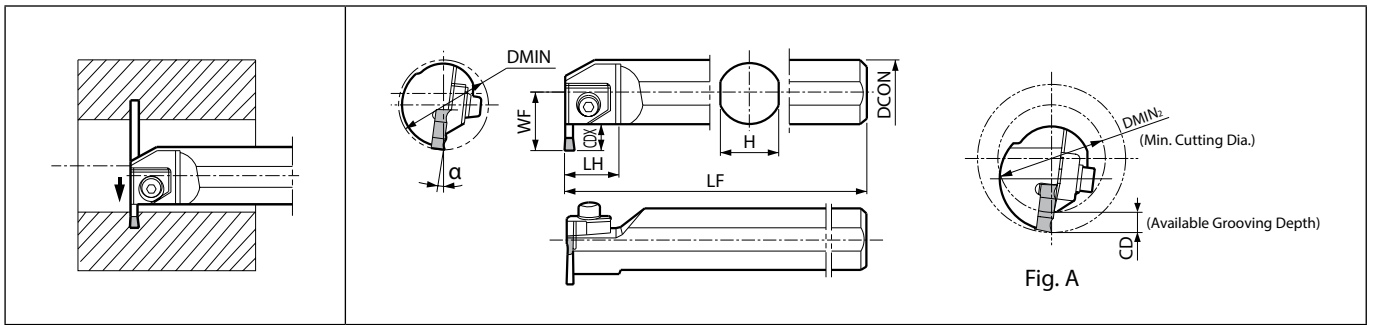
Grooving

External

Internal

Face

KIGH (Internal grooving / Deep grooving)



Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)								Spare parts					Applicable inserts G92
										Clamp	Clamp bolt	Spring	Washer	Wrench	
		R	DMIN	DCON	CDX	H	LH	LF	WF						
KIGHR 4532B-4	●	45	32		30		200	28.2	CGH-1L	HH6X25	SP-6	W-6	LW-5	GH4020-... / GHU40-... GH4520-...	
5540B-4	●	55	40	12	38	27	250	32.3							
6550B-4	●	65	50		48		300	37.3							
KIGHR 4532B-5	●	45	32		30		200	28.2	CGH-1L	HH6X25	SP-6	W-6	LW-5	GH5020-... / GHU50-... / GH5520-... GH6020-... / GHU60-... / GH6520-...	
5540B-5	●	55	40	12	38	27	250	32.3							
6550B-5	●	65	50		48		300	37.3							
KIGHR 5540B-7	●	55	40	12	38	27	250	32.3	CGH-2L	HH6X25	SP-6	W-6	LW-5	GH7020-... / GH7520-... / GH8020-...	

CDX shows the distance from the toolholder to the cutting edge. For the available grooving depth (CD), ref. to „List of Min. Available Cutting Diameter and Groove Depth“.

LH depends on the insert's edge width.

Rake Angle (α) after Installation of GH / GHU insert

GH○○○○○○○		GHU○○○○○	
α	Insert Grades	α	Insert Grades
-5°	A65, A66N, PT600M	+5°	TN60 CR9025
+5°	TC40		
+15°	TN90, TC60 PR930 KW10		

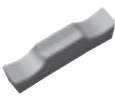


List of the Min. Cutting Diameter and Grooving Depth (Refer to Fig. A)

Toolholder Description	DMIN ₂ (Min. Cutting Dia.)						
	ø110	ø70	ø65	ø60	ø55	ø45	
KIGHR 4532B-○							
5540B-○				ø55			
6550B-○	ø65						
Available Grooving Depth CD (mm)	12	11.5	11	10	9	Under 8	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



GMM/GMG/GMGA

		Carbon steel / Alloy steel		Stainless steel		Cast iron		Non-ferrous metals		Titanium alloy		Hard materials (~ 40HRC)		Hard materials (40HRC ~)	
Insert	Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide					Applicable toolholder G95	
			CW	S	RE	INSL	CW min.	CW max.	CVD		PVD				Cermet
									CR9025	PR905	PR915	PR930	KW10			TN90
 Sharp cutting oriented / Precision class (ground chipbreaker)	GMG 8030-050MG	2	8	5.5	0.5	30	-0.03	+0.03	●	●	●	●	●	●	●
 Full R / Copying / Sharp cutting oriented / Precision class	GMGA 8030-400R	2	8	5.5	4	30	-0.02	+0.02						●	
 Chip control oriented / M class	GMM 8030-080MW	2	8	5.5	0.8	30	-0.05	+0.05	●	●	●	●	●	●	●

If using a full-R insert with KIGM-8 toolholder, you need to modify the corner of insert adapter of toolholder.

Recommended cutting conditions G143

G

Grooving

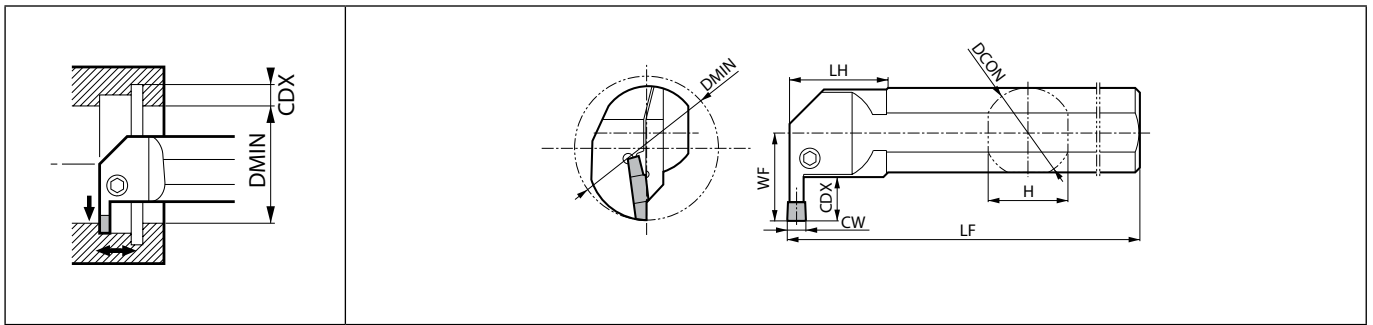
External

Internal

Face

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KIGM-8 (Internal grooving)



Right-hand shown

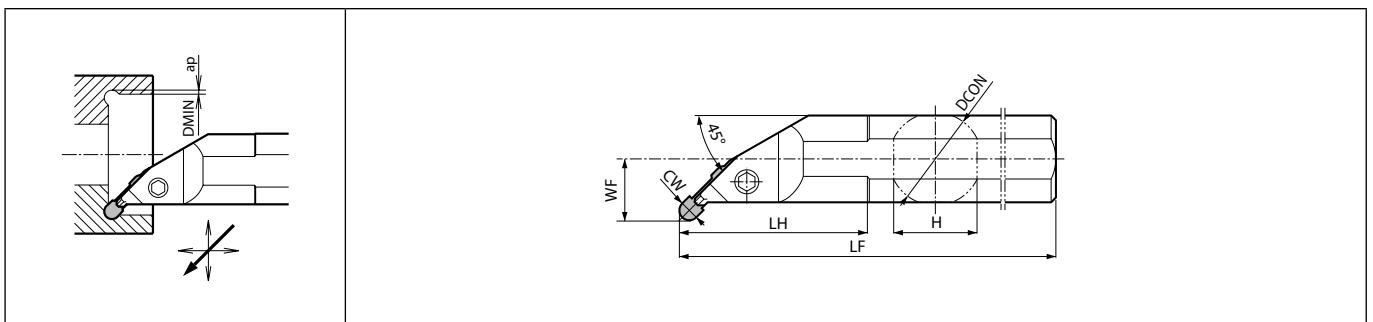
Toolholder dimensions

Description	Availability		Dimension (mm)										Spare parts		Applicable inserts ➔ G94
													Clamp bolt	Wrench	
	R	L	DMIN	DCON	CDX	H	LH	LF	WF	CW min.	CW max.				
KIGM%L 6540B-8	●	●	65	40	20	36	41	300	41	8	8	HH6X20	LW-5	GM..8030-...	

CDX shows available grooving depth.



KIGMU-8 (Internal grooving / Undercut grooving)



Right-hand shown

Toolholder dimensions

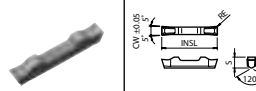
Description	Availability		Dimension (mm)										Spare parts		Applicable inserts ➔ G94
													Clamp bolt	Wrench	
	R	DMIN	DCON	H	LH	ap	LF	WF	CW min.	CW max.					
KIGMUR 6540B-8	●	65	40	36	83	2.2	300	26	8	8	HH6X20	LW-5	GM..8030-...		

CDX shows available grooving depth.

ap shows the distance from the internal face of the workpiece.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GIA

		Carbon steel / Alloy steel		●	○	P					
		Stainless steel		●	○	M					
		Cast iron				K					
		Non-ferrous metals				N					
		Titanium alloy				S					
		Hard materials (~ 40HRC)		●	○	H					
		Hard materials (40HRC ~)									
Insert	Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide		Applicable toolholder G97
			CW	S	RE	INSL	CW min.	CW max.	CR9025	TN60	
 Molded Chipbreaker	GIA 30	2	3	5	0.2	25	-0.05	+0.05	●	●	KGIA3232B-3 KGIA4332B-3 KGIA5140B-3
	GIA 40	2	4	5	0.25	25	-0.05	+0.05	●	●	KGIA3232B-4 KGIA4332B-4 KGIA5140B-4
	GIA 50	2	5	5	0.3	30	-0.05	+0.05	●	●	KGIA5640B-5 KGIA6650B-5

Grooving

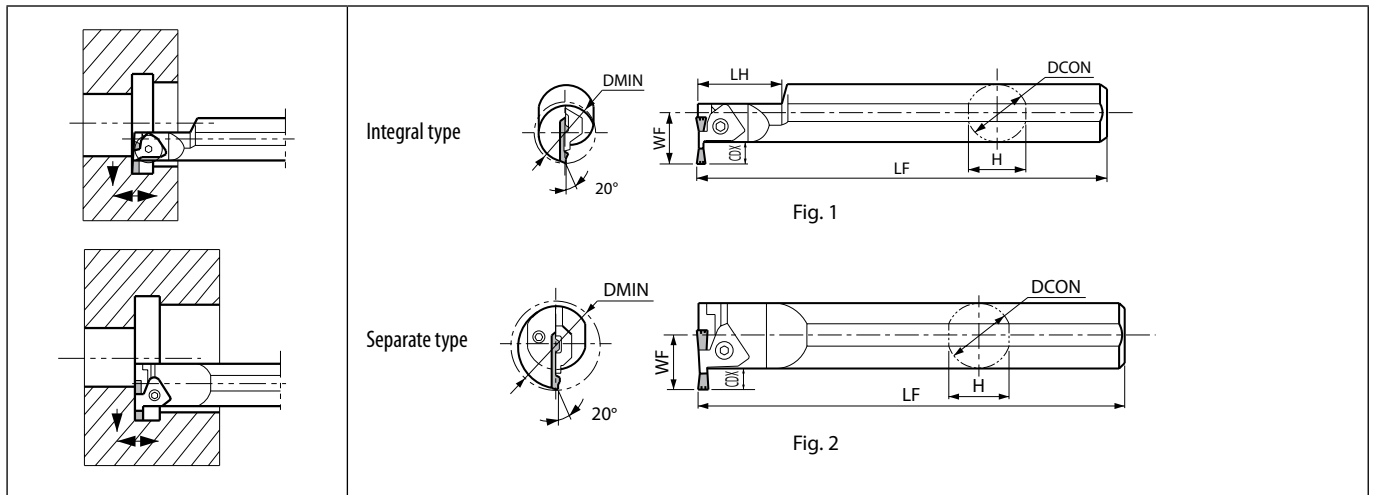
Recommended cutting conditions

Workpiece material	Recommended insert grades (Vc: m/min)		(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)			Remarks
	Cermet	CVD Coated carbide	GIA 30	GIA 40	GIA 50	
Carbon steel	☆ 60~120	★ 60~120	(1) 0.04~0.08 (2) 0.02~0.08 (3) Max. 0.3	(1) 0.04~0.09 (2) 0.02~0.08 (3) Max. 0.4	(1) 0.05~0.1 (2) 0.05~0.08 (3) Max. 0.5	Coolant
Alloy steel	☆ 60~100	★ 60~100	(1) 0.04~0.07 (2) 0.02~0.07 (3) Max. 0.3	(1) 0.04~0.07 (2) 0.02~0.07 (3) Max. 0.4	(1) 0.05~0.08 (2) 0.05~0.08 (3) Max. 0.5	
Stainless steel	-	★ 60~80	(1) 0.04~0.07 (2) 0.02~0.07 (3) Max. 0.3	(1) 0.04~0.07 (2) 0.02~0.07 (3) Max. 0.4	(1) 0.05~0.08 (2) 0.05~0.08 (3) Max. 0.5	

★:1st recommendation ☆:2nd recommendation

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

KGIA (Internal grooving / Deep grooving)



Right-hand shown



Grooving

Toolholder dimensions

Description	Availability	Dimension (mm)								Fig.	Spare parts				Applicable inserts ➔ G96
		R	DMIN	DCON	CDX	H	LH	LF	WF		Clamp bolt	Clamp	Spring	Wrench	
KGIAR 3232B-3 4332B-3 5140B-3	●	32	32	10	30.4	45	200	26.5	1		CGIA-3R	SP-5	LW-4	GIA30	
	●	43			30	-		26.3							
	●	51	40	38	-	250	30.3	2							
KGIAR 3232B-4 4332B-4 5140B-4	●	32	32	10	30.4	45	200	26.5	1		CGIA-4R	SP-5	LW-4	GIA40	
	●	43			30	-		26.3							
	●	51	40	38	-	250	30.3	2							
KGIAR 5640B-5 6650B-5	●	56	40	15	38	-	250	35.3	2		CGIA-5R	SP-5	LW-4	GIA50	
	●	66			50	48	-	300							40.3

CDX shows available grooving depth.

Composition

Type	Spare Parts		Toolholder	Blade	Clamp Screw	Wrench
	Toolholder Description					
Integral Type	KGIAR	3232B-3	-	-	-	-
Separate Type	KGIAR	4332B-3	KGIAR32H	BGIAR43-3	SB-40140TR	FT-15
		5140B-3	KGIAR40H	BGIAR51-3		
Integral Type	KGIAR	3232B-4	-	-	-	-
Separate Type	KGIAR	4332B-4	KGIAR32H	BGIAR43-4	SB-40140TR	FT-15
		5140B-4	KGIAR40H	BGIAR51-4		
Separate Type	KGIAR	5640B-5	KGIAR40H	BGIAR56-5	SB-40140TR	FT-15
		6650B-5	KGIAR50H	BGIAR66-5		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

External dia. of the groove DAXN / DAXX

External dia. of the groove within DAXN ~ DAXX are the available range for the initial grooving on the unprocessed workpiece (Ref. to Fig. 1)

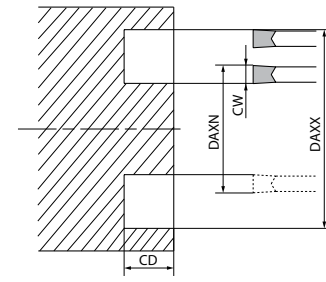
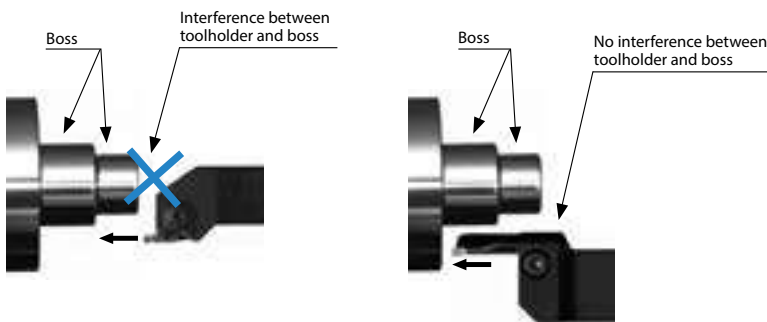


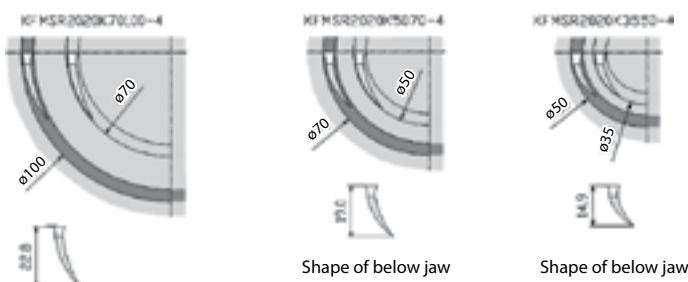
Fig.1

Caution for face grooving

1. When face grooving, the suitable toolholder depends on the length of the boss



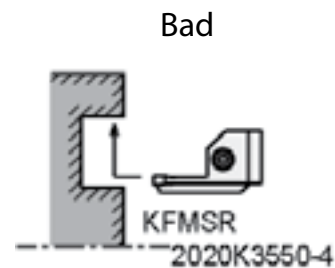
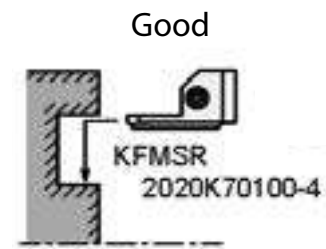
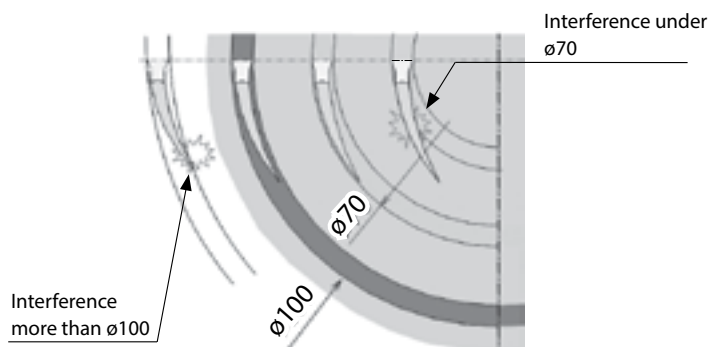
2. Selection of face grooving toolholder



Wider grooving (turning) should be performed from the outside inwards

3. Interference of face grooving toolholder

e.g.) KFMSR2525M70100-4



Example of usage for the face grooving toolholder

When face grooving, KFMSR2525M70100-4 should be between $\phi 70 \sim \phi 100$ for grooving the outer diameter at first. If the workpiece is machined at a diameter $\phi 100$ or $\phi 70$, the jaw of toolholder interferes with the workpiece.

G

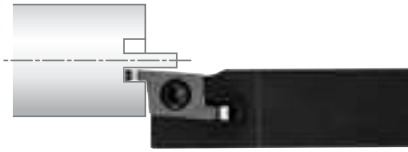
Grooving

External

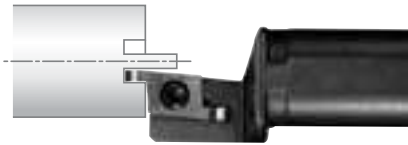
Internal

Face

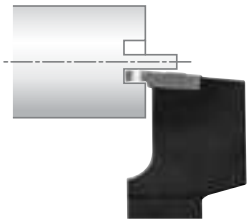
Small diameter face grooving $\phi 6\sim$



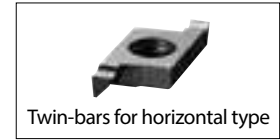
Type	STW
External dia. of the groove (min.)	$\phi 6$
Edge width (mm)	0.5~2.0
Grooving depth (mm)	1.0~3.0
See Page	G106



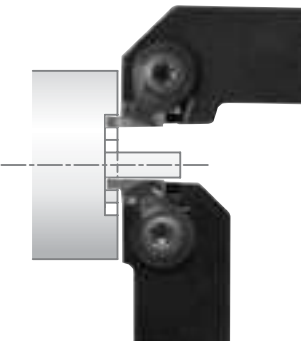
Type	S..-STW
External dia. of the groove (min.)	$\phi 6$
Edge width (mm)	0.5~2.0
Grooving depth (mm)	1.0~3.0
See Page	G107



Type	STWS
External dia. of the groove (min.)	$\phi 6$
Edge width (mm)	0.5~2.0
Grooving depth (mm)	1.0~3.0
See Page	G109



Small diameter face grooving $\phi 8\sim$

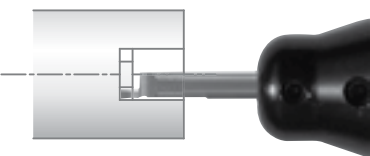


Type	GFVS-AA
External dia. of the groove (min.)	$\phi 8$
Edge width (mm)	1.0~3.0
Grooving depth (mm)	2.2
See Page	G125

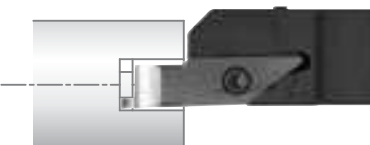
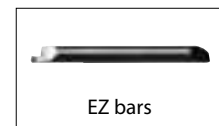
Type	GFVT-AA
External dia. of the groove (min.)	$\phi 8$
Edge width (mm)	1.0~3.0
Grooving depth (mm)	2.2
See Page	G125



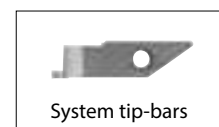
Small diameter face grooving $\phi 5\sim, \phi 8\sim$



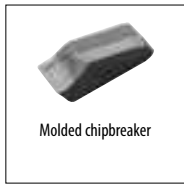
Type	EZFG
External dia. of the groove (min.)	$\phi 5, \phi 6, \phi 8$
Edge width (mm)	1.0~3.0
Grooving depth (mm)	1.5~3.0
See Page	G102



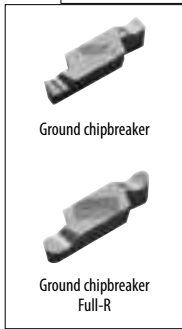
Type	VNFG
External dia. of the groove (min.)	$\phi 8$
Edge width (mm)	1.0~3.0
Grooving depth (mm)	2.0~3.0
See Page	G104



Face grooving $\phi 20\sim$

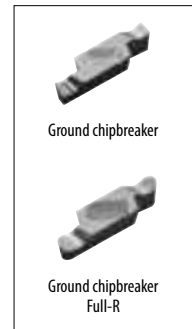


Type	KFTB
External dia. of the groove (min.)	$\phi 65\sim\phi 250$
Edge width (mm)	4.0~5.0
Grooving depth (mm)	25~38
See Page	G140



Type	GFV
External dia. of the groove (min.)	$\phi 20\sim\phi 150$
Edge width (mm)	2.0~6.0
Grooving depth (mm)	2.2~8.1
See Page	G127

Type	GFVS
External dia. of the groove (min.)	$\phi 35\sim\phi 150$
Edge width (mm)	2.5~6.0
Grooving depth (mm)	4.6~8.1
See Page	G129



Type	GFVT
External dia. of the groove (min.)	$\phi 35\sim\phi 150$
Edge width (mm)	2.5~6.0
Grooving depth (mm)	4.6~8.1
See Page	G130

G

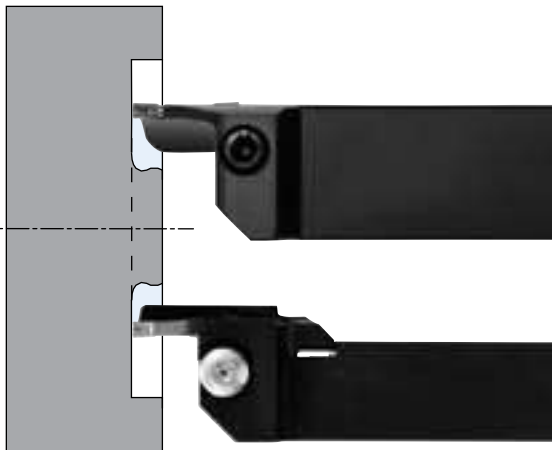
Grooving

External

Internal

Face

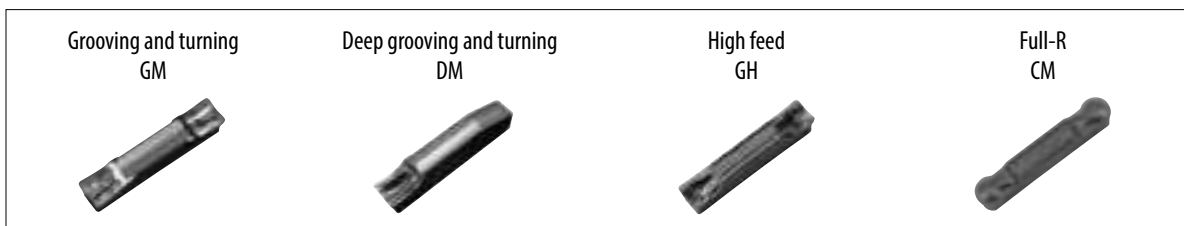
KGDF face grooving $\phi 25\sim$



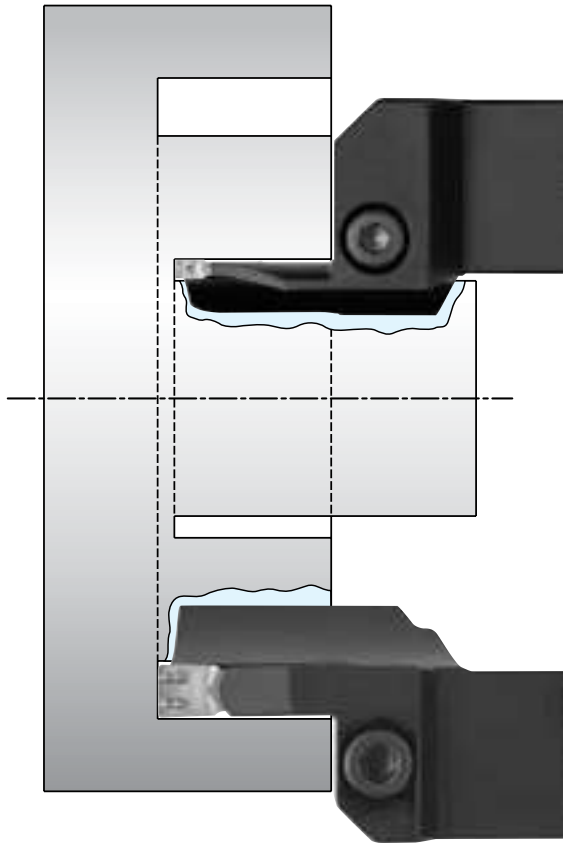
Type	KGDF-Z
External dia. of the groove (min.)	$\phi 50$
Edge width (mm)	3.0~5.0
Grooving depth (mm)	15
See Page	G118

Type	*KGDF
External dia. of the groove (min.)	$\phi 25$
Edge width (mm)	2.0~6.0
Grooving depth (mm)	6~32
See Page	G114~G117

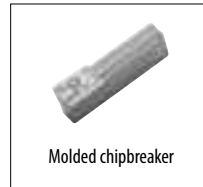
*The separate type toolholders can accept all the blades if their hand is matching.



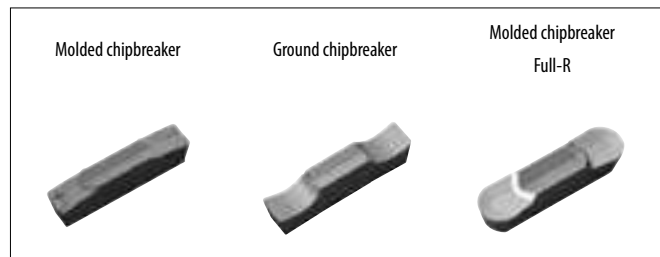
Face grooving & turning $\phi 25\sim$



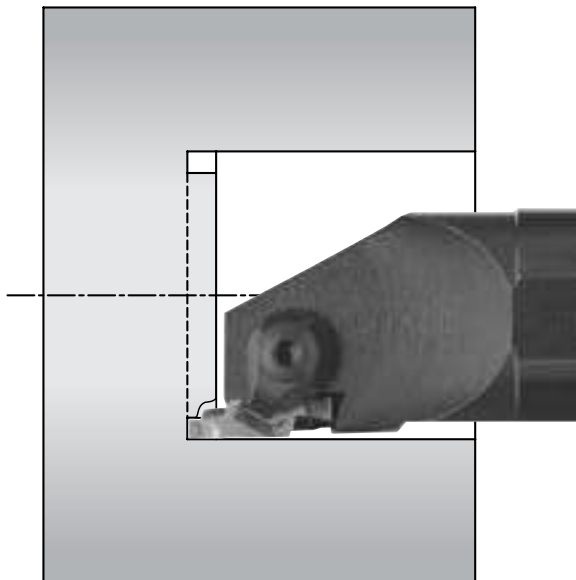
Type	KFMS
External dia. of the groove (min.)	$\phi 25\sim\phi 235$
Edge width (mm)	3.0~6.0
Grooving depth (mm)	13~32
See Page	G135



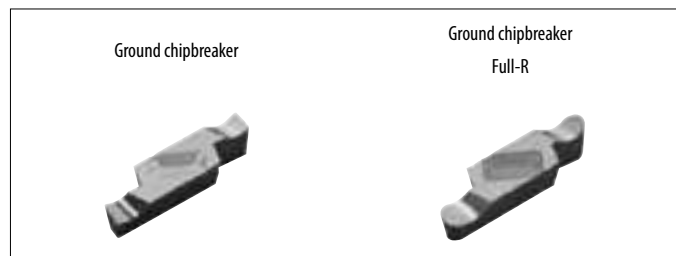
Type	KFMS-8
External dia. of the groove (min.)	$\phi 54\sim\phi 155$
Edge width (mm)	8.0
Grooving depth (mm)	25
See Page	G138



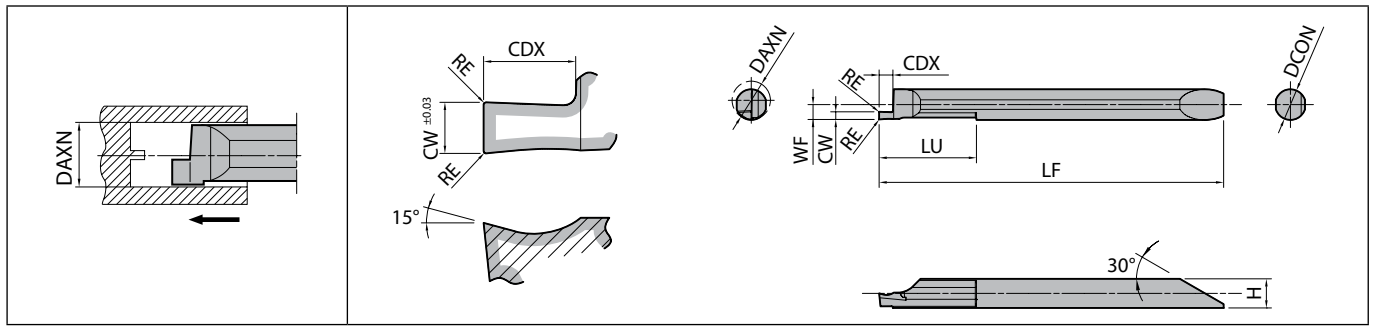
Face grooving $\phi 35\sim$



Type	GIFV
External dia. of the groove (min.)	$\phi 35\sim\phi 50$
Edge width (mm)	2.0~6.0
Grooving depth (mm)	2.2~8.1
See Page	G133



EZFG (Internal grooving / Face grooving)



Right-hand shown

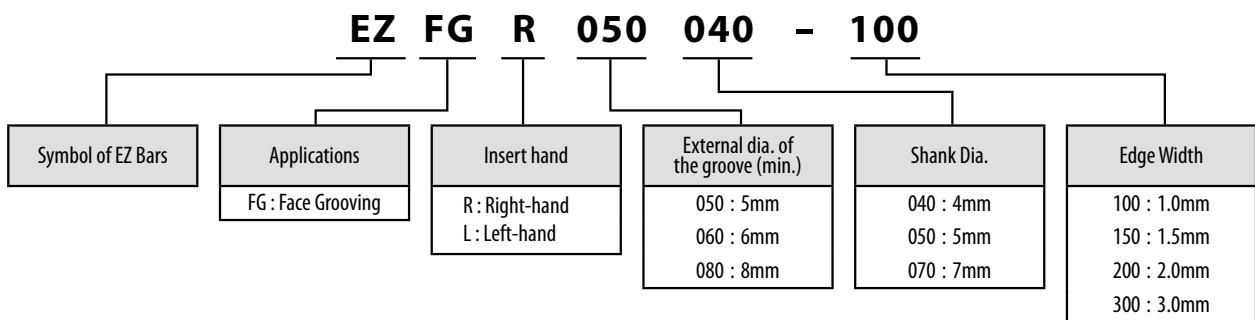
Dimensions

Description	No. of edges	External dia. of the groove (mm)	Dimension (mm)									Tolerance (mm)				Carbide			Applicable sleeve F38~F43	
			DAXN (min.)	CW	CDX	RE	DCON	H	LF	LU	WF	CW min.	CW max.	RE min.	RE max.	PVD		-		
																PR1225				GW05
																R	L				R
EZFG ^{%/L} 050040-100 050040-150	1	5	1 1.5	1.5 2	0.05	4	3.8	45	12	1.9	-0.03	+0.03	-0.013	+0.013	●	●	●	EZH040...		
EZFG ^{%/L} 060050-100 060050-150 060050-200	1	6	1 1.5 2	1.5 2.5 3	0.05	5	4.8	53.2	15	2.4	-0.03	+0.03	-0.013	+0.013	●	●	●	EZH050...		
EZFG ^{%/L} 080070-100 080070-150 080070-200 080070-300	1	8	1 1.5 2 3	2 2.5 3 3	0.05	7	6.8	64.2	25	3.4	-0.03	+0.03	-0.013	+0.013	●	●	●	EZH070...		

CDX shows available grooving depth.

Recommended cutting conditions **G103**

EZ Bars Identification System



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes

Applicable sleeves

Sleeve				Applicable insert for internal face grooving		Applicable machine manufacturer
EZH-CT (Adjustable overhang length with coolant hole) F39	EZH-HP (Adjustable overhang length) F41	EZH-ST F43	Sleeve shank dia.	EZFG	Shank dia.	
			DCON(mm)		DCON(mm)	
-	-	EZH 04012ST-80 05012ST-80 07012ST-80	12	EZFG ⁹⁰ /L 050040-... EZFG ⁹⁰ /L 060050-... EZFG ⁹⁰ /L 080070-...	4 5 7	(General purpose)
-	EZH 04016HP-100 05016HP-100 07016HP-100	EZH 04016ST-100 05016ST-100 07016ST-100	16	EZFG ⁹⁰ /L 050040-... EZFG ⁹⁰ /L 060050-... EZFG ⁹⁰ /L 080070-...	4 5 7	(General purpose)
EZH 04019CT-120 05019CT-120 07019CT-120	EZH 04019HP-120 05019HP-120 07019HP-120	EZH 04019ST-120 05019ST-120 07019ST-120	19.05	EZFG ⁹⁰ /L 050040-... EZFG ⁹⁰ /L 060050-... EZFG ⁹⁰ /L 080070-...	4 5 7	Citizen Machinery
EZH 04020CT-120 05020CT-120 07020CT-120	EZH 04020HP-120 05020HP-120 07020HP-120	EZH 04020ST-120 05020ST-120 07020ST-120	20	EZFG ⁹⁰ /L 050040-... EZFG ⁹⁰ /L 060050-... EZFG ⁹⁰ /L 080070-...	4 5 7	Eguro Tsugami Citizen Machinery (General purpose)
EZH 04022CT-135 05022CT-135 07022CT-135	EZH 04022HP-135 05022HP-135 07022HP-135	EZH 04022ST-135 05022ST-135 07022ST-135	22	EZFG ⁹⁰ /L 050040-... EZFG ⁹⁰ /L 060050-... EZFG ⁹⁰ /L 080070-...	4 5 7	Star Micronics Nomura DS Tsugami
EZH 04025.0CT-135 05025.0CT-135 07025.0CT-135	EZH 04025.0HP-135 05025.0HP-135 07025.0HP-135	EZH 04025.0ST-135 05025.0ST-135 07025.0ST-135	25	EZFG ⁹⁰ /L 050040-... EZFG ⁹⁰ /L 060050-... EZFG ⁹⁰ /L 080070-...	4 5 7	Eguro Tsugami Citizen Machinery (General purpose)
EZH 04025.4CT-120 05025.4CT-120 07025.4CT-120	EZH 04025.4HP-120 05025.4HP-120 07025.4HP-120	EZH 04025.4ST-120 05025.4ST-120 07025.4ST-120	25.4	EZFG ⁹⁰ /L 050040-... EZFG ⁹⁰ /L 060050-... EZFG ⁹⁰ /L 080070-...	4 5 7	Citizen Machinery

- Choose sleeves (DCB) to meet with DCON dimension of Face Grooving Inserts.
- Adjustment Pin cannot be installed to EZH-ST sleeves. To adjust overhang of the bar, please use EZH-CT / HP sleeves.
- Machine manufacturers in random order

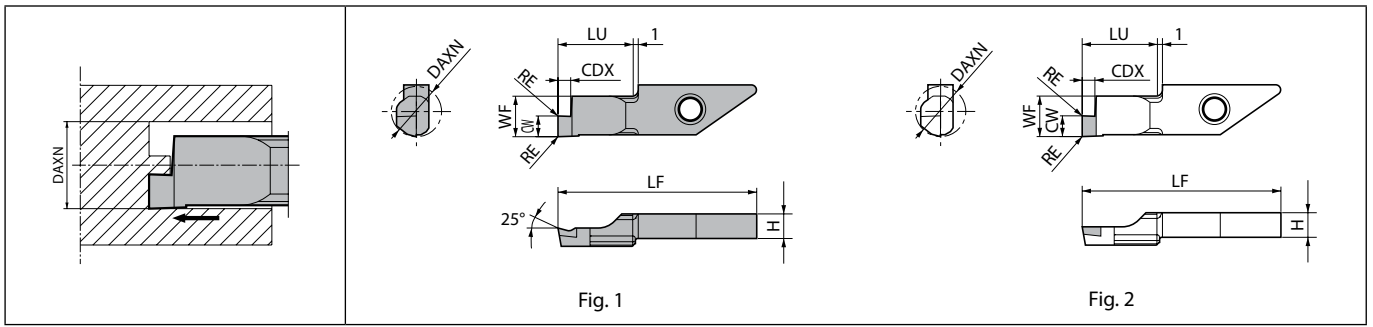
Recommended cutting conditions

Workpiece material	Insert grades		EZFG ⁹⁰ /L 050040-100 EZFG ⁹⁰ /L 060050-100 EZFG ⁹⁰ /L 080070-100	EZFG ⁹⁰ /L 050040-150 EZFG ⁹⁰ /L 060050-150 EZFG ⁹⁰ /L 080070-150	EZFG ⁹⁰ /L 060050-200 EZFG ⁹⁰ /L 080070-200	EZFG ⁹⁰ /L 080070-300	Remarks
	MEGACOAT	Carbide					
	PR1225	GW05	f (mm/rev)				
Carbon steel / Alloy steel	★ 30~100	-	~0.02	~0.03	~0.04	~0.05	Coolant
Stainless steel	★ 30~80	-	~0.01	~0.02	~0.02	~0.03	
Non-ferrous metals	-	★ ~300	~0.03	~0.05	~0.06	~0.08	

★ : 1st recommendation



VNFG



Right-hand shown

Dimensions

Description	No. of edges	External dia. of the groove (mm)		Dimension (mm)							Tolerance (mm)		Fig.	Carbide			PCD	Applicable toolholder ➔ F48~F51
		DAXN (min.)	DAXX (max.)	CW	CDX	RE	H	LF	LU	WF	CW min.	CW max.		PVD				
														PR1225	PR930	KW10			KPD001
VNFGR 0810-10 0820-10 0830-10	1	8 (0)	∞ (∞)	1	2	0.05	3.9	29.6	10	7.3	-0.03	+0.03	1	●	●	●		SVNR...-12N S...-SVNR12N S...-SVNR12SN
VNFGR 0820-10NB 0830-10NB	1			2	3									2	3	0.05	3.9		29.6	10	7.3	-0.03	+0.03	2			MT0	MT0

CDX shows available grooving depth. Recommended cutting conditions ➔ G105
 External dia. of the groove DAXN (0) means that you can make the initial groove within DAXN ~ DAXX and then widen it to the center.

G

Grooving

External

Internal

Face

CBN & PCD Inserts are sold in 1 piece boxes

System tip-bars are sold in 5 piece boxes

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MT0 : Made to order

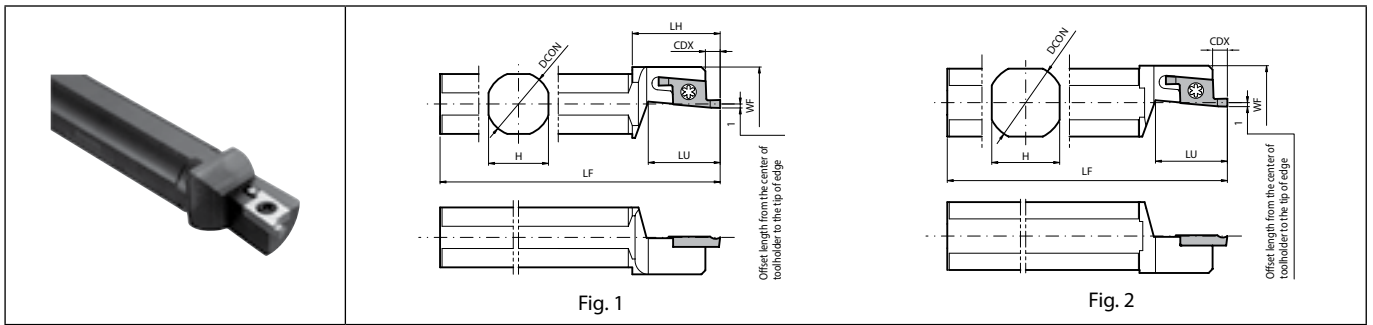
Recommended cutting conditions

Workpiece material	Recommended insert grades (Vc: m/min)			VNFG0810	VNFG0820	VNFG0830	Remarks
	MEGACOAT	PVD Coated Carbide	Carbide				
	PR1225	PR930	KW10				
				f (mm/rev)			
Carbon steel / Alloy steel	★ 30~100	☆ 30~100		~0.02	~0.04	~0.05	Coolant
Stainless steel	★ 30~100	☆ 30~80		~0.01	~0.02	~0.03	
Non-ferrous metals			★ ~300	~0.04	~0.06	~0.08	

★:1st recommendation ☆:2nd recommendation





STW (Face grooving, Round shank for horizontal type insert)



Left-hand shown | Left-hand Insert for Left-hand Toolholder. | (For right-hand toolholder for boring, See page F57.)

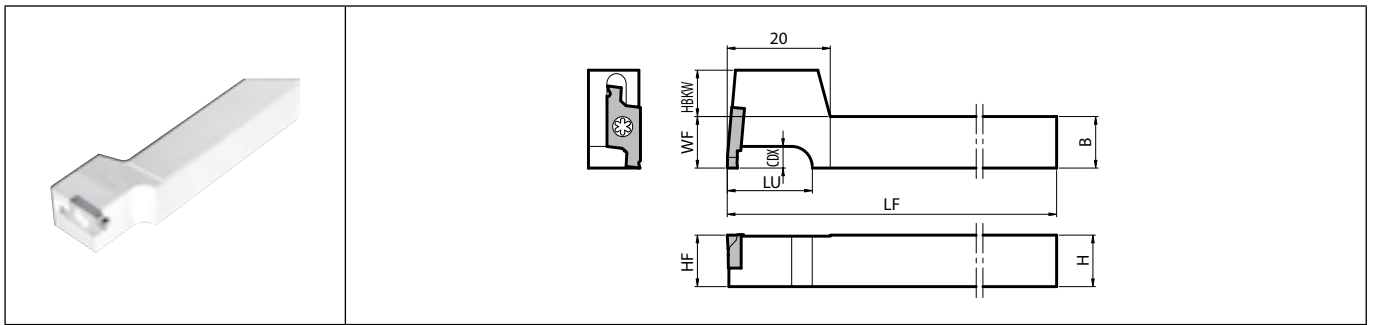
Toolholder dimensions

Description	Availability	Dimension (mm)								Coolant hole	Fig.	Spare parts		Applicable inserts G106
		L	DCON	CDX	H	LH	LF	LU	WF			Screw	Wrench	
														
S12F- STWL15	●	12	3.7	11	22	80	18	20	No	1	SB-3080TR	LTW-10S	TWFG...	
S14H- STWL15	●	14		13		100								
S15F- STWL15	●	15.875		15		85								
S16F- STWL15	●	16	3.7	17	-	90	18	18.5	No	2	SB-3080TR	LTW-10S	TWFG...	
S19G- STWL15	●	19.05		120		19								
S19K- STWL15	●	19.05		18		90								
S20G- STWL15	●	20	3.7	18	-	120	22	19.5	No	2	SB-3080TR	LTW-10S	TWFG...	
S20K- STWL15	●	20		20		125								
S22K- STWL15	●	22		23		110								
S25.0J- STWL15	●	25	3.7	23	-	120	22	24.5	No	2	SB-3080TR	LTW-10S	TWFG...	
S25K- STWL15	●	25.4		25		120								

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX“ of Insert.



STWS (Face grooving)



Right-hand shown

Toolholder dimensions

Description	Availability	Dimension (mm)									Spare parts		Applicable inserts G108
		R	H	B	LU	HF	HBKW	LF	CDX	WF	Screw	Wrench	
		STWSR	1010F-15T	●	10	10	16	10	9	85	4.2	10		SB-3080TR	LTW-10S	TWFGTR...
	1010JX-15T	●						120					
	1212F-15T	●	12	12		12	7	85	12				
	1212JX-15T	●						120					
	1616JX-15T	●	16	16	20	16	3		16				

CDX shows the distance from the toolholder to the cutting edge. Available Groove Depth : „CDX“ of Insert.

Recommended cutting conditions TWFG / TWFGT

Workpiece material	Recommended insert grades (Vc:m/min)			TWFGLO50	TWFGLO80	TWFGLO100	TWFGLO150	TWFGLO180	Remarks		
	MEGACOAT	PVD coated carbide	Carbide	TWFGTR050	TWFGTR080	TWFGTR100	TWFGTR125	TWFGTR150		TWFGTR180	TWFGTR200
	PR1535	PR1025	KW10	f (mm/rev)							
Carbon steel / Alloy steel	★ 30~100	☆ 30~100	-	~0.02	~0.03	~0.04					
Stainless steel	★ 30~80	☆ 30~80	-	~0.01	~0.02	~0.02					
Non-ferrous metals	-	-	★ ~300	~0.03	~0.04	~0.06					

★ :1st recommendation ☆ :2nd recommendation

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Grooving

KGDF: Face grooving

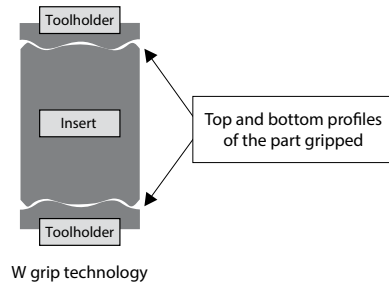
Separate type toolholder (toolholder + blade) and Integral type toolholder are available. Adaptable to a wide range of face grooving applications by changing blades



Insert clamping system "W grip"

Unique "W Grip" (insert anti-slip structure) provides stable machining quality

1. Prevents abnormal machining surface and / or insert breakage resulting from slip of insert.
2. Improves repetitive installation accuracy of insert (GDFM and GDFMS inserts are not applicable to KGD external grooving, cut-off and KGD internal grooving toolholders.)



Smooth chip control

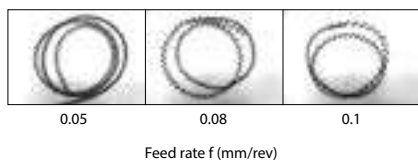
For general purpose GM chipbreaker, for high feed grooving GH chipbreaker, for deep grooving DM chipbreaker and for non-ferrous metals GS chipbreaker

Advantages of chipbreaker

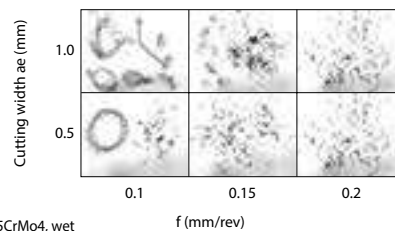
GM: General purpose	GH: High feed grooving	DM: Deep grooving
<p>Smooth surface from cutting edge to the far side: Enhances breaking of chips and maintains their evacuation direction constant.</p> <p>Gradually raised surface: Keeps curling of chips in constant shape.</p> <p>Flat cutting edge line: Improves chip control.</p> <p>Steep surface near the cutting edge: Good chip control during shoulder grooving.</p>	<p>Concave part in middle: Control chips upward.</p> <p>Dots juttet out center side: Changes chip shape smoothly. Stable chip control during shoulder grooving.</p> <p>Slope portion: Constantly curled chips.</p> <p>Negative cutting edge line: Improvement of strong edge.</p> <p>Curved lead edge: Keeps chips in constant shape.</p>	<p>Concave part in middle: Enhances breaking of chips.</p> <p>Inflated inner surface: Enhances breaking of chips and maintains their evacuation direction constant.</p> <p>Smooth surface up to the far side standing wall: Reduces cutting force, enhances breaking of chips and maintains their evacuation in constant direction.</p>

Chip control of GM chipbreaker

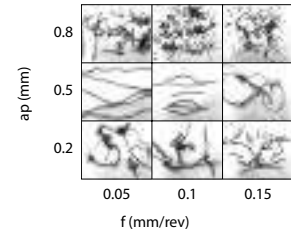
Face grooving ($\phi 62$)



Side grooving









Turning




Cutting conditions: $V_c = 150$ m/min, $f = 0.05 \sim 0.2$ mm/rev, GDFM5020N-040GM, 15CrMo4, wet

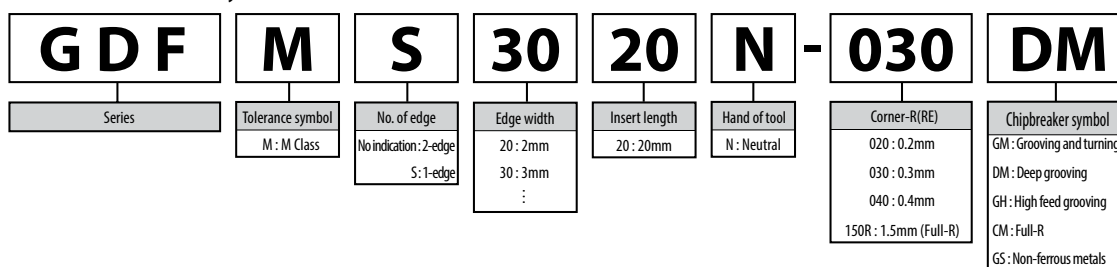
GDFM/GDMFS

		Carbon steel / Alloy steel		Stainless steel		Cast iron		Non-ferrous metals		Titanium alloy		Hard materials (~ 40HRC)		Hard materials (40HRC ~)		P		M		K		N		S		H					
Insert	Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide			Cermet		Applicable toolholder G114 ~ G120																	
			CW	S	RE	INSL	CW min.	CW max.	PVD	-	-	TN620	TN90																		
									PRI215	PRI225	GW15																				
 General purpose	GDFM 2020N-020GM	2	2	3.9	0.2	21	-0.03	+0.03	●	●																			KGDF [®] /L...-2...		
	GDFM 3020N-030GM	2	3	4.3	0.3	20	-0.03	+0.03	●	●																			KGDF [®] /L...-3...		
	GDFM 4020N-040GM	2	4	4.5	0.4	20	-0.03	+0.03	●	●																				KGDF [®] /L...-4...	
	GDFM 5020N-040GM 5020N-080GM	2	5	4.5	0.4 0.8	20	-0.04	+0.04	●	●																				KGDF [®] /L...-5...	
	GDFM 6020N-040GM 6020N-080GM	2	6	4.5	0.4 0.8	20	-0.04	+0.04	●	●																				KGDF [®] /L...-6...	
 High feed	GDFM 4020N-040GH	2	4	4.5	0.4	20	-0.03	+0.03	●	●																				KGDF [®] /L...-4...	
	GDFM 5020N-040GH 5020N-080GH	2	5	4.5	0.4 0.8	20	-0.04	+0.04	●	●																				KGDF [®] /L...-5...	
	GDFM 6020N-040GH 6020N-080GH	2	6	4.5	0.4 0.8	20	-0.04	+0.04	●	●																				KGDF [®] /L...-6...	
 Deep grooving	GDFM 3020N-030DM	2	3	4.3	0.3	20	-0.03	+0.03	●	●																				KGDF [®] /L...-3...	
	GDFM 4020N-040DM	2	4	4.5	0.4	20	-0.03	+0.03	●	●																				KGDF [®] /L...-4...	
	GDFM 5020N-040DM	2	5	4.5	0.4	20	-0.04	+0.04	●	●																				KGDF [®] /L...-5...	
	GDFM 6020N-040DM	2	6	4.5	0.4	20	-0.04	+0.04	●	●																				KGDF [®] /L...-6...	
 Deep grooving / 1-edge	GDFMS 3020N-030DM	1	3	4.3	0.3	20	-0.03	+0.03	●	●																				KGDF [®] /L...-3...	
	GDFMS 4020N-040DM	1	4	4.5	0.4	20	-0.03	+0.03	●	●																					KGDF [®] /L...-4...
	GDFMS 5020N-040DM	1	5	4.5	0.4	20	-0.04	+0.04	●	●																					KGDF [®] /L...-5...
	GDFMS 6020N-040DM	1	6	4.5	0.4	20	-0.04	+0.04	●	●																					KGDF [®] /L...-6...
 Non-Ferrous Metals	GDFG 3020N-020GS	2	3	4.3	0.2	20	-0.2	+0.2			●																			KGDF [®] /L...-3...	
	GDFG 4020N-040GS	2	4	4.5	0.4	20	-0.2	+0.2			●																				KGDF [®] /L...-4...
	GDFG 5020N-040GS	2	5	4.5	0.4	20	-0.2	+0.2			●																				KGDF [®] /L...-5...
	GDFG 6020N-040GS	2	6	4.5	0.4	20	-0.2	+0.2			●																				KGDF [®] /L...-6...
 Full R / Copying	GDFM 3020N-150R-CM	2	3	4.3	1.5	20	-0.03	+0.03	●	●	●																			KGDF [®] /L...-3...	
	GDFM 4020N-200R-CM	2	4	4.5	2	21	-0.03	+0.03	●	●	●																				KGDF [®] /L...-4...
	GDFM 5020N-250R-CM	2	5	4.5	2.5	21	-0.04	+0.04	●	●	●																				KGDF [®] /L...-5...
	GDFM 6020N-300R-CM	2	6	4.5	3	22	-0.04	+0.04	●	●	●																				KGDF [®] /L...-6...

GDFM40/50/60-CM differs from other descriptions in length (INSL) to avoid interference of a toolholder with workpiece.

Recommended cutting conditions  G122

Inserts identification system





● : Standard item R : Right-hand only L : Left-hand only □ : Check availability





KGDF: Toolholder assembly identification

Left-hand

Blade (Blade Description is printed.)	
Left-hand : KGDFL...-C	
	
Left-hand shown	
Right-hand : KGDFR...-C	
	
Right-hand shown	



Toolholder (Toolholder Description is printed.)	
Right-hand : KGDR...-C	
	
Right-hand shown	
Left-hand : KGDL...-C	
	
Left-hand shown	

Right-hand

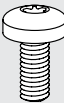

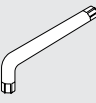


G



Grooving

- Right-hand blade for left-hand toolholder, left-hand blade for right-hand toolholder.
- Please purchase the toolholder and blade separately..
- The insert clamping screw (BH6X10TR), blade fixing screw (SB-60120TR) and wrench (LTW-25) which are included in the toolholder can be used.

	Clamp Bolt (for Insert Clamp)	Clamp Screw (for Blade)	Wrench
External			
Internal			
Face			
	BH6X10TR	SB-60120TR	LTW-25

External dia. of the groove DAXN / DAXX

External dia. of the groove within DAXN ~ DAXX are the available range for the initial grooving on the unprocessed workpiece (Ref. to Fig. 1). Then, you can widen it up to the center towards the inside (excluding the models listed in the right table) and towards the outside according to machine limits.

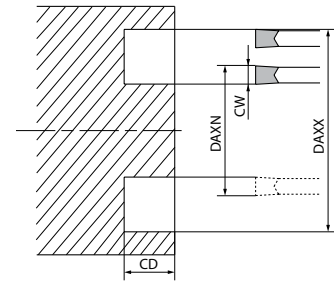


Fig. 1

Limit of Turning toward Center

Turning towards the Center causes the toolholder to interfere with the groove wall depending on the initial cut's diameter.

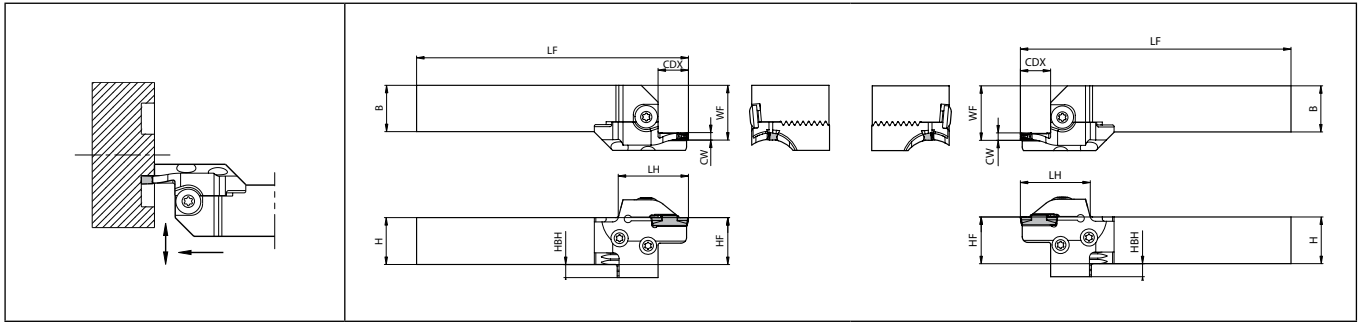
Description	DMIN _z	25	26	27	28 and over		
	ød (mm)						
KGDF ^{90°/L} -25-3A-C + KGD ^{1/2} /h2020-C	Interference	Remaining Boss Dia. ød	4	2	0	0 (No remaining Boss)	
KGDF ^{90°/L} -25-3A-C + KGD ^{1/2} /h2525-C			6	3	0		
KGDF ^{90°/L} -25-4A-C + KGD ^{1/2} /h2020-C			7	4	1		
KGDF ^{90°/L} -25-4A-C + KGD ^{1/2} /h2525-C			9	4	1		
KGDF ^{90°/L} -25-5B-C + KGD ^{1/2} /h2020-C							
KGDF ^{90°/L} -25-5B-C + KGD ^{1/2} /h2525-C							

e.g.)

Toolholder assembled from KGDFR-25-3A-C and KGDL2020-C with ø25 as first cut towards the center, it will cause a rubbing with the toolholder cartridge if ød is 4.0mm.



KGDF (Face grooving / 0° separate type)



Right-hand shown
(Right-hand blade and left-hand toolholder)

Left-hand shown
(Left-hand blade and right-hand toolholder)

Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX (mm)	External dia. of the groove (mm)		Blade description G121	Toolholder description G43	Dimension (mm)							
				DAXX (min.)	DAXX (max.)			H	B	LH	HF	HBH	LF	WF	
0°	20	6	25	30	30	KGDFR -25-2A-C	KGDL2020-C	20	20	33	20	12	24.5	115	
				35	35	-30-2A-C									
				45	45	-35-2A-C									
				60	60	-45-2A-C									
				80	80	-60-2A-C									
				100	100	-80-2A-C									
		13	100	130	100	130		130	KGDFR -100-2A-C						
						25		30	KGDFR -25-2B-C						
						30		35	-30-2B-C						
						35		45	-35-2B-C						
						45		60	-45-2B-C						
						60		80	-60-2B-C						
	25	6	25	30	30	30	KGDFR -25-2A-C	KGDL2525-C	25	25	33	25	7	29.5	140
					35	35	-30-2A-C								
					45	45	-35-2A-C								
					60	60	-45-2A-C								
					80	80	-60-2A-C								
					100	100	-80-2A-C								
		13	100	130	100	130	130		KGDFR -100-2A-C						
						25	30		KGDFR -25-2B-C						
						30	35		-30-2B-C						
						35	45		-35-2B-C						
						45	60		-45-2B-C						
						60	80		-60-2B-C						
32	6	32	32	32	32	KGDFR -32-2A-C	KGDL3232-C	32	32	33	32	-	36.5	160	
				35	35	-35-2A-C									
				45	45	-45-2A-C									
				60	60	-60-2A-C									
				80	80	-80-2A-C									
				100	100	-100-2A-C									
	13	100	130	100	130	130		KGDFR -100-2A-C							
					25	30		KGDFR -25-2B-C							
					30	35		-30-2B-C							
					35	45		-35-2B-C							
					45	60		-45-2B-C							
					60	80		-60-2B-C							

1. KGDF: Right-hand blade for left-hand toolholder, left-hand blade for right-hand toolholder.
The toolholder is applicable for all blade with suitable hand.

Applicable inserts **G111**

2. CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)
Above toolholders are applicable to Cut-off, too.

3. The insert clamping Screw (BH6X10TR), blade fixing Screw (SB-60120TR) and Wrench (LTW-25) which are included in the toolholder can be used.

Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX (mm)	External dia. of the groove (mm)		Blade description ● G121	Toolholder description ● G43	Dimension (mm)						
				DAXN (min.)	DAXX (max.)			H	B	LH	HF	HBH	LF	WF
0°	3	□20	13	25	30	KGDF%: -25-3A-C	KGD ¹ / ₆ 2020-C	20	20	38	20	12	120	24.5
				30	40	KGDF%: -30-3A-C								
				40	50	KGDF%: -40-3A-C								
			15	50	65	KGDF%: -50-3B-C								
				65	85	KGDF%: -65-3B-C								
				85	110	KGDF%: -85-3B-C								
		22	110	145	KGDF%: -110-3B-C									
			50	65	KGDF%: -50-3C-C									
			65	85	KGDF%: -65-3C-C									
		25	85	110	KGDF%: -85-3C-C									
			110	145	KGDF%: -110-3C-C									
			3	□25	13	25		30	KGDF%: -25-3A-C	KGD ¹ / ₆ 2525-C	25	25	38	25	7	145	29.5
	30	40				KGDF%: -30-3A-C								
	40	50				KGDF%: -40-3A-C								
	15	50			65	KGDF%: -50-3B-C								
		65			85	KGDF%: -65-3B-C								
		85			110	KGDF%: -85-3B-C								
	22	110		145	KGDF%: -110-3B-C									
		50		65	KGDF%: -50-3C-C									
		65		85	KGDF%: -65-3C-C									
	25	85		110	KGDF%: -85-3C-C									
		110		145	KGDF%: -110-3C-C									
		3		□32	13	25	30	KGDF%: -25-3A-C	KGD ¹ / ₆ 3232-C		32	32	38	32	-	165	36.5
	30		40			KGDF%: -30-3A-C								
40	50		KGDF%: -40-3A-C											
15	50		65		KGDF%: -50-3B-C									
	65		85		KGDF%: -65-3B-C									
	85		110		KGDF%: -85-3B-C									
22	110		145	KGDF%: -110-3B-C										
	50		65	KGDF%: -50-3C-C										
	65		85	KGDF%: -65-3C-C										
25	85		110	KGDF%: -85-3C-C										
	110		145	KGDF%: -110-3C-C										
	0°		4	□20	13	25	35	KGDF%: -25-4A-C		KGD ¹ / ₆ 2020-C	20	20	20	12	120	24.5
35		50				KGDF%: -35-4B-C								
50		70				KGDF%: -50-4B-C								
15		70			100	KGDF%: -70-4B-C								
		100			150	KGDF%: -100-4B-C								
		150			220	KGDF%: -150-4B-C								
25		220		∞	KGDF%: -220-4B-C									
		35		50	KGDF%: -35-4C-C									
		50		70	KGDF%: -50-4C-C									
25		70		100	KGDF%: -70-4C-C									
		100		150	KGDF%: -100-4C-C									
		150		220	KGDF%: -150-4C-C									
25		220	∞	KGDF%: -220-4C-C										
		4	□25	13	25	35	KGDF%: -25-4A-C	KGD ¹ / ₆ 2525-C	25	25	25	7	145	29.5
					35	50	KGDF%: -35-4B-C							
50					70	KGDF%: -50-4B-C								
15				70	100	KGDF%: -70-4B-C								
				100	150	KGDF%: -100-4B-C								
				150	220	KGDF%: -150-4B-C								
25			220	∞	KGDF%: -220-4B-C									
			35	50	KGDF%: -35-4C-C									
			50	70	KGDF%: -50-4C-C									
25			70	100	KGDF%: -70-4C-C									
			100	150	KGDF%: -100-4C-C									
	150		220	KGDF%: -150-4C-C										
25	220	∞	KGDF%: -220-4C-C											
	4	□32	13	25	35	KGDF%: -25-4A-C	KGD ¹ / ₆ 3232-C	32	32	32	-	175	36.5	
				35	50	KGDF%: -35-4B-C								
50				70	KGDF%: -50-4B-C									
15			70	100	KGDF%: -70-4B-C									
			100	150	KGDF%: -100-4B-C									
			150	220	KGDF%: -150-4B-C									
25		220	∞	KGDF%: -220-4B-C										
		35	50	KGDF%: -35-4C-C										
		50	70	KGDF%: -50-4C-C										
25		70	100	KGDF%: -70-4C-C										
		100	150	KGDF%: -100-4C-C										
		150	220	KGDF%: -150-4C-C										
25	220	∞	KGDF%: -220-4C-C											

1. KGDF: Right-hand blade for left-hand toolholder, left-hand blade for right-hand toolholder.

The toolholder is applicable for all blade with suitable hand.

2. CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)

Above toolholders are applicable to Cut-off, too.

3. The insert clamping Screw (BH6X10TR), blade fixing Screw (SB-60120TR) and Wrench (LTW-25) which are included in the toolholder can be used.

Applicable inserts ● G111



Grooving

Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm)		Blade description ➡ G121	Toolholder description ➡ G43	Dimension (mm)																				
				DAXN (min.)	DAXX (max.)			H	B	LH	HF	HBH	LF	WF														
0°	5	□20	15	25	35	KGDF ^{F%} -25-5B-C	KGDF ^{F%} -25-5B-C	20	20	38	20	12	24.5															
				35	50									-35-5B-C														
				50	75										-50-5B-C													
				75	115											-75-5B-C												
				115	180												-115-5B-C											
				180	235													-180-5B-C										
			235	∞	-235-5B-C																							
			20	25		35								KGDF ^{F%} -25-5C-C					43	125								
			35	50		-35-5C-C																						
			50	75											-50-5C-C													
			75	115												-75-5C-C												
			115	180													-115-5C-C											
		180	235	-180-5C-C																								
		235	∞		-235-5C-C																							
		32	75			115				KGDF ^{F%} -75-5D-C				55				137										
		115	180			-115-5D-C																						
		180	235												-180-5D-C													
		235	∞													-235-5D-C												
		15	25	35													KGDF ^{F%} -25-5B-C		KGDF ^{F%} -25-5B-C	25	25	38	7	29.5				
		35	50	-35-5B-C																								
		50	75		-50-5B-C																							
		75	115			-75-5B-C																						
		115	180							-115-5B-C																		
		180	235											-180-5B-C														
		235	∞												-235-5B-C													
		20	25	35												KGDF ^{F%} -25-5C-C	43	150										
		35	50	-35-5C-C																								
		50	75		-50-5C-C																							
		75	115			-75-5C-C																						
		115	180							-115-5C-C																		
		180	235											-180-5C-C														
		235	∞												-235-5C-C													
		32	75	115												KGDF ^{F%} -75-5D-C	55	162										
		115	180	-115-5D-C																								
		180	235		-180-5D-C																							
		235	∞			-235-5D-C																						
		15	25							35				KGDF ^{F%} -25-5B-C								KGDF ^{F%} -25-5B-C			32	32	38	-	36.5
		35	50							-35-5B-C																		
		50	75												-50-5B-C													
		75	115	-75-5B-C																								
		115	180		-115-5B-C																							
		180	235			-180-5B-C																						
		235	∞											-235-5B-C														
		20	25							35						KGDF ^{F%} -25-5C-C	43	170										
		35	50							-35-5C-C																		
		50	75	-50-5C-C																								
		75	115		-75-5C-C																							
		115	180			-115-5C-C																						
180	235	-180-5C-C																										
235	∞		-235-5C-C																									
32	75						115	KGDF ^{F%} -75-5D-C	55	182																		
115	180			-115-5D-C																								
180	235				-180-5D-C																							
235	∞					-235-5D-C																						

1. KGDF: Right-hand blade for left-hand toolholder, left-hand blade for right-hand toolholder.

Applicable inserts ➡ G111

The toolholder is applicable for all blade with suitable hand.

2. CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)

Above toolholders are applicable to Cut-off, too.

Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm)		Blade description ➔ G121	Toolholder description ➔ G43	Dimension (mm)																		
				DAXN (min.)	DAXX (max.)			H	B	LH	HF	HBH	LF	WF												
0°	6	□20	15	25	35	KGDF ^{F%} -25-6B-C	KGD ^L / _R 2020-C	20	20	38	20	12	24.5													
				35	50									-35-6B-C												
				50	75									-50-6B-C												
				75	115									-75-6B-C												
				115	180									-115-6B-C												
				180	235									-180-6B-C												
			235	∞	-235-6B-C																					
			20	25	35	KGDF ^{F%} -25-6C-C				43				125												
				35	50					-35-6C-C																
				50	75					-50-6C-C																
				75	115					-75-6C-C																
				115	180					-115-6C-C																
		180		235	-180-6C-C																					
		25	235	∞	-235-6C-C	48				130																
			75	115	KGDF ^{F%} -75-6D-C																					
			115	180										-115-6D-C												
			180	235										-180-6D-C												
			235	∞										-235-6D-C												
			32	75										115	55	137										
		115		180		-115-6D-C																				
		180		235	-180-6D-C																					
		235		∞	-235-6D-C																					
		□25	15	25	35	KGDF ^{F%} -25-6B-C				KGD ^L / _R 2525-C				25	25	38	25	7	29.5							
				35	50															-35-6B-C						
				50	75															-50-6B-C						
				75	115															-75-6B-C						
				115	180															-115-6B-C						
				180	235															-180-6B-C						
			235	∞	-235-6B-C																					
			20	25	35	KGDF ^{F%} -25-6C-C										43				150						
				35	50											-35-6C-C										
				50	75											-50-6C-C										
				75	115											-75-6C-C										
				115	180											-115-6C-C										
				180	235											-180-6C-C										
			25	235	∞	-235-6C-C										48				155						
				75	115	KGDF ^{F%} -75-6D-C																				
				115	180																-115-6D-C					
				180	235																-180-6D-C					
				235	∞																-235-6D-C					
				32	75																115	55	162			
			115		180											-115-6D-C										
			180		235	-180-6D-C																				
			235		∞	-235-6D-C																				
			□32	15	25	35										KGDF ^{F%} -25-6B-C				KGD ^L / _R 3232-C	32	32	38	32	-	36.5
					35	50																					-35-6B-C
		50			75	-50-6B-C																				
		75			115	-75-6B-C																				
115	180	-115-6B-C																								
180	235	-180-6B-C																								
235	∞	-235-6B-C																								
20	25	35		KGDF ^{F%} -25-6C-C	43	170																				
	35	50			-35-6C-C																					
	50	75			-50-6C-C																					
	75	115			-75-6C-C																					
	115	180			-115-6C-C																					
	180	235			-180-6C-C																					
25	235	∞		-235-6C-C	48	175																				
	75	115		KGDF ^{F%} -75-6D-C																						
	115	180					-115-6D-C																			
	180	235					-180-6D-C																			
	235	∞					-235-6D-C																			
	32	75					115	55	182																	
115		180			-115-6D-C																					
180		235		-180-6D-C																						
235		∞		-235-6D-C																						

1. KGDF: Right-hand blade for left-hand toolholder, left-hand blade for right-hand toolholder.

The toolholder is applicable for all blade with suitable hand.

2. CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)

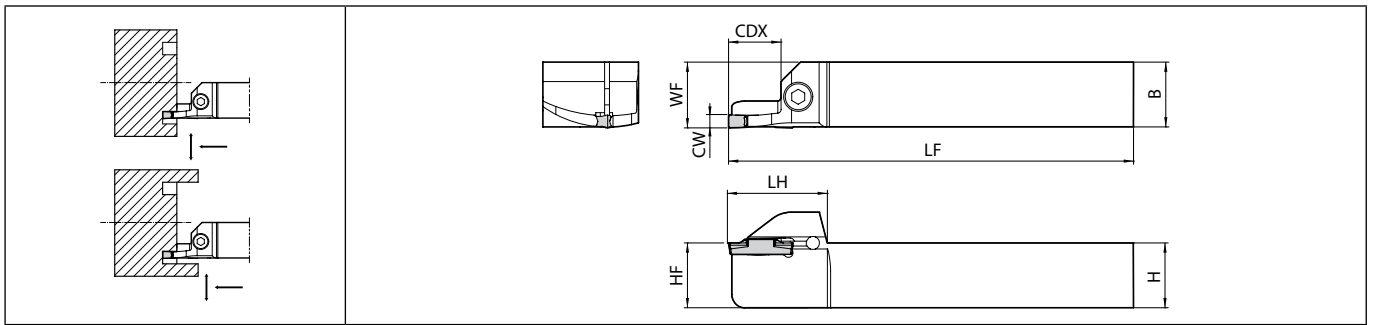
Above toolholders are applicable to Cut-off, too.

Applicable inserts ➔ G111



Grooving

KGDF-Z (Face grooving)

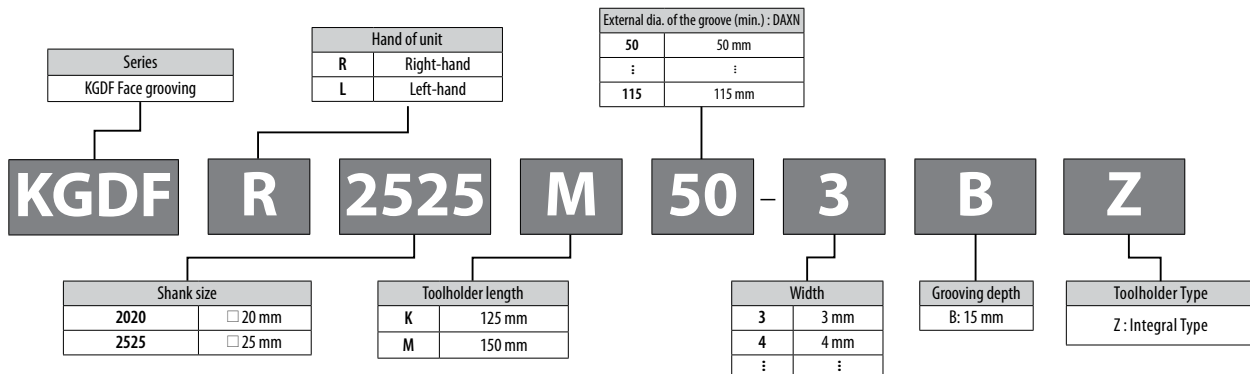


Right-hand shown

Toolholder dimensions

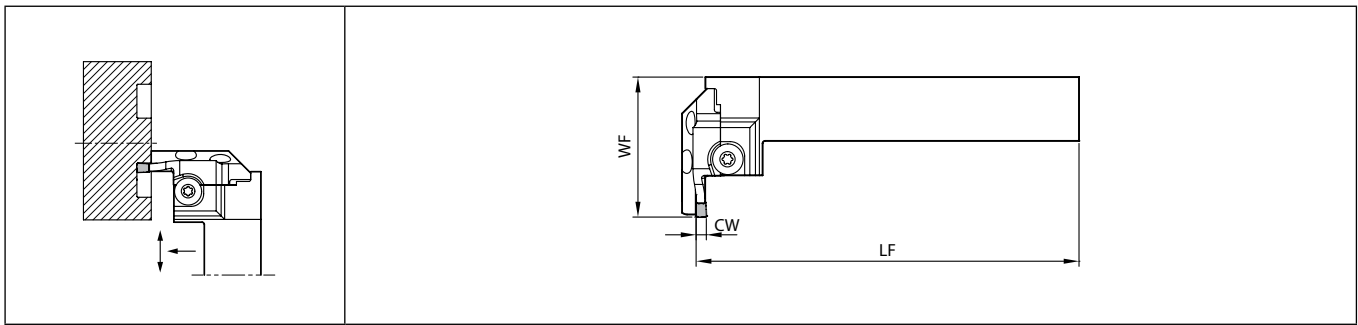
Description	Availability		External dia. of the groove (mm)		Dimension (mm)							Spare parts		Applicable inserts G111	
	R	L	DAXN (min.)	DAXX (max.)	CW	CDX	H	B	LH	HF	LF	WF	Clamp bolt 		Wrench
KGDF% 2020K50-3B-Z	●	●	50	65	3	15	20	20	30.5	20	125	20.3	HH5X16	LW-4	GDFM 3020... GDFMS 3020... GDFG 3020...
2020K65-3B-Z	●	●	65	85											
2020K85-3B-Z	●	●	85	110											
2020K110-3B-Z	●	●	110	145											
2525M50-3B-Z	●	●	50	65											
2525M65-3B-Z	●	●	65	85											
2525M85-3B-Z	●	●	85	110											
2525M110-3B-Z	●	●	110	145											
KGDF% 2020K50-4B-Z	●	●	50	70	4	15	20	20	30.5	20	125	20.3	HH5X16	LW-4	GDFM 4020... GDFMS 4020... GDFG 4020...
2020K70-4B-Z	●	●	70	100											
2020K100-4B-Z	●	●	100	150											
2525M50-4B-Z	●	●	50	70											
2525M70-4B-Z	●	●	70	100											
2525M100-4B-Z	●	●	100	150											
KGDF% 2020K50-5B-Z	●	●	50	75	5	15	20	20	30.5	20	125	20.3	HH5X16	LW-4	GDFM 5020... GDFMS 5020... GDFG 5020...
2020K75-5B-Z	●	●	75	115											
2020K115-5B-Z	●	●	115	180											
2525M50-5B-Z	●	●	50	75											
2525M75-5B-Z	●	●	75	115											
2525M115-5B-Z	●	●	115	180											

KGDF-Z toolholder identification system



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGDF (Face grooving / 90° separate type)



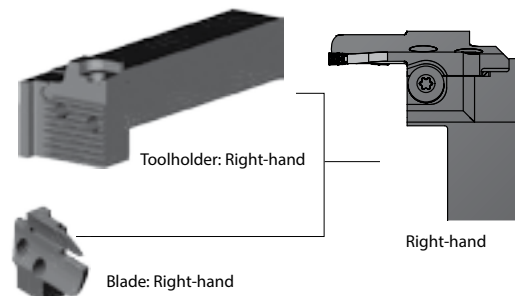
Right-hand shown (Right-hand blade and right-hand toolholder)

Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX (mm)	External dia. of the groove (mm)		Blade description ➔ G121	Toolholder description ➔ G43	Dimension (mm)				
				DAXN (min.)	DAXX (max.)			LF	WF			
90°	2	20	6	25	30	KGDFR -25-2A-C	KGDSR2020-C	125	49.7			
				30	35					-30-2A-C		
				35	45					-35-2A-C		
				45	60					-45-2A-C		
				60	80					-60-2A-C		
				80	100					-80-2A-C		
		100	130	-100-2A-C								
		13	25	30	KGDFR -25-2B-C	52.7						
		30	35	-30-2B-C								
		35	45	-35-2B-C								
		45	60	-45-2B-C								
		60	80	-60-2B-C								
	80	100	-80-2B-C									
	100	130	-100-2B-C									
	15	25	30	KGDFR -25-2B-C	54.7							
	30	35	-30-2B-C									
	35	45	-35-2B-C									
	45	60	-45-2B-C									
	60	80	-60-2B-C									
	80	100	-80-2B-C									
	100	130	-100-2B-C									
	2	25	20	6	25	30	KGDFR -25-2A-C	KGDSR2525-C	150	49.7		
					30	35					-30-2A-C	
					35	45					-35-2A-C	
45					60	-45-2A-C						
60					80	-60-2A-C						
80					100	-80-2A-C						
100		130	-100-2A-C									
13		25	30	KGDFR -25-2B-C	52.7							
30		35	-30-2B-C									
35		45	-35-2B-C									
45		60	-45-2B-C									
60		80	-60-2B-C									
80	100	-80-2B-C										
100	130	-100-2B-C										
15	25	30	KGDFR -25-2B-C	54.7								
30	35	-30-2B-C										
35	45	-35-2B-C										
45	60	-45-2B-C										
60	80	-60-2B-C										
80	100	-80-2B-C										
100	130	-100-2B-C										
90°	3	20	13	25	30	KGDF% -25-3A-C	KGDS% 2020-C	125	52.7			
				30	40					-30-3A-C		
				40	50					-40-3A-C		
				50	65					KGDF% -50-3B-C	54.7	
				65	85					-65-3B-C		
				85	110					-85-3B-C		
		110	145	-110-3B-C								
		22	50	65	KGDF% -50-3C-C	59.7						
		65	85	-65-3C-C								
		85	110	-85-3C-C								
		110	145	-110-3C-C								
		25	85	110	KGDF% -85-3C-C					61.7		
	110	145	-110-3C-C									
	3	25	20	13	25	30	KGDF% -25-3A-C	KGDS% 2525-C	150		52.7	
					30	40						-30-3A-C
					40	50						-40-3A-C
					50	65						KGDF% -50-3B-C	54.7
					65	85				-65-3B-C		
					85	110				-85-3B-C		
		110	145	-110-3B-C								
		22	50	65	KGDF% -50-3C-C	59.7						
		65	85	-65-3C-C								
		85	110	-85-3C-C								
		110	145	-110-3C-C								
25		85	110	KGDF% -85-3C-C	61.7							
110	145	-110-3C-C										

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX (mm)	External dia. of the groove (mm)		Blade description ➔ G121	Toolholder description ➔ G43	Dimension (mm)			
				DAXN (min.)	DAXX (max.)			LF	WF		
90°	4	20	13	25	35	KGDF% -25-4A-C	KGDS% 2020-C	125	52.7		
				35	50					KGDF% -35-4B-C	
				50	70					-50-4B-C	
				70	100					-70-4B-C	
				100	150					-100-4B-C	
				150	220					-150-4B-C	
		220	∞	-220-4B-C							
		15	35	50	KGDF% -35-4C-C	64.7					
		50	70	-50-4C-C							
		70	100	-70-4C-C							
		100	150	-100-4C-C							
		150	220	-150-4C-C							
	220	∞	-220-4C-C								
	25	35	50	KGDF% -35-4C-C	64.7						
	50	70	-50-4C-C								
	70	100	-70-4C-C								
	100	150	-100-4C-C								
	150	220	-150-4C-C								
	220	∞	-220-4C-C								
	4	25	20	13	25	35	KGDF% -25-4A-C	KGDS% 2525-C	150	52.7	
					35	50					KGDF% -35-4B-C
					50	70					-50-4B-C
					70	100					-70-4B-C
					100	150					-100-4B-C
150					220	-150-4B-C					
220		∞	-220-4B-C								
15		35	50	KGDF% -35-4C-C	64.7						
50		70	-50-4C-C								
70		100	-70-4C-C								
100		150	-100-4C-C								
150		220	-150-4C-C								
220	∞	-220-4C-C									

Applicable inserts ➔ G111



- KGDF 90° type is not available as unit (Toolholder + blade). Please purchase toolholder and blade separately.
- Right-hand Blade for Right-hand Toolholder, Left-hand Blade for Left-hand Toolholder.
- The insert clamping Screw (BH6X10TR), blade fixing Screw (SB-60120TR) and Wrench (LTW-25) which are included in the toolholder can be used.



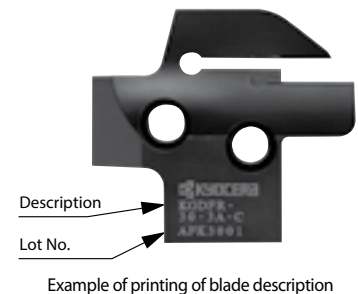
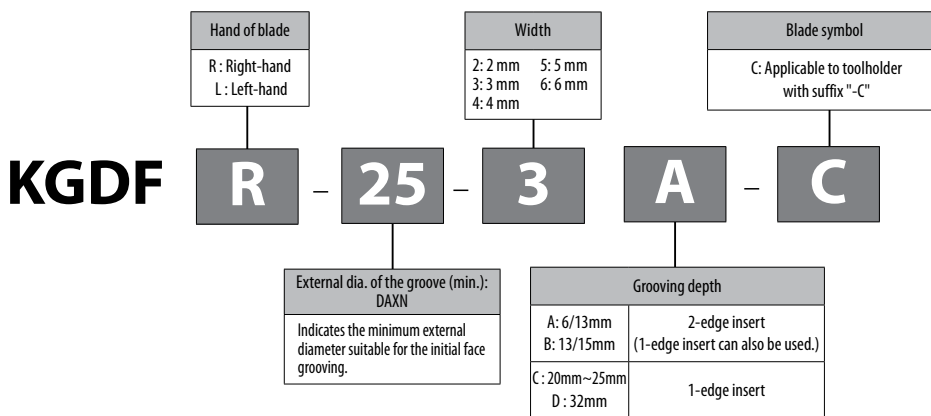
Toolholder dimensions (Blade and toolholder)

Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm)		Blade description Ⓢ G121	Toolholder description Ⓢ G43	Dimension (mm)		
				DAXN (min.)	DAXX (max.)			LF	WF	
90°	5	□20	15	25	35	KGDF%L -25-5B-C	KGDS%L.2020-C	125	54.7	
				35	50	-35-5B-C				
				50	75	-50-5B-C				
				75	115	-75-5B-C				
				115	180	-115-5B-C				
				180	235	-180-5B-C				
			235	∞	-235-5B-C					
			20	25	35	KGDF%L -25-5C-C		125	59.7	
				35	50	-35-5C-C				
				50	75	-50-5C-C				
				75	115	-75-5C-C				
				115	180	-115-5C-C				
		180		235	-180-5C-C					
		25	115	180	-115-5C-C	125	64.7			
			180	235	-180-5C-C					
			235	∞	-235-5C-C					
			32	75	115			KGDF%L -75-5D-C	125	71.7
				115	180			-115-5D-C		
				180	235			-180-5D-C		
		235		∞	-235-5D-C					
		□25	15	25	35	KGDF%L -25-5B-C	KGDS%L.2525-C	150	54.7	
				35	50	-35-5B-C				
				50	75	-50-5B-C				
				75	115	-75-5B-C				
115	180			-115-5B-C						
180	235			-180-5B-C						
235	∞		-235-5B-C							
20	25		35	KGDF%L -25-5C-C	150	59.7				
	35		50	-35-5C-C						
	50		75	-50-5C-C						
	75		115	-75-5C-C						
	115		180	-115-5C-C						
	180	235	-180-5C-C							
25	115	180	-115-5C-C	150	64.7					
	180	235	-180-5C-C							
	235	∞	-235-5C-C							
	32	75	115			KGDF%L -75-5D-C	150	71.7		
		115	180			-115-5D-C				
		180	235			-180-5D-C				
235		∞	-235-5D-C							

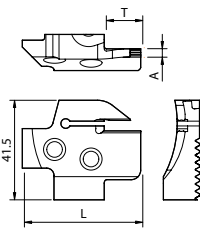
Shank angle	Cutting width CW (mm)	Shank size (mm)	Max. depth of cut CDX(mm)	External dia. of the groove (mm)		Blade description Ⓢ G121	Toolholder description Ⓢ G43	Dimension (mm)		
				DAXN (min.)	DAXX (max.)			LF	WF	
90°	6	□20	15	25	35	KGDF%L -25-6B-C	KGDS%L.2020-C	125	54.7	
				35	50	-35-6B-C				
				50	75	-50-6B-C				
				75	115	-75-6B-C				
				115	180	-115-6B-C				
				180	235	-180-6B-C				
			235	∞	-235-6B-C					
			20	25	35	KGDF%L -25-6C-C		125	59.7	
				35	50	-35-6C-C				
				50	75	-50-6C-C				
				75	115	-75-6C-C				
				115	180	-115-6C-C				
		180		235	-180-6C-C					
		25	115	180	-115-6C-C	125	64.7			
			180	235	-180-6C-C					
			235	∞	-235-6C-C					
			32	75	115			KGDF%L -75-6D-C	125	71.7
				115	180			-115-6D-C		
				180	235			-180-6D-C		
		235		∞	-235-6D-C					
		□25	15	25	35	KGDF%L -25-6B-C	KGDS%L.2525-C	150	54.7	
				35	50	-35-6B-C				
				50	75	-50-6B-C				
				75	115	-75-6B-C				
115	180			-115-6B-C						
180	235			-180-6B-C						
235	∞		-235-6B-C							
20	25		35	KGDF%L -25-6C-C	150	59.7				
	35		50	-35-6C-C						
	50		75	-50-6C-C						
	75		115	-75-6C-C						
	115		180	-115-6C-C						
	180	235	-180-6C-C							
25	115	180	-115-6C-C	150	64.7					
	180	235	-180-6C-C							
	235	∞	-235-6C-C							
	32	75	115			KGDF%L -75-6D-C	150	71.7		
		115	180			-115-6D-C				
		180	235			-180-6D-C				
235		∞	-235-6D-C							

- KGDF 90° type is not available as unit (Toolholder + blade). Please purchase toolholder and blade separately.
 - Right-hand Blade for Right-hand Toolholder, Left-hand Blade for Left-hand Toolholder.
 - The insert clamping Screw (BH6X10TR), blade fixing Screw (SB-60120TR) and Wrench (LTW-25) which are included in the toolholder can be used.
- Applicable inserts Ⓢ G111

Face grooving blade identification system



Blade dimensions

Shape	Blade description	Availability		External dia. of the groove (mm)		Dimension (mm)			Cutting width CW (mm)	Applicable inserts G111	Applicable toolholder G43
		R	L	DAXX (min.)	DAXX (max.)	L	T	A			
 <p>Right-hand shown</p>	KGDFR	-25-2A-C	●		25	30	44.35	6	1.5	2	GDFM 2020N-020GM
		-30-2A-C	●		30	35					
		-35-2A-C	●		35	45					
		-45-2A-C	●		45	60					
		-60-2A-C	●		60	80					
		-80-2A-C	●		80	100					
	-100-2A-C	●		100	130						
	KGDFR	-25-2B-C	●		25	30	49.35	15			
		-30-2B-C	●		30	35					
		-35-2B-C	●		35	45					
		-45-2B-C	●		45	60					
		-60-2B-C	●		60	80					
		-80-2B-C	●		80	100					
	-100-2B-C	●		100	130						
	KGDF%L	-25-3A-C	●	●	25	30	47.35	13			
		-30-3A-C	●	●	30	40					
		-40-3A-C	●	●	40	50					
	KGDF%L	-50-3B-C	●	●	50	65	49.35	15			
		-65-3B-C	●	●	65	85					
		-85-3B-C	●	●	85	110					
	KGDF%L	-110-3B-C	●	●	110	145	59.35	25			
		-50-3C-C	●	●	50	65					
		-65-3C-C	●	●	65	85					
	KGDF%L	-85-3C-C	●	●	85	110	59.35	25			
		-110-3C-C	●	●	110	145					
		-25-4A-C	●	●	25	35			47.35	13	
	KGDF%L	-35-4B-C	●	●	35	50					
		-50-4B-C	●	●	50	70					
	KGDF%L	-70-4B-C	●	●	70	100	49.35	15			
		-100-4B-C	●	●	100	150					
		-150-4B-C	●	●	150	220					
	KGDF%L	-220-4B-C	●	●	220	∞	59.35	25			
		-35-4C-C	●	●	35	50					
		-50-4C-C	●	●	50	70					
	KGDF%L	-70-4C-C	●	●	70	100	59.35	25			
		-100-4C-C	●	●	100	150					
		-150-4C-C	●	●	150	220					
	KGDF%L	-220-4C-C	●	●	220	∞	59.35	25			
		KGDF%L	-25-5B-C	●	●	25			35	49.35	15
			-35-5B-C	●	●	35			50		
	-50-5B-C		●	●	50	75					
	KGDF%L	-75-5B-C	●	●	75	115	49.35	15			
		-115-5B-C	●	●	115	180					
		-180-5B-C	●	●	180	235					
	KGDF%L	-235-5B-C	●	●	235	∞	54.35	20			
		KGDF%L	-25-5C-C	●	●	25			35	59.35	25
			-35-5C-C	●	●	35			50		
	-50-5C-C		●	●	50	75					
KGDF%L	-75-5C-C	●	●	75	115	59.35	25				
	-115-5C-C	●	●	115	180						
	-180-5C-C	●	●	180	235						
KGDF%L	-235-5C-C	●	●	235	∞	66.35	32				
	KGDF%L	-75-5D-C	●	●	75			115	66.35	32	
		-115-5D-C	●	●	115			180			
-180-5D-C		●	●	180	235						
KGDF%L	-235-5D-C	●	●	235	∞	49.35	15				
	KGDF%L	-25-6B-C	●	●	25			35	49.35	15	
		-35-6B-C	●	●	35			50			
-50-6B-C		●	●	50	75						
KGDF%L	-75-6B-C	●	●	75	115	49.35	15				
	-115-6B-C	●	●	115	180						
	-180-6B-C	●	●	180	235						
KGDF%L	-235-6B-C	●	●	235	∞	54.35	20				
	KGDF%L	-25-6C-C	●	●	25			35	59.35	25	
		-35-6C-C	●	●	35			50			
-50-6C-C		●	●	50	75						
KGDF%L	-75-6C-C	●	●	75	115	59.35	25				
	-115-6C-C	●	●	115	180						
	-180-6C-C	●	●	180	235						
KGDF%L	-235-6C-C	●	●	235	∞	66.35	32				
	KGDF%L	-75-6D-C	●	●	75			115	66.35	32	
		-115-6D-C	●	●	115			180			
-180-6D-C		●	●	180	235						
KGDF%L	-235-6D-C	●	●	235	∞	66.35	32				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

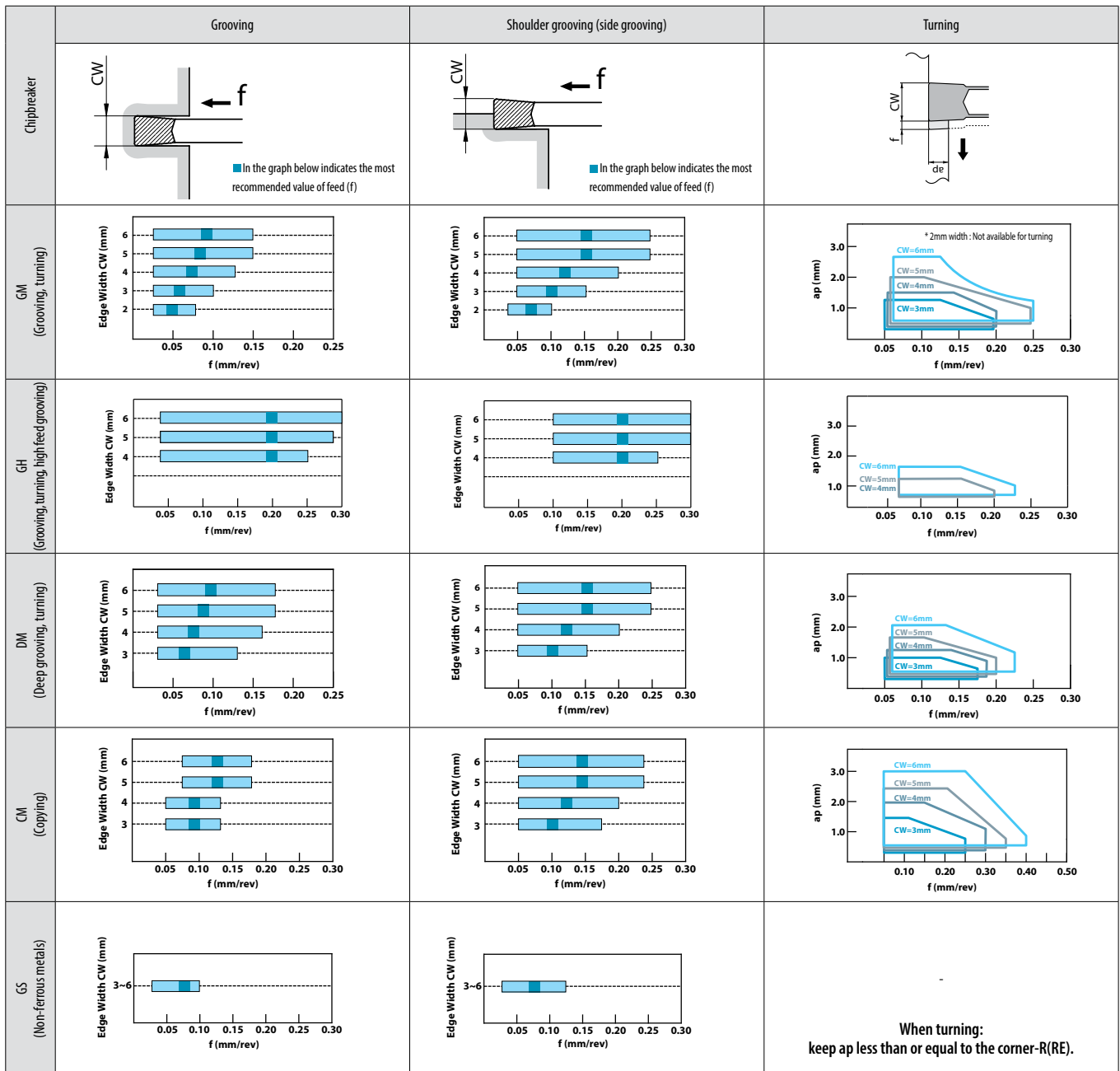


Grooving

Recommended cutting conditions

Workpiece material	Recommended insert grades (Vc: m/min)					Remarks
	Cermet		MEGACOAT		Carbide	
	TN620	TN90	PR1225	PR1215	GW15	
Carbon steel	☆ 60~200	☆ 80~200	★ 60~160	☆ 80~160	-	Coolant
Alloy steel	☆ 60~160	☆ 70~160	★ 60~150	☆ 60~150	-	
Stainless steel	-	-	★ 50~120	☆ 50~120	-	
Cast iron	-	-	-	★ 80~160	-	
Aluminum alloys	-	-	-	-	★ 160~400	
Brass	-	-	-	-	★ 80~160	

★ : 1st recommendation ☆ : 2nd recommendation



When shoulder grooving

- If ap is set smaller, set feed higher.
- If ap is set larger, set feed lower.

Workpiece material: C50, AIMg2.5(GS)

1. The above values are based on the condition that the CDX of toolholder is 15 mm or less.
2. If the toolholder's CDX is over 15 mm, set the values for turning to 90% or less of those above.

Guide for face grooving

1. Toolholder selection

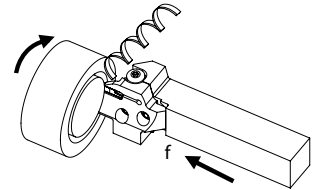
Check the range of applicable "external diameter of the groove" as well as the groove width and depth.

2. Cutting conditions (Feed rate: f)

When machining on steel, set the feed rate (f) so that chips are created in a helical form in cut-off.

3. How to widen the groove (plunge milling and turning)

Start machining from the outside and then proceed to the inside.
Chip control will be better in this way.



Plunge milling (Grooving + side grooving)	Turning	

4. Guide for turning

A. When the cutting amount (ap) is over 0.5 mm

1. Perform plunge milling.
2. Return the cutting by 0.1 mm. Failure to pull the tool back before traverse machining will result in an unbalanced load applied on only one side of the cutting edge.
3. Perform turning (Ref. to Fig. 1)

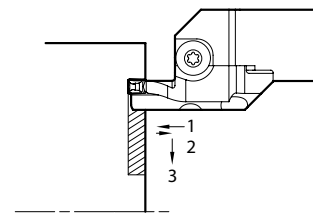
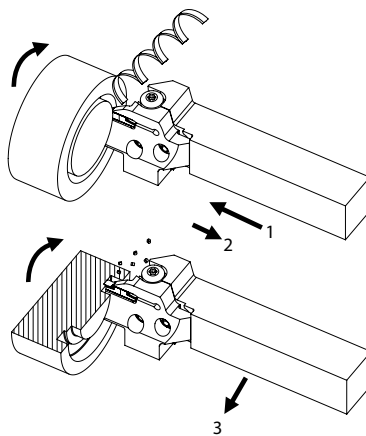


Fig. 1

When widening the face groove width (Ref. to Fig. 2).

Apply the "step turning".
Then perform finishing.

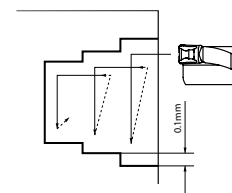


Fig. 2

B. When the cutting amount (ap) is under 0.5 mm

1. Perform Plunge milling.
 2. Perform turning.
- Machining without interruption is possible.
(Ref. to Fig. 3)

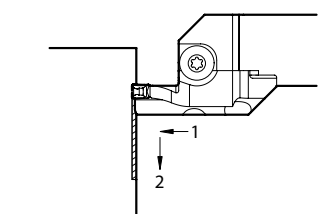
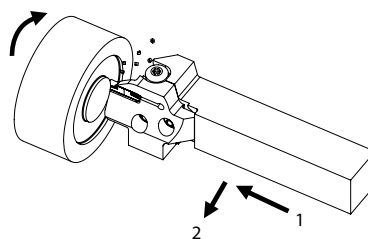
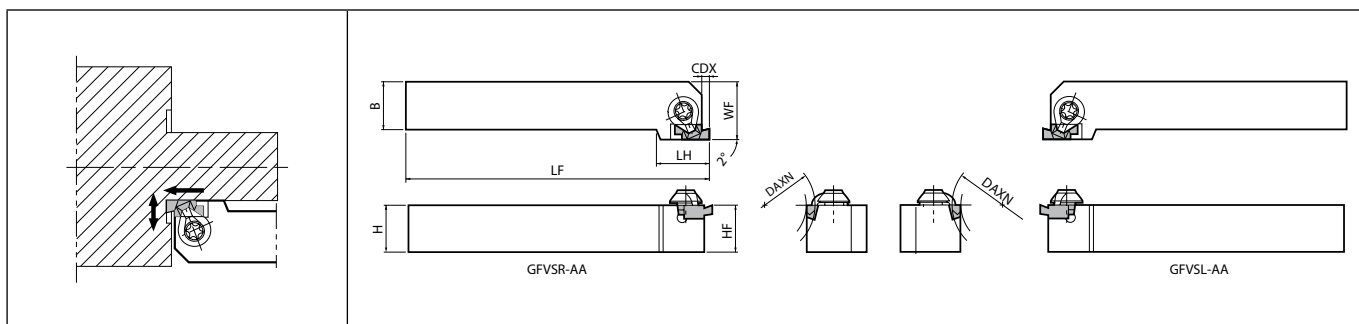


Fig. 3

GFVS-AA (Face grooving)



Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

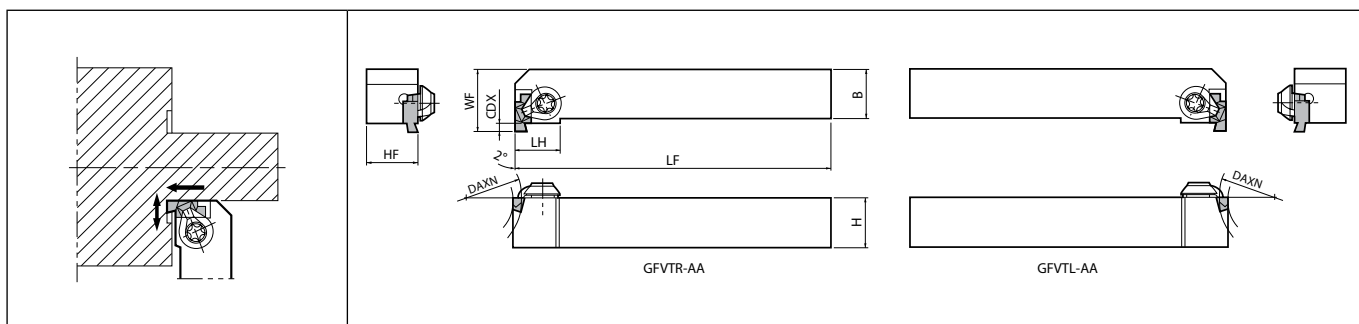
Description	Availability		External dia. of the groove (mm)		Dimension (mm)							Spare parts		Applicable inserts G124
												Clamp set	Wrench	
	R	L	DAXN (min.)	DAXX (max.)	CDX	H	B	LH	HF	LF	WF			
GFVS%L 2020K-08AA 2525M-08AA	●	●	8 (0)	∞ (∞)	2.2	20 25	20 25	18	20 25	125 150	25 32	CPS-5V	FT-15	GVF% _{R...-...AA}

CDX shows available grooving depth.

The value () of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).

The value () of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.

GFVT-AA (Face grooving)



Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

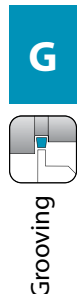
Description	Availability		External dia. of the groove (mm)		Dimension (mm)							Spare parts		Applicable inserts G124
												Clamp set	Wrench	
	R	L	DAXN (min.)	DAXX (max.)	CDX	H	B	LH	HF	LF	WF			
GFVT%L 2020K-08AA 2525M-08AA	●	●	8 (0)	∞ (∞)	2.2	20 25	20 25	14	20 25	125 150	25 32	CPS-5V	FT-15	GVF% _{R...-...AA}

CDX shows available grooving depth.




The value () of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).

The value () of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



GVF

		Carbon steel / Alloy steel										P								
		Stainless steel										M								
		Cast iron										K								
		Non-ferrous metals										N								
		Titanium alloy										S								
		Hard materials (~ 40HRC)										H								
		Hard materials (40HRC ~)										H								
Insert	Description	No. of edges	Dimension (mm)						Tolerance (mm)		Carbide		Cermet	PCD	Applicable toolholder G127~ G129					
			CW	CDX	S	RE	INSL	W1	CW min.	CW max.	PVD	-	-	-						
											PR125	PR930	KW10	TC60		TC60	KPD010			
	GVFR 200-020A	2	2	2.3	4.5	0.2	12	4.3	-0.03	+0.03	●	●	●	●						
	230-020A		2.3								●	●	●	●						
	250-020A		2.5								●	●	●	●						
	270-020A		2.7								●	●	●	●						
	290-020A		2.9								●	●	●	●						
	340-020A		3.4								●	●	●	●						
	GVFL 200-020A	2	2	2.3	4.5	0.2	12	4.3	-0.03	+0.03	●	●	●	●						
	230-020A		2.3								●	●	●	●						
	250-020A		2.5								●	●	●	●						
	270-020A		2.7								●	●	●	●						
	290-020A		2.9								●	●	●	●						
	340-020A		3.4								●	●	●	●						
	GVFR 250-020B	2	2.5	4.8	5	0.2	20	5.8	-0.03	+0.03	●	●	●	●						
	300-020B		3	4.8							●	●	●	●						
	350-020B		3.5	4.8							●	●	●	●						
	400-020B		4	5.3							●	●	●	●						
	430-020B		4.3	5.3							●	●	●	●						
	GVFL 250-020B	2	2.5	4.8	5	0.2	20	5.8	-0.03	+0.03	●	●	●	●						
	300-020B		3	4.8							●	●	●	●						
	350-020B		3.5	4.8							●	●	●	●						
	400-020B		4	5.3							●	●	●	●						
	430-020B		4.3	5.3							●	●	●	●						
	GVFR 350-040C	2	3.5	6.8	7	0.4	27	7	-0.03	+0.03	●	●	●	●						
	400-040C		4	6.8							●	●	●	●						
450-040C	4.5		6.8	●							●	●	●							
500-040C	5		8.3	●							●	●	●							
550-040C	5.5		8.3	●							●	●	●							
600-040C	6		8.3	●							●	●	●							
GVFL 350-040C	2	3.5	6.8	7	0.4	27	7	-0.03	+0.03	●	●	●	●							
400-040C		4	6.8							●	●	●	●							
450-040C		4.5	6.8							●	●	●	●							
500-040C		5	8.3							●	●	●	●							
550-040C		5.5	8.3							●	●	●	●							
600-040C		6	8.3							●	●	●	●							
	GVFR 250-020B	1	2.5	4.8	5	0.2	20	5.8	-0.03	+0.03					●		*1			
	300-020B		3	4.8							●									
	400-020B		4	5.3							●									
	GVFL 250-020B		2.5	4.8							●									
	300-020B		3	4.8							●									
GVFR 350-040C	1	3.5	6.8	7	0.4	27	7	-0.03	+0.03					●		*5				
	GVFR 200-100AR	2	2	2.3	4.5	1.5	12	4.3	-0.03	+0.03	●	●	●	●						
	250-125AR		2.5								1.25	1	●	●	●	●				
	300-150AR		3								1.5	1	●	●	●	●				
	GVFL 200-100AR	2	2	2.3	4.5	1.5	12	4.3	-0.03	+0.03	●	●	●	●						
	250-125AR		2.5								1.25	1	●	●	●	●				
	300-150AR		3								1.5	1	●	●	●	●				
	GVFR 300-150BR	2	3	4.8	5	2	20	5.8	-0.03	+0.03	●	●	●	●						
	400-200BR		4	5.3							●									
300-150BR	3		4.8	●																
400-200BR	4		5.3	●																

Right-hand shown
CDX shows available grooving depth.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

Recommended cutting conditions G146

CBN & PCD Inserts are sold in 1 piece boxes

G126

G

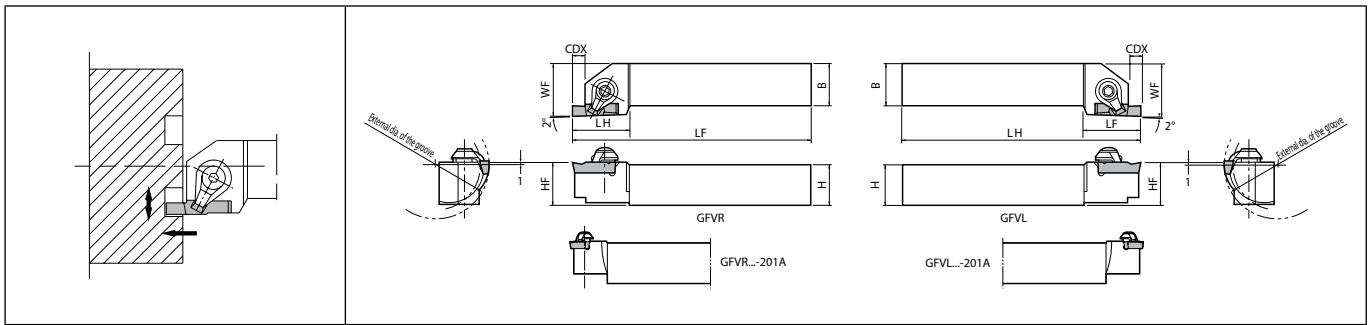
Grooving

External

Internal

Face

GVF (Face grooving)



Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		External dia. of the groove (mm)		Dimension (mm)							Spare parts				Applicable inserts G126															
	R	L	DAXN (min.)	DAXX (max.)	CDX	H	B	LH	HF	LF	WF	Clamp set	Clamp set	Wrench	Wrench																
GVF% 2020K-201A 2525M-201A	●	●	20 (12)	∞ (∞)	2.2	20	20	20	21	125	25	CPS-5V	-	-	FT-15	GVF% 200 ~ 340...A GVF% 200 ~ 300...AR															
GVF% 2020K-351B 2525M-351B	●	●	35 (25)	50 (∞)	4.6	20	20	28	21	125	25	-	CPS-6V	LW-3	-	GVF% 250 ~ 350...B GVF% 300-150BR															
2020K-352B 2525M-352B	●	●			5.1	20	20	28	21	125	25					25	30	26	150	32	GVF% 400 ~ 490...B GVF% 400-200BR										
2020K-501B 2525M-501B	●	●	50 (25)	70 (∞)	4.6	20	20	28	21	125	25					25	30	26	150	32	GVF% 250 ~ 350...B GVF% 300-150BR										
2020K-502B 2525M-502B	●	●			5.1	20	20	28	21	125	25					25	30	26	150	32	GVF% 400 ~ 490...B GVF% 400-200BR										
2020K-701B 2525M-701B	●	●	70 (25)	100 (∞)	4.6	20	20	28	21	125	25					25	30	26	150	32	GVF% 250 ~ 350...B GVF% 300-150BR										
2020K-702B 2525M-702B	●	●			5.1	20	20	28	21	125	25					25	30	26	150	32	GVF% 400 ~ 490...B GVF% 400-200BR										
GVF% 2525M-501C 2525M-502C	●	●	50 (25)	70 (∞)	6.6	25	25	35	26	150	32					-	CPS-8V	LW-4	-	GVF% 350 ~ 450...C GVF% 500 ~ 600...C											
2525M-701C 2525M-702C	●	●			70 (25)															100 (∞)	6.6	8.1	6.6	8.1	6.6	8.1	6.6	8.1	6.6	8.1	6.6	8.1	GVF% 350 ~ 450...C GVF% 500 ~ 600...C
2525M-1001C 2525M-1002C	●	●	100 (25)	150 (∞)	6.6															8.1	6.6	8.1	6.6	8.1	6.6	8.1	6.6	8.1	6.6	8.1	GVF% 350 ~ 450...C GVF% 500 ~ 600...C
2525M-1501C 2525M-1502C	●	●			150 (25)															250 (∞)	6.6	8.1	6.6	8.1	6.6	8.1	6.6	8.1	6.6	8.1	6.6	8.1	GVF% 350 ~ 450...C GVF% 500 ~ 600...C

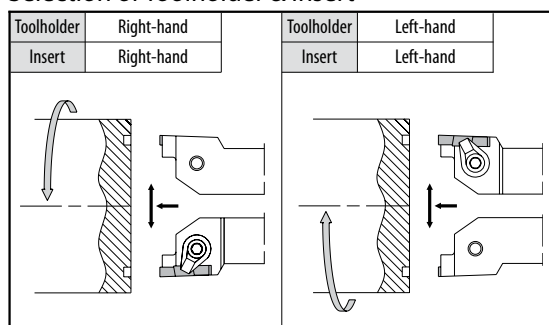
CDX shows available grooving depth.

The value () of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).

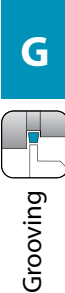
The value () of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.

Standard toolholders are designed with the edge position 1.0 mm above the center. When using non-standard toolholders, set the edge position 1.0 mm above the center.

Selection of Toolholder & Insert



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



External dia. of the groove of GVF

(1) e.g.) GVF^{R/L}...-201A

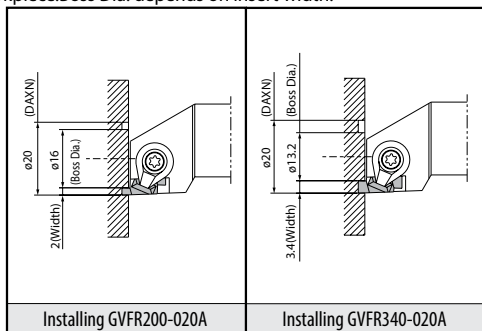
Description	External dia. of the groove (mm)		Applicable inserts
	DAXN (min.)	DAXX (max.)	
GVF ^{R/L} 2020K-201A	20	∞	GVF ^{R/L} 200 ~ 340...A
2525M-201A	(12)	(∞)	GVF ^{R/L} 200 ~ 300...AR

• It is available to infinity ∞ in case of machining the first groove bigger than DAXN.

• When machining towards the outer diameter then there is no MAX. limit to the further groove machining.

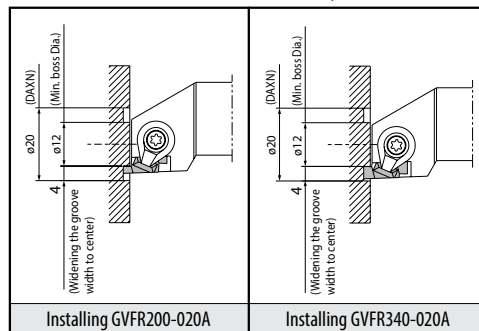
• When machining the initial groove on the face at DAXN $\phi 20$

If the initial groove is made smaller than this, the toolholder interferes with the workpiece. Boss Dia. depends on insert width.



• When widening the groove width to inner diameter.

Face groove diameter DAXN (12) is the limit; the toolholder interferes with the workpiece in case of smaller than $\phi 12$. The toolholder interferes with the workpiece when closer to the center.



G

Grooving

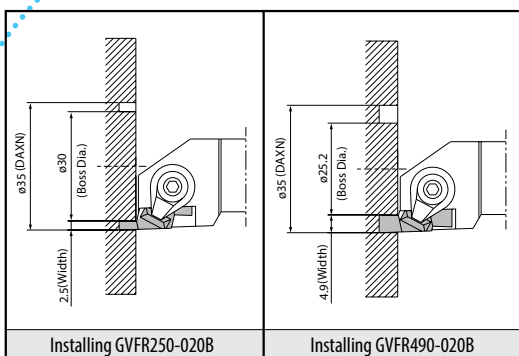
(2) e.g.) GVF^{R/L}...-351B/352B (same as GVF^{R/L}...-○○○B or GVF^{R/L}...-○○○C)

Description	External dia. of the groove (mm)		Applicable inserts
	DAXN (min.)	DAXX (max.)	
GVF ^{R/L} 2020K-351B	35 (25)	50 (∞)	GVF ^{R/L} 250 ~ 350...B
2525M-351B			GVF ^{R/L} 300-150BR
2020K-352B			GVF ^{R/L} 400 ~ 490...B
2525M-352B			GVF ^{R/L} 400-200BR

• It is possible to widen the groove to infinity ∞ when machining the initial groove within DAXN ~ DAXX and then widening to outer diameter.

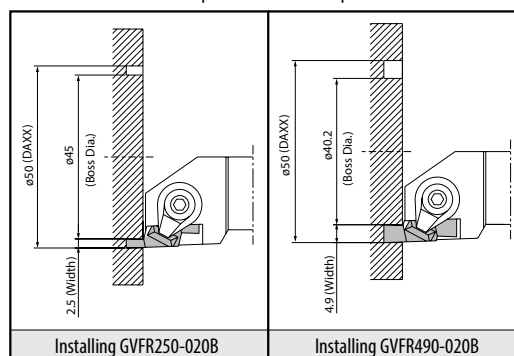
• When machining the initial groove on the face at DAXN $\phi 35$

If the initial groove is made smaller than this, the toolholder interferes with the workpiece. Boss Dia. depends on insert width.



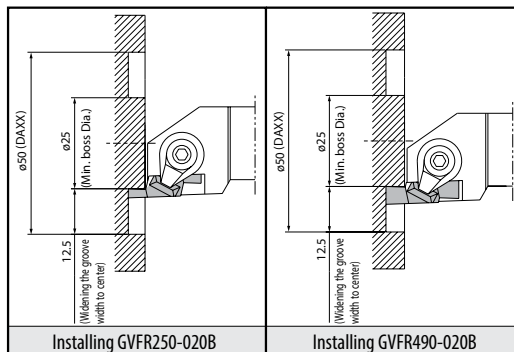
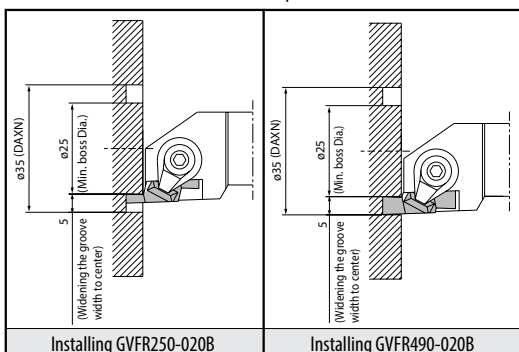
• When machining the initial groove on the face at DAXX $\phi 50$.

If the initial groove is made larger than this, the toolholder interferes with the workpiece. Boss Dia. depends on insert width.

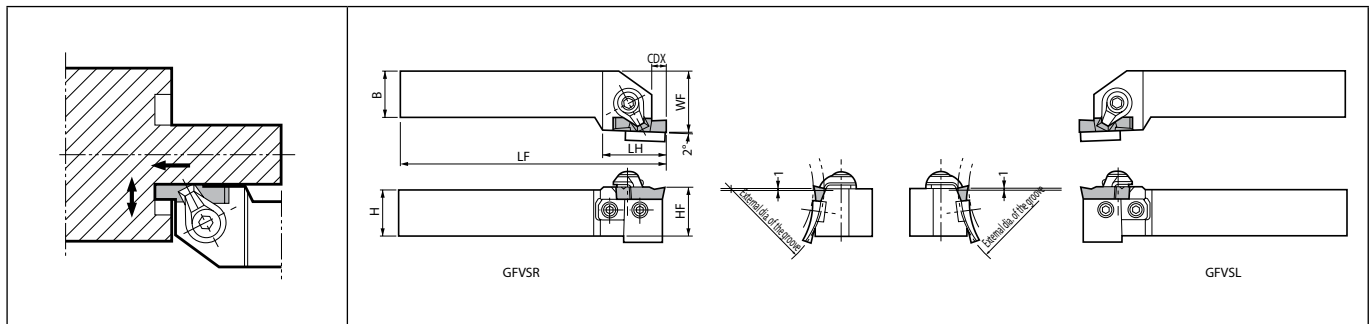


• When widening the groove width to inner diameter.

$\phi 25$ Boss Dia. is the limitation regardless of insert width, even widening the groove width to the center from the initial groove at DAXN ($\phi 35$) or DAXX ($\phi 50$). The toolholder interferes with the workpiece when closer to the center.



GFVS (Face grooving)



Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder. This toolholder can machine various face grooving diameters by replacing the blade.

Toolholder dimensions

Description	Availability		External dia. of the groove (mm)		Dimension (mm)							Spare parts				Applicable inserts G126
												Blade	Bolt	Clamp set	Wrench	
	R	L	DAXN (min.)	DAXX (max.)	CDX	H	B	LH	HF	LF	WF					
GFVS ^{90°} 2020K-351B 2525M-351B 2020K-352B 2525M-352B 2020K-501B 2525M-501B 2020K-502B 2525M-502B 2020K-701B 2525M-701B 2020K-702B 2525M-702B	●	●	35 (25)	50 (∞)	5.1 (4.6)	20	20	30	21	125	25	SF ^{90°} -351B	HH4X12	CPS-6V	LW-3	GVF ^{90°} / _R 250 ~ 350-...B
	●	●				25	25	32	26	150	32					GVF ^{90°} / _R 300-150BR
	●	●	50 (25)	70 (∞)	5.1 (5.1)	20	20	30	21	125	25	SF ^{90°} -352B				GVF ^{90°} / _R 400 ~ 490-...B
	●	●				25	25	32	26	150	32					GVF ^{90°} / _R 400-200BR
	●	●	70 (25)	100 (∞)	5.1 (4.6)	20	20	30	21	125	25	SF ^{90°} -501B				GVF ^{90°} / _R 250 ~ 350-...B
	●	●				25	25	32	26	150	32					GVF ^{90°} / _R 300-150BR
	●	●	100 (25)	∞	5.1 (5.1)	20	20	30	21	125	25	SF ^{90°} -502B				GVF ^{90°} / _R 400 ~ 490-...B
	●	●				25	25	32	26	150	32					GVF ^{90°} / _R 400-200BR
	●	●	150 (25)	∞	5.1 (4.6)	20	20	30	21	125	25	SF ^{90°} -701B				GVF ^{90°} / _R 250 ~ 350-...B
	●	●				25	25	32	26	150	32					GVF ^{90°} / _R 300-150BR
	●	●	250 (25)	∞	5.1 (5.1)	20	20	30	21	125	25	SF ^{90°} -702B				GVF ^{90°} / _R 400 ~ 490-...B
	●	●				25	25	32	26	150	32					GVF ^{90°} / _R 400-200BR
GFVS ^{90°} 2525M-501C 2525M-502C 2525M-701C 2525M-702C 2525M-1001C 2525M-1002C 2525M-1501C 2525M-1502C	●	●	50 (25)	70 (∞)	8.1 (*5.1)	25	25	32	26	150	32	SF ^{90°} -501C	HH4X12	CPS-8V	LW-4	GVF ^{90°} / _R 350 ~ 450-...C
	●	●										8.1 (8.1)				SF ^{90°} -502C	GVF^{90°}/_{R}500 ~ 600-...C
	●	●	70 (25)	100 (∞)	8.1 (*5.1)							SF ^{90°} -701C				GVF ^{90°} / _R 350 ~ 450-...C
	●	●										8.1 (8.1)				SF ^{90°} -702C	GVF^{90°}/_{R}500 ~ 600-...C
	●	●	100 (25)	150 (∞)	8.1 (*5.1)							SF ^{90°} -1001C				GVF ^{90°} / _R 350 ~ 450-...C
	●	●										8.1 (8.1)				SF ^{90°} -1002C	GVF^{90°}/_{R}500 ~ 600-...C
	●	●	150 (25)	250 (∞)	8.1 (*5.1)							SF ^{90°} -1501C				GVF ^{90°} / _R 350 ~ 450-...C
	●	●										8.1 (8.1)				SF ^{90°} -1502C	GVF^{90°}/_{R}500 ~ 600-...C

CDX shows available grooving depth.

The value () of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).

The value () of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.

Standard toolholders are designed with the edge position 1.0 mm above the center. When using non-standard toolholders, set the edge position 1.0 mm above the center.

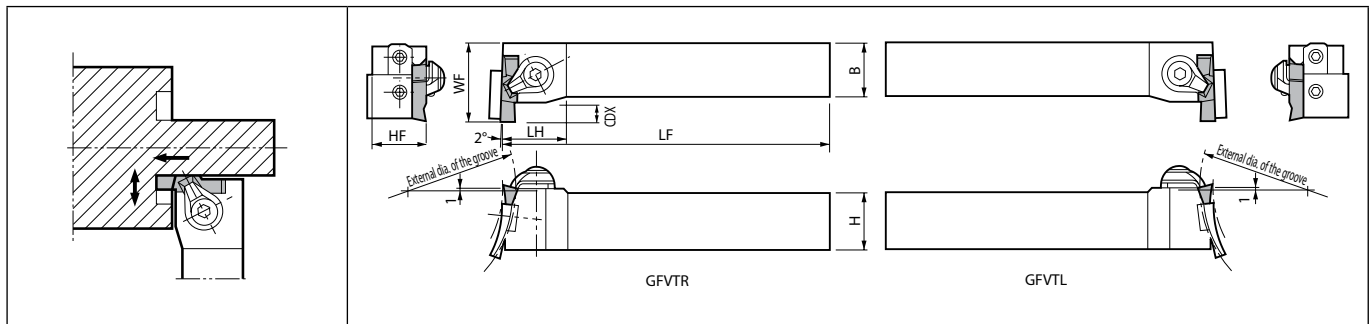
CDX shows the distance from the toolholder to the cutting edge. The grooving depth is the mentioned in ().

GFVS is composed of a base-holder and a blade. If the blade should be damaged, replace it with a new blade as listed in the table on G131.

(e.g.) GFVSR2020K-HB + SFR-351B = GFVSR2020K-351B

*GVF^{90°}/_R400~450-040C: CDX is 6.6

GFVT (Face grooving)



Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.
This toolholder can machine various face grooving diameters by replacing the blade.

Toolholder dimensions

Description	Availability		External dia. of the groove (mm)		Dimension (mm)							Spare parts				Applicable inserts G126				
												Blade	Bolt	Clamp set	Wrench					
	R	L	DAXN (min.)	DAXX (max.)	CDX	H	B	LH	HF	LF	WF									
GFVT [°] /L 2020K-351B	●	●	35 (25)	50 (∞)	5.1 (4.6)	20	20	22	21	125	30	SF [°] /L-351B	HH4X12	CPS-6V	LW-3	GVF [°] / _R 250 ~ 350-...B GVF [°] / _R 300-150BR				
2525M-351B	●	●				50 (25)	70 (∞)	5.1 (4.6)	25	25	25						26	150	35	SF [°] /L-352B	GVF^{°}/_{R}400 ~ 490-...B GVF^{°}/_{R}400-200BR
2020K-352B	●	●	50 (25)	70 (∞)	5.1 (5.1)				20	20	22	21					125	30	SF [°] /L-501B			GVF^{°}/_{R}250 ~ 350-...B GVF^{°}/_{R}300-150BR
2525M-352B	●	●				70 (25)	100 (∞)	5.1 (5.1)	25	25	25	26					150	35		SF [°] /L-502B	GVF^{°}/_{R}400 ~ 490-...B GVF^{°}/_{R}400-200BR
2020K-501B	●	●	70 (25)	100 (∞)	5.1 (4.6)				20	20	22	21					125	30	SF [°] /L-701B			GVF^{°}/_{R}250 ~ 350-...B GVF^{°}/_{R}300-150BR
2525M-501B	●	●				70 (25)	100 (∞)	5.1 (5.1)	25	25	25	26					150	35		SF [°] /L-702B	GVF^{°}/_{R}400 ~ 490-...B GVF^{°}/_{R}400-200BR
2020K-502B	●	●	100 (25)	150 (∞)	8.1 (*5.1)				25	25	27	26					150	38	SF [°] /L-501C			HH4X12	CPS-8V	LW-4	GVF^{°}/_{R}350 ~ 450-...C GVF^{°}/_{R}500 ~ 600-...C
2525M-502B	●	●				100 (25)	150 (∞)	8.1 (8.1)												SF [°] /L-502C	GVF^{°}/_{R}350 ~ 450-...C GVF^{°}/_{R}500 ~ 600-...C
2020K-701B	●	●	100 (25)	150 (∞)	8.1 (*5.1)				SF [°] /L-701C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C										
2525M-701B	●	●				150 (25)	250 (∞)	8.1 (8.1)			SF [°] /L-702C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C								
2020K-702B	●	●	150 (25)	250 (∞)	8.1 (*5.1)				SF [°] /L-1001C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C										
2525M-702B	●	●				150 (25)	250 (∞)	8.1 (8.1)			SF [°] /L-1002C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C								
GFVT [°] /L 2525M-501C	●	●	150 (25)	250 (∞)	8.1 (*5.1)				SF [°] /L-1501C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C										
2525M-502C	●	●				150 (25)	250 (∞)	8.1 (8.1)			SF [°] /L-1502C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C								
2525M-701C	●	●	150 (25)	250 (∞)	8.1 (*5.1)				SF [°] /L-1501C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C										
2525M-702C	●	●				150 (25)	250 (∞)	8.1 (8.1)			SF [°] /L-1502C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C								
2525M-1001C	●	●	150 (25)	250 (∞)	8.1 (*5.1)				SF [°] /L-1501C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C										
2525M-1002C	●	●				150 (25)	250 (∞)	8.1 (8.1)			SF [°] /L-1502C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C								
2525M-1501C	●	●	150 (25)	250 (∞)	8.1 (*5.1)				SF [°] /L-1501C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C										
2525M-1502C	●	●				150 (25)	250 (∞)	8.1 (8.1)			SF [°] /L-1502C	GVF [°] / _R 350 ~ 450-...C GVF [°] / _R 500 ~ 600-...C								

CDX shows available grooving depth.

The value () of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).

The value () of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.

Standard toolholders are designed with the edge position 1.0 mm above the center. When using non-standard toolholders, set the edge position 1.0 mm above the center.

CDX shows the distance from the toolholder to the cutting edge. The grooving depth is the mentioned in ().

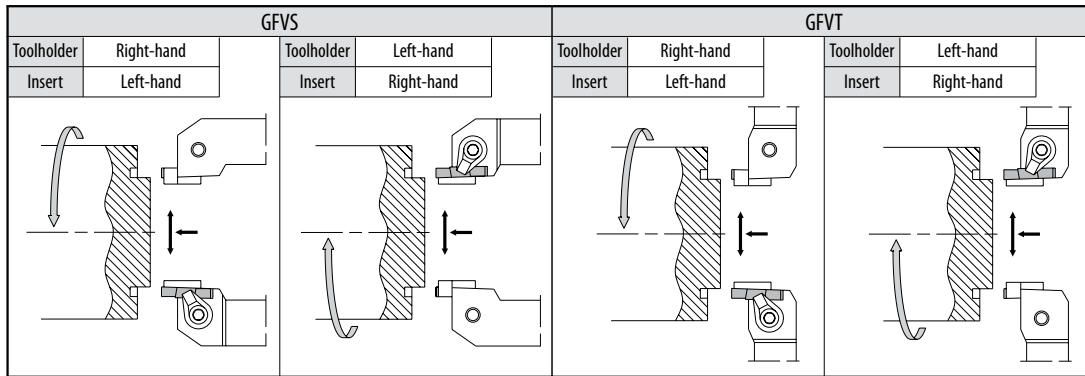
GFVT is composed of a base-holder and a blade. If the blade should be damaged, replace it with a new blade as listed in the table on G131.

(e.g.) GFVTR2020K-HB + SFR-351B = GFVTR2020K-351B

*GVF[°]/_R400~450-040C: CDX is 6.6

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Selection of Toolholder & Insert



Combination of Base-Holder & Blade

Toolholder Description (Stamped below)	Stock		Blade Description	Toolholder Description (Unit Description)		Example of installation (GFVS)	How to refer to the face grooving toolholder and blade
	R	L					
GFVS ^{R/L} 2020K-HB GFVT ^{R/L} 2020K-HB	●	●	SF ^{R/L} -351B	GFVS ^{R/L} 2020K	-351B		<p>Q : Though "GFVSR2525M-HC" is marked on the face grooving toolholder, the size of cutting dia. is unknown. How could it be found out?</p> <p>A : Take off the blade. Description of the blade is listed on the back of the blade.</p> <p>Using the description, check the description of the toolholder in the catalog.</p> <p>If "SFR-1001C" is integrated to "GFVSR2525M-HC", the description of the toolholder is "GVFSR2525M-1001C".</p>
			-352B	GFVT ^{R/L} 2020K	-352B		
			-501B		-501B		
			-502B		-502B		
			-701B		-701B		
			-702B		-702B		
GFVS ^{R/L} 2525M-HB GFVT ^{R/L} 2525M-HB	●	●	SF ^{R/L} -351B	GFVS ^{R/L} 2525M	-351B		
			-352B	GFVT ^{R/L} 2525M	-352B		
			-501B		-501B		
			-502B		-502B		
			-701B		-701B		
			-702B		-702B		
GFVS ^{R/L} 2525M-HC GFVT ^{R/L} 2525M-HC	●	●	SF ^{R/L} -501C	GFVS ^{R/L} 2525M	-501C		
			-502C	GFVT ^{R/L} 2525M	-502C		
			-701C		-701C		
			-702C		-702C		
			-1001C		-1001C		
			-1002C		-1002C		
			-1501C		-1501C		
			-1502C		-1502C		

· Right-hand Blade for Right-hand Toolholder, Left-hand Blade for Left-hand Toolholder.

· Installation of GFVT is also pursuing example of installation of GFVS.



Blade Dimensions

Shape	Description	Stock		Dimension (mm)				External dia. of the groove (mm)		Applicable Inserts	Applicable Toolholders	
		R	L	L	H	T	W	DAXN (min.)	DAXX (max.)			
	SF ^{R/L} -351B	●	●	30.5	11	4.7	2.0	35	50	GVF ^{R/L} 250~350-020B	GFS(S/T) ^{R/L} ○○○○□ -○○○B (Toolholder Stamp GFS(S/T) ^{R/L} ○○○○□-HB)	
	SF ^{R/L} -352B	●	●							GVF ^{R/L} 300-150BR		
	SF ^{R/L} -501B	●	●							GVF ^{R/L} 400~490-020B		
	SF ^{R/L} -502B	●	●							GVF ^{R/L} 400-200BR		
	SF ^{R/L} -701B	●	●							GVF ^{R/L} 250~350-020B		
	SF ^{R/L} -702B	●	●							GVF ^{R/L} 300-150BR		
	SF ^{R/L} -501C	●	●	35	15	7.5	2.8	50	70	GVF ^{R/L} 400~490-020B		GFS(S/T) ^{R/L} ○○○○□ -○○○C (Toolholder Stamp GFS(S/T) ^{R/L} ○○○○□-HC)
	SF ^{R/L} -502C	●	●							GVF ^{R/L} 400-200BR		
	SF ^{R/L} -701C	●	●							GVF ^{R/L} 250~350-020B		
	SF ^{R/L} -702C	●	●							GVF ^{R/L} 300-150BR		
	SF ^{R/L} -1001C	●	●							GVF ^{R/L} 350~450-040C		
	SF ^{R/L} -1002C	●	●							GVF ^{R/L} 500~600-040C		
SF ^{R/L} -1501C	●	●	35	20	7.5	2.8	70	100	GVF ^{R/L} 350~450-040C	GFS(S/T) ^{R/L} ○○○○□ -○○○C (Toolholder Stamp GFS(S/T) ^{R/L} ○○○○□-HC)		
SF ^{R/L} -1502C	●	●							GVF ^{R/L} 500~600-040C			
SF ^{R/L} -1001C	●	●							GVF ^{R/L} 350~450-040C			
SF ^{R/L} -1002C	●	●							GVF ^{R/L} 500~600-040C			
SF ^{R/L} -1501C	●	●							GVF ^{R/L} 350~450-040C			
SF ^{R/L} -1502C	●	●							GVF ^{R/L} 500~600-040C			

- Right-hand shown
- Right-hand Blade for Right-hand Toolholder, Left-hand Blade for Left-hand Toolholder.

External dia. of the groove of GFVS / GFVT

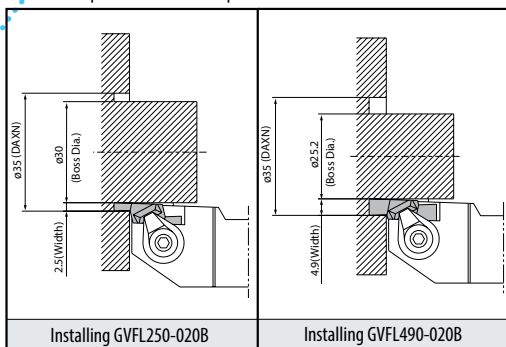
e.g. GFVS^{R/L}...-351B/352B
 (same as GFVS^{R/L}...-○○○B, ...-○○○C) **G129**
 GFVT^{R/L}...-○○○B, ...-○○○C) **G130**

Description	External dia. of the groove (mm)		Applicable inserts
	DAXN (min.)	DAXX (max.)	
GFVS ^{R/L} 2020K-351B	35	50	GVF ^{R/L} 250 ~ 350-...B
2525M-351B			GVF ^{R/L} 300-150BR
2020K-352B			GVF ^{R/L} 400 ~ 490-...B
2525M-352B			GVF ^{R/L} 400-200BR

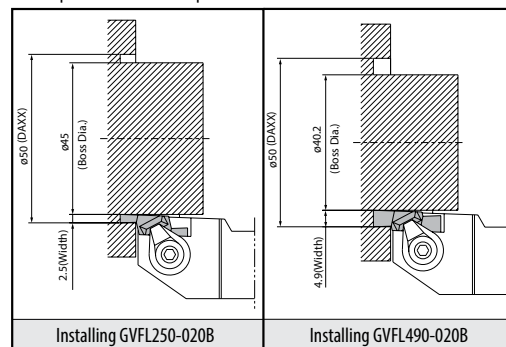
● It is possible to widen the groove to infinity ∞ when machining the initial groove within DAXN ~ DAXX and then widening to outer diameter.

- When machining the initial groove on the face at DAXN $\phi 35$
- When machining the initial groove on the face at DAXX $\phi 50$

If the initial groove is made smaller than this, the toolholder interferes with the workpiece. Boss Dia. depends on insert width.

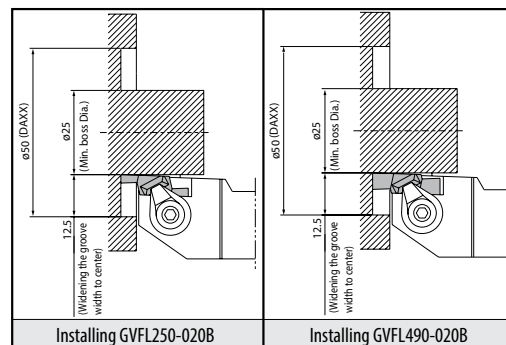
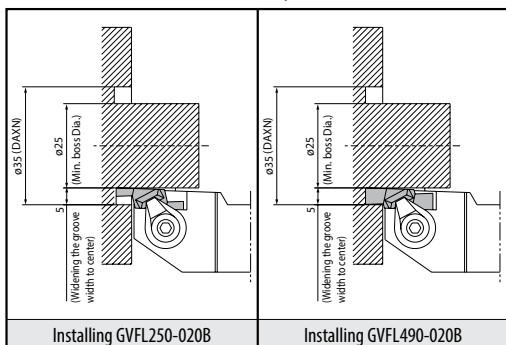


If the initial groove is made larger than this, the toolholder interferes with the workpiece. Boss Dia. depends on insert width.



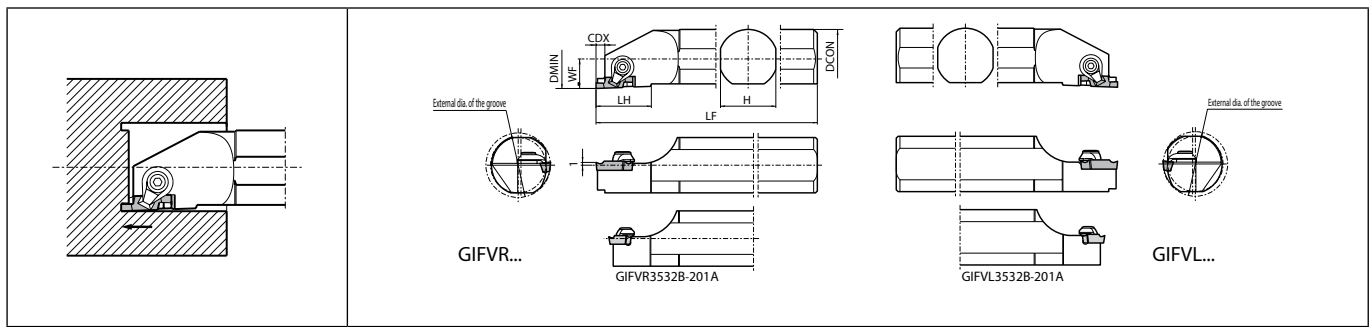
- When widening the groove width to inner diameter

$\phi 25$ Boss Dia. is the limitation regardless of insert width, even widening the groove width to the center from the initial groove at DAXN ($\phi 35$) or DAXX ($\phi 50$). The toolholder interferes with the workpiece when closer to the center.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GIFV (Face grooving)



Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		External dia. of the groove (mm)		Dimension (mm)										Spare parts				Applicable inserts G126
															Clamp set	Clamp set	Wrench	Wrench	
	R	L	DAXN (min.)	DAXX (max.)	DMIN	DCON	CDX	H	LH	LF	WF								
GIFV ^{R/L} 3532B-201A	●	●	35 (12)	∞	35	32	2.2	30	23	250	16	CPS-5V	-	-	FT-15	GVF ^{R/L} ...A(R)			
GIFV ^{R/L} 3532B-351B 3532B-352B 5032B-501B 5032B-502B	●	●	35 (25)	∞	35	4.6	30	30	250	16	-	CPS-6V	LW-3	-	-	GVF ^{R/L} 250 ~ 350...B(R)			
	●	●														50 (25)	∞	50	5.1	GVF^{R/L}400 ~ 490...B(R)
	●	●	50 (25)	∞	50	4.6														GVF^{R/L}250 ~ 350...B(R)
	●	●														50 (25)	∞	50	5.1
GIFV ^{R/L} 5032B-501C 5032B-502C	●	●	50 (25)	∞	50	32	6.6	30	35	250	16	-	CPS-8V	LW-4	-					GVF^{R/L}350 ~ 450-040C
	●	●														50 (25)	∞	50	32

CDX shows available grooving depth.

Standard toolholders are designed with the edge position 1.0 mm above the center.

External dia. of the groove depends on the application.

Applications	Description	Internal dia. of the groove (min.)	External dia. of the groove			Remarks	
			(min.)	DAXN [min.]	DAXX [max.]		(max.)
	GIFV ^{R/L} 3532B-201A	-	-	∞	∞	-	
	GIFV ^{R/L} 3532B-351B			35			
	GIFV ^{R/L} 3532B-352B			50			
	GIFV ^{R/L} 5032B-501B			50			70
	GIFV ^{R/L} 5032B-502B						
GIFV ^{R/L} 5032B-501C	50	70					
GIFV ^{R/L} 5032B-502C	50	70					
	GIFV ^{R/L} 3532B-201A	12	-	∞	∞	If $\phi D1 \geq 58-2CW$, the Face Grooving Dia. can be expanded to Internal dia. of the groove (min.) toward the Center. CW = Edge Width	
	GIFV ^{R/L} 3532B-351B			35			
	GIFV ^{R/L} 3532B-352B			50			
	GIFV ^{R/L} 5032B-501B			50			70
	GIFV ^{R/L} 5032B-502B						
GIFV ^{R/L} 5032B-501C	50	70					
GIFV ^{R/L} 5032B-502C	50	70					
	GIFV ^{R/L} 3532B-201A	12	-	∞	∞	-	
	GIFV ^{R/L} 3532B-351B			35			
	GIFV ^{R/L} 3532B-352B			50			
	GIFV ^{R/L} 5032B-501B			50			70
	GIFV ^{R/L} 5032B-502B						
GIFV ^{R/L} 5032B-501C	50	70					
GIFV ^{R/L} 5032B-502C	50	70					

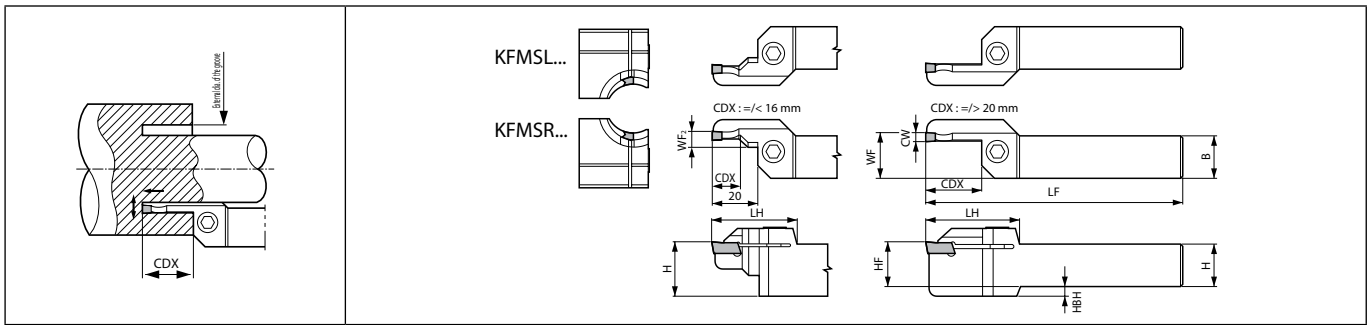
The value () of External dia. of the groove (max.) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX (It is possible to widen the groove to infinity ∞).

The value () of Internal dia. of the groove (min.) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



KFMS (Face grooving)



Toolholder dimensions

Description	Availability		External dia. of the groove (mm)		Dimension (mm)													Spare parts		Applicable inserts G134
					DAXN (min.)	DAXX (max.)	CDX	H	B	LH	HF	HBH	LF	WF	WF ₂	CW	Clamp bolt	Wrench		
	R	L																		
KFMS% 2020K2530-3 2020K3040-3 2020K4050-3 2020K5065-3 2020K6585-3 2020K85110-3 2020K110145-3	●		25	30	13	20	20	39	-	125	20.7	6.1	3	HH5X20	LW-4	FMM30-03 FMN3				
	●		30	40																
	●		40	50	22	20	41	20	-	125	20.7	6.1	3							
	●		50	65																
	●		65	85	25	20	44	20	5	-	-	-	3							
	●		85	110																
	●		110	145	25	25	44	25	-	150	25.7	-	4							
	●	●	25	30																
2525M2530-3	●	●	25	30	13	25	25	39	-	150	25.7	6.1	4	HH5X25	LW-4	FMM40-04 FMN4				
2525M3040-3	●	●	30	40																
2525M4050-3	●	●	40	50	22	25	41	25	-	150	25.7	-	4							
2525M5065-3	●	●	50	65																
2525M6585-3	●	●	65	85	25	25	44	25	-	150	25.7	-	4							
2525M85110-3	●	●	85	110																
2525M110145-3	●	●	110	145	25	25	44	25	-	150	25.7	-	4							
2525M110145-3	●	●	110	145																
KFMS% 2020K2535-4 2020K3550-4 2020K5070-4 2020K70100-4 2020K100150-4 2020K150220-4 2020K220800-4 2525M2535-4 2525M3550-4 2525M5070-4 2525M70100-4 2525M100150-4 2525M150220-4 2525M220800-4	●		25	35	12	20	20	39	-	125	20.7	7.1	4	HH5X20	LW-4	FMM40-04 FMN4				
	●		35	50																
	●		50	70	25	25	44	20	-	125	20.7	-	4							
	●		70	100																
	●		100	150	25	25	44	25	-	150	25.7	-	4							
	●		150	220																
	●		220	∞	12	25	25	39	-	150	25.7	7.1	4							
	●	●	25	35																
	2525M2535-4	●	●	25	35	20	25	44	25	-	150	25.7	-	4						
	2525M3550-4	●	●	35	50															
	2525M5070-4	●	●	50	70	25	25	44	25	-	150	25.7	-	4						
	2525M70100-4	●	●	70	100															
	2525M100150-4	●	●	100	150	25	25	44	25	-	150	25.7	-	4						
	2525M150220-4	●	●	150	220															
	2525M220800-4	●	●	220	∞	12	25	44	25	-	150	25.7	-	4						
	2525M220800-4	●	●	220	∞															



CDX shows available grooving depth.

External dia. of the groove : The diameter range of the initial groove.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Toolholder dimensions

Description	Availability		External dia. of the groove (mm)		Dimension (mm)										Spare parts		Applicable inserts ➔ G134
	R	L	DAXN (min.)	DAXX (max.)	CDX	H	B	LH	HF	HBH	LF	WF	WF ₂	CW			
KFMS ^{R/L} 2020K2535-5 2020K3550-5 2020K5075-5 2020K75115-5 2020K115180-5 2020K180235-5 2020K235800-5	●		25	35	20			39			-	125	20.7 (21.2)			HH5X20	LW-4
	●		35	50													
	●		50	75													
	●		75	115	25	20	20	44	5								
	●		115	180													
	●		180	235	25	25	25	51									
●		235	∞														
2525M2535-5 2525M3550-5 2525M5075-5 2525M75115-5 2525M115180-5 2525M180235-5 2525M235800-5	●	●	25	35	20			39								HH5X25	
	●	●	35	50													
	●	●	50	75													
	●	●	75	115	25	25	25	51									
	●	●	115	180													
	●	●	180	235	32												
●	●	235	∞														

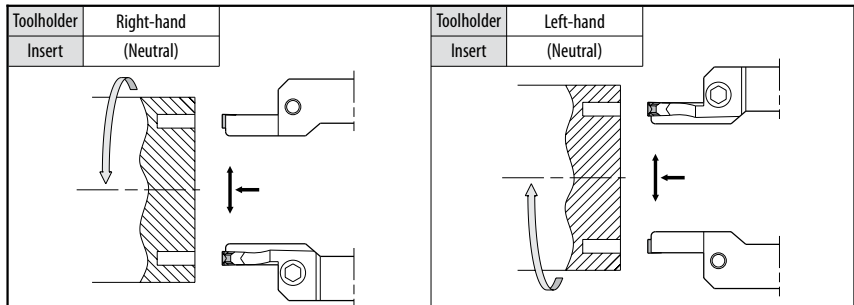
CDX shows available grooving depth.
 External dia. of the groove : The diameter range of the initial groove.
 For KFMS^{R/L}...-5 toolholder can hold a 6 mm width insert. () value shows the dimension of a 6mm width insert.

G



Grooving

Selection of Toolholder & Insert



Limit of Turning toward Center

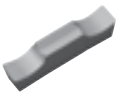
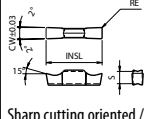

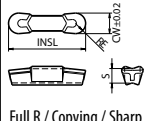

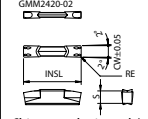
Turning towards the Center causes the toolholder to interfere with the groove wall depending on the initial cut's diameter.

Description	DMIN ₂			
	25	26	27	28 and over
KFMS ^{R/L} 2020K2530-3				
KFMS ^{R/L} 2525M2530-3	4	2	0	0
KFMS ^{R/L} 2020K2535-4				
KFMS ^{R/L} 2525M2535-4	6	3	0	(No remaining Boss)
KFMS ^{R/L} 2020K2535-5	7	4	1	
KFMS ^{R/L} 2525M2535-5	*(5)	*(2)	*(0)	

e.g.) KFMSR 2525M2530-3 with ø25 as first cut towards the center, it will cause a rubbing with the toolholder cartridge if ød is 4.0mm.
 *() value shows the Dimension using FMM60-04 Insert.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GMM/GMG/GMGA

		Carbon steel / Alloy steel		Stainless steel		Cast iron		Non-ferrous metals		Titanium alloy		Hard materials (~ 40HRC)		Hard materials (40HRC ~)		
Insert	Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide				Applicable toolholder G138			
			CW	S	RE	INSL	CW min.	CW max.	CVD		PVD			Cermet		
									CR9025	PR905	PR915	PR930			KW10	TN90
	 Sharp cutting oriented / Precision class (ground chipbreaker)	2	8	5.5	0.5	30	-0.03	+0.03	●	●	●	●	●	●	●	KFMS%/...-8
	 Full R / Copying / Sharp cutting oriented / Precision class	2	8	5.5	4	30	-0.02	+0.02						●		
	 Chip control oriented / M class	2	8	5.5	0.8	30	-0.05	+0.05	●	●	●	●	●	●	●	

If using a full-R insert with KFMS-8 toolholder, you need to modify the corner of insert adapter of toolholder.

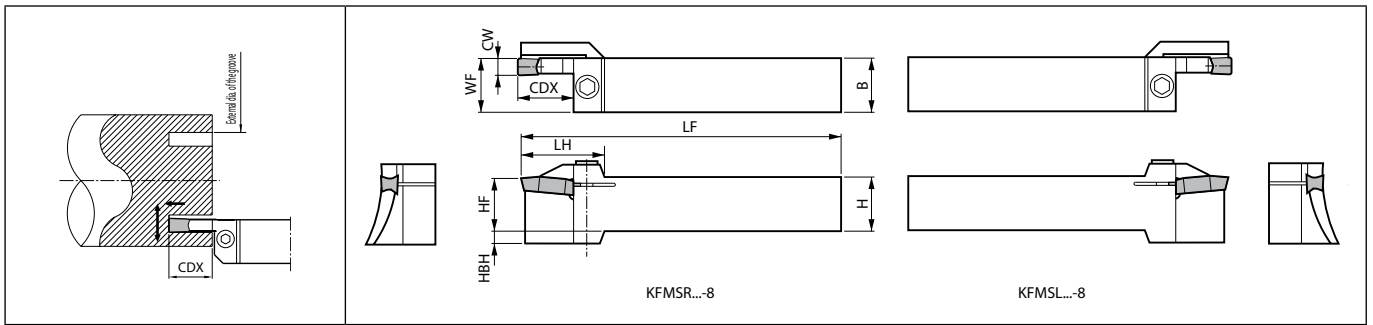
Recommended cutting conditions G143



Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KFMS-8 (Face grooving)



Toolholder dimensions

Description	Availability		External dia. of the groove (mm)		Dimension (mm)										Spare parts		Applicable inserts G137	
															Clamp bolt	Wrench		
	R	L	DAXN (min.)	DAXX (max.)	CDX	H	B	LH	HF	HBH	LF	WF	CW					
KFMS [®] / 2525M5464-8 2525M6382-8 2525M80115-8 2525M105160-8 2525M155510-8 3232P155510-8	●	●	54 (0)	64 (∞)	25	25	25	41	25	6	150	26	8			GMG8030-050MG GMGA8030-400R GMM8030-080MW		
	●	●	63 (0)	82 (∞)													40	2.4
	●	●	80 (0)	115 (∞)														
	●	●	105 (0)	160 (∞)				43	32	-	170	33						
	●	●	155 (0)	510 (∞)														
	●							32	32									

CDX shows available grooving depth.

The value () of External dia. of the groove (DAXX) is the maximum outer diameter value after the initial groove between DAXN ~ DAXX. (It is possible to widen the groove to infinity ∞).

The value () of External dia. of the groove (DAXN) is the minimum diameter of the boss which remains in the center when widening the groove width to a smaller value after the initial groove between DAXN ~ DAXX.

G

Grooving

External


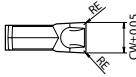
Internal

Face

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

G138

FTK

Insert		Description		No. of edges	Dimension (mm)		Tolerance (mm)		Carbide			Applicable toolholder ➔ G140
					CW	RE	CW min.	CW max.	CR9025	PVD	RW10	
									●	●		P
									●	●		M
									●	●		K
									●	●		N
									●	●		S
									○	○		H
 	FTK 4	1	4	0.25	-0.05	+0.05	●	●			KFTB%...-4S	
	FTK 5	1	5	0.25	-0.05	+0.05	●	●			KFTB%...-5S	

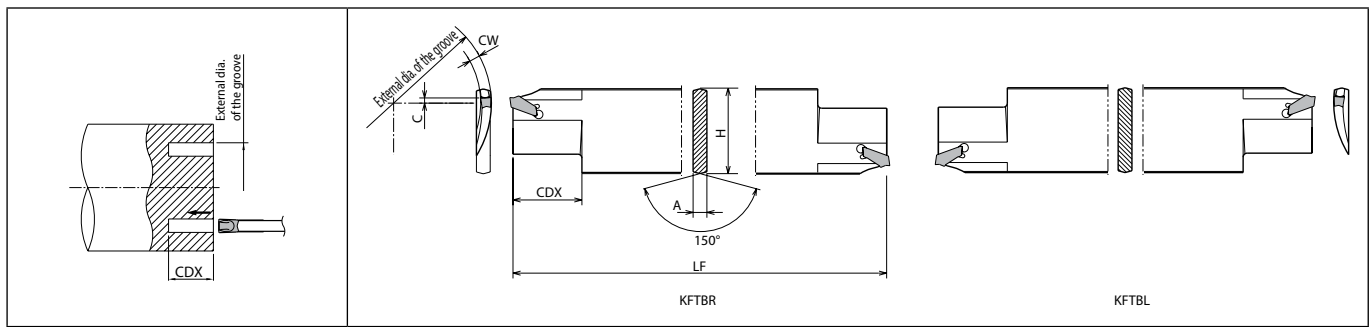
Recommended cutting conditions ➔ G146



Grooving

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KFTB (Face grooving)



Toolholder dimensions

Description	Availability		External dia. of the groove (mm)		Dimension (mm)						Applicable inserts G139	Applicable tool block H62, H63		
	R	L	DAXN (min.)	DAXX (max.)	CDX	H	A	C	LF	CW				
KFTB% 65100-4S 90150-4S 150250-4S 250800-4S	●	●	65	100	25	32	5.2	0	150	4	FTK4	KPKTB...32JCT KTKTB...32 KTKTBF...32		
	●	●	90	150	30									
	●	●	140	250	30									
	●	●	230	∞	30									
KFTB% 90150-5S 150250-5S 250800-5S	●	●	90	150	30	32	5.2	0	150	5			FTK5	KPKTB...32JCT KTKTB...32 KTKTBF...32
	●	●	150	250	32									
	●	●	250	∞	38									
	●	●	250	∞	38									

CDX shows available grooving depth.

External dia. of the groove : The diameter range of the initial groove.

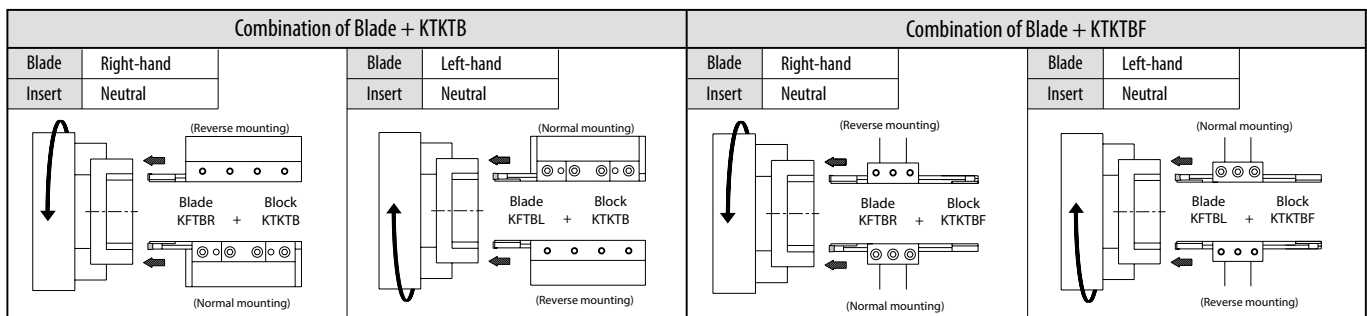
The insert has Self-Clamping system and it is not suitable for tight tolerance grooves (tolerance±0.05mm).

Lightly tap an Insert with a Plastic hammer. (End of insert does not touch toolholder.)

KFTB% 65100-4S toolholder is designed with the edge position 4 mm above the Center.

Dimension H shows virtual apex distance.

Selection of Blade and Insert



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GBA inserts - ground chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)												Remarks
	MEGACOAT	MEGACOAT NANO	MEGACOAT NANO EX		MEGACOAT cermet	Cermet		PVD coated carbide		Carbide	CBN	PCD	
	PR1215	PR1625	PR2015	PR2025	PV7040	TN620	TN90	PR930	PR905	KW10	KBN510 KBN525	KPD001 (KPD010)	
Carbon steel	☆ 80~200	☆ 80~180	★ 80~200	★ 80~180	☆ 150~240	★ 80~220	☆ 150~220	☆ 80~180	-	-	-	-	
Alloy steel	☆ 80~180	☆ 80~160	★ 80~180	☆ 80~160	☆ 130~220	★ 80~200	☆ 130~200	☆ 80~160	-	-	-	-	
Stainless steel	☆ 60~150	☆ 60~130	☆ 60~150	★ 60~130	-	-	☆ 70~150	☆ 60~130	-	-	-	-	
Cast iron	-	-	★ 80~180	-	-	-	-	-	☆ 80~180	☆ 60~120	★ 150~400	-	
Aluminum alloys	-	-	-	-	-	-	-	-	-	★ 150~400	-	★ 150~2,000	
Brass	-	-	-	-	-	-	-	-	-	★ 150~300	-	★ 200~800	
Hard materials	-	-	-	-	-	-	-	-	-	-	★ 80~120	-	

★ :1st recommendation ☆ :2nd recommendation

Workpiece material	(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)					Remarks
	GBA○○○P/L 033~120...	GBA○○○P/L 125~225...	GBA○○○P/L 230~325...	GBA○○○P/L 330~350...	GBA○○○P/L 400~480...	
Carbon steel	(1) 0.03~0.08 (2) Not recom. (3) Not recom.	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.8	Coolant
Alloy steel	(1) 0.03~0.07 (2) Not recom. (3) Not recom.	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.09 (2) 0.05~0.09 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.8	
Stainless steel	(1) 0.03~0.07 (2) Not recom. (3) Not recom.	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.09 (2) 0.05~0.09 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.8	
Cast iron	(1) 0.03~0.08 (2) Not recom. (3) Not recom.	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.8	
Aluminum alloys	(1) 0.05~0.12 (2) Not recom. (3) Not recom.	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	
Brass	(1) 0.05~0.12 (2) Not recom. (3) Not recom.	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	
Hard materials	-	(1) 0.02~0.05 (2) Not recom. (3) Not recom.	(1) 0.03~0.07 (2) 0.01~0.04 (3) Max. 0.1	-	-	

* Above cutting condition is for external grooving. Set both cutting speed and feed 10% lower for internal grooving.

GBA inserts - GM chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)					(1) f for grooving (mm/rev) (2) f for turning (mm/rev) (3) ap for turning (mm)					Remarks
	MEGACOAT	MEGACOAT NANO	MEGACOAT NANO EX		Cermet	GBA43 [°] /L 140-010GM	GBA43 [°] /L 150-020GM	GBA43 [°] /L 175-020GM~ 230-020GM	GBA43 [°] /L 250-030GM~ 350-030GM	GBA43 [°] /L 400-040GM	
	PR1215	PR1625	PR2015	PR2025	TN620						
Carbon steel	☆ 80~220	☆ 80~220	★ 80~220	★ 80~220	★ 80~240	(1) 0.03~0.1 (2) 0.03~0.08 (3) Max. 0.2	(1) 0.03~0.12 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.12 (2) 0.03~0.09 (3) Max. 0.3	(1) 0.04~0.15 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.1 (3) Max. 0.8	Coolant
Alloy steel	☆ 80~200	☆ 80~200	★ 80~200	☆ 80~200	★ 80~220	(1) 0.03~0.1 (2) 0.03~0.08 (3) Max. 0.2	(1) 0.03~0.12 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.12 (2) 0.03~0.09 (3) Max. 0.3	(1) 0.04~0.15 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.1 (3) Max. 0.8	
Stainless steel	☆ 60~150	☆ 60~150	☆ 60~150	★ 60~150	-	(1) 0.03~0.1 (2) 0.03~0.08 (3) Max. 0.2	(1) 0.03~0.1 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.1 (2) 0.03~0.09 (3) Max. 0.3	(1) 0.04~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.04~0.12 (2) 0.05~0.1 (3) Max. 0.8	
Cast iron	-	-	★ 80~200	-	-	(1) 0.03~0.1 (2) 0.03~0.08 (3) Max. 0.2	(1) 0.03~0.12 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.12 (2) 0.03~0.09 (3) Max. 0.3	(1) 0.04~0.15 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.1 (3) Max. 0.8	

* Above cutting condition is for external grooving. Set both cutting speed and feed 20% lower for internal grooving.

★ :1st recommendation ☆ :2nd recommendation



Grooving

Recommended cutting conditions

GBF

Workpiece material	Recommended insert grades (Vc: m/min)			(1) f for grooving (mm/rev)				Remarks
	MEGACOAT	MEGACOAT NANO	Carbide	(2) f for turning (mm/rev)				
	PR1215	PR1535	GW15	(3) ap for turning (mm)				
				GBF32 [®] /L 025 – 053	GBF32 [®] /L 065 – 095	GBF32 [®] /L 100 – 145	GBF3 [®] /L 150 – 300	
Carbon steel	★ 80~180	☆ 70~160	-	(1) 0.01~0.05	(1) 0.02~0.07	(1) 0.03~0.08	(1) 0.03~0.08	
				(2) Not recom.	(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Alloy steel	★ 80~180	☆ 70~160	-	(1) 0.01~0.04	(1) 0.02~0.06	(1) 0.03~0.07	(1) 0.03~0.07	
				(2) Not recom.	(2) Not recom.	(2) 0.02~0.05	(2) 0.02~0.05	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Stainless steel	☆ 60~130	★ 50~120	-	(1) 0.01~0.04	(1) 0.02~0.06	(1) 0.03~0.07	(1) 0.03~0.07	
				(2) Not recom.	(2) Not recom.	(2) 0.02~0.05	(2) 0.02~0.05	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Cast iron	-	-	★ 60~100	(1) 0.01~0.05	(1) 0.02~0.07	(1) 0.03~0.08	(1) 0.03~0.08	
				(2) Not recom.	(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Aluminum	-	-	★ 150~400	(1) 0.01~0.05	(1) 0.02~0.07	(1) 0.03~0.08	(1) 0.03~0.08	
				(2) Not recom.	(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Brass	-	-	★ 150~300	(1) 0.01~0.04	(1) 0.02~0.06	(1) 0.03~0.07	(1) 0.03~0.07	
				(2) Not recom.	(2) Not recom.	(2) 0.02~0.05	(2) 0.02~0.05	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	

★:1st recommendation ☆:2nd recommendation

GBF-000F inserts (RE=0.00)

Workpiece Material	Recommended insert grades (Vc: m/min)			(1) f for grooving (mm/rev)				Remarks
	MEGACOAT	MEGACOAT NANO	Carbide	(2) f for turning (mm/rev)				
	PR1215	PR1535	GW15	(3) ap for turning (mm)				
				GBF32 [®] /L 025 ~ 053 - 000F	GBF32 [®] /L 065 ~ 095 - 000F	GBF32 [®] /L 100 ~ 145 - 000F	GBF32 [®] /L 150 ~ 200 - 000F	
Carbon steel	★ 80 ~ 180	☆ 70 ~ 160	-	(1) 0.005~0.03	(1) 0.01~0.04	(1) 0.01~0.05	(1) 0.01~0.05	
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.04	(2) 0.01~0.04	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Alloy steel	★ 80 ~ 180	☆ 70 ~ 160	-	(1) 0.005~0.025	(1) 0.01~0.03	(1) 0.01~0.04	(1) 0.01~0.04	
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.03	(2) 0.01~0.03	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Stainless steel	☆ 60 ~ 130	★ 50 ~ 120	-	(1) 0.005~0.02	(1) 0.01~0.025	(1) 0.01~0.03	(1) 0.01~0.03	
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.025	(2) 0.01~0.025	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Cast iron	-	-	★ 60 ~ 100	(1) 0.005~0.03	(1) 0.01~0.04	(1) 0.01~0.05	(1) 0.01~0.05	
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.04	(2) 0.01~0.04	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Aluminum	-	-	★ 150 ~ 400	(1) 0.005~0.03	(1) 0.01~0.04	(1) 0.01~0.05	(1) 0.01~0.05	
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.04	(2) 0.01~0.04	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	
Brass	-	-	★ 150 ~ 300	(1) 0.01~0.03	(1) 0.01~0.04	(1) 0.01~0.05	(1) 0.01~0.05	
				(2) Not recom.	(2) Not recom.	(2) 0.01~0.04	(2) 0.01~0.04	
				(3) Not recom.	(3) Not recom.	(3) Max. 0.2	(3) Max. 0.2	

★:1st recommendation ☆:2nd recommendation

GBF-GL inserts

Workpiece Material	Recommended insert grades (Vc: m/min)		(1) f for grooving (mm/rev)				Remarks
	MEGACOAT	MEGACOAT NANO	(2) f for turning (mm/rev)				
	PR1215	PR1535	(3) ap for turning (mm)				
			GBF32R075 - 005GL	GBF32R095 - 100-005GL	GBF32R150 - 200-010GL	GBF32R300 - 010GL	
Carbon Steel	★ 80 ~ 180	☆ 70 ~ 160	(1) 0.02~0.07	(1) 0.03~0.08	(1) 0.03~0.08	(1) 0.04~0.1	
			(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	(2) 0.04~0.08	
			(3) Not recom.	(3) Max. 0.2	(3) Max. 0.3	(3) Max. 0.5	
Alloy Steel	★ 80 ~ 180	☆ 70 ~ 160	(1) 0.02~0.06	(1) 0.03~0.07	(1) 0.03~0.07	(1) 0.04~0.09	
			(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	(2) 0.04~0.08	
			(3) Not recom.	(3) Max. 0.2	(3) Max. 0.3	(3) Max. 0.5	
Stainless Steel	☆ 60 ~ 130	★ 50 ~ 120	(1) 0.02~0.06	(1) 0.03~0.07	(1) 0.03~0.07	(1) 0.04~0.09	
			(2) Not recom.	(2) 0.03~0.06	(2) 0.03~0.06	(2) 0.04~0.08	
			(3) Not recom.	(3) Max. 0.2	(3) Max. 0.3	(3) Max. 0.5	

★:1st recommendation ☆:2nd recommendation

G

Grooving

GMG / GMM / GMN / GMGA

Workpiece material	Recommended insert grades (Vc: m/min)						Grooving				Turning				Remarks
	Cermet	CVD coated carbide	PVD coated carbide			Carbide	Edge width (mm)				Edge width (mm)				
			PR915	PR930	PR905		KW10	2.0~3.0	4.0	5.0	6.0 / 8.0	2.0~3.0	4.0	5.0		6.0 / 8.0
	TN90	CR9025	PR915	PR930	PR905	KW10		f (mm/rev)				f (mm/rev)			
Carbon steel	☆ 100~220	☆ 80~200	☆ 80~200	★ 80~200	-	-	0.05~0.15	0.10~0.25	0.15~0.35	0.20~0.35	0.10~0.20	0.15~0.30	0.20~0.40	0.25~0.40	
Alloy steel	☆ 80~200	☆ 70~180	☆ 70~180	★ 70~180	-	-	0.05~0.15	0.10~0.25	0.15~0.35	0.20~0.35	0.10~0.20	0.15~0.30	0.20~0.40	0.25~0.40	
Stainless steel	☆ 70~160	☆ 60~150	★ 60~150	☆ 60~150	-	-	0.05~0.15	0.10~0.20	0.15~0.35	0.20~0.35	0.10~0.20	0.15~0.25	0.20~0.40	0.25~0.40	
Cast iron	-	-	-	-	★ 100~200	☆ 70~150	0.05~0.20	0.10~0.30	0.15~0.40	0.20~0.40	0.10~0.25	0.15~0.35	0.20~0.45	0.25~0.45	
Aluminum alloys	-	-	-	-	-	★ 200~500	0.05~0.20	0.08~0.25	0.10~0.25	0.12~0.30	0.10~0.20	0.10~0.25	0.10~0.25	0.15~0.30	
Brass	-	-	-	-	-	★ 100~200	0.05~0.15	0.08~0.20	0.10~0.25	0.12~0.30	0.10~0.20	0.10~0.25	0.10~0.25	0.15~0.30	

★:1st recommendation ☆:2nd recommendation

Refer to the notes below for turning conditions

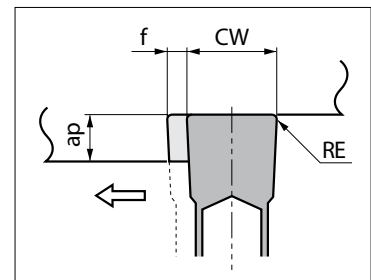
1. When using KGM toolholder

	Recommended cutting conditions	
ap (max.) (mm)	80% or under of edge width	ap ≤ 0.8CW
f (max.) (mm/rev)	10% or under of edge width	f ≤ 0.1CW

(ap) x (f) shall not exceed 1/2 of ap (max.) x f (max.)

Load(mm ²) \ Edge width(mm)	2.0~2.5	3.0	4.0	5.0	6.0	8.0
ap x f	~0.20	~0.36	~0.64	~1.00	~1.44	~2.56

$$ap \times f \leq \frac{1}{2} \times 0.8CW \times 0.1CW = 0.04CW^2$$



2. When using KGM-T toolholder (Deep grooving type) - use 90% of KGM conditions

3. When using KGMM / KGMS / KFMS-8 Toolholder

	Recommended cutting conditions	
ap (max.) (mm)	50% or under of edge width	ap ≤ 0.5CW
f (max.) (mm/rev)	4% or under of edge width	f ≤ 0.04CW

(ap) x (f) should be as follows. (50% or under of KGM)

Load(mm ²) \ Edge width(mm)	2.0~2.5	3.0	4.0	5.0	6.0	8.0
ap x f	~0.10	~0.18	~0.32	~0.50	~0.72	~1.28

$$ap \times f \leq 0.02CW^2$$

4. When using KIGM toolholder

	Recommended cutting conditions	
ap (max.) (mm)	70% or under of Edge Width	ap ≤ 0.7CW
f (max.) (mm/rev)	8% or under of Edge Width	f ≤ 0.08CW

(ap) x (f) should be as follows: 70% or under of KGM

Load(mm ²) \ Edge width(mm)	3.0	4.0	5.0
ap x f	~0.25	~0.44	~0.70

$$ap \times f \leq 0.04CW^2$$

GMG / GMM / GMGA 8030 - face grooving

Workpiece material	Recommended insert grades (Vc: m/min)						Face grooving	Turning	Remarks
	Cermet	CVD coated carbide	PVD coated carbide			Carbide	Edge width (mm)	Edge width (mm)	
			PR915	PR930	PR905		KW10	8.0		8.0
TN90	CR9025	PR915	PR930	PR905	KW10	f (mm/rev)	f (mm/rev)		
Carbon steel	☆ 100~220	☆ 80~160	☆ 80~160	★ 80~160	-	-	0.1~0.2	0.1~0.25	
Alloy steel	☆ 80~160	☆ 70~160	☆ 70~160	★ 70~160	-	-	0.1~0.2	0.1~0.25	
Stainless steel	☆ 70~140	☆ 60~130	★ 60~130	☆ 60~130	-	-	0.1~0.2	0.1~0.25	
Cast iron	-	-	-	-	★ 80~180	☆ 70~130	0.1~0.3	0.1~0.35	
Aluminum alloys	-	-	-	-	-	★ 200~300	0.08~0.25	0.08~0.30	
Brass	-	-	-	-	-	★ 100~150	0.08~0.25	0.08~0.30	

★:1st recommendation ☆:2nd recommendation

Recommended cutting conditions

EZG

Workpiece material	Insert grades (Vc: m/min)		EZGR030030...S	EZG%/.040040-... EZG%/.050050-... EZG%/.040040-...S EZG%/.050050-...S	EZG%/.060060-... EZG%/.070070-... EZG%/.080070-... EZG%/.060060-...S EZG%/.070070-...S EZG%/.080070-...S	Remarks
	MEGACOAT	Carbide				
	PR1225	GW05				
Carbon steel / Alloy steel	★ 30~100	-	~0.02	~0.03	~0.05	Coolant
Stainless steel	★ 30~80	-	~0.01	~0.02	~0.03	
Non-ferrous metals	-	★ ~300	-	~0.05	~0.08	

★:1st recommendation

VNG

Workpiece material	Recommended insert grades (Vc: m/min)			VNG04 VNG05	VNG06 VNG07	Remarks
	MEGACOAT	PVD Coated carbide	Carbide			
	PR1225	PR930	KW10			
Carbon steel / Alloy steel	★ 30~100	☆ 30~100		~0.03	~0.05	Coolant
Stainless steel	★ 30~80	☆ 30~80		~0.02	~0.03	
Non-ferrous metals			★ ~300	~0.05	~0.08	

★:1st recommendation ☆:2nd recommendation

SIGC

Workpiece material	Recommended insert grades (Vc: m/min)		(1) f for grooving (mm/rev)			Remarks
	MEGACOAT NANO PLUS	MEGACOAT NANO	(2) f for turning (mm/rev)			
	PR1725	PR1535	(3) ap for turning (mm)			
			GC08%/.L...	GC10%/.L, GC12%/.L 100 ~ 200...	GC10%/.L, GC12%/.L 250 ~ 300...	
Carbon steel	★ 50~80	☆ 50~80	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	Coolant
			(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
			(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Alloy steel	★ 50~80	☆ 50~80	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	
			(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
			(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Stainless steel	☆ 50~80	★ 50~80	(1) 0.01~0.03	(1) 0.01~0.03	(1) 0.01~0.03	
			(2) 0.01~0.03	(2) 0.01~0.03	(2) 0.01~0.03	
			(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	

★:1st recommendation ☆:2nd recommendation

Ground chipbreaker: GE^{R/L}...A(R), GE^{R/L}...B(R)

Workpiece material	Recommended insert grades (Vc: m/min)				(1) f for grooving (mm/rev)			Remarks
	MEGACOAT	MEGACOAT NANO EX	Carbide	Cermet	(2) f for turning (mm/rev)			
	PR1225	PR2025	KW10	TN6020	(3) ap for turning (mm)			
					GE ^{R/L} 100~200-010A 100~200-100AR	GE ^{R/L} 100~200-010B 100~200-100BR	GE ^{R/L} 250~300-020B	
Carbon steel	☆ 50~80	★ 50~80	-	☆ 50~80	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	Coolant
					(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
					(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Alloy steel	☆ 50~80	★ 50~80	-	☆ 50~80	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	Coolant
					(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
					(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Stainless steel	☆ 50~80	★ 50~80	-	-	(1) 0.01~0.03	(1) 0.01~0.03	(1) 0.01~0.03	Coolant
					(2) 0.01~0.03	(2) 0.01~0.03	(2) 0.01~0.03	
					(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Cast iron	-	-	★ 50~80	-	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	Coolant
					(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
					(3) Max. 0.05	(3) Max. 0.05	(3) Max. 0.1	
Aluminum	-	-	★ 50~100	-	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	Coolant
					(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
					(3) Max. 0.1	(3) Max. 0.1	(3) Max. 0.2	
Brass	-	-	★ 50~100	-	(1) 0.01~0.03	(1) 0.02~0.04	(1) 0.02~0.04	Coolant
					(2) 0.01~0.03	(2) 0.02~0.04	(2) 0.02~0.04	
					(3) Max. 0.1	(3) Max. 0.1	(3) Max. 0.2	

* Use PVD coated grade or carbide for turning with edge width 1mm. (GE^{R/L} 100-005A / 100-005B) ★:1st recommendation ☆:2nd recommendation

Ground chipbreaker: GE^{R/L}...C(R), GE^{R/L}...D(R), GE^{R/L}...E

Workpiece material	Recommended insert grades (Vc: m/min)				(1) f for grooving (mm/rev)						Remarks	
	MEGACOAT	MEGACOAT NANO EX	Carbide	Cermet	(2) f for turning (mm/rev)							
	PR1225	PR2025	GW15	TN6020	(3) ap for turning (mm)							
					GE ^{R/L} 100~200-010C 200-100CR	GE ^{R/L} 250~350-020C 250~300-150CR						
GE ^{R/L} 100~145-010D					GE ^{R/L} 150~195-010D	GE ^{R/L} 200~280-020D 200-100DR		GE ^{R/L} 300~400-020D 300-150DR		GE ^{R/L} 350~430-020E	GE ^{R/L} 450~500-020E	
Carbon steel	☆ 60~140	★ 60~140	-	☆ 120~180	(1) 0.03~0.08	(1) 0.03~0.08	(1) 0.04~0.09	(1) 0.04~0.09	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.12	Coolant
					(2) 0.03~0.08	(2) 0.03~0.08	(2) 0.04~0.09	(2) 0.04~0.09	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1	
					(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	
Alloy steel	☆ 60~120	★ 60~120	-	☆ 100~160	(1) 0.03~0.07	(1) 0.03~0.07	(1) 0.04~0.08	(1) 0.04~0.08	(1) 0.05~0.1	(1) 0.05~0.1	(1) 0.05~0.1	Coolant
					(2) 0.03~0.1	(2) 0.03~0.1	(2) 0.04~0.08	(2) 0.04~0.08	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1	
					(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	
Stainless steel	☆ 60~110	★ 60~110	-	☆ 70~130	(1) 0.03~0.07	(1) 0.03~0.07	(1) 0.04~0.08	(1) 0.04~0.08	(1) 0.05~0.1	(1) 0.05~0.1	(1) 0.05~0.1	Coolant
					(2) 0.03~0.1	(2) 0.03~0.1	(2) 0.04~0.08	(2) 0.04~0.08	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1	
					(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	
Cast iron	-	-	★ 60~100	-	(1) 0.03~0.08	(1) 0.03~0.08	(1) 0.04~0.09	(1) 0.04~0.09	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.12	Coolant
					(2) 0.03~0.08	(2) 0.03~0.08	(2) 0.04~0.09	(2) 0.04~0.09	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1	
					(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.3	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	
Aluminum	-	-	★ 150~300	-	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.15	(1) 0.05~0.15	(1) 0.08~0.15	(1) 0.08~0.15	(1) 0.08~0.15	Coolant
					(2) 0.05~0.12	(2) 0.05~0.12	(2) 0.05~0.15	(2) 0.05~0.15	(2) 0.08~0.15	(2) 0.08~0.15	(2) 0.08~0.15	
					(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.8	(3) Max. 0.8	(3) Max. 0.8	
Brass	-	-	★ 100~250	-	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.15	(1) 0.05~0.15	(1) 0.08~0.15	(1) 0.08~0.15	(1) 0.08~0.15	Coolant
					(2) 0.05~0.12	(2) 0.05~0.12	(2) 0.05~0.15	(2) 0.05~0.15	(2) 0.08~0.15	(2) 0.08~0.15	(2) 0.08~0.15	
					(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.5	(3) Max. 0.8	(3) Max. 0.8	(3) Max. 0.8	

* Use PVD coated grade or carbide for turning with edge width 1mm. (GE^{R/L} 100-010C / 100-010D / 100-010E) ★:1st recommendation ☆:2nd recommendation

Molded chipbreakers: GER...CM, GER...DM, GER...EM

Workpiece material	Recommended insert grades (Vc: m/min)				(1) f for grooving (mm/rev)						Remarks
	MEGACOAT	MEGACOAT NANO EX	Carbide	Cermet	(2) f for turning (mm/rev)						
	PR1225	PR2025	GW15	TN6020	(3) ap for turning (mm)						
					GER 150~200-010CM	GER 250~350-020CM					
GER 150~200-010DM						GER 230~250-020DM	GER 300~400-020DM				
GER 150~200-010EM			GER 250~300-020EM	GER 350~400-020EM	GER 450~500-020EM						
Carbon steel	☆ 60~160	★ 60~160	-	-	(1) 0.03~0.1	(1) 0.03~0.12	(1) 0.04~0.12	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.12	Coolant
					(2) 0.03~0.1	(2) 0.03~0.1	(2) 0.04~0.1	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1	
					(3) Max. 1.0	(3) Max. 1.5	(3) Max. 1.5	(3) Max. 1.5	(3) Max. 1.5	(3) Max. 1.5	
Alloy steel	☆ 60~140	★ 60~140	-	-	(1) 0.03~0.1	(1) 0.03~0.1	(1) 0.04~0.12	(1) 0.05~0.12	(1) 0.05~0.12	(1) 0.05~0.12	Coolant
					(2) 0.03~0.1	(2) 0.03~0.1	(2) 0.04~0.1	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1	
					(3) Max. 1.0	(3) Max. 1.5	(3) Max. 1.5	(3) Max. 1.5	(3) Max. 1.5	(3) Max. 1.5	
Stainless steel	☆ 60~110	★ 60~110	-	-	(1) 0.03~0.08	(1) 0.03~0.08	(1) 0.04~0.08	(1) 0.05~0.1	(1) 0.05~0.1	(1) 0.05~0.1	Coolant
					(2) 0.03~0.1	(2) 0.03~0.1	(2) 0.04~0.1	(2) 0.05~0.1	(2) 0.05~0.1	(2) 0.05~0.1	
					(3) Max. 1.0	(3) Max. 1.5	(3) Max. 1.5	(3) Max. 1.5	(3) Max. 1.5	(3) Max. 1.5	

★: 1st recommendation ☆: 2nd recommendation



GV Inserts - ground chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)						f (mm/rev) = (1) grooving, (2) turning ap (mm) = (3) turning						Remarks	
	Cermet			MEGA COAT	PVD coated carbide	Carbide	GV ⁹ /L 100~300...SS 100~300...S	GV ⁹ /L 145~185...B	GV ⁹ /L 200~280...B	GV ⁹ /L 300~400...B				
	TN90	TC40	TC60	PR1225	PR930	KW10	GV ⁹ /L 100~340...A 200~300...AR		GV ⁹ /L 200-100BR	GV ⁹ /L 300-150BR	GV ⁹ /L 280~300...C	GV ⁹ /L 340~400...C		GV ⁹ /L 430~500...C
Carbon steel	☆ 120~180	☆ 120~180	☆ 80~120	★ 80~160	☆ 80~140	-	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	
Alloy steel	☆ 100~160	☆ 100~160	☆ 80~100	★ 80~140	☆ 80~120	-	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	
Stainless steel	☆ 70~130	-	☆ 60~100	★ 60~130	☆ 60~110	-	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	
Cast iron	-	-	-	-	-	★ 60~100	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	
Aluminum alloys	-	-	-	-	-	★ 150~300	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	
Brass	-	-	-	-	-	★ 100~250	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	

* Use MEGACOAT, PVD coated carbide or carbide for turning with edge width 1mm (GV⁹/L 100SS / 100S / 100A)

★ :1st recommendation ☆ :2nd recommendation

GVF Inserts - ground chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)						f (mm/rev) = (1) grooving, (2) turning ap (mm) = (3) turning					Remarks
	Cermet			MEGACOAT	PVD coated carbide	Carbide	GVF ⁹ /L 200~340...A	GVF ⁹ /L 250~350...B	GVF ⁹ /L 400~490...B	GVF ⁹ /L 350~450...C	GVF ⁹ /L 500~600...C	
	TN90	TC40	TC60	PR1225	PR930	KW10	GVF ⁹ /L 200-100AR ~300-150AR	GVF ⁹ /L 300-150BR	GVF ⁹ /L 400-200BR			
Carbon steel	☆ 150~220	☆ 150~220	☆ 100~150	★ 80~200	☆ 80~180	-	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.8	
Alloy steel	☆ 130~200	☆ 130~200	☆ 80~130	★ 80~180	☆ 80~160	-	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.09 (2) 0.05~0.09 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.8	
Stainless steel	☆ 70~150	-	☆ 60~100	★ 80~150	☆ 60~130	-	(1) 0.03~0.07 (2) 0.03~0.1 (3) Max. 0.3	(1) 0.04~0.08 (2) 0.04~0.08 (3) Max. 0.3	(1) 0.05~0.09 (2) 0.05~0.09 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.8	
Cast iron	-	-	-	-	-	★ 60~100	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.1 (3) Max. 0.8	
Aluminum alloys	-	-	-	-	-	★ 150~400	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.05~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	
Brass	-	-	-	-	-	★ 150~300	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	(1) 0.08~0.15 (2) 0.08~0.15 (3) Max. 0.8	

Apply a sufficient amount of coolant

The ap should be under 0.5 mm if a good surface finish is required

★ :1st recommendation ☆ :2nd recommendation

FTK

Workpiece material	Recommended insert grades (Vc: m/min)				Edge width (mm)		Remarks
	Cermet	CVD coated carbide	PVD coated carbide	Carbide	4.0	5.0	
	TN90	CR9025	PR930	KW10	f (mm/rev)		
Carbon steel	☆ 120~200	★ 80~180	☆ 60~130	-	0.05~0.15	0.05~0.15	
Alloy steel	☆ 100~160	★ 70~150	☆ 60~130	-	0.05~0.15	0.05~0.15	
Stainless steel	☆ 80~150	☆ 60~140	☆ 50~120	-	0.05~0.15	0.05~0.15	
Cast iron	-	-	-	★ 50~100	0.10~0.30	0.10~0.30	
Aluminum alloys	-	-	-	★ 200~450	0.05~0.25	0.05~0.25	
Brass	-	-	-	★ 100~200	0.05~0.25	0.05~0.25	

★ :1st recommendation ☆ :2nd recommendation

GMN inserts (CBN / PCD)

Workpiece material	Recommended insert grades (Vc: m/min)		f (mm/rev) = (1) grooving, (2) turning ap (mm) = (3) turning				Remarks
	CBN	PCD	GMN2	GMN3	GMN4, GMN5	GMN6	
	KBNS10, KBNS25	KPD001 (KPD010)					
Aluminum alloys	-	★ 150~2,000	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.08~0.18 (2) 0.08~0.18 (3) Max. 0.8	(1) 0.10~0.20 (2) 0.10~0.20 (3) Max. 0.8	
Brass	-	★ 200~800	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	(1) 0.08~0.18 (2) 0.08~0.18 (3) Max. 0.8	(1) 0.10~0.20 (2) 0.10~0.20 (3) Max. 0.8	
Cast iron	★ 150~400	-	(1) 0.04~0.09 (2) 0.04~0.09 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.5	(1) 0.05~0.12 (2) 0.05~0.12 (3) Max. 0.5	(1) 0.05~0.15 (2) 0.05~0.15 (3) Max. 0.8	
Hard materials	★ 80~120	-	(1) 0.02~0.05 (2) 0.01~0.03 (3) Max. 0.1	(1) 0.03~0.07 (2) 0.01~0.05 (3) Max. 0.2	(1) 0.03~0.08 (2) 0.03~0.08 (3) Max. 0.3	(1) 0.05~0.1 (2) 0.05~0.1 (3) Max. 0.4	

★ :1st recommendation

G

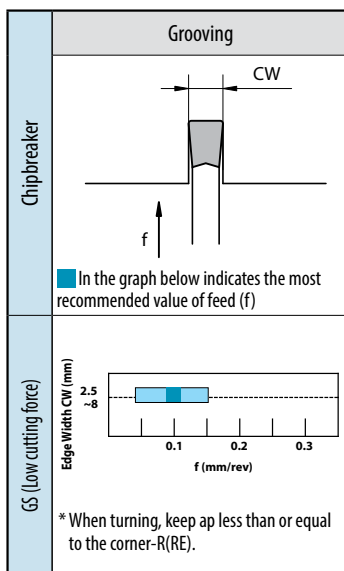
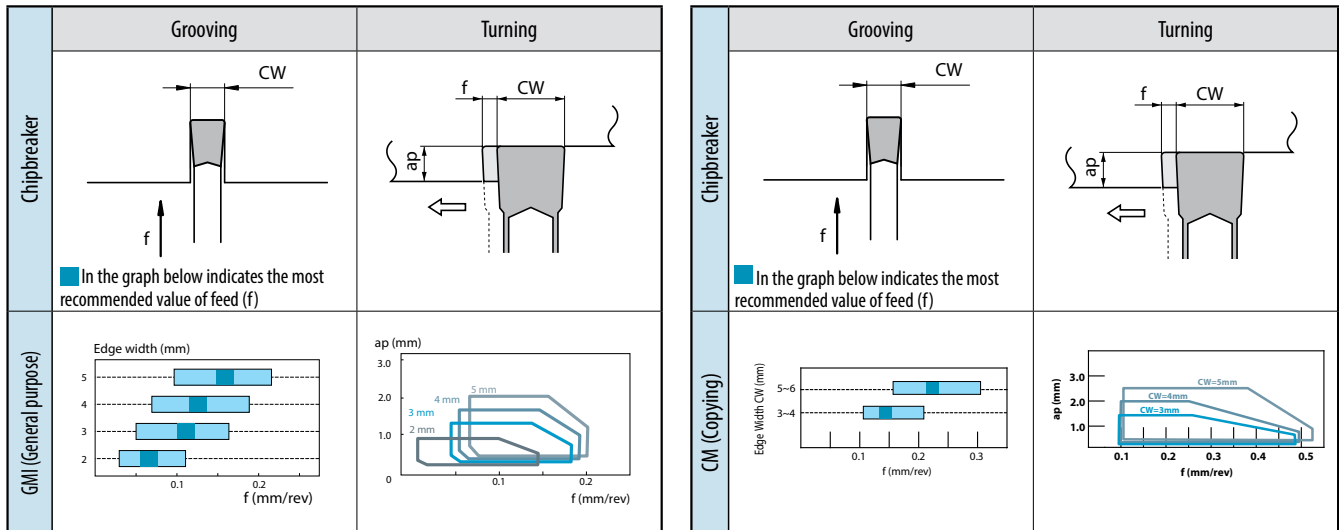
Grooving

KGDI - recommended cutting conditions (Vc)

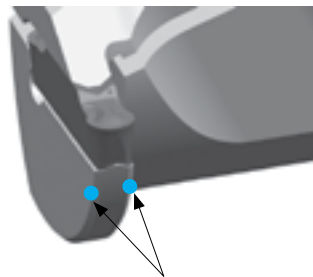
Workpiece material	Chipbreaker	Recommended insert grades (Vc: m/min)						Remarks
		Cermet		MEGACOAT NANO	MEGACOAT		Carbide	
		TN620	TN90	PR1535	PR1225	PR1215	GW15	
Carbon steel	GMI CM GS	☆ 100~220	☆ 100~220	☆ 80~150	★ 80~200	☆ 100~200	-	Coolant
Alloy steel		☆ 80~200	☆ 80~200	☆ 70~150	★ 70~180	☆ 80~180	-	
Stainless steel		☆ 70~180	☆ 70~180	★ 60~150	☆ 60~150	☆ 60~150	-	
Cast iron		-	-	-	-	★ 100~200	-	
Aluminum alloys		-	-	-	-	-	★ 200~500	
Brass		-	-	-	-	-	★ 100~200	

★ : 1st recommendation ☆ : 2nd recommendation

KGDI - recommended cutting conditions (f and ap)



Additional processing of toolholder tip when CM chipbreaker is installed



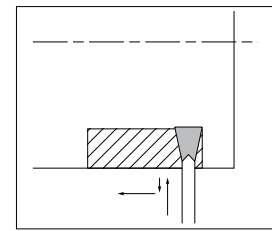
* By slightly chamfering the holder tip of about 0.5 mm, the cutting diameter can be minimized.



Guide for External Grooving

Point (I) (Turning after Grooving)

- 1) Grooving Depth 0.5mm or over : For roughing (Refer to Fig. 1)
 Before turning, pull the tool back about 0.1mm after grooving, instead of turning subsequent to grooving.
 (Failure to pull the tool back before traverse machining will result in an unbalanced load applied on only one side of the cutting edge.)
- 2) Grooving Depth 0.5mm or under : For finishing (Refer to Fig. 2)
 Turning subsequent to grooving is possible because shallow groove depths relate a small load on the cutting edge. (Retention time is not necessary.)



Before turning, pull the tool back about 0.1mm after grooving.
(Grooving Depth 0.5mm or over at roughing)

Fig. 1

Point (II)

- 1) When widening the groove width (Refer to Fig. 3), apply the "Step Turning."
- 2) The widened groove and side walls should be finished last.
 (For better chip control, ap 0.5mm or over is recommended.)

Note) If the workpiece is not supported at the center, reduce the feed rate when grooving towards center.

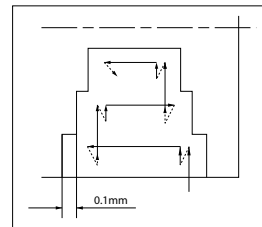
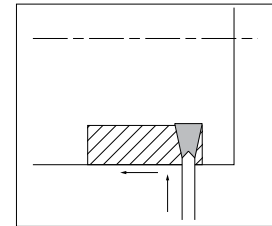


Fig. 3



Turning subsequent to grooving
(Grooving Depth 0.5mm or under at finishing)

Fig. 2

G

Grooving

Guide for Face Grooving

<Toolholder Selection>

- (1) Choose the best tool depending on the groove width.
 External dia. of the groove listed in the catalog indicates the available range (between DAXN and DAXX) for the initial grooving on the unprocessed workpiece (Ref. to Fig. 1).



- (2) Confirm Grooving Depth (CD)



- (3) It is recommended to install the toolholder in the reverse position. (Fig. 2)
 (This will provide smooth chip flow and chip clearance.)

<Guide for turning>

Turning direction should be from the outer diameter to the inner diameter as shown in Fig. 3
 This improves chip evacuation.

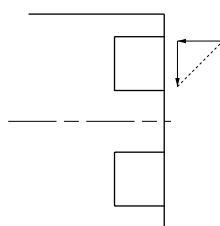


Fig. 3

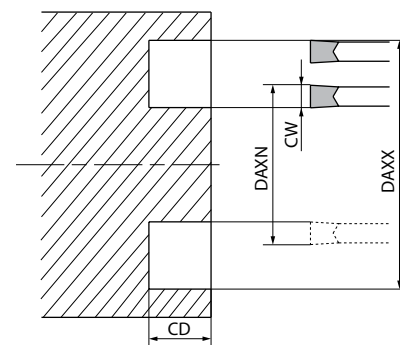


Fig. 1

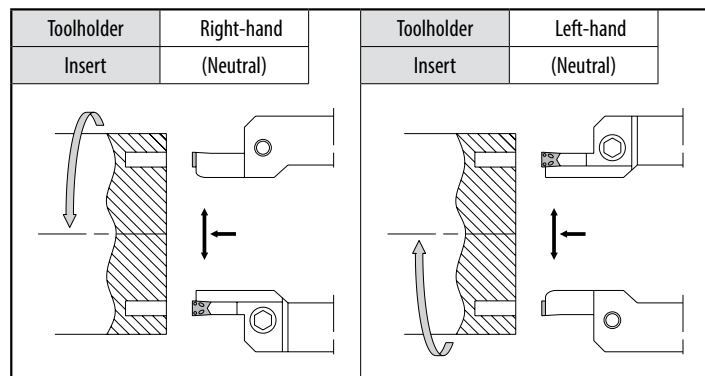


Fig. 2 Toolholder's hand and rotation

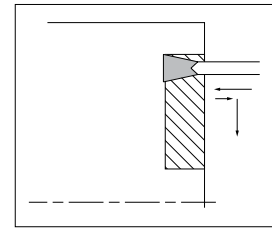
Guide for Face Grooving (Continued)

Point (I) (Turning after Grooving)

1) Grooving Depth 0.5mm or over : For roughing (Refer to Fig. 4)

Before turning, pull the tool back about 0.1mm after grooving, instead of turning subsequent to grooving.

(Failure to pull the tool back before traverse machining will result in an unbalanced load applied on only one side of the cutting edge.)



Before turning, pull the tool back about 0.1mm after grooving.

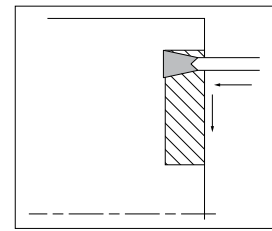
(Grooving Depth 0.5mm or over at roughing)

Fig. 4

2) Grooving Depth 0.5mm or under : For finishing (Refer to Fig. 5)

Turning subsequent to grooving is possible because shallow groove depths relate a small load on the cutting edge.

(Retention time is not necessary.)



Turning subsequent to grooving

(Grooving Depth 0.5mm or under at finishing)

Fig. 5

Point (II)

1) When widening the groove width. (Ref. to Fig. 6)

Apply the "Step Turning".

2) The widened groove and side walls should be finished last.

(For better chip control, ap 0.5mm or over is recommended.)

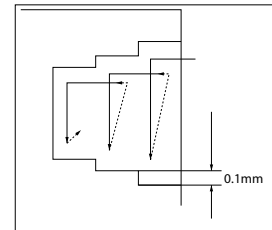
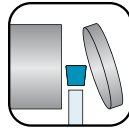
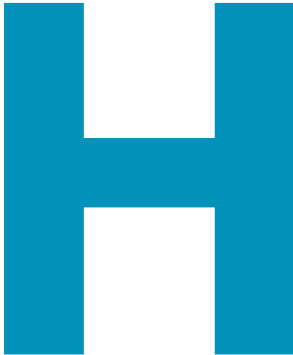


Fig. 6

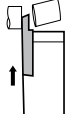

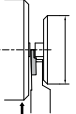
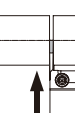
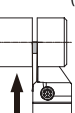
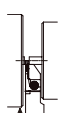
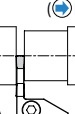
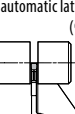
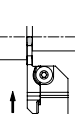
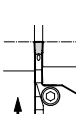
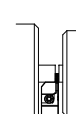
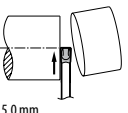
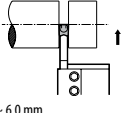
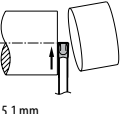
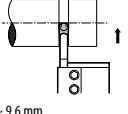
Trouble shooting

Trouble	Countermeasures
Whitish trace remains at the groove bottom.	<p>(1) Increase the cutting speed for finishing process only. (This can handle most of the cases.) If the method is not successful, try (2) as follows.</p> <p>(2) Check the insert edge's parallelness. (Adjustment: Apply the insert edge to the workpiece face and adjust the toolholder within the angle of $\pm 5^\circ$. (Fig. 7))</p> <p>Fig. 7</p>
Chips are entangled.	<p>(1) Install the toolholder in the reverse position. Adjust the coolant flow to the cutting edge.</p> <p>(2) When widening the groove, do not machine one deep groove. Instead, repeat shallow grooving and turning.</p>
Insert cracks when turning.	Reverse the facing direction.
Groove is not straight.	<p>Check the edge's parallelness. Decrease the feed rate.</p>










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Small diameter cut-off		H6
TKF type	KTKF	H9
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	KTKF-S	H18
KGZ type		H20
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	KGZ (Integral type for automatic lathe)	H28
	KGZS (for sub spindle tooling)	H29
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	KTKH-S (Integral type)	H73

Product lineup

For small diameter cut-off (automatic lathes) CUTDIA ~ø16 mm	KTKF (H9, H10, H12)  CUTDIA : ~ ø5, ø8, ø12, ø16 CW : 0.5 ~ 2.0 mm	KTKF-JCTM (H15)  CUTDIA : ~ ø5, ø8, ø12, ø16 CW : 0.5 ~ 2.0 mm		For sub spindle tooling KTKF-S (H18)  CUTDIA : ~ ø5, ø8, ø12, ø16 CW : 0.5 ~ 2.0 mm	
KGZ (Top clamp) CUTDIA ~ø51 mm	KGZ (H28)  CW : 1.3 ~ 3.0 mm	KGZ-JCTM (H26)  CUTDIA : ~ ø24, ø32 CW : 2.0 ~ 3.0 mm		For sub spindle tooling KGZS (H29)  CUTDIA : ~ ø24 CW : 1.3 ~ 3.0 mm	
KGD (Top clamp) CUTDIA ~ø51 mm	KGD (H34, H40)  CW : 1.3 ~ 4.0 mm	KGD-JCTM (for automatic lathes) (H39)  CUTDIA : ~ ø24, ø32 CW : 2.0 ~ 4.0 mm	KGD-S (H41)  CW : 2.0 ~ 4.0 mm	For sub spindle tooling KGD-JCT (H43)  CW : 3.0 ~ 4.0 mm	KGDS (H36)  CUTDIA : ~ ø24 CW : 1.3 ~ 3.0 mm
KPK (1-edge) CUTDIA ~ ø120	Toolholder Type CUTDIA ø35 ~ ø79	KPKH(-JCT) (H67, H68)  CW : 2.0 ~ 5.0 mm		Blade type CUTDIA ø32 ~ ø120	KPKB(-JCT) (H60, H61)  CW : 1.6 ~ 6.0 mm
KTKB KTKH (1-edge) CUTDIA ~ ø120	Toolholder Type CUTDIA ø30 ~ ø79	KTKH-S (H73)  CW : 2.2 ~ 5.1 mm		Blade type CUTDIA ø32 ~ ø120	KTKB-S(S) (H72)  CW : 1.6 ~ 9.6 mm

H
Cut-Off

Cut-off tools

Series name	Shape	Advantage	Applications
For small diameter cut-off		<ol style="list-style-type: none"> 1) Insert clamp is side screw type from lateral side 2) 2-edge insert 3) Max. Cut-off Dia. : ø16 	<ol style="list-style-type: none"> 1) For cut-off and grooving of small workpieces 2) For automatic lathe, small machine
KGD		<ol style="list-style-type: none"> 1) Insert is clamped from top side 2) 1-edge and 2-edge inserts available 3) Integral type and separate type are available 4) Max. Cut-off Dia. : ø50 	<ol style="list-style-type: none"> 1) PM chipbreaker --- for cut-off 2) PH chipbreaker --- for cut-off (high feed rate) for grooving 3) PG chipbreaker --- for cut-off (for automatic lathe), sharp-cutting oriented 4) PF chipbreaker --- for cut-off (for automatic lathe), low feed 5) PQ chipbreaker --- for cut-off (for automatic lathe), medium feed
KGZ		<ol style="list-style-type: none"> 1) Stable machining with sturdy clamp design Easy insert management 2) 1-edge and 2-edge inserts available 3) Max. Cut-off Dia. : ø51 	<ol style="list-style-type: none"> 1) For cut-off and grooving of small workpieces 2) For automatic lathe, small machine
KPK		<ol style="list-style-type: none"> 1) Self-clamping System that Opens and Closes the Contact Surface with a Wrench 2) 1-edge insert 3) Molded Chipbreaker 4) Blade Type JCT Type for High-pressure Coolant (Internal Coolant) is Available 5) Max. Cut-off Dia. : ø100 	<ol style="list-style-type: none"> 1) For cut-off and deep grooving 2) PM Chipbreaker --- General Purpose PH Chipbreaker --- For Tough Edge / High Feed Rate
KTKB KTKH		<ol style="list-style-type: none"> 1) Self-Clamping System Tap the insert lightly with a plastic hammer to set it in the pocket 2) 1-edge insert 3) Blade type and Integral Shank type 4) Max. Cut-off Dia. : ø120 	<ol style="list-style-type: none"> 1) For cut-off and deep grooving 2) Standard chipbreaker is general cut-off type Feed rate : 0.1mm/rev or over   P Chipbreaker is for cut-off at low feed rates Feed rate : 0.03~0.08mm/rev

Tool selection

		For small diameter cut-off	KGD	KGZ	KPK	KTKB / KTKH
Insert	1. Insert's edge number 1-edge insert...For larger dia. workpiece (max. ø120) 2-edge insert...For smaller dia. workpiece Cost per corner is reduced	-	-	-	✓	✓
	2. Use a neutral angle insert if there is no limit to the finished shape.	TKF...S TKF...NB	GDM GDMS	GDZ	PKM	TKN
	3. Insert with lead angle is recommended to prevent remaining boss.	TKF...DR	GDM- [°] / _L (Fig. 2)	GZM / GZG- [°] / _L (Fig. 2)	PKM- [°] / _L (Fig. 1)	TK [°] / _L (Fig. 1)
	4. If you want to make the remaining boss smaller when machining small or thin parts, use sharp corner and lead angle insert.	TKF...DR	-	-	-	-
	5. Use the minimum width insert suitable for the machining.	✓	✓	✓	✓	✓
Toolholder	1. Use a suitable toolholder (blade) for the workpiece dia.	✓	✓	✓	✓	✓
	2. Use a more rigid toolholder (blade).	✓	✓	✓	✓	✓
	3. Use a back clamp toolholder if there is no space for clamping tools from top side (automatic lathe).	✓	-	-	-	-

How to select cut-off inserts with / without lead angle (Including sharp corner)

1. Use a neutral angle insert if there is no limit to the finished shape.
2. Use an angled insert to reduce the size of the remaining boss.
3. Use a sharp-cornered lead-angled insert to make the remaining boss much smaller when machining small parts and thin parts.

Hand of lead angle	N (Neutral)	R (Right-hand)	L (Left-hand)
	Angled insert can reduce the burr size when cutting off. When using a larger lead angle, cutting force becomes smaller, but the feed rate should be reduced.		

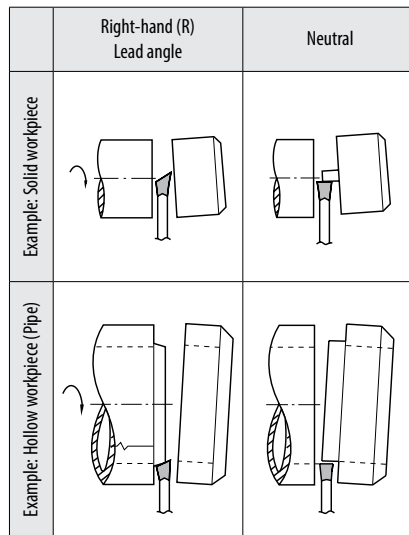


Fig.1

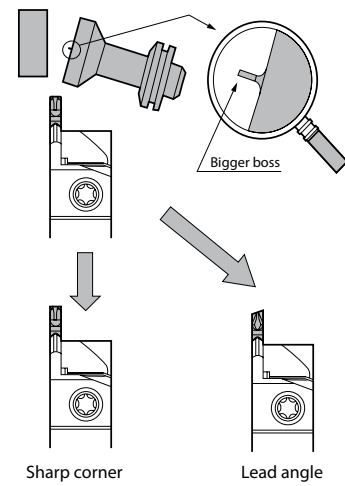


Fig.2

Caution

1. For PKM, PKM-[°]/_L, TKN and TK[°]/_L, set the cutting edge height 0.1~0.2 mm above the center height (Fig. 3)
For other toolholders, set the cutting edge to the center height.
2. Be sure to perform wet processing. Apply enough coolant to the cutting edge.
3. Keep a constant rate during processing so that optimum product life will be achieved.
4. Cut off as close to the chuck as possible.
5. Lower the feed rate to 1/2 to 1/3 at the near center to prevent impact caused by machining.

Overuse of insert and toolholder (blade) may cause insert breakage and toolholder (blade) damage.
Do not rework the insert and toolholder (blade) to prevent damage.
Clean the insert pocket well with compressed air when replacing insert.

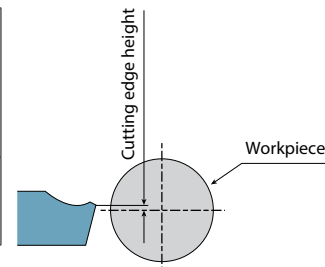
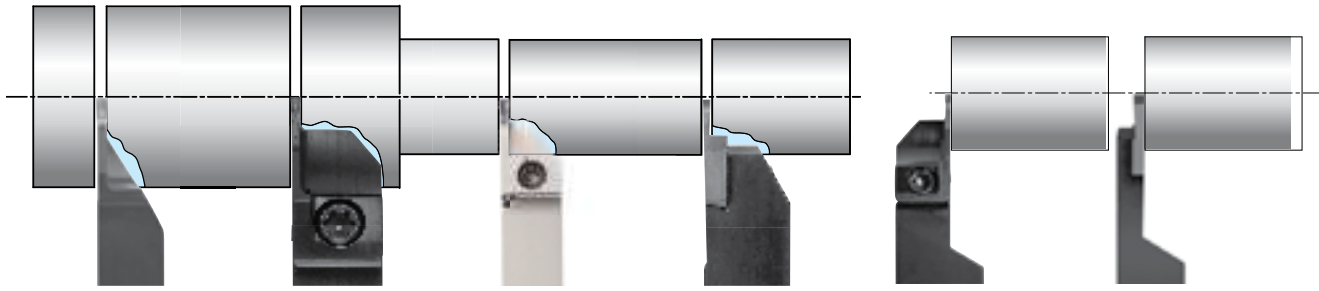


Fig. 3 (PKM, PKM-[°]/_L, TKN, TK[°]/_L)

Small dia. cut-off ~ $\phi 51$

Small shank



KPKH / KTKH-S	KGD / KGD-JCTM	KGZ	KTKF	KGDS / KGZS	KTKF-S
CUTDIA: ~ $\phi 45$ Shank: □20~25 (KPKH) □10~25 (KTKH-S) CW: 3.0~4.0 (KPKH) 2.2~4.1 (KTKH-S) Self clamp	CUTDIA: ~ $\phi 51$ Shank: □10~25 CW: 1.3~4.0 Top clamp	CUTDIA: ~ $\phi 51$ Shank: □10~25 CW: 1.3~3.0 Top clamp	CUTDIA: ~ $\phi 16$ Shank: □10~25 CW: 0.5~2.0 Lateral side clamp	CUTDIA: ~ $\phi 24$ Shank: □16 CW: 1.3~3.0 Top clamp	CUTDIA: ~ $\phi 16$ Shank: □10~12 CW: 0.5~2.0 Lateral side clamp
	⊕ H34 H39	⊕ H28	⊕ H9, H10, H12, H15	⊕ H29 H36	⊕ H18

⊕ H67
H68
H73

For KGZ

Low feed
PF chipbreaker

Medium feed
PM chipbreaker

High feed
PH chipbreaker

Low cutting force
PG chipbreaker

For KTKF / KTKF-S

2-edge

Low cutting force

For KPKH

PM chipbreaker
for general cut-off

PH chipbreaker
Tough edge

For KGD

Sharp cutting
PG chipbreaker

Low feed
PF chipbreaker

Medium feed
PQ chipbreaker

For KTKH-S

Chipbreaker for
general cut-off

Chipbreaker for
low feed cut-off

KTKH-S
(Self clamp)

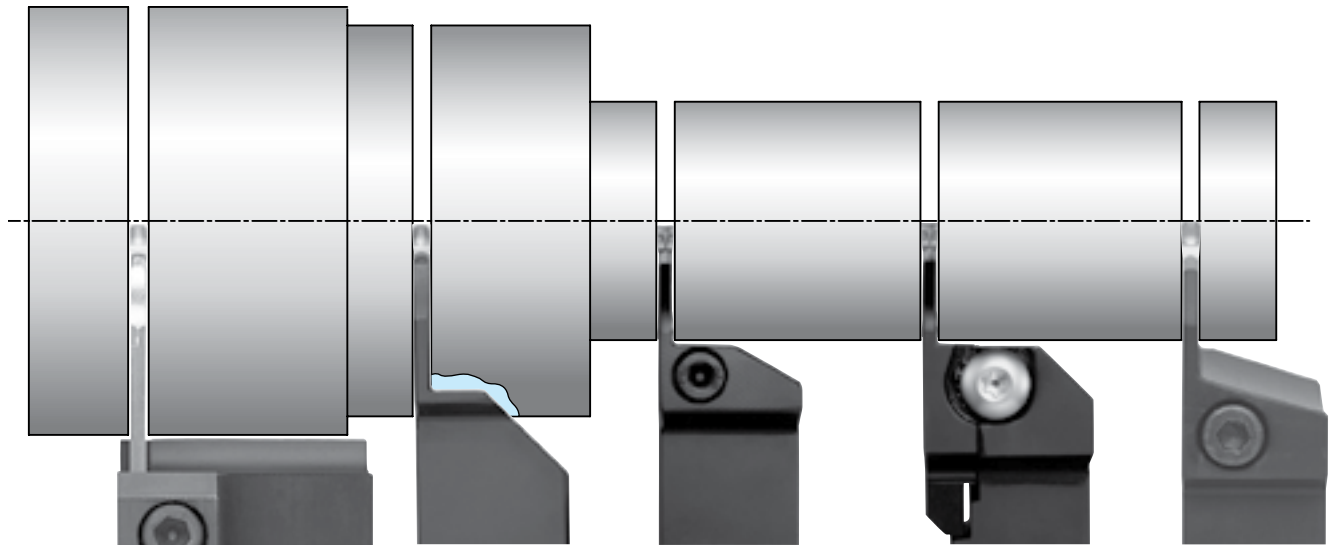
KGZ
(Top clamp)

KTKF
(Lateral side clamp)

H

Cut-Off

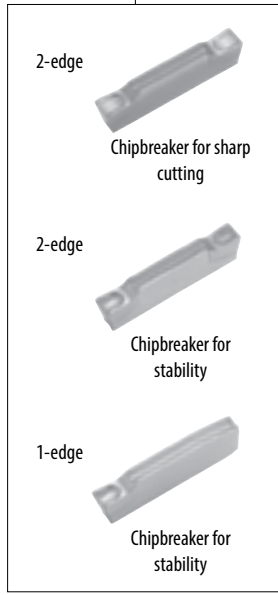
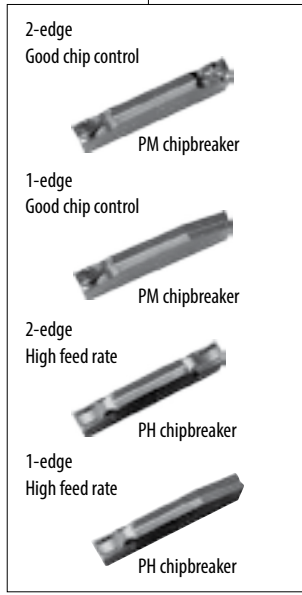
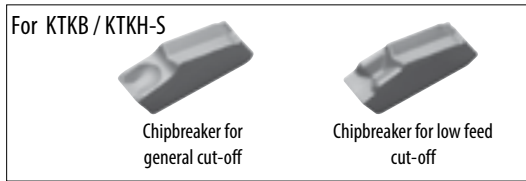
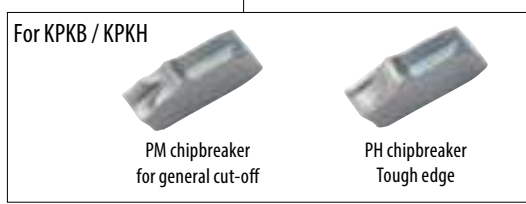
General cut-off ~ ϕ 120



Integral type	Separate type	Integral type
KGD / KGD-JCT	KGD-S	KGM-T
CUTDIA: ~ ϕ 50 Shank: □16/ 20~25 CW: 2.0/3.0~4.0 Top clamp	CUTDIA: ~ ϕ 50 Shank: □20~32 CW: 2.0~4.0 Top clamp	CUTDIA: ~ ϕ 60 Shank: □16~32 CW: 2.0~6.0 Top clamp

Blade + Toolblock	Integral type
KPKB / KTKB	KPKH / KTKH-S
CUTDIA: ~ ϕ 120 Toolblock: □16~32 CW: 1.6~6.0 (KPKB) 1.6~9.6 (KTKB) Self clamp	CUTDIA: ~ ϕ 79 Shank: □20~25 CW: 2.0~5.0 (KPKH) 3.1~5.1 (KTKH-S) Self clamp

H40, H43
H41
H52



Blade + Toolblock		Separate type	Integral type		
KPKB	KTKB	KGD-S	KTKH-S	KGD / KGD-JCT	KGM-T

TKF12

		Carbon steel / Alloy steel		Stainless steel		Cast iron		Non-ferrous metals				P		M		K		N	
Insert	Description	No. of edges	Dimension (mm)							Angle (°)	Tolerance (mm)		Carbide			Applicable toolholder H9, H10 H12, H15 H18			
			CW	S	D1	RE	W1	CUTDIA	PSIRR		CW min.	CW max.	PVD	-					
	TKF12R 050-NB-20DR	2	0.5	8.7	5	0	3	5	20	-0.03	+0.03	●	●	KTKFR...-12 KTKFR...-12-Y KTKFR-12JCTM KTKFR...-12SA KTKFR...-12SB					
	TKF12R 070-NB-20DR		8					●				●							
	TKF12R 100-NB-20DR		12					●				●							
	TKF12R 150-NB-20DR		12					●				●							
	TKF12R 200-NB-20DR		12					●				●							
	TKF12L 050-NB-20DR		0.5					5				5	0		3	5	●	●	KTKFL...-12 KTKFL-12JCTM KTKFL...-12SA KTKFL...-12SB
	TKF12L 070-NB-20DR		0.7					8				●	●						
	TKF12L 100-NB-20DR		1					12				●	●						
	TKF12L 150-NB-20DR		1.5					12				●	●						
	TKF12L 200-NB-20DR		2					12				●	●						

Lead angle (PSIRR) shows the angle when installed in toolholder.

As Fig. 1 of H11 shows, the cut-off diameter of the insert (CUTDIA) is indicated when the top of the cut-off edge progresses 1 mm from the center.

Right-hand shown

Inserts identification system

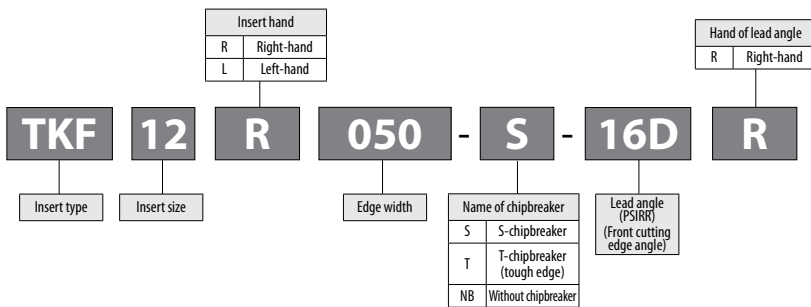


Table 1

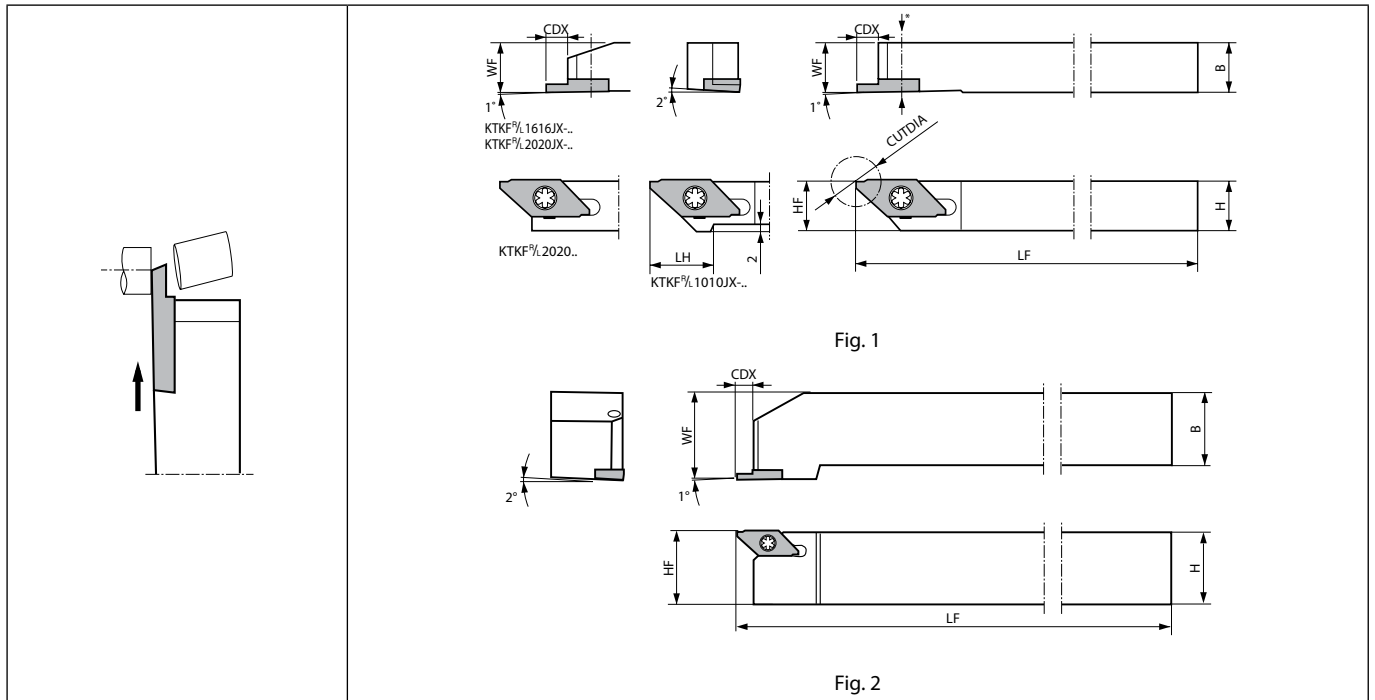
Toolholder	Right-hand	Toolholder	Left-hand
Insert	Right-hand	Insert	Left-hand
Lead angle	Right-hand	Lead angle	Right-hand

Descriptions of chipbreaker edge shape

Edge shape	S chipbreaker		T chipbreaker (Tough edge)		NB (Without chipbreaker)	
	GAN	Description	GAN	Description	GAN	Description
	15°	TKF12...-S	12°	TKF...-T TKF...-T-16DR	0°	TKF...-NB TKF...-NB-20DR
	20°	TKF16...-S TKF16...-S-16DR				
	25°	TKF12...-S-16DR				

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)								Fig.	Spare parts		Applicable inserts H6~H8
												Screw	Wrench	
	R	L	CDX	H	B	LH	HF	LF	WF					
KTKF% 1010JX-12	●	●	6	10	10	15	10	120	10	1	SB-4590TRWN	FT-10	TKF12%...	
1212F-12	●	●		12	12		12	85	12					
1212JX-12	●	●		16	16	-	16	120	16					
1616JX-12	●	●		20	20		20		20					
2020JX-12	●	●		25	25		25	150	30					
2525M-12	●													
KTKF% 1010JX-16	●	●	8	10	10	20	10	120	10	1	SB-4590TRWN	FT-10	TKF16%...	
1212F-16	●	●		12	12		12	85	12					
1212JX-16	●	●		16	16	-	16	120	16					
1616JX-16	●	●		20	20		20		20					
2020JX-16	●	●		25	25		25	150	30					
2525M-16	●													

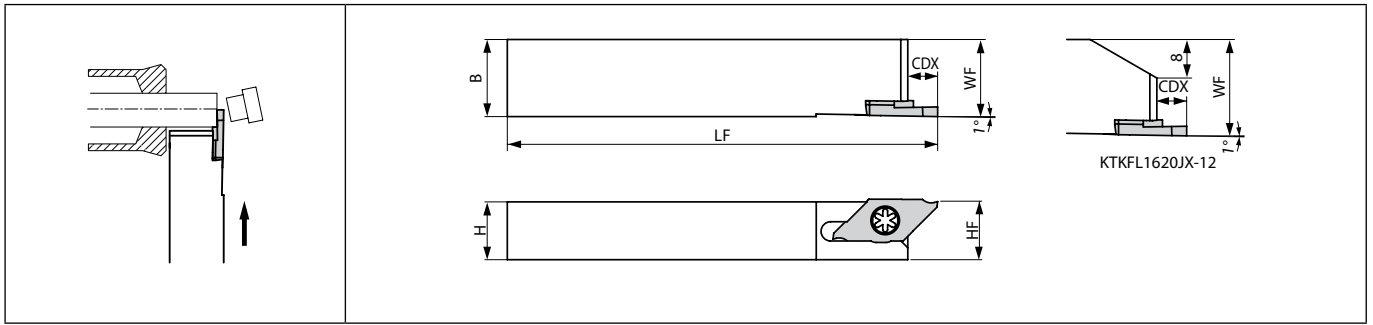
CDX shows the distance from the toolholder to the cutting edge.
See H6 to H8 for the actual cut-off diameter.

Recommended cutting conditions H19

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



KTKF (Goose-neck holder)



Left-hand shown | Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)						Spare parts		Applicable inserts ● H6, H7	
		L	CDX	H	B	HF	LF	WF	Screw		Wrench
KTKFL 1216JX-12	●	6	12	16	12	120	16	SB-4590TRWN	FT-10	TKF12L...	
1620JX-12	●		16	20	16		20				

CDX shows the distance from the toolholder to the cutting edge.
See H6 to H7 for the actual cut-off diameter.

Recommended cutting conditions ● H19

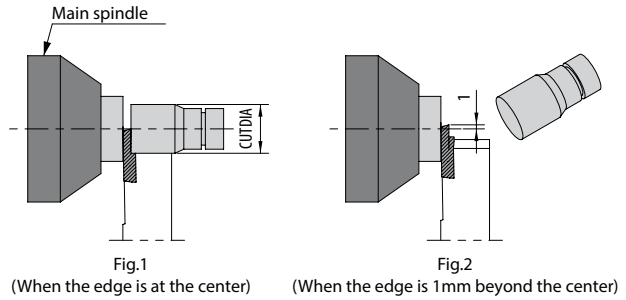


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

How to Use

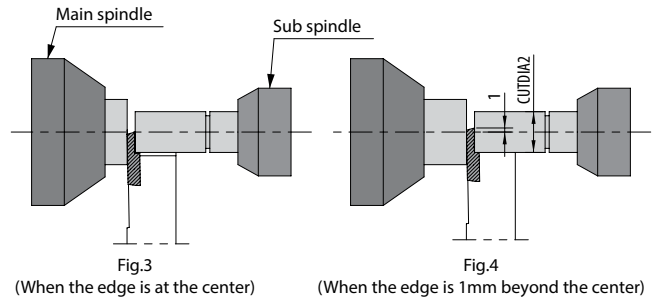
1) When using main spindle only

Maximum cutting diameter is CUTDIA (Fig.1).
 Even if the cutting edge runs beyond the center line (Fig.2),
 the insert does not contact the workpiece, since the workpiece falls off.
 (The clearance between the insert and the workpiece is 0.2 mm)



2) When using both main and sub spindles

In this case, when the cutting edge runs beyond the center line, the insert will contact the workpiece, since the workpiece does not fall off.
 Therefore the programmed distance beyond the center must be considered.
 e.g.) When the cutting edge is programmed to run 1mm beyond the center.
 Workpiece maximum, CUTDIA2 (Fig.4) = [CUTDIA - 1 mm × 2] (mm)
 (The clearance between the insert and the workpiece is 0.2 mm)



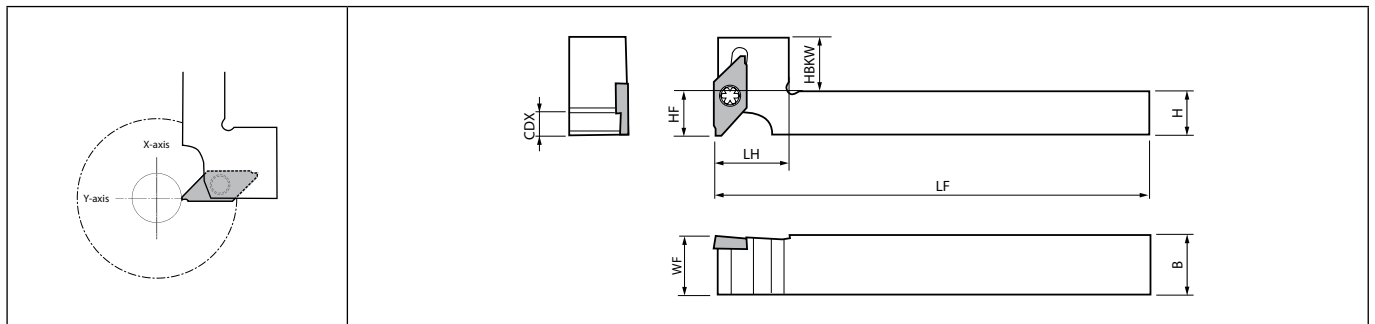
How to select edge preparation

Troubleshooting

Problems	Countermeasures	Countermeasures						
		Lead angle (PSIRR)		Edge width		Name of chipbreaker		
		Neutral (0°)	Yes	Narrower	Wider	S	T	NB
Insert fracture	Insert fracture prevention	Effective			Effective		Effective	Effective
Long cutting time	Cutting time reduction	Effective			Effective		Effective	Effective
Entangled chips	Prevention of chip entanglement	Effective		Effective		Effective		
Large boss remain	Small boss remain		Effective	Effective		Effective		
Ring remain (Hollow workpiece)	Prevention of ring remain		Effective	Effective		Effective		
Deformation of hollow workpiece (pipe)	Preventing deformation		Effective	Effective		Effective		







KTKF (Y-axis toolholder)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)									Spare parts		Applicable inserts ➡ H6, H7
		R	CDX	H	B	LH	HF	HBKW	LF	WF	Screw	Wrench	
													
KTKFR 1216JX-12-Y 1616JX-12-Y	● ●	6 16	12 16	16 16	20 25	12 16	15 11	120 16	16	SB-4590TRWN 	FT-10 	TKF12R...	

CDX shows the distance from the toolholder to the cutting edge.
See H6 to H7 for the actual cut-off diameter.

Recommended cutting conditions ➡ H19

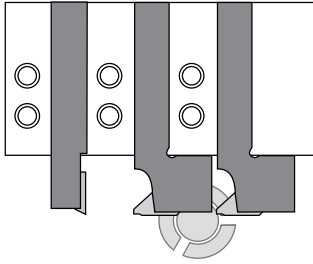


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

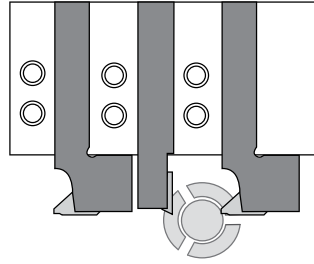
Precautions for using Y-axis toolholder

Do not use Y-axis toolholders side by side to prevent interference. (Only two Y-axis holder can be used at the same time)

With interference

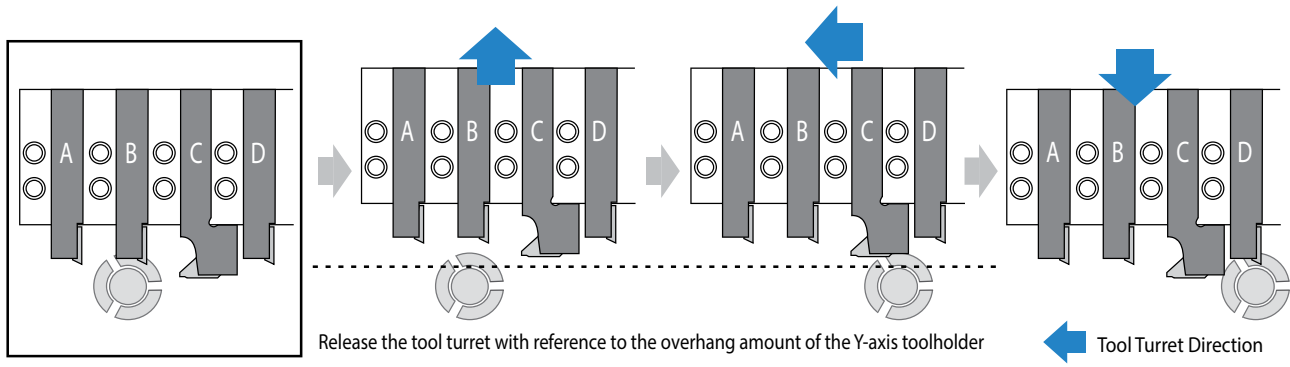


Without interference



Standard toolholders may be mounted between two Y-axis toolholders

When changing the tool, set the retracted position with reference to the cutting edge of the Y-axis holder. (When exchanging from tool B to D)



Note that using other toolholders together will result in different outside diameters

(Unit : mm)

Y-axis toolholder overhang	Examples	Overhang amount L			
		Available outside cutting diameter (φ)	20	22	25
20		A	Without restriction	Without restriction	Without restriction
		B	13.0	13.0	13.0
		C	Without restriction	Without restriction	Without restriction
25		A	38.0	58.0	Without restriction
		B	14.9	13.6	13.0
		C	45.0	60.0	Without restriction

Cut-off toolholders for automatic lathe great for high pressure coolant

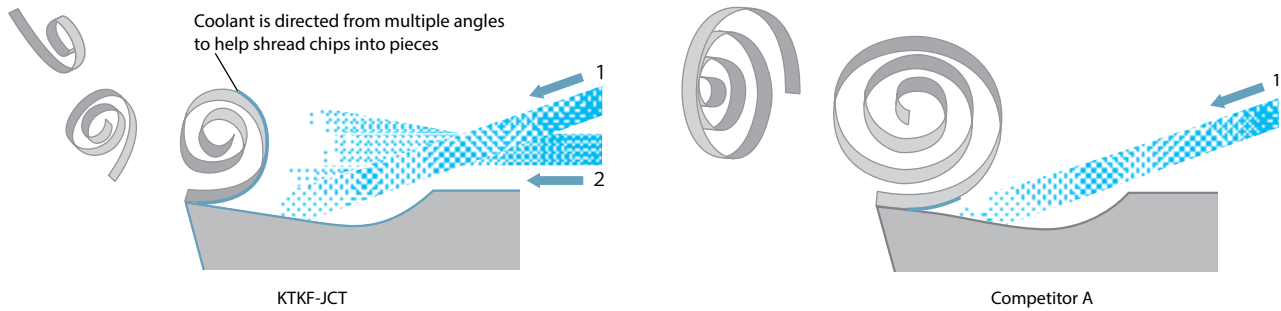
KTKF-JCTM

Finely breaks chips into small pieces. Superior chip control performance when machining difficult-to-cut material and stainless steel. Superior cooling action improves tool life.

1 Superior chip control performance

Discharges coolant in two directions toward rake surface of insert. Finely breaks chips into small pieces.

Coolant discharge structure comparison



Chip control comparison (Internal evaluation)

X5CrNi18 10

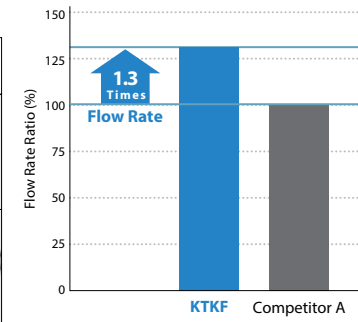
f (mm/rev)	0.01	0.02	0.03
KTKF-JCT			
Competitor A			

TAB6400 (Ti-6Al-4V)

f (mm/rev)	0.01	0.02	0.03
KTKF-JCT			
Competitor A			

Cutting conditions: Vc = 80 m/min, Wet (Oil-based) lubricating pressure: 1.5 MPa (Internal)
Workpiece: ø12 mm

Coolant flow rate comparison (Internal evaluation)

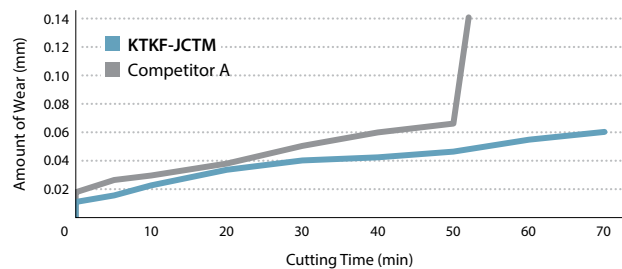


2 Superior cooling action improves tool life

Coolant is directed from the flank face of the insert as well
An ample supply of coolant to the tool edge area helps to further suppress insert wear

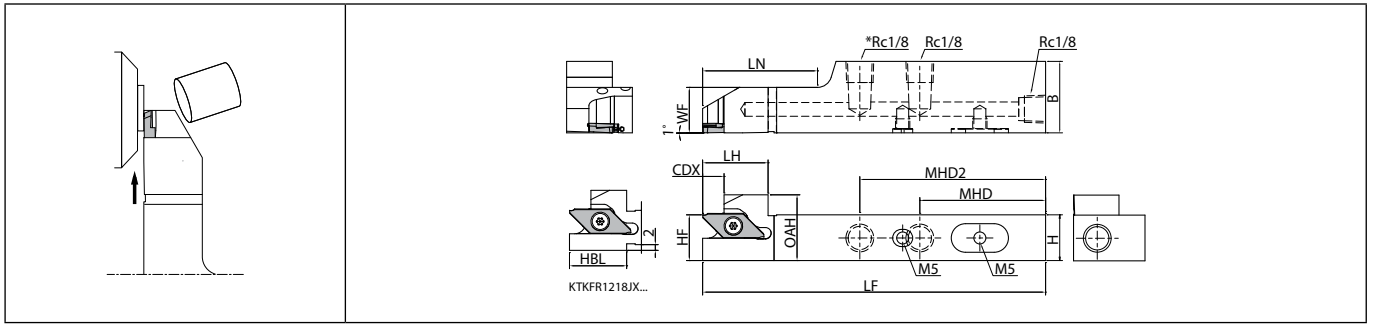


Wear resistance comparison (Internal evaluation)



Cutting conditions: Vc = 100 m/min, f = 0.02 mm/rev, Wet (Oil-based)
Lubricating pressure: 1.5 MPa (Internal) Workpiece material: TAB6400 (Ti-6Al-4V) ø12

KTKFR-JCTM (Coolant-through holders)



Right-hand shown | Right-hand Insert for Right-hand Toolholder. | KTKFR12-JCTM : 2-Rc1/8

Toolholder dimensions

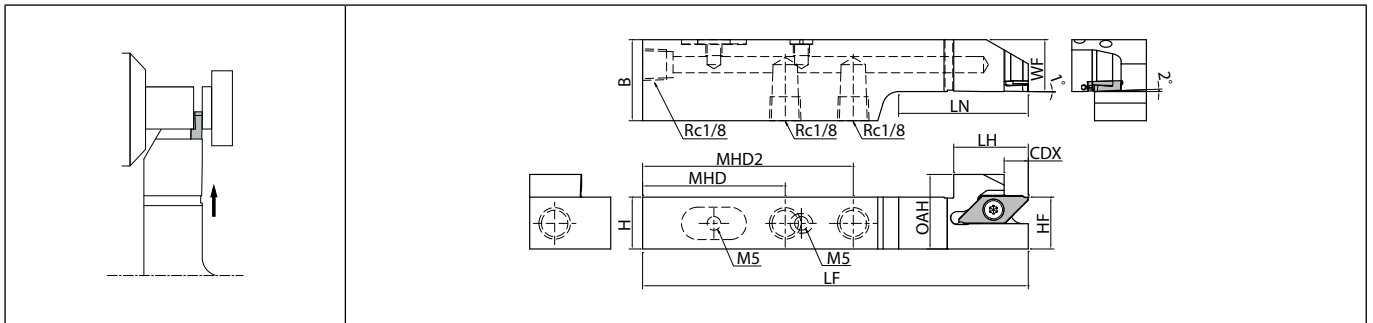
Description	Availability		Dimension (mm)											Coolant hole	Spare parts				Applicable inserts H6~H8
	R	CDX	H	B	LH	OAH	MHD	MHD2	HF	HBL	LF	LN	WF		Plug	Plug	Screw	Wrench	
	KTKFR 1218JX-12JCTM	●		12	18	20	19	54	-	12	20		28		12	Yes	GP-1	HSSX4LP		SB-4590TRWN	FT-10	TKF12R...
1625JX-12JCTM	●	7.5	16	25	23	23	44	65	16	-	120	16	40						
2025JX-12JCTM	●		20		27			20				20							
KTKFR 1625JX-16JCTM	●	9.6	16	25	23	23	44	65	16	-	120	40	16	Yes	GP-1	HSSX4LP	SB-4590TRWN	FT-10	TKF16R...
2025JX-16JCTM	●		20		27			20				41	20						

CDX shows the distance from the toolholder to the cutting edge.
See H6 to H8 for the actual cut-off diameter.

Recommended cutting conditions H19



KTKFL-JCTM (Coolant-through holders)



Left-hand shown | Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)											Coolant hole	Spare parts				Applicable inserts H6~H8
	L	CDX	H	B	LH	OAH	MHD	MHD2	HF	LF	LN	WF	Plug		Plug	Screw	Wrench		
	KTKFL 1625JX-12JCTM	●	7.5	16	25	23	23	44	65	16	120	40	16		Yes	GP-1	HSSX4LP	SB-4590TRWN		FT-10	TKF12L...
2025JX-12JCTM	●		20		27			20				20							
KTKFL 1625JX-16JCTM	●	9.6	16	25	23	23	44	65	16	120	40	16	Yes	GP-1					HSSX4LP			SB-4590TRWN	FT-10	TKF16L...
2025JX-16JCTM	●		20		27			20				41			20				

CDX shows the distance from the toolholder to the cutting edge.
See H6 to H8 for the actual cut-off diameter.

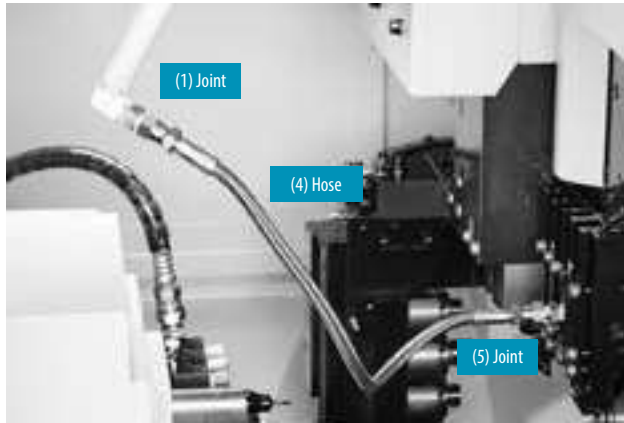
Recommended cutting conditions H19

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

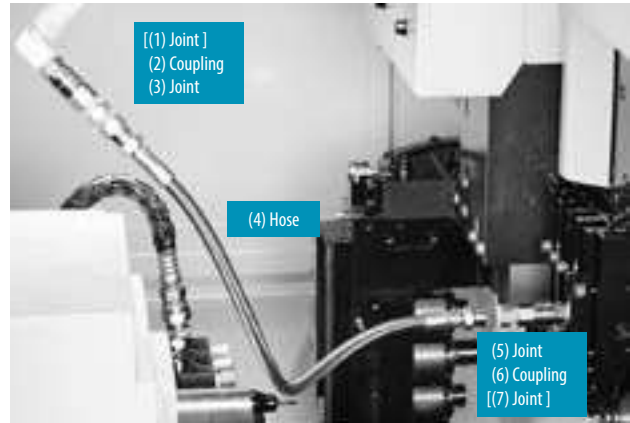
Coolant pipe parts

Pipe parts will be required separately if internal coolant is used.

Without coupling (Pump pressure: Up to 20 MPa)



With coupling (Pump pressure: Up to 7.5 MPa)



H
Cut-Off

Combination part description (Example)

Spare parts	Description
(1) Joint	J-ST-R1/8-G1/8
(4) Hose	HS-G1/8-G1/8-500
(5) Joint	J-ST-R1/8-G1/8

Convert the thread standards on the machine's side (Rc1/4, Rc1/8, NPT1/8, etc.) to the thread standard on the hose side (G1/8) for use.
Use sealing agents such as seal tapes when installing piping parts.

Combination part description (Example)

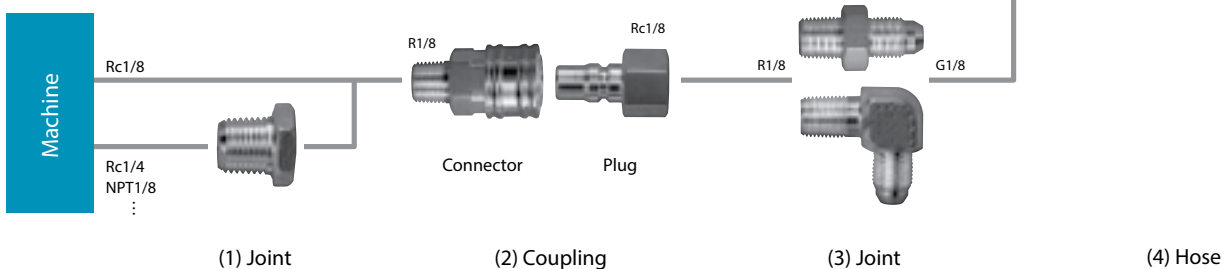
Spare parts	Description
[(1) Joint]	-
(2) Coupling	CP-ST-R1/8, P-ST-RC1/8
(3) Joint	J-ST-R1/8-G1/8
(4) Hose	HS-G1/8-G1/8-500
(5) Joint	J-ST-R1/8-G1/8
(6) Coupling	P-ST-RC1/8, CP-ST-R1/8
[(7) Joint]	-

Convert the thread standards on the machine's side (Rc1/4, Rc1/8, NPT1/8, etc.) to thread standards of the coupling (Rc1/8, etc.) or hose (G1/8) for use.
Use sealing agents such as seal tapes when installing piping parts.

Without coupling (Pump pressure: Up to 20 MPa)



With coupling (Pump pressure: Up to 7.5 MPa)



Piping installation parts description

Joint [(1)(3)(5)(7)]

Pressure resistance: ~20.0MPa

Exterior	Description	Thread standard	Std.
	J-ST-R1/4-G1/8	R1/4 ⇔ G1/8	●
	J-ST-NPT1/8-G1/8	NPT1/8 ⇔ G1/8	●
	J-ST-R1/8-G1/8	R1/8 ⇔ G1/8	●
	J-AN-R1/8-G1/8		●
	J-ST-R1/4-RC1/8	R1/4 ⇔ Rc1/8	●
	J-ST-NPT1/8-RC1/8	NPT1/8 ⇔ Rc1/8	●
	J-ST-R1/8-RC1/8	Rc1/8 ⇔ R1/8 (Extension Joint)	●

Coupling [(2)(6)]

Pressure resistance: ~7.5MPa

Exterior	Description	Thread standard	Std.
	CP-ST-R1/8	R1/8	●
	P-ST-RC1/8	Rc1/8	●

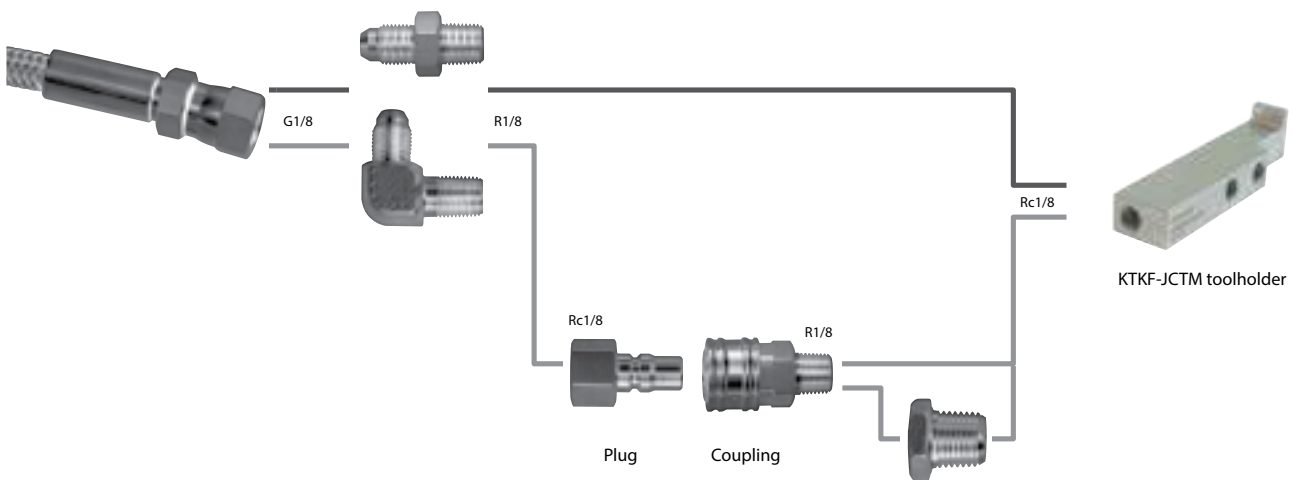
Hose (4)

Pressure resistance: ~20.0MPa

Exterior	Description	Thread standard	Total length (mm)	Std.
	HS-G1/8-G1/8-200	G1/8	200	●
	HS-G1/8-G1/8-300		300	●
	HS-G1/8-G1/8-400		400	●
	HS-G1/8-G1/8-500		500	●
	HS-G1/8-G1/8-600		600	●
	HS-G1/8-G1/8-800		800	●

Cautions

1. Make sure machine door is completely closed before use of these parts.
2. Use appropriate seal for the male thread of the piping parts and make sure the connection is secure.
Use plugs to seal off unused coolant holes.
3. Connect and fasten the coolant hose firmly.
4. The use of copper washers may cause leakage but will have no effect on the performance.
5. Commercial piping parts can be used if the thread standards are same. Check the pressure resistance before use.
6. Regularly changing the coolant filter is recommended.



(4) Hose

(5) Joint

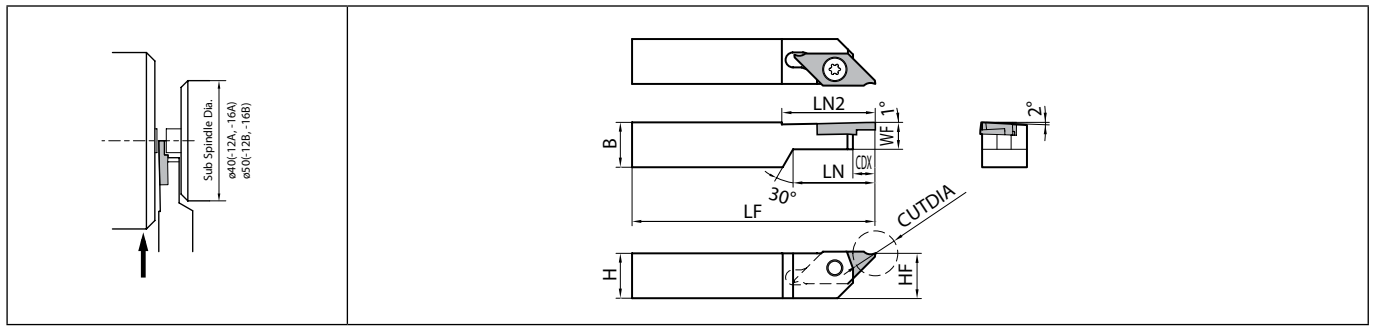
(6) Coupling

(7) Joint (Extension joint)

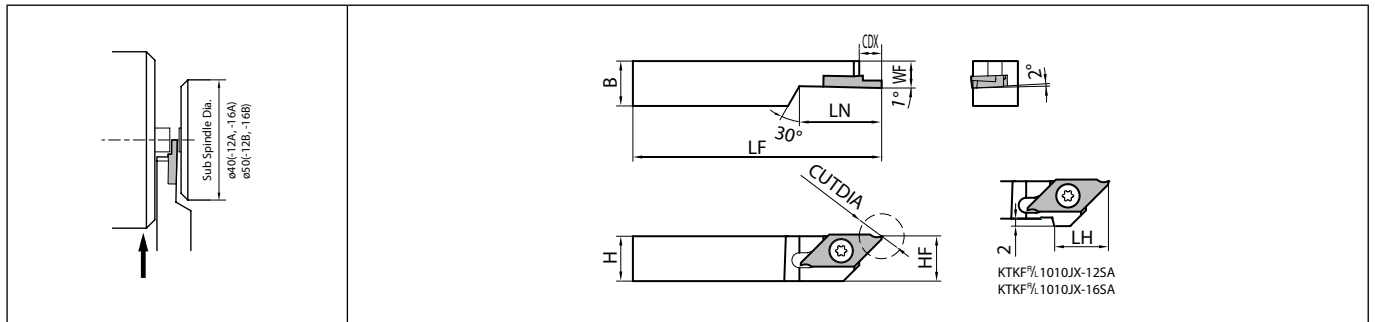
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



KTKF-S (Cut-off / for sub spindle tooling)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.



Left-hand shown | Left-hand Insert for Left-hand Toolholder.

H

Cut-Off

Toolholder dimensions

Description	Availability		Dimension (mm)									Spare parts		Applicable inserts ● H6~H8
												Screw	Wrench	
	R	L	CDX	H	B	LH	HF	LF	LN	LN2	WF			
KTKF%L 1010JX-12SA	●	●	6	10	10	15	10	120	22	26	7.2	SB-4570TRN	FT-10	TKF12%L...
KTKF%L 1212F-12SA	●	●		12	12	-	12	85							26
KTKF%L 1010JX-16SA	●	●	8	10	10	20	10	120	22	30	7.2	SB-4570TRN	FT-10	TKF16%L...
KTKF%L 1212F-16SA	●	●		12	12	-	12	85							26
KTKF%L 1212JX-16SB	●	●												

CDX shows the distance from the toolholder to the cutting edge.

Cut-off diameter (CUTDIA) depends on the insert edge width.

See H6 to H8 for the actual cut-off diameter.

Only Right-hand is available for LN2 dimension.

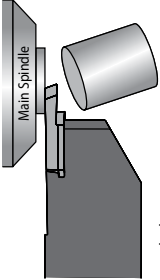
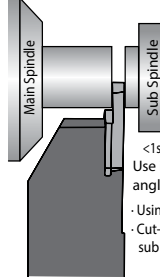
Recommended cutting conditions ● H19

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF / KTKF-S selection reference

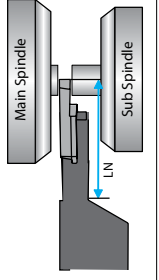
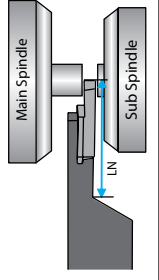
KTKF

- Both Right-hand and Left-hand types are applicable to gang tool post.
- Basically Left-hand type is used for cut-off operation using a sub spindle.

KTKFR (Right-hand toolholder)	KTKFL (Left-hand toolholder)
 <p><1st. Recommendation> Use insert with lead angle to remove boss. · Not using sub spindle · Cut-off operation near main spindle side</p>	 <p><1st. Recommendation> Use insert without lead angle. · Using sub spindle · Cut-off operation near sub spindle side</p>

KTKF-S

- When machining workpiece with small diameter, use KTKF-S to reduce overhang distance from the main spindle.

KTKFR-SA/B (Right-hand toolholder)	KTKFL-SA/B (Left-hand toolholder)
 <p><How to select> Hand of Toolholder · Long workpiece and more rigidity · Cut-off operation near main spindle side <How to select> LN dimension · Sub Spindle Dia. ø40→22 (SA type) ø50→26 (SB type)</p>	 <p><How to select> Hand of Toolholder · Short workpiece and less rigidity · Cut-off operation near sub spindle side <How to select> LN dimension · Sub Spindle Dia. ø40→22 (SA type) ø50→26 (SB type)</p>

Recommended cutting conditions (TKF12 / 16)

Workpiece material	Recommended insert grades (Vc: m/min)					TKF12						TKF16		Remarks
	MEGACOAT NANO PLUS	MEGACOAT NANO	MEGACOAT	DLC coated carbide	Carbide	Edge width CW (mm)						1.5	2.0	
						0.5	0.7	1.0	1.25	1.5	2.0			
						f (mm/rev)								
Carbon steel	★ 70 ~ 170 (50 ~ 140)	☆ 70 ~ 150 (50 ~ 120)	☆ 70 ~ 150 (50 ~ 120)	-	-	0.01 ~ 0.02	0.01 ~ 0.03	0.01 ~ 0.04 (0.01 ~ 0.05)	0.01 ~ 0.04	0.01 ~ 0.04 (0.02 ~ 0.1)	0.01 ~ 0.04 (0.02 ~ 0.1)	0.02 ~ 0.07 (0.02 ~ 0.1)	0.02 ~ 0.07 (0.02 ~ 0.1)	Coolant
Alloy steel	★ 70 ~ 170 (50 ~ 140)	☆ 70 ~ 150 (50 ~ 120)	☆ 70 ~ 150 (50 ~ 120)	-	-	0.01 ~ 0.02	0.01 ~ 0.03	0.01 ~ 0.04 (0.01 ~ 0.05)	0.01 ~ 0.04	0.01 ~ 0.04 (0.02 ~ 0.1)	0.01 ~ 0.04 (0.02 ~ 0.1)	0.02 ~ 0.07 (0.02 ~ 0.1)	0.02 ~ 0.07 (0.02 ~ 0.1)	
Stainless steel	☆ 60 ~ 140 (40 ~ 120)	★ 60 ~ 120 (40 ~ 100)	☆ 60 ~ 120 (40 ~ 100)	-	-	0.005 ~ 0.015	0.01 ~ 0.02	0.01 ~ 0.02 (0.01 ~ 0.03)	0.01 ~ 0.02	0.01 ~ 0.02 (0.01 ~ 0.05)	0.01 ~ 0.02 (0.01 ~ 0.05)	0.01 ~ 0.04 (0.01 ~ 0.05)	0.01 ~ 0.04 (0.01 ~ 0.05)	
Cast iron	-	-	-	-	★ 50 ~ 100	0.01 ~ 0.03	0.01 ~ 0.04	0.01 ~ 0.05	0.01 ~ 0.05	0.01 ~ 0.05	0.01 ~ 0.05	0.02 ~ 0.08	0.02 ~ 0.08	
Aluminum alloys	-	-	-	★ 200 ~ 500	☆ 200 ~ 450	0.01 ~ 0.03	0.01 ~ 0.04	0.01 ~ 0.05	0.01 ~ 0.05	0.01 ~ 0.05	0.01 ~ 0.05	0.02 ~ 0.08	0.02 ~ 0.08	
Brass	-	-	-	-	★ 100 ~ 200	0.01 ~ 0.03	0.01 ~ 0.04	0.01 ~ 0.06	0.01 ~ 0.06	0.01 ~ 0.06	0.01 ~ 0.06	0.02 ~ 0.1	0.02 ~ 0.1	

*(:): Tough edge type (TKF.T.)

★: 1st Recommendation ☆: 2nd Recommendation

Cut-off solutions for small parts machining

KGZ

Provides stable machining and is easy to use with unique clamp design

New coating PR20 series provides longer tool life and supports a wide range of applications

1 Achieved stable machining with newly developed clamp structure

Toolholder Sturdy clamps

Three unique features



Cutting edge movement comparison (Internal evaluation)

Load (N)	KGZ (mm)	Competitor A (mm)
0	0.00	0.00
40	~0.02	~0.04
80	~0.04	~0.07
120	~0.06	~0.10
160	~0.08	~0.13

KGZR1212JX-2

1. Gap section Tapered slit creates strong insert hold

Tapered shape Prevents collapse Strong clamping force in the insert direction

2. Top clamp

Pulls insert inward to increase hold

Clamp to inside

3. Stopper

The insert stop is designed with an obtuse shape to resist machining load and a large surface area distributes stress Improved holder durability for high-efficiency machining

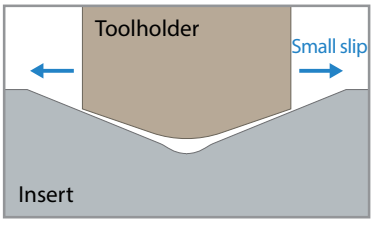
Machining load Obtuse angle

Insert Ease insert installation

Top V Shape Different groove angles at ends and center

Groove end

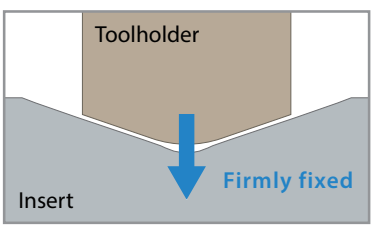
Small groove angle on top of insert
These grooves prevent the insert from shifting and provide fast and accurate insert mounts



Image

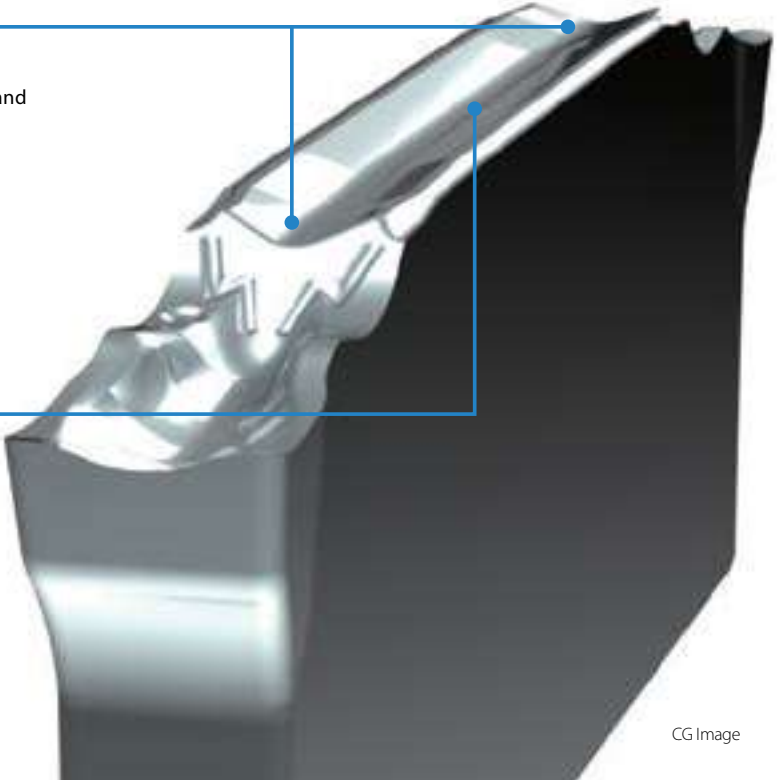
Center of groove

Large groove angle on top of insert
Firmly engages the toolholder to increase hold



Image

Dependability



CG Image



Excellent chatter resistance

Machined surface comparison (Internal evaluation)



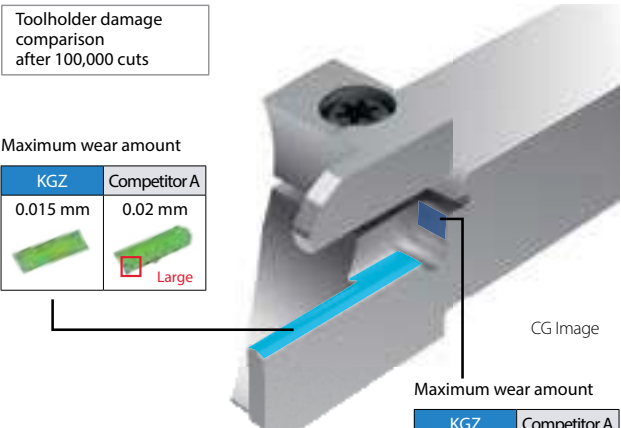
Cutting conditions : Vc = ~ 60 m/min, f = 0.12 mm/rev, Workpiece material : X10CrNiS18 9 (ø14)
Wet (External coolant) KGZR1212JX-2 Edge width : 2 mm (PM Chipbreaker)

Strong toolholder durability

Toolholder durability comparison (Internal evaluation)

Toolholder damage comparison after 100,000 cuts

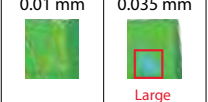
KGZ	Competitor A
0.015 mm	0.02 mm



CG Image

KGZ	Competitor A
0.01 mm	0.035 mm

Maximum wear amount



Cutting conditions : Vc = ~ 80 m/min, f = 0.1 mm/rev, Workpiece material : X10CrNiS18 9 (ø14)
Wet (External coolant) KGZR1212JX-2 Edge width : 2 mm (PM Chipbreaker)

2 New insert grades PR20 series is available MEGACOAT NANO EX coating technology provides longer tool life

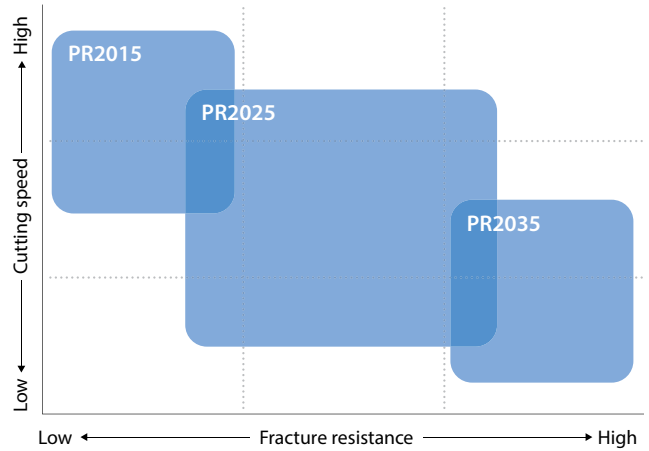
New insert grades for grooving and cut-off solutions

PR20 Series

PR2015 1st recommendation for cast iron
Also available for steel and stainless steel

PR2025 1st recommendation for steel
Also available for stainless steel

PR2035 1st recommendation for stainless steel
Also available for steel

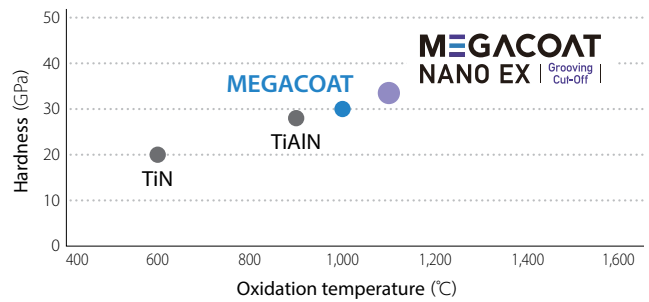


H New coating for grooving and cut-o machining



Achieve long tool life and high stability with the combination of high content aluminum nano coating layer

Coating characteristics (Internal evaluation)



Insert section

Carbide substrate

AlTiN-based coating

Multi-layering

Special nano coating layer

Long tool life Excellent wear and fracture resistance

Multi-layering of high content aluminum nano layers added with high melting point material having different concentration suppresses hexagonal crystal precipitation and achieves excellent oxidation resistance

Stable machining High coating toughness

Crystal grain re-nement
Optimized internal stress suppresses crack growth

Unique Technology (Patent applied)

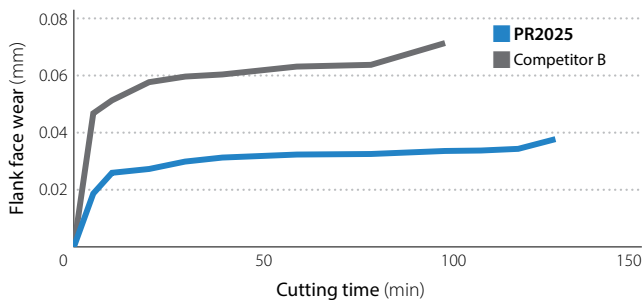
Proprietary coating process
Improve high content aluminum nano layers performance

Maintains a cubic crystal structure to maximize the properties of aluminum (Al)

CG image

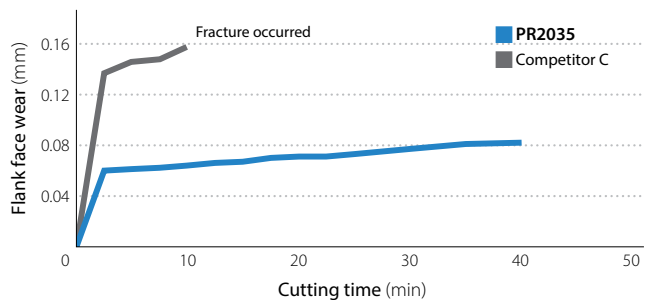
Cutting performance

C45 Wear resistance comparison (Internal evaluation)











Cutting conditions : Vc = ~ 100 m/min, f = 0.1 mm/rev
Workpiece material : C45 (φ20) Wet (External coolant) GZM2020N-020PM

X5CrNi18 10 Wear resistance comparison (Internal evaluation)



Cutting conditions : Vc = ~ 80 m/min, f = 0.05 mm/rev
Workpiece material : X5CrNi18 10 (φ20) Wet (External coolant) GZM2020N-020PM

3 Choose from a variety of insert and chipbreaker combinations for a wide range of applications

	Chip control oriented			Sharp edge
Chipbreakers	<p>Low feed machining PF Chipbreaker</p>  <p>With/Without Lead angle</p>	<p>Medium feed machining PM Chipbreaker</p>  <p>With/Without Lead angle</p>	<p>High feed machining PH Chipbreaker</p>  <p>No Lead angle</p>	<p>Low cutting force PG Chipbreaker</p>  <p>With/Without Lead angle</p>
Grades	<ul style="list-style-type: none"> PR2015 PR2025 PR2035 	<ul style="list-style-type: none"> PR2015 PR2025 PR2035 	<ul style="list-style-type: none"> PR2015 PR2025 PR2035 	<ul style="list-style-type: none"> PR2025 PR2035 PDL025 GW15
Features	<p>Edge width from 1.3 mm For reducing cost of steel workpiece</p>  <p>S10C</p>	<p>High versatility For a variety of machining</p>  <p>SUS304</p>	<p>Reduced cycle time For high feed machining</p>  <p>S45C</p>	<p>Superior sharpness For aluminum alloy machining</p>  <p>A6061</p>

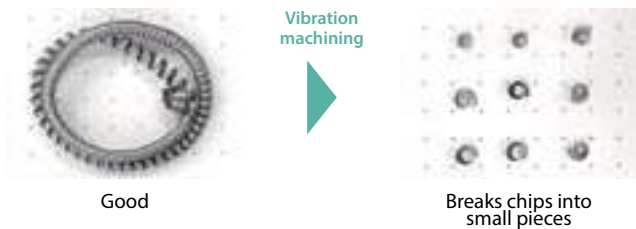


4 Supports vibration/oscillation machining with stable chip control and longer tool life

Stable machining Breaks chips into small pieces with vibration machining

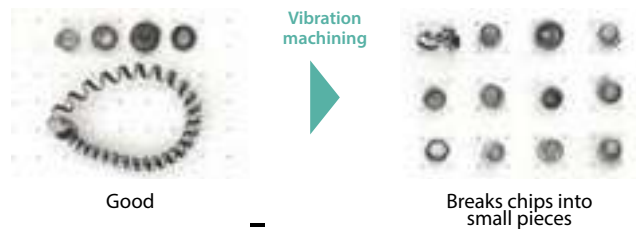
X5CrNi18 10 Chip control comparison (Internal evaluation)

PF Chipbreaker



Cutting conditions : $V_c = \sim 120$ m/min, $f = 0.03$ mm/rev
Workpiece material : X5CrNi18 10 ($\phi 14$) Wet (External coolant)
KGZR1212JX-2 Edge width : 2 mm

PM Chipbreaker

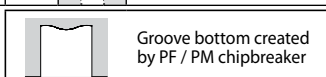


Cutting conditions : $V_c = \sim 120$ m/min, $f = 0.05$ mm/rev
Workpiece material : X5CrNi18 10 ($\phi 14$) Wet (External coolant)
KGZR1616JX-2 Edge width : 2 mm





GZM/GZMS/GZG

Insert		Description		No. of edges		Dimension (mm)				Angle (°)	Tolerance (mm)		Carbide			Applicable toolholder H26~H29				
						CW	S	RE	INSL		PSIR%	CW min.	CW max.	PR2015	PR2025		PR2035			
																		Carbon steel / Alloy steel		P
																		Stainless steel		M
Cast iron		K																		
Non-ferrous metals		N																		
	Low feed	GZM 1316N-003PF 1316N-015PF	2	1.3	4.4	0.03 0.15	16	-	-0.04	+0.04	●●●	●●●	●●●	KGZ [®] /L...-1.3(...) KGZS [®] /L...-1.3(...)						
		GZM 1516N-003PF 1516N-015PF	2	1.5	4.4	0.03 0.15	16	-	-0.04	+0.04	●●●	●●●	●●●	KGZ [®] /L...-1.5(...) KGZS [®] /L...-1.5(...)						
	Low feed	GZM 1316R-003PF-15D 1316L-003PF-15D	2	1.3	4.4	0.03	16	15	-0.04	+0.04	●●●	●●●	●●●	KGZ [®] /L...-1.3(...) KGZS [®] /L...-1.3(...)						
		GZM 1516R-003PF-15D 1516L-003PF-15D 1516R-015PF-15D	2	1.5	4.4	0.03 0.03 0.15	16	15	-0.04	+0.04	●●●	●●●	●●●	KGZ [®] /L...-1.5(...) KGZS [®] /L...-1.5(...)						
	Low feed	GZM 2020N-003PF 2020N-015PF	2	2	5.9	0.03 0.15	20	-	-0.04	+0.04	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZS [®] /L-2(...)						
		GZM 2520N-003PF 2520N-015PF	2	2.5	5.9	0.03 0.15	20	-	-0.04	+0.04	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZS [®] /L-2(...)						
		GZM 3020N-003PF 3020N-015PF	2	3	5.9	0.03 0.15	20	-	-0.04	+0.04	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZ [®] /L...-3(...) KGZS [®] /L-2(...)						
	Low feed	GZM 2020R-003PF-15D 2020L-003PF-15D 2020R-015PF-15D	2	2	5.9	0.03 0.03 0.15	20	15	-0.04	+0.04	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZS [®] /L-2(...)						
		GZM 2520R-003PF-15D 2520L-003PF-15D 2520R-015PF-15D	2	2.5	5.9	0.03 0.03 0.15	20	15	-0.04	+0.04	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZS [®] /L-2(...)						
		GZM 3020R-003PF-15D 3020L-003PF-15D 3020R-015PF-15D	2	3	5.9	0.03 0.03 0.15	20	15	-0.04	+0.04	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZ [®] /L...-3(...) KGZS [®] /L-2(...)						
	Medium feed	GZM 2020N-020PM	2	2	5.9	0.2	20	-	-0.03	+0.03	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZS [®] /L-2(...)						
		GZM 2520N-020PM	2	2.5	5.9	0.2	20	-	-0.03	+0.03	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZS [®] /L-2(...)						
		GZM 3020N-025PM	2	3	5.9	0.25	20	-	-0.03	+0.03	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZ [®] /L...-3(...) KGZS [®] /L-2(...)						
	Medium feed	GZM 2020R-020PM-6D	2	2	5.9	0.2	20	6	-0.03	+0.03	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZS [®] /L-2(...)						
		GZM 2520R-020PM-6D	2	2.5	5.9	0.2	20	6	-0.03	+0.03	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZS [®] /L-2(...)						
		GZM 3020R-025PM-6D	2	3	5.9	0.25	20	6	-0.03	+0.03	●●●	●●●	●●●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZ [®] /L...-3(...) KGZS [®] /L-2(...)						

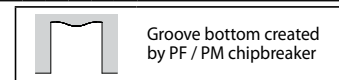
Handed insert shows Right-hand
Using the PF / PM chipbreaker (for cut-off) for grooving cannot create a flat bottom (Ref. to the right figure).



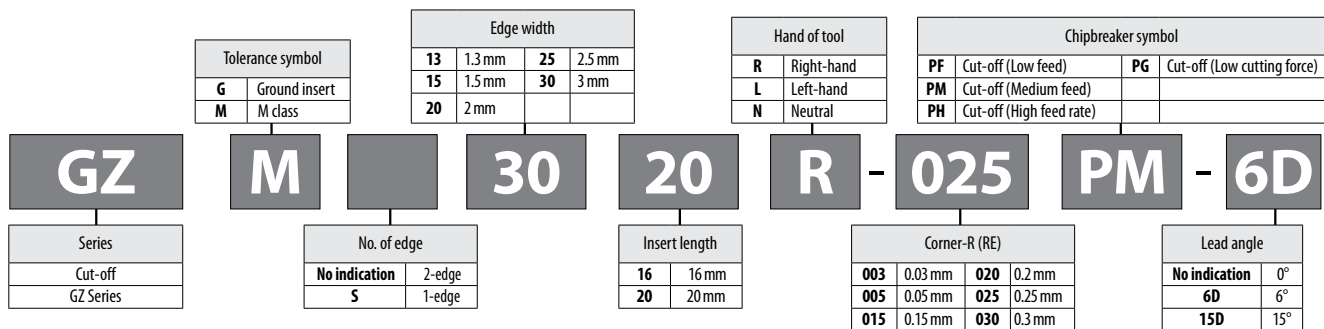
GZM/GZMS/GZG

Insert		Description	No. of edges	Dimension (mm)					Angle (°)	Tolerance (mm)		Carbide					Applicable toolholder H26~H29	
				CW	S	RE	INSL	PSIR%		CW min.	CW max.	DLC	PVD	-				
												P01025	PR2015	PR2025	PR2035	GW15		
	High feed	GZM 2020N-020PH	2	2	5.9	0.2	20	-	-0.03	+0.03	●	●	●	●	●	●	KGZ [®] /L...-2(...) KGZS [®] /L-2(...)	
		GZM 2520N-020PH	2	2.5	5.9	0.2	20	-	-0.03	+0.03	●	●	●	●	●	●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZS [®] /L-2(...)	
		GZM 3020N-030PH	2	3	5.9	0.03	20	-	-0.03	+0.03	●	●	●	●	●	●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZ [®] /L...-3(...) KGZS [®] /L-2(...)	
	High feed	GZMS 2020N-020PH	1	2	5.9	0.2	20	-	-0.03	+0.03	●	●	●	●	●	●	KGZ [®] /L...-2(...) KGZS [®] /L-2(...)	
		GZMS 3020N-030PH	1	3	5.9	0.03	20	-	-0.03	+0.03	●	●	●	●	●	●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZ [®] /L...-3(...) KGZS [®] /L-2(...)	
	Low cutting force	GZG 2020N-005PG	2	2	5.9	0.05	20	-	-0.02	+0.02	●	●	●	●	●	●	KGZ [®] /L...-2(...) KGZS [®] /L-2(...)	
		GZG 2520N-005PG	2	2.5	5.9	0.05	20	-	-0.02	+0.02	●	●	●	●	●	●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZS [®] /L-2(...)	
		GZG 3020N-005PG	2	3	5.9	0.05	20	-	-0.02	+0.02	●	●	●	●	●	●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZ [®] /L...-3(...) KGZS [®] /L-2(...)	
	Low cutting force	GZG 2020R-005PG-15D	2	2	5.9	0.05	20	15	-0.02	+0.02	●	●	●	●	●	●	KGZ [®] /L...-2(...) KGZS [®] /L-2(...)	
		GZG 2520R-005PG-15D	2	2.5	5.9	0.05	20	15	-0.02	+0.02	●	●	●	●	●	●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZS [®] /L-2(...)	
		GZG 3020R-005PG-15D	2	3	5.9	0.05	20	15	-0.02	+0.02	●	●	●	●	●	●	KGZ [®] /L...-2(...) KGZ [®] /L...-2.4(...) KGZ [®] /L...-3(...) KGZS [®] /L-2(...)	

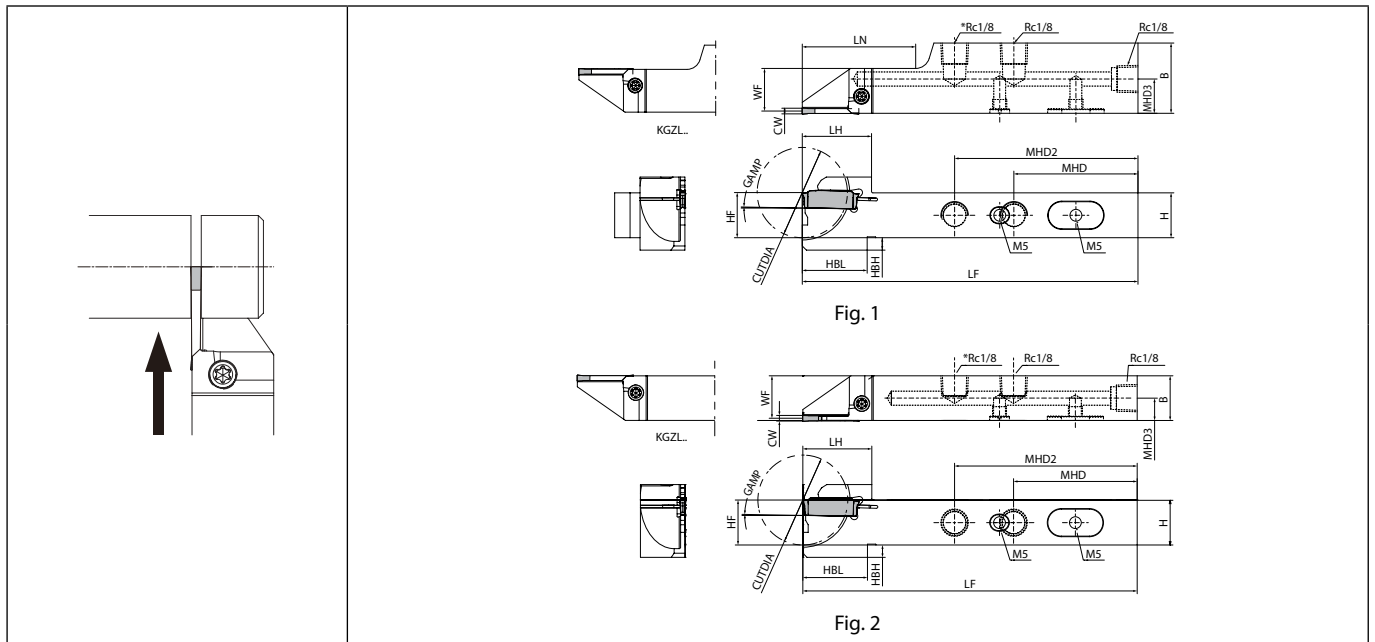
Handed insert shows Right-hand
Using the PF / PM chipbreaker (for cut-off) for grooving cannot create a flat bottom (Ref. to the right figure).



Inserts identification system



KGZ-JCTM (Coolant-through holders)



Right-hand shown | KGZ%.12...JCTM : 2-Rc1/8

Toolholder dimensions

Description	Availability		Dimension (mm)															Coolant hole	Fig.	Spare parts				Applicable inserts ● H24, H25	
	R	L	CUTDIA	H	B	LH	MHD	MHD2	MHD3	HF	HBH	HBL	LF	LN	WF	CW min.	CW max.			GAMP (°)	Plug 1	Plug 2	Screw		Wrench
KGZR 1212JX-2JCTM	●		24	12	12	19.8	59	-	6	12	5	19.8	120	-	11.2	2	3	1	Yes	2	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG2020... GZM2020... GZM2020... GZG2520... GZM2520... GZG3020... GZM3020... GZM3020...
KGZL 1212JX-2JCTM		●																							
KGZR 1218JX-2JCTM	●		24	12	18	19.8	54	-	8.4	12	8.5	19.8	120	-	43.7	2	3	1	Yes	1	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG2020... GZM2020... GZM2020... GZG2520... GZM2520... GZG3020... GZM3020... GZM3020...
KGZL 1218JX-2JCTM		●																							
KGZR 1616JX-2JCTM	●		32	16	16	24.8	44	65	8	16	4.5	23.2	120	-	15.2	2	3	1	Yes	2	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG2020... GZM2020... GZM2020... GZG2520... GZM2520... GZG3020... GZM3020... GZM3020...
KGZL 1616JX-2JCTM		●																							
KGZR 1625JX-2JCTM	●		32	16	25	24.8	44	65	12.2	16	4.5	23.2	120	-	40	2	3	1	Yes	1	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG2020... GZM2020... GZM2020... GZG2520... GZM2520... GZG3020... GZM3020... GZM3020...
KGZL 1625JX-2JCTM		●																							
KGZR 1212JX-2.4JCTM	●		24	12	12	19.8	59	-	6	12	5	19.8	120	-	11	2.4	3	1	Yes	2	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG2520... GZM2520... GZG3020... GZM3020... GZM3020...
KGZL 1212JX-2.4JCTM		●																							
KGZR 1218JX-2.4JCTM	●		24	12	18	19.8	54	-	8.4	12	8.5	19.8	120	-	43.7	2.4	3	1	Yes	1	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG2520... GZM2520... GZG3020... GZM3020... GZM3020...
KGZL 1218JX-2.4JCTM		●																							
KGZR 1616JX-2.4JCTM	●		32	16	16	24.8	44	65	8	16	4.5	23.2	120	-	15	2.4	3	1	Yes	2	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG2520... GZM2520... GZG3020... GZM3020... GZM3020...
KGZL 1616JX-2.4JCTM		●																							
KGZR 1625JX-2.4JCTM	●		32	16	25	24.8	44	65	12.2	16	4.5	23.2	120	-	40	2.4	3	1	Yes	1	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG2520... GZM2520... GZG3020... GZM3020... GZM3020...
KGZL 1625JX-2.4JCTM		●																							
KGZR 1212JX-3JCTM	●		24	12	12	19.8	59	-	6	12	5	19.8	120	-	10.8	3	3	1	Yes	2	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG3020... GZM3020... GZM3020...
KGZL 1212JX-3JCTM		●																							
KGZR 1218JX-3JCTM	●		24	12	18	19.8	54	-	8.6	12	8.5	19.8	120	-	43.7	3	3	1	Yes	1	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG3020... GZM3020... GZM3020...
KGZL 1218JX-3JCTM		●																							
KGZR 1616JX-3JCTM	●		32	16	16	24.8	44	65	8	16	4.5	23.2	120	-	14.8	3	3	1	Yes	2	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG3020... GZM3020... GZM3020...
KGZL 1616JX-3JCTM		●																							
KGZR 1625JX-3JCTM	●		32	16	25	24.8	44	65	12.2	16	4.5	23.2	120	-	40	3	3	1	Yes	1	GP-1	HSSX4LP	SB-40120TR	LTW-15S	GZG3020... GZM3020... GZM3020...
KGZL 1625JX-3JCTM		●																							

Recommended cutting conditions ● H44, H45

Direct coolant holder for small parts machining

JCTM Series

Long tool life and stable machining by internal coolant with/without piping system
 Rectangular shank with optimized coolant channel design

1st recommendation

Square shank is also available

Without piping When the tool turret supports direct coolant

- Coolant is supplied directly from tool turret into the holder
- No need for piping just by installing tools

With piping

- Compatible with internal coolant on any machine with standard piping parts



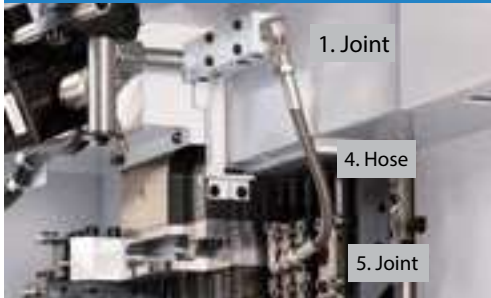
CG Image



Piping parts

Piping parts will be required separately if internal coolant is used.
 Pump pressure : Up to 20 MPa. Pump pressure: Up to 7.5 MPa if coupling is used.

Without coupling (Pump pressure: Up to 20 MPa)

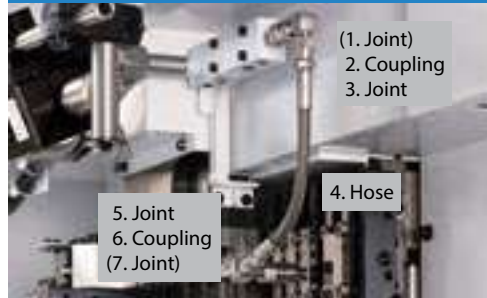


Combination Part Description (Example)

Spare Parts	Description
1. Joint	J-AN-R1/8-G1/8
4. Hose	HS-G1/8-G1/8-200
5. Joint	J-AN-R1/8-G1/8

Convert the thread standards on the machine's side (Rc1/4, Rc1/8, NPT1/8, etc.) to the thread standard on the hose side (G1/8) for use.
 Use sealing agents such as seal tapes when installing piping parts.

With coupling (Pump pressure: Up to 7.5 MPa)



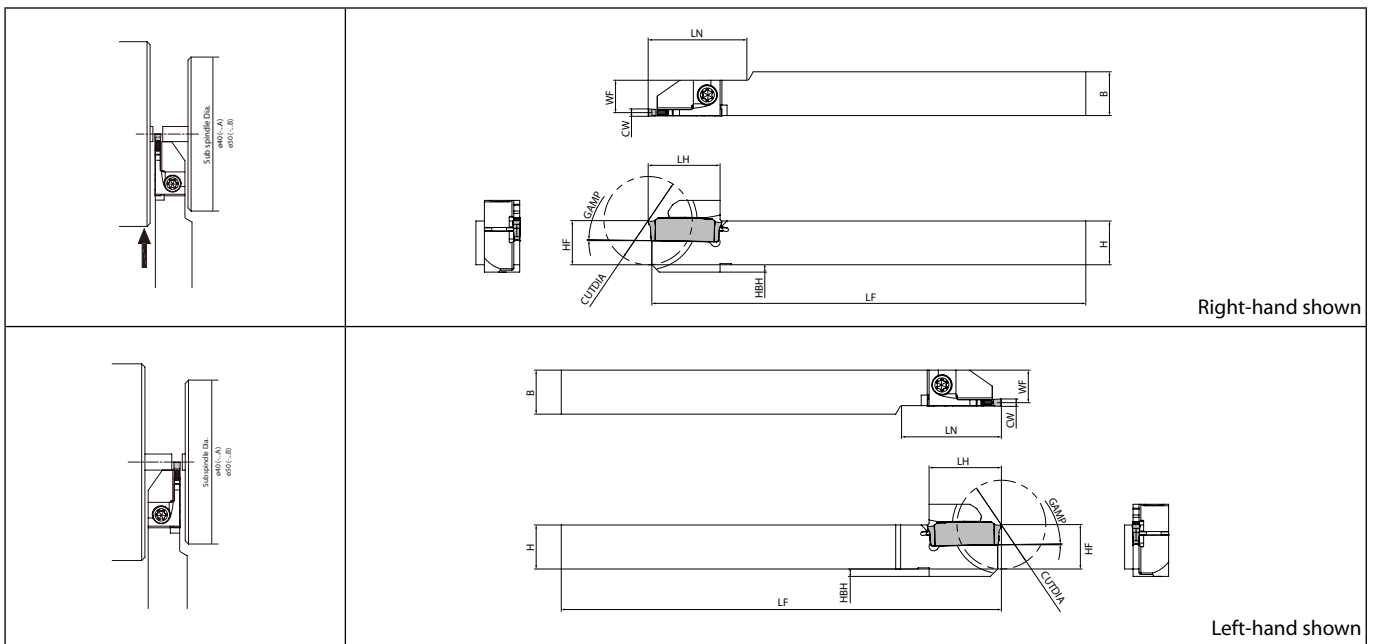
Combination Part Description (Example)

Spare Parts	Description
(1. Joint)	-
2. Coupling	CP-ST-R1/8, P-ST-RC1/8
3. Joint	J-AN-R1/8-G1/8
4. Hose	HS-G1/8-G1/8-200
5. Joint	J-AN-R1/8-G1/8
6. Coupling	P-ST-RC1/8, CP-ST-R1/8
(7. Joint)	-

Convert the thread standards on the machine's side (Rc1/4, Rc1/8, NPT1/8, etc.) to the thread standards of the coupling (Rc1/8, etc.) or hose (G1/8) for use.
 Use sealing agents such as seal tapes when installing piping parts.

For piping installation parts description, please refer to H17.

KGZS (Cut-off / for sub spindle tooling)



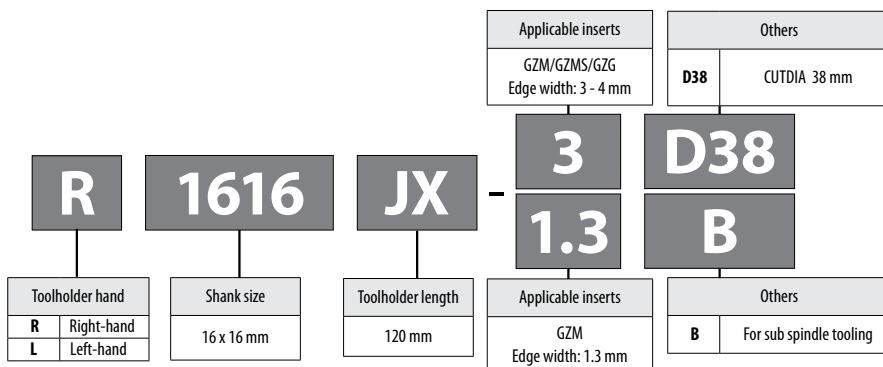
Toolholder dimensions

Description	Availability		Dimension (mm)											Angle		Spare parts		Applicable inserts ➔ H24, H25							
	R	L	CUTDIA	H	B	LH	HF	HBH	LF	LN	WF	CW min.	CW max.	GAMP (°)	Screw	Wrench									
																	GAMP (°)								
KGZS ^{R/L} 1212F-1.3A 1212JX-1.3B 1616JX-1.3B	●	●	24	12	12	19.8	12	2.1	85	22	8.4	1.3	1.3	1	SB-40120TR	LTW-15S	GZM1316...								
KGZS ^{R/L} 1212F-1.5A 1212JX-1.5B 1616JX-1.5B	●	●		12	12		12	2.1	85	22								120	27	8.4	1.5	1.5	SB-40120TR	LTW-15S	GZM1516...
KGZS ^{R/L} 1212F-2A 1212JX-2B 1616JX-2B	●	●		12	12		12	2.1	85	22								120	27	8.7	2	3	SB-40120TR	LTW-15S	GZG2020..., GZM2020..., GZMS2020..., GZG2520..., GZM2520..., GZG3020..., GZM3020..., GZMS3020...

Recommended cutting conditions ➔ H31

Toolholder identification system

KGZ
KGZS



KGZ / KGZS selection reference

KGZ

Standard type	
<ul style="list-style-type: none"> Both Right-hand and Left-hand types are applicable to gang tool post. Basically Left-hand type is used for cut-off operation using a sub spindle. 	
KGZR (Right-hand toolholder)	KGZL (Left-hand toolholder)
<p><1st. Recommendation> Use insert with lead angle to remove boss. · Not using sub spindle · Cut-off operation near main spindle side</p>	<p><1st. Recommendation> Use insert without lead angle. · Using sub spindle · Cut-off operation near sub spindle side</p>

KGZS

Sub spindle type	
<ul style="list-style-type: none"> When machining workpiece with small diameter, use KGZS to reduce overhang distance from the main spindle. 	
KGZSR (Right-hand toolholder)	KGZSL (Left-hand toolholder)
<ul style="list-style-type: none"> Long workpiece and more rigidity Cut-off operation near main spindle side 	<ul style="list-style-type: none"> Short workpiece and less rigidity Cut-off operation near sub spindle side

H



Cut-Off

KGZ recommended cutting conditions

Workpiece material	Recommended insert grades (Vc: m/min)			f (mm/rev)						Remarks
				MEGACOAT NANO EX			Edge width CW (mm)			
	PR2015	PR2025	PR2035	PF (RE = 0.03 mm)		PF (RE = 0.15 mm)				
Carbon steel	☆ 70 ~ 180	★ 70 ~ 150	☆ 70 ~ 150	0.01 ~ 0.04	0.02 ~ 0.06	0.02 ~ 0.08	0.01 ~ 0.05	0.03 ~ 0.08	0.04 ~ 0.10	Coolant
Alloy steel	☆ 70 ~ 180	★ 70 ~ 150	☆ 70 ~ 150							
Stainless steel	☆ 60 ~ 150	☆ 60 ~ 120	★ 60 ~ 120	0.01 ~ 0.03	0.01 ~ 0.04	0.01 ~ 0.05	0.01 ~ 0.04	0.03 ~ 0.07	0.04 ~ 0.08	
Cast iron	★ 80 ~ 200	-	-	0.01 ~ 0.05	0.02 ~ 0.07	0.03 ~ 0.08	0.01 ~ 0.06	0.03 ~ 0.09	0.04 ~ 0.10	

★: 1st Recommendation ☆: 2nd Recommendation

Workpiece material	Recommended insert grades (Vc: m/min)					f (mm/rev)				Remarks
						PM	PH	PG		
	MEGACOAT NANO EX			DLC coated carbide	Carbide	Edge width CW (mm)				
Carbon steel	☆ 70 ~ 180	★ 70 ~ 150	☆ 70 ~ 150	-	-	0.05 ~ 0.15	0.10 ~ 0.20	0.01 ~ 0.04	0.01 ~ 0.05	Coolant
Alloy steel	☆ 70 ~ 180	★ 70 ~ 150	☆ 70 ~ 150	-	-					
Stainless steel	☆ 60 ~ 150	☆ 60 ~ 120	★ 60 ~ 120	-	-	0.04 ~ 0.12	0.08 ~ 0.16	0.01 ~ 0.03	0.01 ~ 0.04	
Cast iron	★ 80 ~ 200	-	-	-	☆ 50 ~ 100	0.05 ~ 0.15	0.10 ~ 0.20	0.01 ~ 0.04	0.01 ~ 0.05	
Aluminum alloys	-	-	-	★ 200 ~ 500	☆ 200 ~ 450	-	-	0.01 ~ 0.05	0.01 ~ 0.06	
Brass	-	-	-	-	★ 100 ~ 200	-	-	0.01 ~ 0.07	0.01 ~ 0.08	

★: 1st Recommendation ☆: 2nd Recommendation

Precautions

Maximum ap of the next tool (indicated as tool A) and holder interference

1. When using JCTM holder 1218/1212, note maximum ap of the next tool to avoid interference.

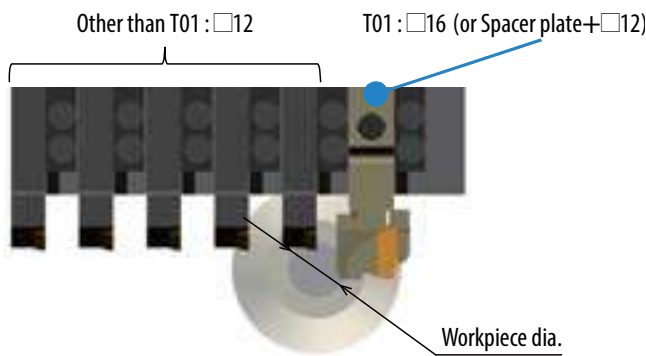


Estimated maximum ap of tool A (mm)

JCTM Description \ Workpiece dia.	ø12	ø16	ø20
KGZ ^{R/L} 1218JX-*JCTM	2.4	2.0	1.7
KGZ ^{R/L} 1212JX-*JCTM	-	-	3.8

2. When using JCTM holder 1218/1625/1616 for T01 of the following target models, check the workpiece dia. in advance to avoid interference.

< Target models > T01: □16 (or Spacer plate + □12) holder is mounted, and machines other than T01: □12 holder only is mounted.



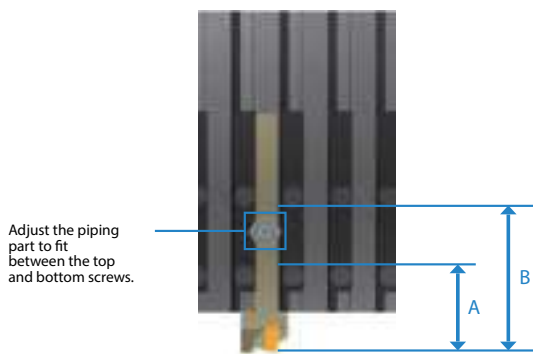
Interference guideline of workpiece dia. (mm)

JCTM Description \ Workpiece dia.	ø14 or less	Greater than ø14
KGZ ^{R/L} 1218JX-*JCTM	Available	Not available → Use □12 square shank
KGZ ^{R/L} 1616JX-*JCTM		
KGZ ^{R/L} 1625JX-*JCTM		



Piping part interference avoidance

Rectangular shank (KGZ^{R/L} 1218..., KGZ^{R/L} 1625...) are recommended for use with piping parts connected to JCTM holders. When connecting piping parts to the JCTM square shank, check the lengths of A and B below to avoid interference with the screws of the tool turret









Shank size	Availability of square shank use
□12	"A" shorter than 51.5 mm and "B" longer than 68.5 mm → Available Other than the above conditions → Not available (Use a rectangular shank)
□16	Available

Compatibility with conventional tools

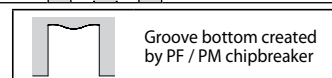
KGZ is not compatible with the conventional tools (KGD/KGM)



GDM/GDMS/GDG

		Carbon steel / Alloy steel		Stainless steel		Cast iron		Non-ferrous metals		P		M		K		N								
Insert	Description	No. of edges	Dimension (mm)				Angle (°)	Tolerance (mm)		Carbide					Applicable toolholder H34, H36, H39 H40, H41, H43									
			CW	S	RE	INSL		PSIR%	CW min.	CW max.	DLC	PVD	-											
				P01025	PR1215	PR1225	PR1535	GW15																
 Low feed	GDM 1316N-003PF 1316N-015PF	2	1.3	3.7	0.03 0.15	16			-0.04	+0.04	●	●	●	●	●	●	●							
	GDM 1516N-003PF 1516N-015PF										●	●	●	●	●	●	●							
	GDM 2020N-003PF 2020N-015PF	2	2	4.3	0.03 0.15	20					●	●	●	●	●	●	●							
	GDM 2520N-003PF 2520N-015PF	2.5	●								●	●	●	●	●									
	GDM 3020N-003PF 3020N-015PF	3	3	0.03 0.15	20							●	●	●	●	●	●	●						
 Low feed	GDM 1316R-003PF-15D 1316L-003PF-15D	2	1.3	3.7	0.03 0.15	16			-0.04	+0.04	●	●	●	●	●	●	●							
	GDM 1516R-003PF-15D 1516L-003PF-15D 1516R-015PF-15D										1.5	0.03 0.15	16							●	●	●	●	●
	GDM 2020R-003PF-15D 2020L-003PF-15D 2020R-015PF-15D	2	2	4.3	0.03 0.15	20			-0.04	+0.04	●	●	●	●	●	●	●							
	GDM 2520R-003PF-15D 2520L-003PF-15D 2520R-015PF-15D	2.5	0.03 0.15								20							●	●	●	●	●	●	●
	GDM 3020R-003PF-15D 3020L-003PF-15D 3020R-015PF-15D	3	3	0.03 0.15	20							●	●	●	●	●	●	●						
 Medium feed	GDM 2020N-010PQ	2	2	4.3	0.1	20			-0.03	+0.03	●	●	●	●	●	●	●							
	GDM 2520N-010PQ	2.5	0.1								20							●	●	●	●	●	●	●
	GDM 3020N-010PQ	3	0.1								20							●	●	●	●	●	●	●
 Medium feed	GDM 2020R-010PQ-15D	2	2	4.3	0.1	20	15		-0.03	+0.03	●	●	●	●	●	●	●							
	GDM 2520R-010PQ-15D	2.5	0.1								20							●	●	●	●	●	●	●
	GDM 3020R-010PQ-15D	3	0.1								20							●	●	●	●	●	●	●
 Low cutting force	GDG 2020N-005PG	2	2	4.3	0.05	20			-0.02	+0.02	●	●	●	●	●	●	●							
	GDG 2520N-005PG	2.5	0.05								20							●	●	●	●	●	●	●
	GDG 3020N-005PG	3	0.05								20							●	●	●	●	●	●	●
 Low cutting force	GDG 2020R-005PG-15D	2	2	4.3	0.05	20	15		-0.02	+0.02	●	●	●	●	●	●	●							
	GDG 2520R-005PG-15D	2.5	0.05								20							●	●	●	●	●	●	●
	GDG 3020R-005PG-15D	3	0.05								20							●	●	●	●	●	●	●

Handed insert shows Right-hand
Using the PF / PM chipbreaker (for cut-off) for grooving cannot create a flat bottom (Ref. to the right figure).

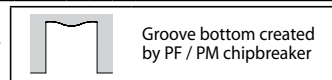


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

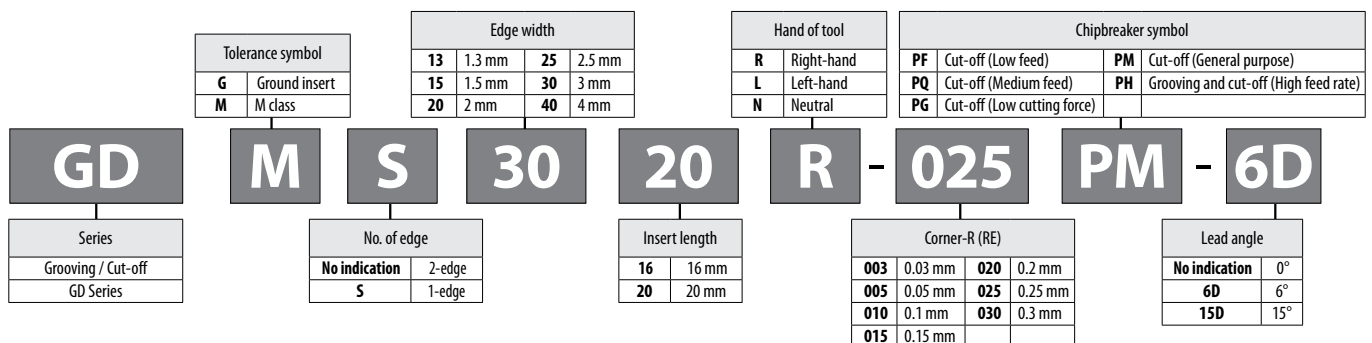
GDM/GDMS/GDG

Insert		Description	No. of edges	Dimension (mm)				Angle (°)	Tolerance (mm)		Carbide			Applicable toolholder H34, H39~H41, H43
				CW	S	RE	INSL		PSIR%	CW min.	CW max.	PVD	PR1215		PR1225	PR1335
														P
														M
														K
														N
		GDM 2020N-020PM	2											KGD [®] /L...-2(...) KGD [®] /L...-2B
		GDM 2520N-020PM	2	2.5	4.3		20	-	-0.03	+0.03				KGD [®] /L...-2(...), KGD [®] /L...-2.4(...) KGD [®] /L...-2B
		GDM 3020N-025PM	2	3										KGD [®] /L...-2(...), KGD [®] /L...-2.4(...) KGD [®] /L...-3(...), KGD [®] /L...-2B
		GDM 4020N-030PM	2	4										KGD [®] /L...-3(...), KGD [®] /L...-3... KGD [®] /L...-4T...
		GDM 2020R-020PM-6D	2											KGD [®] /L...-2(...) KGD [®] /L...-2B
		GDM 2520R-020PM-6D	2	2.5	4.3		20	6	-0.03	+0.03				KGD [®] /L...-2(...), KGD [®] /L...-2.4(...) KGD [®] /L...-2B
		GDM 3020R-025PM-6D	2	3										KGD [®] /L...-2(...), KGD [®] /L...-2.4(...) KGD [®] /L...-3(...), KGD [®] /L...-2B
		GDMS 2020N-020PM	1	2	4.3	0.25	20	-	-0.03	+0.03				KGD [®] /L...-2(...) KGD [®] /L...-2B
		GDMS 3020N-025PM	1	3										KGD [®] /L...-2(...), KGD [®] /L...-2.4(...) KGD [®] /L...-3(...), KGD [®] /L...-2B
		GDMS 4020N-030PM	1	4										KGD [®] /L...-3(...), KGD [®] /L...-3... KGD [®] /L...-4T...
		GDMS 2020R-020PM-6D	1	2	4.3	0.25	20	6	-0.03	+0.03				KGD [®] /L...-2(...) KGD [®] /L...-2B
		GDMS 3020R-025PM-6D	1	3										KGD [®] /L...-2(...), KGD [®] /L...-2.4(...) KGD [®] /L...-3(...), KGD [®] /L...-2B
		GDMS 4020R-030PM-6D	1	4										KGD [®] /L...-3(...), KGD [®] /L...-3... KGD [®] /L...-4T...
		GDM 2020N-020PH	2											KGD [®] /L...-2(...) KGD [®] /L...-2B
		GDM 3020N-030PH	2	3	4.3	0.3	20	-	-0.03	+0.03				KGD [®] /L...-2(...), KGD [®] /L...-2.4(...) KGD [®] /L...-3(...), KGD [®] /L...-2B
		GDM 4020N-030PH	2	4										KGD [®] /L...-3(...), KGD [®] /L...-3... KGD [®] /L...-4T...
		GDMS 2020N-020PH	1	2	4.3	0.3	20	-	-0.03	+0.03				KGD [®] /L...-2(...) KGD [®] /L...-2B
		GDMS 3020N-030PH	1	3										KGD [®] /L...-2(...), KGD [®] /L...-2.4(...) KGD [®] /L...-3(...), KGD [®] /L...-2B
		GDMS 4020N-030PH	1	4										KGD [®] /L...-3(...), KGD [®] /L...-3... KGD [®] /L...-4T...

Handed insert shows Right-hand
Using the PF / PM chipbreaker (for cut-off) for grooving cannot create a flat bottom (Ref. to the right figure).



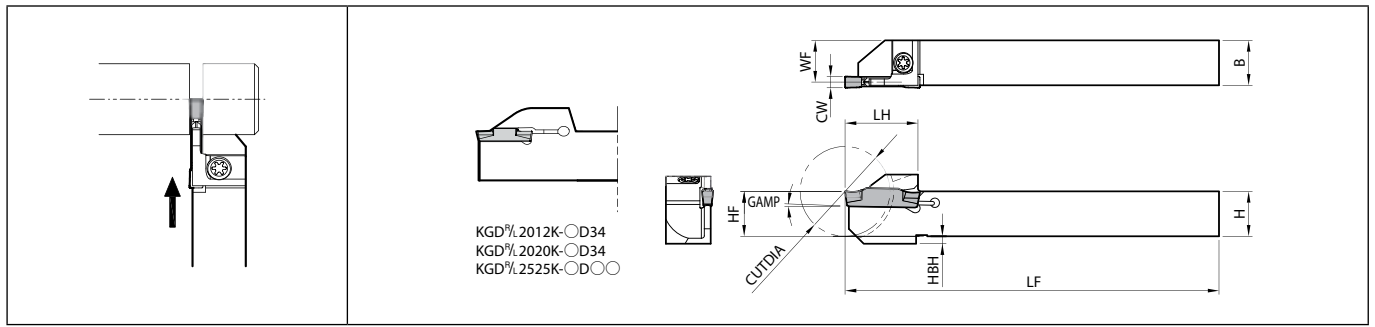
Inserts identification system



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



KGD (for Automatic Lathe)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)											Angle	Spare parts					Applicable inserts ● H32, H33				
															Clamp bolt	Screw	Screw	Wrench	Wrench					
KGD% 1010JX-1.3D16 1010JX-1.3 1212F-1.3D16 1212JX-1.3D16 1212F-1.3 1212JX-1.3	● ●	● ●	16	10	10	18	10	2	120	9.9	1.3	1.3	5	-	SB-40120TR	-	-	LTW-15S	GDM1316...					
	● ●	● ●	20						85	9.5										120	85	11.5		
	● ●	● ●	16						12	12										19.5	12	120	85	11.5
	● ●	● ●	24						120	85										11.5	120	85	11.5	
	● ●	● ●	16						12	12										19.5	12	120	85	11.4
	● ●	● ●	24						120	85										11.4	120	85	11.4	
KGD% 1010JX-1.5D16 1010JX-1.5 1212F-1.5D16 1212JX-1.5D16 1212F-1.5 1212JX-1.5	● ●	● ●	16	10	10	18	10	2	120	9.7	1.5	1.5	5	-	SB-40120TR	-	-	LTW-15S	GDM1516...					
	● ●	● ●	20						85	9.4										120	85	11.4		
	● ●	● ●	16						12	12										19.5	12	120	85	11.4
	● ●	● ●	24						120	85										11.4	120	85	11.4	
	● ●	● ●	16						12	12										19.5	12	120	85	11.4
	● ●	● ●	24						120	85										11.4	120	85	11.4	
KGD% 1010JX-2 1212F-2 1212JX-2 1616JX-2 2012K-2D34 2020K-2D34 2525K-2D34	● ●	● ●	20	10	10	18	10	2	120	9.2	2	3	1	-	SB-40120TR	-	-	LTW-15S	GDG2020... GDM2020... GDMS2020... GDG2520... GDM2520... GDG3020... GDM3020... GDMS3020...					
	● ●	● ●	24						85	11.2										120	152	11.2		
	● ●	● ●	32						16	16										24.5	16	120	152	11.2
	● ●	● ●	34						20	12										32.5	20	125	192	19.2
	● ●	● ●	20						12	12										19.5	12	125	192	19.2
	● ●	● ●	34						20	12										32.5	20	125	192	19.2
	● ●	● ●	25						25	25										25	25	242	24.2	24.2
	● ●	● ●	25						25	25										25	25	242	24.2	24.2
KGD% 1010JX-2.4 1212F-2.4 1212JX-2.4 1616JX-2.4 2012K-2.4D34 2020K-2.4D34 2525K-2.4D34	● ●	● ●	20	10	10	18	10	2	120	9	2.4	3	1	-	SB-40120TR	-	-	LTW-15S	GDG2520... GDM2520... GDG3020... GDM3020... GDMS3020...					
	● ●	● ●	24						85	11										120	15	11		
	● ●	● ●	32						16	16										24.5	16	120	15	11
	● ●	● ●	34						20	12										32.5	20	125	19	19
	● ●	● ●	20						12	12										19.5	12	125	19	19
	● ●	● ●	34						20	12										32.5	20	125	19	19
	● ●	● ●	25						25	25										25	25	24	24	24
	● ●	● ●	25						25	25										25	25	24	24	24
KGD% 1212JX-3	● ●	● ●	24	12	12	19.5	12	2	120	10.8	3	3	1	-	SB-40120TR	-	-	LTW-15S	GDG3020..., GDM3020... GDMS3020...					
KGD% 1616JX-3 1616JX-3D38 1913K-3D38 2012JX-3D42 2012JX-3D51 2020JX-3D42 2020JX-3D51 2525K-3D51	● ●	● ●	32	16	16	24.5	16	-	120	14.8	3	4	1	-	SB-40120TR	-	-	LTW-15S	GDG3020... GDM3020... GDMS3020... GDM4020... GDMS4020...					
	● ●	● ●	38						19	13										29	19	125	11.8	
	● ●	● ●	42						12	31										36	20	120	10.8	
	● ●	● ●	51						20	31										36	20	120	18.8	
	● ●	● ●	42						20	31										36	20	120	18.8	
	● ●	● ●	51						20	31										36	20	120	18.8	
	● ●	● ●	51						25	25										41.5	25	125	23.8	
	● ●	● ●	51						25	25										41.5	25	125	23.8	
	● ●	● ●	51						25	25										41.5	25	125	23.8	
	● ●	● ●	51						25	25										41.5	25	125	23.8	

4mm width Insert cannot be installed in KGD% 1212JX-3

Recommended tightening torque of clamp screw : 2.0N·m (SB-40120TR), 2.5N·m (SE-50125TR), 6.5N·m (HH5X16)

When machining the material greater than ø36 mm with KGD%...-3D38, KGD%...-3D42 and KGD%...-3D51 toolholders, please use 1-edge inserts.

Maximum cutting diameter for 2-edge inserts is ø36 mm.

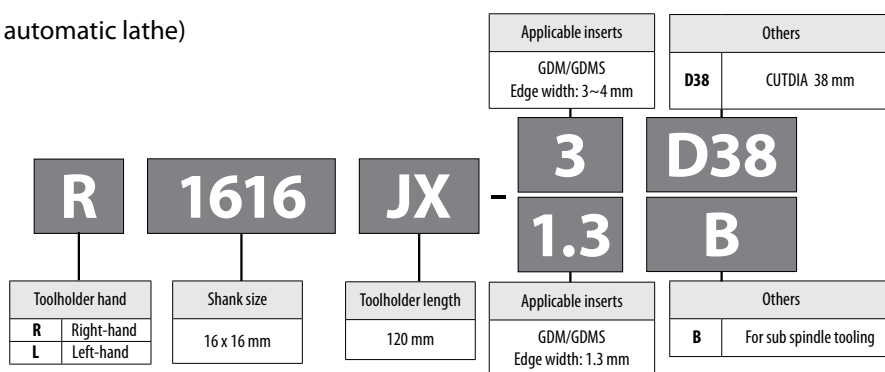
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions ● H44, H45

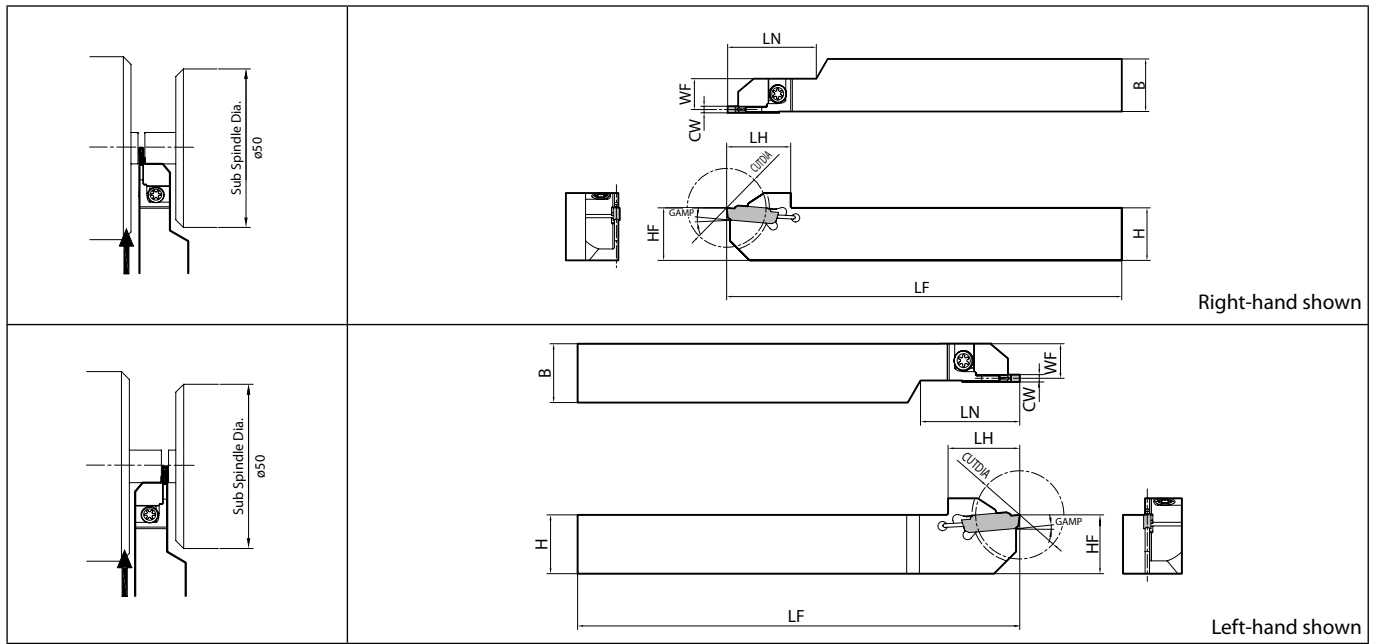
Toolholder identification system

KGD / KGDS (for automatic lathe)

KGD
KGDS



KGDS (Cut-off / for sub spindle tooling)



H



Cut-Off

Toolholder dimensions

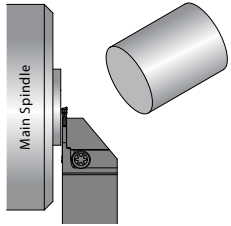
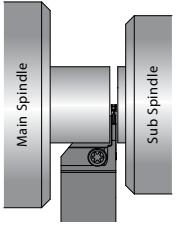
Description	Availability		Dimension (mm)											Angle	Spare parts		Applicable inserts ➔ H32, H33
															Screw	Wrench	
	R	L	CUTDIA	H	B	LH	HF	LF	LN	WF	CW min.	CW max.	GAMP (°)				
KGDS%L 1616JX-1.3B	●	●									9.5	1.3	1.3	5	SB-40120TR	LTW-15S	GDM1316...
1616JX-1.5B	●	●	24	16	16	19.5	16	120	27	9.4	1.5	1.5	GDM1516...				
1616JX-2B	●	●									9.2	2	3				1	GDG2020..., GDM2020..., GDMS2020..., GDG2520..., GDM2520..., GDG3020..., GDM3020..., GDMS3020...

Recommended cutting conditions ➔ H44, H45

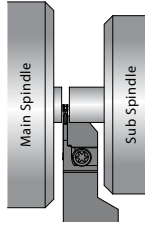
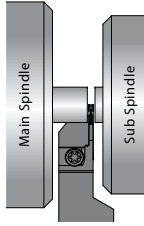
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD / KGDS selection reference

KGD

Standard type	
<ul style="list-style-type: none"> · Both Right-hand and Left-hand types are applicable to gang tool post. · Basically Left-hand type is used for cut-off operation using a sub spindle. 	
KGDR (Right-hand toolholder)	KGDL (Left-hand toolholder)
	
<p><1st. Recommendation> Use insert with lead angle to remove boss.</p> <ul style="list-style-type: none"> · Not using sub spindle · Cut-off operation near main spindle side 	<p><1st. Recommendation> Use insert without lead angle.</p> <ul style="list-style-type: none"> · Using sub spindle · Cut-off operation near sub spindle side

KGDS

Sub spindle type	
<ul style="list-style-type: none"> · When machining workpiece with small diameter, use KGDS to reduce overhang distance from the main spindle. 	
KGDSR (Right-hand toolholder)	KGDSL (Left-hand toolholder)
	
<ul style="list-style-type: none"> · Long workpiece and more rigidity · Cut-off operation near main spindle side 	<ul style="list-style-type: none"> · Short workpiece and less rigidity · Cut-off operation near sub spindle side



Direct coolant cut-off toolholders for automatic lathe

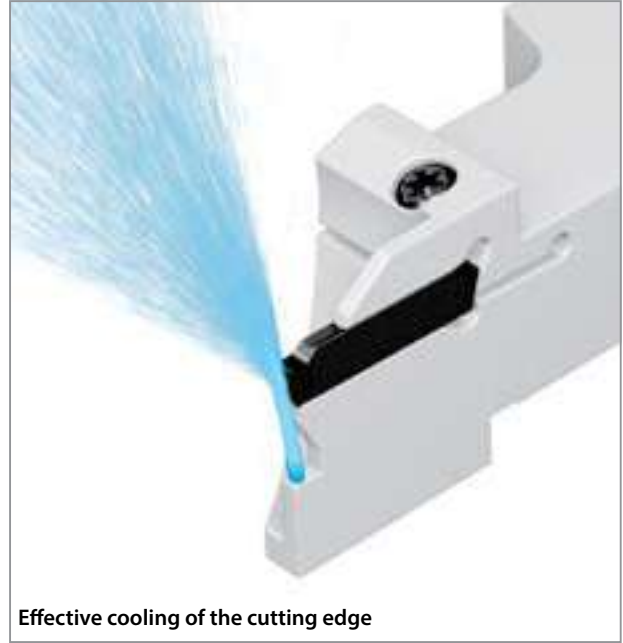
KGD-JCTM

(for automatic lathe)

1 Optimized coolant hole position

2 Discharge coolant towards the flank face of the insert

Directing coolant towards the cutting edge lengthens tool life.



Effective cooling of the cutting edge

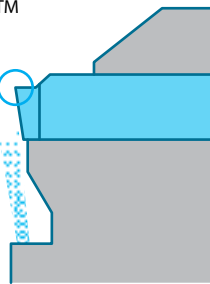
H



Cut-Off

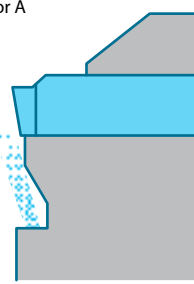
Coolant discharging

KGD-JCTM



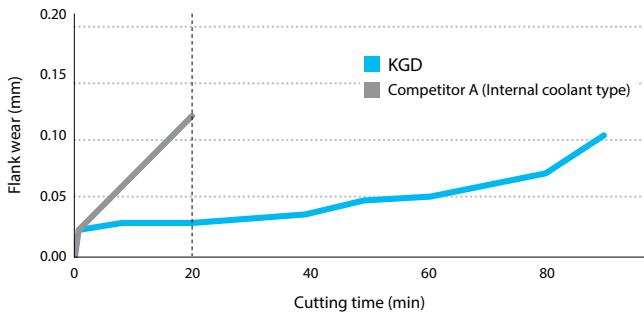
Sufficient cooling towards the cutting edge

Competitor A



Coolant does not flow directly towards the cutting edge

Wear resistance comparison (Internal evaluation)



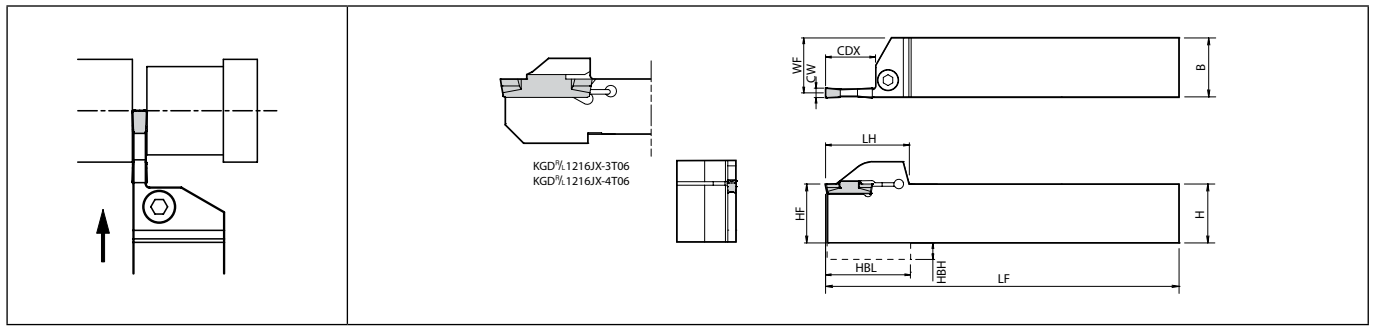
Cutting conditions: $V_c = 80$ m/min, $f = 0.06$ mm/rev (~2 mm : $f = 0.02$ mm/rev),
 KGDR1625H-2JCT, GDM2020N-015PF PR1535 (CW: 2.0 mm)
 Workpiece material : X5CrNi18 10 (ø25) Internal coolant (1.5MPa) Cut-off

Cutting edge condition (after machining 20min)



High density and high speeds coolant provides effective cooling of the cutting edge
 Superior cooling action improves tool life

KGD (Integral type)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)													Spare parts				Applicable inserts ● H32, H33	
			R	L	CDX	H	B	LH	HF	HBH	HBL	LF	WF	CW min.	CW max.	Clamp bolt	Screw	Wrench	Wrench		
	KGD% 1616H-2T06 1616H-2T10 1616H-2T17 2012K-2T17 2020K-2T06 2020K-2T10 2020K-2T17 2525M-2T06 2525M-2T10 2525M-2T17	●	●	6	16	16	27.7 30.2 31.2	16	4	28 30.5 31.5	100	15.2				2	3	HH5X16	-		LW-4	-	GDG2020... GDM2020... GDMS2020... GDG2520... GDM2520... GDG3020... GDM3020... GDMS3020...
KGD% 2012K-2.4T17 2020K-2.4T17	●	●	17	20	20	32.5	20	-	-	125	11 19	2.4	3	HH5X16	-	LW-4	-	-	GDG2520..., GDM2520..., GDG3020... GDM3020..., GDMS3020...		
KGD% 1216JX-3T06 1616H-3T06 1616H-3T10 1616H-3T20 2012K-3T20 2020K-3T06 2020K-3T10 2020K-3T20 2525M-3T06 2525M-3T10 2525M-3T20	●	●	6	12	16	19.5 27.7 30.2 34.2	12	2	19 28 30.5 34.5	120	14.8			3	4	HH5X16	SE-5012STR	-	LW-4	LW-20	GDG3020... GDM3020... GDMS3020... GDM4020... GDMS4020...
KGD% 1216JX-4T06 2020K-4T10 2020K-4T20 2525M-4T10 2525M-4T20 2525M-4T25	●	●	6	12	16	19.5 30.5 34.5	12	2	19 20	120	14.3			4	5	HH5X16	SE-5012STR	-	LW-4	LW-20	GDM4020... GDMS4020...

CDX : Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)

Recommended tightening torque of clamp bolt : 6.5N·m (HH5X16), 8.0N·m (HH6X25), 2.5N·m (SE-5012STR)

Above toolholders are applicable to external grooving, too.

Recommended cutting conditions ● H44, H45

Toolholder identification system

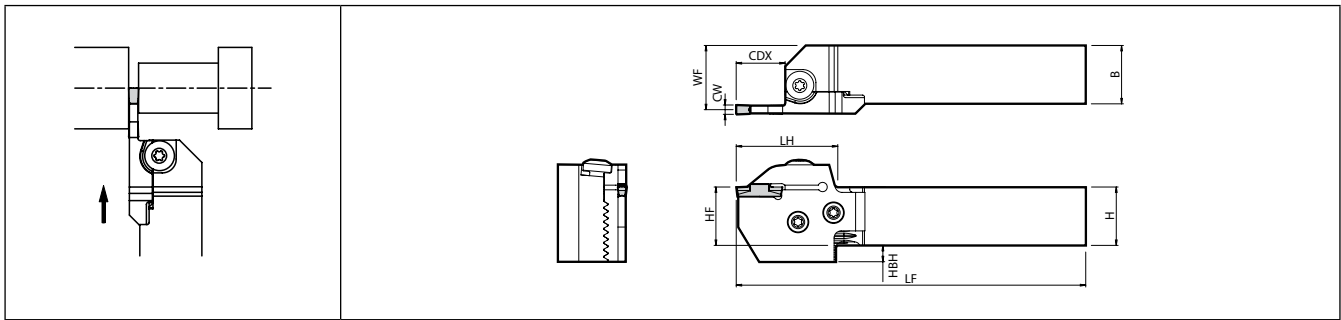
KGD (Integral type)

KGD **R** **1616** **H** - **2** **T** **06**

Toolholder hand R Right-hand L Left-hand	Shank size 16 × 16 mm	Toolholder length 100mm	Applicable inserts GDM/GDMS 2~3 mm	Max. depth of cut 06: 6 mm
--	--------------------------	----------------------------	--	-------------------------------

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD-S (0° separate type)



Right-hand shown (Right-hand blade and right-hand toolholder)

Toolholder dimensions (Blade and toolholder)

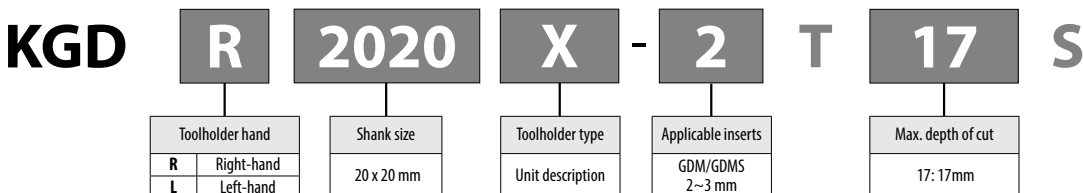
Shank angle	Width (mm)	Max. depth of cut (mm)	Shank size (mm)	Unit description	Availability		Blade description G43	Toolholder description G43	Dimension (mm)										Spare parts				
					R	L			CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.	Clamp bolt (for insert clamp)	Screw (for blade)	Wrench		
0°	2	17	20	KGD% 2020X-2T17S	●		KGD%L-2T17-C	KGD% 2020-C	20	20		20	12	122	23.4	2	3	BH6X10TR	SB-60120TR	LTW-25			
				KGD% 2525X-2T17S	●	●			KGD% 2525-C	17	25	25	40	25	7						147	28.4	
				No unit description ⇨					KGD% 3232-C		32	32		32	-						167	35.4	
	3	10	10	20	KGD% 2020X-3T10S	●		KGD%L-3T10-C	KGD% 2020-C	20	20		20	12	115	23	3				4		
					KGD% 2525X-3T10S	●	●			KGD% 2525-C	10	25	25	33	25	7						140	28
					No unit description ⇨					KGD% 3232-C		32	32		32	-						160	35
	20	20	20	20	KGD% 2020X-3T20S	●	●	KGD%L-3T20-C	KGD% 2020-C	20	20		20	12	125	23	4						
					KGD% 2525X-3T20S	●	●			KGD% 2525-C	20	25	25	43	25	7					150	28	
					KGD% 3232X-3T20S	●				KGD% 3232-C		32	32		32	-					170	35	
	4	10	10	20	KGD% 2020X-4T10S	●		KGD%L-4T10-C	KGD% 2020-C	20	20		20	12	115	22.5	5						
					KGD% 2525X-4T10S	●				KGD% 2525-C	10	25	25	33	25	7					140	27.5	
					No unit description ⇨					KGD% 3232-C		32	32		32	-					160	34.5	
20		20	20	20	KGD% 2020X-4T20S	●		KGD%L-4T20-C	KGD% 2020-C	20	20		20	12	125	22.5							
					KGD% 2525X-4T20S	●	●			KGD% 2525-C	20	25	25	43	25	7		150	27.5				
					KGD% 3232X-4T20S	●				KGD% 3232-C		32	32		32	-		170	34.5				
25	25	25	25	KGD% 2020X-4T25S	●	●	KGD%L-4T25-C	KGD% 2020-C	20	20		20	12	130	22.5								
				KGD% 2525X-4T25S	●	●			KGD% 2525-C	25	25	25	48	25	7	155	27.5						
				KGD% 3232X-4T25S	●				KGD% 3232-C		32	32		32	-	175	34.5						

- When using the toolholder in normal mounting position, the lower jaw of toolholder may interfere with the tool presetter.
- The toolholder and blade descriptions are printed on the toolholder body. (Unit description is not printed.)
KGD-S: Right-hand blade for right-hand toolholder, left-hand blade for left-hand toolholder.
The toolholder is applicable for all blade with suitable hand.
- When the unit description is not available (No unit description) and/or if stock status is blank, please purchase toolholder and blade separately.
- CDX: Maximum depth to which processing can be made. (If the CDX is 20 mm or more, the maximum groove-depth of groove made by the 2-edge insert will be 18 mm.)
- Recommended tightening torque of clamp bolt for insert : 6.5N·m (Groove width 2 ~ 4mm)
- Above toolholders are applicable to external grooving, too.

Applicable inserts ● H32, H33
Recommended cutting conditions ● H44, H45

Toolholder identification system

KGD (Separate type / Unit description)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Great for high pressure coolant External grooving and cut-off

KGD-JCT

Coolant is directed from two directions towards the flank face of the insert
Improved chip control and longer tool life for external grooving and cut-off

1 Excellent chip control

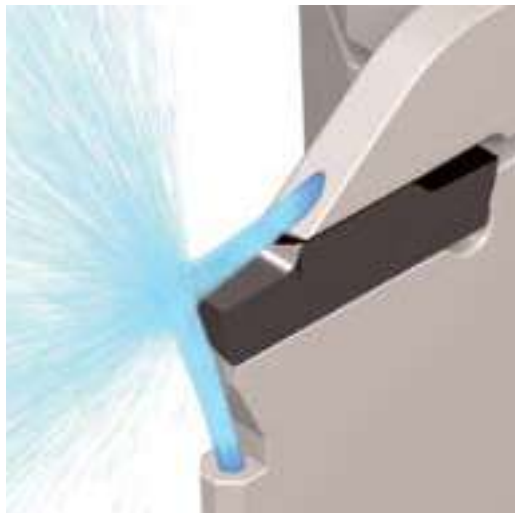
Coolant towards the rake face

Coolant hole position and angle improve chip control

Chip control comparison (Internal evaluation)

KGD-JCT showed better chip control performance even at lower feed rates

$f = 0.05 \text{ mm/rev}$ (1.5MPa)

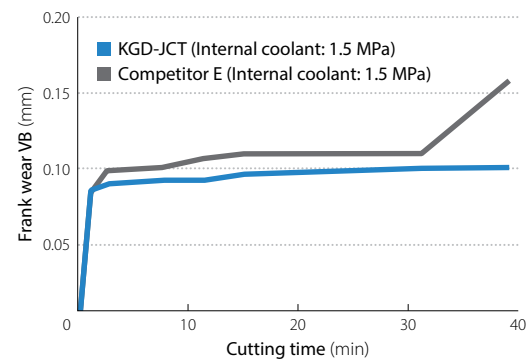
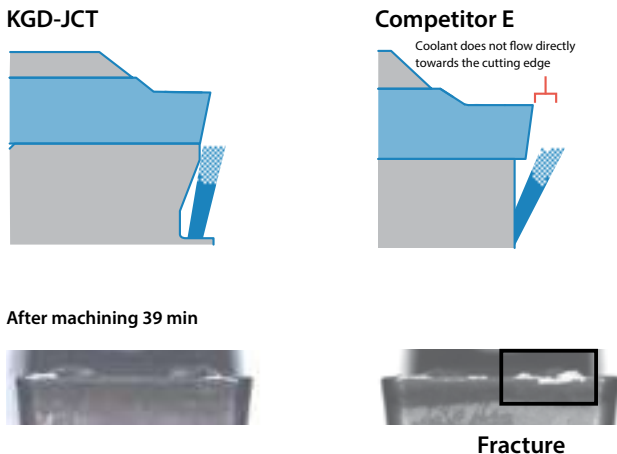


Cutting Conditions : $V_c = 150 \text{ m/min}$, $d = 8 \text{ mm}$, $f = 0.05 \text{ mm/rev}$, Wet
Edge Width 4 mm Workpiece Material : 15CrMo4 Grooving

2 Cooling the cutting edge leads to longer tool life

Coolant towards the rake surface and the flank face of the insert
Directing coolant towards the cutting edge lengthens tool life

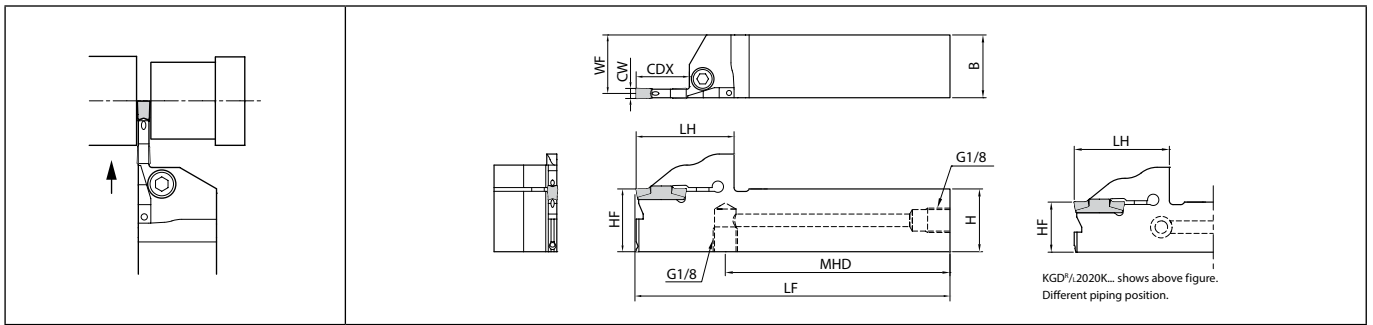
Wear resistance comparison (Internal evaluation)



Cutting conditions : $V_c = 180 \text{ m/min}$, $d = 9 \text{ mm}$, $f = 0.15 \text{ mm/rev}$, Wet
Edge width 4 mm Workpiece material : 15CrMo4 Grooving

KGD-JCT minimizes wear and provides longer tool life without insert fracturing

KGD-JCT (Coolant-through holders)



Right-hand shown | Applicable pressure : ~15MPa

Toolholder dimensions

Description	Availability		Dimension (mm)										Spare parts			Applicable inserts ● H32, H33		
													Clamp bolt	Plug	Wrench			
	R	L	CDX	H	B	LH	HF	LF	WF	MHD	CW min.	CW max.						
KGD [®] /L 2020K-3T06JCT 2020K-3T10JCT 2020K-3T20JCT 2525K-3T06JCT 2525K-3T10JCT 2525K-3T20JCT	●	●	6			31.5												GDG3020... GDM3020... GDMS3020... GDM4020... GDMS4020...
	●	●	10	20	20	34	20			18.8	94.2			HH5X16	HSG1/8X8.0	LW-4		
	●	●	20			38			125		90.2			HH5X25				
	●	●	6			31.5					96.5							
	●	●	10	25	25	34	25			23.8	94.5							
KGD [®] /L 2020K-4T10JCT 2020K-4T20JCT 2525K-4T10JCT 2525K-4T20JCT 2525K-4T25JCT	●	●	10	20	20	34	20			18.3	94.2			HH5X16	HSG1/8X8.0	LW-4	GDM4020... GDMS4020...	
	●	●	20			38			125		90.2							
	●	●	10			34					94.5			HH5X25				
	●	●	20	25	25	39	25			23.3	89.5							
	●	●	25			44					84.5							

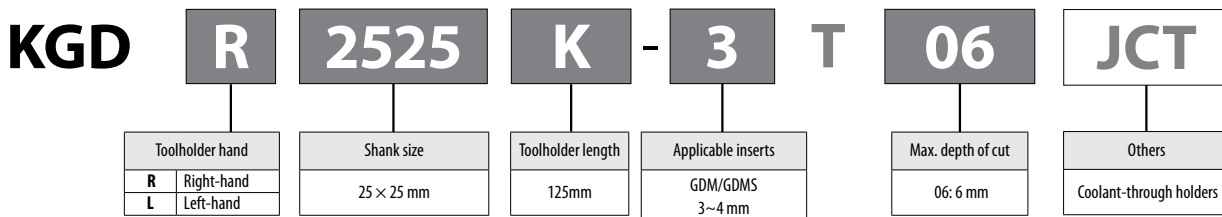
Please see page D12 for piping parts of coolant-through holders.

Recommended cutting conditions ● H44, H45



Toolholder identification system

KGD (Integral type)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KGD recommended cutting conditions (PF/PQ/PG chipbreaker)

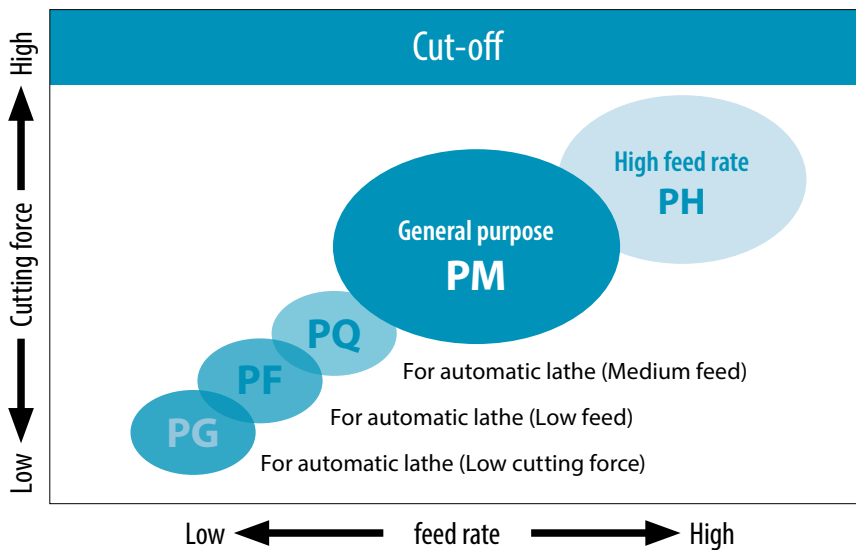
Workpiece material	Recommended insert grades (Vc: m/min)			f (mm/rev)						Remarks
				PF (RE = 0.03 mm)			PF (RE = 0.15 mm)			
	MEGACOAT NANO	MEGACOAT		Edge width CW (mm)						
PR1535	PR1225	PR1215	1.3 / 1.5	2.0	2.5 / 3.0	1.3 / 1.5	2.0	2.5 / 3.0		
Carbon steel	☆ 70 ~ 150	★ 70 ~ 150	☆ 70 ~ 180	0.01 ~ 0.04	0.02 ~ 0.06	0.02 ~ 0.08	0.01 ~ 0.05	0.03 ~ 0.08	0.04 ~ 0.10	
Alloy steel	☆ 70 ~ 150	★ 70 ~ 150	☆ 70 ~ 180							
Stainless steel	★ 60 ~ 120	☆ 60 ~ 120	☆ 60 ~ 150							
Cast iron	-	-	★ 80 ~ 200							

★: 1st Recommendation ☆: 2nd Recommendation

Workpiece Material	Recommended insert grades (Vc: m/min)					f (mm/rev)				Remarks
						PQ		PG		
	MEGACOAT NANO	MEGACOAT		DLC coated carbide	Carbide	Edge width CW (mm)				
PR1535	PR1225	PR1215	PDL025	GW15	2.0	2.5 / 3.0	2.0	2.5 / 3.0		
Carbon steel	☆ 70 ~ 150	★ 70 ~ 150	☆ 70 ~ 180	-	-	0.03 ~ 0.1	0.04 ~ 0.12	0.01 ~ 0.04	0.01 ~ 0.05	
Alloy steel	☆ 70 ~ 150	★ 70 ~ 150	☆ 70 ~ 180	-	-					
Stainless steel	★ 60 ~ 120	☆ 60 ~ 120	☆ 60 ~ 150	-	-	0.02 ~ 0.07	0.02 ~ 0.08	0.01 ~ 0.03	0.01 ~ 0.04	
Cast iron	-	-	★ 80 ~ 200	-	☆ 50 ~ 100	0.04 ~ 0.1	0.04 ~ 0.12	0.01 ~ 0.04	0.01 ~ 0.05	
Aluminum Alloys	-	-	-	★ 200 ~ 500	☆ 200 ~ 450	-	-	0.01 ~ 0.05	0.01 ~ 0.06	
Brass	-	-	-	-	★ 100 ~ 200	-	-	0.01 ~ 0.07	0.01 ~ 0.08	

★: 1st Recommendation ☆: 2nd Recommendation

Application map

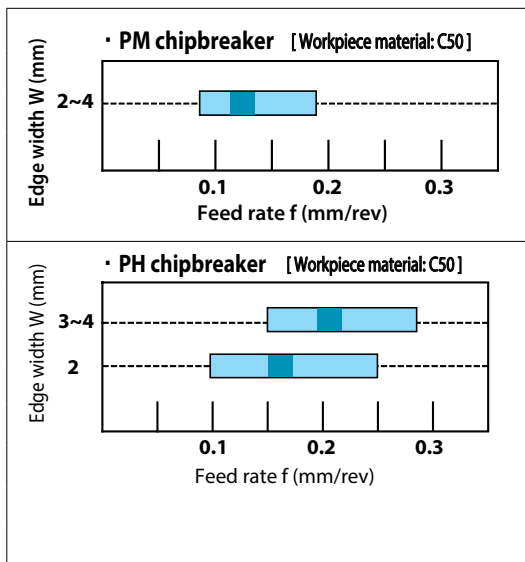


KGD recommended cutting conditions (PM / PH chipbreaker)

Workpiece material	Recommended insert grades (Vc: m/min)			f (mm/rev)			Remarks
	MEGACOAT NANO	MEGACOAT		PM	PH		
		PR1535	PR1225	PR1215	Edge width CW (mm)		
				2 ~ 4	2	3 ~ 4	
Carbon steel	☆ 80 ~ 200	★ 80 ~ 200	☆ 100 ~ 200	0.08 ~ 0.18	0.10 ~ 0.25	0.15 ~ 0.28	Coolant
Alloy steel	☆ 70 ~ 180	★ 70 ~ 180	☆ 80 ~ 180				
Stainless steel	★ 60 ~ 150	☆ 60 ~ 150	☆ 60 ~ 150	0.06 ~ 0.12	0.05 ~ 0.12	0.08 ~ 0.15	
Cast iron	-	-	★ 100 ~ 200	0.08 ~ 0.18	0.10 ~ 0.25	0.15 ~ 0.28	

★: 1st Recommendation ☆: 2nd Recommendation

Example of feed [■ In the graph indicates the most recommended value of feed (f)]









Caution (Cut-off)

1. Be sure to perform wet processing. Apply enough coolant to the cutting edge.
2. Keep a constant rate during processing so that optimum product life will be achieved.
3. Cut-off as close to the chuck as possible.
4. Lower the feed rate to 1/2 to 1/3 at the near center to prevent impact caused by machining.



GM/GMM/GMN/GM^{R/L}

		Carbon steel / Alloy steel		Stainless steel		Cast iron		Non-ferrous metals		P		M		K		N	
Insert	Description	No. of edges	Dimension (mm)				Tolerance (mm)		Carbide					Applicable toolholder H50~H52			
			CW	S	RE	INSL	CW min.	CW max.	CVD		PVD		Cermet				
									CR9025	PR915	PR930	PR1115			KW10	TN90	
	GMM 1520-MT	2	1.5	4.3	0 0.05	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-1.5(-85)			
	GMM 2020-MT	2	2	4.3	0 0.05	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-1.5(-85) KGM ^{R/L} ...-2(...)			
	GMM 2520-MT	2	2.5	4.3	0 0.05	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-2(...) KGM ^{R/L} ...-2.5(-85)			
	GMM 3020-MT	2	3	4.3	0 0.05	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-2(...), KGM ^{R/L} ...-2.5(-85) KGM ^{R/L} ...-3(T20)			
	GMM 1520-NB	2	1.5	4.3	0	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-1.5(-85)			
	GMM 2020-NB	2	2	4.3	0	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-1.5(-85) KGM ^{R/L} ...-2(...)			
	GMM 2520-NB	2	2.5	4.3	0	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-2(...) KGM ^{R/L} ...-2.5(-85)			
	GMM 3020-NB	2	3	4.3	0	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-2(...), KGM ^{R/L} ...-2.5(-85) KGM ^{R/L} ...-3(T20)			
	GMM 2020-TK	2	2	4.3	0.2	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-1.5(-85) KGM ^{R/L} ...-2(...)			
	GMM 2520-TK	2	2.5	4.3	0.2	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-2(...) KGM ^{R/L} ...-2.5(-85)			
	GMM 3020-TK	2	3	4.3	0.25	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-2(...), KGM ^{R/L} ...-2.5(-85) KGM ^{R/L} ...-3(T20)			
	GMM 2020-TMR	2	2	4.3	0.2	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-1.5(-85) KGM ^{R/L} ...-2(...)			
	GMM 2520-TMR	2	2.5	4.3	0.2	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-2(...) KGM ^{R/L} ...-2.5(-85)			
	GMM 3020-TMR	2	3	4.3	0.25	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-2(...), KGM ^{R/L} ...-2.5(-85) KGM ^{R/L} ...-3(T20)			
	GMN 2-TK	1	2	4.3	0.2	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-1.5(-85) KGM ^{R/L} ...-2(...)			
	GMN 3-TK	1	3	4.3	0.25	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-2(...), KGM ^{R/L} ...-2.5(-85) KGM ^{R/L} ...-3(T20)			
	GMN 4-TK	1	4	4.3	0.3	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-3(T20), KGM ^{R/L} ...-4(T..)			
	GMN 2.2	1	2.2	4.3	0.17	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-2(...)			
	GMN 3	1	3	4.3	0.2	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-2(...), KGM ^{R/L} ...-2.5(-85) KGM ^{R/L} ...-3(T20)			
	GMN 4	1	4	4.3	0.25	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-3(T20), KGM ^{R/L} ...-4(T..)			
	GMN 5	1	5	4.3	0.8	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-4(T..), KGM ^{R/L} ...-5(T25)			
	GMN 6	1	6	4.3	0.8	20	-0.05	+0.05	●	●	●	●	●	KGM ^{R/L} ...-5(T25), KGM ^{R/L} ...-6T30			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

GM/GMM/GMN/GM^{R/L}








		Carbon steel / Alloy steel												P			
		Stainless steel												M			
		Cast iron												K			
		Non-ferrous metals												N			
Insert	Description	No. of edges	Dimension (mm)					Angle (°)	Tolerance (mm)		Carbide					Cermets	Applicable toolholder H50~H52
			CW	S	RE	INSL	PSIR ^{R/L}		CW min.	CW max.	CR9025	PVD	-	-	-		
										PR905	PR915	PR930	PR1115	KW10	TN90		
	GMM 1520R-MT-15D	2	1.5	4.3	0 0.05	20	15	-0.05	+0.05		●	●	●	●		KGM ^{R/L} ...-1.5(-85)	
	GMM 2020R-MT-15D 2020R-MT-15D 2020L-MT-15D	2	2	4.3	0 0.05 0	20	15	-0.05	+0.05	●	●	●	●	●		KGM ^{R/L} ...-1.5(-85) KGM ^{R/L} ...-2(...)	
	GMM 2520R-MT-15D	2	2.5	4.3	0 0.05	20	15	-0.05	+0.05		●	●	●	●		KGM ^{R/L} ...-2(...) KGM ^{R/L} ...-2.5(-85)	
	GMM 3020R-MT-15D 3020R-MT-15D 3020L-MT-15D	2	3	4.3	0 0.05 0	20	15	-0.05	+0.05	●	●	●	●	●		KGM ^{R/L} ...-2(...), KGM ^{R/L} ...-2.5(-85) KGM ^{R/L} ...-3(T20)	
	GMM 2020R-TK-8D	2	2	4.3	0.2	20	8	-0.05	+0.05		●	●	●	●		KGM ^{R/L} ...-1.5(-85) KGM ^{R/L} ...-2(...)	
	GMM 2520R-TK-8D	2	2.5	4.3	0.2	20	8	-0.05	+0.05		●	●	●	●		KGM ^{R/L} ...-2(...) KGM ^{R/L} ...-2.5(-85)	
	GMM 3020R-TK-8D	2	3	4.3	0.25	20	8	-0.05	+0.05	●	●	●	●	●		KGM ^{R/L} ...-2(...), KGM ^{R/L} ...-2.5(-85) KGM ^{R/L} ...-3(T20)	
	GMM 2020R-TMR-6D	2	2	4.3	0.2	20	6	-0.05	+0.05					●		KGM ^{R/L} ...-1.5(-85) KGM ^{R/L} ...-2(...)	
	GMM 2520R-TMR-6D	2	2.5	4.3	0.2	20	6	-0.05	+0.05					●		KGM ^{R/L} ...-2(...) KGM ^{R/L} ...-2.5(-85)	
	GMM 3020R-TMR-6D	2	3	4.3	0.25	20	6	-0.05	+0.05					●		KGM ^{R/L} ...-2(...), KGM ^{R/L} ...-2.5(-85) KGM ^{R/L} ...-3(T20)	
	GMR 2-TK-8D	1	2	4.3	0.2	20	8	-0.05	+0.05			●	●	●		KGM ^{R/L} ...-1.5(-85) KGM ^{R/L} ...-2(...)	
	GMR 3-TK-8D	1	3	4.3	0.25	20	8	-0.05	+0.05		●	●	●	●		KGM ^{R/L} ...-2(...), KGM ^{R/L} ...-2.5(-85) KGM ^{R/L} ...-3(T20)	
	GMR 4-TK-8D	1	4	4.3	0.3	20	8	-0.05	+0.05		●	●	●	●		KGM ^{R/L} ...-3(T20), KGM ^{R/L} ...-4(T.)	
	GMR 2.2-8D GML 2.2-8D	1	2.2	4.3	0.17	20	8	-0.05	+0.05	●	●	●	●	●		KGM ^{R/L} ...-2(...)	
	GMR 2.2-15D	1	2.2	4.3	0	20	15	-0.05	+0.05	●	●	●	●	●		KGM ^{R/L} ...-2(...)	
	GMR 3-4D GML 3-4D	1	3	4.3	0.2	20	4	-0.05	+0.05	●	●	●	●	●		KGM ^{R/L} ...-2(...), KGM ^{R/L} ...-2.5(-85) KGM ^{R/L} ...-3(T20)	
	GMR 4-4D GML 4-4D	1	4	4.3	0.25	20	4	-0.05	+0.05	●	●	●	●	●		KGM ^{R/L} ...-3(T20), KGM ^{R/L} ...-4(T.)	

Handed insert shows Right-hand

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Edge preparation

Series	MT-chipbreaker		TK-chipbreaker		TMR-chipbreaker	Without chipbreaker (NB)	
	Chamfer + R honed	Chamfer + R honed	Chamfer + R honed	Sharp Edge	Chamfer + R honed	R honed	Sharp Edge
Edge prep.	Corner-R (RE) = 0.05	Sharp corner	Corner-R (RE) = 0.2-0.3	Corner-R (RE) = 0.2-0.3	Corner-R (RE) = 0.2	Corner-R (RE) = 0.05	Sharp Corner
							
	CR9025/PR915	PR930/KW10	CR9025/PR915	PR930/KW10	PR1115	CR9025	PR930/KW10

· Sharp edge specification can reduce cutting force by 40% less than that of chamfer edge.

Series	Advantage
GMM-MT	Specific chipbreaker for cut-off operations requiring sharp cutting performance. Minimizes the boss.
GMM-NB	Cutting edge is flat with non-chipbreaker. It works well for brass, etc.
GMM-TK	Stable design with chipbreaker for cut-off. Large corner-R. 2-edge for economical performance.
GMN-TK	Same chipbreaker geometry as GMM-TK. 1-edge. Wide application range.
GMN (Std.) (No indication)	Mainly for deep grooving, but available for groove widening and turning due to projection near side cutting edge. 1-edge and wide application range. Available for cut-off applications.

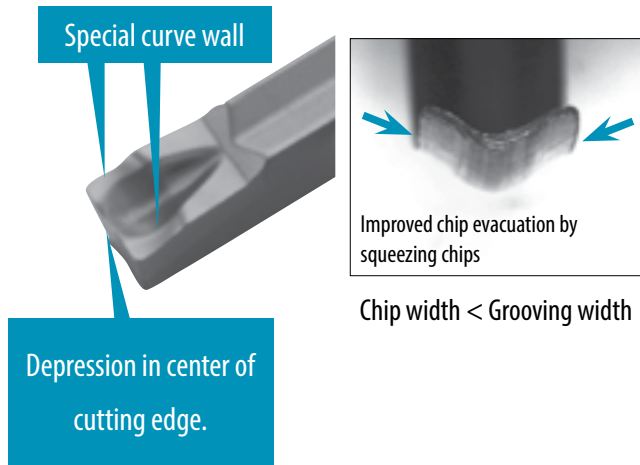
H



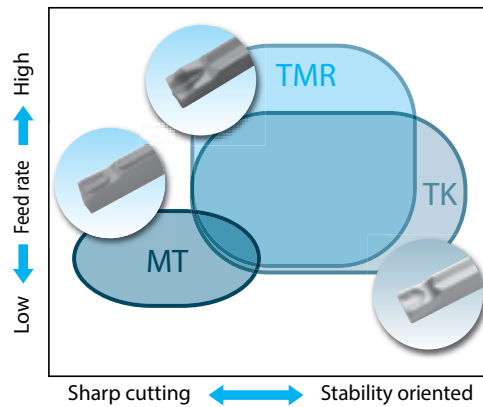
Cut-Off

TMR-chipbreaker

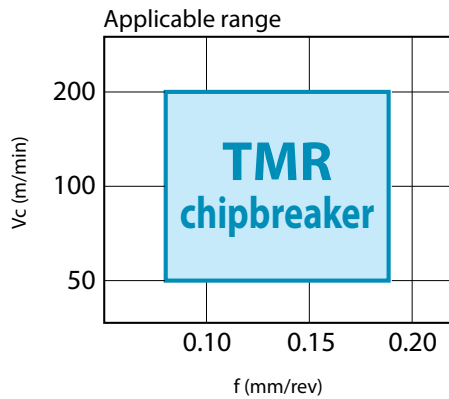
Advantages



GMM chipbreaker MAP



TMR application range



TMR-chipbreaker enables stable chip control also for high feed rates

Good chip control even when cutting speed (spindle revolution) is increased.

(Workpiece Material: 15CrMo4, ø30, constant spindle revolution)

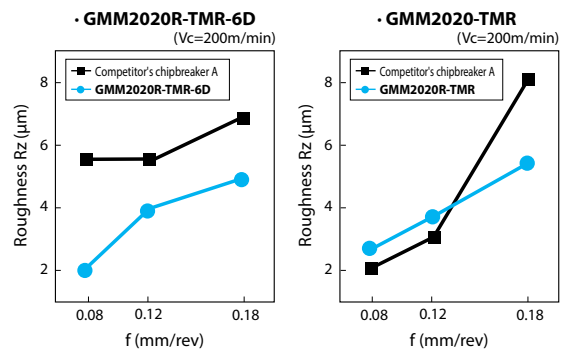
Description	n=1,060min ⁻¹ (Vc=100m/min)		n=2,123min ⁻¹ (Vc=200m/min)	
	f=0.12mm/rev	f=0.18mm/rev	f=0.12mm/rev	f=0.18mm/rev
GMM 3020-TMR (Neutral)				
GMM 3020R-TMR-6D (Lead angle)				

Recommended cutting conditions

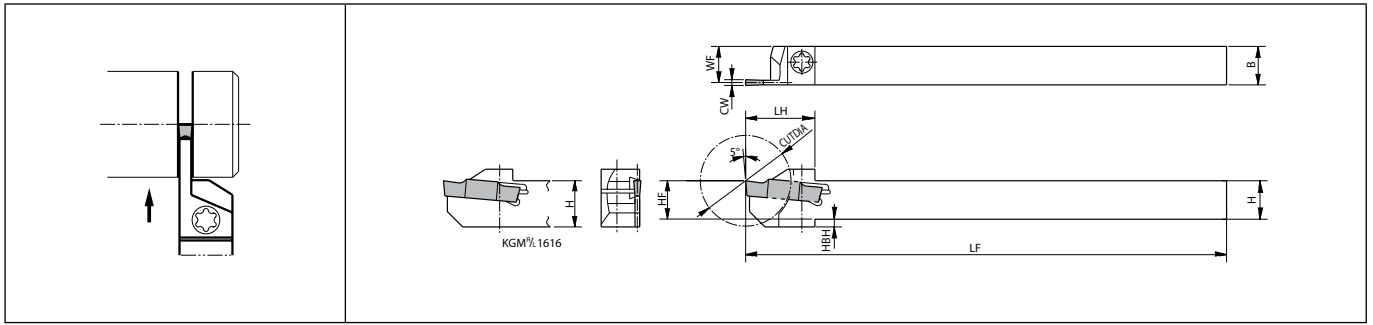
Workpiece Material	Vc (m/min)	f (mm/rev)
Carbon steel	60 ~ 200	0.08 ~ 0.18
Alloy steel	60 ~ 150	
Stainless steel	50 ~ 140	

Workpiece surface roughness

TMR Chipbreaker provides good surface roughness on the workpiece end face at high feed rate ranges.



KGM (for Automatic Lathe)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)											Spare parts		Applicable inserts ➔ H46, H47
														Screw	Wrench	
	R	L	CUTDIA	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.				
KGM%L 1010JX-1.5 1212F-1.5-85 1212JX-1.5	<input type="checkbox"/>	<input type="checkbox"/>	18	10	10	18	10	2	120	9.4	1.5	2	SE-40120TR	LTW-15S	GMM1520... GMM2020... GM_2-TK(-8D)	
	<input type="checkbox"/>	<input type="checkbox"/>	23	12	12	19	12		85	11.4						
	<input type="checkbox"/>	<input type="checkbox"/>							120							
KGM%L 1010JX-2 1212F-2-85 1212JX-2 1616JX-2	<input type="checkbox"/>	<input type="checkbox"/>	18	10	10	18	10	2	120	9.15	2	3	SE-40120TR	LTW-15S	GMM2020... GM_2-TK(-8D) GM_2.2(-...D) GM_3(...)	
	<input type="checkbox"/>	<input type="checkbox"/>	23	12	12	19	12		85	11.15						
	<input type="checkbox"/>	<input type="checkbox"/>							120							
	<input type="checkbox"/>	<input type="checkbox"/>	30	16	16	24.5	16		-	15.15			SE-50125TR	LTW-20		
KGM%L 1212F-2.5-85 1212JX-2.5 1616JX-2.5	<input type="checkbox"/>	<input type="checkbox"/>	23	12	12	19	12	2	85	11	2.4	3	SE-40120TR	LTW-15S	GMM2520... GMM3020... GM_3(...)	
	<input type="checkbox"/>	<input type="checkbox"/>							120							15
	<input type="checkbox"/>	<input type="checkbox"/>	30	16	16	24.5	16		-					SE-50125TR		LTW-20
KGM%L 1616JX-3	<input type="checkbox"/>	<input type="checkbox"/>	30	16	16	24.5	16	-	120	14.8	3	4	SE-50125TR	LTW-20	GMG3020..., GM_3(...), GM_4(...)	

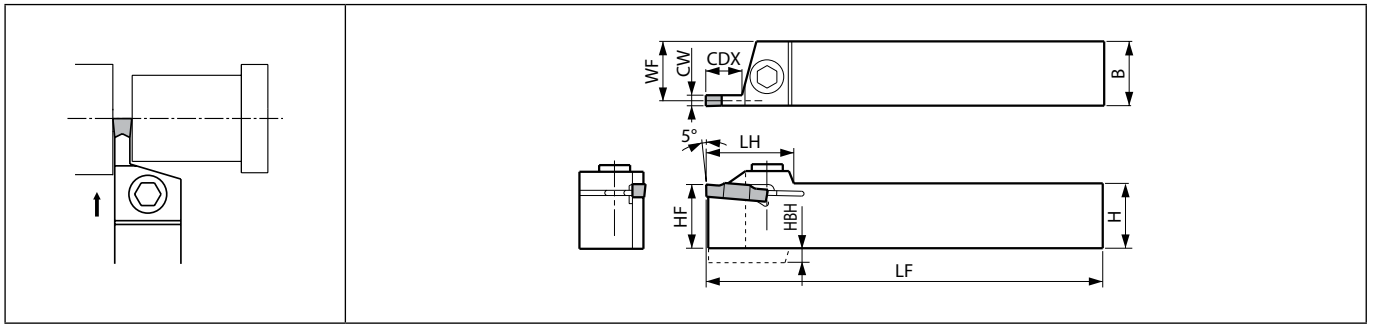
KGM will be switched to KGZ=> H28

Recommended cutting conditions ➔ H55



● : Standard item R : Right-hand only L : Left-hand only ☐ : Will be discontinued

KGM



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)										Spare parts				Applicable inserts H46, H47
													Clamp bolt	Screw	Wrench	Wrench	
	R	L	CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.					
KGM [®] L 1212H-3 1616H-3 2020K-3 2525M-3	●		9	12	12	27	12	4	100	10.8	3	3	-	SB-5TR	-	LTW-20	GMG3020..., GM_3(...)
	●			16	16		16	14.8	4	HH5X16			-	LW-4	-	GMG3020..., GM_3(...), GM_4(...)	
	●	●		20	20		20	125		18.8			HH5X25	-	LW-4		
	●	●		25	25		25	150	23.8	4				HH5X16	-	LW-4		-	GM_4(...) GMN5
KGM [®] L 2020K-4 2525M-4	●		10	20	20	27	20	-	125		18.3	4	5	HH5X16	-	LW-4	-	GM_4(...) GMN5
	●	●		25	25		25	150	23.3	HH5X25	-			LW-4	-		
KGM [®] R 2020K-5 2525M-5	●		10	20	20	27	20	-	125	17.8	5	6	HH5X16	-	LW-4	-	GMN5 GMN6
	●			25	25		25	150	22.8	HH5X25			-	LW-4	-		

CDX shows available grooving depth.

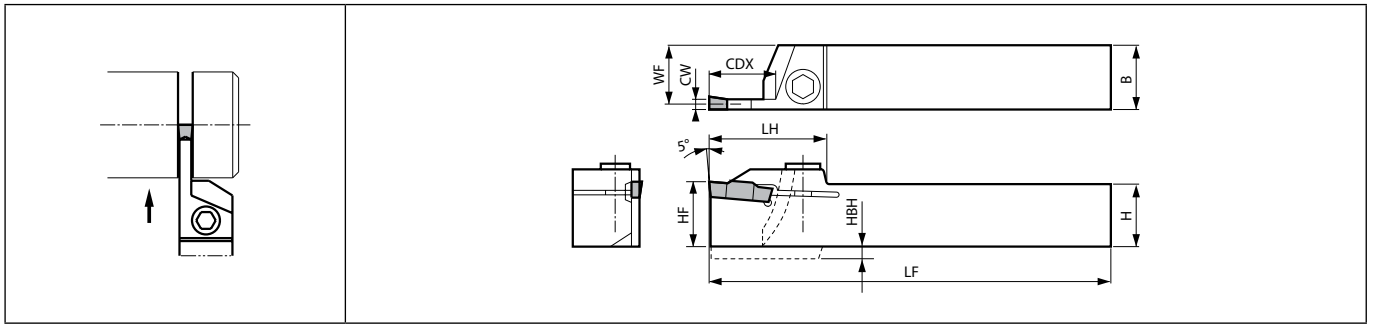
4mm width Insert can be installed in KGM[®]L 1212H-3, but is not recommended due to the toolholder's rigidity.

KGM will be switched to KGD=> H40

Recommended cutting conditions H55



KGM (Deep grooving)



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)													Spare parts				Applicable inserts ● H46, H47
																Clamp bolt	Screw	Wrench	Wrench	
	R	L	CDX	H	B	LH	HF	HBH	LF	WF	CW min.	CW max.								
KGM [®] /L 2012K-2T17 2020K-2T17 2525M-2T17		●	17	20	12	33	20	25	125	11.15	2	3	-	SB-STR	-	LTW-20	GMM2020..., GM_2-TK(-8D) GM_2.2(-.D), GM_3(...)			
	●	●		20	20					19.15			HH5X16	-	LW-4	-				
	●	●		25	25					24.15			HH5X25	-	LW-4	-				
KGM [®] /L 1616H-3T20 2012K-3T20 2020K-3T20 2525M-3T20	●		20	16	16	36	20	25	125	14.8	3	4	HH5X16	-	LW-4	-	GMG3020... GM_3(...) GM_4(...)			
		●		20	12					10.8			-	SB-STR	-	LTW-20				
	●	●		20	20					18.8			HH5X16	-	LW-4	-				
	●	●		25	25					23.8			HH5X25	-	LW-4	-				
KGM [®] /L 2020K-4T20 2525M-4T20 2525M-4T25	●		20	20	20	36	20	25	125	18.3	4	5	HH5X16	-	LW-4	-	GM_4(...) GMN5			
	●			25	25					25			150	23.3	HH5X25	-		LW-4	-	
	●	●		25	25					41			25	150	23.3	HH5X25		-	LW-4	-
KGM [®] /L 2525M-5T25 3232P-5T25	●	●	25	25	25	42	25	32	150	22.8	5	6	HH5X25	-	LW-4	-	GMN5 GMN6			
	●			32	32					29.8			HH5X25	-	LW-4	-				
KGMR 2525M-6T30	●		30	25	25	45	25	32	150	22.4	6	6	HH5X25	-	LW-4	-	GMN6			

CDX shows the distance from the toolholder to the cutting edge. Ref. to the Table (H54) for the relationship between the available grooving depth and the cutting dia.

When using GMG / GMM (2-edge) insert, set the groove depth under 15 mm.











KGM will be switched to KGD=> H40


Recommended cutting conditions ● H55

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



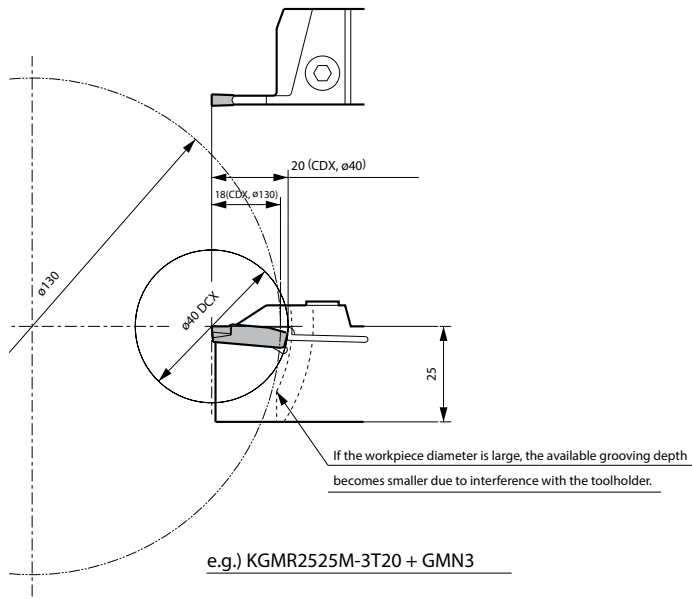
Applicable inserts

Applications See page	Grooving / Turning G48	Grooving / Turning G48	Grooving G49	Full-R / Copying G49	Full-R / Copying G50	Cut-off / Deep grooving H46, H47	Cut-off / Deep grooving H46	Cut-off / Deep grooving H46, H47	Cut-off / Deep grooving H46, H47	Cut-off / Deep grooving H46, H47
Insert								 TMR		
Toolholder description										
KGM [®] /L...1.5	-	-	-	-	-	GMM1520..MT GMM2020..MT GMM1520 [®] /L...MT GMM2020 [®] /L...MT	GMM1520..NB GMM2020..NB	GMM2020..T. GMM2020R..T.	GMN2..TK GMR2..TK	-
KGM [®] /L...2(T)	GMM2420..MW GMM3020..MW	GMG3020..MS GMM3020..MS	GMG2520..MG GMG3020..MG	GMG3020..R GMM3020..R	-	GMM2020..MT GMM2520..MT GMM3020..MT GMM1520 [®] /L...MT GMM2520 [®] /L...MT GMM3020 [®] /L...MT	GMM2020..NB GMM2520..NB GMM3020..NB	GMM2020..T. GMM2520..T. GMM3020..T. GMM2020R..T. GMM2520R..T. GMM3020R..T.	GMN2..TK GMN3..TK GMR2..TK GMR3..TK	GMN2.2 GMN3 KGM [®] /L.2.2 GM [®] /L.3
KGM [®] /L...2.5	GMM2420..MW GMM3020..MW	GMG3020..MS GMM3020..MS	GMG2520..MG GMG3020..MG	GMG3020..R GMM3020..R	-	GMM2520..MT GMM3020..MT GMM2520 [®] /L...MT GMM3020 [®] /L...MT	GMM2520..NB GMM3020..NB	GMM2520..T. GMM3020..T. GMM2520R..T. GMM3020R..T.	GMN3..TK GMR3..TK	GMN3 GM [®] /L.3
KGM [®] /L...3(T)	GMM3020..MW GMM4020..MW	GMG3020..MS GMM3020..MS GMG4020..MS GMM4020..MS	GMG3020..MG GMG3520..MG GMG4020..MG	GMG3020..R GMM3020..R GMG4020..R GMM4020..R	-	GMM3020..MT GMM3020 [®] /L...MT	GMM3020..NB	GMM3020..T. GMM3020R..T.	GMN3..TK GMN4..TK GMR3..TK GMR4..TK	GMN3 GMN4 GM [®] /L.3 GM [®] /L.4
KGM [®] /L...4(T)	GMM4020..MW GMM5020..MW	GMG4020..MS GMM4020..MS GMG5020..MS GMM5020..MS	GMG4020..MG GMG5020..MG	GMG4020..R GMM4020..R GMG5020..R GMM5020..R	-	-	-	-	GMN4..TK GMR4..TK	GMN4 GMN5 GM [®] /L.4
KGM [®] /L...5T	GMM5020..MW GMM6020..MW	GMG5020..MS GMM5020..MS GMG6020..MS GMM6020..MS	GMG5020..MG GMG6020..MG	GMG5020..R GMM5020..R GMG6020..R GMM6020..R	GMGA6020..R	-	-	-	-	GMN5 GMN6
KGM [®] /L...6T	GMM6020..MW	GMG6020..MS GMM6020..MS	GMG6020..MG	GMG6020..R GMM6020..R	GMGA6020..R	-	-	-	-	GMN6
KGM [®] /L...8	GMM8030..MW	-	GMG8030..MG	-	GMGA8030..R	-	-	-	-	-

Recommended cutting conditions  H55



Possible cutting diameter of KGM / KGM-T type



There is a limit to available grooving depth depending on the workpiece diameter.



KGM (for automatic lathe) possible cutting diameter and available grooving depth table

Toolholder description		DCX (Cutting dia.)															
KGM ^{FL}	1010□-1.5...	-	-	-	-	-	-	-	18	21	26	38	76	∞			
	1212□-1.5...	-	-	-	-	23	27	37	71	∞	∞	∞	∞				
	1010□-2...	-	-	-	-	-	-	-	18	21	26	38	76				
	1212□-2...	-	-	-	-	23	27	37	71	∞							
	1616□-2...	30	37	47	68	89	131	∞	∞								
	1212□-2.5...	-	-	-	-	23	27	37	71								
	1616□-2.5...	30	37	47	68	89	131	∞	∞								
	1616□-3...	30	37	47	68	89	131	∞	∞	∞							
Available grooving depth CDX (mm)	15	14	13	12	11.5	11	10	9	8					7	6	5	4	3	2	1

KGM-T possible cutting diameter and available grooving depth table (GMN, GM^{FL} when using 1-edge insert)

Toolholder description		DCX (Cutting dia.)																			
KGM ^{FL}	2012K-2T17	-	-	-	-	-	-	-	-	66	80	130	260	∞							
	2020K-2T17	-	-	-	-	-	-	-	-	66	80	130	260								
	2525M-2T17	-	-	-	-	-	-	-	-	66	80	130	260								
	1616H-3T20	-	-	-	-	-	40	54	70	100	180	∞									
	2012K-3T20	-	-	-	-	-	-	-	-	-	-							-			
	2020K-3T20	-	-	-	-	-	-	-	-	-	-							-			
	2525M-3T20	-	-	-	-	-	40	90	130	240											
	2020K-4T20	-	-	-	-	-	-	-	-	-	-	-	-					∞			
	2525M-4T20	-	-	-	-	-	-	-	-	-	-	-									
	2525M-4T25	-	-	-	-	-	-	-	-	-	-	-									
	2525M-5T25	-	-	50	140	240	∞														
	3232P-5T25	-	-	50	280	600															
	2525M-6T30	100	300	∞	∞	∞	∞														
	Available grooving depth CDX (mm)	30	27	25	23	22					20	19	18					17	16	15	14	13 or under

Recommended cutting conditions (GMM-MT, GMM-TK, GMM-NB)

Workpiece material	Recommended insert grades (Vc: m/min)				Edge width CW (mm)				Remarks
	CVD coated carbide	PVD coated carbide		Carbide	1.5	2.0 / 2.5	3.0	4.0	
	CR9025	PR915	PR930	KW10	f (mm/rev)				
Carbon steel	☆ 80 ~ 180	★ 60 ~ 150	☆ 60 ~ 130	-	0.01 ~ 0.04	0.02 ~ 0.15	0.03 ~ 0.20	0.08 ~ 0.30	Coolant
Alloy steel	☆ 70 ~ 150	★ 60 ~ 150	☆ 60 ~ 130	-	0.01 ~ 0.04	0.02 ~ 0.15	0.03 ~ 0.20	0.08 ~ 0.30	
Stainless steel	☆ 60 ~ 140	★ 50 ~ 140	☆ 50 ~ 120	-	0.01 ~ 0.03	0.02 ~ 0.10	0.03 ~ 0.15	0.08 ~ 0.25	
Cast iron	-	-	-	★ 50 ~ 100	0.01 ~ 0.05	0.05 ~ 0.12	0.10 ~ 0.25	0.10 ~ 0.30	
Aluminum alloys	-	-	-	★ 200 ~ 450	0.01 ~ 0.05	0.05 ~ 0.10	0.05 ~ 0.20	0.05 ~ 0.25	
Brass	-	-	-	★ 100 ~ 200	0.01 ~ 0.05	0.05 ~ 0.10	0.05 ~ 0.15	0.05 ~ 0.20	

· When machining Steel and Stainless Steel by Insert of PR930, decrease the feed rate by 20%.

★: 1st Recommendation ☆: 2nd Recommendation

Recommended cutting conditions (GMM-TMR)

Workpiece material	Vc (m/min)	f (mm/rev)	Remarks
Carbon steel	60 ~ 200	0.08 ~ 0.18	Coolant
Alloy steel	60 ~ 150		
Stainless steel	50 ~ 140		



High-performance cut-off solutions

KPK Series

Easy insert replacement reduces downtime

High performance, long tool life and stable machining with strong clamping mechanism

1 Easy insert replacement



Reduce down time with fast insert replacement

Turn wrench slightly to release insert

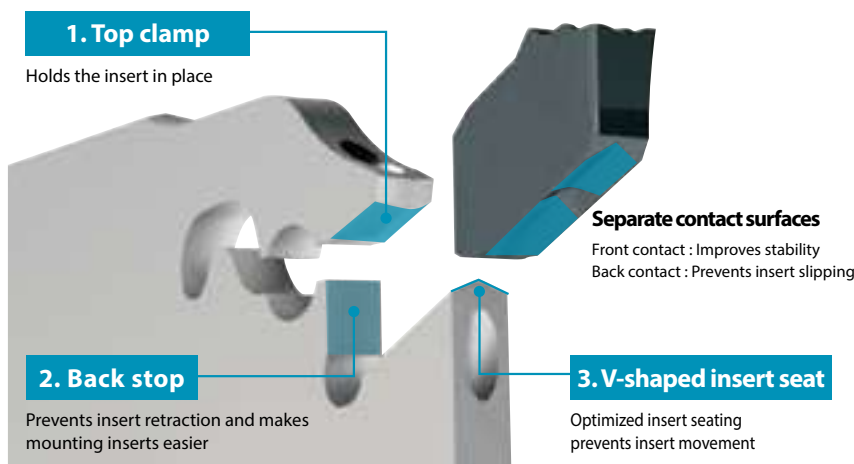
No hammer or screw required
self-clamping



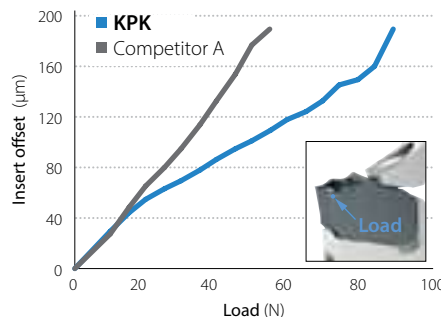
H

2 Firm insert clamp ensures added safety and security

The firmly secured insert uses three contact surfaces to eliminate sliding or chattering



Insert deviation comparison (Internal evaluation)



Measured tool : KPKB32-3 PKM30N-025PM

Cutting performance comparison (Internal evaluation)



Cutting conditions : $n = 320 \text{ min}^{-1}$ (constant), $V_c = \sim 100 \text{ m/min}$, $f = 0.12 \text{ mm/rev}$, Wet (External coolant) Workpiece material : 34CrMo4 ($\phi 100$) Edge width : 3mm

3 Unique chipbreaker for long tool life and stable machining

Advanced chipbreaker technology inherited from KGD lineup provides excellent chip control



General purpose
PM Chipbreaker

Insert grade

- For Steel : PR1625
- For Stainless steel : PR1535
- For Cast iron and Aluminum : GW15

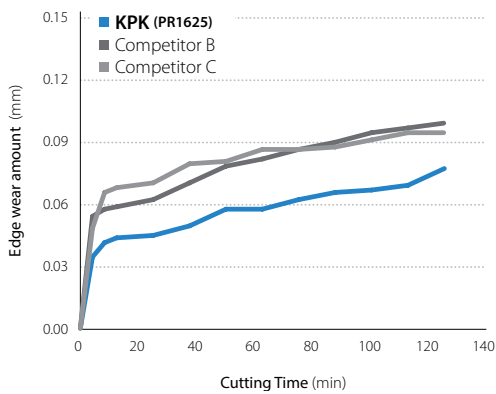


For tough edge and high-feed machining
PH Chipbreaker

Insert grade

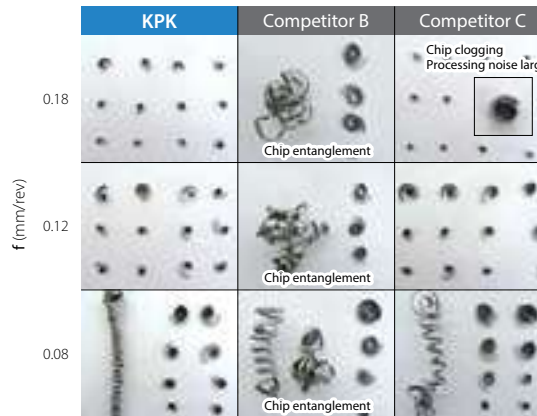
- For Steel : PR1625
- For Stainless steel : PR1535

Wear resistance comparison (Internal evaluation)



Cutting conditions : $n = 955 \text{ min}^{-1}$ (constant), $V_c \sim 150 \text{ m/min}$
 $f = 0.12 \text{ mm/rev}$ ($\sim \phi 10 : f = 0.05 \text{ mm/rev}$) Wet (External coolant)
 Workpiece material : 15CrMo4 ($\phi 50$) Edge width : 3 mm (PM Chipbreaker)

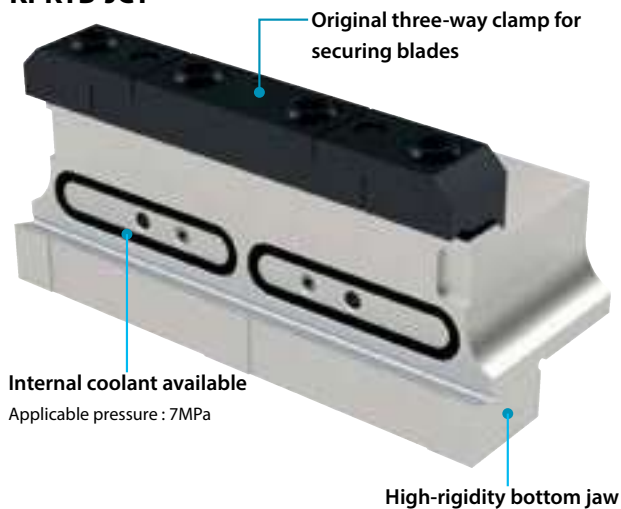
Chip control comparison (Internal evaluation)



Cutting conditions : $n = 780 \text{ min}^{-1}$ (constant), $V_c \sim 120 \text{ m/min}$, Wet (External coolant)
 Workpiece material : 15CrMo4 ($\phi 50$) Edge width : 3 mm (PM Chipbreaker)

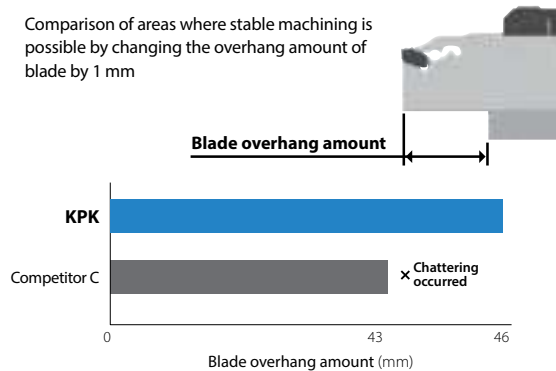
4 Rigid toolblock prevents chattering and provides internal coolant

KPKTB-JCT



Chattering resistance comparison (Internal evaluation)

Comparison of areas where stable machining is possible by changing the overhang amount of blade by 1 mm



Cutting conditions : $n = 650 \text{ min}^{-1}$ (constant), $V_c \sim 100 \text{ m/min}$, $f = 0.12 \text{ mm/rev}$
 Wet (Internal coolant : Normal pressure) Workpiece material : 34CrMo4($\phi 50$),
 Edge width : 3 mm (PM Chipbreaker)


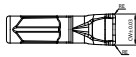

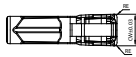

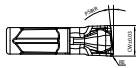
Check

KTKTB type is compatible with internal coolant with an optional internal connector. ($\sim 1 \text{ MPa}$)

*Refer to page H65 for the supply method (Type C).



PKM

Insert		Description	No. of edges	Dimension (mm)		Angle (°)	Tolerance (mm)		Carbide			Applicable toolholder ● H60, H61, H67, H68
				CW	RE		PSIR%	CW min.	CW max.	PVD	-	
								Carbon steel / Alloy steel ☺ ● Stainless steel ● ☺ Cast iron ● ☺ Non-ferrous metals ● ☺			P M K N	
								PR1535 PR1625 GW15				
  <p>General purpose</p>	PKM 16N-015PM	1	1.6	0.15	-	-0.03	+0.03	●	●	●	KPKB19-1, KPKB26-1(JCT) KPKB32-1(JCT)	
	PKM 20N-020PM	1	2	0.2	-	-0.03	+0.03	●	●	●	KPKB19-2, KPKB26-2(JCT) KPKB32-2(JCT), KPKH%L2020K-2(JCT)	
	PKM 24N-020PM	1	2.4	0.2	-	-0.03	+0.03	●	●	●	KPKB19-2, KPKB26-2(JCT) KPKB32-2(JCT), KPKH%L2020K-2(JCT)	
	PKM 30N-025PM	1	3	0.25	-	-0.03	+0.03	●	●	●	KPKB26-3(JCT), KPKB32-3(JCT) KPKH%L...-3(JCT), KPKH%L...-3D45	
	PKM 40N-030PM	1	4	0.3	-	-0.03	+0.03	●	●	●	KPKB26-4(JCT), KPKB32-4(JCT) KPKH%L...-4(JCT), KPKH%L...-4D45	
	PKM 48N-030PM	1	4.8	0.3	-	-0.03	+0.03	●	●	●	KPKB26-5(JCT), KPKB32-5(JCT) KPKH%L2525M-5	
	PKM 50N-030PM	1	5	0.3	-	-0.03	+0.03	●	●	●	KPKB26-5(JCT), KPKB32-5(JCT) KPKH%L2525M-5	
	PKM 60N-035PM	1	6	0.35	-	-0.03	+0.03	●	●	●	KPKB32-6(JCT)	
  <p>High feed</p>	PKM 20N-020PH	1	2	0.2	-	-0.03	+0.03	●	●	●	KPKB19-2, KPKB26-2(JCT) KPKB32-2(JCT), KPKH%L2020K-2(JCT)	
	PKM 30N-030PH	1	3	0.3	-	-0.03	+0.03	●	●	●	KPKB26-3(JCT), KPKB32-3(JCT) KPKH%L...-3(JCT), KPKH%L...-3D45	
	PKM 40N-030PH	1	4	0.3	-	-0.03	+0.03	●	●	●	KPKB26-4(JCT), KPKB32-4(JCT) KPKH%L...-4(JCT), KPKH%L...-4D45	
	PKM 50N-030PH	1	5	0.3	-	-0.03	+0.03	●	●	●	KPKB26-5(JCT), KPKB32-5(JCT) KPKH%L2525M-5	
	PKM 60N-040PH	1	6	0.4	-	-0.03	+0.03	●	●	●	KPKB32-6(JCT)	
  <p>General purpose with lead angle</p>	PKM 16R-015PM-6D 16L-015PM-6D	1	1.6	0.15	6	-0.03	+0.03	●	●	●	KB19-1, KPKB26-1(JCT)KPKB32-1(JCT)	
	PKM 20R-020PM-6D 20L-020PM-6D	1	2	0.2	6	-0.03	+0.03	●	●	●	KPKB19-2, KPKB26-2(JCT) KPKB32-2(JCT), KPKH%L2020K-2(JCT)	
	PKM 24R-020PM-6D 24L-020PM-6D	1	2.4	0.2	6	-0.03	+0.03	●	●	●	KPKB19-2, KPKB26-2(JCT) KPKB32-2(JCT), KPKH%L2020K-2(JCT)	
	PKM 30R-025PM-6D 30L-025PM-6D	1	3	0.25	6	-0.03	+0.03	●	●	●	KPKB26-3(JCT), KPKB32-3(JCT) KPKH%L...-3(JCT), KPKH%L...-3D45	
	PKM 40R-030PM-6D 40L-030PM-6D	1	4	0.3	6	-0.03	+0.03	●	●	●	KPKB26-4(JCT), KPKB32-4(JCT) KPKH%L...-4(JCT), KPKH%L...-4D45	
	PKM 50R-030PM-6D 50L-030PM-6D	1	5	0.3	6	-0.03	+0.03	●	●	●	KPKB26-5(JCT), KPKB32-5(JCT) KPKH%L2525M-5	


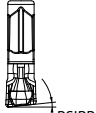
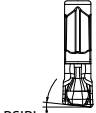
Handed insert shows Right-hand

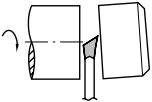
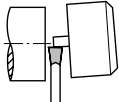
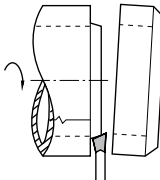
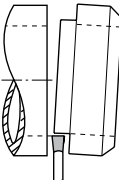
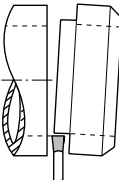
● : Standard item R : Right-hand only L : Left-hand only ☐ : Check availability



Lead angle direction and usage

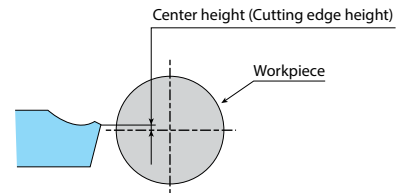
1. If there is no restriction on the finished shape, use an insert without lead angle.
2. Insert with lead angle is recommended to prevent remaining boss.
3. If you want to make the remaining boss smaller when machining small or thin parts, use insert with lead angle.

	N (Neutral)	R (Right-hand)	L (Left-hand)
Hand of lead angle			
	· Inserts with lead angle (PSIR $\%$) reduce burrs at cut-off machining. · The larger the lead angle (PSIR $\%$), the smaller the cutting force. The feed also needs to be smaller.		

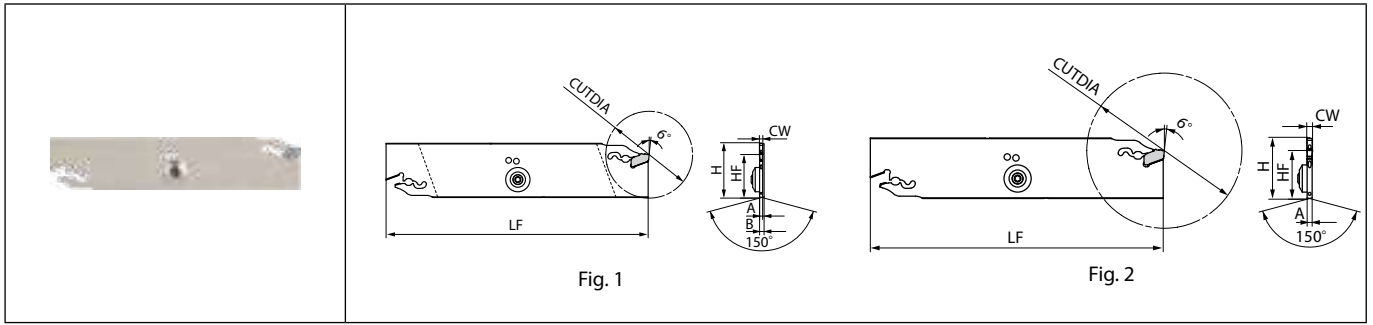
	Right-hand (R) Lead angle	Neutral	Right-hand (R) Lead angle	Neutral
Solid workpiece			Hollow workpiece (Pipe)	
				

Caution

1. Set cutting edge height 0.1mm above core height.
 2. Machining with ample supply of coolant is recommended.
 3. Keep a constant rate during processing so that optimum product life will be achieved.
 4. Cut off as close to the chuck as possible.
 5. To prevent impacts, reduce feed rate by 1/2 ~ 1/3 when nearing the center of the workpiece.
- Overuse of insert and toolholder (blade) may cause insert breakage and toolholder (blade) damage.



KPKB-JCT (Coolant-through holders)



With coolant supply | Applicable pressure : ~7MPa

Toolholder dimensions

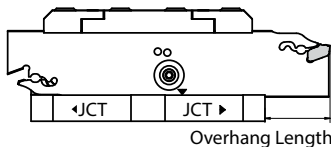
Description	Availability	Dimension (mm)							Coolant hole	Fig.	Spare parts				Applicable inserts ● H58	Applicable tool block ● H62, H63
		CUTDIA	A	B	H	HF	LF	CW			Releasing wrench	Coolant cap	Screw	Wrench		
KPKB 26-1JCT	●	35	1.4	2.6	26	21.4	110	1.6	1	LPW-5	CCP-4	SB-4065TR	FT-15	PKM16...	KPKTB...-26JCT KTKTB...-26	
KPKB 26-2JCT	●	50	1.8					2								
KPKB 26-3JCT	●	75	2.6	2.4												
KPKB 26-4JCT	●	80	3.4	3	Yes	2	4									
KPKB 26-5JCT	●	80	4.2	4.8	5		5	Coolant cap screw Tightening torque 3.0 N-m		PKM30...	PKM40...	PKM48...	PKM50...			
KPKB 32-1JCT	●	35	1.4	2.6	32	25	150	1.6	1	LPW-5	CCP-4	SB-4065TR	FT-15	PKM16...		KPKTB...-32JCT KTKTB...-32 KTKTBF...-32
KPKB 32-2JCT	●	50	1.8					2								
KPKB 32-3JCT	●	100	2.6	2.4												
KPKB 32-4JCT	●	100	3.4	3	Yes	2	4									
KPKB 32-5JCT	●	120	4.2	4.8	5		5	Coolant cap screw Tightening torque 3.0 N-m		PKM30...	PKM40...	PKM48...	PKM50...			
KPKB 32-6JCT	●	120	5.4	6	6	6	6	6	6	6	6	6	6	6	6	

See page H64 for insert mounting and removal instructions
When using internal coolant with KTKTB, KTKTBF type toolblocks, coolant supply piping (CCN -5) sold separately.
H: Length between virtual vertices

Recommended cutting conditions ● H69

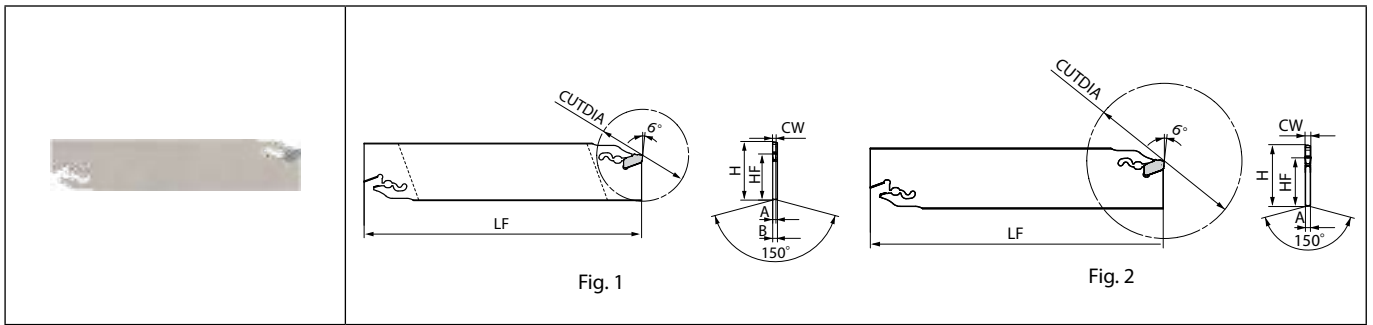
Minimum /maximum overhang length while using internal coolant

Description	Overhang length	
	min.	max.
	KPKB26-1JCT	15	34.5
KPKB26-2/3/4JCT	20	40
KPKB26-5JCT	23	43
KPKB32-1JCT	18	49
	13	
	13	
KPKB32-2/3/4JCT	27.5	59
	22.5	
	22.5	
KPKB32-5/6JCT	31.5	63
	26.5	
	26.5	




● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KPKB



Toolholder dimensions

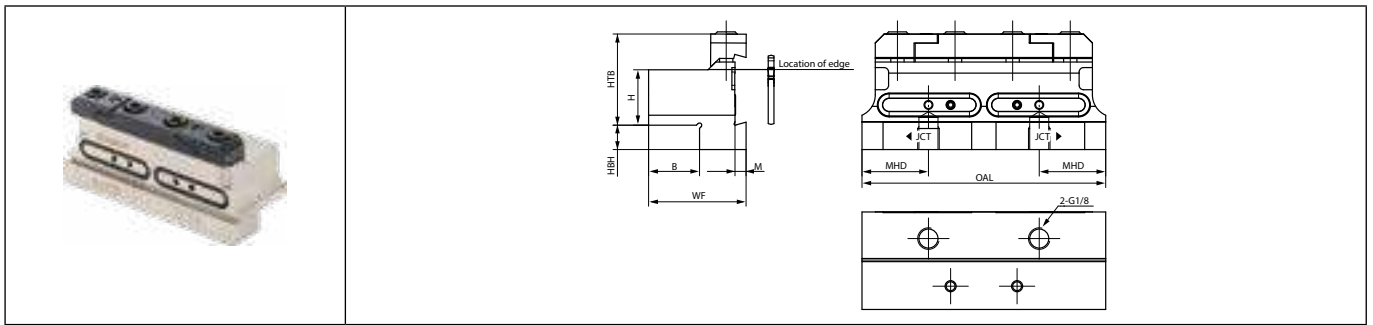
Description	Availability	Dimension (mm)							Coolant hole	Fig.	Spare parts Releasing wrench 	Applicable inserts H58	Applicable tool block H62, H63	
		CUTDIA	A	B	H	HF	LF	CW						
KPKB 19-1	●	32	1.4	2.6	19	15.7	86	1.6	No	1	LPW-5	PKM16... PKM20... PKM24...	KTKTB..-19	
	●	40	1.8	-				2						2.4
KPKB 26-1	●	35	1.4	2.6	26	21.4	110	1.6	No	2	LPW-5	PKM16... PKM20... PKM24... PKM30... PKM40... PKM48... PKM50...	KPKTB..-26JCT KTKTB..-26	
	●	50	1.8	2				2.4						
	●	75	2.6	3				4						
	●	80	3.4	4.8				5						
	●	80	4.2	5				5						
KPKB 32-1	●	35	1.4	2.6	32	25	150	1.6	No	1	LPW-5	PKM16... PKM20... PKM24... PKM30... PKM40... PKM48... PKM50... PKM60...	KPKTB..-32JCT KTKTB..-32 KTKTBF..-32	
	●	50	1.8					2						2.4
	●	100	2.6					3						4
	●	100	3.4					4						4
	●	120	4.2					4.8						5
	●	120	5.4					5						6

See page H64 for insert mounting and removal instructions
H: Length between virtual vertices

Recommended cutting conditions H69



KPKTB-JCT (Coolant-through type)



With coolant supply | Applicable pressure : ~7MPa

Toolholder dimensions

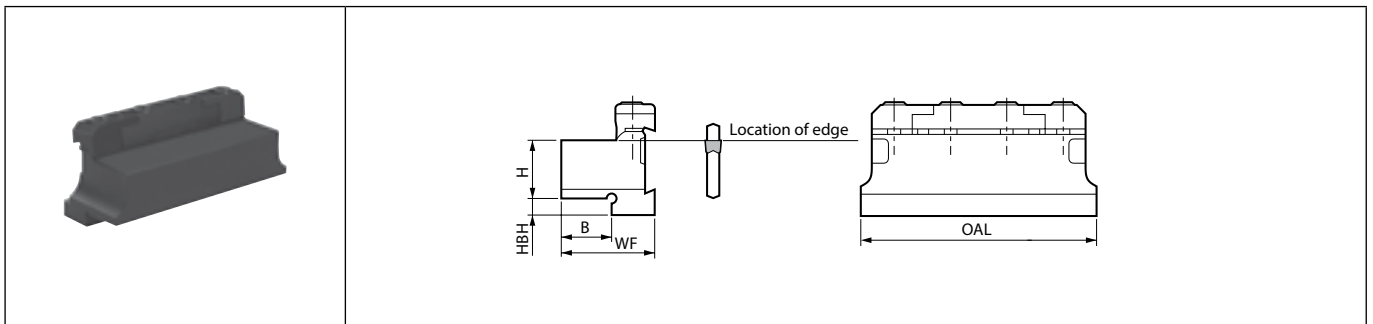
Description	Availability	Dimension (mm)									Coolant hole	Spare parts						Applicable blade ● G140 H60 H61 H72
		H	B	HBH	HTB	M	MHD	OAL	WF	Clamp bolt		Clamp set (separate type)	O-ring	Plug	Screw	Wrench		
KPKTB 20-26JCT	●	20	19	12.4	33	4	23.5	86	39	Yes	HH6X16	BCS-2	GR-020	HSG1/8X8.0	HS3X4	LW-5	KPKB26-__JCT, KTKB26-__	
20-32JCT	●			16			25	100	40	Yes		BCS-3	GR-026		HS4X4			KPKB32-__JCT, KTKB32-__, KFTB%/L...-4S, KFTB%/L...-5S
25-32JCT	●	25	23	11	41	5	30	110	44	Yes		BCS-4	GR-029					
32-32JCT	●	32	29	5					50	Yes								

Includes only one HSG1/8X8.0 plug.
 KPKTB-JCT type block is also compatible with conventional KTKB type blades.
 See page **H66** for coolant piping parts.
 When using internal coolant, the coolant may appear to leak slightly, but this should not affect machining performance.
 (If the O-ring is damaged, order separately.)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKTB

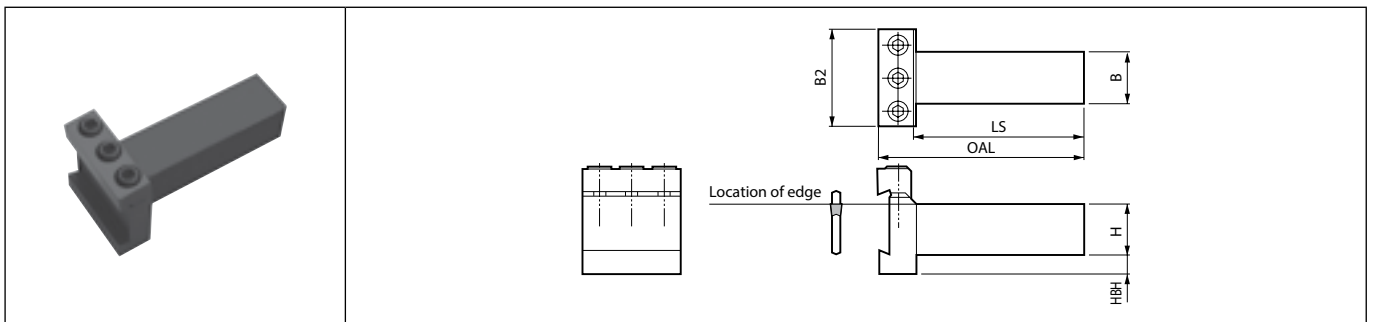


Toolholder dimensions

Description	Availability	Dimension (mm)					Spare parts				Applicable blade	
							Clamp bolt	Clamp set (integral type)	Clamp set (separate type)	Wrench	Cut-off	Face grooving
		H	B	HBH	OAL	WF						
KTKTB 16-19 20-19	●	16	15.5	4	76	29.5 34	HH5X25	BCS-1	-	LW-4	KPKB19-_ KTKB19-1SS, KTKB19-2S	-
KTKTB 16-26 20-26	●	16	15.5	13	86	31.5 36	HH6X30	-	BCS-2	LW-5	KPKB26-_(JCT) KTKB26-1SS, KTKB26-_S	-
KTKTB 20-32 25-32 32-32	●	20	19	13	100	38	HH6X30	-	BCS-3	LW-5	KPKB32-_(JCT) KTKB32-1SS, KTKB32-_ KTKB%L32-_S	KFTB%L...-4S KFTB%L...-5S
	●	25	23	8	110	42			BCS-4			
	●	32	29	5	110	48						



KTKTBF



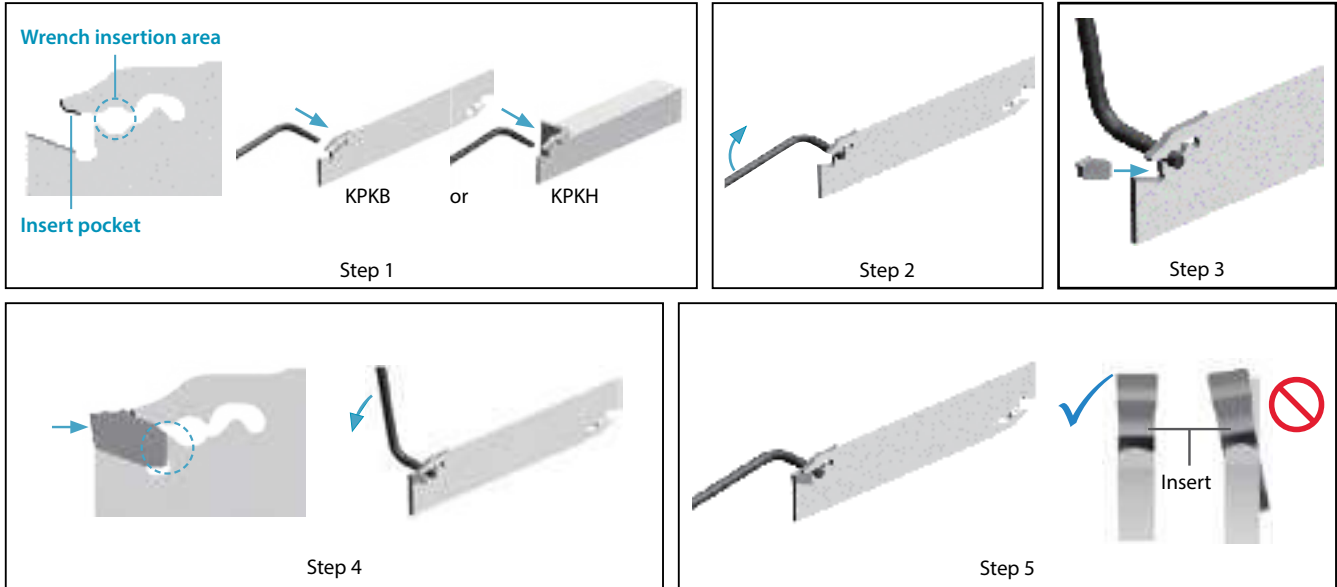
Toolholder dimensions

Description	Availability	Dimension (mm)						Spare parts			Applicable blade	
								Clamp bolt	Clamp set (integral type)	Wrench	Cut-off	Face grooving
		H	B	B2	HBH	LS	OAL					
KTKTBF 25-32 32-32	●	25	25	48	9.5	84.5	102	HH6X30	BCS-5	LW-5	KPKB32-_(JCT) KTKB32-1SS, KTKB32-_ KTKB%L32-_S	KFTB%L...-4S KFTB%L...-5S
	●	32	32	48	2.5	99.5	117					

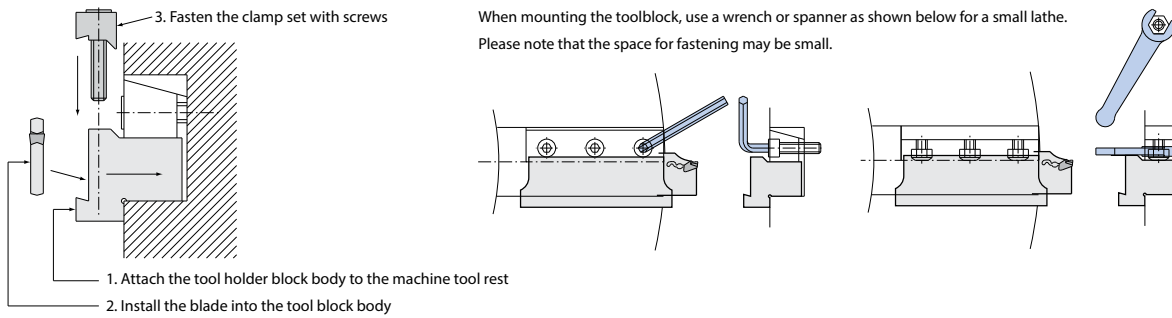
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

How to mount and remove the insert

1. Use compressed air or other measures to remove chips from the insert mounting part and wrench insertion space and put in the wrench.
2. Turn the wrench.
3. Put in the insert into insert mounting part. (When removing the insert, follow the same procedure and remove it at step 3.)
4. Please clamp it while gently pressing it makes contact with the back end of blade's surface.
5. Make sure that the insert is set straight.

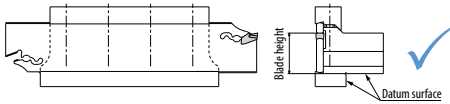


Installation guide

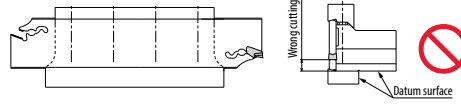


How to install the tool holder block and blade

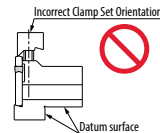
Correct blade installation



Incorrect blade installation



Incorrect Clamp Set Orientation

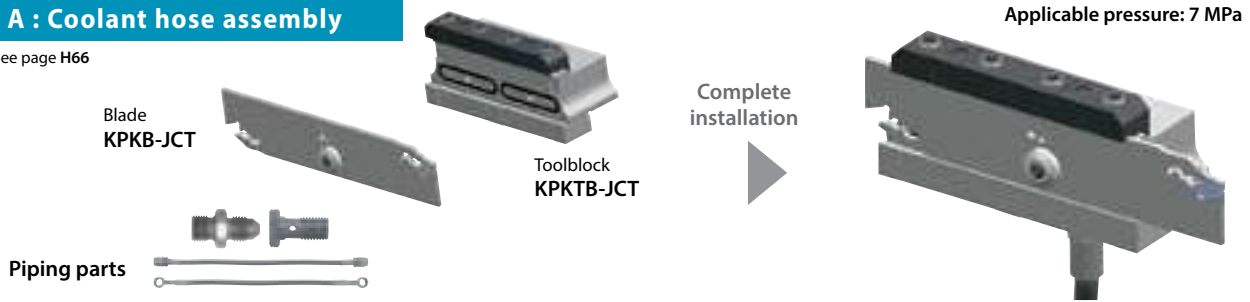


If the clamp set is mounted in the reverse direction, a large gap is created between the tool holder block main body and the clamp set as shown in the left figure. If you continue to use the product, the blade may break off. Reinstall in the correct orientation.

Internal coolant supply method Supplies according to machine specifications and requirements

A : Coolant hose assembly

See page H66



B : VDI holder assembly

(Internal coolant type)

Applicable pressure: 7 MPa



C : Coolant pipe assembly

See page H66

Applicable pressure: 1 MPa



Coolant supply pipe mounting method

Attach to the blade with the supplied screw
Form pipe to the required shape and connect it to the piping of the machine.

Cautions

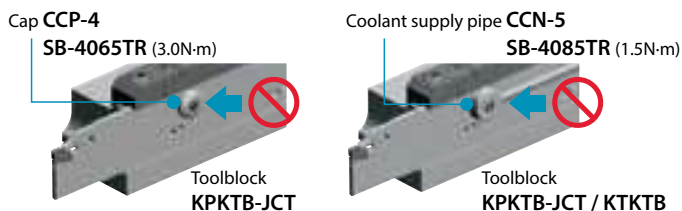
When mounting KPKB-JCT blade

When using internal coolant, keep the arrow (▼) on the blade within the range marked on the toolblock.



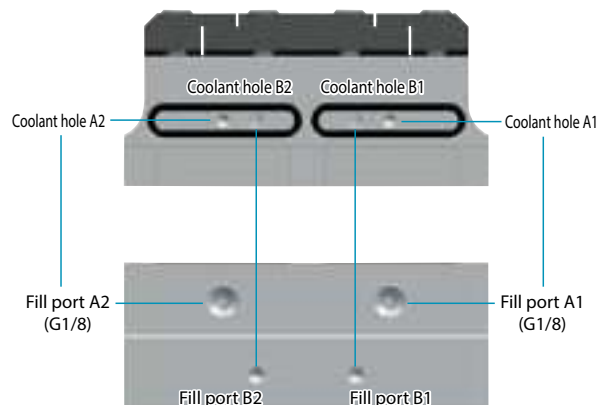
When the cap and coolant supply pipe are mounted

Coolant cannot be supplied correctly if it is mounted in the wrong position.



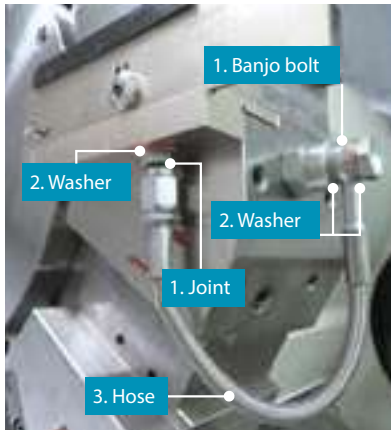
When using a toolblock

When using the discharge port B1 (B2), use a sealant for the filler cap (HSG 1/8 X 8.0) of the accessory part of the coolant supply port A1 (A2).



A : Coolant hose assembly

Connection method and piping parts

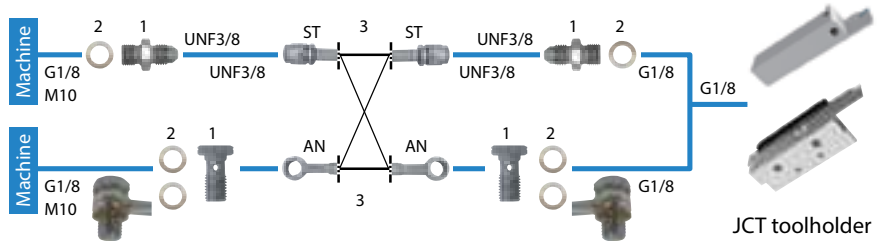


Easy connection with high pressure hose and joint

Even without a high pressure pump, internal coolant can be used at a normal pressure.

Banjo bolt available for angled hose connection

<Piping installation guide>



Depending on machine specifications and piping methods, 1.Joint / Banjo bolt x 2 2.Washer x 2-4 3.Hose x 1

1. Joint / Banjo bolt (Sold separately)

Pressure Resistance : ~30MPa

Shape	Description	Stock	Thread standard	
			Thread connection to the machine	
	J-G1/8-UNF3/8	●	G1/8	
	J-M10X1.5-UNF3/8	●	M10X1.5	
	BB-G1/8	●	G1/8	
	BB-M10X1.5	●	M10X1.5	

2.Washer (Sold separately)

Pressure Resistance : ~30MPa

Shape	Description	Stock
	WS-10	●

*Use 2 washers for a banjo bolt

3.Hose (Sold separately)

Pressure Resistance : ~30MPa

Shape	Description	Stock	Thread standard		Dimension (mm)
					L
	HS-ST-ST-200	●	UNF3/8	UNF3/8	200
	HS-ST-ST-250	●			250
	HS-ST-AN-200	●	UNF3/8	(Banjo bolt)	200
	HS-ST-AN-250	●			250
	HS-AN-AN-200	●	(Banjo bolt)	(Banjo bolt)	200
	HS-AN-AN-250	●			250

Cautions

1. Make sure machine door is completely closed before use of these parts.
2. Use appropriate seal for the male thread of the piping parts and make sure the connection is secure.
Use plugs to seal off unused coolant holes.
3. Connect and fasten the coolant hose firmly.
4. The use of copper washers may cause leakage but will have no effect on the performance.
5. Commercial piping parts can be used if the thread standards are same. Check the pressure resistance before use.
6. Regularly changing the coolant filter is recommended.

C : Coolant pipe assembly

Piping parts

Coolant supply pipe (Sold separately)

Pressure resistance : ~1MPa

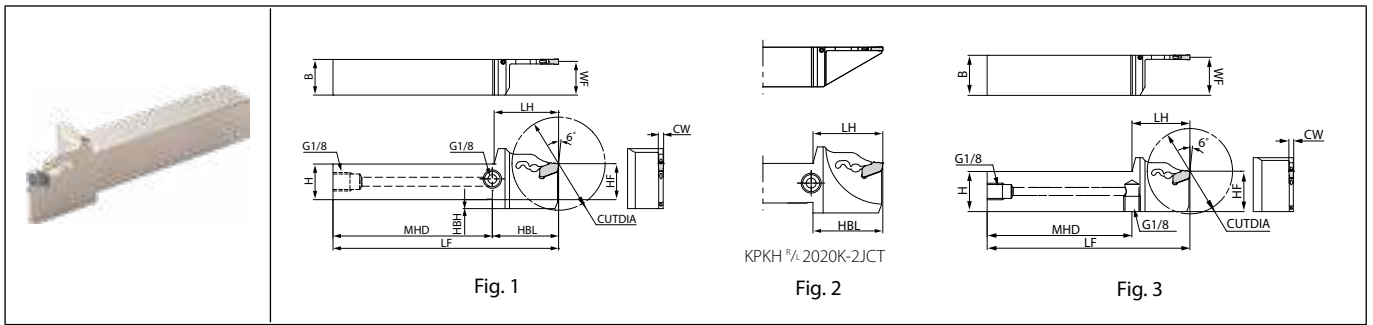
Shape	Description	Stock	Dimension				Parts (Screw)
			A	B	C	D	
	CCN-5	●	190	16	5	6	SB-408STR

Use wrench (FT -15) supplied with the blade when connecting.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



KPKH-JCT (Coolant-through holders)



Right-hand shown

Toolholder dimensions

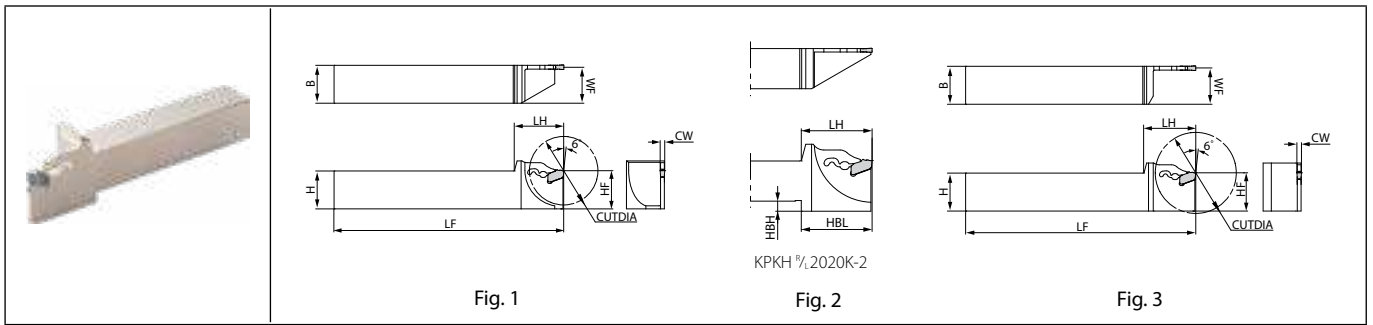
Description	Availability		Dimension (mm)											Coolant hole	Fig.	Spare parts		Applicable inserts H58
	R	L	CUTDIA	H	B	LH	MHD	HF	HBH	HBL	LF	WF	CW			Plug	Releasing wrench	
KPKH ^{3/4} 2020K-2JCT	●	●	38	20	20	35.1	89	20	5	35.1	125	19.15	2 2.4	Yes	2	HSG1/8X8.0	LPW-5	PKM20... PKM24...
KPKH ^{3/4} 2020K-3JCT	●	●	52	20	20	36	88	20	5	37	125	18.75	3	Yes	1	HSG1/8X8.0	LPW-5	PKM30...
	●	●	53	25	25		89	25	-	-		23.75						
KPKH ^{3/4} 2020K-4JCT	●	●	62	20	20	42.5	83	20	5	42	125	18.35	4	Yes	1	HSG1/8X8.0	LPW-5	PKM40...
	●	●	68	25	25		82	25	-	-		23.35						

See page H64 for insert mounting and removal instructions
See page H66 for coolant piping parts.

Recommended cutting conditions H69



KPKH



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)											Coolant hole	Fig.	Spare parts	Applicable inserts ● H58
	R	L	CUTDIA	H	B	LH	HF	HBH	HBL	LF	WF	CW	Releasing wrench				
KPKH% 2020K-2	●	●	38	20	20	33.1	20	5	33.1	125	19.15	2 2.4	No	2	LPW-5	PKM20... PKM24...	
KPKH% 2020K-3	●	●	52	20	20	34	20			125	18.75	3	No	3		PKM30...	
2525M-3	●	●	53	25	25					150	23.75						
KPKH% 2020K-4	●	●	62	20	20	40.5	20			125	18.35	4	No			PKM40...	
2525M-4	●	●	68	25	25					150	23.35						
KPKH% 2525M-5	●	●	79	25	25	45.9	25			150	22.95	4.8 5	No		PKM48... PKM50...		
KPKH% 2020K-3D35	●	●	35	20	20	32.5	20			125	18.75	3	No	1	LPW-5	PKM30...	
2525M-3D45	●	●	45	25	25					150	23.75						
KPKH% 2020K-4D45	●	●	45	20	20	35	20			125	18.35	4	No			PKM40...	
2525M-4D45	●	●	45	25	25					150	23.35						

See page H64 for insert mounting and removal instructions

Recommended cutting conditions ● H69



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

PM Chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)			f (mm/rev)			Remarks
	MEGACOAT NANO		Carbide	Edge width CW (mm)			
	PR1625	PR1535		1.6	2 ~ 4	4.8 ~ 6	
Carbon steel	★ 80 - 220	☆ 80 - 220	-	0.03 - 0.12	0.08 - 0.18	0.10 - 0.22	Coolant
Alloy steel	★ 70 - 200	☆ 70 - 200	-				
Stainless steel	☆ 60 - 150	★ 60 - 150	-	0.03 - 0.08	0.06 - 0.12	0.08 - 0.15	
Cast iron	-	-	★ 50 - 100	0.03 - 0.08	0.08 - 0.18	0.10 - 0.22	
Aluminum alloys	-	-	★ 200 - 450	0.03 - 0.08	0.08 - 0.18	0.10 - 0.22	
Brass	-	-	★ 100 - 200				

Reduce feed to 1/2 ~ 1/3 at the center of the workpiece.

★: 1st Recommendation ☆: 2nd Recommendation

PH Chipbreaker

Workpiece material	Recommended insert grades (Vc: m/min)			f (mm/rev)			Remarks
	MEGACOAT NANO		Carbide	Edge width CW (mm)			
	PR1625	PR1535		2	3 ~ 4	5 ~ 6	
Carbon steel	★ 80 - 220	☆ 80 - 220	-	0.10 - 0.22	0.15 - 0.28	0.15 - 0.35	Coolant
Alloy steel	★ 70 - 200	☆ 70 - 200	-				
Stainless steel	☆ 60 - 150	★ 60 - 150	-	0.05 - 0.12	0.08 - 0.15	0.08 - 0.18	

Reduce feed to 1/2 ~ 1/3 at the center of the workpiece.

★: 1st Recommendation ☆: 2nd Recommendation



TKN/TK

Insert		Description		Dimension (mm)		Angle (°)	Tolerance (mm)		Carbide					Cermets	Applicable toolholder H72, H73					
									No. of edges	CW	RE	PSIR%	CW min.			CW max.	CR9025	PVD	-	-
																	PR1535	PR930	KW10	TN620	TN90
									<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	P					
									<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	M				
									<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	K				
									<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	N				
		TKN 1.6	1.6	0.15	-	-0.05	+0.05	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB...-1SS					
		TKN 2	2.2	0.2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB19-2S, KTKB26-2S, KTKB32-2S, KTKH%/L...-2S		
		TKN 2.4	2.4	0.2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB26-3S, KTKB32-3S, KTKH%/L...-3S, KTKH%/L...-3T.S	
		TKN 3	3.1	0.25				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB26-4S, KTKB32-4S, KTKH%/L...-4S, KTKH%/L...-4T2S	
		TKN 4	4.1	0.3				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB26-5S, KTKB32-5S, KTKH%/L 2525M-5S	
		TKN 4.8	4.8	0.3				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
		TKN 5	5.1	0.3				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
		TKN 6	6.4	0.35				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB32-6S	
		TKN 8	8	0.4				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB%/L 32-8S	
		TKN 9	9.6	0.45				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB%/L 32-9S	
		TKN 1.6-P	1.6	0.2	-	-0.05	+0.05	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB...-1SS					
		TKN 2-P	2.2	0.2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB19-2S, KTKB26-2S, KTKB32-2S, KTKH%/L...-2S		
		TKN 3-P	3.1	0.25				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB26-3S, KTKB32-3S, KTKH%/L...-3S, KTKH%/L...-3T.S	
		TKR 1.6	1.6	0.15	8	-0.05	+0.05	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB...-1SS					
		TKL 1.6	1.6	0.15				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
		TKR 2	2.2	0.2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB19-2S, KTKB26-2S, KTKB32-2S, KTKH%/L...-2S	
		TKL 2	2.2	0.2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
		TKR 2.4	2.4	0.2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB26-3S, KTKB32-3S, KTKH%/L...-3S, KTKH%/L...-3T.S	
		TKL 2.4	2.4	0.2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
		TKR 3	3.1	0.25				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB26-4S, KTKB32-4S, KTKH%/L...-4S, KTKH%/L...-4T2S	
		TKL 3	3.1	0.25				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
TKR 4	4.1	0.3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB26-5S, KTKB32-5S, KTKH%/L 2525M-5S						
TKL 4	4.1	0.3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>							
		TKR 1.6-P	1.6	0.2	8	-0.05	+0.05	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB...-1SS					
		TKL 1.6-P	1.6	0.2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
		TKR 2-P	2.2	0.2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TKTB19-2S, KTKB26-2S, KTKB32-2S, KTKH%/L...-2S	
		TKL 2-P	2.2	0.2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
		TKR 3-P	3.1	0.25	8	-0.05	+0.05	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	TKTB26-3S, KTKB32-3S, KTKH%/L...-3S, KTKH%/L...-3T.S					
		TKL 3-P	3.1	0.25				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			

Handed insert shows Right-hand

TKN – cut-off tools

Cutting range	Chipbreaker	Advantage
General cut-off	Standard (No indication)	General cut-off type for feed rates over 0.1mm/rev Superior chip evacuation
Low feed cut-off	P	Chipbreaker specially designed for low feed machining on automatic lathes, etc. Chips are controlled at feed rate 0.03~0.08mm/rev

Inserts edge preparation

Edge preparation	Chamfer + R honed	Sharp edge	R honed
Standard chipbreaker	TN90 / PR1535 / CR9025	PR930 / KW10	-
P-chipbreaker	-	-	TN620 / TN90 / CR9025 PR1535 / PR930 / KW10

Sharp edge specification can reduce cutting force by 40% less than that of chamfer edge.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

H70



How to select cut-off inserts with / without lead angle (Including sharp corner)

1. Use a neutral angle insert if there is no limit to the finished shape.
2. Use an angled insert to reduce the size of the remaining boss.
3. Use a sharp-cornered lead-angled insert to make the remaining boss much smaller when machining small parts and thin parts.

Hand of lead angle	N (Neutral)	R (Right-hand)	L (Left-hand)
Angled insert can reduce the burr size when cutting off. When using a larger lead angle, cutting force becomes smaller, but the feed rate should be reduced.			

	Right-hand (R) Lead angle	Neutral
Example: Solid workpiece		
Example: Hollow workpiece (Pipe)		

Fig.1

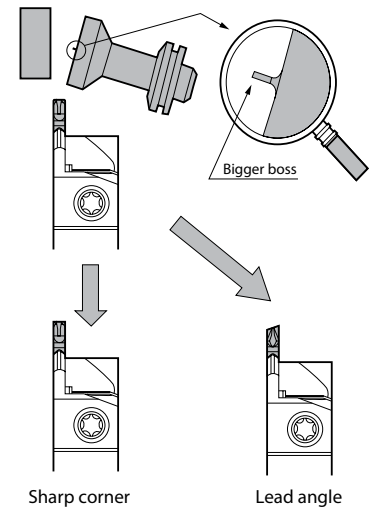


Fig.2

Caution

1. For PKM, PKM^{R/L}, TKN and TK^{R/L}, set the cutting edge height 0.1~0.2 mm above the center height (Fig. 3)
For other toolholders, set the cutting edge to the center height.
2. Be sure to perform wet processing. Apply enough coolant to the cutting edge.
3. Keep a constant rate during processing so that optimum product life will be achieved.
4. Cut off as close to the chuck as possible.
5. Lower the feed rate to 1/2 to 1/3 at the near center to prevent impact caused by machining.

Overuse of insert and toolholder (blade) may cause insert breakage and toolholder (blade) damage.
Do not rework the insert and toolholder (blade) to prevent damage.
Clean the insert pocket well with compressed air when replacing insert.

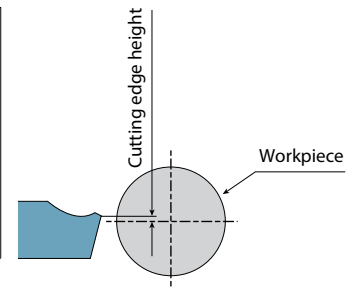


Fig. 3 (PKM, PKM^{R/L}, TKN, TK^{R/L})

Set up (TKN / TK^{R/L})

1. Tap the insert lightly with a plastic hammer to push it into the extent that it cannot be removed by hand. (Fig.1)
(Pull it to the point where it does not fall out when picked up lightly with fingers)
2. Remove the insert with the supplied wrench. (Fig.2)

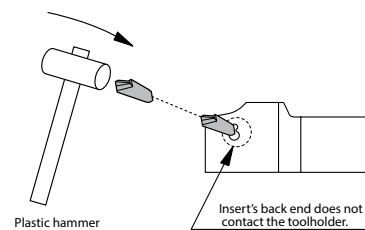


Fig.1: How to attach inserts

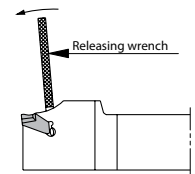
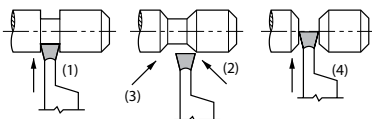


Fig.2: How to detach inserts

Application example of cut-off

1. Cut-off after chamfering

- (1) Grooving (2)(3) Chamfering (4) Cut-off

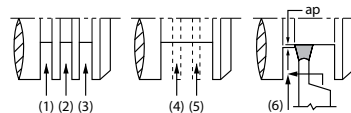


2. Wide grooving

- (1)~(5) Groove widening

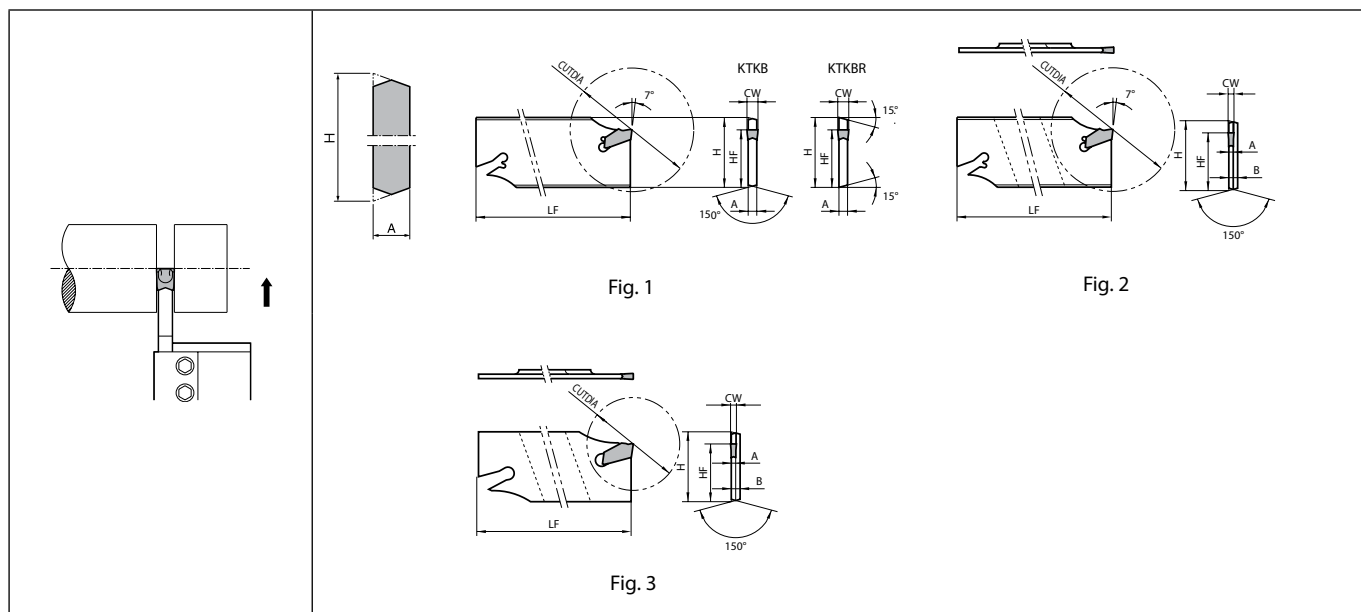
(6) Finishing

(Value of "ap" shall be under the value of Corner-R)



(In order to prevent both corners' unequal wear)

KTKB




H



Cut-Off

Toolholder dimensions

Description	Availability	Dimension (mm)							Fig.	Spare parts Releasing wrench 	Applicable inserts H70	Applicable tool block H62, H63				
		CUTD/A	A	B	H	HF	LF	CW								
KTKB 19-1SS 26-1SS 32-1SS	● ● ●	32 35	1.2	2.4	19 26 32	15.7 21.4 25	86 110 150	1.6	3	LTK-5	TKN1.6, TKN1.6-P TK%1.6, TKR1.6-P	KTKTB16-19, KTKTB20-19 KTKTB16-26, KTKTB20-26, KPCTB20-26JCT KTKTB20-32, KTKTB25-32, KTKTB32-32 KTKTBF25-32, KTKTBF32-32, KPCTB20-32JCT KPCTB25-32JCT, KPCTB32-32JCT				
KTKB 19-2S	●	40	1.8	-	19	15.7	86	2.2 2.4	1				TKN2, TKN2-P TK%2, TK%2-P TKN2.4, TK%2.4	KTKTB16-19, KTKTB20-19		
KTKB 26-2S 26-3S 26-4S 26-5S	● ● ● ●	50 75 80	1.8 2.6 3.4 4.2	-	26	21.4	110	3.1 4.1 4.8 5.1	1						TKN3, TKN3-P, TK%3, TK%3-P TKN4, TK%4 TKN5, TK%5	KTKTB16-26 KTKTB20-26 KPCTB20-26JCT
KTKB 32-2S 32-3S 32-4S 32-5S 32-6S	● ● ● ● ●	50 100 120	1.8 2.6 3.4 4.2 5.4	2.6	32	25	150	2.2 2.4 3.1 4.1 4.8 5.1 6.4	2 1		TKN2, TKN2-P, TK%2, TK%2-P TKN2.4, TK%2.4 TKN3, TKN3-P, TK%3, TK%3-P TKN4, TK%4 TKN5, TK%5 TKN6	KTKTB20-32 KTKTB25-32 KTKTB32-32 KTKTBF25-32 KPCTB20-32JCT KPCTB25-32JCT KPCTB32-32JCT				
KTKBR 32-8S KTKBL 32-8S	R L	120	6.8	-	32	25	150	8	1								TKN8	KTKTB20-32JCT KPCTB25-32JCT KPCTB32-32JCT
KTKBR 32-9S	R	120	8	-	32	25	150	9.6	1				TKN9			

Suffix "-SS" means silver coating.

Releasing wrench is "LTK-5".

How to attach inserts, See Page H71.

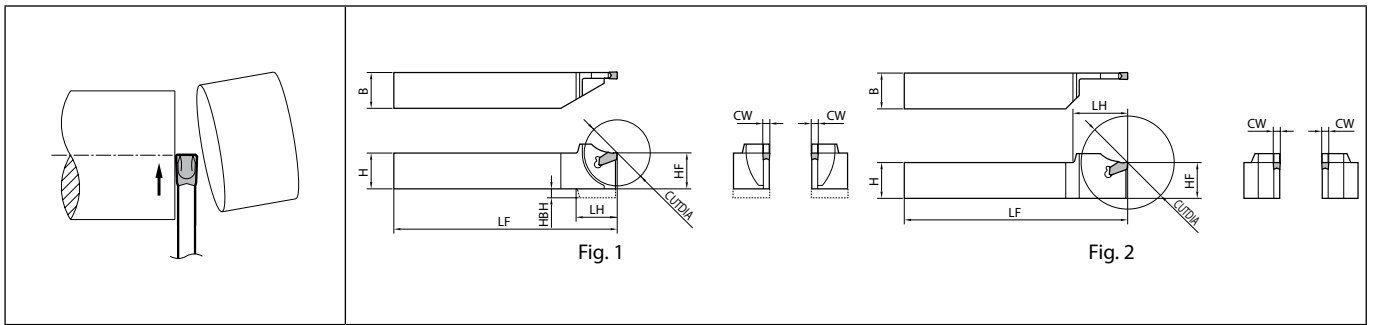
Dimension H shows virtual apex distance.

Recommended cutting conditions H74

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

H72

KTKH



Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)									Fig.	Spare parts		Applicable inserts H70
													Releasing wrench		
	R	L	CUTDIA	H	B	LH	HF	HBH	LF	CW					
KTKH%L 1010F-2S 1212H-2S 1612H-2S 1616H-2S 2012K-2S 2020K-2S	●	●	28	10	10	18.6	10	5	80	2.2 2.4	1	LTK-5	TKN2 TKN2-P TK%L.2 TK%L.2-P TKN2.4 TK%L.2.4		
	●	●	31	12	12	19.8	12	4	100						
	●	●	31	16	16	19.8	16	-	100						
	●	●	36	20	20	22.8	20	-	125						
	●	●	36	20	20	22.8	20	-	125						
KTKH%L 1612H-3S 1616H-3S 2012K-3S 2020K-3S 2525M-3S	●	●	35	16	12	21.7	16	4	100	3.1 2	1 2	LTK-5	TKN3 TKN3-P TK%L.3 TK%L.3-P		
	●	●	40	20	12	25.3	20	-	125						
	●	●	51	20	20	31	20	-	125						
	●	●	52	25	25	31.5	25	-	150						
	●	●	52	25	25	31.5	25	-	150						
KTKH%L 2012K-4S 2020K-4S 2525M-4S	●	●	43	20	12	26.3	20	-	125	4.1 2	1 2	LTK-5	TKN4 TK%L.4		
	●	●	59	20	20	35	20	-	125						
	●	●	66	25	25	38	25	-	150						
KTKH%L 2525M-5S	●	●	77	25	25	43.5	25	-	150	4.8 5.1	2	LTK-5	TKN5 TK%L.5		
	●	●	77	25	25	43.5	25	-	150						
KTKH%L 2020K-3T17S 2525M-3T22S	●	●	33	20	20	21.8	20	-	125	3.1 150	1	LTK-5	TKN3, TKN3-P TK%L.3, TK%L.3-P		
	●	●	43	25	25	26.8	25	-	150						
KTKH%L 2020K-4T22S 2525M-4T22S	●	●	44	20	20	26.8	20	-	125	4.1 150	1	LTK-5	TKN4 TK%L.4		
	●	●	44	25	25	26.8	25	-	150						

How to attach inserts, See Page H71.

Recommended cutting conditions H74

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Recommended cutting conditions (TKN, TK^{R/L})

Workpiece material	Recommended insert grades (Vc: m/min)						Edge width CW (mm)					Remarks
	Cermet		CVD coated carbide	MEGACOAT NANO	PVD coated carbide	Carbide	1.6	2.2 / 2.4	3.1	4.1	4.8 ~ 9.6	
	TN620	TN90	CR9025	PR1535	PR930	KW10	f (mm/rev)					
Carbon steel	☆ 60 ~ 200	☆ 120 ~ 200	★ 80 ~ 180	☆ 60 ~ 150	☆ 60 ~ 130	-	0.02 ~ 0.08	0.04 ~ 0.18	0.05 ~ 0.25	0.08 ~ 0.30	0.15 ~ 0.40	Coolant
Alloy steel	☆ 60 ~ 160	☆ 100 ~ 160	★ 70 ~ 150	☆ 60 ~ 150	☆ 60 ~ 130	-	0.02 ~ 0.08	0.04 ~ 0.18	0.05 ~ 0.25	0.08 ~ 0.30	0.15 ~ 0.40	
Stainless steel	☆ 60 ~ 150	☆ 80 ~ 150	☆ 60 ~ 140	★ 50 ~ 120	☆ 60 ~ 140	-	0.02 ~ 0.06	0.04 ~ 0.12	0.05 ~ 0.18	0.08 ~ 0.25	0.10 ~ 0.30	
Cast iron	-	-	-	-	-	★ 50 ~ 100	0.02 ~ 0.08	0.05 ~ 0.12	0.10 ~ 0.25	0.10 ~ 0.30	0.15 ~ 0.35	
Aluminum alloys	-	-	-	-	-	★ 100 ~ 450	0.02 ~ 0.10	0.05 ~ 0.10	0.05 ~ 0.20	0.05 ~ 0.25	0.10 ~ 0.25	
Brass	-	-	-	-	-	★ 100 ~ 200	0.02 ~ 0.10	0.05 ~ 0.10	0.05 ~ 0.15	0.05 ~ 0.20	0.10 ~ 0.25	

★: 1st Recommendation ☆: 2nd Recommendation

H



Cut-Off



Introduction	J2
Threading inserts	J6
Metric	External threading J6
	Internal threading J7
Unified	External threading J8
	Internal threading J9
Parallel pipe, Whitworth	External threading J10
	Internal threading J11
Tapered pipe	External threading J12
	Internal threading J13
American national tapered pipe	External threading J14
	Internal threading J15
60° type (Partial profile/M, UN)	External threading J16
	Internal threading J17
55° type (Partial profile/G, R, Rc, W)	External threading J18
	Internal threading J19
30° type (Trapezoidal)	External threading J20
	Internal threading J21
Threading toolholders	J22
External toolholders	KTN/KTNS/KTN-JCT J22
	S-KTN J25
Internal toolholders	SIN/CIN J26
Multipurpose threading tools	J28
TKFT for small parts machining	KTKF J29
Threading tools	J34
TTX	KTTX/S-KTTX J35
TT for external threading	KTT J37
TT for internal threading	KITG J39
EZ Bars for micro internal threading	EZT J40
System Tip-Bars for micro internal threading	VNT J44
TPGB for internal threading	S-STWP/S-STWP-E J47
Recommended cutting conditions	J48
Depth of cut and number of passes	J49
Applicable toolholders and inserts	J58
Threading methods	J63
Thread types and basic profiles	J65

Tooling application table (External thread)

Thread types	Metric	Unified	Parallel pipe	Whitworth	Tapered pipe	American national tapered pipe	30° trapezoidal	
	M	UN, UNC UNF, UNEF	G(PF)	W	R(PT) (BSPT)	NPT	Tr	
Thread shape								
Toolholder shape	Pitch	mm	TPI	TPI	TPI	TPI	mm	
 KTN J22 (KTN-JCT) J23	Full profile	0.5~5.0 (0.5~3.0) J6	24~8 (24~8) J8	19~11 (19~11) J10	16~11 (16~11) J10	28~11 (28~11) J12	18~11.5 (18~11.5) J14	-
	Partial profile	0.5~5.0 (0.5~3.0) J16	48~5 (48~8) J16	28~11 (28~11) J18	40~5 (40~8) J18	28~11 (28~11) J18	-	2.0~5.0 (2.0~3.0) J20
 KTNS J24	Full profile	0.5~3.0 J6	24~8 J8	19~11 J10	16~11 J10	28~11 J12	18~11.5 J14	-
	Partial profile	0.5~3.0 J16	48~8 J16	28~11 J18	40~8 J18	28~11 J18	-	2.0~3.0 J20
 Sleeve holder S-KTN J25	Full profile	0.5~3.0 J6	24~8 J8	19~11 J10	16~11 J10	28~11 J12	18~11.5 J14	-
	Partial profile	0.5~3.0 J16	48~8 J16	28~11 J18	40~8 J18	28~11 J18	-	2.0~3.0 J20
 KTT J37	Full profile	1.0~2.0 J36	-	-	-	-	-	-
	Partial profile	0.5~3.5 J36	56~8 J36	28~11 J36	24~7 J36	28~11 J36	-	-
 KTTX J35	Full profile	0.5~2.0 J34	56~14 J34	28~11 J34	24~11 J34	28~11 J34	-	-
	Partial profile	0.5~2.0 J34	56~14 J34	28~11 J34	24~11 J34	28~11 J34	-	-
 S-KTTX J35	Full profile	0.5~2.0 J34	56~14 J34	28~11 J34	24~11 J34	28~11 J34	-	-
	Partial profile	0.5~2.0 J34	56~14 J34	28~11 J34	24~11 J34	28~11 J34	-	-
 KTKF J29	Full profile	0.2~1.5 J29	64~18 J29	28~19 J29	40~16 J29	28~19 J29	-	-
	Partial profile	0.2~1.5 J29	64~18 J29	28~19 J29	40~16 J29	28~19 J29	-	-
 KTKF / KTKF-Y J30, J31 (Goose-neck holder / Y-axis holder)	Full profile	0.2~1.5 J29	64~18 J29	28~19 J29	40~16 J29	28~19 J29	-	-
	Partial profile	0.2~1.5 J29	64~18 J29	28~19 J29	40~16 J29	28~19 J29	-	-

Pitch inside () indicates KTN-JCT.

Tooling application table (Internal thread)

Thread types	Metric	Unified	Parallel pipe	Whitworth	Tapered pipe	American national tapered pipe	30° trapezoidal	
	M	UN, UNC UNF, UNEF	G(PF) Rp(PS)	W	Rc(PT) (BSPT)	NPT	Tr	
Thread shape								
Pitch	mm	TPI	TPI	TPI	TPI	TPI	mm	
Toolholder shape								
 Ezt J40	Partial profile	0.5~1.75 J40	36~16 J40	28~19 J40	24~18 J40	28~19 J40	18~14 J40	-
 Vnt J44	Partial profile	0.75~1.5 J44	28~18 J44	-	-	-	-	-
 Sin J26	Full profile	0.5~5.0 J7	24~8 J9	19~11 J11	16~11 J11	28~11 J13	18~11.5 J15	-
	Partial profile	0.5~5.0 J17	48~5 J17	28~11 J19	40~5 J19	28~11 J19	-	2.0~5.0 J21
 Cin J27	Full profile	1.0~5.0 J7	24~8 J9	19~11 J11	16~11 J11	14~11 J13	18~11.5 J15	-
	Partial profile	0.5~5.0 J17	48~5 J17	28~11 J19	40~5 J19	28~11 J19	-	2.0~5.0 J21
 Kitg J39	Partial profile	0.5~3.0 J38	48~8 J38	28~11 J38	24~8 J38	28~11 J38	-	-
 Stwp J47	Partial profile	0.75~3.5 J46	28~8 J46	-	-	-	-	-

For parallel pipe and tapered pipe, the average values are only to be used if specifically recommendation.



Threading

Threading insert with molded chipbreaker

TQ chipbreaker

Increase productivity with improved chip control

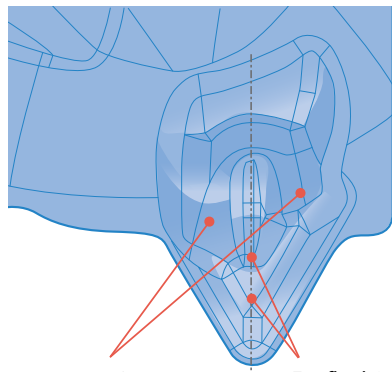
Improved tool life with new insert grades

1 Stable chip control

Stable chip control with asymmetric chipbreaker design

Chipbreaker geometry

Stable chip control regardless of cutting direction

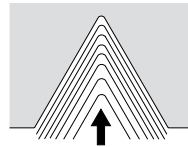


For radial infeed
Asymmetric dot design controls chip-flow direction

For flank infeed /
Modified flank infeed
Breaks chips easily with shallow breaker depth

Chip control performance (Internal evaluation)

Radial infeed

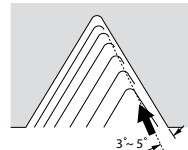


TQ chipbreaker



Competitor A

Modified flank infeed



TQ chipbreaker



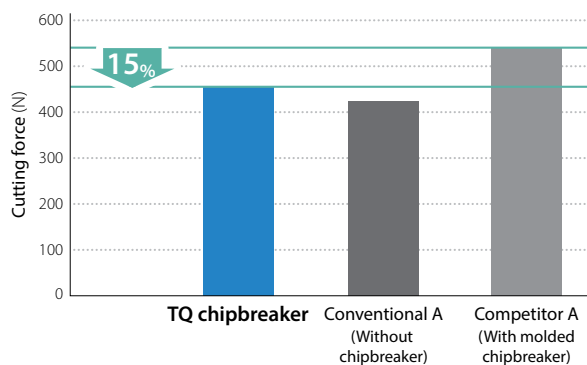
Competitor A

Cutting conditions: $V_c = 150$ m/min, $a_p = 0.12$ mm (4th pass), $L = 25$ mm, wet, 16ER150 ISO type M45×1.5 workpiece material: 15CrMo4

2 Low cutting force and suppressed vibration

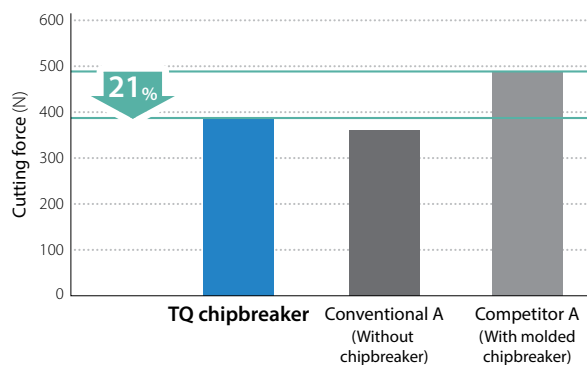
Strong edge and low cutting force

Comparison of cutting force radial infeed (Internal evaluation)



Cutting conditions: $V_c = 150$ m/min, wet, 16ER150 ISO type
Cutting force shows the average of 6 passes, M35×1.5 workpiece material: 15CrMo4

Cutting force comparison modified flank infeed (Internal evaluation)



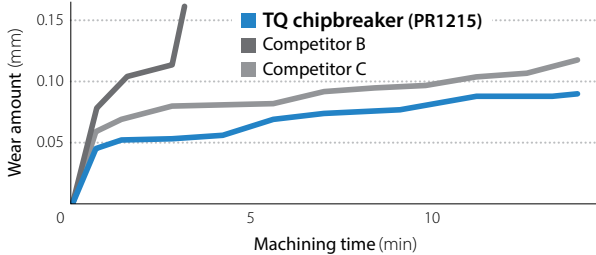
Cutting conditions: $V_c = 150$ m/min, adjusted angle: 5 degrees, wet, 16ER150 ISO type
Cutting force shows the average of 6 passes, M35×1.5 workpiece material: 15CrMo4

3 Improved tool life with new insert grades

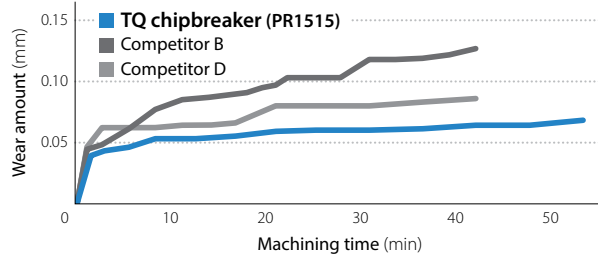
For steel machining PR1215
For Stainless steel machining PR1515 (First recommendation) PR1535 (Stability focused)

Wear resistance comparison (Internal evaluation)

Workpiece material : 34CrMo4



Workpiece material : X5CrNi1810



Cutting conditions: Vc = 150 m/min, TP = 1.5 mm, number of passes = 6, wet, 16ER150 ISO type Radial infeed

Cutting conditions: Vc = 100 m/min, TP = 1.5 mm, number of passes = 8, wet, 16ER150 ISO type Radial infeed

KTKF J29~J31

“Threading” is added to small parts machining special tool series

For threading

TKFT



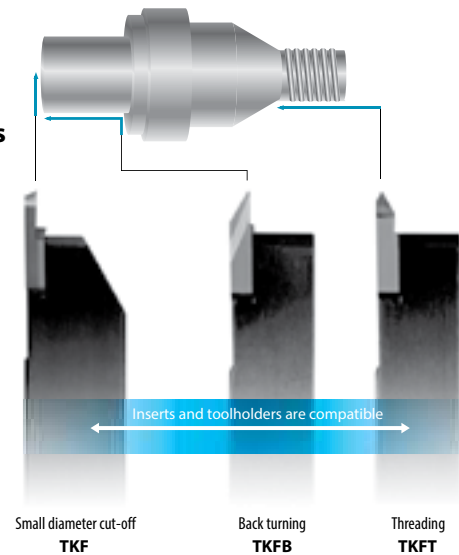
Applicable for various type of threading

Metric (M)

Parallel pipe [G(PF)]

Unified (UN)

Tapered pipe [R(PT) (BSPT)]



Threading

Threading insert features

Full profile and partial profile

	Insert shape	Function	Features
Full profile		Wiper edge	(1) Burr-free thread surface; high quality (Smooth feeling) (2) Leave the workpiece diameter slightly oversized for full topping (3) Every pitch size requires a specific insert
Partial profile			(1) Thread's corner tends to be sharp edged (2) Thread's O.D. or I.D. need to be finished to the size before threading (3) One insert can machine various pitch sizes

Thread precision


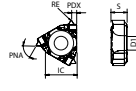

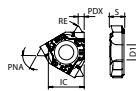

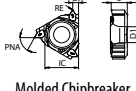

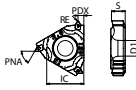

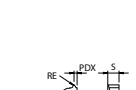
Thread types		Thread precision		
		Strict ←		→ loose
Metric	External	4h (1st class)	6g (2nd class)	8g (3rd class)
	Internal	5H (1st class)	6H (2nd class)	7H (3rd class)
Unified	External	3A	2A	1A
	Internal	3B	2B	1B
Applicable precision with		*⊙	✓	✓

* Not recommended if strict thread precision is required.

External threading (Metric)

Insert		Description		Thread type		Symbol thread type		Pitch (mm)		Profile type		Thread angle PNA (°)		Dimension (mm)					Carbide			Cermets	Applicable toolholder ➔ J22~J25		
														IC	S	D1	RE	PDX	PVD					GW15	TC60
																			PR1115	PR1215	PR1515					PR1535

Internal threading (Metric)

Insert		Description		Material					Dimension (mm)					Carbide					Cermets	Applicable toolholder J26, J27
				Thread type	Symbol thread type	Pitch (mm)	Profile type	Thread angle PNA (°)	IC	S	D1	RE	PDX	PVD			GW15	TC60		
														PR1115	PR1215	PR1515					PR1535
		Carbon steel / Alloy steel										●					P			
		Stainless steel										●					M			
		Cast iron										●					K			
		Non-ferrous metals										●					N			
		11R	100ISO-TF 125ISO-TF 150ISO-TF 175ISO-TF	Metric	M	1 1.25 1.5 1.75	Full profile	60	6.35	3.18	3	0.07 0.08 0.11 0.12	0.8 1.1 1.1 1.1	●●●●	●●●●	●●●●	●●●●	●●●●	SINR...-11E SINR...-11	
		16R	100ISO-TF 125ISO-TF 150ISO-TF 175ISO-TF 200ISO-TF 250ISO-TF 300ISO-TF	Metric	M	1 1.25 1.5 1.75 2 2.5 3	Full profile	60	9.525	3.68	4	0.07 0.08 0.11 0.12 0.14 0.17 0.19	0.8 1.1 1.1 1.1 1.5 1.5 1.6	●●●●	●●●●	●●●●	●●●●	●●●●	SINR...-16 CINR...-16	
	 Molded Chipbreaker	11R	100ISO-TQ 125ISO-TQ 150ISO-TQ 175ISO-TQ	Metric	M	1 1.25 1.5 1.75	Full profile	60	6.35	3.18	3	0.07 0.08 0.11 0.12	0.8 1.1 1.1 1.1	●●●●	●●●●	●●●●	●●●●	●●●●	SINR...-11E SINR...-11	
	 Molded Chipbreaker	16R	100ISO-TQ 125ISO-TQ 150ISO-TQ 175ISO-TQ 200ISO-TQ 250ISO-TQ 300ISO-TQ	Metric	M	1 1.25 1.5 1.75 2 2.5 3	Full profile	60	9.525	3.68	4	0.07 0.08 0.11 0.12 0.14 0.17 0.19	0.8 1.1 1.1 1.1 1.5 1.5 1.6	●●●●	●●●●	●●●●	●●●●	●●●●	SINR...-16 CINR...-16	
		11R	050ISO 075ISO 100ISO 125ISO 150ISO 175ISO 200ISO	Metric	M	0.5 0.75 1 1.25 1.5 1.75 2	Full profile	60	6.35	3.18	3	0.03 0.05 0.07 0.08 0.11 0.12 0.14	0.55 0.68 0.8 1.1 1.1 1.1 0.9	●●●●	●●●●	●●●●	●●●●	●●●●	SINR...-11E SINR...-11	
		11L	100ISO 150ISO			1 1.5						0.07 0.11	0.8 1.1	●●●●	●●●●	●●●●	●●●●	SINL...-11E SINL...-11		
		16R	100ISO 125ISO 150ISO 175ISO 200ISO 250ISO 300ISO	Metric	M	1 1.25 1.5 1.75 2 2.5 3	Full profile	60	9.525	3.68	4	0.07 0.08 0.11 0.12 0.14 0.16 0.19	0.8 1.1 1.1 1.1 1.5 1.5 1.6	●●●●	●●●●	●●●●	●●●●	●●●●	SINR...-16 CINR...-16	
		16L	100ISO 150ISO 200ISO			1 1.5 2						0.07 0.11 0.14	0.8 1.1 1.5	●●●●	●●●●	●●●●	●●●●	SINL...-16 CINL...-16		
		22R	300ISO 350ISO 400ISO 450ISO 500ISO	Metric	M	3 3.5 4 4.5 5	Full profile	60	12.7	4.9	4.85	0.19 0.23 0.26 0.3 0.34	1.8 2.1 2.8 2.8 2.8	●●●●	●●●●	●●●●	●●●●	●●●●	SINR...-22 CINR...-22	

Right-hand shown

Recommended cutting conditions J48
Depth of Cut & Number of Passes J49

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

J
Threading

Internal threading (Unified)

Insert		Description		Thread type		Symbol thread type		Pitch (TPI)		Profile type		Thread angle PNA (°)		Dimension (mm)					Carbide			Cermetal	Applicable toolholder J26, J27		
														IC	S	D1	RE	PDX	PVD					TC60	
																			PR1115	PR1215	PR1515				PR1535
		Carbon steel / Alloy steel																		P					
		Stainless steel																		M					
		Cast iron																		K					
		Non-ferrous metals																		N					
		16R	08UN-TF	Unified	UN UNF UNEF	Full profile	60	9.525	3.68	4	0.21	1.8	●	●	●	●	●	●	●	●	SINR...-16 CINR...-16				
			10UN-TF										0.17	1.5	●	●	●	●	●						
			12UN-TF										0.14	1.5	●	●	●	●	●						
			13UN-TF										0.13	1.5	●	●	●	●	●						
			14UN-TF										0.12	1.5	●	●	●	●	●						
			16UN-TF										0.1	1.1	●	●	●	●	●						
			18UN-TF										0.09	1	●	●	●	●	●						
			20UN-TF										0.08	1	●	●	●	●	●						
			24UN-TF										0.06	0.8	●	●	●	●	●						
													16R	08UN-TQ	Unified	UN UNF UNEF	Full profile	60	9.525	3.68		4	0.21	1.8	●
	10UN-TQ			0.17	1.5	●	●	●	●	●															
	12UN-TQ			0.14	1.5	●	●	●	●	●															
	13UN-TQ			0.13	1.5	●	●	●	●	●															
	14UN-TQ			0.12	1.5	●	●	●	●	●															
	16UN-TQ			0.1	1.1	●	●	●	●	●															
	18UN-TQ			0.09	1	●	●	●	●	●															
	20UN-TQ			0.08	1	●	●	●	●	●															
	24UN-TQ			0.06	0.8	●	●	●	●	●															
				16R	12UN	Unified	UN UNF UNEF	Full profile	60	9.525	3.68	4	0.14	1.5							●				●
			14UN	0.12	1.5										●	●	●	●	●						
			16UN	0.1	1.1										●	●	●	●	●						
			18UN	0.09	1										●	●	●	●	●						
			20UN	0.07	1										●	●	●	●	●						
			24UN	0.05	0.8										●	●	●	●	●						
22R	08UN	8	Full profile	60	12.7	4.9	4.85	0.2	1.8	●	●	●	●	●	●	●	SINR...-22 CINR...-22								

Right-hand shown

Recommended cutting conditions J48
Depth of Cut & Number of Passes J49




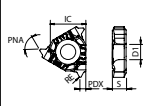

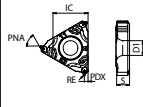

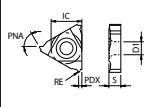
Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

External threading (Parallel pipe G(PF), Whitworth W)

Insert		Description		Thread type	Symbol thread type	Pitch (TPI)		Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide			Cermets	Applicable toolholder J22~J25
						G(PF)	W			IC	S	D1	RE	PDX	PVD				
															PR1115	PR1215	PR1515			PR1535
 	16ER	11W-TF 14W-TF 16W-TF 19W-TF	Parallel pipe Whitworth	G(PF) W	11	11	Full profile	55	9.525	3.68	4	0.3	1.5	●	●	●	-		
					14	14						0.23	1.5	●	●	●			
					-	16						0.19	1.1	●	●	●			
 	16ER	11W-TQ 14W-TQ 16W-TQ 19W-TQ	Parallel pipe Whitworth	G(PF) W	11	11	Full profile	55	9.525	3.68	4	0.3	1.5	●	●	●	-	KTNR...-16 KTNR...-16F KTNR...-16JCT KTNSR...-16 S...-KTNL16	
					14	14						0.23	1.5	●	●	●			
					-	16						0.19	1.1	●	●	●			
 	16ER	11W 14W 19W	Parallel pipe Whitworth	G(PF) W	11	11	Full profile	55	9.525	3.68	4	0.3	1.5	●	●	●	-		
					14	14						0.23	1.5	●	●	●			
					19	-						0.16	1	●	●	●			

Right-hand shown

Recommended cutting conditions J48
Depth of Cut & Number of Passes J50

J



Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

Internal threading (Tapered pipe Rc(PT)(BSPT))

Insert		Description							Dimension (mm)					Carbide			Cermat	Applicable toolholder J26, J27		
				Thread type	Symbol thread type	Pitch (TPI)	Profile type	Thread angle PNA (°)	IC	S	D1	RE	PDX	PVD					GW15	TC60
														PR1115	PR1215	PR1515					PR1535
		Carbon steel / Alloy steel					●	●	●	●	●	●	●	●	●	●	●	●	P	
		Stainless steel					●	●	●	●	●	●	●	●	●	●	●	●	M	
		Cast iron					●	●	●	●	●	●	●	●	●	●	●	●	K	
		Non-ferrous metals					●	●	●	●	●	●	●	●	●	●	●	●	N	
		111R	14BSPT-TF 19BSPT-TF 28BSPT-TF	Tapered pipe	Rc,(PT) (BSPT)	14 19 28	Full profile	55	6.35	3.18	3	0.22 0.16 0.1	0.97 0.78 0.6	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	SINR...-11E SINR...-11	
		161R	11BSPT-TF 14BSPT-TF	Tapered pipe	Rc,(PT) (BSPT)	11 14	Full profile	55	9.525	3.68	4	0.29 0.22	1.5 0.97	● ●	● ●	● ●	● ●	● ●	SINR...-16 CINR...-16	
	 Molded Chipbreaker	111R	14BSPT-TQ 19BSPT-TQ 28BSPT-TQ	Tapered pipe	Rc,(PT) (BSPT)	14 19 28	Full profile	55	6.35	3.18	3	0.22 0.16 0.1	0.97 0.78 0.6	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	SINR...-11E SINR...-11	
	 Molded Chipbreaker	161R	11BSPT-TQ 14BSPT-TQ	Tapered pipe	Rc,(PT) (BSPT)	11 14	Full profile	55	9.525	3.68	4	0.29 0.22	1.5 0.97	● ●	● ●	● ●	● ●	● ●	SINR...-16 CINR...-16	
		111R	14BSPT 19BSPT 28BSPT	Tapered pipe	Rc,(PT) (BSPT)	14 19 28	Full profile	55	6.35	3.18	3	0.22 0.16 0.1	0.97 0.78 0.6	● ● ●	● ● ●	● ● ●	● ● ●	● ● ●	SINR...-11E SINR...-11	
		161R	11BSPT 14BSPT	Tapered pipe	Rc,(PT) (BSPT)	11 14	Full profile	55	9.525	3.68	4	0.29 0.22	1.5 0.97	● ●	● ●	● ●	● ●	● ●	SINR...-16 CINR...-16	

Right-hand shown


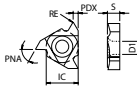
Recommended cutting conditions J48
Depth of Cut & Number of Passes J50

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

Internal threading (60° Partial profile / Metric, Unified)

Insert		Description		Carbon steel / Alloy steel				●		P												
				Stainless steel				●		M												
				Cast iron				●		K												
				Non-ferrous metals				●		N												
Insert		Description		Thread type	Symbol thread type	Pitch				Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide	Cermets	Applicable toolholder J26, J27			
						Metric (mm)		Unified (TPI)				IC	S	D1	RE	PDX				PVD	GW15	TC60
						min.	max.	min.	max.													
		06IR	60005	Metric	M	UN/UNF	Partial profile	60	0.75	1.25	28	20	3.97	1.91	2.3	0.05	0.6	●		SINR...-06E		
		08IR	60007						1	1.75	20	16	4.76	2.38	2.3	0.07	0.8	●		SINR...-08E		
		11IR	60005 A60						0.75 0.5	1.5 1.5	32 48	16 16	6.35	3.18	3	0.05 0.02	1	●	●	SINR...-11E SINR...-11		
		16IR	6001 60015 A60 AG60 G60						1.5	2.5	16	10	9.525	3.68	4	0.1	1.5	●	●	SINR...-16 CINR...-16		
									2.5	2.5	11	10				0.15	1.5	●	●			
									0.5	1.5	48	16				0.02	1	●	●			
		0.5	3	48	8				0.02	1.7	●	●										
		1.75	3	14	8				0.11	1.7	●	●										
22IR	N60																SINR...-22 CINR...-22					

Right-hand shown

Recommended cutting conditions J48
Depth of Cut & Number of Passes J51, J52, J54

Corner-R(RE) selection for partial profiling insert

	External threading	Internal threading	Metric, Unified thread
Metric unified	RE ≤ 0.1443TP	RE ≤ 0.0720TP	Corner-R(RE) at Internal threading is almost half of that of External
Parallel pipe (Whitworth) Tapered pipe	(For both external and Internal thread) RE ≤ 0.1373TP		Parallel pipe, Tapered pipe, Whitworth thread Same Corner-R(RE) for both External and Internal threading

RE: Corner-R TP: Pitch (= $\frac{25.4}{n}$) n: TPI

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

External threading (55° Partial profile / G, R, W)

Insert		Description		Thread type	Symbol thread type	Pitch				Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide					Applicable toolholder J22~J25		
						G(PF), Rc(PT) (TPI)		W (TPI)				IC	S	D1	RE	PDX	PVD						Cermat	
						min.	max.	min.	max.								PR1115	PR1215	PR1515	PR1535	GW15			TC60
																	-	-						
		16ER	A55-TF	Parallel / Tapered pipe Whitworth	G(PF) R(PT) W	28	19	40	16	Partial profile	55	9.525	3.68	4	0.06	1	●	●	●	●	●	●		
			AG55-TF			28	11	40	8						0.06	1.6	●	●	●	●				
			G55-TF			14	11	14	8						0.22	1.6	●	●	●	●				
		16ER	A55-TQ	Parallel / Tapered pipe Whitworth	G(PF) R(PT) W	28	19	40	16	Partial profile	55	9.525	3.68	4	0.06	1	●	●	●	●	●			
			AG55-TQ			28	11	40	8						0.06	1.6	●	●	●			●		
			G55-TQ			14	11	14	8						0.22	1.6	●	●	●			●		
		16ER	5501	Parallel / Tapered pipe Whitworth	G(PF) R(PT) W	28	11	24	10	Partial profile	55	9.525	3.68	4	0.1	1.5					●	●		
			5502			14	11	16	9						0.2	1.5								
			A55			28	19	40	16						0.06	1								
			AG55			28	11	40	8						0.06	1.65								
		G55	14	11	14	8	0.22	1.7																
22ER	N55															●					●			

Right-hand shown

Recommended cutting conditions J48
Depth of Cut & Number of Passes J52~J54

Threading

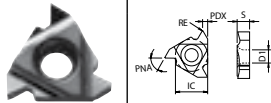
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

Internal threading (55° Partial profile / G, Rc, W)

Insert		Description		Thread type	Symbol thread type	Pitch				Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide	Cermets	Applicable toolholder J26, J27					
						G(PF), Rc(PT) (TPI)		W (TPI)				IC	S	D1	RE	PDX				PVD	GW15	TC60		
						min.	max.	min.	max.															
						28		24			55	3.97	1.91	2.3	0.1	0.6	●		SINR..-06E					
		08IR 5501				28	19	24	20		55	4.76	2.38	2.3	0.1	0.8	●		SINR..-08E					
		11IR 55005 A55		Parallel / Tapered pipe Whitworth	G(PF) Rc(PT) W	28	14	24	14	Partial profile	55	6.35	3.18	3	0.05	1.1	●	●	●	SINR..-11E				
		16IR 5501 A55 AG55 G55				28	11	24	11						0.1					1.5	●	●	●	SINR..-16
						28	19	40	16						0.06					1	●	●	●	CINR..-16
						28	11	40	8						0.06					1.7	●	●	●	
						14	11	14	8						0.22					1.7	●	●	●	
		22IR N55				-	-	7	5		55	12.7	4.9	4.85	0.47	2.5	●	●	SINR..-22					



Right-hand shown

Recommended cutting conditions J48
Depth of Cut & Number of Passes J52~J54

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability


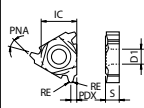

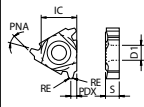
Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes



Threading

External threading (30° Trapezoidal Tr)

Insert		Description		Thread type	Symbol thread type	Pitch (mm)	Profile type	Thread angle PNA (°)	Dimension (mm)					PVD	Carbide	Cermet	Applicable toolholder J22~J25	
									IC	S	D1	RE	PDX					
		16ER	200TR 300TR	30° type (Trapezoidal)	Tr	2 3	Partial profile	30	9.525	3.68	4	0.2	1.6	●	●	●	●	KTNR...-16 KTNR...-16F KTNR...-16JCT KTNSR...-16 S...-KTNL16
		22ER	400TR 500TR	30° type (Trapezoidal)	Tr	4 5	Partial profile	30	12.7	4.9	4.85	0.2	2.5	●	●	●	●	KTNR...-22

Right-hand shown

Recommended cutting conditions J48
Depth of Cut & Number of Passes J53

J





Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

TC60 (Threading inserts) are sold in 10 piece boxes

Internal threading (30° Trapezoidal Tr)

		Carbon steel / Alloy steel										●	P
		Stainless steel										●	M
		Cast iron											K
		Non-ferrous metals											N
Insert	Description	Thread type	Symbol thread type	Pitch (mm)	Profile type	Thread angle PNA (°)	Dimension (mm)					PVD Carbide	Applicable toolholder ● J26, J27
							IC	S	D1	RE	PDX		
	16IR 200TR 300TR	30° type (Trapezoidal)	Tr	2 3	Partial profile	30	9.525	3.68	4	0.2	1.6	● ●	SINR..-16 CINR..-16
	22IR 400TR 500TR	30° type (Trapezoidal)	Tr	4 5	Partial profile	30	12.7	4.9	4.85	0.2	2.5	● ●	SINR..-22 CINR..-22

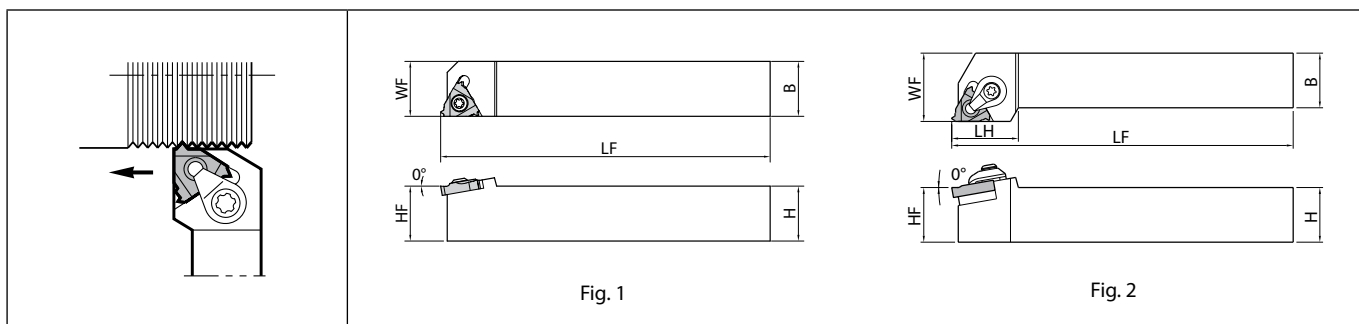
Right-hand shown

Recommended cutting conditions ● J48
Depth of Cut & Number of Passes ● J53

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Threading inserts are sold in 5 piece boxes

KTN (External threading)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

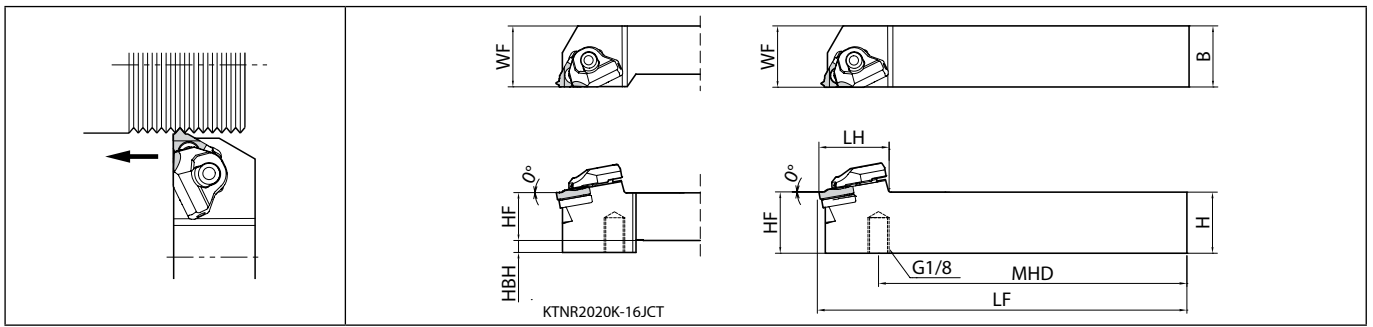
Toolholder dimensions

Description	Availability		Dimension (mm)							Fig.	Applicable inserts ● J6, J8, J10 ● J12, J14, J16 ● J18, J20
	R	L	H	B	LH	HF	LF	WF			
KTN& 1216JX-16F 1616H-16 1616JX-16F 2020H-16 2020JX-16F 2020K-16 2525M-16	●	●	12	16	-	12	120	16	1	16E ⁹ /...	
	●	●	16		25	100	20	2			
	●	●	20	20	-	16	120	16	1		
	●	●			25	100	25	2			
	●	●			-	20	120	20	1		
	●	●	25	25	25	125	25	2			
	●	●			25	150	30				
KTNR 2525M-22 3225P-22	●		25	25	29	25	150	32	2	22ER...	
	●		32		34	32	170				

Description	Spare parts							
	Clamp set	Clamp set	Screw	Shim screw	Shim	Wrench	Wrench	Wrench
KTN& 1216JX-16F 1616H-16 1616JX-16F 2020H-16 2020JX-16F 2020K-16 2525M-16	-	CPS-5S	SB-3.5TR	-	-	-	-	LTW-15S
	CPS-5S		-	SP3X8	TN-32		FT-15	-
	-		SB-3.5TR	-	-		-	LTW-15S
	CPS-5S		-	SP3X8	TN-32		FT-15	-
	-		SB-3.5TR	-	-		-	LTW-15S
	CPS-5S		-	SP3X8	TN-32		FT-15	-
KTN 2525M-22 3225P-22	-	CPS-6S	-	SP3X8	TN-43	LW-3	-	-

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTN-JCT (External threading, Coolant-through holders)



Right-hand shown | Right-hand Insert for Right-hand Toolholder. | Pressure Resistance : ~15MPa

Toolholder dimensions

Description	Availability		Dimension (mm)								Coolant hole	Spare parts					Applicable inserts ● J6, J8, J10 J12, J14, J16 J18, J20
												Clamp set	Pipe connection	Shim screw	Shim	Wrench	
	R	H	B	LH	MHD	HF	HBH	LF	WF								
KTNR 2020K-16JCT	●	20	20	33.3	100.7	20	5	125	25	Yes						16ER...	
2525M-16JCT	●	25	25	-	125.7	25	-	150	25	Yes						16ER...	

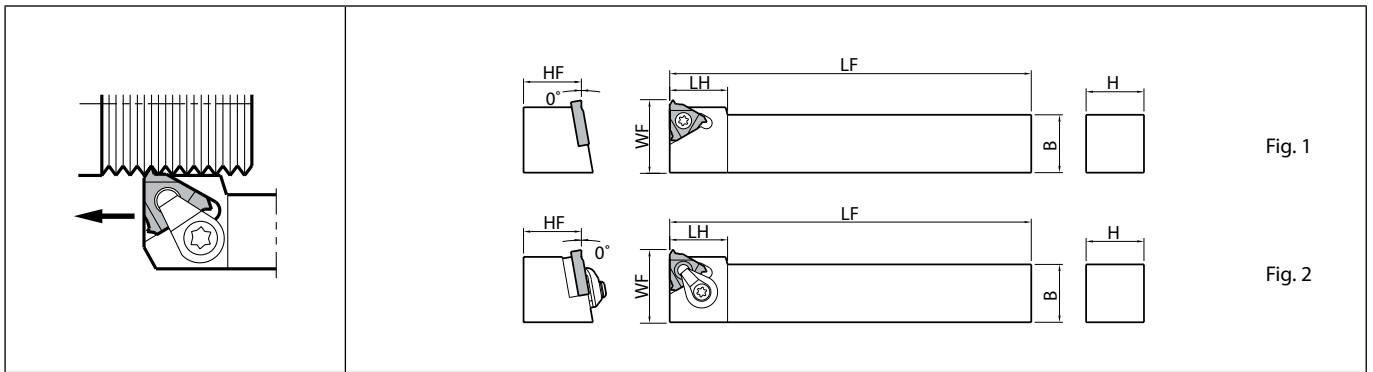
Please see page D12 for piping parts of coolant-through holders.
 Only the O-ring (SS-035) included with the pipe connection can be ordered.



Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTNS (External threading)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

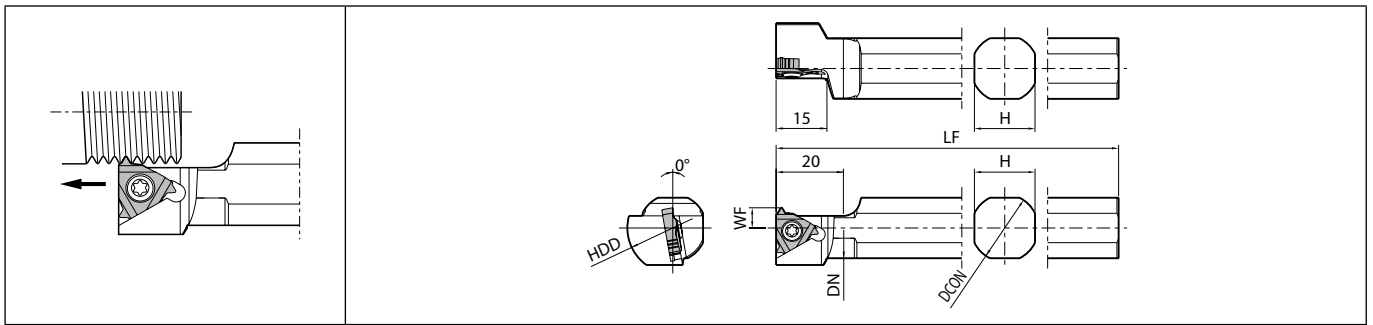
Description	Availability	Dimension (mm)						Fig.	Spare parts					Applicable inserts ● J6, J8, J10 ● J12, J14, J16 ● J18, J20
									Clamp set	Screw	Shim screw	Shim	Wrench	
KTNSR 1010H-16	●	10	10	16	10	100	16	1	-	SB-3.5TR	-	-	FT-15	16ER...
1212K-16	●	12	12	18	12	18	18	2	CPS-5S	-	SP3X8	TN-32		
1616K-16	●	16	16	16	16	125	22							
2020K-16	●	20	20	20	20	27.4	27.4							



Threading



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-KTN (External threading)



Left-hand shown | Right-hand Insert for Left-hand Toolholder.

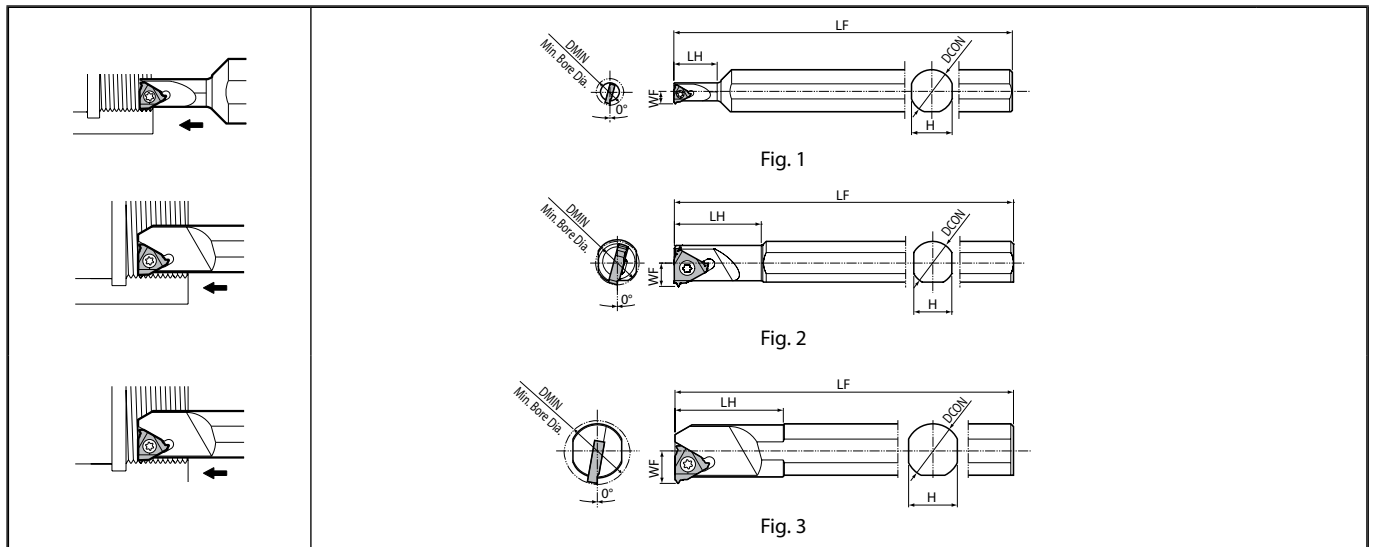
Toolholder dimensions

Description	Availability	Dimension (mm)						Spare parts		Applicable inserts ● J6, J8, J10 J12, J14, J16 J18, J20	
		L	DCON	H	DN	HDD	LF	WF	Screw		Wrench
											
S16F- KTNL16	●	16	15	15		85	6	SB-3.5TR	LTW-15S	16ER...	
S19K- KTNL16	●	19.05	17	18	27						
S20K- KTNL16	●	20	18	19		120					
S22K- KTNL16	●	22	20	21							
S25.0H- KTNL16	●	25				100	10				
S25K- KTNL16	●	25.4	23	24	32	120					



●: Standard item R: Right-hand only L: Left-hand only □: Check availability

SIN



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

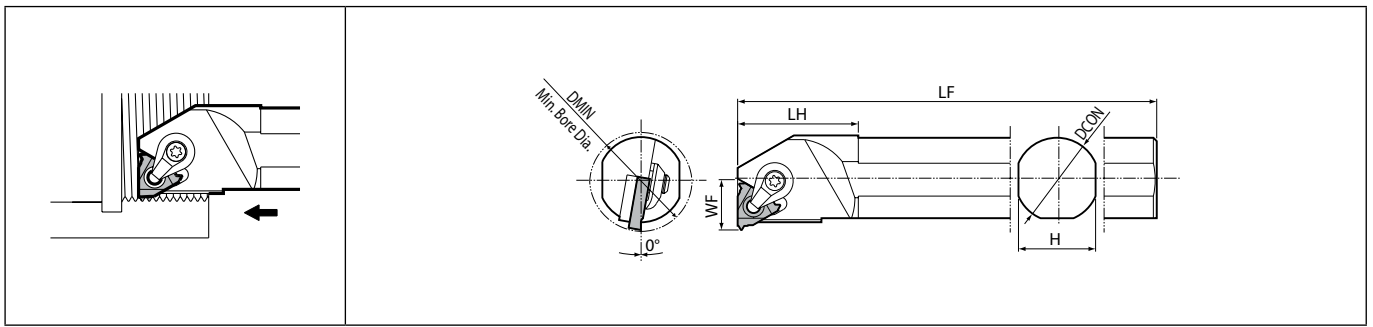
Toolholder dimensions

Description	Availability		Dimension (mm)							Fig.	Spare parts			Applicable inserts ● J7, J9, J11 ● J13, J15, J17 ● J19, J21
											Screw	Wrench	Wrench	
SINR 0612S-06E	●		6.4	12	11	10	100	3.8	1	SB-2040TR	-	FT-6	061R...	
SINR 0816S-08E	●		7.8	16	15	16	125	4	1	SB-2050TR	-	FT-6	081R...	
SIN ^{R/L} 1216S-11E	●	●	12	16	14	25	150	6.3	1	SB-2TR	-	FT-8	111 ^{R/L} ...	
SIN ^{R/L} 1516S-11	●	●	15			30		7.5						
SIN ^{R/L} 1616S-16	●	●	16	16	14	32	150	8.6	2	SB-3.5TR	FT-15	-	161 ^{R/L} ...	
SIN ^{R/L} 2016S-16	●	●	20			37		10						
SIN ^{R/L} 2420S-16	●	●	24			20		18						40	180	12	3
SINR 2420S-22	●		24	20	18	40	180	13.5	3	SB-4085TR	FT-15	-	221R...	

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



CIN



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)						Spare parts						Applicable inserts J7, J9, J11 J13, J15, J17 J19, J21
									Clamp set	Clamp set	Shim screw	Shim	Wrench	Wrench	
	R	L	DMIN	DCON	H	LH	LF	WF							
CIN ^{R/L} 3025S-16	●	●	30	25	23	36	200	15		-	SP3X8	TN-32	-	FT-15	16I ^{R/L} ...
3732S-16	●		37	32	30	45	250	18.5							
CIN ^R 3025S-22	●		30	25	23	40	200	16.5	-	CPS-6S	SP3X8	TN-43	LW-3	-	22I ^R ...
3732S-22	●		37	32	30	45	250	20							



Threading

Guide for internal threading

For internal threading, pay extra attention to “stabilizing bore dia.” and “chip evacuation”.

1. “Stabilizing bore dia.”

Because small pitch Internal threading has small corner-R (RE), there is variation in the bore dia. which may greatly influence the tool life of an insert. In order to eliminate the variation in the bore dia., “0” Cutting (zero cutting) should be performed as the zero pass, before the first pass in threading. The bore dia. is cut with the specified dimension, and the first pass of threading becomes stable.

2. “Chip evacuation”

If machining process is continued when chips are tangled with a toolholder and other parts of the machine, it may cause damages to the insert. Therefore, please ensure that there are no tangled chips in the machine by the following method.

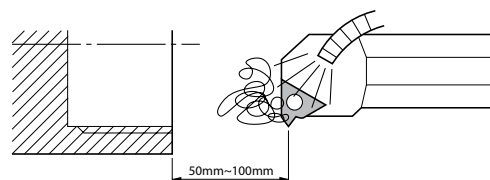
<When processing the first workpiece>

Set the program with the “single block”

Keep the threading starting point 50 mm~100 mm away from the side of workpiece, and confirm that coolant is flushing down the chips for each pass.

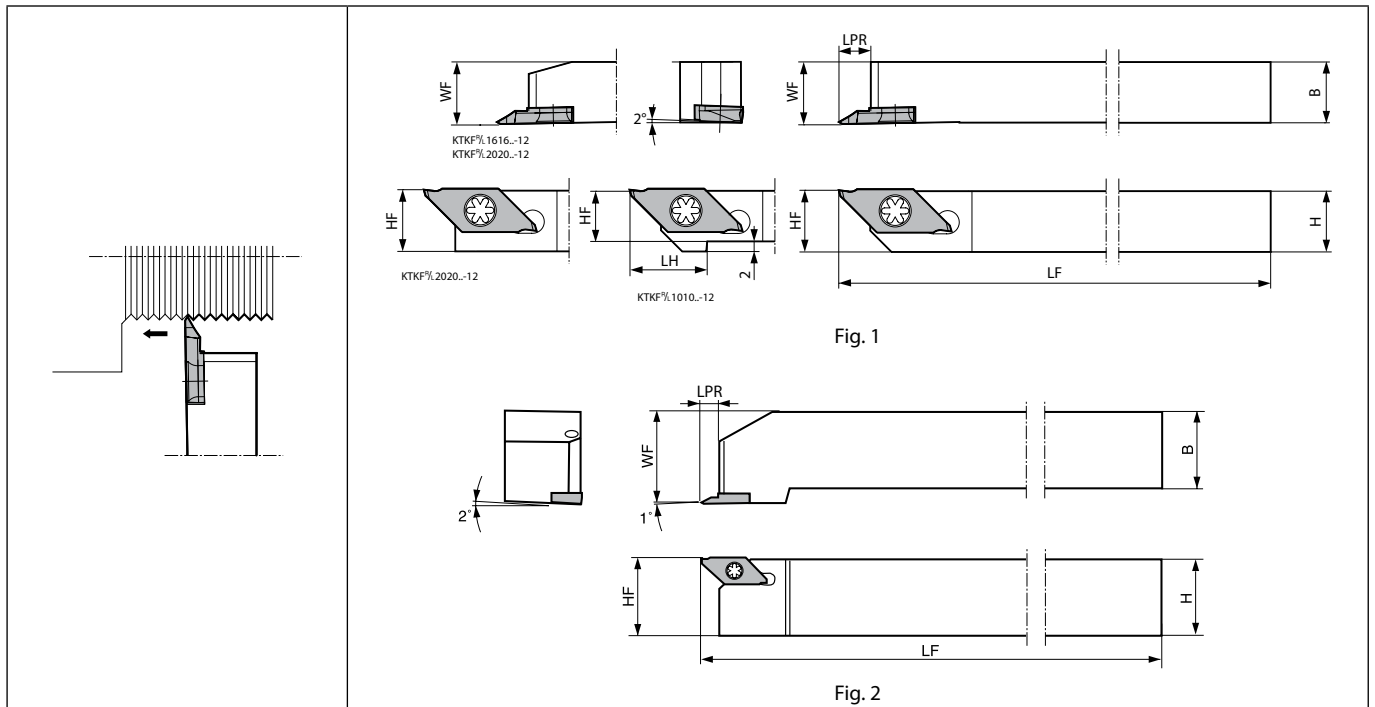
<When processing the second workpiece and later>

Ensure that chips are not tangled; then, start the continuous run.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF (Threading)



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability		Dimension (mm)							Fig.	Spare parts		Applicable inserts ➔ J28
											Screw	Wrench	
	R	L	H	B	LH	LPR	HF	LF	WF				
KTKF%L 1010JX-12	●	●	10	10	15	6	10	120	10	1	SB-4590TRWN	FT-10	TKFT12%L...
1212F-12	●	●	12	12	12		85	12					
1212JX-12	●	●	16	16	16		120	16					
1616JX-12	●	●	20	20	20		20	20					
2020JX-12	●	●	25	25	25		150	30	2					TKFT12R...
2525M-12	●												

LPR shows the distance from the toolholder to the cutting edge.
See Page H15 for internal coolant type (coolant-through holders)

Threading inserts identification system (Ref. to Table 1)

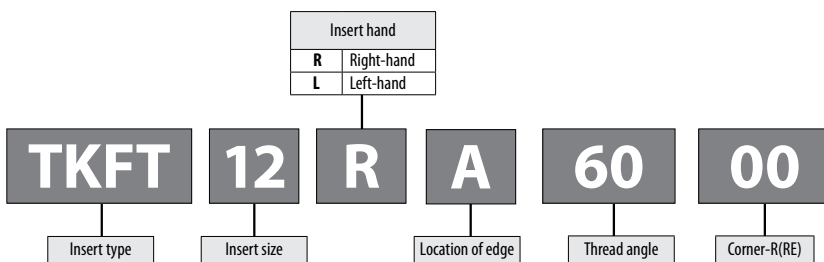
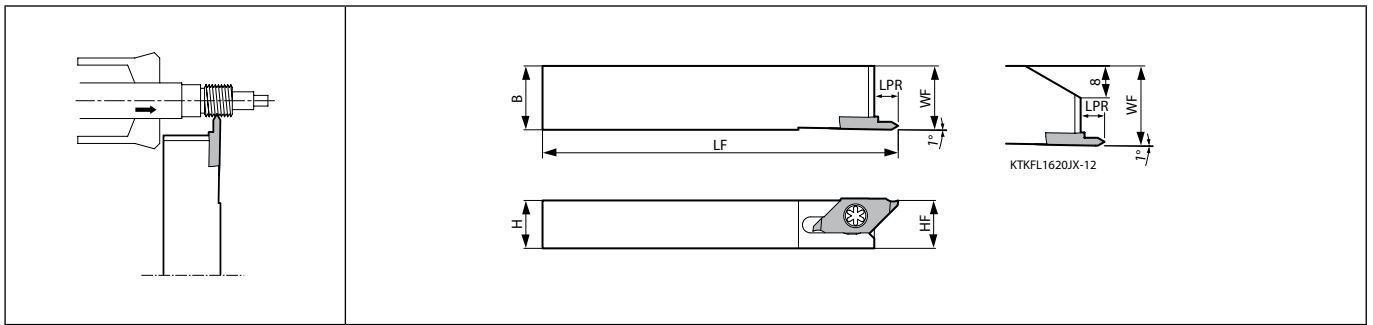


Table 1

Right-hand insert		
A type TKFT12RA..	B type TKFT12RB..	N type TKFT12RN..
Left-hand insert		
A type TKFT12LA..	B type TKFT12LB..	N type TKFT12LN..

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF (Threading, Goose-neck holder)



Left-hand shown | Left-hand Insert for Left-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)						Spare parts		Applicable inserts J28
								Screw	Wrench	
		L	H	B	LPR	HF	LF	WF		
KTKFL 1216JX-12	●	12	16		12		16	SB-4590TRWN	FT-10	TKFT12L...
1620JX-12	●	16	20	6	16	120	20			

LPR shows the distance from the toolholder to the cutting edge.

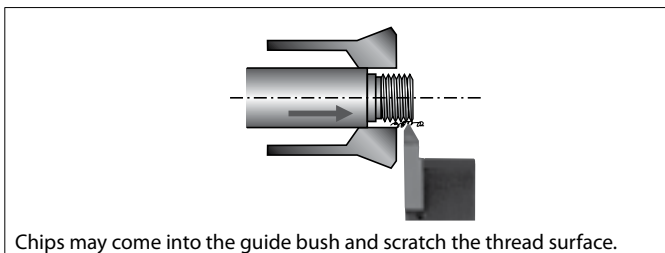


Threading

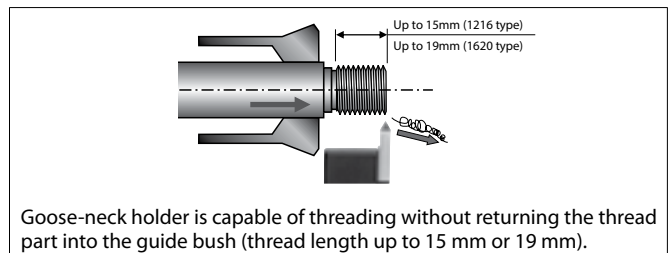
Swiss tool automatic lathe (Guide bush system)

Goose-neck holder is applicable to automatic lathes whose toolholder does not move to longitudinal direction (Z-axis direction).

Conventional tool

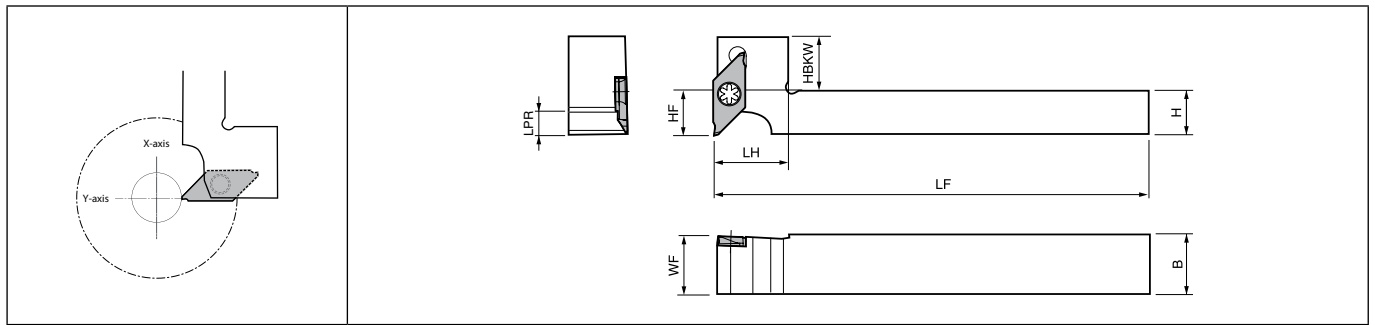


Goose-neck holder





● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

KTKF-Y (Threading, Y-axis toolholder)



Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)									Spare parts		Applicable inserts ➔ J28
		R	H	B	LH	HF	LPR	HBKW	LF	WF	Screw	Wrench	
													
KTKFR 1216JX-12-Y 1616JX-12-Y	● ●	12 16	16	20 25	12 16	6	15 11	120	16	SB-4590TRWN	FT-10	TKFT12R...	

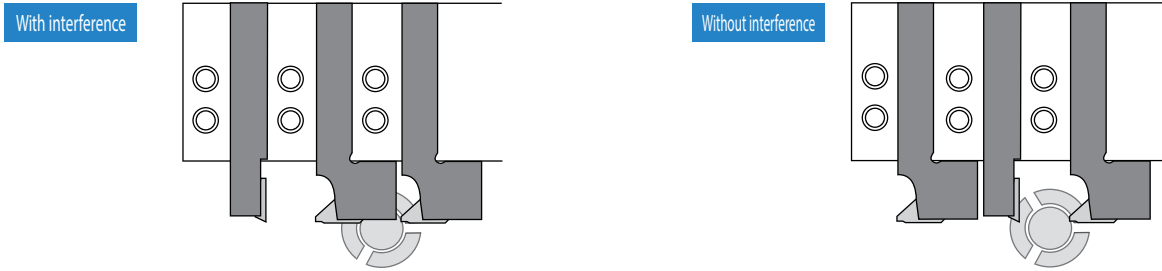
LPR shows the distance from the toolholder to the cutting edge.



Threading

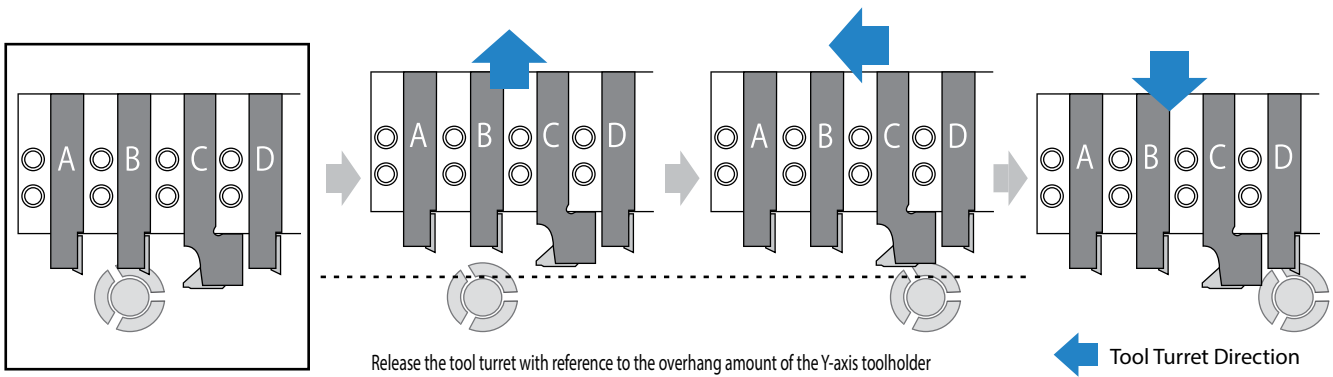
Precautions for using Y-axis toolholder

Do not use Y-axis toolholders side by side to prevent interference. (Only two Y-axis holder can be used at the same time)



Standard toolholders may be mounted between two Y-axis toolholders

When changing the tool, set the retracted position with reference to the cutting edge of the Y-axis holder. (When exchanging from tool B to D)



Threading

Note that using other toolholders together will result in different outside diameters

(Unit : mm)

Y-axis Toolholder Overhang	Examples	Overhang Amount L			
		Available Outside Cutting Diameter(ϕ)	20	22	25
20		A	Without Restriction	Without Restriction	Without Restriction
		B	13.0	13.0	13.0
		C	Without Restriction	Without Restriction	Without Restriction
25		A	38.0	58.0	Without Restriction
		B	14.9	13.6	13.0
		C	45.0	60.0	Without Restriction

Recommended cutting conditions

Workpiece material	Recommended insert grades			
	MEGACOAT NANO PLUS	MEGACOAT NANO	MEGACOAT	Carbide
	PR1725	PR1535	PR1225	KW10
Carbon steel	Vc = 70 ~170 m/mim			-
	First ap (Radial): 0.2mm and under			
Alloy steel	Vc = 70 ~170 m/mim			-
	First ap (Radial): 0.2 mm and under			
Stainless steel	Vc = 60~100 m/mim			-
	First ap (Radial): 0.15 mm and under			
Cast iron	-			Vc = 100 m/mim
	-			First ap (Radial): 0.2 mm and under
Aluminum alloys	-			Vc = 150~400 m/mim
	-			First ap (Radial): 0.2 mm and under
Brass	-			Vc = 150~300 m/mim
	-			First ap (Radial): 0.15 mm and under

- Coolant is recommended.
 - In case of threading stainless steel, please set two to three passes more than <ap - passes> listed below.

Depth of cut & number of passes

TKFT 60° / 55° Partial profile

(ap shows the value of radial ap)

Type	Pitch (mm/TPI)	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	
Metric	External thread	TKFT 12R/L A/B6000	Max 0.05 Flat	0.15	4	0.06	0.04	0.03	0.02								
				0.19	4	0.07	0.06	0.04	0.02								
				0.23	4	0.08	0.07	0.06	0.02								
				0.27	5	0.08	0.07	0.06	0.04	0.02							
				0.30	5	0.10	0.08	0.06	0.04	0.02							
				0.34	6	0.10	0.08	0.06	0.04	0.04	0.02						
		TKFT 12R/L A/B6000 12R/L A/B60005	0.05	0.38	6	0.10	0.10	0.07	0.05	0.04	0.02						
				0.33	5	0.10	0.10	0.07	0.04	0.02							
		TKFT 12R/L A/B6000 12R/L A/B60005	0.05	0.45	7	0.10	0.10	0.08	0.06	0.05	0.04	0.02					
				0.40	6	0.10	0.10	0.08	0.06	0.04	0.02						
		TKFT 12R/L A/B60005	0.05	0.48	6	0.10	0.10	0.10	0.10	0.06	0.02						
				0.52	7	0.10	0.10	0.10	0.08	0.07	0.05	0.02					
				0.56	7	0.10	0.10	0.10	0.10	0.08	0.06	0.02					
				0.71	8	0.15	0.15	0.12	0.10	0.08	0.06	0.03	0.02				
0.66	7			0.18	0.15	0.12	0.10	0.06	0.03	0.02							
0.90	9			0.20	0.18	0.13	0.10	0.10	0.07	0.05	0.05	0.02					
TKFT 12R/L A/B60005 12R/L N6001	0.10	0.85	8	0.20	0.18	0.13	0.10	0.10	0.07	0.05	0.02						
		1.04	10	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05	0.02				
Parallel pipe	External thread	TKFT 12R/L A/B55005	0.05	0.67	7	0.18	0.15	0.12	0.10	0.06	0.04	0.02					
			0.05	1.01	9	0.20	0.18	0.14	0.12	0.12	0.10	0.08	0.05	0.02			
Whitworth	External thread	TKFT 12R/L A/B55005	0.05	0.79	8	0.18	0.18	0.12	0.10	0.08	0.07	0.04	0.02				
			0.05	0.96	9	0.20	0.20	0.15	0.10	0.10	0.08	0.06	0.05	0.02			
			0.05	1.07	10	0.20	0.18	0.15	0.12	0.10	0.10	0.08	0.07	0.05	0.02		
			0.05	1.21	11	0.20	0.18	0.15	0.15	0.12	0.10	0.10	0.08	0.07	0.04	0.02	

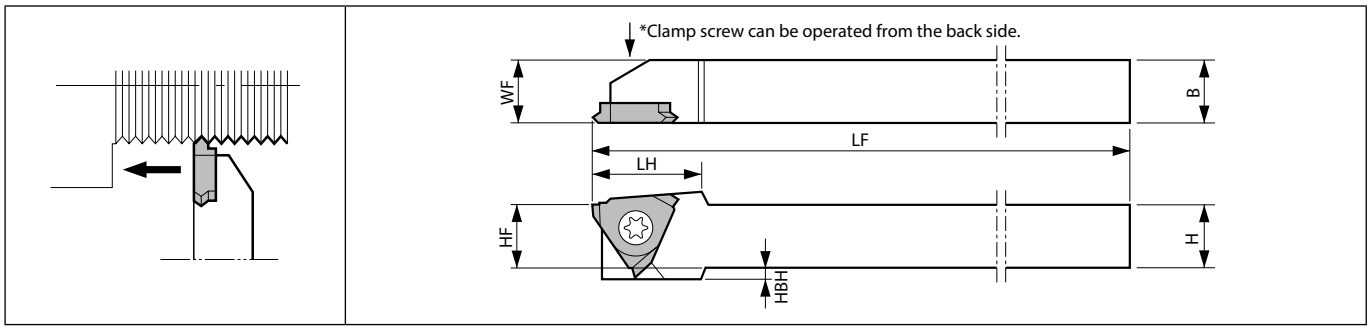


Threading

TTX

Insert		Description		Thread type		Symbol thread type		Pitch		Profile type		Thread angle PNA (°)		Dimension (mm)						Carbide		Applicable toolholder ➔ J35
														Dimension (mm)						Carbide		
														IC	S	D1	RE	PDX	PDX1	PRI115	PR930	
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KTTX

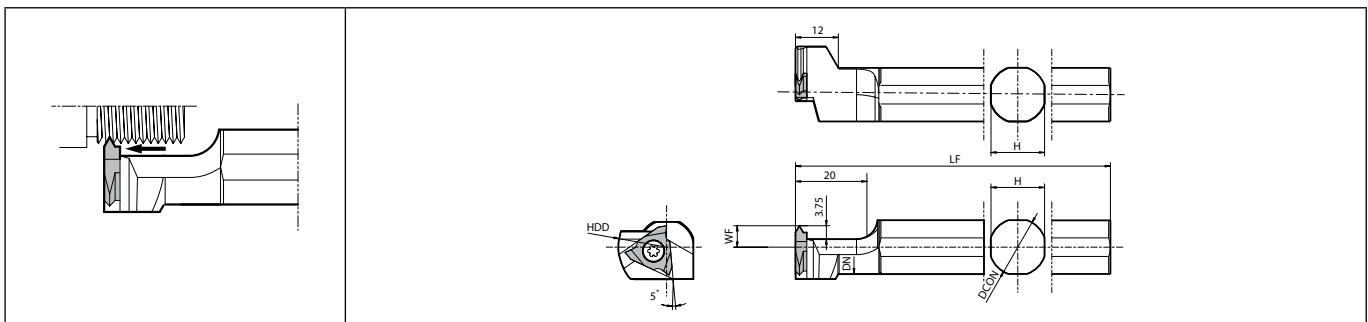


Thread to shoulder | Right-hand shown | Right-hand Insert for Right-hand Toolholder.

Toolholder dimensions

Description	Availability	Dimension (mm)							Spare parts		Applicable inserts ● J34	
		R	H	B	LH	HF	HBH	LF	WF	Screw		Wrench
		KTTXR	●	10	10	17.6	10	2	120	10		SB-4070TRW	FT-8	TTX32R...
1212F-16F	●	12	12	12			85	12				
1212JX-16F	●	16	16	16	-	120	16					
1616JX-16F	●	20	20	20		125	20					
2020K-16F	●											

S-KTTX



Thread to shoulder | Left-hand shown | Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

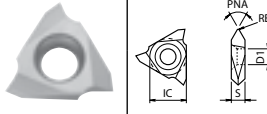
Description	Availability	Dimension (mm)							Spare parts		Applicable inserts ● J34
		L	DCON	H	DN	HDD	LF	WF	Screw	Wrench	
		S12F- KTTXL16	●	12	11	11		80	6	SB-4070TRW		FT-8	TTX32R...
S14H- KTTXL16	●	14	13	13		100					
S15F- KTTXL16	●	15.875	15	14.6	27	85					
S16F- KTTXL16	●	16				90					
S19G- KTTXL16	●	19.05	17	17.6	120						
S19K- KTTXL16	●	20	18	18.6	90						
S20G- KTTXL16	●				120						
S20K- KTTXL16	●				100						
S25.0H- KTTXL16	●	25	23	23.6	32	100					
S25K- KTTXL16	●	25.4				120					

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Threading

TT (External threading)

				Carbon steel / Alloy steel				● ○		P												
				Stainless steel				● ○		M												
				Cast iron				● ○		K												
				Non-ferrous metals				● ○		N												
Insert	Description	Thread type	Symbol thread type	Pitch				Profile type	Thread angle PNA (°)	Dimension (mm)					Carbide			Applicable toolholder J37				
				M(mm) G, PT (TPI)		UN, W (TPI)				IC	S	D1	RE	PDX	PVD	-						
				min.	max.	min.	max.										PR115		PR930	KW10		
	TT32R 6000 6001 6002 6003	Metric Unified	M UN	0.5	56	2.5	10	Partial profile	60	9.525	3.18	4.4	0	●	●	-	KTTR...-16					
	1			24	0.1								●	●								
	1.5	16	0.2	●	●																	
	2.5	11	0.3	●	●																	
	TT32L 6000 6001 6002	Metric Unified	M UN	0.5	56	2.5	10						0	●	●			-	KTTL...-16			
	1			24	0.1								●	●								
	1.5	16	0.2	●	●																	
	TT32R 5501 5502	Parallel/Tapered pipe	G PT W	28	11	24	10		55	12.7	4.76	5.5	0.1	●	●	-	KTTR...-16					
	14			11	14	10	0.2						●	●								
	TT32L 5501 5502	Whitworth	G PT W	28	11	24	10						0.1	●	●							
14	11			14	10	0.2	●	●														
TT43R 6001 6002 6003 6004	Metric Unified	M UN	1	24	3.5	8	60	12.7					4.76	5.5	0.1			●	●	-	KTTR...-22	
1.5			16	0.2											●			●				
2.5	11	0.3	●	●																		
3	8	0.4	●	●																		
TT43L 6001 6002	Metric Unified	M UN	1	24	3.5	8			0.1	●	●											
1.5			16	0.2					●	●												
TT43R 5501 5502 5503	Parallel/Tapered pipe	G PT W	28	11	24	7	55	12.7	4.76	5.5	0.1	●	●	-	KTTR...-22							
14			11	16	10	0.2					●	●										
11	11	10	7	0.3	●	●																
TT43L 5501 5502	Whitworth	G PT W	28	11	24	7					55	12.7	4.76			5.5	0.1	●	●	-	KTTL...-22	
14			11	16	7	0.2											●	●				
TT43ER 100M 125M 150M 200M	Metric	M	1	-	-	-											Full profile	60	12.7			4.76	5.5	0.12	●	●	-	KTTR...-22
1.25			0.8	●			●															
1.5			0.9	●			●															
2			1	●			●															
												0.15	●	●								
												0.19	●	●								
												1	●	●								
												0.25	●	●								
												1.7	●	●								

Right-hand shown

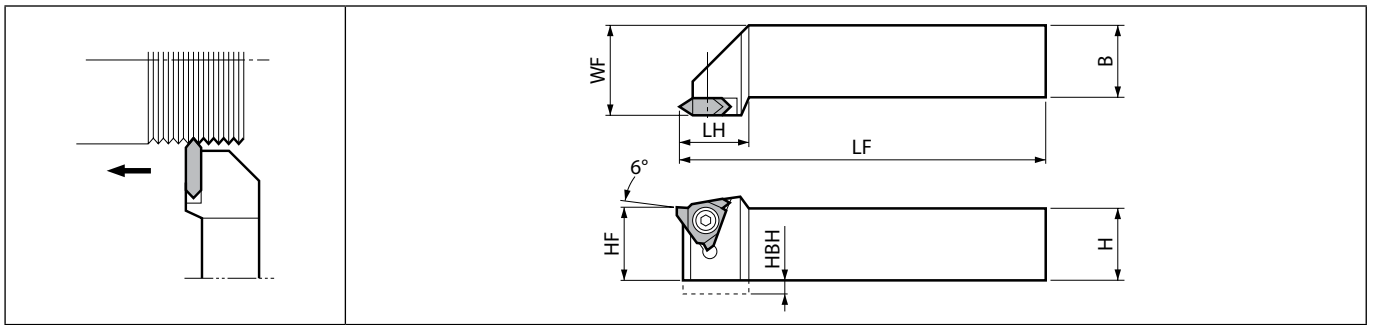
Recommended cutting conditions J48
Depth of Cut & Number of Passes J55, J56

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PR930 / PR115 (Threading inserts) are sold in 5 piece boxes

KW10 (Threading inserts) are sold in 10 piece boxes

KTT



Right-hand shown | Right-hand Insert for Right-hand Toolholder, Left-hand Insert for Left-hand Toolholder.



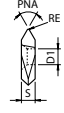
Toolholder dimensions

Description	Availability		Dimension (mm)								Spare parts					Applicable inserts J36
											Screw	Screw	Wrench	Wrench	Wrench	
	R	L	H	B	LH	HF	HBH	LF	WF							
KTT% 1010F-16	●	●	10	10	18	10	4	80	12	SB-4070TRS			-	FT-10	TT32&...	
1212H-16	●	●	12	12		12	2	100	16							
1616H-16	●	●	16	16		16			20							
2020K-16	●	●	20	20		20	-	125	25	SB-4TR			FT-15	-		
2525M-16	●	●	25	25		25		150	30							
KTT% 2020K-22	●	●	20	20	25	20	-	125	25	-	GS-50	LW-3	-	-	TT43&...	
2525M-22	●	●	25	25		25	-	150	30						TT43ER...M	

●: Standard item R: Right-hand only L: Left-hand only □: Check availability



TT (Internal threading)

				Carbon steel / Alloy steel				● ○		P							
				Stainless steel				● ○		M							
				Cast iron				● ○		K							
				Non-ferrous metals				● ○		N							
Insert	Description	Thread type	Symbol thread type	Pitch				Profile type	Thread angle PNA (°)	Dimension (mm)				Carbide			Applicable toolholder ● J39
				M(mm) G, PT (TPI)		UN, W (TPI)				IC	S	D1	RE	PVD	-		
				min.	max.	min.	max.									PR1115		PR930	KW10
  	TT32R 6000 6001	Metric Unified	M UN	0.5	2.5	48	10	60	9.525	3.18	4.4	0	●	●	KITGL...-16		
				1.5		16						0.1	●	●			
	TT32L 6000 6001	Parallel/ Tapered pipe	G PT W	0.5	2.5	48	10	55	12.7	4.76	5.5	0	●	●	KITGR...-16		
				1.5		16						0.1	●	●			
	TT32R 5501 5502	Whitworth	G PT W	28	11	24	10	55	12.7	4.76	5.5	0.1	●	●	KITGL...-16		
				-	-	16	18					0.2	●	●			
	TT32L 5501 5502	Metric Unified	M UN	28	11	24	10	60	12.7	4.76	5.5	0.1	●	●	KITGR...-16		
				-	-	16	18					0.2	●	●			
TT43R 6001 6002	Parallel/ Tapered pipe	G PT W	1.5	3	16	10	55	12.7	4.76	5.5	0.1	●	●	KITGL...-22			
			3	3	8	8					0.2	●	●				
TT43L 6001 6002	Whitworth	G PT W	1.5	3	16	10	55	12.7	4.76	5.5	0.1	●	●	KITGR...-22			
			3	3	8	8					0.2	●	●				
TT43R 5501 5502 5503	Metric Unified	M UN	28	11	24	8	60	12.7	4.76	5.5	0.1	●	●	KITGL...-22			
			14	11	16	11					0.2	●	●				
TT43L 5501 5502	Parallel/ Tapered pipe	G PT W	28	11	24	8	55	12.7	4.76	5.5	0.1	●	●	KITGR...-22			
			14	11	16	8					0.2	●	●				

Right-hand shown

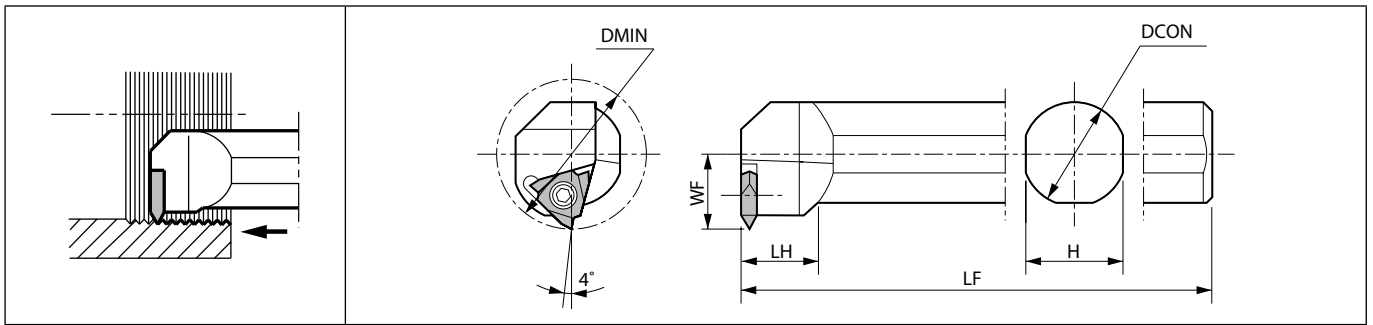
Recommended cutting conditions ● J48
Depth of Cut & Number of Passes ● J55, J56

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PR930 / PR1115 (Threading inserts) are sold in 5 piece boxes

KW10 (Threading inserts) are sold in 10 piece boxes

KITG



Right-hand shown | Left-hand Insert for Right-hand Toolholder, Right-hand Insert for Left-hand Toolholder.

Toolholder dimensions

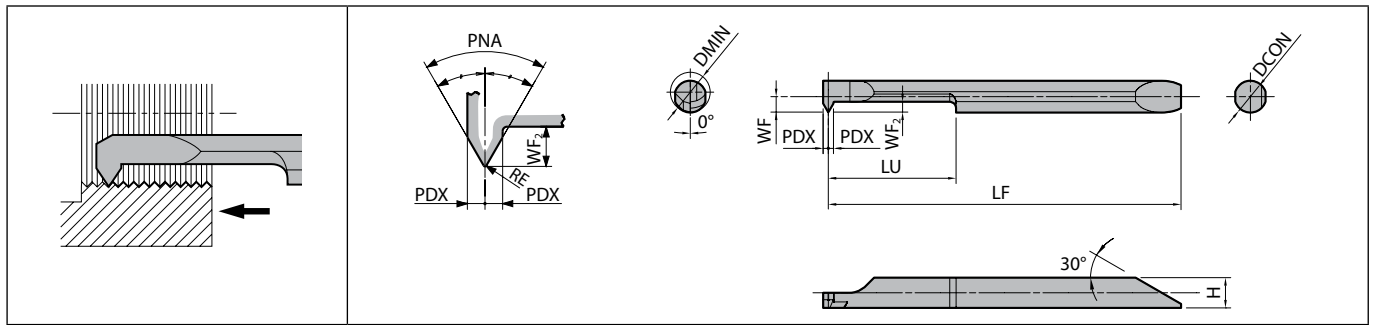
Description	Availabi- lity		Dimension (mm)							Spare parts				Applicable inserts ➡ J38
										Screw	Screw	Wrench	Wrench	
	R	L	DMIN	DCON	H	LH	LF	WF						
KITG%L 3525T-16	●	●	35	25	23	18	220	17.5	SB-4TR	-	-	FT-15	TT32 ¹ / _{R...}	
KITG%L 4532T-22	●	●	45	32	30	20	250	22.5	-	GS-50	LW-3	-	TT43 ¹ / _{R...}	

Max. available Pitch : KITG&3525T-16...TP 2.5mm or 10TPI, KITG&4532T-22...TP 3.0mm or 8TPI.



Threading

EZT (Internal threading)



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)									Thread angle PNA (°)	Tolerance (mm)		Carbide		Applicable Thread					
		DMIN	DCON	H	LF	LU	WF	WF ₂	PDX	RE		RE min.	RE max.	PVD	-	Metric		Unified		American National Tapered Pipe	
																Nominal Thread	Pitch (mm)	Nominal Thread	Pitch (TPI)	Nominal Thread	Pitch (TPI)
EZTR 030025-60-002 035030-60-002 040035-60-004 050040-60-004 060050-60-004 070060-60-004	1	3	2.5	2.3	34.5	6	1.19	1	0.5	0.02	60°	0.01	0.01	●	●	M4 and over (Fine Thread : M3.5 and over)	0.35~0.8	No.8-32UNC No.8-36UNF and over	36~32	-	-
		3.5	3	2.8	38.4	8.4	1.44	1.2	0.6					●	●	M4.5 and over (Fine Thread : M4.5 and over)	0.5~1.0	No.10-24UNC No.8-36UNF and over	36~24	-	-
		4	3.5	3.3	41.4	10.4	1.69	1.3	0.65					●	●	M5 and over (Fine Thread : M6 and over)	0.75~1.25	No.12-24UNC No.12-28UNF and over	28~20	-	-
		5	4	3.8	44.35	15.35	1.94	1.3	0.65					●	●	M7 and over (Fine Thread : M6 and over)	0.75~1.5	1/4-20UNC 1/4-28UNF and over	28~18	-	-
		6	5	4.8	52.4	19.2	2.44	1.6	0.8					●	●	M8 and over (Fine Thread : M7 and over)	0.75~1.5	5/16-18UNC 5/16-24UNF and over	24~16	1/4NPT 3/8NPT	18
		7	6	5.8	60.2	24	2.94	2	1					●	●	M9 and over (Fine Thread : M8 and over)	0.75~1.75	3/8-16UNC 3/8-24UNF and over	24~16	1/4NPT and over	18,14
														Whitworth		Parallel Pipe / Tapered Pipe					
														Nominal Thread	Pitch (TPI)	Nominal Thread	Pitch (TPI)				
EZTR 060050-55-008 080070-55-008	1	6	5	4.8	52.4	19.2	2.44	1.6	0.8	0.085	55°	0.015	0.015	●	●	W10 TPI24 and over	24~20	G1/16 and over R1/16 and over	28	-	-
		8	7	6.8	63.2	24	3.44	2	1					●	●	W11 TPI20 and over	20~18	G1/8 and over R1/8 and over	28,19	-	-

For American National Tapered Pipe (NPT), use EZTR.-60-004. ● J43

Applicable sleeves ● J41
Recommended cutting conditions ● J42
Depth of Cut & Number of Passes ● J42, J43

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

EZ bars are sold in 1 piece boxes



Applicable sleeves

Sleeve description				Applicable inserts		Applicable machine manufacturer
EZH-CT (Adjustable overhang length / with coolant hole) F38, F39	EZH-HP (Adjustable overhang length) F40, F41	EZH-ST F42, F43	Sleeve shank dia. DCON (mm)	EZT	Shank dia.	
					DCON (mm)	
-	-	EZH 02512ST-80 03012ST-80 03512ST-80 04012ST-80 05012ST-80 06012ST-80 07012ST-80	12	EZTR030025-... EZTR035030-... EZTR040035-... EZTR050040-... EZTR060050-... EZTR070060-... EZTR080070-...	2.5 3 3.5 4 5 6 7	(General purpose)
-	EZH 02516HP-100 03016HP-100 03516HP-100 04016HP-100 05016HP-100 06016HP-100 07016HP-100	EZH 02516ST-100 03016ST-100 03516ST-100 04016ST-100 05016ST-100 06016ST-100 07016ST-100	16	EZTR030025-... EZTR035030-... EZTR040035-... EZTR050040-... EZTR060050-... EZTR070060-... EZTR080070-...	2.5 3 3.5 4 5 6 7	(General purpose)
EZH 02519CT-120 03019CT-120 03519CT-120 04019CT-120 05019CT-120 06019CT-120 07019CT-120	EZH 02519HP-120 03019HP-120 03519HP-120 04019HP-120 05019HP-120 06019HP-120 07019HP-120	EZH 02519ST-120 03019ST-120 03519ST-120 04019ST-120 05019ST-120 06019ST-120 07019ST-120	19.05	EZTR030025-... EZTR035030-... EZTR040035-... EZTR050040-... EZTR060050-... EZTR070060-... EZTR080070-...	2.5 3 3.5 4 5 6 7	Citizen machinery
EZH 02520CT-120 03020CT-120 03520CT-120 04020CT-120 05020CT-120 06020CT-120 07020CT-120	EZH 02520HP-120 03020HP-120 03520HP-120 04020HP-120 05020HP-120 06020HP-120 07020HP-120	EZH 02520ST-120 03020ST-120 03520ST-120 04020ST-120 05020ST-120 06020ST-120 07020ST-120	20	EZTR030025-... EZTR035030-... EZTR040035-... EZTR050040-... EZTR060050-... EZTR070060-... EZTR080070-...	2.5 3 3.5 4 5 6 7	Eguro Tsugami Citizen machinery (General purpose)
EZH 02522CT-135 03022CT-135 03522CT-135 04022CT-135 05022CT-135 06022CT-135 07022CT-135	EZH 02522HP-135 03022HP-135 03522HP-135 04022HP-135 05022HP-135 06022HP-135 07022HP-135	EZH 02522ST-135 03022ST-135 03522ST-135 04022ST-135 05022ST-135 06022ST-135 07022ST-135	22	EZTR030025-... EZTR035030-... EZTR040035-... EZTR050040-... EZTR060050-... EZTR070060-... EZTR080070-...	2.5 3 3.5 4 5 6 7	Star micronics Nomura DS Tsugami
EZH 02525.0CT-135 03025.0CT-135 03525.0CT-135 04025.0CT-135 05025.0CT-135 06025.0CT-135 07025.0CT-135	EZH 02525.0HP-135 03025.0HP-135 03525.0HP-135 04025.0HP-135 05025.0HP-135 06025.0HP-135 07025.0HP-135	EZH 02525.0ST-135 03025.0ST-135 03525.0ST-135 04025.0ST-135 05025.0ST-135 06025.0ST-135 07025.0ST-135	25	EZTR030025-... EZTR035030-... EZTR040035-... EZTR050040-... EZTR060050-... EZTR070060-... EZTR080070-...	2.5 3 3.5 4 5 6 7	Eguro Tsugami Citizen machinery (General purpose)
EZH 02525.4CT-120 03025.4CT-120 03525.4CT-120 04025.4CT-120 05025.4CT-120 06025.4CT-120 07025.4CT-120	EZH 02525.4HP-120 03025.4HP-120 03525.4HP-120 04025.4HP-120 05025.4HP-120 06025.4HP-120 07025.4HP-120	EZH 02525.4ST-120 03025.4ST-120 03525.4ST-120 04025.4ST-120 05025.4ST-120 06025.4ST-120 07025.4ST-120	25.4	EZTR030025-... EZTR035030-... EZTR040035-... EZTR050040-... EZTR060050-... EZTR070060-... EZTR080070-...	2.5 3 3.5 4 5 6 7	Citizen machinery

Choose sleeves (DCB) to meet with DCON dimension of bar.

Adjustment Pin cannot be installed to EZH-ST sleeves. To adjust overhang of the bar, please use EZH-CT / HP sleeves.

Machine manufacturers in random order.



Threading

Recommended cutting conditions

Workpiece material	Recommended insert grades (Vc: m/min)	
	MEGACOAT	Carbide
	PR1225	GW15
Carbon steel / Alloy steel	★ 30~50	-
Stainless steel	★ 30~50	-
Non-ferrous metals	-	★ 30~50

★: 1st Recommendation

<Note>

- 1) The standard cutting speed is Vc=30~50m/min.
The table feed may not follow the expected conditions when machining small diameter workpieces at high speeds.
- 2) Coolant is recommended.

Depth of cut & number of passes (Metric: M)

Pitch (mm)	Total ap (mm)	No. of passes	1Pass	2Pass	3Pass	4Pass	5Pass	6Pass	7Pass	8Pass	9Pass	10Pass	11Pass	12Pass	13Pass	14Pass	15Pass	16Pass	17Pass	18Pass	19Pass	20Pass
0.5	0.3	9	0.05	0.05	0.04	0.04	0.03	0.03	0.02	0.02	0.02											
0.7	0.42	10	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.02										
0.75	0.45	10	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03										
0.8	0.48	11	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03	0.03									
1.00	0.61	12	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03								
1.25	0.77	14	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.03						
1.50	0.93	17	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03			
1.75	1.1	20	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03

Depth of cut & number of passes (Whitworth)

TPI	Total ap (mm)	No. of passes	1Pass	2Pass	3Pass	4Pass	5Pass	6Pass	7Pass	8Pass	9Pass	10Pass	11Pass	12Pass	13Pass	14Pass	15Pass	16Pass	17Pass
24	0.65	13	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03				
20	0.81	15	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03		
18	0.91	17	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03

Depth of cut & number of passes (Unified: UN, UNC, UNF, UNEF)

TPI	Total ap (mm)	No. of passes	1Pass	2Pass	3Pass	4Pass	5Pass	6Pass	7Pass	8Pass	9Pass	10Pass	11Pass	12Pass	13Pass	14Pass	15Pass	16Pass	17Pass	18Pass
36	0.44	10	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.03	0.02	0.02								
32	0.5	11	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03							
28	0.55	12	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03						
24	0.65	12	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.03						
20	0.78	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.03				
18	0.88	17	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	
16	0.99	18	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.03

Parallel pipe: G(PF), Rp(PS)

Nominal thread Symbol (Previous symbol)	TPI	Internal thread (G, Rp)		Same root's radius	
		Insert	Bore dia.		
G ¹ / ₁₆ (-)	28	EZTR	060050-55-008	6.56	0.12
G ¹ / ₈ (PF ¹ / ₈)			080070-55-008	8.57	
G ¹ / ₄ (PF ¹ / ₄)	19	EZTR	080070-55-008	11.45	0.18
G ³ / ₈ (PF ³ / ₈)				14.95	

Tapered pipe: R, Rc(PT)(BSPT)

Nominal thread Symbol (Previous symbol)	TPI	Internal thread (Rc)		Same root's radius	
		Insert	Bore dia.		
R ¹ / ₁₆ , Rc ¹ / ₁₆ (-)	28	EZTR	060050-55-008	-	0.12
R ¹ / ₈ , Rc ¹ / ₈ (PT ¹ / ₈)			080070-55-008	-	
R ¹ / ₄ , Rc ¹ / ₄ (PT ¹ / ₄)	19	EZTR	080070-55-008	-	0.18
R ³ / ₈ , Rc ³ / ₈ (PT ³ / ₈)				-	

• When using "EZT type" for Parallel pipe / Tapered pipe threading, thread's corners become sharp edged due to its Partial profile, and the shape will not be the same as the standard shape for Parallel pipe / tapered pipe.

Depth of cut & number of passes (Parallel pipe / Tapered pipe)

TPI	Total ap (mm)	No. of passes	1 Pass	2 Pass	3 Pass	4 Pass	5 Pass	6 Pass	7 Pass	8 Pass	9 Pass	10 Pass	11 Pass	12 Pass	13 Pass	14 Pass	15 Pass	16 Pass	17 Pass	18 Pass	
28	0.61	12	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03							
19	0.95	18	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	0.03

Application of American national tapered pipe thread (NPT)

Nominal thread	TPI	Internal thread			
		Toolholder	Insert		
			Partial profile	Full profile	
¹ / ₁₆ NPT ¹ / ₈ NPT	27	No tools available			
¹ / ₄ NPT ³ / ₈ NPT	18	EZH Sleeves	EZTR060050-60-004 EZTR070060-60-004	-	
¹ / ₂ NPT ³ / ₄ NPT	14	EZH Sleeves	EZTR070060-60-004	-	
¹ / ₂ NPT ³ / ₄ NPT	14	SINR1616S-16 SINR2016S-16	-	16IR14NPT	

• Application of NPTF thread

NPTF is the thread for sealing pipes without using any sealing material.

Thread symbol is similar to NPT but the tolerance is different from that of NPT, therefore the above inserts are not available for NPTF.

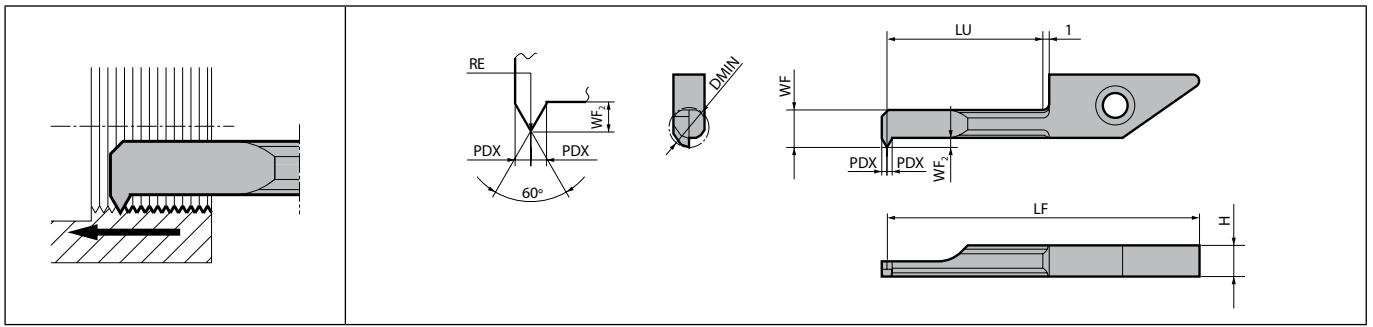
Depth of cut & number of passes (American national tapered pipe)

TPI	Total ap (mm)	No. of passes	1 Pass	2 Pass	3 Pass	4 Pass	5 Pass	6 Pass	7 Pass	8 Pass	9 Pass	10 Pass	11 Pass	12 Pass	13 Pass	14 Pass	15 Pass	16 Pass	17 Pass	18 Pass	19 Pass
18	1.23	16	0.18	0.14	0.12	0.12	0.10	0.09	0.08	0.08	0.07	0.06	0.05	0.04	0.03	0.03	0.02	0.02			
14	1.56	19	0.18	0.16	0.14	0.14	0.12	0.10	0.09	0.09	0.08	0.07	0.07	0.06	0.05	0.05	0.04	0.04	0.03	0.03	0.02



Threading

VNT



Right-hand shown

Dimensions

Description	No. of edges	Dimension (mm)										Tolerance (mm)		Carbide			Applicable Thread				Applicable toolholder F48~F51
		DMIN	H	LF	LU	WF	WF ₂	PDX	RE	RE min.	RE max.	PVD	-	Metric		Unified					
														PR1225	PR930	KW10	Nominal Thread	Pitch (mm)	Nominal Thread	Pitch (TPI)	
VNTR 045-11	1	4.5	3.9	30.2	10.4	3.6	1.3	0.6	0.05	0.02	0	●	●	●	M6 and over	0.75~1.25	1/4-20UNC, 1/4-28UNF and over	28~20	SVNR...-12N SVNSR-12-11N S...-SVNR12N S...-SVNR12SN		
060-11		6		30	10.2	4.6	1.6					0.8	●	●	●	M8 and over	0.75~1.50	5/16-18UNC, 5/16-24UNF and over		24~18	

Recommended cutting conditions J45
Depth of Cut & Number of Passes J45



Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

System tip-bars are sold in 5 piece boxes

Recommended cutting condition

Workpiece material	Recommended insert grades (Vc: m/min)		
	MEGACOAT	PVD coated carbide	Carbide
	PR1225	PR930	KW10
Carbon steel	★ 30~50	☆ 30~50	-
Stainless steel	★ 30~50	☆ 30~50	-
Non-ferrous metals	-	-	★ 30~50

<Note>

- 1) The standard cutting speed is Vc=30~50m/min. The table feed may not follow the expected conditions when machining small diameter workpieces at high speeds.
2) Coolant is recommended.

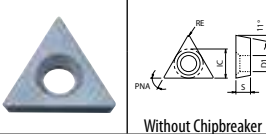
★: 1st Recommendation ☆: 2nd Recommendation

Depth of cut and number of passes (Metric: M)

Pitch (mm)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
0.75	0.44	10	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03							
1.00	0.60	12	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.03	0.03					
1.25	0.76	14	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03			
1.50	0.92	17	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03



TPGB

		Carbon steel / Alloy steel										●	○	P							
		Stainless steel												M							
		Cast iron										●		K							
		Non-ferrous metals										●		N							
Insert	Description	No. of edges	Dimension (mm)				Angle (°)		Pitch				Profile type	Thread type	Symbol thread type	Cermet				Applicable toolholder ● J47	
			IC	S	D1	RE	AN	PNA	M (mm)		UN (TPI)					Carbide		Cermet			
									min.	max.	min.	max.				-	PVD	-			
 <p>Without Chipbreaker</p>	TPGB 1102005 110201	3	6.35	2.38	3.7	0.05 0.1	11	60	0.75 1.5	1.5	28 16	16	Partial profile	Metric Unified	M UN	●	●	●	●	...	...STWP&11-12(E)
	TPGB 1103005 110301 110302	3	6.35	3.18	3.3	0.05 0.1 0.2	11	60	0.75 1.5 3	3.5	28 16 8	11 8 8	Partial profile	Metric Unified	M UN	●	●	●	●	...	...STWP&11-16(E) ...STWP&11-20(E) ...STWP&11-25(E)
																●	●	●	●
																●	●	●	●

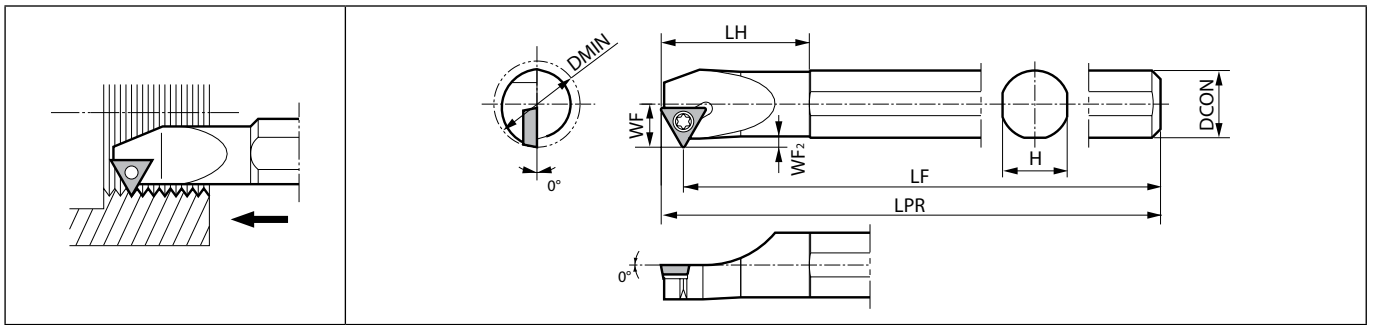
Recommended cutting conditions ● J48
Depth of Cut & Number of Passes ● J57



Threading

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

S-STWP (Steel shank bar)



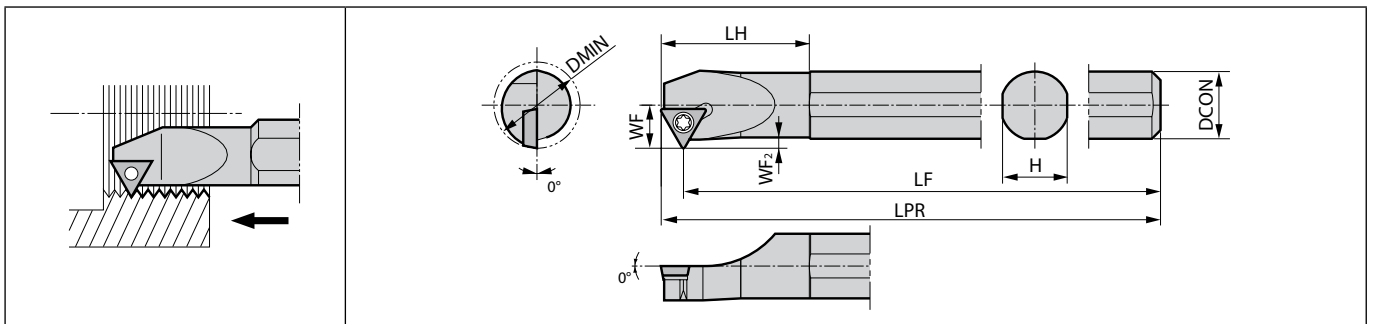
This toolholder can also be used as a boring bar | Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMO (°)	Coolant hole	Pitch max (mm)	Spare parts		Applicable inserts ➔ J46
	R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF ₂				Screw	Wrench	
	S10M- STWPR11-12	●		12	10	9.2	23	150	144.5	6				1	0		No	1.5	SB-3STR FT-10 SB-3TR	TPGB1102.. TPGB1103..
S12M- STWPR11-16	●		16	12	11	30		8	1.5			2				
S16Q- STWPR11-20	●		20	16	15	35	180	174.5	10	2		3				
S20R- STWPR11-25	●		25	20	19	40	200	194.5	12.5	2.5		3.5				

WF₂ : shows the Max. available ap.

S-STWP-E (Excellent bar)



This toolholder can also be used as a boring bar | Right-hand shown

Toolholder dimensions

Description	Availability		Dimension (mm)								GAMO (°)	Coolant hole	Pitch max (mm)	Spare parts		Applicable inserts ➔ J46
	R	L	DMIN	DCON	H	LH	LPR	LF	WF	WF ₂				Screw	Wrench	
	S10M- STWP ^{PL} 11-12E	●	●	12	10	9.2	23	150	144.5	6				1	0		No	1.5	SB-3STR FT-10 SB-3TR	TPGB1102.. TPGB1103..
S12M- STWP ^{PL} 11-16E	●	●	16	12	11	30		8	1.5			2				
S16R- STWP ^{PL} 11-20E	●	●	20	16	15	35	200	194.5	10	2		3				
S20X- STWP ^{PL} 11-25E	●	●	25	20	19	40	220	214.5	12.5	2.5		3.5				

WF₂ : shows the Max. available ap.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Threading

KTN / KTNS / SIN / CIN / S-KTN

Workpiece material	Recommended insert grades (Vc: m/min)					
	Cermet	MEGACOAT	MEGACOAT NANO		PVD coated carbide	Carbide
	TC60	PR1215	PR1515	PR1535	PR1115	GW15
Carbon steel	☆ 100~150	★ 100~150	-	-	☆ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under			0.3 mm and under	
Alloy steel	☆ 100~150	★ 100~150	-	-	☆ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under			0.3 mm and under	
Stainless steel	☆ 60~80	-	☆ 60~100	★ 40~80	☆ 60~80	-
First ap (Radial)	0.25 mm and under		0.25 mm and under	0.25 mm and under	0.25 mm and under	
Cast iron	-	-	-	-	-	★ 100
First ap (Radial)						0.3 mm and under
Aluminum alloys	-	-	-	-	-	★ 150~400
First ap (Radial)						0.3 mm and under
Brass	-	-	-	-	-	★ 150~300
First ap (Radial)						0.3 mm and under

For O61R / O81R, please lower it to a figure under 40% of above condition list

KTT

Workpiece material	Recommended insert grades (Vc: m/min)		
	PVD coated carbide		Carbide
	PR930	PR1115	KW10
Carbon steel	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	
Alloy steel	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	
Stainless steel	☆ 60~80	★ 60~80	-
First ap (Radial)	0.25 mm and under	0.25 mm and under	
Cast iron	-	-	★ 100
First ap (Radial)			0.3 mm and under
Aluminum alloys	-	-	★ 150~400
First ap (Radial)			0.3 mm and under
Brass	-	-	★ 150~300
First ap (Radial)			0.3 mm and under

S-STWP(-E)

Workpiece material	Recommended insert grades (Vc: m/min)			
	Cermet		PVD coated cermet	Carbide
	TN620	TN60	PV720	KW10
Carbon steel	☆ 100~150	☆ 100~150	★ 100~150	-
First ap (Radial)	0.25 mm and under	0.25 mm and under	0.25 mm and under	
Alloy steel	☆ 100~150	☆ 100~150	★ 100~150	-
First ap (Radial)	0.25 mm and under	0.25 mm and under	0.25 mm and under	
Stainless steel	-	-	-	-
First ap (Radial)				
Cast iron	-	-	-	★ 100
First ap (Radial)				0.25 mm and under
Aluminum alloys	-	-	-	★ 150~400
First ap (Radial)				0.25 mm and under
Brass	-	-	-	★ 150~300
First ap (Radial)				0.25 mm and under

KTTX / S-KTTX

Workpiece material	Recommended insert grades (Vc: m/min)			
	Cermet	PVD coated carbide		Carbide
	TC60	PR930	PR1115	KW10
Carbon steel	☆ 100~150	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	0.3 mm and under	
Alloy steel	☆ 100~150	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	0.3 mm and under	
Stainless steel	☆ 60~80	☆ 60~80	★ 60~80	-
First ap (Radial)	0.25 mm and under	0.25 mm and under	0.25 mm and under	
Cast iron	-	-	-	★ 100
First ap (Radial)				0.3 mm and under
Aluminum alloys	-	-	-	★ 150~400
First ap (Radial)				0.3 mm and under
Brass	-	-	-	★ 150~300
First ap (Radial)				0.3 mm and under

KITG

Workpiece material	Recommended insert grades (Vc: m/min)		
	PVD coated carbide		Carbide
	PR930	PR1115	KW10
Carbon steel	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	
Alloy steel	☆ 100~150	★ 100~150	-
First ap (Radial)	0.3 mm and under	0.3 mm and under	
Stainless steel	☆ 60~80	★ 60~80	-
First ap (Radial)	0.25 mm and under	0.25 mm and under	
Cast iron	-	-	★ 100
First ap (Radial)			0.3 mm and under
Aluminum alloys	-	-	★ 150~400
First ap (Radial)			0.3 mm and under
Brass	-	-	★ 150~300
First ap (Radial)			0.3 mm and under

★: 1st Recommendation ☆: 2nd Recommendation

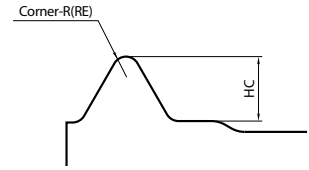
• Coolant is recommended.

• In case of using cermet insert, honing the edge with hand lapper enables higher stability.

• In case of threading Stainless steel, please set two to three passes more than previous description of <Depth of cut & number of passes>.

Cautions for usage of Full profile insert.

- 1) Max. ap is based on the value of 0.05~0.08 mm
- 2) Finishing ap should be 0.02~0.05mm.
- 3) Prepare chamfering for C0.3~C0.5 to the workpiece to prevent the insert cracking during the 1st pass.
- 4) Coolant is recommended.



11/16/22 (Full profile) type

(ap shows the value of radial ap)

Type	Pitch / TPI		Description	HC (mm)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19				
	mm / TPI																												
Metric	External thread	1.00 mm	16ER 100ISO-TF/TQ	0.64	0.72	5	0.23	0.19	0.15	0.10	0.05																		
		1.25 mm	125ISO-TF/TQ	0.80	0.88	6	0.26	0.21	0.16	0.12	0.08	0.05																	
		1.50 mm	150ISO-TF/TQ	0.95	1.03	6	0.26	0.24	0.21	0.16	0.11	0.05																	
		1.75 mm	175ISO-TF/TQ	1.11	1.19	8	0.26	0.22	0.19	0.16	0.13	0.10	0.08	0.05															
		2.00 mm	200ISO-TF/TQ	1.27	1.35	10	0.26	0.21	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05													
		2.50 mm	250ISO-TF/TQ	1.57	1.65	12	0.26	0.23	0.21	0.18	0.14	0.12	0.12	0.10	0.10	0.10	0.08	0.06	0.05										
		3.00 mm	300ISO-TF/TQ	1.87	1.95	14	0.26	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.10	0.10	0.08	0.08	0.05	0.02								
		0.50 mm	16E% 050ISO	0.33	0.38	4	0.14	0.12	0.08	0.04																			
		0.75 mm	075ISO	0.48	0.53	5	0.17	0.14	0.10	0.08	0.04																		
		1.00 mm	100ISO	0.64	0.72	5	0.23	0.19	0.15	0.10	0.05																		
		1.25 mm	125ISO	0.80	0.88	6	0.26	0.21	0.16	0.12	0.08	0.05																	
		1.50 mm	150ISO	0.95	1.03	6	0.26	0.24	0.21	0.16	0.11	0.05																	
		2.00 mm	200ISO	1.27	1.35	10	0.26	0.21	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05													
		2.50 mm	250ISO	1.57	1.65	12	0.26	0.23	0.21	0.18	0.14	0.12	0.12	0.10	0.10	0.10	0.08	0.06	0.05										
		3.00 mm	300ISO	1.87	1.95	14	0.26	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.10	0.10	0.08	0.08	0.05	0.02								
	3.50 mm	350ISO	2.18	2.26	15	0.28	0.25	0.22	0.20	0.20	0.18	0.16	0.15	0.15	0.12	0.10	0.10	0.08	0.05	0.02									
	4.00 mm	400ISO	2.48	2.56	17	0.28	0.25	0.24	0.22	0.20	0.18	0.16	0.15	0.15	0.14	0.12	0.12	0.10	0.10	0.08	0.05	0.02							
	4.50 mm	450ISO	2.79	2.87	18	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.16	0.16	0.14	0.14	0.13	0.12	0.10	0.10	0.07	0.05	0.02						
	5.00 mm	500ISO	3.10	3.18	19	0.30	0.28	0.27	0.26	0.23	0.20	0.18	0.18	0.17	0.16	0.16	0.15	0.15	0.13	0.12	0.10	0.07	0.05	0.02					
	1.00 mm	11IR 100ISO-TF/TQ	0.60	0.68	5	0.20	0.18	0.15	0.11	0.04																			
	1.25 mm	125ISO-TF/TQ	0.74	0.82	7	0.20	0.18	0.14	0.12	0.08	0.06	0.04																	
	1.50 mm	150ISO-TF/TQ	0.88	0.96	8	0.24	0.18	0.14	0.10	0.08	0.07	0.05	0.05																
	1.75 mm	175ISO-TF/TQ	1.02	1.10	9	0.24	0.18	0.16	0.14	0.10	0.10	0.08	0.07	0.05	0.05														
	0.50 mm	11I% 050ISO	0.31	0.36	4	0.14	0.10	0.08	0.04																				
	0.75 mm	075ISO	0.45	0.50	5	0.15	0.14	0.10	0.07	0.04																			
	1.00 mm	100ISO	0.60	0.68	5	0.20	0.18	0.15	0.11	0.04																			
	1.25 mm	125ISO	0.74	0.82	7	0.20	0.18	0.14	0.12	0.08	0.06	0.04																	
	1.50 mm	150ISO	0.88	0.96	8	0.24	0.18	0.14	0.10	0.08	0.07	0.05	0.05																
	1.75 mm	175ISO	1.02	1.10	9	0.24	0.18	0.16	0.14	0.10	0.10	0.08	0.05	0.05															
	2.00 mm	200ISO	1.18	1.26	10	0.24	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05														
1.00 mm	16IR 100ISO-TF/TQ	0.60	0.68	5	0.20	0.18	0.15	0.11	0.04																				
1.25 mm	125ISO-TF/TQ	0.74	0.82	7	0.20	0.18	0.14	0.12	0.08	0.06	0.04																		
1.50 mm	150ISO-TF/TQ	0.88	0.96	8	0.22	0.18	0.14	0.12	0.10	0.08	0.07	0.05	0.05																
1.75 mm	175ISO-TF/TQ	1.02	1.10	9	0.22	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05																
2.00 mm	200ISO-TF/TQ	1.18	1.26	10	0.24	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05															
2.50 mm	250ISO-TF/TQ	1.46	1.54	12	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.05	0.05													
3.00 mm	300ISO-TF/TQ	1.76	1.84	14	0.26	0.24	0.21	0.18	0.16	0.15	0.13	0.12	0.10	0.10	0.07	0.05	0.05	0.05	0.02										
1.00 mm	16I% 100ISO	0.60	0.68	5	0.20	0.18	0.15	0.11	0.04																				
1.25 mm	125ISO	0.74	0.82	7	0.20	0.18	0.14	0.12	0.08	0.06	0.04																		
1.50 mm	150ISO	0.88	0.96	8	0.22	0.18	0.14	0.12	0.10	0.08	0.07	0.05	0.05																
2.00 mm	200ISO	1.18	1.26	10	0.24	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05															
2.50 mm	250ISO	1.46	1.54	12	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.05	0.05													
3.00 mm	300ISO	1.76	1.84	14	0.26	0.24	0.21	0.18	0.16	0.15	0.13	0.12	0.10	0.10	0.07	0.05	0.05	0.05	0.02										
3.00 mm	22IR 300ISO	1.76	1.84	14	0.26	0.24	0.21	0.18	0.16	0.15	0.13	0.12	0.10	0.10	0.07	0.05	0.05	0.05	0.02										
3.50 mm	350ISO	2.05	2.13	15	0.26	0.24	0.22	0.20	0.17	0.17	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.05	0.02										
4.00 mm	400ISO	2.34	2.42	17	0.26	0.24	0.22	0.20	0.18	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.10	0.10	0.08	0.05	0.02								
4.50 mm	450ISO	2.63	2.71	18	0.26	0.25	0.24	0.22	0.20	0.20	0.18	0.17	0.15	0.13	0.13	0.12	0.12	0.10	0.10	0.07	0.05	0.02							
5.00 mm	500ISO	2.92	3.00	19	0.28	0.26	0.24	0.22	0.20	0.20	0.18	0.18	0.16	0.16	0.15	0.14	0.13	0.12	0.10	0.10	0.05	0.02							
Unified	External thread	24 TPI	16ER 24UN-TF/TQ	0.67	0.75	5	0.24	0.20	0.16	0.10	0.05																		
		20 TPI	20UN-TF/TQ	0.80	0.88	6	0.24	0.20	0.16	0.13	0.10	0.05																	
		18 TPI	18UN-TF/TQ	0.89	0.97	6	0.26	0.22	0.18	0.15	0.11	0.05																	
		16 TPI	16UN-TF/TQ	1.01	1.09	7	0.26	0.22	0.18	0.15	0.12	0.11	0.05																
		14 TPI	14UN-TF/TQ	1.15	1.23	8	0.26	0.22	0.18	0.16	0.14	0.12	0.10	0.05															
		13 TPI	13UN-TF/TQ	1.24	1.32	9	0.26	0.22	0.18	0.16	0.14	0.12	0.11	0.08	0.0														

11/16 (Full profile)

(ap shows the value of radial ap)

Type	Pitch / TPI		Description	HC (mm)	Total ap (mm)	No. of Passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
	mm / TPI																									
Parallel pipe	External thread	19 TPI	16ER 19W-TF/TQ	0.89	0.97	6	0.27	0.22	0.18	0.15	0.10	0.05														
		14 TPI	14W-TF/TQ	1.19	1.27	9	0.27	0.22	0.18	0.16	0.11	0.10	0.10	0.08	0.05											
		11 TPI	11W-TF/TQ	1.50	1.58	12	0.27	0.22	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05								
	Internal thread	19 TPI	16IR 19W-TF/TQ	0.88	0.96	6	0.25	0.21	0.20	0.15	0.10	0.05														
		14 TPI	14W-TF/TQ	1.19	1.27	9	0.27	0.22	0.18	0.16	0.11	0.10	0.10	0.08	0.05											
		11 TPI	11W-TF/TQ	1.50	1.58	12	0.27	0.22	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05								
Whitworth	External thread	16 TPI	16ER 16W-TF/TQ	1.05	1.13	8	0.25	0.21	0.18	0.16	0.12	0.08	0.08	0.05												
		14 TPI	14W-TF/TQ	1.19	1.27	9	0.27	0.22	0.18	0.16	0.11	0.10	0.10	0.08	0.05											
		11 TPI	11W-TF/TQ	1.50	1.58	12	0.27	0.22	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05								
	Internal thread	16 TPI	16IR 16W-TF/TQ	1.05	1.13	8	0.25	0.21	0.18	0.16	0.12	0.08	0.08	0.05												
		14 TPI	14W-TF/TQ	1.19	1.27	9	0.27	0.22	0.18	0.16	0.11	0.10	0.10	0.08	0.05											
		11 TPI	11W-TF/TQ	1.50	1.58	12	0.27	0.22	0.18	0.16	0.12	0.12	0.12	0.10	0.10	0.07	0.07	0.05								
Tapered pipe	External thread	28 TPI	16ER 28BSPT-TF/TQ	0.58	0.63	5	0.20	0.15	0.13	0.11	0.04	0.05														
		19 TPI	19BSPT-TF/TQ	0.86	0.94	6	0.26	0.20	0.18	0.15	0.10	0.05														
		14 TPI	14BSPT-TF/TQ	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04											
		11 TPI	11BSPT-TF/TQ	1.48	1.56	12	0.26	0.22	0.18	0.16	0.12	0.12	0.11	0.10	0.10	0.07	0.07	0.05								
		28 TPI	16ER 28BSPT	0.58	0.63	5	0.20	0.15	0.13	0.11	0.04															
		19 TPI	19BSPT	0.86	0.94	6	0.26	0.20	0.18	0.15	0.10	0.05														
	Internal thread	28 TPI	11IR 28BSPT-TF/TQ	0.58	0.63	5	0.20	0.16	0.13	0.10	0.04	0.06	0.04													
		19 TPI	19BSPT-TF/TQ	0.86	0.94	7	0.22	0.20	0.18	0.14	0.10	0.06	0.04													
		14 TPI	14BSPT-TF/TQ	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04											
		28 TPI	11IR 28BSPT	0.58	0.63	5	0.20	0.16	0.13	0.10	0.04	0.06	0.04													
		19 TPI	19BSPT	0.86	0.94	7	0.22	0.20	0.18	0.14	0.10	0.06	0.04													
		14 TPI	14BSPT	1.16	1.24	9	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.04											
American national tapered pipe	External thread	18 TPI	16ER 18NPT	1.14	1.22	13	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.07	0.06	0.05	0.04	0.02							
		14 TPI	14NPT	1.46	1.54	15	0.20	0.18	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.05	0.04	0.02					
		11.5 TPI	11.5NPT	1.77	1.85	16	0.22	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.10	0.08	0.08	0.07	0.06	0.04	0.02				
	Internal thread	18 TPI	16IR 18NPT	1.14	1.22	13	0.20	0.16	0.14	0.12	0.10	0.10	0.08	0.08	0.07	0.06	0.05	0.04	0.02							
		14 TPI	14NPT	1.46	1.54	15	0.20	0.18	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.05	0.04	0.02					
		11.5 TPI	11.5NPT	1.77	1.85	16	0.22	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.10	0.10	0.08	0.08	0.07	0.06	0.04	0.02				

60°/ 55° (Partial profile)

(ap shows the value of radial ap)

Type	Pitch / TPI		Description	Corner-R (RE)	Total ap (mm)	No. of Passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
	mm / TPI																									
Metric	External thread	0.5 mm	16ER A60-TF/TQ	0.06	0.33	5	0.10	0.08	0.07	0.05	0.03															
			AG60-TF/TQ	0.06	0.33	5	0.10	0.08	0.07	0.05	0.03															
		0.75 mm	16ER A60-TF/TQ	0.06	0.51	6	0.14	0.11	0.09	0.07	0.06	0.04														
			AG60-TF/TQ	0.06	0.51	6	0.14	0.11	0.09	0.07	0.06	0.04														
		1.00 mm	16ER A60-TF/TQ	0.06	0.70	7	0.18	0.13	0.12	0.09	0.08	0.06	0.04													
			AG60-TF/TQ	0.06	0.70	7	0.18	0.13	0.12	0.09	0.08	0.06	0.04													
		1.25 mm	16ER A60-TF/TQ	0.06	0.89	8	0.18	0.15	0.14	0.12	0.10	0.08	0.07	0.05												
			AG60-TF/TQ	0.06	0.89	8	0.18	0.15	0.14	0.12	0.10	0.08	0.07	0.05												
		1.50 mm	16ER A60-TF/TQ	0.06	1.08	9	0.21	0.17	0.16	0.14	0.11	0.09	0.08	0.07	0.05											
			AG60-TF/TQ	0.06	1.08	9	0.21	0.17	0.16	0.14	0.11	0.09	0.08	0.07	0.05											
		1.75 mm	16ER G60-TF/TQ	0.22	1.11	8	0.24	0.20	0.18	0.16	0.13	0.10	0.06	0.04												
			AG60-TF/TQ	0.06	1.27	11	0.22	0.20	0.18	0.13	0.11	0.09	0.09	0.08	0.07	0.05										
		2.00 mm	16ER G60-TF/TQ	0.22	1.30	10	0.24	0.20	0.18	0.16	0.14	0.12	0.09	0.07	0.06	0.04										
			AG60-TF/TQ	0.06	1.46	11	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.09	0.08	0.06	0.04									
		2.50 mm	16ER G60-TF/TQ	0.22	1.67	12	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.06	0.04									
			AG60-TF/TQ	0.06	1.84	13	0.25	0.22	0.20	0.19	0.17	0.16	0.14	0.11	0.10	0.09	0.07	0.05								
		3.00 mm	16ER G60-TF/TQ	0.22	2.05	14	0.25	0.23	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.07	0.05						
			AG60-TF/TQ	0.06	2.22	15	0.27	0.25	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.05						
	Internal thread	0.5 mm	16ER A60	0.06	0.33	5	0.10	0.08	0.07	0.05	0.03															
			AG60	0.06	0.33	5	0.10	0.08	0.07	0.05	0.03															
		0.75 mm	16ER A60	0.06	0.51	6	0.14	0.11	0.09	0.07	0.06	0.04														
			AG60	0.06	0.51	6	0.14	0.11	0.09	0.07	0.06	0.04														
		1.00 mm	16ER A60	0.06	0.70	7	0.18	0.13	0.12	0.09	0.08	0.06	0.04													
			AG60	0.06	0.70	7	0.18	0.13	0.12	0.09	0.08	0.06	0.04													
		1.25 mm	16ER A60	0.06	0.89	8	0.18	0.15	0.14	0.12	0.10	0.08	0.07	0.05												
			AG60	0.06	0.89	8	0.18	0.15	0.14	0.12	0.10	0.08	0.07	0.05												
		1.50 mm	16ER A60	0.06	1.08	9	0.21	0.17	0.16	0.14	0.11	0.09														

60° / 55° (Partial profile)

(ap shows the value of radial ap)

Type	Pitch / TPI		Description	Corner-R (RE)	Total ap (mm)	No. of Passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
	mm / TPI																											
Metric	External thread	3.50 mm	22ER N60	0.48	2.17	15	0.27	0.25	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.05							
		4.00 mm			2.55	17	0.28	0.26	0.24	0.22	0.20	0.18	0.17	0.16	0.14	0.13	0.12	0.10	0.09	0.08	0.07	0.06	0.05					
		4.50 mm			2.93	18	0.30	0.28	0.26	0.25	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.09	0.08	0.07	0.06	0.05				
		5.00 mm			3.31	19	0.30	0.28	0.27	0.26	0.25	0.24	0.23	0.22	0.20	0.18	0.16	0.14	0.13	0.10	0.09	0.08	0.07	0.06	0.05			
		0.75 mm			061R 60005	0.05	0.44	10	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03											
	Internal thread	1.00 mm	061R 60005	0.05	0.60	12	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.04	0.03										
			061R 60007	0.07	0.58	12	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.04	0.04	0.04	0.04	0.03										
			081R 60005	0.05	0.76	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03								
		1.25 mm	061R 60005	0.05	0.76	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03								
			081R 60007	0.07	0.74	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03								
		1.5 mm	081R 60007	0.07	0.90	17	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03			
		1.75 mm	081R 60007	0.07	1.07	19	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.03		
		0.50 mm			0.30	5	0.08	0.07	0.06	0.05	0.04																	
		1.00 mm	111R A60	0.02	0.63	6	0.16	0.14	0.12	0.10	0.07	0.04																
		1.50 mm	111R A60	0.02	0.95	9	0.18	0.16	0.13	0.12	0.10	0.08	0.08	0.06	0.04													
	Internal thread	0.5 mm	161R A60	0.02	0.30	5	0.08	0.07	0.06	0.05	0.04																	
			AG60	0.02	0.30	5	0.08	0.07	0.06	0.05	0.04																	
		0.75 mm	161R A60	0.02	0.47	6	0.12	0.10	0.08	0.07	0.06	0.04																
			AG60	0.02	0.47	6	0.12	0.10	0.08	0.07	0.06	0.04																
		1.00 mm	161R A60	0.02	0.63	6	0.16	0.14	0.12	0.10	0.07	0.04																
			AG60	0.02	0.63	6	0.16	0.14	0.12	0.10	0.07	0.04																
		1.25 mm	161R A60	0.02	0.79	7	0.16	0.15	0.14	0.13	0.10	0.07	0.04															
			AG60	0.02	0.79	7	0.16	0.15	0.14	0.13	0.10	0.07	0.04															
		1.50 mm	161R A60	0.02	0.95	9	0.18	0.16	0.13	0.12	0.10	0.08	0.08	0.06	0.04													
			AG60	0.02	0.95	9	0.18	0.16	0.13	0.12	0.10	0.08	0.08	0.06	0.04													
		1.75 mm	161R G60	0.11	1.03	9	0.20	0.17	0.15	0.13	0.11	0.10	0.08	0.05	0.04													
			AG60	0.02	1.12	10	0.20	0.18	0.16	0.13	0.12	0.10	0.08	0.06	0.05	0.04												
		2.00 mm	161R G60	0.11	1.19	10	0.20	0.18	0.17	0.15	0.13	0.11	0.08	0.07	0.06	0.04												
			AG60	0.02	1.28	12	0.20	0.17	0.15	0.13	0.12	0.11	0.10	0.09	0.07	0.06	0.04	0.04										
		2.50 mm	161R G60	0.11	1.51	14	0.20	0.18	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.05	0.04	0.02								
	AG60		0.02	1.60	16	0.20	0.18	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.05	0.05	0.04	0.04	0.02							
	3.00 mm	161R G60	0.11	1.84	16	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.10	0.10	0.08	0.07	0.06	0.04	0.02							
		AG60	0.02	1.93	18	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.13	0.12	0.10	0.10	0.08	0.07	0.06	0.05	0.04	0.02						
	3.50 mm			2.05	14	0.26	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.12	0.11	0.10	0.08	0.06	0.05									
	4.00 mm			2.38	16	0.26	0.24	0.23	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.10	0.08	0.06	0.05								
	4.50 mm			2.70	18	0.26	0.24	0.23	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.10	0.08	0.06	0.05	0.05	0.05			
	5.00 mm			3.03	19	0.30	0.27	0.25	0.24	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.10	0.08	0.06	0.05	0.05	0.05		
	Unified	External thread	48 TPI	16ER A60-TF/TQ	0.06	0.35	5	0.10	0.08	0.07	0.06	0.04																
				AG60-TF/TQ	0.06	0.35	5	0.10	0.08	0.07	0.06	0.04																
			24 TPI	16ER A60-TF/TQ	0.06	0.75	7	0.18	0.15	0.13	0.10	0.08	0.07	0.04														
				AG60-TF/TQ	0.06	0.75	7	0.18	0.15	0.13	0.10	0.08	0.07	0.04														
			20 TPI	16ER A60-TF/TQ	0.06	0.91	8	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.05													
				AG60-TF/TQ	0.06	0.91	8	0.18	0.16	0.14	0.12	0.10	0.09	0.07	0.05													
			18 TPI	16ER A60-TF/TQ	0.06	1.01	8	0.20	0.18	0.16	0.14	0.12	0.08	0.08	0.05													
				AG60-TF/TQ	0.06	1.01	8	0.20	0.18	0.16	0.14	0.12	0.08	0.08	0.05													
16 TPI			16ER A60-TF/TQ	0.06	1.15	10	0.22	0.18	0.15	0.13	0.11	0.10	0.08	0.08	0.06	0.04												
			AG60-TF/TQ	0.06	1.15	10	0.22	0.18	0.15	0.13	0.11	0.10	0.08	0.08	0.06	0.04												
14 TPI			16ER G60-TF/TQ	0.22	1.15	9	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.07	0.05													
			AG60-TF/TQ	0.06	1.32	11	0.22	0.20	0.18	0.15	0.13	0.10	0.09	0.08	0.07	0.06	0.04											
13 TPI			16ER G60-TF/TQ	0.22	1.26	9	0.24	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05													
			AG60-TF/TQ	0.06	1.43	11	0.25	0.23	0.20	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04											
12 TPI			16ER G60-TF/TQ	0.22	1.38	10	0.25	0.22	0.20	0.17	0.15	0.12	0.10	0.07	0.06	0.04												
			AG60-TF/TQ	0.06	1.55	12	0.24	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.09	0.07	0.06	0.04										
10 TPI			16ER G60-TF/TQ	0.22	1.71	12	0.25	0.22	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.06	0.05										
			AG60-TF/TQ	0.06	1.87	13	0.25	0.22	0.21	0.20	0.18	0.16	0.14	0.12	0.11	0.10	0.08	0.06	0.04									
9 TPI			16ER G60-TF/TQ	0.22	1.92	13	0.27	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.11	0.10	0.08	0.06	0.04									

60° / 55° (Partial profile)

(ap shows the value of radial ap)

Type	Pitch / TPI		Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19				
	mm / TPI																												
Unified	Internal thread	28 TPI	061R 60005	0.05	0.54	12	0.07	0.06	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03											
		24 TPI		0.05	0.64	12	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.03										
		20 TPI	061R 60005	0.05	0.77	14	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03						
		18 TPI	081R 60007	0.07	0.85	17	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03	0.03	0.03				
		16 TPI	081R 60007	0.07	0.96	18	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.03			
		48 TPI	111R A60	0.02	0.32	5	0.08	0.07	0.07	0.06	0.04																		
		24 TPI			0.67	7	0.14	0.13	0.12	0.10	0.08	0.06	0.04																
		20 TPI			0.8	8	0.14	0.13	0.12	0.12	0.11	0.08	0.06	0.04															
		18 TPI			0.9	9	0.15	0.14	0.13	0.12	0.11	0.08	0.07	0.06	0.04														
		16 TPI			1.01	10	0.15	0.14	0.13	0.12	0.12	0.10	0.08	0.07	0.06	0.04													
		48 TPI			161R A60	0.02	0.32	5	0.08	0.07	0.07	0.06	0.04																
		24 TPI	161R A60	0.02	0.67	7	0.14	0.13	0.12	0.10	0.08	0.06	0.04																
					0.67	7	0.14	0.13	0.12	0.10	0.08	0.06	0.04																
		20 TPI	161R A60	0.02	0.80	8	0.14	0.13	0.12	0.12	0.11	0.08	0.06	0.04															
					0.80	8	0.14	0.13	0.12	0.12	0.11	0.08	0.06	0.04															
		18 TPI	161R A60	0.02	0.90	9	0.15	0.14	0.13	0.12	0.11	0.08	0.07	0.06	0.04														
					0.90	9	0.15	0.14	0.13	0.12	0.11	0.08	0.07	0.06	0.04														
		16 TPI	161R A60	0.02	1.01	10	0.15	0.14	0.13	0.12	0.12	0.10	0.08	0.07	0.06	0.04													
					1.01	10	0.15	0.14	0.13	0.12	0.12	0.10	0.08	0.07	0.06	0.04													
		14 TPI	161R G60	0.02	1.07	9	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.04														
					1.16	11	0.15	0.14	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.06	0.04												
		13 TPI	161R G60	0.02	1.16	10	0.20	0.18	0.16	0.14	0.12	0.11	0.08	0.07	0.06	0.04													
					1.25	12	0.18	0.16	0.15	0.13	0.12	0.11	0.10	0.09	0.07	0.06	0.04	0.04											
		12 TPI	161R G60	0.02	1.26	11	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.08	0.07	0.06	0.05	0.04											
					1.35	13	0.20	0.18	0.16	0.14	0.12	0.11	0.10	0.08	0.07	0.06	0.05	0.04	0.04										
		10 TPI	161R G60	0.02	1.54	14	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.08	0.06	0.05	0.05	0.04	0.04	0.02							
					1.63	16	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.08	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.02					
		9 TPI	161R G60	0.02	1.72	16	0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.07	0.06	0.06	0.04	0.02						
1.81	17				0.20	0.18	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.07	0.06	0.06	0.05	0.05	0.04	0.02						
8 TPI	161R G60	0.02	1.95	17	0.22	0.20	0.18	0.17	0.16	0.15	0.14	0.12	0.11	0.10	0.09	0.08	0.07	0.07	0.06	0.06	0.05	0.03	0.02						
			2.04	19	0.20	0.19	0.18	0.17	0.15	0.14	0.14	0.13	0.11	0.10	0.09	0.07	0.06	0.06	0.05	0.04	0.04	0.03	0.02						
7 TPI	221R N60	0.22	2.14	14	0.26	0.24	0.23	0.22	0.20	0.18	0.16	0.14	0.12	0.11	0.10	0.07	0.06	0.05	0.05	0.04	0.02								
6 TPI	221R N60		2.53	17	0.28	0.26	0.23	0.22	0.20	0.18	0.17	0.15	0.14	0.13	0.12	0.10	0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.02					
5 TPI	221R N60		3.08	19	0.30	0.28	0.26	0.25	0.23	0.22	0.20	0.17	0.15	0.14	0.13	0.12	0.10	0.09	0.08	0.07	0.06	0.05	0.04	0.03	0.02	0.01			
Parallel pipe / Tapered pipe	External thread	28 TPI	16ER A55-TF/TQ	0.06	0.67	7	0.16	0.14	0.10	0.09	0.08	0.06	0.04																
		19 TPI		0.06	1.02	8	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05															
		14 TPI	16ER G55-TF/TQ	0.22	1.20	9	0.22	0.19	0.17	0.15	0.13	0.12	0.10	0.08	0.06	0.05	0.04												
		11 TPI	16ER G55-TF/TQ	0.22	1.60	12	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.10	0.08	0.06	0.05	0.04											
		28 TPI	16ER A55	0.06	0.67	7	0.16	0.14	0.10	0.09	0.08	0.06	0.04																
		19 TPI	16ER A55	0.06	1.02	8	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05															
		14 TPI	16ER G55	0.22	1.20	9	0.22	0.19	0.17	0.15	0.13	0.12	0.10	0.08	0.06	0.05	0.04												
		11 TPI	16ER G55	0.22	1.60	12	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.10	0.08	0.06	0.05	0.04											
		28 TPI	061R 5501	0.10	0.61	12	0.07	0.07	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03											
		19 TPI	081R 5501		0.10	0.95	18	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03					
		28 TPI	111R A55	0.06	0.67	7	0.16	0.14	0.10	0.09	0.08	0.06	0.04																
		19 TPI	111R A55	0.06	1.02	8	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05															
		28 TPI	161R A55	0.06	0.67	7	0.16	0.14	0.10	0.09	0.08	0.06	0.04																
		19 TPI	161R A55	0.06	1.02	8	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.05															
		14 TPI	161R G55	0.22	1.20	9	0.22	0.19	0.17	0.15	0.13	0.12	0.10	0.08	0.06	0.05	0.04												
		11 TPI	161R G55	0.22	1.60	12	0.24	0.22	0.20	0.18	0.16	0.14	0.13	0.10	0.08	0.06	0.05	0.04											
		Whitworth	External thread	48 TPI	16ER A55-TF/TQ	0.06	0.37	5	0.12	0.09	0.07	0.05	0.04																
				24 TPI	16ER A55-TF/TQ	0.06	0.79	7	0.18	0.16	0.14	0.11	0.08	0.07	0.05														
				20 TPI	16ER A55-TF/TQ	0.06	0.96	8	0.20	0.18	0.15	0.13	0.10	0.08	0.07	0.05													
				18 TPI	16ER A55-TF/TQ	0.06	1.07	9	0.20	0.17	0.16	0.14	0.11	0.09	0.08	0.07	0.05												
				16 TPI	16ER A55-TF/TQ	0.06	1.22	11	0.20	0.18	0.16	0.13	0.11	0.10	0.09														

11 / 16 (60° / 55°, Partial profile)

(ap shows the value of radial ap)

Type	Pitch / TPI mm / TPI	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19			
Metric (60°)	External thread	1.00 mm	16ER 6001	0.10	0.66	5	0.21	0.19	0.12	0.09	0.05																
		1.25 mm	16ER 6001	0.10	0.85	6	0.25	0.21	0.15	0.12	0.07	0.05															
		1.50 mm	6001	0.10	1.04	8	0.23	0.21	0.19	0.15	0.11	0.06	0.05	0.04													
			6002	0.20	0.94	7	0.23	0.20	0.18	0.14	0.10	0.05	0.04														
		1.75 mm	6001	0.10	1.23	9	0.25	0.22	0.20	0.17	0.14	0.09	0.07	0.05	0.04												
			6002	0.20	1.13	8	0.25	0.22	0.20	0.16	0.14	0.07	0.05	0.04													
		2.00 mm	6001	0.10	1.42	11	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.04										
	6002		0.20	1.32	10	0.25	0.22	0.20	0.16	0.14	0.12	0.08	0.07	0.04	0.04												
	2.50 mm	6001	0.10	1.79	13	0.25	0.22	0.20	0.18	0.16	0.16	0.14	0.12	0.10	0.10	0.09	0.08	0.05	0.04								
		6002	0.20	1.69	12	0.25	0.22	0.20	0.18	0.16	0.16	0.12	0.12	0.10	0.10	0.08	0.06	0.04									
	Internal thread	0.75 mm	11IR 60005	0.05	0.44	5	0.14	0.12	0.10	0.06	0.02																
		1.00 mm	11IR 60005	0.05	0.60	6	0.18	0.15	0.10	0.08	0.05	0.04															
		1.25 mm	11IR 60005	0.05	0.76	7	0.18	0.15	0.12	0.10	0.10	0.07	0.04														
		1.50 mm	6001	0.10	0.87	8	0.18	0.16	0.12	0.10	0.10	0.08	0.08	0.06	0.04												
16IR 6001			0.10	0.87	8	0.18	0.16	0.12	0.10	0.10	0.08	0.08	0.05														
1.75 mm		16IR 6001	0.10	1.04	9	0.20	0.18	0.15	0.12	0.12	0.10	0.08	0.05	0.04													
2.00 mm		6001	0.10	1.20	11	0.20	0.18	0.15	0.12	0.12	0.10	0.10	0.08	0.06	0.05	0.04											
	60015	0.15	1.47	13	0.20	0.18	0.16	0.15	0.14	0.12	0.12	0.10	0.10	0.08	0.06	0.06	0.04	0.02									
Parallel pipe / Tapered pipe (55°)	External thread	28 TPI	16ER 5501	0.10	0.61	5	0.20	0.16	0.12	0.08	0.05																
		19 TPI	16ER 5501	0.10	0.95	7	0.22	0.20	0.16	0.14	0.10	0.08	0.05														
		14 TPI	5501	0.10	1.34	10	0.24	0.20	0.18	0.16	0.13	0.10	0.10	0.10	0.08	0.05											
			5502	0.20	1.22	9	0.24	0.20	0.18	0.16	0.11	0.10	0.10	0.08	0.05												
		11 TPI	5501	0.10	1.73	13	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.05	0.02								
	5502		0.20	1.62	12	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.04	0.02										
	Internal thread	28 TPI	11IR 55005	0.05	0.67	7	0.18	0.15	0.12	0.08	0.06	0.05	0.03														
			16IR 5501	0.10	0.61	6	0.18	0.15	0.12	0.08	0.05	0.03															
		19 TPI	11IR 55005	0.05	1.01	8	0.20	0.18	0.16	0.14	0.12	0.08	0.08	0.05													
			16IR 5501	0.10	0.95	7	0.20	0.18	0.16	0.14	0.12	0.10	0.05														
		14 TPI	11IR 55005	0.05	1.39	11	0.20	0.18	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.05										
	16IR 5501		0.10	1.34	10	0.20	0.18	0.18	0.16	0.14	0.14	0.11	0.10	0.08	0.05												
	11 TPI	16IR 5501	0.10	1.73	12	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.10	0.10	0.07	0.05										
		5502	0.20	1.62	11	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.11	0.07	0.05											
Whitworth (55°)	External thread	24 TPI	16ER 5501	0.10	0.73	6	0.22	0.18	0.12	0.09	0.07	0.05															
		20 TPI	16ER 5501	0.10	0.90	6	0.22	0.18	0.17	0.16	0.12	0.05															
		18 TPI	5501	0.10	1.01	7	0.24	0.20	0.18	0.16	0.10	0.08	0.05														
			5502	0.20	1.15	9	0.24	0.20	0.16	0.14	0.12	0.10	0.08	0.06	0.05												
		16 TPI	5501	0.10	1.34	10	0.24	0.20	0.18	0.16	0.13	0.10	0.10	0.10	0.08	0.05											
			5502	0.20	1.22	9	0.24	0.20	0.18	0.16	0.11	0.10	0.10	0.08	0.05												
		12 TPI	5501	0.10	1.58	12	0.25	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.08	0.07	0.05									
			5502	0.20	1.46	11	0.25	0.20	0.18	0.16	0.15	0.14	0.10	0.08	0.08	0.07	0.05										
		11 TPI	5501	0.10	1.73	12	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.10	0.10	0.07	0.05									
	5502		0.20	1.62	11	0.25	0.20	0.18	0.18	0.16	0.16	0.14	0.12	0.10	0.08	0.05											
	10 TPI	5501	0.10	1.92	14	0.25	0.23	0.23	0.20	0.18	0.16	0.12	0.12	0.10	0.10	0.08	0.08	0.05	0.02								
		5502	0.20	1.80	13	0.25	0.23	0.23	0.20	0.18	0.16	0.12	0.10	0.10	0.08	0.08	0.05	0.02									
	9 TPI	16ER 5502	0.20	2.03	14	0.25	0.23	0.23	0.20	0.20	0.18	0.16	0.12	0.12	0.10	0.08	0.08	0.06	0.02								
	Internal thread	24 TPI	11IR 55005	0.05	0.71	7	0.18	0.15	0.12	0.10	0.08	0.05	0.03														
			16IR 5501	0.10	0.65	6	0.18	0.15	0.12	0.10	0.07	0.03															
		20 TPI	11IR 55005	0.05	0.87	8	0.18	0.16	0.14	0.12	0.10	0.06	0.06	0.05													
			16IR 5501	0.10	0.81	7	0.18	0.16	0.14	0.12	0.10	0.06	0.05														
		18 TPI	11IR 55005	0.05	0.97	8	0.20	0.18	0.16	0.14	0.10	0.08	0.06	0.05													
			16IR 5501	0.10	0.91	7	0.20	0.18	0.16	0.14	0.10	0.08	0.05														
16 TPI		11IR 55005	0.05	1.09	9	0.20	0.18	0.16	0.14	0.10	0.10	0.08	0.08	0.05													
		16IR 5501	0.10	1.04	8	0.20	0.18	0.16	0.15	0.12	0.10	0.08	0.05														
14 TPI		5501	0.10	1.26	10	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.10	0.08	0.05												
		5502	0.20	1.08	8	0.20	0.18	0.18	0.16	0.13	0.10	0.08	0.05														
12 TPI	5501	0.10	1.42	10	0.25	0.20	0.18	0.16	0.14	0.14	0.12	0.10	0.08	0.05													
	5502	0.20	1.30	9	0.25	0.22	0.18	0.16	0.14	0.12	0.10	0.08	0.05														
11 TPI	5501	0.10	1.56	11	0.25	0.20	0.18	0.16	0.16	0.14	0.12	0.12	0.10	0.08	0.05												
	5502	0.20	1.44	10	0.25	0.20</																					

TT (60° / 55°, Partial profile) Part 1

(ap shows the value of radial ap)

Type	Pitch / TPI	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17				
	mm / TPI																									
Metric (60°)	External thread	0.50 mm TT32 ³ / _L 6000	0.00	0.38	6	0.10	0.10	0.07	0.05	0.04	0.02															
		0.70 mm TT32 ³ / _L 6000	0.00	0.53	7	0.10	0.10	0.10	0.08	0.07	0.06	0.02														
		0.75 mm TT32 ³ / _L 6000	0.00	0.57	8	0.10	0.10	0.10	0.08	0.08	0.05	0.04	0.02													
		0.80 mm TT32 ³ / _L 6000	0.00	0.61	8	0.10	0.10	0.10	0.10	0.08	0.06	0.05	0.02													
		1.00 mm	TT32 ³ / _L 6000	0.00	0.76	8	0.15	0.12	0.12	0.11	0.10	0.08	0.06	0.02												
			TT32/43 ³ / _L 6001	0.10	0.66	6	0.20	0.15	0.12	0.10	0.07	0.02														
		1.25 mm	TT32 ³ / _L 6000	0.00	0.95	9	0.18	0.16	0.14	0.12	0.10	0.10	0.08	0.05	0.02											
			TT32/43 ³ / _L 6001	0.10	0.85	7	0.25	0.20	0.13	0.10	0.10	0.05	0.02													
		1.50 mm	TT32 ³ / _L 6000	0.00	1.14	10	0.20	0.18	0.16	0.14	0.12	0.10	0.10	0.07	0.05	0.02										
			TT32/43 ³ / _L 6001	0.10	1.04	9	0.25	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.02											
				6002	0.20	0.94	8	0.25	0.18	0.14	0.12	0.10	0.08	0.05	0.02											
		1.75 mm	TT32 ³ / _L 6000	0.00	1.33	11	0.25	0.23	0.20	0.13	0.10	0.10	0.10	0.08	0.07	0.05	0.02									
			TT32/43 ³ / _L 6001	0.10	1.23	10	0.25	0.23	0.20	0.13	0.10	0.10	0.08	0.07	0.05	0.02										
				6002	0.20	1.13	9	0.25	0.23	0.20	0.13	0.10	0.08	0.07	0.05	0.02										
		2.00 mm	TT32 ³ / _L 6000	0.00	1.52	12	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.10	0.10	0.08	0.05	0.02								
			TT32/43 ³ / _L 6001	0.10	1.42	11	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.10	0.10	0.08	0.05	0.02								
				6002	0.20	1.32	10	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.10	0.08	0.05	0.02								
		2.50 mm	TT32 ³ / _L 6000	0.00	1.89	13	0.27	0.25	0.20	0.18	0.17	0.15	0.14	0.14	0.13	0.10	0.08	0.06	0.02							
	TT32/43 ³ / _L 6001		0.10	1.79	12	0.27	0.25	0.20	0.18	0.17	0.15	0.14	0.13	0.12	0.10	0.06	0.02									
			6002	0.20	1.69	11	0.27	0.25	0.20	0.18	0.17	0.15	0.14	0.13	0.10	0.08	0.02									
			6003	0.30	1.59	11	0.27	0.25	0.20	0.18	0.17	0.15	0.12	0.10	0.08	0.05	0.02									
	3.00 mm	TT43 ³ / _L 6001	0.10	2.17	14	0.30	0.25	0.23	0.20	0.20	0.18	0.16	0.14	0.14	0.12	0.10	0.08	0.05	0.02							
			6002	0.20	2.07	13	0.30	0.25	0.23	0.20	0.20	0.18	0.15	0.14	0.13	0.12	0.10	0.05	0.02							
			6003	0.30	1.97	12	0.30	0.25	0.23	0.20	0.20	0.18	0.15	0.14	0.12	0.10	0.08	0.02								
			6004	0.40	1.87	12	0.30	0.25	0.23	0.20	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.02								
	3.50 mm	TT43 ³ / _L 6001	0.10	2.55	16	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.08	0.05	0.02					
			6002	0.20	2.45	15	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.10	0.10	0.05	0.02					
			6003	0.30	2.35	14	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.02						
			6004	0.40	2.25	14	0.30	0.27	0.23	0.22	0.20	0.18	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.02						
	Internal thread	0.50 mm TT32 ³ / _L 6000	0.00	0.32	5	0.12	0.08	0.06	0.04	0.02																
		0.70 mm TT32 ³ / _L 6000	0.00	0.45	6	0.15	0.10	0.08	0.06	0.04	0.02															
		0.75 mm TT32 ³ / _L 6000	0.00	0.49	6	0.15	0.12	0.08	0.07	0.05	0.02															
		0.80 mm TT32 ³ / _L 6000	0.00	0.52	6	0.15	0.12	0.10	0.08	0.05	0.02															
		1.00 mm TT32 ³ / _L 6000	0.00	0.65	7	0.15	0.14	0.12	0.10	0.08	0.04	0.02														
		1.25 mm	TT32 ³ / _L 6000	0.00	0.81	8	0.18	0.16	0.14	0.12	0.10	0.05	0.04	0.02												
			TT32/43 ³ / _L 6001	0.10	0.87	8	0.20	0.18	0.16	0.14	0.10	0.08	0.05	0.04	0.02											
1.50 mm		TT32 ³ / _L 6000	0.00	1.14	10	0.20	0.18	0.16	0.13	0.12	0.10	0.10	0.08	0.05	0.02											
		TT32/43 ³ / _L 6001	0.10	1.04	9	0.20	0.18	0.16	0.13	0.12	0.10	0.08	0.05	0.02												
2.00 mm		TT32 ³ / _L 6000	0.00	1.30	12	0.20	0.18	0.16	0.13	0.13	0.12	0.10	0.10	0.08	0.05	0.03	0.02									
		TT32/43 ³ / _L 6001	0.10	1.20	11	0.20	0.18	0.16	0.13	0.13	0.12	0.10	0.08	0.05	0.03	0.02										
2.50 mm		TT32 ³ / _L 6000	0.00	1.62	14	0.23	0.20	0.18	0.18	0.13	0.13	0.12	0.10	0.10	0.08	0.07	0.05	0.03	0.02							
		TT32/43 ³ / _L 6001	0.10	1.52	13	0.23	0.20	0.18	0.18	0.13	0.12	0.10	0.08	0.07	0.05	0.03	0.02									
3.00 mm		TT43 ³ / _L 6001	0.10	1.85	15	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.10	0.08	0.07	0.05	0.05	0.02						
		6002	0.20	1.75	14	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.08	0.07	0.05	0.05	0.02							
Parallel pipe / Tapered pipe (55°)		External thread	28TPI TT32 ³ / _L 5501	0.10	0.61	5	0.20	0.18	0.15	0.06	0.02															
			19TPI TT32/43 ³ / _L 5501	0.10	0.95	8	0.20	0.18	0.15	0.13	0.12	0.10	0.05	0.02												
				5502	0.20	1.34	10	0.25	0.22	0.20	0.16	0.14	0.12	0.10	0.08	0.05	0.02									
	14TPI TT32/43 ³ / _L 5501		0.10	1.73	13	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.04	0.02								
			5502	0.20	1.62	12	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.04	0.02								
	5503		0.30	1.50	11	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.04	0.02										
	Internal thread	28TPI TT32/43 ³ / _L 5501	0.10	0.61	6	0.18	0.15	0.12	0.08	0.06	0.02															
		19TPI TT32/43 ³ / _L 5501	0.10	0.95	7	0.20	0.18	0.16	0.14	0.12	0.10	0.05														
			5502	0.10	1.34	10	0.20	0.18	0.18	0.16	0.14	0.11	0.10	0.08	0.05											
		14TPI TT32/43 ³ / _L 5501	0.10	1.73	13	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.04	0.02								
			5502	0.20	1.62	12	0.25	0.22	0.22	0.20	0.18	0.14	0.12	0.10	0.08	0.05	0.04	0.02								
		5503	0.30	1.50	11	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.07	0.04	0.02										
	Whitworth (55°)	External thread	24TPI TT32/43 ³ / _L 5501																							

TT (60° / 55°, Partial profile) Part 2

(ap shows the value of radial ap)

Type	Pitch / TPI	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17				
	mm / TPI																									
Whitworth (55°)	Internal thread	24TPI TT32/43 [°] 5501	0.10	0.65	6	0.20	0.16	0.12	0.10	0.05	0.02															
		20TPI TT32/43 [°] 5501	0.10	0.81	7	0.20	0.18	0.16	0.12	0.08	0.05	0.02														
		18TPI TT32/43 [°] 5501	0.10	0.91	8	0.20	0.18	0.16	0.15	0.10	0.05	0.05	0.02													
		16TPI TT32/43 [°] 5501	0.10	1.04	9	0.20	0.18	0.15	0.14	0.12	0.10	0.08	0.05	0.02												
			5502	0.20	0.92	8	0.20	0.18	0.16	0.13	0.10	0.08	0.05	0.02												
		14TPI TT32/43 [°] 5501	0.10	1.20	10	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.08	0.05	0.02											
			5502	0.20	1.08	9	0.20	0.18	0.16	0.15	0.14	0.10	0.08	0.05	0.02											
		12TPI TT32/43 [°] 5501	0.10	1.42	10	0.23	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.05	0.02											
			5502	0.20	1.30	9	0.25	0.22	0.20	0.18	0.16	0.12	0.10	0.05	0.02											
		11TPI TT32/43 [°] 5501	0.10	1.56	11	0.25	0.22	0.22	0.18	0.16	0.14	0.12	0.10	0.10	0.05	0.02										
			5502	0.20	1.44	10	0.25	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.05	0.02										
		10TPI TT43 [°] 5503	0.30	1.33	9	0.25	0.22	0.20	0.18	0.16	0.14	0.10	0.06	0.02												
			5501	0.10	1.73	12	0.25	0.22	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.05	0.02									
			5502	0.20	1.61	11	0.25	0.22	0.20	0.18	0.17	0.16	0.14	0.12	0.10	0.05	0.02									
		9TPI TT43 [°] 5501	0.10	1.93	13	0.25	0.23	0.22	0.20	0.18	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.02								
			5502	0.20	1.82	12	0.25	0.23	0.22	0.20	0.18	0.16	0.15	0.14	0.12	0.10	0.05	0.02								
			5503	0.30	1.70	11	0.25	0.22	0.22	0.20	0.20	0.18	0.14	0.12	0.10	0.05	0.02									
		8TPI TT43 [°] 5501	0.10	2.19	15	0.27	0.25	0.23	0.21	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.08	0.05	0.02							
			5502	0.20	2.07	14	0.27	0.25	0.23	0.21	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.06	0.05	0.02						
			5503	0.30	1.96	13	0.30	0.25	0.23	0.22	0.20	0.18	0.15	0.12	0.10	0.08	0.06	0.05	0.02							
				5504	0.40	1.84	12	0.30	0.25	0.23	0.21	0.20	0.18	0.14	0.12	0.08	0.06	0.05	0.02							

TT (60°, Full profile)

(ap shows the value of radial ap)

Type	Pitch / TPI	Description	HC (mm)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
	mm / TPI																								
Metric	External thread	1.00 mm TT43E [°] 100M	0.64	0.72	5	0.23	0.19	0.15	0.10	0.05															
		1.25 mm	0.80	0.88	6	0.26	0.21	0.16	0.12	0.08	0.05														
		1.50 mm	0.95	1.03	6	0.26	0.24	0.21	0.16	0.11	0.05														
		2.00 mm	1.27	1.35	10	0.26	0.21	0.18	0.16	0.14	0.12	0.10	0.08	0.05	0.05										

TTX (60° / 55°, Partial profile)

(ap shows the value of radial ap)

Type	Pitch / TPI	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17			
	mm / TPI																								
Metric (60°)	External thread	0.50 mm TTX32R 6000	0.00	0.38	6	0.10	0.10	0.07	0.05	0.04	0.02														
			6000S	0.05	0.33	5	0.10	0.10	0.07	0.04	0.02														
		0.70 mm TTX32R 6000	0.00	0.53	7	0.10	0.10	0.10	0.08	0.07	0.06	0.02													
			6000S	0.05	0.48	6	0.10	0.10	0.10	0.10	0.06	0.02													
		0.75 mm TTX32R 6000	0.00	0.57	8	0.10	0.10	0.10	0.08	0.08	0.05	0.04	0.02												
			6000S	0.05	0.52	7	0.10	0.10	0.10	0.08	0.07	0.05	0.02												
		0.80 mm TTX32R 6000	0.00	0.61	8	0.10	0.10	0.10	0.10	0.08	0.06	0.05	0.02												
			6000S	0.05	0.56	7	0.10	0.10	0.10	0.10	0.08	0.06	0.02												
		1.00 mm TTX32R 6000	0.00	0.76	8	0.15	0.13	0.12	0.12	0.10	0.08	0.04	0.02												
			6000S	0.05	0.71	7	0.18	0.15	0.12	0.10	0.08	0.06	0.02												
		1.25 mm TTX32R 6001	0.10	0.66	6	0.20	0.15	0.12	0.10	0.07	0.02														
			0.10	0.85	7	0.25	0.20	0.13	0.10	0.10	0.05	0.02													
1.50 mm TTX32R 6001	0.10	1.04	9	0.25	0.18	0.14	0.12	0.10	0.10	0.08	0.05	0.02													
	0.10	1.23	10	0.25	0.23	0.20	0.13	0.10	0.10	0.08	0.07	0.05	0.02												
1.75 mm TTX32R 6001	0.10	1.42	11	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.10	0.08	0.05	0.02											
	0.10	1.42	11	0.25	0.23	0.20	0.16	0.13	0.10	0.10	0.10	0.08	0.05	0.02											
Parallel pipe / tapered pipe (55°)	External thread	28TPI TTX32R 5501	0.10	0.61	5	0.20	0.18	0.15	0.06	0.02															
		19TPI TTX32R 5501	0.10	0.95	8	0.20	0.18	0.15	0.13	0.12	0.10	0.05	0.02												
		14TPI TTX32R 5501S	0.15	0.90	7	0.20	0.18	0.16	0.14	0.12	0.08	0.02													
		11TPI TTX32R 5501S	0.15	1.28	10	0.25	0.20	0.18	0.16	0.12	0.12	0.10	0.08	0.05	0.02										
Whitworth (55°)	External thread	24TPI TTX32R 5501	0.10	0.73	6	0.20	0.18	0.16	0.12	0.05	0.02														
			20TPI TTX32R 5501	0.10	0.90	7	0.20	0.18	0.16	0.14	0.12	0.08	0.02												
		18TPI TTX32R 5501S	0.15	0.84	7	0.20	0.18	0.16	0.12	0.10	0.06	0.02													
			0.15	0.95	8	0.20	0.18	0.15	0.14	0.12	0.10	0.04	0.02												
		16TPI TTX32R 5501S	0.15	1.10	9	0.20	0.18	0.16	0.14	0.12	0.12	0.10	0.06	0.02											
			0.15	1.28	10	0.25	0.20	0.18	0.16	0.12	0.12	0.10	0.08	0.05	0.02										
		14TPI TTX32R 5501S	0.15	1.28	10	0.25	0.20	0.18	0.16	0.12	0.12	0.10	0.08	0.05	0.02										
			0.15	1.52	11	0.25	0.20	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.05	0.02									
		12TPI TTX32R 5501S	0.15	1.67	12	0.25	0.22	0.20	0.18	0.16	0.14	0.14	0.12	0.10	0.08	0.06	0.02								

- <Note> 1) Select the insert with suitable corner-R(RE) determined by the pitch.
- 2) Do not exceed 0.3mm for the 1st ap.
- 3) Finishing ap should be 0.02~0.05mm.
- 4) Prepare chamfering for C0.3~C0.5 to the workpiece to prevent the insert cracking during the 1st pass.
- 5) Coolant is recommended.

TTX

Suitable for threading of smaller pitch sizes or more TPI than TT. Suitable for threading to the shoulder.

Insert description	Thread types	Metric (mm)	Unified (TPI)	Parallel pipe (TPI)	Whitworth (TPI)
TTX32R	6000	0.5~1.0			

TPGB (60°, Partial profile)

(ap shows the value of radial ap)

Type	Pitch / TPI mm / TPI	Description	Corner-R (RE)	Total ap (mm)	No. of passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17															
Metric (60°)	Internal thread	0.75 mm	TPGB 1102005	0.05	0.44	5	0.15	0.12	0.10	0.05	0.02																										
			1103005																																		
		0.80 mm	TPGB 1102005	0.05	0.47	5	0.15	0.14	0.10	0.06	0.02																										
			1103005																																		
		1.00 mm	TPGB 1102005	0.05	0.60	6	0.18	0.14	0.12	0.10	0.04	0.02																									
			1103005																																		
		1.25 mm	TPGB 1102005	0.05	0.76	7	0.18	0.16	0.14	0.12	0.10	0.04	0.02																								
			1103005																																		
		1.50 mm	TPGB 1102005	0.05	0.92	8	0.20	0.18	0.16	0.14	0.10	0.08	0.04	0.02																							
			1103005																																		
		1.50 mm	TPGB 110201	0.10	0.87	8	0.20	0.18	0.16	0.14	0.08	0.05	0.04	0.02																							
			110301																																		
		1.75 mm	TPGB 1102005	0.05	1.09	9	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.04	0.02																						
			1103005																																		
		1.75 mm	TPGB 110201	0.10	1.04	9	0.20	0.18	0.16	0.13	0.12	0.10	0.08	0.05	0.02																						
			110301																																		
		2.00 mm	TPGB 1102005	0.05	1.25	11	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.10	0.06	0.04	0.02																				
			1103005																																		
		2.00 mm	TPGB 110201	0.10	1.20	11	0.20	0.18	0.16	0.13	0.13	0.12	0.10	0.08	0.05	0.03	0.02																				
			110301																																		
2.50 mm	TPGB 1102005	0.05	1.57	13	0.23	0.20	0.18	0.18	0.14	0.13	0.12	0.10	0.08	0.07	0.07	0.05	0.02																				
	1103005																																				
2.50 mm	TPGB 110201	0.10	1.52	13	0.23	0.20	0.18	0.18	0.13	0.13	0.12	0.10	0.08	0.07	0.05	0.03	0.02																				
	110301																																				
3.00 mm	TPGB 1102005	0.05	1.90	15	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.12	0.10	0.08	0.08	0.07	0.05	0.02																		
	1103005																																				
	110301																			0.10	1.85	15	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.10	0.08	0.07	0.05	0.05	0.02
3.00 mm	TPGB 110201	0.10	1.75	14	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.08	0.07	0.05	0.05	0.02																			
	1103005																																				
	110302																		0.20	1.75	14	0.25	0.22	0.20	0.18	0.14	0.14	0.13	0.12	0.10	0.08	0.07	0.05	0.05	0.02		
3.50 mm	TPGB 1102005	0.05	2.22	16	0.25	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.05	0.02																	
	1103005																																				
	110301																				0.10	2.17	16	0.25	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.10	0.08	0.07
3.50 mm	TPGB 110201	0.10	2.07	15	0.25	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.12	0.10	0.08	0.07	0.05	0.02																		
	110302																																				

Guide for internal threading

For internal threading, pay extra attention to “stabilizing bore dia.” and “chip evacuation”.

1. “Stabilizing bore dia.”

Because small pitch Internal threading has small corner-R (RE), there is variation in the bore dia. which may greatly influence the tool life of an insert. In order to eliminate the variation in the bore dia., “0” Cutting (zero cutting) should be performed as the zero pass, before the first pass in threading. The bore dia. is cut with the specified dimension, and the first pass of threading becomes stable.

2. “Chip evacuation”

If machining process is continued when chips are tangled with a toolholder and other parts of the machine, it may cause damages to the insert. Therefore, please ensure that there are no tangled chips in the machine by the following method.

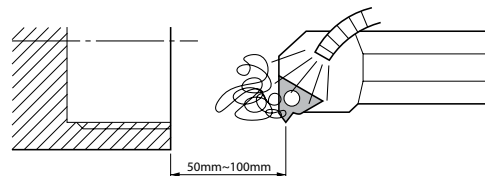
<When processing the first workpiece>

Set the program with the “single block”

Keep the threading starting point 50 mm~100 mm away from the side of workpiece, and confirm that coolant is flushing down the chips for each pass.

<When processing the second workpiece and later>

Ensure that chips are not tangled; then, start the continuous run.



In applicable toolholder / insert lists on J58- J62, right-hand insert / right-hand toolholder descriptions are listed based on the previous TNN type inserts. For other applicable inserts / toolholders or stock availability of left-hand, see each relevant page and J65.

Parallel pipe [G(PF), Rp(PS)]

Nominal thread Symbol (Previous symbol)	TPI	External thread (G)			Internal thread (G, Rp)				Same root's radius
		Toolholder	Insert		Toolholder	Insert		Bore dia.	
Partial profile	Full profile		Partial profile	Full profile					
G 1/16 (-)	28	KTNR ○○○○□-16 KTNSR ○○○○□-16 S ○○○-KTNL16	16ERA55-TF/TQ 16ERAG55-TF/TQ 16ERA55 16ERAG55	-	SINR0612S-06E (EZT J40)	06IR5501	-	6.56	0.12
G 1/8 (PF 1/8)								8.57	
G 1/4 (PF 1/4)	19	KTNR ○○○○□-16 KTNSR ○○○○□-16 S ○○○-KTNL16	16ERA55-TF/TQ 16ERAG55-TF/TQ 16ERA55 16ERAG55	16ER19W-TF/TQ 16ER19W	SINR0816S-08E (EZT J40)	08IR5501	-	11.45	0.18
G 3/8 (PF 3/8)					SINR1216S-11E (EZT J40)			11IRA55 11IR5500S		-	14.95
G 1/2 (PF 1/2)	14	KTNR ○○○○□-16 KTNSR ○○○○□-16 S ○○○-KTNL16	16ERAG55-TF/TQ 16ERAG55-TF/TQ 16ERAG55 16ERAG55	16ER14W-TF/TQ 16ER14W	SINR1516S-11	11IR5500S	-	18.63	0.25
G 5/8 (PF 5/8)					SINR1616S-16				
G 3/4 (PF 3/4)					SINR2016S-16	16IRAG55 16IRG55 16IR5501 16IR5502	16IR14W-TF/TQ 16IR14W	20.59	
G 7/8 (PF 7/8)								SINR2420S-16		24.12
G 1 (PF 1)					27.88				
G 1 1/8 (PF 1 1/8)	11	KTNR ○○○○□-16 KTNSR ○○○○□-16 S ○○○-KTNL16	16ERAG55-TF/TQ 16ERAG55-TF/TQ 16ERAG55 16ERAG55	16ER11W-TF/TQ 16ER11W	SINR2420S-16	16IRAG55 16IRG55 16IR5501 16IR5502	16IR11W-TF/TQ 16IR11W	30.29	0.32
G 1 1/4 (PF 1 1/4)					CINR3025S-16			34.94	
					CINR3732S-16			38.95	
Hereafter, all the threads are 11 TPI and the root's radius 0.32. The same tool for G1 1/4 is recommended.									

Threading

Tapered pipe [R Rc(PT)(BSPT)]

Nominal thread Symbol (Previous symbol)	TPI	External thread (R)			Internal thread (Rc)				Same root's radius
		Toolholder	Insert		Toolholder	Insert			
Partial profile	Full profile		Partial profile	Full profile					
R 1/16, Rc 1/16 (-)	28	KTNR ○○○○□-16 KTNSR ○○○○□-16 S ○○○-KTNL16	(16ERA55-TF/TQ) (16ERAG55-TF/TQ) (16ERA55) (16ERAG55)	16ER28BSPT-TF/TQ 16ER28BSPT	SINR0612S-06E (EZT J40)	06IR5501	-	0.12	
R 1/8, Rc 1/8 (PT 1/8)									
R 1/4, Rc 1/4 (PT 1/4)	19	KTNR ○○○○□-16 KTNSR ○○○○□-16 S ○○○-KTNL16	(16ERA55-TF/TQ) (16ERAG55-TF/TQ) (16ERA55) (16ERAG55)	16ER19BSPT-TF/TQ 16ER19BSPT	SINR0816S-08E (EZT J40)	08IR5501	-	0.18	
R 3/8, Rc 3/8 (PT 3/8)					SINR1216S-11E (EZT J40)				(11IRA55) (11IR5500S)	11IR19BSPT-TF/TQ 11IR19BSPT
R 1/2, Rc 1/2 (PT 1/2)	14	KTNR ○○○○□-16 KTNSR ○○○○□-16 S ○○○-KTNL16	(16ERAG55-TF/TQ) (16ERAG55-TF/TQ) (16ERAG55) (16ERAG55)	16ER14BSPT-TF/TQ 16ER14BSPT	SINR1516S-11	(11IR5500S)	11IR14BSPT-TF/TQ 11IR14BSPT	0.25	
R 3/4, Rc 3/4 (PT 3/4)					SINR1616S-16				
R 1, Rc 1 (PT 1)					SINR2016S-16				
R 1 1/4, Rc 1 1/4 (PT 1 1/4)	11	KTNR ○○○○□-16 KTNSR ○○○○□-16 S ○○○-KTNL16	(16ERAG55-TF/TQ) (16ERAG55-TF/TQ) (16ERAG55) (16ERAG55)	16ER11BSPT-TF/TQ 16ER11BSPT	SINR2420S-16	(16IRAG55) (16IRG55) (16IR5501) (16IR5502)	16IR11BSPT-TF/TQ 16IR11BSPT	0.32	
R 1 1/2, Rc 1 1/2 (PT 1 1/2)					CINR3025S-16				
	CINR3732S-16								
Hereafter, all the threads are 11 TPI and the root's radius 0.32. The same tool for R1 1/2 is recommended.					Hereafter, all the threads are 11 TPI and the root's radius 0.32. The same tool for Rc1 1/2 is recommended.				

1) The largest size of minimum diameter toolholder is recommended for Internal threading toolholders.

Therefore it is available if minimum diameter is smaller than recommended toolholders.

(e.g.) SINR2420S-16 (Min. Bore dia.: ø24mm) is recommended for the Tool of G7/8 Internal threading from the above table, but SINR2016S-16 can also be used.

2) When using "Partial profile" for Tapered pipe threading, thread's corners become sharp edged, and the shape will not be the same as the standard shape for Tapered pipe.

American national tapered pipe (NPT)

Nominal thread	TPI	External thread			Internal thread		
		Toolholder	Insert		Toolholder	Insert	
			Partial profile	Full profile		Partial profile	Full profile
1/16NPT 1/8NPT	27	KTTR○○○○□-16 KTXR○○○○□-16F	TT32R6000 TTX32R6000	-	No tools available		
1/4NPT 3/8NPT	18	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	-	16ER18NPT	EZH Sleeves J41	EZTR060050-60-004 EZTR070060-60-004	-
1/4NPT 3/4NPT	14	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	-	16ER14NPT	EZH Sleeves J41	EZTR070060-60-004	-
1/2NPT 3/4NPT	14	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	-	16ER14NPT	SINR1616S-16 SINR2016S-16	-	16IR14NPT
1 NPT 1 1/2 NPT 1 1/2 NPT 2 NPT	11.5	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	-	16ER11.5NPT	SINR2420S-16 CINR3025S-16 CINR3732S-16	-	16IR11.5NPT

• Application of NPTF thread
 NPTF is the thread for sealing pipes without using any sealing material.
 Thread symbol is similar to NPT but the tolerance is different from that of NPT, therefore the above inserts are not available for NPTF.

30° Trapezoidal (Tr)

The JIS Standard Trapezoidal Size to be machined by previous TNN Insert are shown.

Nominal thread	Pitch (mm)	External thread			Internal thread			Bore dia.
		Toolholder	Insert		Toolholder	Insert		
			Partial profile	Full profile		Partial profile	Full profile	
Tr 16X2 Tr 18X2 Tr 20X2	2	No tools available			No tools available	-	-	14.00
Tr 22X3 Tr 24X3 Tr 26X3	3	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	16ER200TR	-	SINR1616S-16	16IR200TR	-	16.00 18.00
Tr 28X3 Tr 30X3 Tr 32X3 Tr 34X3 Tr 36X3 Tr 38X3 Tr 40X3	3				KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	16ER300TR	-	SINR2420S-16	16IR300TR	-	19.00 21.00 23.00 25.00 27.00 29.00
Tr 42X3 Tr 44X3 Tr 46X3 Tr 48X3 Tr 50X3 Tr 52X3 Tr 55X3 Tr 60X3 Tr 65X3	3	KTNR○○○○□-16 KTNSR○○○○□-16 S○○□-KTNL16	16ER300TR	-				CINR3025S-16	16IR300TR	-	31.00 33.00 35.00 37.00
Tr 70X4 Tr 75X4 Tr 80X4 Tr 90X4 Tr 95X4 Tr 100X4 Tr 105X4 Tr 110X4	4				KTNR○○○○□-22	22ER400TR	-	CINR3732S-22	22IR400TR	-	39.00 41.00 43.00 45.00 47.00 49.00 52.00 57.00 62.00 66.00 71.00 76.00 86.00 91.00 96.00 101.00 106.00

• TM thread: TM thread (old JIS 30° trapezoidal thread) has been discontinued. But if the "Nominal dia. X pitch" is the same, the above Tr thread can be used.
 • TW thread: TW thread is 29° trapezoidal thread, therefore the above inserts are not available.



Threading

Metric coarse thread: M

Nominal thread	Pitch (mm)	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
M1	0.25 0.5	No tools available	-	-	0.73
M3			-	-	2.46
M4			EZTR030025-60-002	-	3.24
M5	0.8	-	EZTR040035-60-004	-	4.13
M6	1.0	-	VNTR045-11	-	4.92
M7	1.0	-	EZTR050040-60-004	-	5.92
M8	1.25	-	VNTR045-11	-	
			EZTR060050-60-004	-	
			VNTR060-11	-	
M9	1.25	-	SINR0612S-06E	06IR60005	7.65
			-	EZTR070060-60-004	
M10	1.5	-	06IR60005	-	8.38
M11	1.5	SINR0816S-08E	08IR60007	-	9.38
M12	1.75	SINR0816S-08E	08IR60007	-	10.11
M16	2.0	SINR1216S-11E	-	11IR200ISO	13.84
M18	2.5	No tools available			15.29
M20	2.5	SINR1616S-16	Table 5	16IR250ISO-□□	17.29
M22	2.5	-	-	-	19.29
M24	3.0	SINR2016S-16	Table 4	16IR300ISO-□□	20.75
M27	3.0	-	-	-	23.75
M30	3.5	SINR2420S-22	-	22IR350ISO	26.21
M33	3.5	-	-	-	29.21
M36	4.0	CINR3025S-22	22IRN60	22IR400ISO	31.67
M39	4.0	-		22IR450ISO	34.67
M42	4.5	CINR3732S-22		22IR500ISO	37.13
M45	4.5	-		-	40.13
M48	5.0	CINR3732S-22	-	-	42.59
M52	5.0	-	-	-	46.59
M56	5.5	* Threading of M56 and over is not available due to too large pitch size.			50.05

Metric fine thread: M

Nominal thread	Pitch (mm)	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
M14x1.5	1.5	SINR1216S-11E	11IRA60	11IR150ISO-□□	12.38
M14x1.25	1.25		11IR60005	11IR125ISO-□□	12.65
M14x1.0	1.0		-	11IR100ISO-□□	12.92
M15x1.5	1.5	SINR1216S-11E	11IRA60	11IR150ISO-□□	13.38
M15x1.0	1.0		11IR60005	11IR100ISO-□□	13.92
M16x1.5	1.5	SINR1216S-11E	11IRA60	11IR150ISO-□□	14.38
M16x1.0	1.0		11IR60005	11IR100ISO-□□	14.92
M17x1.5	1.5	SINR1516S-11	11IRA60	11IR150ISO-□□	15.38
M17x1.0	1.0		11IR60005	11IR100ISO-□□	15.92
M18x2.0	2.0	SINR1516S-11	-	11IR200ISO	15.84
M18x1.5	1.5	SINR1616S-16	Table 2	16IR150ISO-□□	16.38
M18x1.0	1.0		Table 3	16IR100ISO-□□	16.92
M20x2.0	2.0	SINR1616S-16	Table 1	16IR200ISO-□□	17.84
M20x1.5	1.5		Table 2	16IR150ISO-□□	18.38
M20x1.0	1.0		Table 3	16IR100ISO-□□	18.92
M22x2.0	2.0	SINR1616S-16	Table 1	16IR200ISO-□□	19.84
M22x1.5	1.5		Table 2	16IR150ISO-□□	20.38
M22x1.0	1.0		Table 3	16IR100ISO-□□	20.92
M24x2.0	2.0	SINR2016S-16	Table 1	16IR200ISO-□□	21.84
M24x1.5	1.5		Table 2	16IR150ISO-□□	22.38
M24x1.0	1.0		Table 3	16IR100ISO-□□	22.92
M25x2.0	2.0	SINR2016S-16	Table 1	16IR200ISO-□□	22.84
M25x1.5	1.5		Table 2	16IR150ISO-□□	23.38
M25x1.0	1.0		Table 3	16IR100ISO-□□	23.92
M26x1.5	1.5	SINR2420S-16	Table 2	16IR150ISO-□□	24.38
M27x2.0	2.0		Table 1	16IR200ISO-□□	24.84
M27x1.5	1.5		SINR2420S-16	Table 2	16IR150ISO-□□	25.38
M27x1.0	1.0	Table 3		16IR100ISO-□□	25.92
M28x2.0	2.0	SINR2420S-16	Table 1	16IR200ISO-□□	25.84
M28x1.5	1.5		Table 2	16IR150ISO-□□	26.38
M28x1.0	1.0		Table 3	16IR100ISO-□□	26.92
M30x3.0	3.0	SINR2420S-16	-	22IR300ISO	26.75
M30x2.0	2.0		Table 4	16IR300ISO-□□	
M30x1.5	1.5	SINR2420S-16	Table 1	16IR200ISO-□□	27.84
M30x1.0	1.0		Table 2	16IR150ISO-□□	28.38
M30x1.0	1.0		Table 3	16IR100ISO-□□	28.92
M32x2.0	2.0	SINR2420S-16	Table 1	16IR200ISO-□□	29.84
M32x1.5	1.5	CINR3025S-16	Table 2	16IR150ISO-□□	30.38
M33x3.0	3.0	SINR2420S-22	-	22IR300ISO	29.75
M33x2.0	2.0		SINR2420S-16	Table 4		16IR300ISO-□□
M33x1.5	1.5	CINR3025S-16	Table 1	16IR200ISO-□□	30.84
M35x1.5	1.5		Table 2	16IR150ISO-□□	31.38
M36x3.0	3.0	CINR3025S-22	-	22IR300ISO	32.75
M36x2.0	2.0		CINR3025S-16	Table 4		16IR300ISO-□□
M36x1.5	1.5	CINR3025S-16	Table 1	16IR200ISO-□□	33.84
M38x1.5	1.5		Table 2	16IR150ISO-□□	34.38
M39x3.0	3.0	CINR3025S-22	-	22IR300ISO	35.75
M39x2.0	2.0		CINR3025S-16	Table 4		16IR300ISO-□□
M39x1.5	1.5	CINR3732S-16	Table 1	16IR200ISO-□□	36.84
M40x3.0	3.0		Table 2	16IR150ISO-□□	37.38
M40x2.0	2.0	CINR3025S-22	-	22IR300ISO	36.75
M40x1.5	1.5		CINR3025S-16	Table 4		16IR300ISO-□□
M42x4.0	4.0	CINR3732S-22	22IRN60	22IR400ISO	37.67
M42x3.0	3.0		-	-	22IR300ISO
M42x2.0	2.0	CINR3732S-16	Table 4	16IR300ISO-□□	38.75
M42x1.5	1.5		Table 1	16IR200ISO-□□	39.84
M45x4.0	4.0	-	* Threading of M45 and over can be machined by the same tool for M42. (TP=4.0, 3.0, 2.0, 1.5)		40.67
M45x3.0	3.0		-	-	-

Table 1 (TP=2.0 mm)




Table 2 (TP=1.5 mm)




Table 3 (TP=1.0 mm)




Table 4 (TP=3.0 mm)

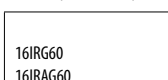
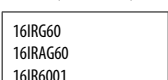


Table 5 (TP=2.5 mm)



Metric fine thread: M

Nominal thread	Pitch (mm)	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
M1x0.2	0.2	No tools available	-	-	0.78
M3x0.35			-	-	2.62
M3.5x0.35			0.35	-	-	3.12
M4.5x0.5	0.5	-	EZTR030025-60-002	-	3.96
M5x0.5	0.5	-	EZTR035030-60-002	-	4.46
M6x0.75	0.75	-	VNTR045-11	-	5.19
M7x0.75	0.75	-	EZTR050040-60-004	-	6.20
M8x1.0	1.0	-	VNTR060-11	-	
			EZTR060050-60-004	-	
			VNTR060-11	-	
M8x0.75	0.75	-	SINR0612S-06E	06IR60005	6.92
			-	EZTR060050-60-004	
M9x1.0	1.0	-	VNTR060-11	-	7.19
			SINR0612S-06E	06IR60005	
			SINR0816S-08E	08IR60007	
M9x0.75	0.75	-	EZTR070060-60-004	-	7.92
			VNTR060-11	-	
M10x1.25	1.25	-	SINR0612S-06E	06IR60005	8.19
			-	VNTR060-11	
			SINR0816S-08E	08IR60007	
M10x1.0	1.0	-	VNTR060-11	-	8.65
			SINR0816S-08E	08IR60007	
M10x0.75	0.75	-	VNTR060-11	-	8.92
			SINR0612S-06E	06IR60005	
			-	VNTR060-11	
M11x1.0	1.0	-	VNTR060-11	-	9.19
			SINR0816S-08E	08IR60007	
			-	VNTR060-11	
M11x0.75	0.75	-	SINR0612S-06E	06IR60005	9.92
			-	VNTR060-11	
M12x1.5	1.5	SINR0816S-08E	08IR60007	-	10.19
M12x1.25	1.25		-	-	10.38
M12x1.0	1.0		-	-	10.65

Above shows the usage example of applicable toolholder / insert.



J

Unified coarse thread: UNC

Nominal thread	TPI	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
No.2-56 UNC .	56	No tools available	-	-	1.69
.					.
No.6-32 UNC	32	-	EZTR030025-60-002	-	2.65
No.8-32 UNC	32	-	EZTR035030-60-002	-	3.31
No.10-24 UNC	24	-	EZTR040035-60-004	-	3.68
No.12-24 UNC	24	-	EZTR050040-60-004	-	4.34
1/4-20 UNC	20	-	EZTR050040-60-004	-	4.98
.		-	VNTR045-11	-	
5/16-18 UNC	18	-	EZTR060050-60-004	-	6.41
.		-	VNTR060-11	-	
3/8-16 UNC	16	-	EZTR070060-60-004	-	7.81
7/16-14 UNC	14	No tools available			9.15
1/2-13 UNC	13				10.58
9/16-12 UNC	12				12.00
5/8-11 UNC	11				13.38
3/4-10 UNC	10				16.30
7/8-9 UNC	9				19.17
1-8 UNC	8	SINR1616S-16	16IRAG60 16IRG60	16IR10UN(-□□)	21.96
1 1/8-7 UNC	7	SINR2420S-22	22IRN60	-	24.65
1 1/4-7 UNC				-	27.82
1 3/8-6 UNC	6	CINR3025S-22	-	-	30.34
1 1/2-6 UNC				-	33.52
1 3/4-5 UNC	5	CINR3732S-22	-	-	38.95
2-4 1/2 UNC .	4 1/2	* 2-4 1/2 UNC and over cannot be machined, because no inserts are available for the TPI.			44.69
.					.

Unified extra fine thread: UNEF

Nominal thread	TPI	Internal thread				
		Toolholder	Insert		Bore dia.	
			Partial profile	Full profile		
No.12-32UNEF 1/4-32UNEF 5/16-32UNEF 3/8-32UNEF	32	-	EZTR035030-60-002	-	4.63	
.					5.49	
.					7.08	
.					8.67	
7/16-28UNEF 1/2-28UNEF	28	SINR0612S-06E	06IR60005	-	10.13	
.					11.72	
9/16-24UNEF 5/8-24UNEF	24	SINR1216S-11E	11IRA60 11IR60005	-	13.14	
.		SINR1516S-11	14.73			
11/16-24UNEF	24	-	-	-	16.32	
3/4-20UNEF 13/16-20UNEF 7/8-20UNEF 15/16-20UNEF 1-20UNEF	20	SINR1616S-16	16IRA60 16IRAG60	-	16IR24UN(-□□)	
.		-			17.68	
.		SINR2016S-16			16IR20UN(-□□)	19.26
.		-			20.85	
.		-			22.44	
1 1/16-18UNEF 1 1/8-18UNEF 1 3/16-18UNEF 1 1/4-18UNEF 1 5/16-18UNEF 1 3/8-18UNEF 1 7/16-18UNEF	18	SINR2420S-16	-	-	24.03	
.		-			25.46	
.		-			27.05	
.		-			28.63	
.		-			30.22	
.		CINR3025S-16			16IR18UN(-□□)	31.81
.		-			33.40	
1 1/2-18UNEF	18	-	-	-	34.98	
1 9/16-18UNEF	18	-	-	-	36.57	
1 5/8-18UNEF	18	-	-	-	38.16	
1 11/16-18UNEF	18	CINR3732S-16	-	-	39.75	
.	.	.	.	.	41.33

Unified fine thread: UNF

Nominal thread	TPI	Internal thread			
		Toolholder	Insert		Bore dia.
			Partial profile	Full profile	
No.0-80 UNF .	80	No tools available	-	-	1.18
.					.
No.6-40 UNF	40	-	EZTR030025-60-002	-	2.82
No.8-36 UNF	36	-	EZTR035030-60-002	-	3.40
No.10-32 UNF	32	-	EZTR040035-60-004	-	3.97
No.12-28 UNF	28	-	EZTR050040-60-004	-	4.50
1/4-28 UNF	28	-	EZTR050040-60-004	-	5.37
.		-	VNTR045-11	-	
5/16-24 UNF	24	-	EZTR060050-60-004	-	6.79
.		-	VNTR060-11	-	
.		SINR0612S-06E	06IR60005	-	
3/8-24 UNF	24	-	EZTR070060-60-004	-	8.38
.		SINR0612S-06E	06IR60005	-	
7/16-20 UNF 1/2-20 UNF	20	SINR0816S-08E	08IR60007	-	9.74
.		-	-	-	11.33
9/16-18 UNF 5/8-18 UNF	18	SINR1216S-11E	11IRA60 11IR60005	-	12.76
.		-	-	-	14.35
3/4-16 UNF	16	SINR1516S-11	11IRA60 11IR60005	-	17.33
.		SINR1616S-16	-	16IR16UN(-□□)	
7/8-14 UNF	14	SINR2016S-16	-	-	20.26
1-12 UNF	12	SINR2016S-16	16IRAG60 16IRG60	-	23.10
1 1/8-12 UNF	12	SINR2420S-16	16IR6001	16IR12UN(-□□)	26.28
1 1/4-12 UNF					29.46
1 3/8-12 UNF	12	CINR3025S-16	-	-	32.63
1 1/2-12 UNF					36.81



Threading

Whitworth coarse thread: W

Nominal thread	TPI	Internal thread			Bore dia.
		Toolholder	Insert		
			Partial profile	Full profile	
W 1/4	20	No tools available	-	-	4.91
W 5/16	18		-	-	6.34
W 3/8	16	No tools available	-	-	7.73
W 7/16	14		-	-	9.06
W 1/2	12		-	-	10.30
W 9/16	12		-	-	11.89
W 5/8	11		-	-	13.26
W 3/4	10		-	-	16.17
W 7/8	9	SINR1616S-16	16IRAG55	-	19.03
W 1	8	SINR2016S-16	16IRG55	-	21.80
W 1 1/8	7	SINR2420S-22	22IRN55	-	24.47
W 1 1/4					27.64
W 1 3/8	6	CINR3025S-22	22IRN55	-	30.13
W 1 1/2					33.30
W 1 5/8					35.52
W 1 3/4	5	CINR3732S-22	22IRN55	-	38.69
W 1 7/8	4 1/2	No tools available	-	-	41.23
W 2					44.41
W 2 1/4	4	-	-	-	49.96

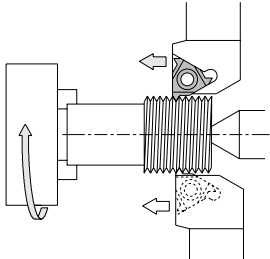
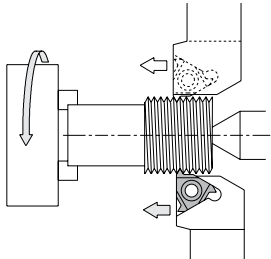
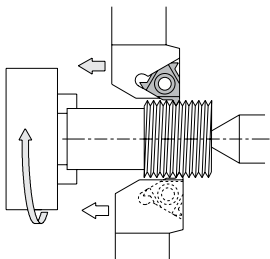
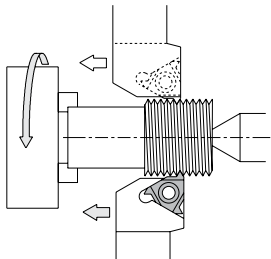
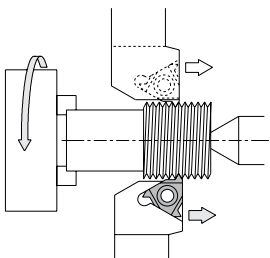
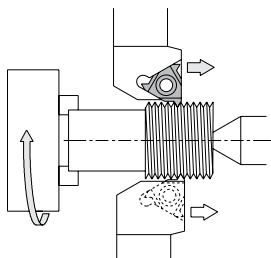
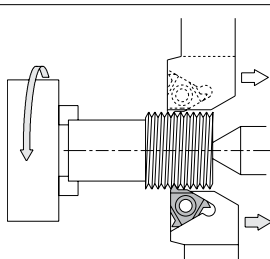
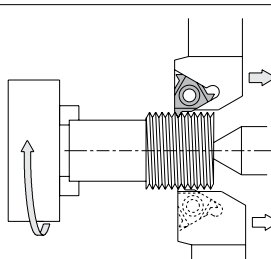
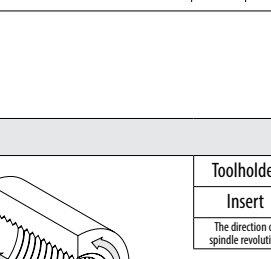

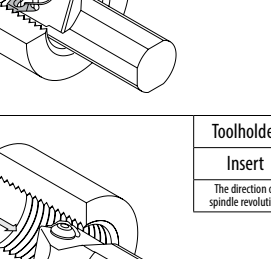
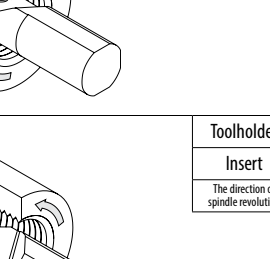
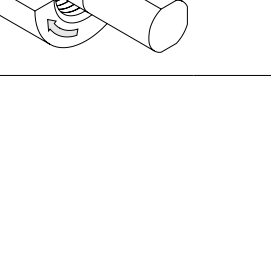
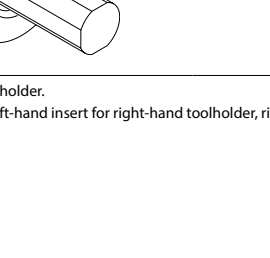
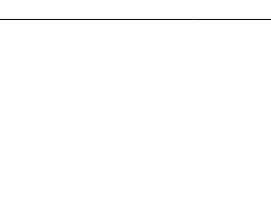
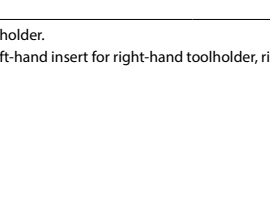
Whitworth fine thread: W

Nominal thread	TPI	Internal thread			Bore dia.				
		Toolholder	Insert						
			Partial profile	Full profile					
W9.5 TPI 24	24	SINR0816S-08E	08IR5501	-	8.30				
W10 TPI 24			EZTR060050-55-008		8.80				
W10.5 TPI 24			-		9.30				
W9.5 TPI 20	20	SINR0816S-08E	08IR5501	-	8.06				
W10 TPI 20			-		8.56				
W10.5 TPI 20			-		9.06				
W11 TPI 20			EZTR060050-55-008		9.56				
W11.5 TPI 20			EZTR080070-55-008		10.06				
W12 TPI 20			-		10.56				
W12.5 TPI 20			-		11.06				
W13 TPI 20	-	11.56							
W13.5 TPI 20	20	SINR1216S-11E	11IRA55 11IR55005	-	12.06				
W11 TPI 18	18	No tools available	-	-	9.40				
W11.5 TPI 18					9.90				
W12 TPI 18					10.40				
W12.5 TPI 18					10.90				
W14 TPI 18					12.40				
W14.5 TPI 18	18	SINR1216S-11E	11IRA55 11IR55005	-	12.90				
W15 TPI 18					13.40				
W16 TPI 18					14.40				
W13 TPI 16	16	No tools available	-	-	11.20				
W13.5 TPI 16					11.70				
W14 TPI 16	16	SINR1216S-11E	11IRA55 11IR55005	-	12.20				
W14.5 TPI 16					12.70				
W15 TPI 16					13.20				
W17 TPI 16	16	SINR1516S-11	-	-	15.20				
W18 TPI 16	16	SINR1616S-16	16IRAG55	(16IR16W-□□)	16.20				
W19 TPI 16			16IRG55		17.20				
W20 TPI 16			16IR5501 16IR5502		18.20				
W16 TPI 14	14	SINR1216S-11E	11IRA55 11IR55005	-	13.94				
W17 TPI 14					14.94				
W18 TPI 14	14	SINR1516S-11	-	-	15.94				
W21 TPI 14	14	SINR1616S-16	16IRAG55	(16IR14W-□□)	18.94				
W22 TPI 14					19.94				
W23 TPI 14	14	SINR2016S-16	16IRAG55 16IRG55 16IR5501 16IR5502	(16IR14W-□□)	20.94				
W24 TPI 14					21.94				
W25 TPI 14					22.94				
W26 TPI 14					23.94				
W19 TPI 12					12	SINR1616S-16	-	-	16.60
W20 TPI 12	17.60								
W21 TPI 12	18.60								
W22 TPI 12	19.60								
W28 TPI 12	12	SINR2420S-16	-	-					25.60
W30 TPI 12									27.60
W32 TPI 12	12	CINR3025S-16	16IRAG55 16IRG55 16IR5501 16IR5502	-					29.60
W34 TPI 12									31.60
W35 TPI 12									32.60
W36 TPI 12									33.60
W38 TPI 12					35.60				
W40 TPI 12					37.60				
W42 TPI 12					39.60				
W44 TPI 12	12	CINR3732S-16	-	-	41.60				
W45 TPI 12					42.60				
W46 TPI 12					43.60				
W48 TPI 12					45.60				
W50 TPI 12					47.60				
.					.				
.					.				
W23 TPI 10	10	SINR2016S-16	-	-	20.12				
W24 TPI 10					21.12				
W25 TPI 10					22.12				
W26 TPI 10					23.12				
W28 TPI 9	9	SINR2420S-16	16IRAG55 16IRG55	-	24.80				
W30 TPI 9					26.80				
W32 TPI 9					28.80				
W34 TPI 8	8	CINR3025S-16	-	-	30.40				
W35 TPI 8					31.40				
W36 TPI 8					32.40				
W38 TPI 8					34.40				
W40 TPI 8					36.40				
W42 TPI 8					38.40				
W44 TPI 7	7	CINR3732S-22	22IRN55	-	39.89				
W45 TPI 7					40.89				
W46 TPI 7					41.89				
W48 TPI 7					43.89				
W50 TPI 7					45.89				
W52 TPI 7	47.89								
W55 TPI 6	6	CINR3732S-22	22IRN55	-	50.20				
W58 TPI 6					53.20				
W60 TPI 6					55.20				
W62 TPI 6					57.20				
.					67.20				
W75 TPI 5	5	CINR3732S-22	22IRN55	-	69.24				
.					.				
.					.				
W105 TPI 5	4	No tools available	-	-	99.24				
W110 TPI 4					102.8				
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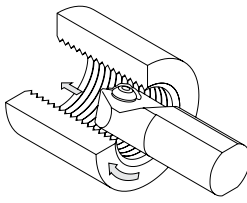
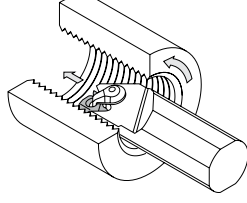
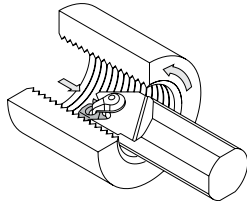
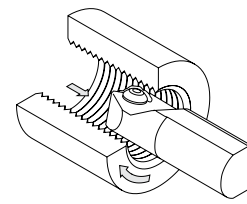

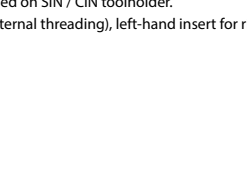

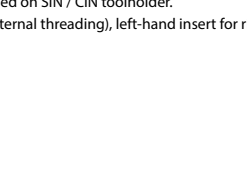
Threading

External threading (Left-hand thread / Right-hand thread)

		External thread													
Left-hand thread	Left-hand thread	<table border="1"> <tr><th>Toolholder</th><td>Left-hand</td></tr> <tr><th>Insert</th><td>Left-hand</td></tr> <tr><th>The direction of spindle revolution</th><td>M04</td></tr> </table> 	Toolholder	Left-hand	Insert	Left-hand	The direction of spindle revolution	M04	<table border="1"> <tr><th>Toolholder</th><td>Right-hand</td></tr> <tr><th>Insert</th><td>Right-hand</td></tr> <tr><th>The direction of spindle revolution</th><td>M03</td></tr> </table> 	Toolholder	Right-hand	Insert	Right-hand	The direction of spindle revolution	M03
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* These tables are based on KTN / KTNS / KTT / KTTX toolholder.

Internal threading (Left-hand thread / Right-hand thread)

		Internal thread													
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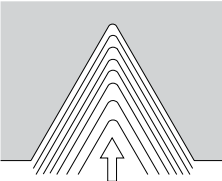
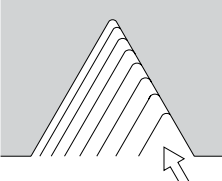
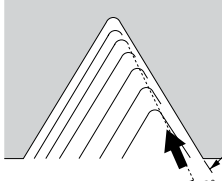
* These tables are based on SIN / CIN toolholder.

For KITG (for large Internal threading), left-hand insert for right-hand toolholder, right-hand insert for left-hand toolholder.



Threading

Infeed methods

Infeed methods	Features
 <p>Radial infeed</p>	<ul style="list-style-type: none"> • The most common threading method. The cutting edge moves toward the center of the workpiece every pass. • Suitable for relatively small pitch size threading. • V-shape chips are generated and chip control may be difficult depending on workpiece material.
 <p>Flank infeed</p>	<ul style="list-style-type: none"> • Suitable for large pitch size threading. • The wear on the right side edge of the figure (no ap) tends to become greater. • Chips flow to one side.
 <p>Modified flank infeed</p>	<ul style="list-style-type: none"> • Revised compound methods of the above flank infeed method. • No "no ap." condition. • Chips flow to one side.

Lead angle of thread

Thread's lead angle β as shown in Fig. 1 decides from the workpiece diameter "D" (Pitch dia.) And the lead "L" (In case of single-start thread, it is the same as pitch "TP"). By rolling a right-angled triangle around a cylinder and the angle ACB in Fig. 2 becomes the lead angle β . The calculation formula is shown as follows.

$$\tan\beta = \frac{L}{\pi D} = \frac{nTP}{\pi D}$$

β : Lead angle D: Pitch dia. n: Number of thread TP: Pitch
 L: Lead (In case of single-start thread, it is equal to TP. In case of n-start thread, it is equal to n x TP.)

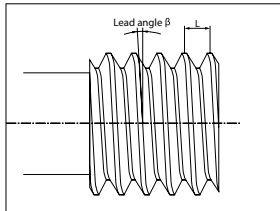


Fig. 1

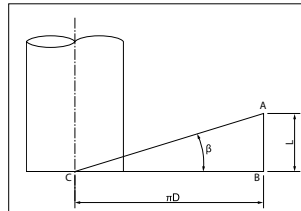


Fig. 2

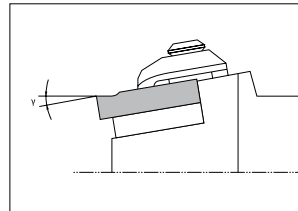


Fig. 3

Relief angle of thread

Against this lead angle, the threading insert requires side relief angle α . Negative type threading insert has no relief angle. When installing the negative type insert in the toolholder, the edge inclination angle γ (Fig. 3) is set, and at the same time front relief angle as well as side relief angle are generated to the insert. Side relief angle is described by the following formula. (Fig. 4)

$$\tan\alpha = \tan\gamma \times \tan\left(\frac{\theta}{2}\right)$$

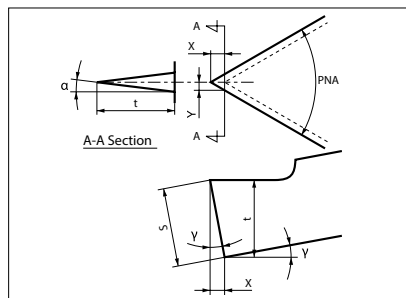


Fig. 4

Symbol	e.g.)
α : Side relief angle	
γ : Inclination angle after installing insert	External insert: 10° Internal insert: 15°
PNA: Insert's thread angle	Metric: 60° Tapered pipe: 55° 30° trapezoidal: 30°
S: Insert thickness	

$$\begin{cases} X=S \cdot \sin\gamma \\ Y=X \cdot \tan(\theta/2)=t \cdot \tan\alpha \\ t=S \cdot \cos\gamma \end{cases}$$

Table 1

Inserts	Side relief angle α	
	External	Internal
60° thread (M, UN, NPT)	5° 49'	8° 47'
55° thread (W, G, PT)	5° 14'	7° 56'
30° trapezoidal (Tr)	2° 43'	5° 7'

Ref. to Table 1 for the side relief angle depending on the insert type.

However, the side relief angle is set for 1° in the traveling direction by the toolholder itself, so that the actual side relief angle becomes $\alpha+1^\circ$.

Thread types & basic profile / Applicable toolholders & inserts

	Basic profile	Symbol (Previous symbol)	Type	Applicable inserts	Applicable toolholders
Metric		M e.g.) M30	External	○○E%○○○ISO(-TF/TQ) ○○ER□□60(-TF/TQ) 16ER60○○	KTN%○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
			Internal	TT43E%○○○M TT○○%60○○ TTX32R60○○	KTT%○○○○□-○○ KTTXR○○○○□-16F, S○○□-KTTXL16
Unified		UN UNC UNF UNEF e.g.) ¾-16 UNF	External	○○ER○○UN(-TF/TQ) ○○ER□□60(-TF/TQ) 16ER60○○	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
			Internal	TT○○%60○○ TTX32R60○○	KTT%○○○○□-○○ KTTXR○○○○□-16F, S○○□-KTTXL16
Parallel pipe		External: G(PF) Internal: G(PF) Rp(PS) e.g.) G ¾ (PF ¾)	External	○○ER○○W(-TF/TQ) ○○ER□□55 16ER55○○	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
			Internal	TT○○%55○○ TTX32R55○○	KTT%○○○○□-○○ KTTXR○○○○□-16F, S○○□-KTTXL16
Whitworth		W e.g.) W ¾	External	○○ER○○W(-TF/TQ) ○○ER□□55 16ER55○○	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
			Internal	TT○○%55○○ TTX32R55○○	KTT%○○○○□-○○ KTTXR○○○○□-16F, S○○□-KTTXL16
Tapered pipe		External: R(PT) (BSPT) Internal: Rc(PT) (BSPT) e.g.) R ½ (PT ½)	External	16ER○○BSPT(-TF/TQ)	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
			Internal	TT○○%55○○* TTX32R55○○*	KTT%○○○○□-○○ KTTXR○○○○□-16F, S○○□-KTTXL16
American national tapered pipe		NPT e.g.) ¾-18 NPT	External	16ER○○(○)NPT	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
			Internal	○○IR○○(○)NPT	SINR○○○○S-○○ CINR○○○○S-○○
30° Trapezoidal		Tr e.g.) Tr 26x3	External	○○ER○○○TR	KTNR○○○○□-○○ KTNSR○○○○□-16 S○○□-KTNL16
			Internal	○○IR○○○TR	SINR○○○○S-○○ CINR○○○○S-○○

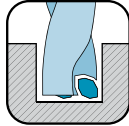
Above shows the usage example of applicable Toolholder / Insert.

* For the case when the thread root's corner-R(RE) can be smaller than the standard.









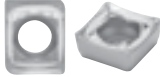
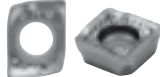


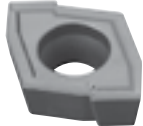


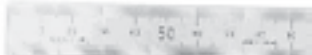
Threading

K



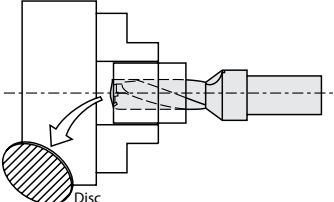
Introduction		K2
MagicDrill DRA		K4
Applicable drill heads	DRA drill heads (GM - General purpose)	K6
	DRA drill heads (FTP-H - for steel beam / FTP - Counterboring)	K9
	DRA drill heads (HQP - Precision / for Carbon steel)	K12
	DRA drill heads (HQS - For difficult-to-cut materials/stainless steel)	K15
Straight shank SS	SS-DRA 1.5 DC	K16
	SS-DRA 3 DC	K17
	SS-DRA 5 DC	K18
	SS-DRA 8 DC	K19
Chamfering attachment for SS-DRA	CH-DRA	K20
Flanged shank SF	SF-DRA 1.5 DC	K22
	SF-DRA 3 DC	K23
	SF-DRA 5 DC	K24
	SF-DRA 8 DC	K25
	SF-DRA 12 DC	K26
MagicDrill DRC		K32
MagicDrill DRV		K48
Applicable inserts	LCMT (outer edge)	K50
	SCMT (outer edge)	K51
	LCMT (inner edge)	K52
	SCMT (inner edge)	K53
Toolholder DRV	DRV 2 DC	K54
	DRV 3 DC	K56
	DRV 4 DC	K58
	DRV 5 DC	K60
	DRV 6 DC	K62
Chamfering attachment for DRV	DRV-CH	K66
Adjustable sleeve (DRV/DRZ)		K70
SHE type	SHE	K70
MagicDrill DRZ		K74
MagicDrill DRW for bigger diameter ($\varnothing 60 \sim \varnothing 100$ mm and more)		K88

Product lineup






Type	Shape	Drill dia. Drilling depth)	Cutting edge	Remarks
DRA K4	Screw clamp	$\phi 7.94 \sim \phi 25.50$ (1.5D) $\phi 7.94 \sim \phi 33.0$ (3D/5D/8D) $\phi 12 \sim \phi 25.5$ (12D)	Module type with double edges	Lineup  SS-DRA  SF-DRA  Chamfering attachment
DRC K32	Self-clamping	$\phi 7.94 \sim \phi 25.99$ (3D/5D/8D)	Module type with double edges	Lineup  SS-DRC  SF-DRC  Chamfering attachment
DRV K48	Silver coating	$\phi 12 \sim \phi 60$ (2D/3D/4D 5D/6D)	Individually designed Inner & outer edges  Outer edge  Inner edge	Chip shape (Workpiece material: C50) drill dia. $\phi 20$ Chip from outer edge  Chip from inner edge 
DRZ K74	DRZ	$\phi 13 \sim \phi 59$ (2D/3D) $\phi 13 \sim \phi 50$ (4D) $\phi 27 \sim \phi 50$ (5D)	Inner & outer edges on one insert 	Chip shape (Workpiece material: C50) drill dia. $\phi 23$ Chip from outer edge  Chip from inner edge 
DRZ-CR [Cartridge type] (Made to order) K83	DRZ-CR	$\phi 60 \sim$ (2D/3D/4D)		

K
Drilling

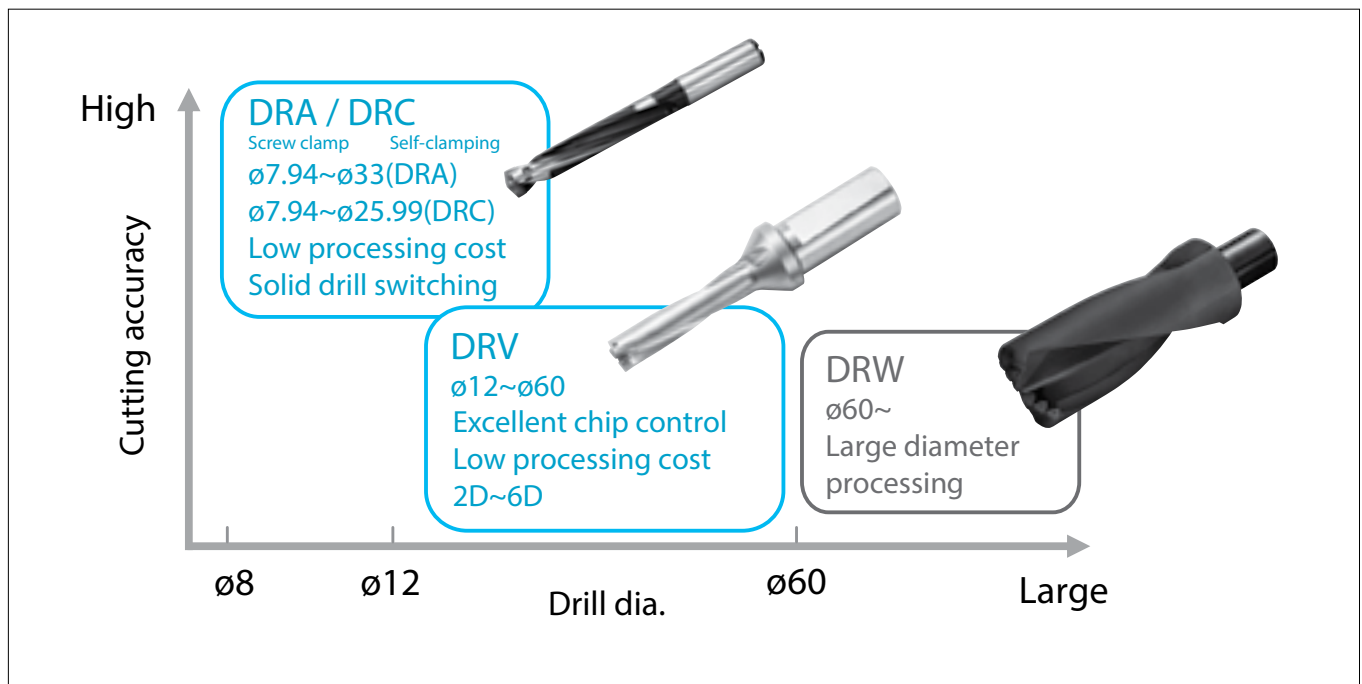
Caution



When drilling through the workpiece, a disk may be ejected. Proper machine guarding is necessary to prevent injury. The safety cover is necessary for the conventional lathe machines to prevent any accidents.

Type	Shape	Drill dia. Drilling depth)	Cutting edge	Remarks
<p>DRW (Made to order for some products)</p> <p> K88</p>		<p>ø60~ (1D/2D/3D)</p>	<p>Inner & outer edges on one insert</p> 	<p>Custom-order item</p>   <p>BT integral arbor type is also available</p> <p>Maximum drilling diameter is ø200.</p>

MagicDrill series application map



K



Drilling

High efficiency modular drill

MagicDrill DRA

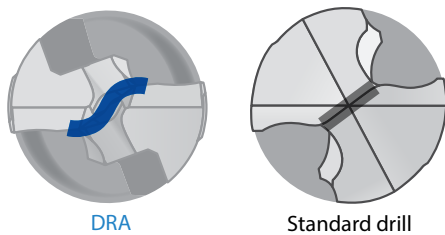
Excellent hole accuracy with a low cutting force design

5 advantages to solve common drilling difficulties

1 Low cutting force design improves hole accuracy

Special chisel edge with S-curve reduces thrust force and reduces vibration.

Cutting edge image



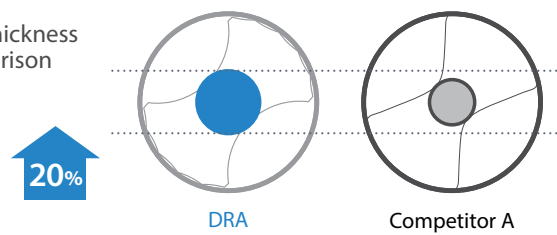
DRA

Standard drill

2 Optimal web thickness reduces deflection

Improved hole accuracy by controlling drill deflection with a 20% thicker web compared with Competitor A.

Web thickness comparison

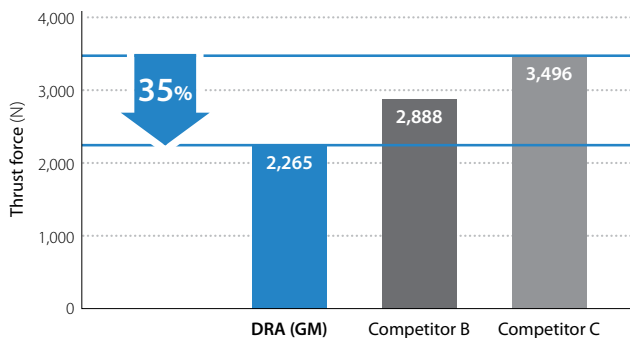


DRA

Competitor A

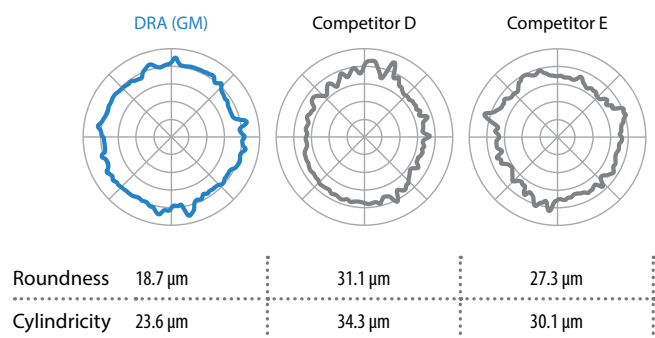
K

Cutting force comparison (Internal evaluation)



Cutting conditions: $V_c = 120$ m/min, $f = 0.25$ mm/rev
Drilling diameter $\phi 14$, $L/D = 5$, Drilling depth 45 mm, Wet, Workpiece material: C50

Roundness · Cylindricity comparison (Internal evaluation)



Cutting conditions: $V_c = 120$ m/min, $f = 0.3$ mm/rev
Drilling diameter $\phi 14$, $L/D = 5$, Measurement position 55 mm, Wet, Workpiece material: C50

3 Fine chip breaking even in deep hole drilling applications

Optimized chip thinning for stable chip evacuation.
Support groove with wider flute (5D, 8D) enables smooth chip evacuation.

Chip comparison (Internal evaluation)

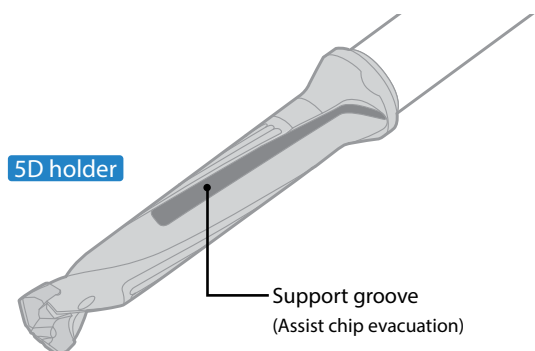


DRA (GM)

Competitor F

Competitor G

Cutting conditions: $V_c = 60$ m/min, $f = 0.2$ mm/rev, Drilling diameter $\phi 14$, $L/D = 5$
Drilling depth 70 mm, Wet, Workpiece material: X5CrNi1810

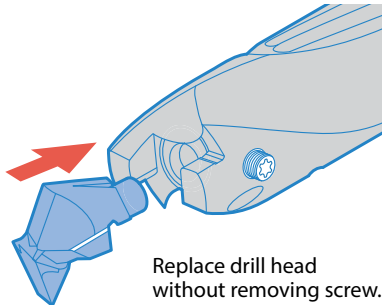


5D holder

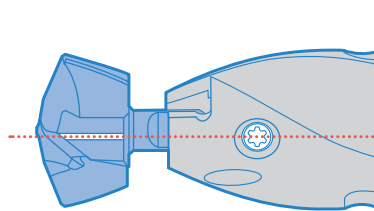
Support groove (Assist chip evacuation)

4 Easy drill head replacement

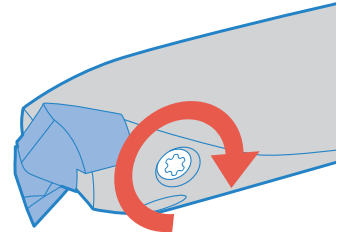
Replace drill head without removing screw.



Replace drill head without removing screw.



Install the drill head onto toolholder (Align drill head guide line with screw position).



Fix the drill head by tightening the screw.

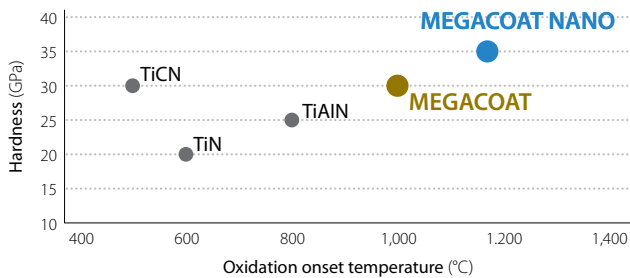
5 Long tool life and stable machining of various workpieces

MEGACOAT NANO grade PR1535 is used to machine various materials from steel to stainless steel, with the combination of a tough substrate and a special nano layer coating.

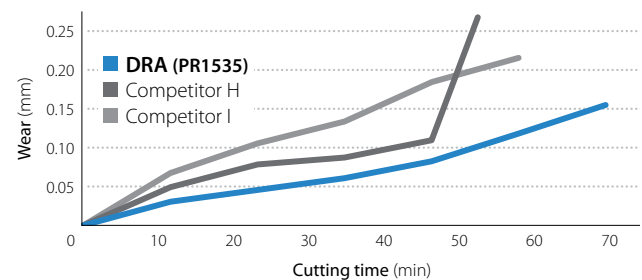
1st recommendation

Steel / Stainless steel PR1535	Cast iron PR1525
-----------------------------------	---------------------

Coating properties



Wear resistance comparison (Internal evaluation)



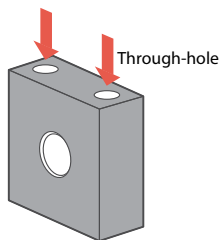
Cutting conditions: $V_c = 100$ m/min, $f = 0.25$ mm/rev
Drilling dia. $\phi 14$, L/D = 5, Drilling depth 45 mm, Wet, Workpiece material: 42CrMo4

K
Drilling

Case studies

Attachment ST44-2

$V_c = 70$ m/min ($n = 1,240$ min⁻¹)
 $f = 0.23$ mm/rev ($V_f = 285$ mm/min)
Drilling depth 100 mm
Wet (Internal coolant)
With center hole drilling
SF25-DRA180M-8
DA1800M-GM PR1535



Cutting time

DRA $\phi 18-8D$

45 sec

30%

Competitor J
 $\phi 18-7D$
(Modular drill)

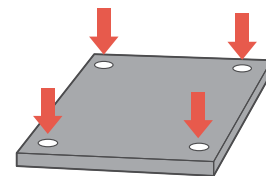
65 sec

Competitor J applied a peck cycle to avoid chip clogging.
DRA controlled chip evacuation without pecking.

(User evaluation)

Plate X5CrNi1810

$V_c = 60$ m/min ($n = 2,120$ min⁻¹)
 $f = 0.12$ mm/rev ($V_f = 254$ mm/min)
Drilling depth 15 mm
Wet (Internal coolant)
SS10-DRA090M-3
DA0900M-GM PR1535



Number of holes

DRA $\phi 9-3D$

500

5 times



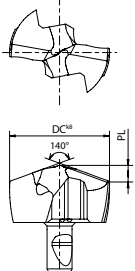
Competitor K
 $\phi 9-3D$
(Modular drill)

100


DRA extended the tool life by 5 times compared to Competitor K.
DRA maintained stable machining and excellent surface finish with less cutting noise.

(User evaluation)

DRA drill heads (GM - General purpose)

Drill head		Description	Dimension (mm)		Tolerance		Carbide		Applicable toolholder K16~K19 K22~K26		
			DC	PL	k8 (min.)	k8 (max.)	PVD	PR1525 PR1535			
							●	●	P		
							○	●	M		
							●	○	K		
							●	●	N		
 Drilling	  General purpose	DA 0794M-GM	7.94	1.34	0	+0.022	●	●	SF12-DRA080M-○ SS10-DRA080M-○		
		0800M-GM	8	1.35			●	●			
		0810M-GM	8.1	1.37			●	●			
		0820M-GM	8.2	1.38			●	●			
		0830M-GM	8.3	1.4			●	●			
		0840M-GM	8.4	1.42	●	●	0	+0.022	●	●	SF12-DRA085M-○ SS10-DRA085M-○
		DA 0850M-GM	8.5	1.44	●	●					
		0860M-GM	8.6	1.46	●	●					
		0870M-GM	8.7	1.48	●	●					
		0880M-GM	8.8	1.49	●	●					
		0890M-GM	8.9	1.51	●	●	0	+0.022	●	●	SF12-DRA090M-○ SS10-DRA090M-○
		DA 0900M-GM	9	1.52	●	●					
		0910M-GM	9.1	1.54	●	●					
		0920M-GM	9.2	1.56	●	●					
		0930M-GM	9.3	1.58	●	●					
		0940M-GM	9.4	1.59	●	●	0	+0.022	●	●	SF12-DRA095M-○ SS10-DRA095M-○
		DA 0950M-GM	9.5	1.61	●	●					
		0960M-GM	9.6	1.63	●	●					
		0970M-GM	9.7	1.65	●	●					
		0980M-GM	9.8	1.67	●	●					
		0990M-GM	9.9	1.68	●	●	0	+0.027	●	●	SF16-DRA100M-○ SS12-DRA100M-○
		DA 1000M-GM	10	1.7	●	●					
		1010M-GM	10.1	1.72	●	●					
		1020M-GM	10.2	1.74	●	●					
		1030M-GM	10.3	1.75	●	●					
		1040M-GM	10.4	1.77	●	●	0	+0.027	●	●	SF16-DRA105M-○ SS12-DRA105M-○
		DA 1050M-GM	10.5	1.79	●	●					
		1060M-GM	10.6	1.81	●	●					
1070M-GM	10.7	1.83	●	●							
1080M-GM	10.8	1.85	●	●							
1090M-GM	10.9	1.86	●	●	0	+0.027	●	●	SF16-DRA110M-○ SS12-DRA110M-○		
DA 1100M-GM	11	1.87	●	●							
1110M-GM	11.1	1.89	●	●							
1120M-GM	11.2	1.91	●	●							
1130M-GM	11.3	1.92	●	●							
1140M-GM	11.4	1.94	●	●	0	+0.027	●	●	SF16-DRA115M-○ SS12-DRA115M-○		
DA 1150M-GM	11.5	1.96	●	●							
1160M-GM	11.6	1.98	●	●							
1170M-GM	11.7	2	●	●							
1180M-GM	11.8	2.01	●	●							
1190M-GM	11.9	2.03	●	●	0	+0.027	●	●	SF16-DRA120M-○ SS14-DRA120M-○		
DA 1200M-GM	12	2.03	●	●							
1210M-GM	12.1	2.05	●	●							
1220M-GM	12.2	2.07	●	●							
1230M-GM	12.3	2.08	●	●							
1240M-GM	12.4	2.1	●	●							


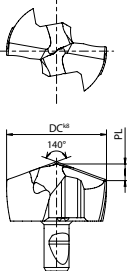
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions  K28

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes

DRA drill heads (GM - General purpose)

Drill head		Description		Dimension (mm)		Tolerance		Carbide	Applicable toolholder K16~K19 K22~K26
				DC	PL	k8 (min.)	k8 (max.)		
				Carbon steel / Alloy steel				●	P
				Mold and die steel				○	
				Stainless steel				●	M
				Cast iron				○	K
				Non-ferrous metals				●	N
  General purpose	DA	1250M-GM 1260M-GM 1270M-GM 1280M-GM 1290M-GM	12.5 12.6 12.7 12.8 12.9	2.12 2.14 2.16 2.17 2.19	0	+0.027	●●●●●	SF16-DRA125M-○ SS14-DRA125M-○	
	DA	1300M-GM 1310M-GM 1320M-GM 1330M-GM 1340M-GM	13 13.1 13.2 13.3 13.4	2.2 2.22 2.24 2.25 2.27	0	+0.027	●●●●●	SF16-DRA130M-○ SS14-DRA130M-○	
	DA	1350M-GM 1360M-GM 1370M-GM 1380M-GM 1390M-GM	13.5 13.6 13.7 13.8 13.9	2.29 2.31 2.33 2.35 2.36	0	+0.027	●●●●●	SF16-DRA135M-○ SS14-DRA135M-○	
	DA	1400M-GM 1410M-GM 1420M-GM 1430M-GM 1440M-GM	14 14.1 14.2 14.3 14.4	2.33 2.34 2.36 2.38 2.4	0	+0.027	●●●●●	SF16-DRA140M-○ SS16-DRA140M-○	
	DA	1450M-GM 1460M-GM 1470M-GM 1480M-GM 1490M-GM	14.5 14.6 14.7 14.8 14.9	2.42 2.43 2.45 2.47 2.49	0	+0.027	●●●●●	SF16-DRA145M-○ SS16-DRA145M-○	
	DA	1500M-GM 1510M-GM 1520M-GM 1530M-GM 1540M-GM 1550M-GM 1560M-GM 1570M-GM 1580M-GM 1590M-GM	15 15.1 15.2 15.3 15.4 15.5 15.6 15.7 15.8 15.9	2.52 2.54 2.55 2.57 2.59 2.61 2.63 2.65 2.66 2.68	0	+0.027	●●●●●	SF20-DRA150M-○ SS16-DRA150M-○	
	DA	1600M-GM 1610M-GM 1620M-GM 1630M-GM 1640M-GM 1650M-GM 1660M-GM 1670M-GM 1680M-GM 1690M-GM	16 16.1 16.2 16.3 16.4 16.5 16.6 16.7 16.8 16.9	2.69 2.71 2.73 2.75 2.76 2.78 2.8 2.82 2.84 2.86	0	+0.027	●●●●●	SF20-DRA160M-○ SS18-DRA160M-○	

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.



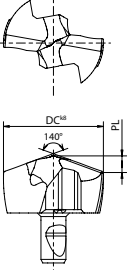

Recommended cutting conditions ☉ K28

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability


DA drill heads are sold in 1 piece boxes



DRA drill heads (GM - General purpose)

Drill head		Description		Dimension (mm)		Tolerance		Carbide		Applicable toolholder K16~K19 K22~K26
				DC	PL	k8 (min.)	k8 (max.)	PVD	PR1525 PR1535	
								●	○	P
								○	●	M
								●	○	K
								○	●	N
 <p>Drilling</p>   <p>General purpose</p>	 <p>Drilling</p>	DA	1700M-GM 1710M-GM 1720M-GM 1730M-GM 1740M-GM 1750M-GM 1760M-GM 1770M-GM 1780M-GM 1790M-GM	17 17.1 17.2 17.3 17.4 17.5 17.6 17.7 17.8 17.9	2.86 2.88 2.9 2.92 2.93 2.95 2.97 2.99 3.01 3.03	0	+0.027	●	○	SF20-DRA170M-○ SS18-DRA170M-○
		DA	1800M-GM 1810M-GM 1820M-GM 1830M-GM 1840M-GM 1850M-GM 1860M-GM 1870M-GM 1880M-GM 1890M-GM	18 18.1 18.2 18.3 18.4 18.5 18.6 18.7 18.8 18.9	3.04 3.06 3.07 3.09 3.11 3.13 3.15 3.17 3.18 3.2	0	+0.027 +0.033 +0.033 +0.033 +0.033 +0.033 +0.033 +0.033 +0.033 +0.033	●	○	SF25-DRA180M-○ SS20-DRA180M-○
		DA	1900M-GM 1910M-GM 1920M-GM 1930M-GM 1940M-GM 1950M-GM 1960M-GM 1970M-GM 1980M-GM 1990M-GM	19 19.1 19.2 19.3 19.4 19.5 19.6 19.7 19.8 19.9	3.21 3.23 3.25 3.27 3.29 3.3 3.32 3.34 3.36 3.38	0	+0.033	●	○	SF25-DRA190M-○ SS20-DRA190M-○
		DA	2000M-GM 2010M-GM 2020M-GM 2030M-GM 2040M-GM 2050M-GM 2060M-GM 2070M-GM 2080M-GM 2090M-GM	20 20.1 20.2 20.3 20.4 20.5 20.6 20.7 20.8 20.9	3.37 3.39 3.41 3.43 3.45 3.46 3.48 3.5 3.52 3.54	0	+0.033	●	○	SF25-DRA200M-○ SS25-DRA200M-○
		DA	2100M-GM 2150M-GM	21 21.5	3.54 3.63	0	+0.033	●	○	SF25-DRA210M-○ SS25-DRA210M-○
		DA	2200M-GM 2250M-GM	22 22.5	3.71 3.8	0	+0.033	●	○	SF25-DRA220M-○ SS25-DRA220M-○
		DA	2300M-GM 2350M-GM	23 23.5	3.87 3.96	0	+0.033	●	○	SF25-DRA230M-○ SS25-DRA230M-○
		DA	2400M-GM 2450M-GM	24 24.5	4.04 4.13	0	+0.033	●	○	SF25-DRA240M-○ SS25-DRA240M-○
		DA	2500M-GM 2550M-GM	25 25.5	4.2 4.29	0	+0.033	●	○	SF25-DRA250M-○ SS32-DRA250M-○
		DA	2600M-GM 2650M-GM	26 26.5	4.8 4.9	0	+0.033	●	○	SF32-DRA260M-○


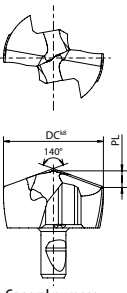
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions  K28

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes

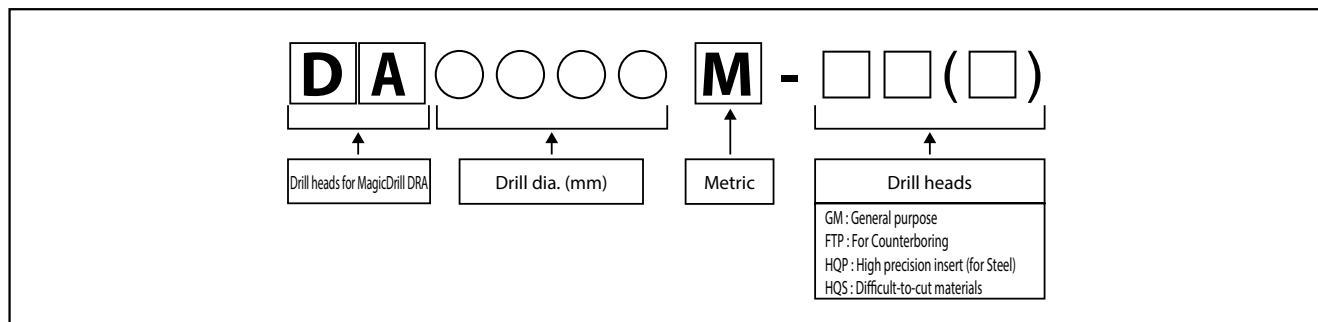
DRA drill heads (GM - General purpose)

		Carbon steel / Alloy steel		●		○		P	
		Mold and die steel							
		Stainless steel		●		○		M	
		Cast iron		●		○		K	
		Non-ferrous metals						N	
Drill head	Description	Dimension (mm)		Tolerance		Carbide		Applicable toolholder ● K23~K25	
		DC	PL	k8 (min.)	k8 (max.)	PVD	PR1525 : PR1535		
  General purpose	DA 2700M-GM	27	4.99	0	+0.033	●	●	SF32-DRA270M-○	
	DA 2750M-GM	27.5	5.09			●	●		
	DA 2800M-GM	28	4.73	0	+0.033	●	●	SF32-DRA280M-○	
	DA 2850M-GM	28.5	4.83			●	●		
	DA 2900M-GM	29	4.9	0	+0.033	●	●	SF32-DRA290M-○	
	DA 2950M-GM	29.5	5.01			●	●		
	DA 3000M-GM	30	5.07	0	+0.033	●	●	SF32-DRA300M-○	
	DA 3050M-GM	30.5	5.17		+0.039	●	●		
	DA 3100M-GM	31	5.26	0	+0.039	●	●	SF32-DRA310M-○	
	DA 3150M-GM	31.5	5.37			●	●		
DA 3200M-GM	32	5.41	0	+0.039	●	●	SF32-DRA320M-○		
DA 3250M-GM	32.5	5.51			●	●			
DA 3300M-GM	33	5.62			●	●			


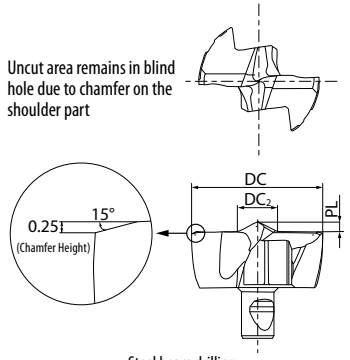
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ● K28

Description Identification System (Drill head)



DRA drill heads (FTP-H - steel beam drilling)

		Carbon steel / Alloy steel		●		○		P	
		Mold and die steel							
		Stainless steel		●		○		M	
		Cast iron		●		○		K	
		Non-ferrous metals						N	
Drill head	Description	Dimension (mm)			Tolerance		Carbide		Applicable toolholder ● K23~K25
		DC	DC ₂	PL	k8 (min.)	k8 (max.)	PVD	PR1535	
  Steel beam drilling	DA 1400M-FTP-H	14	4.20	0.60			●	SS16-DRA140M-○ SF16-DRA140M-○	
	DA 1600M-FTP-H	16	4.60	0.70	0	+0.027	●	SS18-DRA160M-○ SF20-DRA160M-○	
	DA 1800M-FTP-H	18	5.00	0.80			●	SS20-DRA180M-○ SF25-DRA180M-○	
	DA 2000M-FTP-H	20	5.70	0.90			●	SS25-DRA200M-○ SF25-DRA200M-○	
	DA 2100M-FTP-H	21	6.00	0.95			●	SS25-DRA210M-○ SF25-DRA210M-○	
	DA 2200M-FTP-H	22	6.40	1.00	0	+0.033	●	SS25-DRA220M-○ SF25-DRA220M-○	
	DA 2400M-FTP-H	24	6.80	1.10			●	SS25-DRA240M-○ SF25-DRA240M-○	
	DA 2600M-FTP-H	26	7.00	1.20			●	SF25-DRA250M-○ SS32-DRA250M-○	

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Applicable to 1.5D, 3D, 5D and 8D holders, Prepared hole (0.5 x DC) is needed when using 8D holder

Please note that the insert DA2600M-FTP-H should be mounted on toolholder size S...-DRA250M-○ type only.

Recommended cutting conditions ● K28

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes

Double margin type

High-precision drill heads for steel machining

HQP

Special two-step bottom and double margin
Reduces shock for higher-precision machining of steel

PR1525
Drilling diameter $\phi 7.94 \sim \phi 19.9$



For difficult-to-cut materials/ stainless steel machining

HQS

Special two-step bottom and double margin
Improving stability of difficult-to-cut materials and stainless steel during machining operations

PR1535
Drilling diameter $\phi 8.00 \sim \phi 19.5$



Special two-step bottom



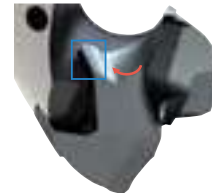
Suppress sudden fracture when entering the workpiece
Improvement of cutting edge strength

Double margin



Optimized for difficult-to-cut materials machining
Improvement of heat resistance

Unique flute shape

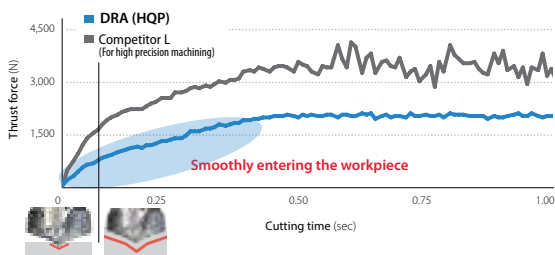


Superior chip control
Prevents damage to hole walls.
Excellent finished surface

High-precision drill heads for steel machining

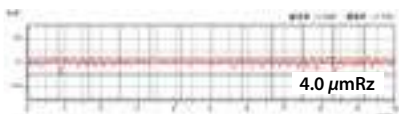
HQP

Cutting force comparison when entering the workpiece
(Internal evaluation)



Cutting conditions: $V_c = 100$ m/min, $f = 0.25$ mm/rev, $H = 30$ mm, Wet
Workpiece material: C50 $\phi 16$ (3D)

Hole wall surface finish comparison
(Internal evaluation)



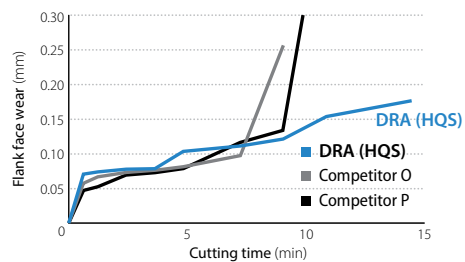
Cutting conditions: $V_c = 100$ m/min, $f = 0.25$ mm/rev, $H = 80$ mm, Wet
Workpiece material: C50 $\phi 16$ (3D)

For difficult-to-cut materials/ stainless steel machining

HQS



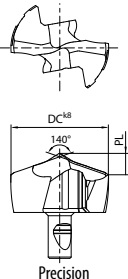
Inconel

Wear resistance comparison (Internal evaluation)




Cutting conditions: $V_c = 20$ m/min, $f = 0.15$ mm/rev, Drilling diameter $\phi 14.5$ (3D)
Drilling depth 40 mm, Wet (internal/external), Workpiece material: Inconel 718, BT50 M/C

DRA drill heads (HQP - Precision / for Carbon steel)

Drill head		Description		Dimension (mm)		Tolerance		Carbide	Applicable toolholder K16~K19 K22~K26
				DC	PL	k8 (min.)	k8 (max.)			PVD	PR1525
				Carbon steel / Alloy steel				●	P
				Mold and die steel					
				Stainless steel				●	M
				Cast iron				●	K
				Non-ferrous metals				●	N
 Drilling	  Precision	DA	0794M-HQP	7.94	1.9	0	+0.022	●	SF12-DRA080M-○ SS10-DRA080M-○
			0800M-HQP	8	1.91				
			0810M-HQP	8.1	1.93				
			0820M-HQP	8.2	1.94				
			0830M-HQP	8.3	1.96				
			0840M-HQP	8.4	1.98				
		DA	0850M-HQP	8.5	1.99	0	+0.022	●	SF12-DRA085M-○ SS10-DRA085M-○
			0860M-HQP	8.6	2.01				
			0870M-HQP	8.7	2.03				
			0880M-HQP	8.8	2.05				
			0890M-HQP	8.9	2.06				
		DA	0900M-HQP	9	2.19	0	+0.022	●	SF12-DRA090M-○ SS10-DRA090M-○
			0910M-HQP	9.1	2.21				
			0920M-HQP	9.2	2.22				
			0930M-HQP	9.3	2.24				
			0940M-HQP	9.4	2.26				
		DA	0950M-HQP	9.5	2.27	0	+0.022	●	SF12-DRA095M-○ SS10-DRA095M-○
			0960M-HQP	9.6	2.29				
			0970M-HQP	9.7	2.31				
			0980M-HQP	9.8	2.32				
	0990M-HQP	9.9	2.34						
DA	1000M-HQP	10	2.35	0	+0.022 +0.027 +0.027 +0.027 +0.027	●	SF16-DRA100M-○ SS12-DRA100M-○		
	1010M-HQP	10.1	2.36						
	1020M-HQP	10.2	2.38						
	1030M-HQP	10.3	2.4						
	1040M-HQP	10.4	2.41						
DA	1050M-HQP	10.5	2.43	0	+0.027	●	SF16-DRA105M-○ SS12-DRA105M-○		
	1060M-HQP	10.6	2.44						
	1070M-HQP	10.7	2.46						
	1080M-HQP	10.8	2.47						
	1090M-HQP	10.9	2.49						
DA	1100M-HQP	11	2.65	0	+0.027	●	SF16-DRA110M-○ SS12-DRA110M-○		
	1110M-HQP	11.1	2.67						
	1120M-HQP	11.2	2.68						
	1130M-HQP	11.3	2.7						
	1140M-HQP	11.4	2.72						
DA	1150M-HQP	11.5	2.73	0	+0.027	●	SF16-DRA115M-○ SS12-DRA115M-○		
	1160M-HQP	11.6	2.75						
	1170M-HQP	11.7	2.76						
	1180M-HQP	11.8	2.78						
	1190M-HQP	11.9	2.8						
DA	1200M-HQP	12	2.79	0	+0.027	●	SF16-DRA120M-○ SS14-DRA120M-○		
	1210M-HQP	12.1	2.81						
	1220M-HQP	12.2	2.82						
	1230M-HQP	12.3	2.84						
	1240M-HQP	12.4	2.86						
DA	1250M-HQP	12.5	2.87	0	+0.027	●	SF16-DRA125M-○ SS14-DRA125M-○		
	1260M-HQP	12.6	2.89						
	1270M-HQP	12.7	2.91						
	1280M-HQP	12.8	2.92						
	1290M-HQP	12.9	2.94						


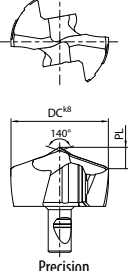
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions  K29

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes

DRA drill heads (HQP - Precision / for Carbon steel)

Drill head		Description		Dimension (mm)		Tolerance		Carbide	Applicable toolholder K16~K19 K22~K26
				DC	PL	k8 (min.)	k8 (max.)			PVD	PR1525
				Carbon steel / Alloy steel				●	P
				Mold and die steel					
				Stainless steel				●	M
				Cast iron				●	K
				Non-ferrous metals				●	N
		DA	1300M-HQP 1310M-HQP 1320M-HQP 1330M-HQP 1340M-HQP	13 13.1 13.2 13.3 13.4	2.98 2.99 3.01 3.02 3.04	0	+0.027	● ● ● ● ●	SF16-DRA130M-○ SS14-DRA130M-○
		DA	1350M-HQP 1360M-HQP 1370M-HQP 1380M-HQP 1390M-HQP	13.5 13.6 13.7 13.8 13.9	3.06 3.07 3.09 3.1 3.12	0	+0.027	● ● ● ● ●	SF16-DRA135M-○ SS14-DRA135M-○
		DA	1400M-HQP 1410M-HQP 1420M-HQP 1430M-HQP 1440M-HQP	14 14.1 14.2 14.3 14.4	3.11 3.12 3.14 3.16 3.17	0	+0.027	● ● ● ● ●	SF16-DRA140M-○ SS16-DRA140M-○
		DA	1450M-HQP 1460M-HQP 1470M-HQP 1480M-HQP 1490M-HQP	14.5 14.6 14.7 14.8 14.9	3.19 3.21 3.22 3.24 3.25	0	+0.027	● ● ● ● ●	SF16-DRA145M-○ SS16-DRA145M-○
		DA	1500M-HQP 1510M-HQP 1520M-HQP 1530M-HQP 1540M-HQP 1550M-HQP 1560M-HQP 1570M-HQP 1580M-HQP 1590M-HQP	15 15.1 15.2 15.3 15.4 15.5 15.6 15.7 15.8 15.9	3.33 3.35 3.36 3.38 3.39 3.41 3.42 3.44 3.46 3.47	0	+0.027	● ● ● ● ● ● ● ● ● ●	SF20-DRA150M-○ SS16-DRA150M-○
		DA	1600M-HQP 1610M-HQP 1620M-HQP 1630M-HQP 1640M-HQP 1650M-HQP 1660M-HQP 1670M-HQP 1680M-HQP 1690M-HQP	16 16.1 16.2 16.3 16.4 16.5 16.6 16.7 16.8 16.9	3.55 3.57 3.58 3.6 3.62 3.63 3.65 3.66 3.68 3.69	0	+0.027	● ● ● ● ● ● ● ● ● ●	SF20-DRA160M-○ SS18-DRA160M-○
		DA	1700M-HQP 1710M-HQP 1720M-HQP 1730M-HQP 1740M-HQP 1750M-HQP 1760M-HQP 1770M-HQP 1780M-HQP 1790M-HQP	17 17.1 17.2 17.3 17.4 17.5 17.6 17.7 17.8 17.9	3.73 3.75 3.77 3.78 3.8 3.81 3.83 3.84 3.86 3.88	0	+0.027	● ● ● ● ● ● ● ● ● ●	SF20-DRA170M-○ SS18-DRA170M-○

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.


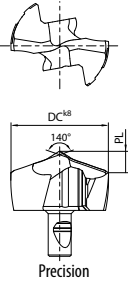
Recommended cutting conditions → K29

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes



DRA drill heads (HQP - Precision / for Carbon steel)

Drill head		Description		Dimension (mm)		Tolerance		Carbide	Applicable toolholder K16~K19 K22~K26
				DC	PL	k8 (min.)	k8 (max.)		
								●	P
								●	M
								●	K
								●	N
		DA	1800M-HQP	18	3.97	0	+0.027	●	SF25-DRA180M-○ SS20-DRA180M-○
			1810M-HQP	18.1	3.98			●	
			1820M-HQP	18.2	4			●	
			1830M-HQP	18.3	4.02			●	
			1840M-HQP	18.4	4.03			●	
			1850M-HQP	18.5	4.05			●	
			1860M-HQP	18.6	4.06			●	
			1870M-HQP	18.7	4.08			●	
			1880M-HQP	18.8	4.09			●	
			1890M-HQP	18.9	4.11			●	
		DA	1900M-HQP	19	4.2	0	+0.033	●	SF25-DRA190M-○ SS20-DRA190M-○
			1910M-HQP	19.1	4.22			●	
			1920M-HQP	19.2	4.23			●	
			1930M-HQP	19.3	4.25			●	
			1940M-HQP	19.4	4.26			●	
			1950M-HQP	19.5	4.28			●	
			1960M-HQP	19.6	4.29			●	
			1970M-HQP	19.7	4.31			●	
			1980M-HQP	19.8	4.33			●	
			1990M-HQP	19.9	4.34			●	

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions ➔ K29

K



Drilling

DRA

DRC

DRV


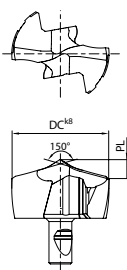
DRZ

DRW

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes

DRA drill heads (HQS - For difficult-to-cut materials / stainless steel)

Drill head		Description		Dimension (mm)		Tolerance		Carbide	Applicable toolholder K16~K19 K22~K26
				DC	PL	k8 (min.)	k8 (max.)			PVD	PR1535
				Carbon steel / Alloy steel					P
				Mold and die steel					
				Stainless steel				●	M
				Cast iron					K
				Non-ferrous metals					N
  <p>Difficult-to-cut materials</p>	DA	0800M-HQS 0820M-HQS	8 8.2	1.76 1.78	0	+0.022	●	SF12-DRA080M-○ SS10-DRA080M-○	
	DA	0850M-HQS 0870M-HQS 0880M-HQS	8.5 8.7 8.8	1.82 1.85 1.86	0	+0.022	●	SF12-DRA085M-○ SS10-DRA085M-○	
	DA	0900M-HQS 0930M-HQS 0940M-HQS	9 9.3 9.4	1.97 2.01 2.02	0	+0.022	●	SF12-DRA090M-○ SS10-DRA090M-○	
	DA	0950M-HQS 0970M-HQS 0980M-HQS	9.5 9.7 9.8	2.03 2.05 2.06	0	+0.022	●	SF12-DRA095M-○ SS10-DRA095M-○	
	DA	1000M-HQS 1030M-HQS 1040M-HQS	10 10.3 10.4	2.17 2.21 2.22	0	+0.022 +0.027 +0.027	●	SF16-DRA100M-○ SS12-DRA100M-○	
	DA	1050M-HQS 1080M-HQS	10.5 10.8	2.23 2.27	0	+0.027	●	SF16-DRA105M-○ SS12-DRA105M-○	
	DA	1100M-HQS	11	2.38	0	+0.027	●	SF16-DRA110M-○ SS12-DRA110M-○	
	DA	1150M-HQS	11.5	2.44	0	+0.027	●	SF16-DRA115M-○ SS12-DRA115M-○	
	DA	1200M-HQS	12	2.5	0	+0.027	●	SF16-DRA120M-○ SS14-DRA120M-○	
	DA	1250M-HQS 1260M-HQS	12.5 12.6	2.57 2.58	0	+0.027	●	SF16-DRA125M-○ SS14-DRA125M-○	
	DA	1300M-HQS	13	2.68	0	+0.027	●	SF16-DRA130M-○ SS14-DRA130M-○	
	DA	1350M-HQS 1390M-HQS	13.5 13.9	2.74 2.78	0	+0.027	●	SF16-DRA135M-○ SS14-DRA135M-○	
	DA	1400M-HQS 1420M-HQS	14 14.2	2.79 2.81	0	+0.027	●	SF16-DRA140M-○ SS16-DRA140M-○	
	DA	1450M-HQS	14.5	2.85	0	+0.027	●	SF16-DRA145M-○ SS16-DRA145M-○	
	DA	1500M-HQS 1520M-HQS 1530M-HQS 1550M-HQS 1570M-HQS	15 15.2 15.3 15.5 15.7	2.96 2.99 3 3.02 3.04	0	+0.027	●	SF20-DRA150M-○ SS16-DRA150M-○	
	DA	1600M-HQS 1610M-HQS 1620M-HQS 1630M-HQS 1650M-HQS	16 16.1 16.2 16.3 16.5	3.18 3.2 3.21 3.22 3.25	0	+0.027	●	SF20-DRA160M-○ SS18-DRA160M-○	
	DA	1700M-HQS 1750M-HQS 1770M-HQS	17 17.5 17.7	3.38 3.44 3.46	0	+0.027	●	SF20-DRA170M-○ SS18-DRA170M-○	
	DA	1800M-HQS 1810M-HQS 1850M-HQS	18 18.1 18.5	3.59 3.6 3.65	0	+0.027 +0.033 +0.033	●	SF25-DRA180M-○ SS20-DRA180M-○	
	DA	1900M-HQS 1930M-HQS 1950M-HQS	19 19.3 19.5	3.79 3.82 3.84	0	+0.033	●	SF25-DRA190M-○ SS20-DRA190M-○	

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

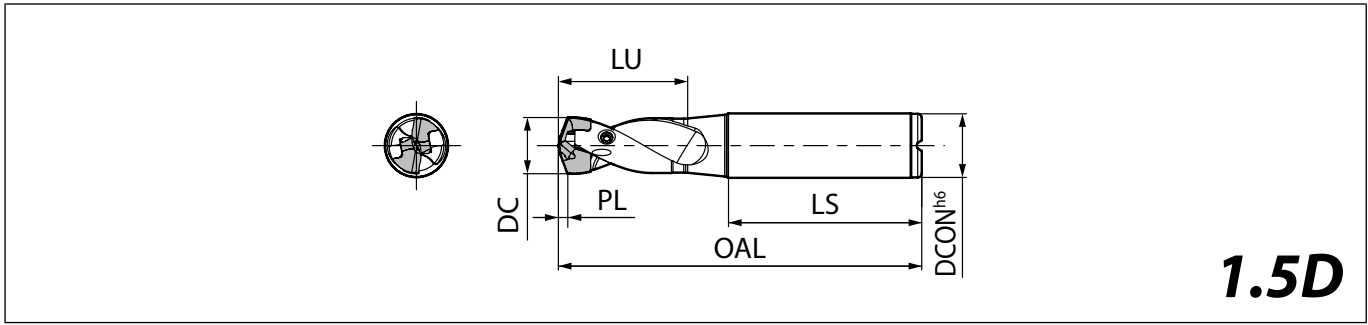
Recommended cutting conditions → K29

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DA drill heads are sold in 1 piece boxes



SS-DRA (Drilling depth : 1.5 x DC)

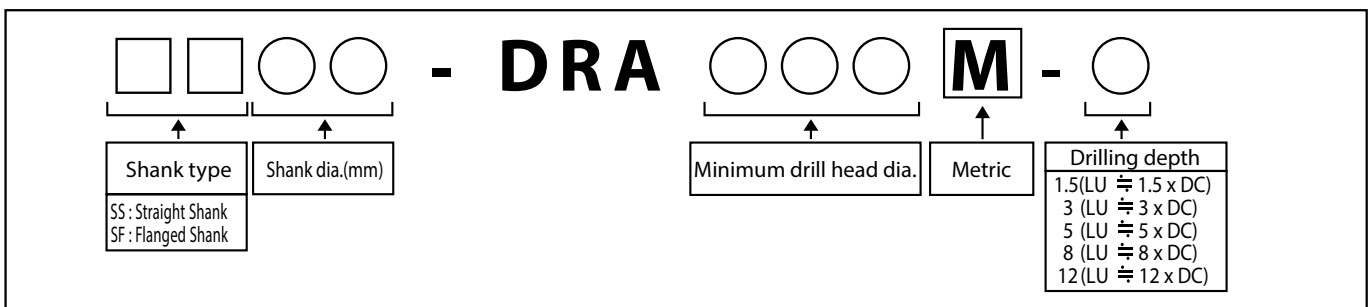


For PL indicates distance from drill point to corner edge K6~K15

Toolholder dimensions

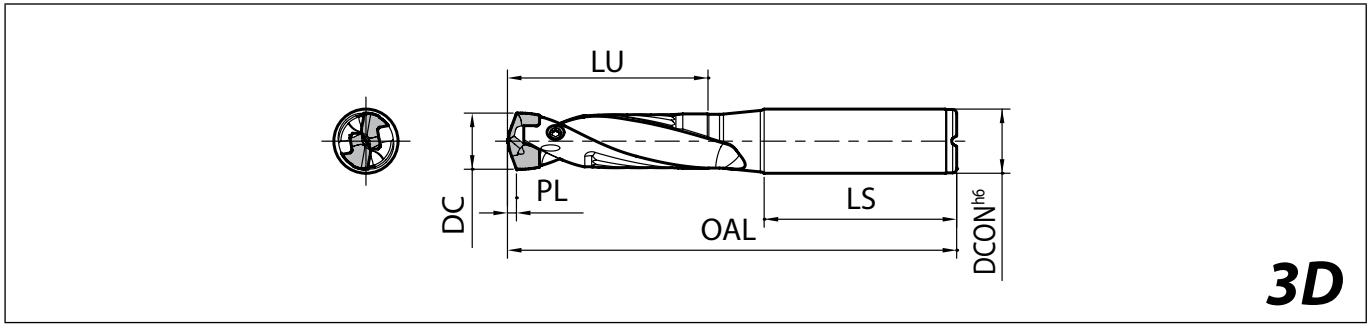
Description	Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads K6~K15	Applicable chamfering attachment K20
		DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
SS10- DRA080M-1.5 DRA085M-1.5 DRA090M-1.5 DRA095M-1.5	●	7.94	8.49	10	66.2	12.8	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	●	8.5	8.99		67.5	13.5						DA0850M-...~DA0890M-...	
	●	9	9.49		68.7	14.3						DA0900M-...~DA0940M-...	
	●	9.5	9.99		70	15						DA0950M-...~DA0990M-...	
SS12- DRA100M-1.5 DRA105M-1.5 DRA110M-1.5 DRA115M-1.5	●	10	10.49	12	76.2	15.8	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	●	10.5	10.99		77.5	16.5						DA1050M-...~DA1090M-...	
	●	11	11.49		79.7	17.3						DA1100M-...~DA1140M-...	
	●	11.5	11.99		81	18						DA1150M-...~DA1190M-...	
SS14- DRA120M-1.5 DRA125M-1.5 DRA130M-1.5 DRA135M-1.5	●	12	12.49	14	82.2	18.8	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	●	12.5	12.99		83.5	19.5						DA1250M-...~DA1290M-...	
	●	13	13.49		84.7	20.3						DA1300M-...~DA1340M-...	
	●	13.5	13.99		86	21						DA1350M-...~DA1390M-...	
SS16- DRA140M-1.5 DRA145M-1.5 DRA150M-1.5	●	14	14.49	16	90.2	21.8	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	●	14.5	14.99		91.5	22.5						DA1450M-...~DA1490M-...	
	●	15	15.99		95	24						DA1500M-...~DA1590M-...	
SS18- DRA160M-1.5 DRA170M-1.5	●	16	16.99	18	98.5	25.5	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	●	17	17.99		101	27						DA1700M-...~DA1790M-...	
SS20- DRA180M-1.5 DRA190M-1.5	●	18	18.99	20	106.5	28.5	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...	S32-CH20-DRA
	●	19	19.99		109	30						DA1900M-...~DA1990M-...	
SS25- DRA200M-1.5 DRA210M-1.5 DRA220M-1.5 DRA230M-1.5 DRA240M-1.5	●	20	20.99	25	117.5	31.5	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	●	21	21.99		120	33						DA2100M-...~DA2150M-...	
	●	22	22.99		123.5	34.5						DA2200M-...~DA2250M-...	
	●	23	23.99		126	36						DA2300M-...~DA2350M-...	
	●	24	24.99		128.5	37.5						DA2400M-...~DA2450M-...	
SS32- DRA250M-1.5	●	25	25.5	32	135	39	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

Description Identification System (Toolholder)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SS-DRA (Drilling depth : 3 x DC)



For PL indicates distance from drill point to corner edge K6~K15

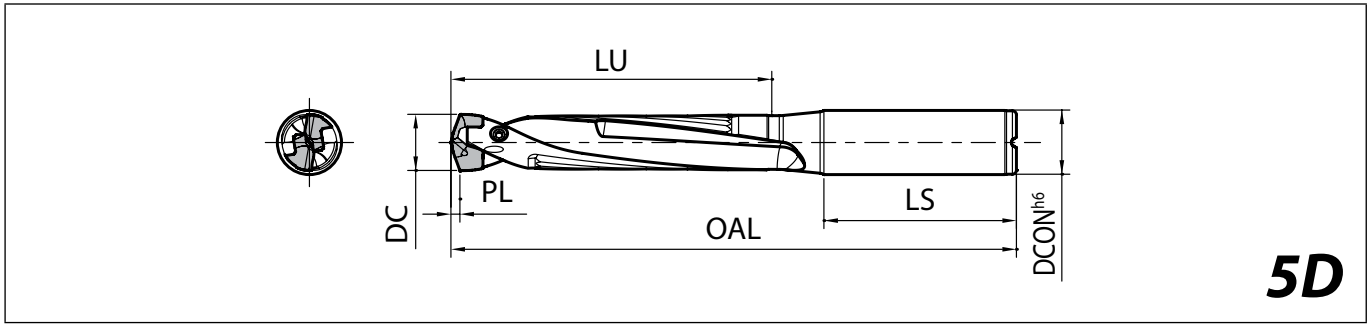
Toolholder dimensions

Description	Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads K6~K15	Applicable chamfering attachment K20
		DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
SS10- DRA080M-3 DRA085M-3 DRA090M-3 DRA095M-3	●	7.94	8.49	10	79	25.5	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	●	8.5	8.99		81	27						DA0850M-...~DA0890M-...	
	●	9	9.49		83	28.5						DA0900M-...~DA0940M-...	
	●	9.5	9.99		85	30						DA0950M-...~DA0990M-...	
SS12- DRA100M-3 DRA105M-3 DRA110M-3 DRA115M-3	●	10	10.49	12	92	31.5	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	●	10.5	10.99		94	33						DA1050M-...~DA1090M-...	
	●	11	11.49		97	34.5						DA1100M-...~DA1140M-...	
	●	11.5	11.99		99	36						DA1150M-...~DA1190M-...	
SS14- DRA120M-3 DRA125M-3 DRA130M-3 DRA135M-3	●	12	12.49	14	101	37.5	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	●	12.5	12.99		103	39						DA1250M-...~DA1290M-...	
	●	13	13.49		105	40.5						DA1300M-...~DA1340M-...	
	●	13.5	13.99		107	42						DA1350M-...~DA1390M-...	
SS16- DRA140M-3 DRA145M-3 DRA150M-3	●	14	14.49	16	112	43.5	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	●	14.5	14.99		114	45						DA1450M-...~DA1490M-...	
	●	15	15.99		119	48						DA1500M-...~DA1590M-...	
SS18- DRA160M-3 DRA170M-3	●	16	16.99	18	124	51	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	●	17	17.99		128	54						DA1700M-...~DA1790M-...	
SS20- DRA180M-3 DRA190M-3	●	18	18.99	20	135	57	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...	S32-CH20-DRA
	●	19	19.99		139	60						DA1900M-...~DA1990M-...	
SS25- DRA200M-3 DRA210M-3 DRA220M-3 DRA230M-3 DRA240M-3	●	20	20.99	25	149	63	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	●	21	21.99		153	66						DA2100M-...~DA2150M-...	
	●	22	22.99		158	69						DA2200M-...~DA2250M-...	
	●	23	23.99		162	72						DA2300M-...~DA2350M-...	
	●	24	24.99		166	75						DA2400M-...~DA2450M-...	
SS32- DRA250M-3	●	25	25.5	32	174	78	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



SS-DRA (Drilling depth : 5 x DC)



For PL indicates distance from drill point to corner edge K6~K15

Toolholder dimensions

Description	Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads K6~K15	Applicable chamfering attachment K20
		DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
SS10- DRA080M-5 DRA085M-5 DRA090M-5 DRA095M-5	●	7.94	8.49	10	96	42.5	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	●	8.5	8.99		99	45						DA0850M-...~DA0890M-...	
	●	9	9.49		102	47.5						DA0900M-...~DA0940M-...	
	●	9.5	9.99		105	50						DA0950M-...~DA0990M-...	
SS12- DRA100M-5 DRA105M-5 DRA110M-5 DRA115M-5	●	10	10.49	12	113	52.5	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	●	10.5	10.99		116	55						DA1050M-...~DA1090M-...	
	●	11	11.49		120	57.5						DA1100M-...~DA1140M-...	
	●	11.5	11.99		123	60						DA1150M-...~DA1190M-...	
SS14- DRA120M-5 DRA125M-5 DRA130M-5 DRA135M-5	●	12	12.49	14	126	62.5	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	●	12.5	12.99		129	65						DA1250M-...~DA1290M-...	
	●	13	13.49		132	67.5						DA1300M-...~DA1340M-...	
	●	13.5	13.99		135	70						DA1350M-...~DA1390M-...	
SS16- DRA140M-5 DRA145M-5 DRA150M-5	●	14	14.49	16	141	72.5	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	●	14.5	14.99		144	75						DA1450M-...~DA1490M-...	
	●	15	15.99		151	80						DA1500M-...~DA1590M-...	
SS18- DRA160M-5 DRA170M-5	●	16	16.99	18	158	85	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	●	17	17.99		164	90						DA1700M-...~DA1790M-...	
SS20- DRA180M-5 DRA190M-5	●	18	18.99	20	173	95	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...	S32-CH20-DRA
	●	19	19.99		179	100						DA1900M-...~DA1990M-...	
SS25- DRA200M-5 DRA210M-5 DRA220M-5 DRA230M-5 DRA240M-5	●	20	20.99	25	191	105	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	●	21	21.99		197	110						DA2100M-...~DA2150M-...	
	●	22	22.99		204	115						DA2200M-...~DA2250M-...	
	●	23	23.99		210	120						DA2300M-...~DA2350M-...	
	●	24	24.99		216	125						DA2400M-...~DA2450M-...	
SS32- DRA250M-5	●	25	25.5	32	226	130	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

K

Drilling

DRA

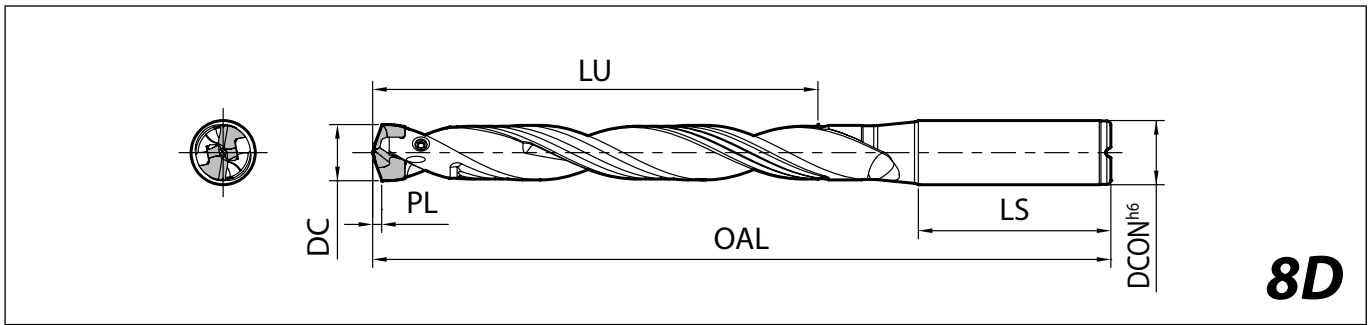
DRC

DRV

DRZ

DRW

SS-DRA (Drilling depth : 8 x DC)



For PL indicates distance from drill point to corner edge K6~K15

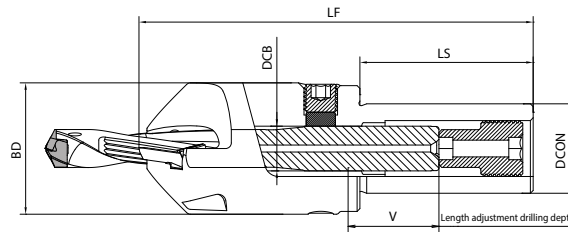
Toolholder dimensions

Description	Availability	Dimension (mm)						Coolant hole	Spare parts			Applicable drill heads K6~K15	Applicable chamfering attachment K20
		DC min.	DC max.	DCON	OAL	LU	LS		Screw	Wrench	Wrench		
SS10- DRA080M-8 DRA085M-8 DRA090M-8 DRA095M-8	●	7.94	8.49	10	121	68	40	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...	S20-CH10-DRA
	●	8.5	8.99		126	72						DA0850M-...~DA0890M-...	
	●	9	9.49		130	76						DA0900M-...~DA0940M-...	
	●	9.5	9.99		135	80						DA0950M-...~DA0990M-...	
SS12- DRA100M-8 DRA105M-8 DRA110M-8 DRA115M-8	●	10	10.49	12	144	84	45	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...	S32-CH12-DRA
	●	10.5	10.99		149	88						DA1050M-...~DA1090M-...	
	●	11	11.49		154	92						DA1100M-...~DA1140M-...	
	●	11.5	11.99		159	96						DA1150M-...~DA1190M-...	
SS14- DRA120M-8 DRA125M-8 DRA130M-8 DRA135M-8	●	12	12.49	14	163	100	45	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...	S32-CH14-DRA
	●	12.5	12.99		168	104						DA1250M-...~DA1290M-...	
	●	13	13.49		172	108						DA1300M-...~DA1340M-...	
	●	13.5	13.99		177	112						DA1350M-...~DA1390M-...	
SS16- DRA140M-8 DRA145M-8 DRA150M-8	●	14	14.49	16	184	116	48	Yes	HS-3048TRP	DTP-6	-	DA1400M-...~DA1440M-...	S32-CH16-DRA
	●	14.5	14.99		189	120						DA1450M-...~DA1490M-...	
	●	15	15.99		199	128						DA1500M-...~DA1590M-...	
SS18- DRA160M-8 DRA170M-8	●	16	16.99	18	209	136	48	Yes	HS-3048TRP	DTP-6	-	DA1600M-...~DA1690M-...	S32-CH18-DRA
	●	17	17.99		218	144						DA1700M-...~DA1790M-...	
SS20- DRA180M-8 DRA190M-8	●	18	18.99	20	230	152	50	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...	S32-CH20-DRA
	●	19	19.99		239	160						DA1900M-...~DA1990M-...	
SS25- DRA200M-8 DRA210M-8 DRA220M-8 DRA230M-8 DRA240M-8	●	20	20.99	25	254	168	56	Yes	HS-4067TRP	DTP-7	-	DA2000M-...~DA2090M-...	-
	●	21	21.99		263	176						DA2100M-...~DA2150M-...	
	●	22	22.99		273	184						DA2200M-...~DA2250M-...	
	●	23	23.99		282	192						DA2300M-...~DA2350M-...	
	●	24	24.99		291	200						DA2400M-...~DA2450M-...	
SS32- DRA250M-8	●	25	25.5	32	304	208	60	Yes	HS-4067TRP	DTP-7	-	DA2500M-...~DA2550M-...	-

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Chamfering attachment



Dimensions

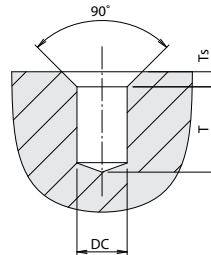
Description	Availability	Applicable drill shank dia. (mm) DCB	Dimension (mm)					Applicable inserts
			DCON	BD	LF	LS	V(Max.)	
S20-CH10-DRA	●	10	20	39	110	52	18	CT12T3-45DA
S32-CH12-DRA	●	12	32	43	130	62	24	
S32-CH14-DRA	●	14	32	45	130	62	24	
S32-CH16-DRA	●	16	32	47	141	62	24	
S32-CH18-DRA	●	18	32	49	145	62	24	
S32-CH20-DRA	●	20	32	53	150	62	24.5	

Applicable inserts

Insert	Description	MEGACOAT NANO	Dimension (mm)	
		PR1535	W1	S
	CT12T3-45DA	●	13.54	3.97

K

Drilling depth and chamfering dimension



Drilling

DRA

DRC

DRV

DRZ








DRW

Drill dia. (mm) DC		Drilling depth (mm)						Chamfering dimension (mm)		Applicable chamfering holder
		T (3D Drill)		T (5D Drill)		T (8D Drill)				
min.	max.	min.	max.	min.	max.	min.	max.	Ts	Ts max.	
7.94	8.49	12.5	20	18	36	43	60	2.5	8	S20-CH10-DRA
8.50	8.99	12.5	21.5	21.5	38.5	48	64			
9.00	9.49	12.5	23	24	41	52	68			
9.50	9.99	12.5	24.5	27.5	43.5	57.5	72.5			
10.00	10.49	15.5	26	22	46	52	76	4	8	S32-CH12-DRA
10.50	10.99	16	27.5	24.5	48.5	56	80			
11.00	11.49	16.5	29	27	51	60	84			
11.50	11.99	17.5	30.5	29.5	53.5	64	88			
12.00	12.49	18	32	32	56	68	92	4	8	S32-CH14-DRA
12.50	12.99	19	34	35	59	72.5	96.5			
13.00	13.49	19.5	35.5	37.5	61.5	76	100			
13.50	13.99	20	36.5	39.5	63.5	80	104			
14.00	14.49	21	38.5	42.5	66.5	84.5	108.5	4	8	S32-CH16-DRA
14.50	14.99	21.5	40	45	69	88.5	112.5			
15.00	15.99	22.5	41.5	47.5	71.5	92.5	116.5			
16.00	16.99	24	44.5	52.5	76.5	100.5	124.5			
17.00	17.99	25.5	47.5	57.5	81.5	108.5	132.5	4	8	S32-CH18-DRA
18.00	18.99	27.5	51	64	87	121	141			S32-CH20-DRA
19.00	19.99	29.5	54	69	92	129	149	4	8	

Ts: Maximum chamfer depth with recommended cutting conditions for DRA
 Ts max.: Adjusting cutting conditions, such as reducing feed to 50% and/or lower cutting speed, is required.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Spare parts

Chamfering holder	Adjustment screw		For fixing drills				For mounting inserts			
			Clamp	Clamp screw		Plunge screw	Clamp	Clamp screw	Wrench	
Description		Hexagon hole two side widths (mm)			Hexagon hole two side widths (mm)	Tightening torque (N-m)				
S20-CH10-DRA	AJ-12X22	6	CP-CH10	HS8X8	4	12	BNP6	C09N	W6X18N	DTM-15
S32-CH12-DRA	AJ-16X30		CP-CH12			15				
S32-CH14-DRA	AJ-20X30	8	CP-CH14	HS10X10	5	20				
S32-CH16-DRA			CP-CH16			HS12X10					6	30
S32-CH18-DRA	AJ-22X35	10	CP-CH18	HS16X10	8							30
S32-CH20-DRA			CP-CH20			45				

Method to use DRA chamfering attachment

1. Mount DRA drill into the chamfering attachment.



Fig. 1 Install the DRA

2. Install an insert and tighten temporarily with clearance between the cutting edge and DRA body.

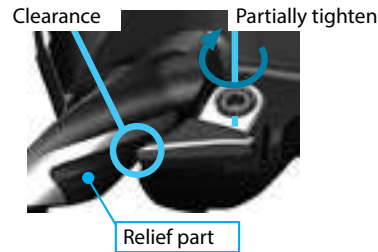


Fig. 2 Install inserts

3. Adjust drilling depth by turning adjustment screw with hexagon wrench

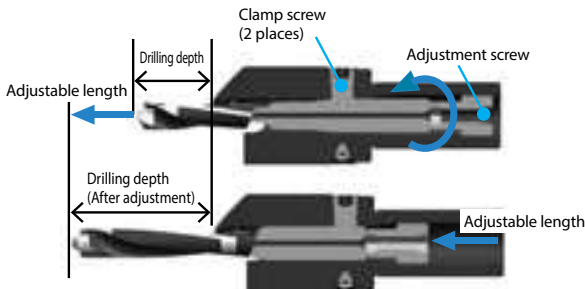


Fig. 3 Adjustment of drilling depth

4. Align the flute edge and black relief part of the drill to the position shown in Fig.4 by rotating the DRA drill.

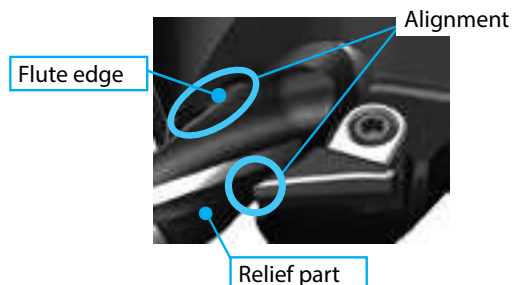


Fig. 4 DRA alignment

5. Fasten the two clamp screws for DRA (See Table 1. for recommended torque)

Table 1 Recommended torque

Chamfering attachment	Clamp screw	
	Recommended torque (N-m)	Hexagon hole two side widths (mm)
S20-CH10-DRA	12	4
S32-CH12-DRA	15	
S32-CH14-DRA	20	5
S32-CH16-DRA	30	6
S32-CH18-DRA	30	
S32-CH20-DRA	45	8

6. Tighten the inserts while lightly pressing the edge of insert against the relief part. (Recommended torque 3.5N·m)

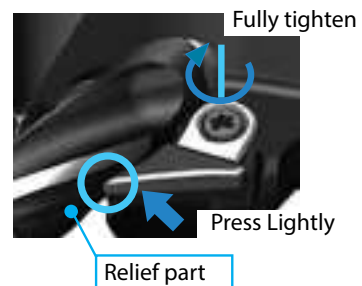


Fig. 5 Fully tighten

Cautions

- Chamfering attachment is dedicated for straight shank SS-DRA.
- It cannot be used for flanged shank SF-DRA.
- Chamfering requires two chamfering inserts. Using one insert is not recommended.
- Only fully remove clamp screws when replacing them.

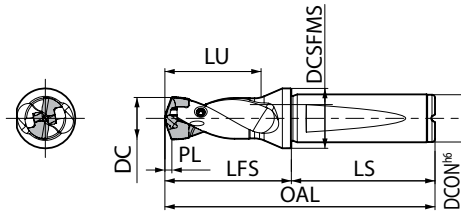
- Clamps and clamp screws for mounting inserts need to be replaced regularly
- Screw locking adhesive is applied to adjustment screw. The effect will eventually wear off if the screws are used for a long time. Regular replacement is recommended.
- Please do not operate the plunge screws.

K



Drilling

SF-DRA (Drilling depth : 1.5 x DC)



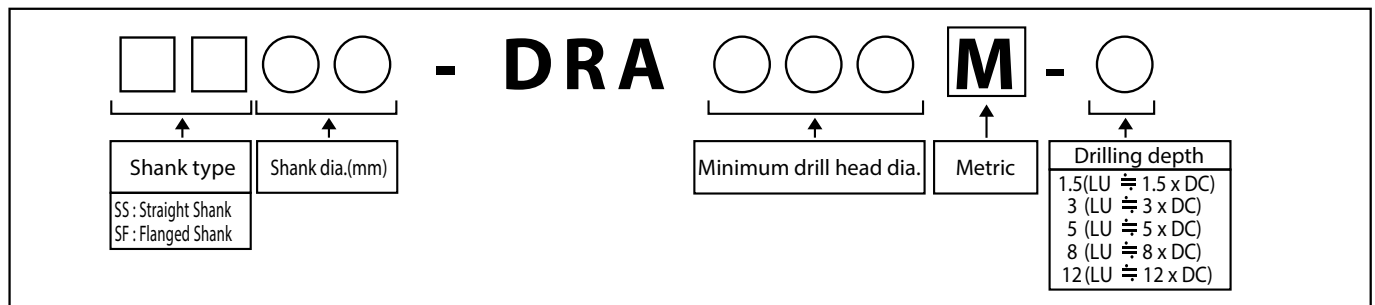
1.5D

For PL indicates distance from drill point to corner edge K6~K15

Toolholder dimensions

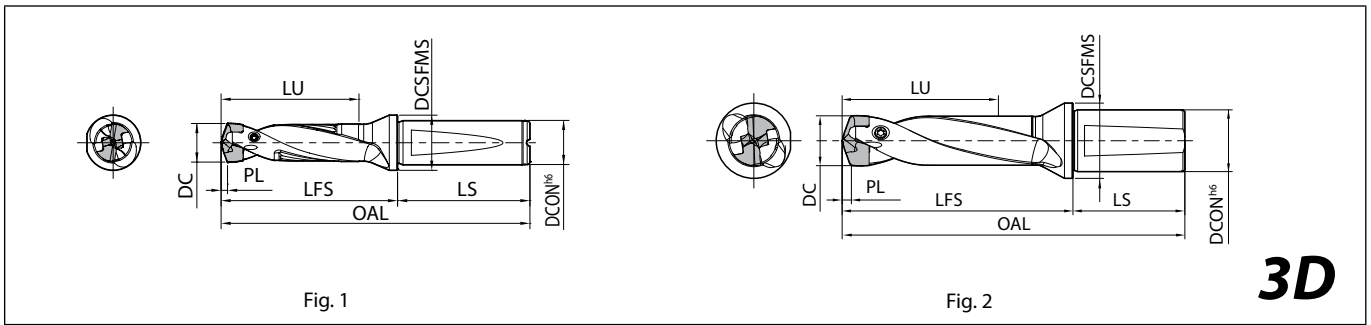
Description	Availability	Dimension (mm)								Coolant hole	Spare parts			Applicable drill heads K6~K15
		DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
		[Icons: Screw, Wrench, Wrench]												
SF12- DRA080M-1.5	●	7.94	8.49	12	71.2	26.2	12.8	45	16	Yes	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...
DRA085M-1.5	●	8.5	8.99		72.5	27.5	13.5							DA0850M-...~DA0890M-...
DRA090M-1.5	●	9	9.49		73.7	28.7	14.3							DA0900M-...~DA0940M-...
DRA095M-1.5	●	9.5	9.99		75	30	15							DA0950M-...~DA0990M-...
SF16- DRA100M-1.5	●	10	10.49	16	79.2	31.2	15.8	48	20	Yes	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...
DRA105M-1.5	●	10.5	10.99		80.5	32.5	16.5							DA1050M-...~DA1090M-...
DRA110M-1.5	●	11	11.49		82.7	34.7	17.3							DA1100M-...~DA1140M-...
DRA115M-1.5	●	11.5	11.99		84	36	18							DA1150M-...~DA1190M-...
DRA120M-1.5	●	12	12.49		85.2	37.2	18.8							DA1200M-...~DA1240M-...
DRA125M-1.5	●	12.5	12.99		86.5	38.5	19.5							DA1250M-...~DA1290M-...
DRA130M-1.5	●	13	13.49		87.7	39.7	20.3							DA1300M-...~DA1340M-...
DRA135M-1.5	●	13.5	13.99		89	41	21							DA1350M-...~DA1390M-...
DRA140M-1.5	●	14	14.49		90.2	42.2	21.8							DA1400M-...~DA1440M-...
DRA145M-1.5	●	14.5	14.99		91.5	43.5	22.5							DA1450M-...~DA1490M-...
SF20- DRA150M-1.5	●	15	15.99	20	97	47	24	50	25	Yes	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...
DRA160M-1.5	●	16	16.99		100.5	50.5	25.5							DA1600M-...~DA1690M-...
DRA170M-1.5	●	17	17.99		103	53	27							DA1700M-...~DA1790M-...
SF25- DRA180M-1.5	●	18	18.99	25	112.5	56.5	28.5	56	32	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...
DRA190M-1.5	●	19	19.99		115	59	30							DA1900M-...~DA1990M-...
DRA200M-1.5	●	20	20.99		117.5	61.5	31.5							DA2000M-...~DA2090M-...
DRA210M-1.5	●	21	21.99		120	64	33							DA2100M-...~DA2150M-...
DRA220M-1.5	●	22	22.99		123.5	67.5	34.5							DA2200M-...~DA2250M-...
DRA230M-1.5	●	23	23.99		126	70	36							DA2300M-...~DA2350M-...
DRA240M-1.5	●	24	24.99		128.5	72.5	37.5							DA2400M-...~DA2450M-...
DRA250M-1.5	●	25	25.5		131	75	39							DA2500M-...~DA2550M-...

Description Identification System (Toolholder)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRA (Drilling depth : 3 x DC)



For PL indicates distance from drill point to corner edge K6~K15

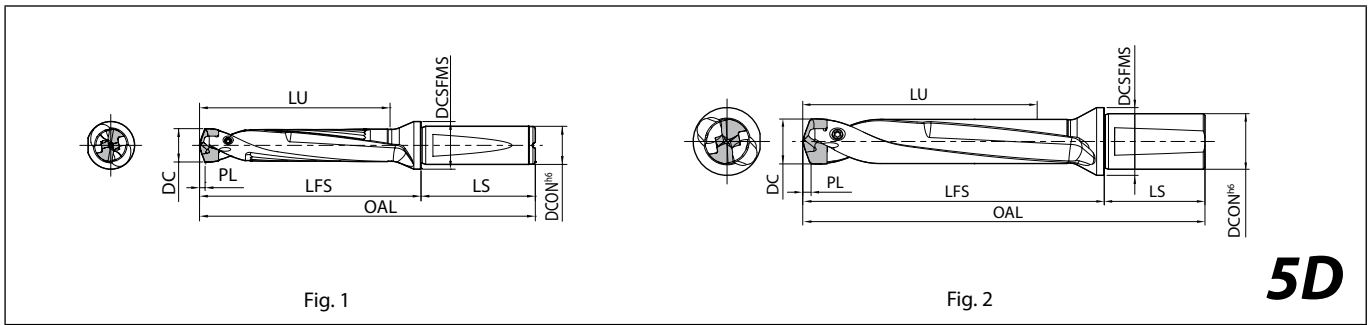
Toolholder dimensions

Description	Availability	Dimension (mm)							Coolant hole	Fig.	Spare parts			Applicable drill heads K6~K15																											
		DC min.	DC max.	DCON	OAL	LFS	LU	LS			DCSFMS	Screw	Wrench		Wrench																										
SF12- DRA080M-3 DRA085M-3 DRA090M-3 DRA095M-3	● ● ● ●	7.94 8.5 9 9.5	8.49 8.99 9.49 9.99	12	84 86 88 90	39 41 43 45	25.5 27 28.5 30	45	16	Yes	1	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...																										
SF16- DRA100M-3 DRA105M-3 DRA110M-3 DRA115M-3 DRA120M-3 DRA125M-3 DRA130M-3 DRA135M-3 DRA140M-3 DRA145M-3	● ● ● ● ● ● ● ● ● ● ●	10 10.5 11 11.5 12 12.5 13 13.5 14 14.5	10.49 10.99 11.49 11.99 12.49 12.99 13.49 13.99 14.49 14.99		16	95 97 100 102 104 106 108 110 112 114	47 49 52 54 56 58 60 62 64 66								31.5 33 34.5 36 37.5 39 40.5 42 43.5 45	48	20	Yes	1	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...																		
SF20- DRA150M-3 DRA160M-3 DRA170M-3	● ● ●	15 16 17	15.99 16.99 17.99			20	121 126 130								71 76 80								48 51 54	50	25	Yes	1	HS-3048TRP	DTP-6	-	DA1150M-...~DA1190M-...										
SF25- DRA180M-3 DRA190M-3 DRA200M-3 DRA210M-3 DRA220M-3 DRA230M-3 DRA240M-3 DRA250M-3	● ● ● ● ● ● ● ●	18 19 20 21 22 23 24 25	18.99 19.99 20.99 21.99 22.99 23.99 24.99 25.99				25								141 145 149 153 158 162 166 170								85 89 93 97 102 106 110 114								57 60 63 66 69 72 75 78	56	32	Yes	1	HS-4067TRP	DTP-7	-	DA1200M-...~DA1240M-...		
SF32- DRA260M-3 DRA270M-3 DRA280M-3 DRA290M-3 DRA300M-3 DRA310M-3 DRA320M-3	● ● ● ● ● ● ●	26 27 28 29 30 31 32	26.99 27.99 28.99 29.99 30.99 31.99 33	32				178 181 185 189 193 196 200	120 123 127 131 135 138 142	81 84 87 90 93 96 99	58	39	Yes	2	HS-50100TRP								DTPM-15								-								DA1400M-...~DA1440M-...		
																																								DA1500M-...~DA1590M-...	
																																									DA1600M-...~DA1690M-...
																																									DA1700M-...~DA1790M-...
																																									DA1800M-...~DA1890M-...
																																									DA1900M-...~DA1990M-...
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● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRA (Drilling depth : 5 x DC)



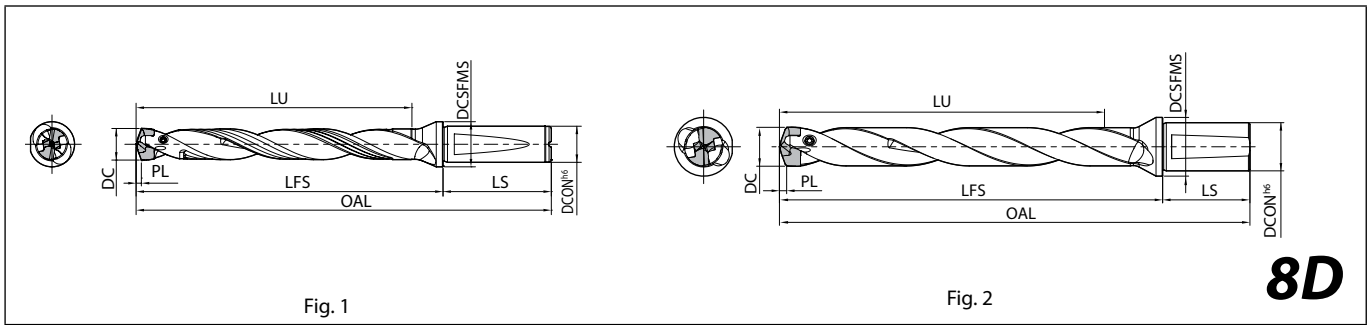
For PL indicates distance from drill point to corner edge K6~K15

Toolholder dimensions

Description	Availability	Dimension (mm)							Coolant hole	Fig.	Spare parts			Applicable drill heads K6~K15										
		DC min.	DC max.	DCON	OAL	LFS	LU	LS			DCSFMS	Screw	Wrench		Wrench									
SF12- DRA080M-5 DRA085M-5 DRA090M-5 DRA095M-5	●	7.94	8.49	12	101	56	42.5	45	16	Yes	1	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...									
	●	8.5	8.99		104	59	45								DA0850M-...~DA0890M-...									
	●	9	9.49		107	62	47.5								DA0900M-...~DA0940M-...									
	●	9.5	9.99		110	65	50								DA0950M-...~DA0990M-...									
SF16- DRA100M-5 DRA105M-5 DRA110M-5 DRA115M-5 DRA120M-5 DRA125M-5 DRA130M-5 DRA135M-5 DRA140M-5 DRA145M-5	●	10	10.49	16	116	68	52.5	48	20	Yes	1	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...									
	●	10.5	10.99		119	71	55								DA1050M-...~DA1090M-...									
	●	11	11.49		123	75	57.5								DA1100M-...~DA1140M-...									
	●	11.5	11.99		126	78	60								DA1150M-...~DA1190M-...									
	●	12	12.49		129	81	62.5								DA1200M-...~DA1240M-...									
	●	12.5	12.99		132	84	65								DA1250M-...~DA1290M-...									
	●	13	13.49		135	87	67.5								DA1300M-...~DA1340M-...									
	●	13.5	13.99		138	90	70								DA1350M-...~DA1390M-...									
	●	14	14.49		141	93	72.5								DA1400M-...~DA1440M-...									
	●	14.5	14.99		144	96	75								DA1450M-...~DA1490M-...									
	SF20- DRA150M-5 DRA160M-5 DRA170M-5	●	15		15.99	20	153								103	80	50	25	Yes	1	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...
		●	16		16.99		160								110	85								DA1600M-...~DA1690M-...
●		17	17.99	166	116		90	DA1700M-...~DA1790M-...																
SF25- DRA180M-5 DRA190M-5 DRA200M-5 DRA210M-5 DRA220M-5 DRA230M-5 DRA240M-5 DRA250M-5	●	18	18.99	25	179	123	95	56	32	Yes	1	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...									
	●	19	19.99		185	129	100								DA1900M-...~DA1990M-...									
	●	20	20.99		191	135	105								DA2000M-...~DA2090M-...									
	●	21	21.99		197	141	110								DA2100M-...~DA2150M-...									
	●	22	22.99		204	148	115								DA2200M-...~DA2250M-...									
	●	23	23.99		210	154	120								DA2300M-...~DA2350M-...									
	●	24	24.99		216	160	125								DA2400M-...~DA2450M-...									
	●	25	25.99		222	166	130								DA2500M-...~DA2550M-...									
SF32- DRA260M-5 DRA270M-5 DRA280M-5 DRA290M-5 DRA300M-5 DRA310M-5 DRA320M-5	●	26	26.99	32	232	174	135	58	39	Yes	2	HS-50100TRP	DTPM-15	-	DA2600M-...~DA2650M-...									
	●	27	27.99		237	179	140								DA2700M-...~DA2750M-...									
	●	28	28.99		243	185	145								DA2800M-...~DA2850M-...									
	●	29	29.99		249	191	150								DA2900M-...~DA2950M-...									
	●	30	30.99		255	197	155								DA3000M-...~DA3050M-...									
	●	31	31.99		260	202	160								DA3100M-...~DA3150M-...									
	●	32	33		266	208	165								DA3200M-...~DA3300M-...									

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRA (Drilling depth : 8 x DC)



For PL indicates distance from drill point to corner edge K6~K15

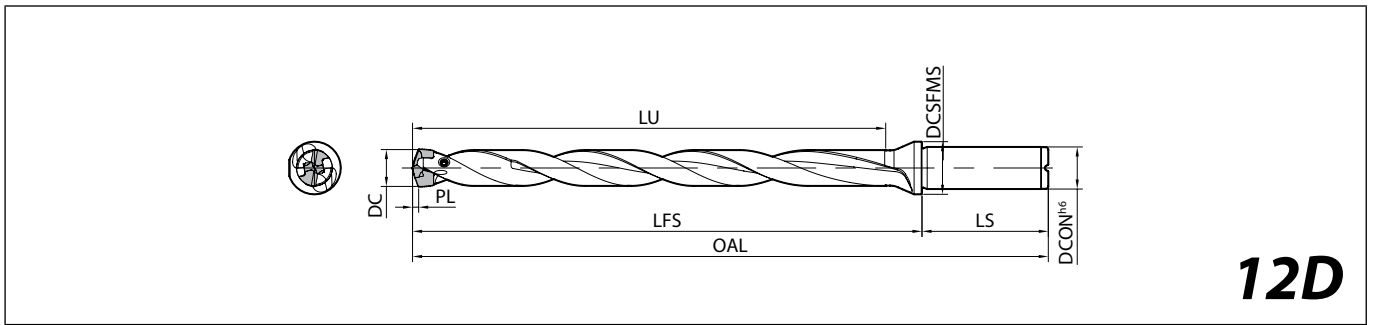
Toolholder dimensions

Description	Availability	Dimension (mm)							Coolant hole	Fig.	Spare parts			Applicable drill heads K6~K15									
		DC min.	DC max.	DCON	OAL	LFS	LU	LS			DCSFMS	Screw	Wrench		Wrench								
SF12- DRA080M-8 DRA085M-8 DRA090M-8 DRA095M-8	● ● ● ●	7.94 8.5 9 9.5	8.49 8.99 9.49 9.99	12	126 131 135 140	81 86 90 95	68 72 76 80	45	16	Yes	1	HS-2524TRP	-	FTP-5	DA0794M-...~DA0840M-...								
																						DA0850M-...~DA0890M-...	
																							DA0900M-...~DA0940M-...
																							DA0950M-...~DA0990M-...
SF16- DRA100M-8 DRA105M-8 DRA110M-8 DRA115M-8 DRA120M-8 DRA125M-8 DRA130M-8 DRA135M-8 DRA140M-8 DRA145M-8	● ● ● ● ● ● ● ● ● ● ●	10 10.5 11 11.5 12 12.5 13 13.5 14 14.5	10.49 10.99 11.49 11.99 12.49 12.99 13.49 13.99 14.49 14.99	16	147 152 157 162 166 171 175 180 184 189	99 104 109 114 118 123 127 132 136 141	84 88 92 96 100 104 108 112 116 120	48	20	Yes	1	HS-2534TRP	-	FTP-5	DA1000M-...~DA1040M-...								
																							DA1050M-...~DA1090M-...
																							DA1100M-...~DA1140M-...
																							DA1150M-...~DA1190M-...
																							DA1200M-...~DA1240M-...
																							DA1250M-...~DA1290M-...
																							DA1300M-...~DA1340M-...
																							DA1350M-...~DA1390M-...
																							DA1400M-...~DA1440M-...
																							DA1450M-...~DA1490M-...
SF20- DRA150M-8 DRA160M-8 DRA170M-8	● ● ●	15 16 17	15.99 16.99 17.99	20	201 211 220	151 161 170	128 136 144	50	25	Yes	1	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...								
																							DA1600M-...~DA1690M-...
																							DA1700M-...~DA1790M-...
SF25- DRA180M-8 DRA190M-8 DRA200M-8 DRA210M-8 DRA220M-8 DRA230M-8 DRA240M-8 DRA250M-8	● ● ● ● ● ● ● ● ●	18 19 20 21 22 23 24 25	18.99 19.99 20.99 21.99 22.99 23.99 24.99 25.99	25	236 245 254 263 273 282 291 300	180 189 198 207 217 226 235 244	152 160 168 176 184 192 200 208	56	32	Yes	1	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...								
																							DA1900M-...~DA1990M-...
																							DA2000M-...~DA2090M-...
																							DA2100M-...~DA2150M-...
																							DA2200M-...~DA2250M-...
																							DA2300M-...~DA2350M-...
																							DA2400M-...~DA2450M-...
																							DA2500M-...~DA2550M-...
SF32- DRA260M-8 DRA270M-8 DRA280M-8 DRA290M-8 DRA300M-8 DRA310M-8 DRA320M-8	● ● ● ● ● ● ●	26 27 28 29 30 31 32	26.99 27.99 28.99 29.99 30.99 31.99 33	32	313 321 330 339 348 356 365	255 263 272 281 290 298 307	216 224 232 240 248 256 264	58	39	Yes	2	HS-50100TRP	DTPM-15	-	DA2600M-...~DA2650M-...								
																							DA2700M-...~DA2750M-...
																							DA2800M-...~DA2850M-...
																							DA2900M-...~DA2950M-...
																							DA3000M-...~DA3050M-...
																							DA3100M-...~DA3150M-...
																							DA3200M-...~DA3300M-...



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRA (Drilling depth : 12 x DC)



12D


For PL indicates distance from drill point to corner edge K6~K15

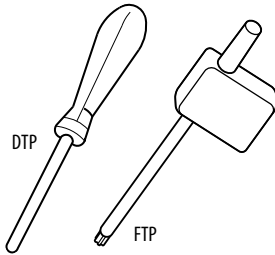
Toolholder dimensions

Description	Availability	Dimension (mm)								Coolant hole	Spare parts			Applicable drill heads K6~K15
		DC min.	DC max.	DCON	OAL	LFS	LU	LS	DCSFMS		Screw	Wrench	Wrench	
		K												
SF16- DRA120M-12 DRA125M-12 DRA130M-12 DRA135M-12 DRA140M-12 DRA145M-12	●	12	12.49	16	216	168	150	48	20	Yes	HS-2534TRP	-	FTP-5	DA1200M-...~DA1240M-...
●	12.5	12.99	223		175	156	DA1250M-...~DA1290M-...							
●	13	13.49	229		181	162	DA1300M-...~DA1340M-...							
●	13.5	13.99	236		188	168	DA1350M-...~DA1390M-...							
●	14	14.49	242		194	174	DA1400M-...~DA1440M-...							
●	14.5	14.99	249		201	180	DA1450M-...~DA1490M-...							
SF20- DRA150M-12 DRA160M-12 DRA170M-12	●	15	15.99	20	265	215	192	50	25	Yes	HS-3048TRP	DTP-6	-	DA1500M-...~DA1590M-...
●	16	16.99	279		229	204	DA1600M-...~DA1690M-...							
●	17	17.99	292		242	216	DA1700M-...~DA1790M-...							
SF25- DRA180M-12 DRA190M-12 DRA200M-12 DRA210M-12 DRA220M-12 DRA230M-12 DRA240M-12 DRA250M-12	●	18	18.99	25	312	256	228	56	32	Yes	HS-4067TRP	DTP-7	-	DA1800M-...~DA1890M-...
●	19	19.99	325		269	240	DA1900M-...~DA1990M-...							
●	20	20.99	338		282	252	DA2000M-...~DA2090M-...							
●	21	21.99	351		295	264	DA2100M-...~DA2150M-...							
●	22	22.99	365		309	276	DA2200M-...~DA2250M-...							
●	23	23.99	378		322	288	DA2300M-...~DA2350M-...							
●	24	24.99	391		335	300	DA2400M-...~DA2450M-...							
●	25	25.5	404		348	312	DA2500M-...~DA2550M-...							

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Spare parts

Clamp screw	Description
	HS-2524TRP
	HS-2534TRP
	HS-3048TRP
	HS-4067TRP

Wrench	Description	Tightening torque (N-m)
	FTP-5	0.5
	DTP-6	0.8
	DTP-7	1.2

Recommended cutting conditions

General purpose GM

Workpiece material	Recommended drill heads grades / Vc (m/min)		n (min ⁻¹)	Drill dia. DC (mm)							
	PR1535	PR1525		f (mm/rev)	ø8	ø11	ø14	ø18	ø22	ø25	ø29	ø33
Low carbon steel	★ 100 - 180	☆ 100 - 180	n (min ⁻¹)	3,980 - 7,160	2,890 - 5,210	2,270 - 4,090	1,770 - 3,180	1,450 - 2,600	1,270 - 2,290	1,100 - 1,980	970 - 1,740
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.4	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45
Carbon steel	★ 100 - 150	☆ 100 - 150	n (min ⁻¹)	3,980 - 5,970	2,890 - 4,340	2,270 - 3,410	1,770 - 2,650	1,450 - 2,170	1,270 - 1,910	1,100 - 1,650	970 - 1,450
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.4	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45
Alloy steel	★ 70 - 120	☆ 70 - 120	n (min ⁻¹)	2,790 - 4,780	2,030 - 3,470	1,590 - 2,730	1,240 - 2,120	1,010 - 1,740	890 - 1,530	770 - 1,320	680 - 1,160
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.4	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45
Mold steel	★ 50 - 90	☆ 50 - 90	n (min ⁻¹)	1,990 - 3,580	1,450 - 2,600	1,140 - 2,050	880 - 1,590	720 - 1,300	640 - 1,150	550 - 990	490 - 870
			f (mm/rev)	0.08 - 0.17	0.08 - 0.22	0.11 - 0.25	0.11 - 0.28	0.14 - 0.32	0.14 - 0.32	0.14 - 0.32	0.14 - 0.32
Stainless steel	★ 40 - 70	☆ 40 - 70	n (min ⁻¹)	1,590 - 2,790	1,160 - 2,030	910 - 1,590	710 - 1,240	580 - 1,010	510 - 890	440 - 770	390 - 680
			f (mm/rev)	0.1 - 0.24	0.1 - 0.24	0.12 - 0.3	0.15 - 0.3	0.15 - 0.3	0.15 - 0.35	0.15 - 0.35	0.15 - 0.35
Titanium alloys	★ 30 - 40	☆ 30 - 40	n (min ⁻¹)	1,190 - 1,590	870 - 1,160	680 - 910	530 - 710	430 - 580	380 - 510	330 - 440	290 - 390
			f (mm/rev)	0.08 - 0.12	0.08 - 0.15	0.10 - 0.15	0.12 - 0.18	0.12 - 0.18	0.12 - 0.23	0.12 - 0.23	0.12 - 0.23
Gray cast iron	☆ 90 - 170	★ 90 - 170	n (min ⁻¹)	3,580 - 6,760	2,600 - 4,920	2,050 - 3,870	1,590 - 3,010	1,300 - 2,460	1,150 - 2,170	990 - 1,870	870 - 1,640
			f (mm/rev)	0.14 - 0.29	0.14 - 0.37	0.19 - 0.43	0.19 - 0.45	0.24 - 0.45	0.24 - 0.45	0.24 - 0.45	0.24 - 0.45
Nodular cast iron	☆ 40 - 120	★ 40 - 120	n (min ⁻¹)	1,590 - 4,780	1,160 - 3,470	910 - 2,730	710 - 2,120	580 - 1,740	510 - 1,530	440 - 1,320	390 - 1,160
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.4	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45	0.2 - 0.45

Recommended cutting conditions above is for 1.5D/3D type.

As drilling depth increases (1.5D/3D → 5D → 8D → 12D), cutting speed and feed rates need to be set lower than the recommended values.

Recommended feed rate: 1.5/3D type=100%, 5D type=80% or less

Recommended cutting speed and feed rate: 8D type=80% or less, 12D type=70% or less

★:1st recommendation ☆:2nd recommendation

K

Counterboring FTP

Workpiece material	Recommended drill head grades / Vc (m/min)		n (min ⁻¹)	Drill dia. DC (mm)					
	PR1535	PR1525		f (mm/rev)	ø8	ø11	ø14	ø18	ø22	ø25
Low carbon steel	★ 80 - 150	☆ 80 - 150	n (min ⁻¹)	3,150 - 6,000	2,300 - 4,350	1,800 - 3,400	1,400 - 2,650	1,150 - 2,200	1,000 - 1,900
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.40	0.20 - 0.45	0.20 - 0.45
Carbon steel	★ 80 - 120	☆ 80 - 120	n (min ⁻¹)	3,150 - 4,750	2,300 - 3,450	1,800 - 2,700	1,400 - 2,100	1,150 - 1,750	1,000 - 1,500
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.40	0.20 - 0.45	0.20 - 0.45
Alloy steel	★ 70 - 120	☆ 70 - 120	n (min ⁻¹)	2,800 - 4,750	2,000 - 3,450	1,600 - 2,700	1,250 - 2,100	1,000 - 1,750	900 - 1,500
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.40	0.20 - 0.40	0.20 - 0.45
Mold steel	★ 40 - 70	☆ 40 - 70	n (min ⁻¹)	1,600 - 2,800	1,150 - 2,000	900 - 1,600	700 - 1,250	600 - 1,000	500 - 900
			f (mm/rev)	0.08 - 0.17	0.08 - 0.22	0.11 - 0.25	0.11 - 0.28	0.14 - 0.30	0.14 - 0.32
Stainless steel	★ 40 - 70	☆ 40 - 70	n (min ⁻¹)	1,600 - 2,800	1,150 - 2,000	900 - 1,600	700 - 1,250	600 - 1,000	500 - 900
			f (mm/rev)	0.10 - 0.20	0.10 - 0.20	0.10 - 0.24	0.15 - 0.24	0.15 - 0.24	0.15 - 0.28
Gray cast iron	☆ 70 - 140	★ 70 - 140	n (min ⁻¹)	2,800 - 5,600	2,000 - 4,050	1,600 - 3,200	1,250 - 2,500	1,000 - 2,000	900 - 1,800
			f (mm/rev)	0.14 - 0.29	0.14 - 0.37	0.19 - 0.43	0.19 - 0.45	0.24 - 0.45	0.24 - 0.45
Nodular cast iron	☆ 40 - 100	★ 40 - 100	n (min ⁻¹)	1,600 - 4,000	1,150 - 2,900	900 - 2,750	700 - 1,750	600 - 1,450	500 - 1,250
			f (mm/rev)	0.12 - 0.24	0.12 - 0.31	0.16 - 0.36	0.16 - 0.40	0.2 - 0.45	0.2 - 0.45

* The recommended cutting conditions are for drilling on plain surface

The conditions for drilling on slant hole shows the depth from the top of workpiece

Set the feed rate 50% or under when inclination angle is 30 or under. Set the feed rate 30% or under when inclination angle is over 30°

Traversing is not recommended. Applicable to 1.5D,3D,5D,8D and 12D holders. Prepared hole (0.5xDC) is needed when using 8D/12D holder

Recommended feed rate: 1.5/3D type=100%, 5D type=80% or less

Recommended cutting speed and feed rate: 8D type=80% or less, 12D type=70% or less

★:1st recommendation ☆:2nd recommendation

Counterboring FTP-H (steel beam drilling)

Workpiece material	Recommended drill head grade / Vc (m/min)	f (mm/rev) according to drill dia. DC (mm)							
		ø14	ø16	ø18	ø20	ø21	ø22	ø24	ø26
Structural steel (S355, St52)	★ 90	0.18	0.18	0.18	0.20	0.20	0.20	0.20	0.22

* Please reduce feed in case of operation on thinner plates.

Oil mist quantity is different by machine. Please adjust cutting speed by checking colors of chips.

High precision insert for steel HQP

Workpiece material	Recommended drill heads grade / Vc(m/min)	n (min ⁻¹)	Drill dia. DC (mm)			
			f (mm/rev)	ø8	ø11	ø14	ø18
Low carbon steel	80 - 180	n (min ⁻¹)	3,180 - 7,160	2,310 - 5,210	1,810 - 4,090	1,410 - 3,180
		f (mm/rev)	0.12 - 0.24	0.12 - 0.28	0.16 - 0.32	0.16 - 0.36
Carbon steel	80 - 150	n (min ⁻¹)	3,180 - 7,160	2,310 - 5,210	1,810 - 4,090	1,410 - 3,180
		f (mm/rev)	0.12 - 0.24	0.12 - 0.28	0.16 - 0.32	0.16 - 0.36
Alloy steel	70 - 120	n (min ⁻¹)	2,790 - 4,780	2,030 - 3,470	1,590 - 2,730	1,240 - 2,120
		f (mm/rev)	0.12 - 0.24	0.12 - 0.28	0.16 - 0.32	0.16 - 0.36
Mold steel	50 - 90	n (min ⁻¹)	1,990 - 3,580	1,450 - 2,600	1,140 - 2,050	880 - 1,590
		f (mm/rev)	0.08 - 0.17	0.08 - 0.2	0.11 - 0.23	0.11 - 0.26

Caution : Recommended cutting conditions above is for 1.5D/3D type. As drilling depth increases (1.5D/3D→5D→8D→12D), feed rates need to be set lower than the recommended values.
 Recommended feed rate : 1.5D/3D type=100%, 5D type=80% or less, 8D/12D type=70% or less

Difficult-to-cut materials / Stainless steel HQS

Workpiece material	Recommended drill heads grade / Vc(m/min)	n (min ⁻¹)	Drill dia. DC (mm)			
			f (mm/rev)	ø8	ø11	ø14	ø18
Stainless steel	40 - 50	n (min ⁻¹)	1,590 - 1,990	1,160 - 1,450	910 - 1,140	710 - 880
		f (mm/rev)	0.08 - 0.12	0.10 - 0.15	0.10 - 0.15	0.12 - 0.18
			*Feed rate 0.08 mm/rev or less is recommended until drilling depth reaches 1.0 x DC. The combination of internal and external coolant is recommended			
Heat-resistant alloy	15 - 20	n (min ⁻¹)	600 - 800	430 - 580	340 - 450	270 - 350
		f (mm/rev)	0.08 - 0.12	0.08 - 0.15	0.10 - 0.15	0.12 - 0.18
			*Feed rate 0.08 mm/rev or less is recommended until drilling depth reaches 1.0 x DC. The combination of internal and external coolant is recommended			
Titanium alloy	30 - 40	n (min ⁻¹)	1,190 - 1,590	870 - 1,160	680 - 910	530 - 710
		f (mm/rev)	0.08 - 0.12	0.08 - 0.15	0.10 - 0.15	0.12 - 0.18
			*Feed rate 0.08 mm/rev or less is recommended until drilling depth reaches 1.0 x DC. The combination of internal and external coolant is recommended			

Caution : Recommended cutting conditions above is for 1.5D/3D type. As drilling depth increases (1.5D/3D→5D→8D→12D), feed rates need to be set lower than the recommended values.
 Recommended feed rate : 1.5D/3D type=100%, 5D type=80% or less, 8D/12D type=70% or less

If chip clogging occurs at the entrance to drilling, refer to "Cautions for machining with HQS drill head" in K31.



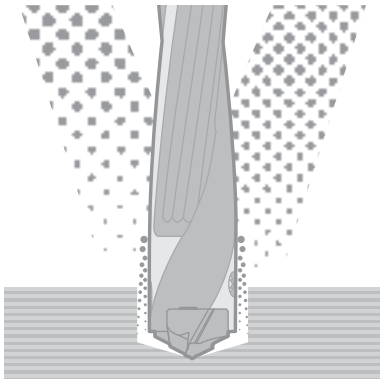
Coolant * Dry machining is not recommended.

1st recommendation

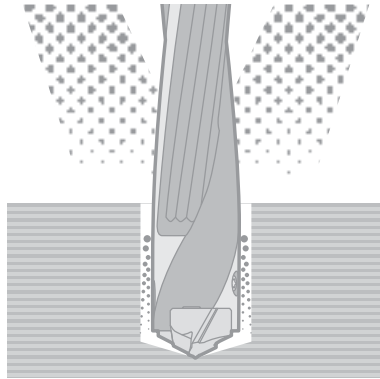
Internal coolant

Internal and external coolant is recommended

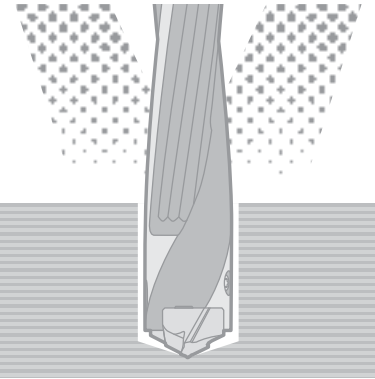
Drilling depth less than 1DC



Stainless steel, high feed rate



In case of external coolant

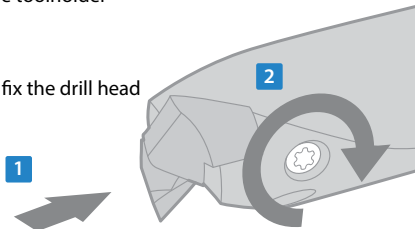


Lathe: 3DC or less
Vertical M/C: 1.5DC or less

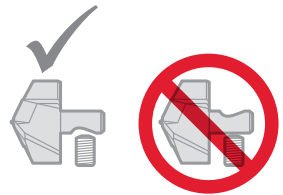
K

How to attach drill heads

- 1 Install drill head onto the toolholder in the right direction
- 2 Tighten clamp screw to fix the drill head
K27



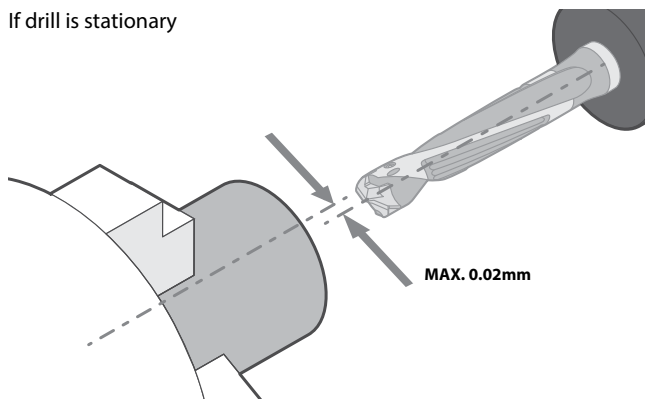
Be careful of the drill head direction



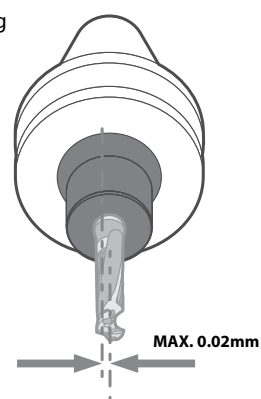
- * 1 Remove dust on chip pockets using air blow for every replacement.
- * 2 Make sure that the locating surfaces of the drill head closely contacts the toolholder.

Core deviation

If drill is stationary



If drill is rotating



This can be used with a boring sleeve and collet chuck, please be sure to set deviation amount 0.02mm or under between workpiece and drill.

Make sure to use arbor that is not deformed. Center of arbor deviation must be within 0.02mm.

Drilling

DRA
DRC
DRV
DRZ
DRW

Cautions for installation on machining center

For installation of MagicDrill DRA

1st choice

Hydro chuck, power chuck, collet chuck, etc.

Hydro chuck

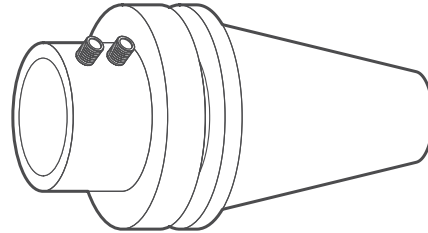
Power chuck

Collet chuck

Install MagicDrill DRA to the chucks

2nd choice

Side lock arbor

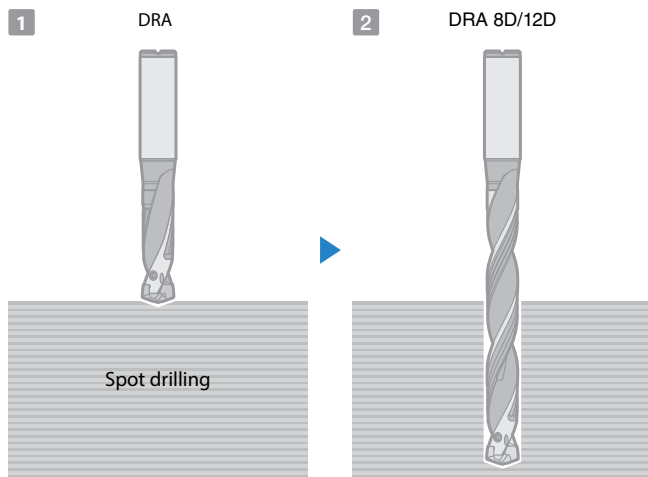


Example of side lock arbor

Cautions for machining with 8D/12D holder Cautions for machining with HQS drill head

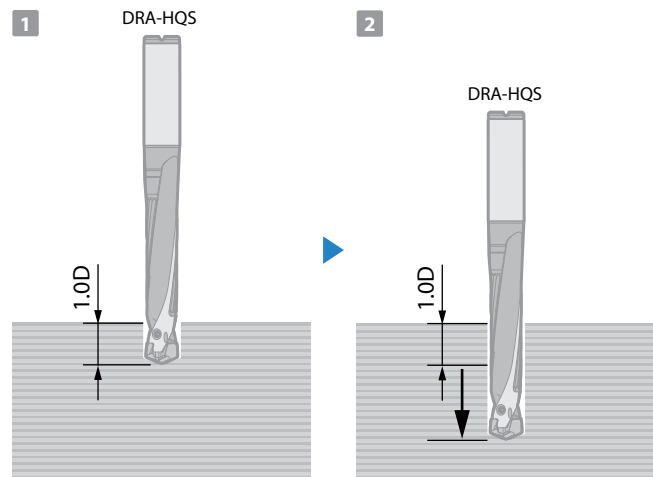
Recommended machining

- 1 Make a center spot using DRA 1.5D/3D/5D type.
(Center spot should be at least half of cutting diameter)
- 2 Then drill the hole using DRA (8D/12D type).



If chips are clogged at the entrance of drill hole machining in stainless steel machining, etc., the following machining method is recommended.

- 1 Up to 1.0D, the feed rate shall be 0.08 mm/rev or less.
- 2 After 1.0D, machining at the feed rate within the recommended range.



K
Drilling

Applicable workpieces

Applications	Shape of workpiece	Caution for machining
Plain surface		<ol style="list-style-type: none"> 1. When machining stainless steel, for hole depths of up to 0.5DC, keep feed rate at 0.15mm/rev or less. 2. Internal coolant is recommended for smooth chip removal. For stainless steel, the combination of internal and external coolant is recommended.
Stacked plates		<ol style="list-style-type: none"> 1. Fix stacked plates securely to ensure they do not slip while machining.
Concave surface		<ol style="list-style-type: none"> 1. When machining concave holes, set the feed rate at half of recommended feed or less for continuous hole machining. 2. Utilize a step feeding if chips are not broken short at the inlet.
Pipe material		<ol style="list-style-type: none"> 1. Hole machining above the centerline of the pipe is possible. 2. Do not machine on curved surface areas.



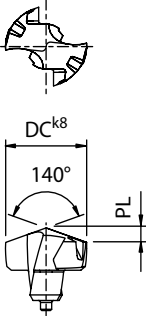
* Machining possible with FTP and 1.5D toolholder

Not recommended workpieces


Applications	Shape of workpiece	Applications	Shape of workpiece
*Hole expansion		*Slant surface	
Applications	Shape of workpiece	Applications	Shape of workpiece
Half cylindrical		*Cored hole	

* Machining possible with FTP and 1.5D toolholder

DRC drill heads (SC - Carbon steel, alloy steel and cast iron)

Drill head	Description	Dimension (mm)		Tolerance		Carbide	Applicable toolholder K35~K37 K40~K42
		DC	PL	k8 (min.)	k8 (max.)		
  	DC 0794M-SC	7.94	1.37	0	+0.022	●	SF12-DRC080M-○ SS10-DRC080M-○
	0800M-SC	8	1.38				
	0810M-SC	8.1	1.4				
	0820M-SC	8.2	1.42				
	0830M-SC	8.3	1.43				
	0840M-SC	8.4	1.45				
	DC 0850M-SC	8.5	1.47	0	+0.022	●	SF12-DRC085M-○ SS10-DRC085M-○
	0860M-SC	8.6	1.48				
	0870M-SC	8.7	1.5				
	0880M-SC	8.8	1.52				
	0890M-SC	8.9	1.54				
	DC 0900M-SC	9	1.55	0	+0.022	●	SF12-DRC090M-○ SS10-DRC090M-○
	0910M-SC	9.1	1.57				
	0920M-SC	9.2	1.59				
	0930M-SC	9.3	1.61				
	0940M-SC	9.4	1.62				
	DC 0950M-SC	9.5	1.64	0	+0.022	●	SF12-DRC095M-○ SS10-DRC095M-○
	0960M-SC	9.6	1.66				
	0970M-SC	9.7	1.67				
	0980M-SC	9.8	1.69				
	0990M-SC	9.9	1.71				
	DC 1000M-SC	10	1.72	0	+0.022	●	SF16-DRC100M-○ SS12-DRC100M-○
	1010M-SC	10.1	1.74		+0.027		
	1020M-SC	10.2	1.76		+0.027		
	1030M-SC	10.3	1.78		+0.027		
	1040M-SC	10.4	1.8		+0.027		
	DC 1050M-SC	10.5	1.81	0	+0.027	●	SF16-DRC105M-○ SS12-DRC105M-○
	1060M-SC	10.6	1.83				
	1070M-SC	10.7	1.85				
	1080M-SC	10.8	1.86				
	1090M-SC	10.9	1.88				
	DC 1100M-SC	11	1.9	0	+0.027	●	SF16-DRC110M-○ SS12-DRC110M-○
	1110M-SC	11.1	1.91				
	1120M-SC	11.2	1.93				
	1130M-SC	11.3	1.95				
	1140M-SC	11.4	1.97				
DC 1150M-SC	11.5	1.98	0	+0.027	●	SF16-DRC115M-○ SS12-DRC115M-○	
1160M-SC	11.6	2					
1170M-SC	11.7	2.02					
1180M-SC	11.8	2.04					
1190M-SC	11.9	2.06					
DC 1200M-SC	12	2.07	0	+0.027	●	SF16-DRC120M-○ SS14-DRC120M-○	
1210M-SC	12.1	2.09					
1220M-SC	12.2	2.11					
1230M-SC	12.3	2.12					
1240M-SC	12.4	2.14					
DC 1250M-SC	12.5	2.16	0	+0.027	●	SF16-DRC125M-○ SS14-DRC125M-○	
1260M-SC	12.6	2.17					
1270M-SC	12.7	2.19					
1280M-SC	12.8	2.21					
1290M-SC	12.9	2.23					
DC 1300M-SC	13	2.24	0	+0.027	●	SF16-DRC130M-○ SS14-DRC130M-○	
1310M-SC	13.1	2.26					
1320M-SC	13.2	2.28					
1330M-SC	13.3	2.3					
1340M-SC	13.4	2.31					


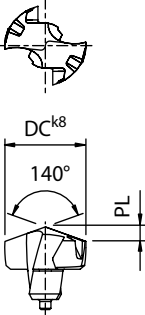
k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions  K44


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DC drill heads are sold in 1 piece boxes

DRC drill heads (SC - Carbon steel, alloy steel and cast iron)

Drill head	Description	Dimension (mm)		Tolerance		Carbide	Applicable toolholder K35~K37 K40~K42
		DC	PL	k8 (min.)	k8 (max.)		
 	DC 1350M-SC	13.5	2.33	0	+0.027	●	SF16-DRC135M-○ SS14-DRC135M-○
	1360M-SC	13.6	2.35				
	1370M-SC	13.7	2.36				
	1380M-SC	13.8	2.38				
	1390M-SC	13.9	2.4				
	DC 1400M-SC	14	2.41	0	+0.027	●	SF16-DRC140M-○ SS16-DRC140M-○
	1410M-SC	14.1	2.43				
	1420M-SC	14.2	2.45				
	1430M-SC	14.3	2.47				
	1440M-SC	14.4	2.49				
	DC 1450M-SC	14.5	2.5	0	+0.027	●	SF16-DRC145M-○ SS16-DRC145M-○
	1460M-SC	14.6	2.52				
	1470M-SC	14.7	2.54				
	1480M-SC	14.8	2.55				
	1490M-SC	14.9	2.57				
	DC 1500M-SC	15	2.59	0	+0.027	●	SF20-DRC150M-○ SS16-DRC150M-○
	1510M-SC	15.1	2.6				
	1520M-SC	15.2	2.62				
	1530M-SC	15.3	2.64				
	1540M-SC	15.4	2.66				
	1550M-SC	15.5	2.68				
	1560M-SC	15.6	2.7				
	1570M-SC	15.7	2.71				
	1580M-SC	15.8	2.73				
	DC 1600M-SC	16	2.76	0	+0.027	●	SF20-DRC160M-○ SS18-DRC160M-○
	1610M-SC	16.1	2.78				
	1620M-SC	16.2	2.8				
	1630M-SC	16.3	2.81				
1640M-SC	16.4	2.83					
1650M-SC	16.5	2.85					
1660M-SC	16.6	2.87					
1670M-SC	16.7	2.89					
1680M-SC	16.8	2.9					
1690M-SC	16.9	2.92					
DC 1700M-SC	17	2.93	0	+0.027	●	SF20-DRC170M-○ SS18-DRC170M-○	
1710M-SC	17.1	2.95					
1720M-SC	17.2	2.97					
1730M-SC	17.3	2.99					
1740M-SC	17.4	3					
1750M-SC	17.5	3.02					
1760M-SC	17.6	3.04					
1770M-SC	17.7	3.06					
1780M-SC	17.8	3.08					
1790M-SC	17.9	3.09					
DC 1800M-SC	18	3.1	0	+0.033	●	SF25-DRC180M-○ SS20-DRC180M-○	
1810M-SC	18.1	3.12					
1820M-SC	18.2	3.14					
1830M-SC	18.3	3.16					
1840M-SC	18.4	3.18					
1850M-SC	18.5	3.19					
1860M-SC	18.6	3.21					
1870M-SC	18.7	3.23					
1880M-SC	18.8	3.25					
1890M-SC	18.9	3.27					

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

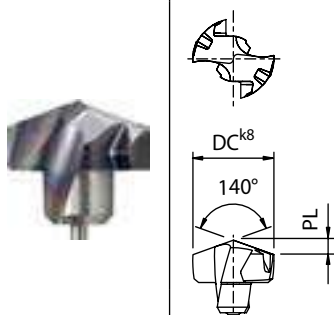
Recommended cutting conditions  K44

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DC drill heads are sold in 1 piece boxes



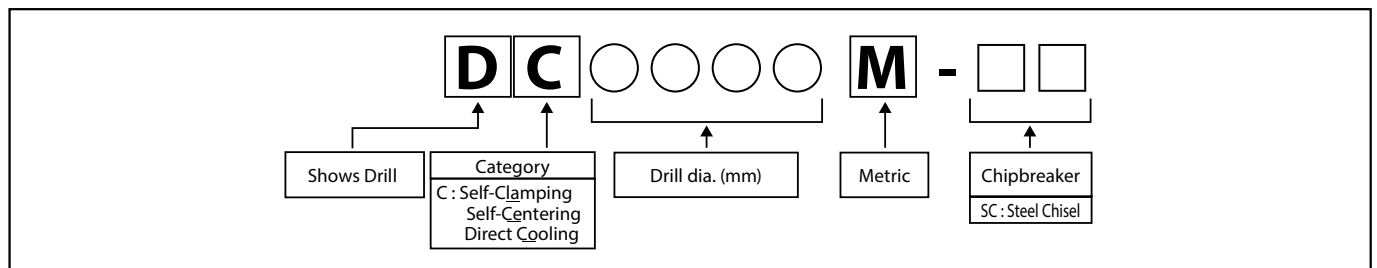
DRC drill heads (SC - Carbon steel, alloy steel and cast iron)

Drill head	Description	Dimension (mm)		Tolerance		Carbide	Applicable toolholder K35~K37 K40~K42
		DC	PL	k8 (min.)	k8 (max.)		
	DC 1900M-SC	19	3.28	0	+0.033	●	SF25-DRC190M-○ SS20-DRC190M-○
	1910M-SC	19.1	3.29				
	1920M-SC	19.2	3.31				
	1930M-SC	19.3	3.33				
	1940M-SC	19.4	3.35				
	1950M-SC	19.5	3.37				
	1960M-SC	19.6	3.39				
	1970M-SC	19.7	3.4				
	1980M-SC	19.8	3.42				
	1990M-SC	19.9	3.44				
	DC 2000M-SC	20	3.45	0	+0.033	●	SF25-DRC200M-○ SS25-DRC200M-○
	2010M-SC	20.1	3.47				
	2020M-SC	20.2	3.48				
	2030M-SC	20.3	3.5				
	2040M-SC	20.4	3.52				
	2050M-SC	20.5	3.54				
	2060M-SC	20.6	3.56				
	2070M-SC	20.7	3.58				
	2080M-SC	20.8	3.59				
	2090M-SC	20.9	3.61				
2099M-SC	20.99	3.63					
DC 2100M-SC	21	3.62	0	+0.033	●	SF25-DRC210M-○ SS25-DRC210M-○	
2150M-SC	21.5	3.71					
DC 2200M-SC	22	3.79	0	+0.033	●	SF25-DRC220M-○ SS25-DRC220M-○	
2250M-SC	22.5	3.88					
DC 2300M-SC	23	3.97	0	+0.033	●	SF25-DRC230M-○ SS25-DRC230M-○	
2350M-SC	23.5	4.06					
DC 2400M-SC	24	4.14	0	+0.033	●	SF25-DRC240M-○ SS25-DRC240M-○	
2450M-SC	24.5	4.23					
DC 2500M-SC	25	4.31	0	+0.033	●	SF25-DRC250M-○ SS32-DRC250M-○	
2550M-SC	25.5	4.4					
2599M-SC	25.99	4.49					

k8 is the dimension tolerance of the drill head. It is not the dimension tolerance of the hole diameter.

Recommended cutting conditions → K44

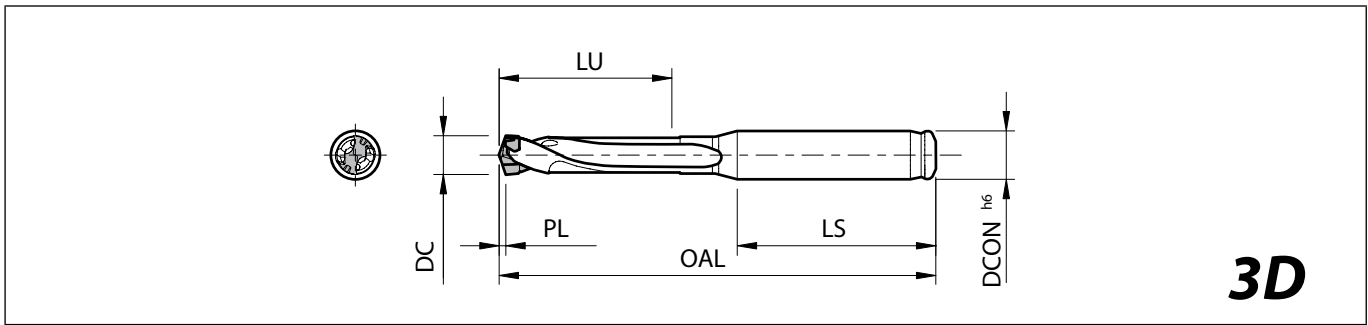
Description Identification System (Drill head)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DC drill heads are sold in 1 piece boxes

SS-DRC (Drilling depth : 3 x DC)



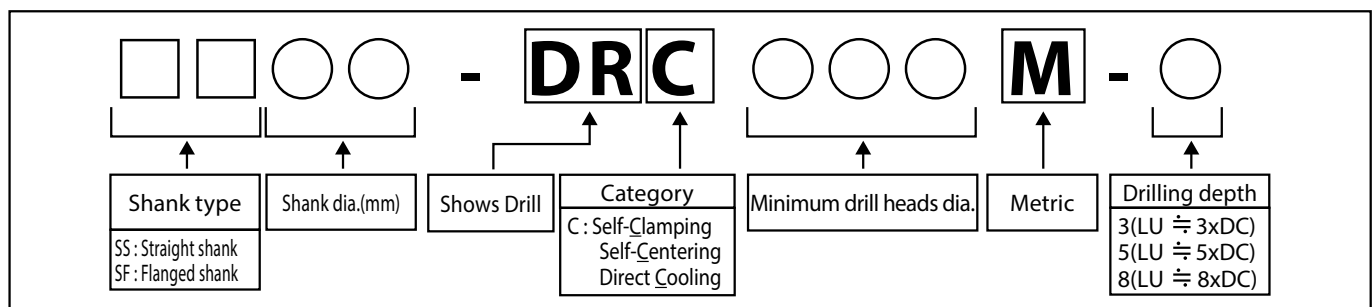
For PL indicates distance from drill point to corner edge K32~K34

Toolholder dimensions

Description	Availability	Dimension (mm)						Coolant hole	Spare parts Wrench	Applicable drill heads K32~K34	Applicable chamfering attachment K38
		DC min.	DC max.	DCON	OAL	LU	LS				
SS10- DRC080M-3 DRC085M-3 DRC090M-3 DRC095M-3	●	7.94	8.49	10	79	25.5	40	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC DC0850M-SC~DC0890M-SC DC0900M-SC~DC0940M-SC DC0950M-SC~DC0990M-SC	S20-CH10
	●	8.5	8.99		81	27					
	●	9	9.49		83	28.5					
	●	9.5	9.99		85	30					
SS12- DRC100M-3 DRC105M-3 DRC110M-3 DRC115M-3	●	10	10.49	12	92	31.5	45	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC DC1050M-SC~DC1090M-SC DC1100M-SC~DC1140M-SC DC1150M-SC~DC1190M-SC	S32-CH12
	●	10.5	10.99		94	33					
	●	11	11.49		96	34.5					
	●	11.5	11.99		98	36					
SS14- DRC120M-3 DRC125M-3 DRC130M-3 DRC135M-3	●	12	12.49	14	101	37.5	45	Yes	WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC DC1250M-SC~DC1290M-SC DC1300M-SC~DC1340M-SC DC1350M-SC~DC1390M-SC	S32-CH14
	●	12.5	12.99		103	39					
	●	13	13.49		105	40.5					
	●	13.5	13.99		107	42					
SS16- DRC140M-3 DRC145M-3 DRC150M-3	●	14	14.49	16	112	43.5	48	Yes	WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC DC1450M-SC~DC1490M-SC DC1500M-SC~DC1580M-SC	S32-CH16
	●	14.5	14.99		114	45					
	●	15	15.99		118	48					
SS18- DRC160M-3 DRC170M-3	●	16	16.99	18	122	51	48	Yes	WDRC17	DC1600M-SC~DC1690M-SC DC1700M-SC~DC1790M-SC	S32-CH18
	●	17	17.99		127	54					
SS20- DRC180M-3 DRC190M-3	●	18	18.99	20	133	57	50	Yes	WDRC17	DC1800M-SC~DC1890M-SC DC1900M-SC~DC1990M-SC	
	●	19	19.99		137	60					
SS25- DRC200M-3 DRC210M-3 DRC220M-3 DRC230M-3 DRC240M-3	●	20	20.99	25	147	63	56	Yes	WDRC17	DC2000M-SC~DC2099M-SC DC2100M-SC~DC2150M-SC DC2200M-SC~DC2250M-SC DC2300M-SC~DC2350M-SC DC2400M-SC~DC2450M-SC	
	●	21	21.99		151	66					
	●	22	22.99		156	69					
	●	23	23.99		160	72					
	●	24	24.99		164	75					
SS32- DRC250M-3	●	25	25.99	32	172	78	60	Yes	WDRC17	DC2500M-SC~DC2599M-SC	

* Choose „WDRC17“, when purchasing wrench only.

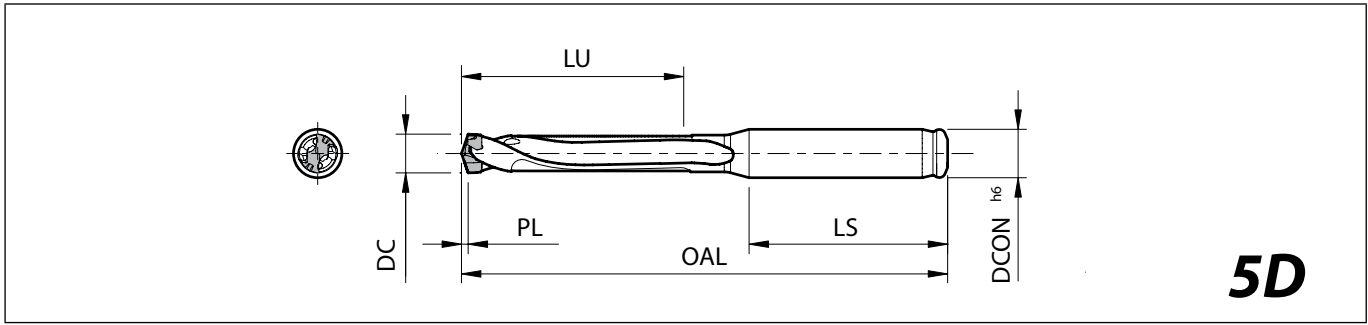
Description Identification System (Toolholder)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



SS-DRC (Drilling depth : 5 x DC)



For PL indicates distance from drill point to corner edge K32~K34

Toolholder dimensions

Description	Availability	Dimension (mm)						Coolant hole	Spare parts Wrench	Applicable drill heads K32~K34	Applicable chamfering attachment K38
		DC min.	DC max.	DCON	OAL	LU	LS				
SS10- DRC080M-5 DRC085M-5 DRC090M-5 DRC095M-5	●	7.94	8.49	10	97	42.5	40	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC	S20-CH10
	●	8.5	8.99		100	45				DC0850M-SC~DC0890M-SC	
	●	9	9.49		103	47.5				DC0900M-SC~DC0940M-SC	
	●	9.5	9.99		107	50				DC0950M-SC~DC0990M-SC	
SS12- DRC100M-5 DRC105M-5 DRC110M-5 DRC115M-5	●	10	10.49	12	115	52.5	45	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC	S32-CH12
	●	10.5	10.99		118	55				DC1050M-SC~DC1090M-SC	
	●	11	11.49		121	57.5				DC1100M-SC~DC1140M-SC	
	●	11.5	11.99		124	60				DC1150M-SC~DC1190M-SC	
SS14- DRC120M-5 DRC125M-5 DRC130M-5 DRC135M-5	●	12	12.49	14	127	62.5	45	Yes	WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC	S32-CH14
	●	12.5	12.99		130	65				DC1250M-SC~DC1290M-SC	
	●	13	13.49		133	67.5				DC1300M-SC~DC1340M-SC	
	●	13.5	13.99		137	70				DC1350M-SC~DC1390M-SC	
SS16- DRC140M-5 DRC145M-5 DRC150M-5	●	14	14.49	16	143	72.5	48	Yes	WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC	S32-CH16
	●	14.5	14.99		146	75				DC1450M-SC~DC1490M-SC	
	●	15	15.99		152	80				DC1500M-SC~DC1580M-SC	
SS18- DRC160M-5 DRC170M-5	●	16	16.99	18	158	85	48	Yes	WDRC17	DC1600M-SC~DC1690M-SC	S32-CH18
	●	17	17.99		165	90				DC1700M-SC~DC1790M-SC	
SS20- DRC180M-5 DRC190M-5	●	18	18.99	20	173	95	50	Yes	WDRC17	DC1800M-SC~DC1890M-SC	
	●	19	19.99		179	100				DC1900M-SC~DC1990M-SC	
SS25- DRC200M-5 DRC210M-5 DRC220M-5 DRC230M-5 DRC240M-5	●	20	20.99	25	191	105	56	Yes	WDRC17	DC2000M-SC~DC2099M-SC	
	●	21	21.99		198	110				DC2100M-SC~DC2150M-SC	
	●	22	22.99		204	115				DC2200M-SC~DC2250M-SC	
	●	23	23.99		210	120				DC2300M-SC~DC2350M-SC	
	●	24	24.99		216	125				DC2400M-SC~DC2450M-SC	
SS32- DRC250M-5	●	25	25.99	32	227	130	60	Yes	WDRC17	DC2500M-SC~DC2599M-SC	

* Choose „WDRC17“, when purchasing wrench only.

K

Drilling

DRA

DRC

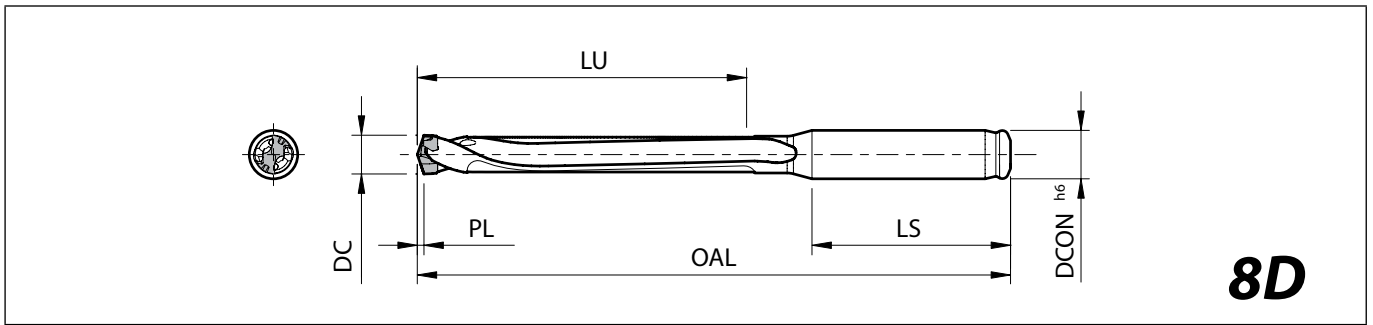
DRV

DRZ

DRW

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SS-DRC (Drilling depth : 8 x DC)



For PL indicates distance from drill point to corner edge K32~K34

Toolholder dimensions

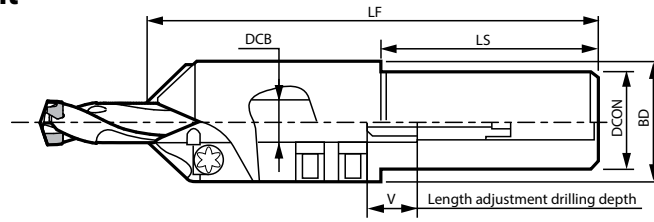
Description	Availability	Dimension (mm)						Coolant hole	Spare parts	Applicable drill heads K32~K34	Applicable chamfering attachment K38
		DC min.	DC max.	DCON	OAL	LU	LS		Wrench		
SS10- DRC080M-8 DRC085M-8 DRC090M-8 DRC095M-8	●	7.94	8.49	10	122.5	68	40	Yes	WDRC17 *(Included wrench : WDRC8)	DC0794M-SC~DC0840M-SC	S20-CH10
	●	8.5	8.99		127	72				DC0850M-SC~DC0890M-SC	
	●	9	9.49		131.5	76				DC0900M-SC~DC0940M-SC	
	●	9.5	9.99		137	80				DC0950M-SC~DC0990M-SC	
SS12- DRC100M-8 DRC105M-8 DRC110M-8 DRC115M-8	●	10	10.49	12	146.5	84	45	Yes	WDRC17 *(Included wrench : WDRC10)	DC1000M-SC~DC1040M-SC	S32-CH12
	●	10.5	10.99		151	88				DC1050M-SC~DC1090M-SC	
	●	11	11.49		155.5	92				DC1100M-SC~DC1140M-SC	
	●	11.5	11.99		160	96				DC1150M-SC~DC1190M-SC	
SS14- DRC120M-8 DRC125M-8 DRC130M-8 DRC135M-8	●	12	12.49	14	164.5	100	45	Yes	WDRC17 *(Included wrench : WDRC12)	DC1200M-SC~DC1240M-SC	S32-CH14
	●	12.5	12.99		169	104				DC1250M-SC~DC1290M-SC	
	●	13	13.49		173.5	108				DC1300M-SC~DC1340M-SC	
	●	13.5	13.99		179	112				DC1350M-SC~DC1390M-SC	
SS16- DRC140M-8 DRC145M-8 DRC150M-8	●	14	14.49	16	186.5	116	48	Yes	WDRC17 *(Included wrench : WDRC14)	DC1400M-SC~DC1440M-SC	S32-CH16
	●	14.5	14.99		191	120				DC1450M-SC~DC1490M-SC	
	●	15	15.99		200	128				DC1500M-SC~DC1580M-SC	
SS18- DRC160M-8 DRC170M-8	●	16	16.99	18	209	136	48	Yes	WDRC17	DC1600M-SC~DC1690M-SC	S32-CH18
	●	17	17.99		219	144				DC1700M-SC~DC1790M-SC	
SS20- DRC180M-8 DRC190M-8	●	18	18.99	20	230	152	50	Yes	WDRC17	DC1800M-SC~DC1890M-SC	
	●	19	19.99		239	160				DC1900M-SC~DC1990M-SC	
SS25- DRC200M-8 DRC210M-8 DRC220M-8 DRC230M-8 DRC240M-8	●	20	20.99	25	254	168	56	Yes	WDRC17	DC2000M-SC~DC2099M-SC	
	●	21	21.99		264	176				DC2100M-SC~DC2150M-SC	
	●	22	22.99		273	184				DC2200M-SC~DC2250M-SC	
	●	23	23.99		282	192				DC2300M-SC~DC2350M-SC	
	●	24	24.99		291	200				DC2400M-SC~DC2450M-SC	
SS32- DRC250M-8	●	25	25.99	32	305	208	60	Yes	WDRC17	DC2500M-SC~DC2599M-SC	

* Choose „WDRC17“, when purchasing wrench only.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Chamfering attachment

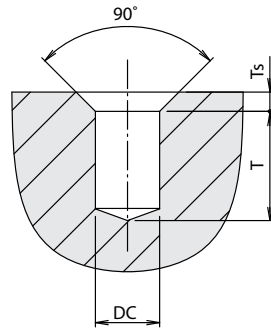


Dimensions

Description	Availability	Applicable Drill Shank Dia. (mm) DCB	Dimension (mm)					Applicable Inserts K39
			DCON	BD	LF	LS	V	
S20-CH10	●	10	20	29	122	52	17	CT08T2-45A
S32-CH12	●	12	32	38	133	62	21	CT12T3-45A
S32-CH14	●	14		40	137		16	
S32-CH16	●	16		42	141		19	
S32-CH18	●	18		47	144		15	

Chamfering attachment is dedicated for Straight Shank SS-DRC. It cannot be used for Flanged Shank SF-DRC.

Drilling depth and chamfering dimension



K

Drilling

Drill dia. (mm) DC		Drilling depth (mm)						Chamfering dimension (mm) Ts		Applicable chamfering holder
		T(3D drill)		T(5D drill)		T(8D drill)		Ts 100	Ts max.	
min.	max.	min.	max.	min.	max.	min.	max.			
7.94	8.49	11	19	21	37	47	63	2.5	5.0	S20-CH10
8.50	8.99	12	21	24	40	51	67			
9.00	9.49	12	23	27	43	56	72			
9.50	9.99	13	25	31	47	61	77	3.5	7.0	S32-CH12
10.00	10.49	13	26	28	49	60	81			
10.50	10.99	14	28	31	52	64	85			
11.00	11.49	14	30	34	55	69	90	4.0	8.0	S32-CH14
11.50	11.99	15	32	37	58	73	94			
12.00	12.49	15	30	41	56	79	94			
12.50	12.99	17	32	44	59	83	96	4.0	8.0	S32-CH16
13.00	13.49	19	34	47	62	88	103			
13.50	13.99	21	36	51	66	93	108			
14.00	14.49	19	37	50	68	94	112	4.0	8.0	S32-CH18
14.50	14.99	21	39	53	71	98	116			
15.00	15.99	25	43	59	77	107	125			
16.00	16.99	30	44	66	80	117	131	4.0	8.0	
17.00	17.99	35	49	73	87	127	141			

Ts 100: Max. chamfering dimension at the full feed.
Ts max.: Max. chamfering dimension at a 50% feed reduction.
(Max. chamfering dimension of machining possible without step feeding)

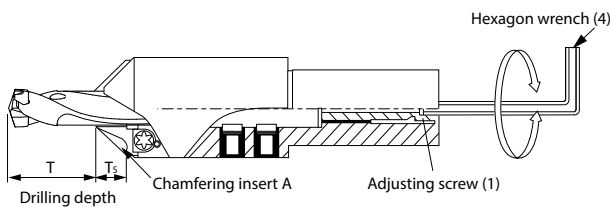
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable inserts

Insert		Description	Dimension (mm)		PVD coated carbide PR0315	Applicable chamfering holder K38
			W1	S		
	CT08T2-45A	8	2.83	●	S20-CH10	
	CT12T3-45A	12	3.98	●	S32-CH12 S32-CH14 S32-CH16 S32-CH18	

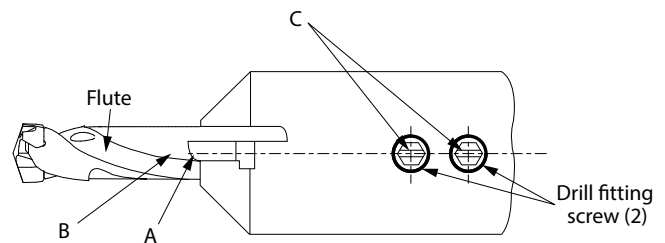
Method to use DRC chamfering attachment

I. Drilling depth adjustment



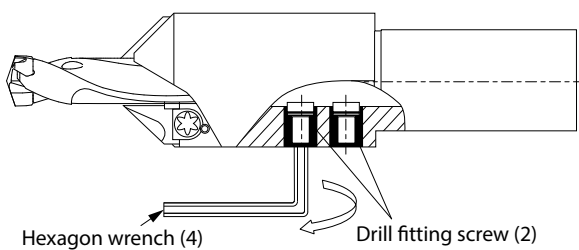
Insert drill into chamfering holder.
Next, temporarily attach the chamfering insert A.
Turn the adjusting screw (1) with the hexagon wrench (4).
to set the drilling depth T.

II. Drill location check



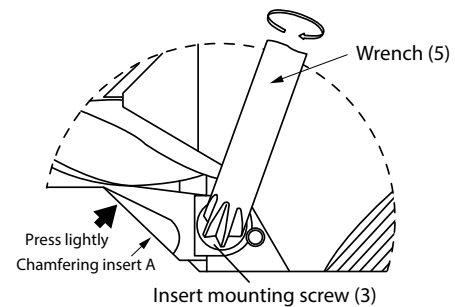
Rotate the drill so that the lower end of the chamfering insert A is aligned with the body clearance B of the drill.
Set it so that slot C and the drill fitting screws (2) are lined up as shown in the figure above.

III. Fix the drill



Tighten the drill fitting screws (2) with the hexagon wrench (4)
(When using a torque wrench, please refer to the table below)

IV. Installation of the chamfering insert



Press the chamfering insert A lightly into the drill and tighten the insert mounting screw (3) with wrench (5).

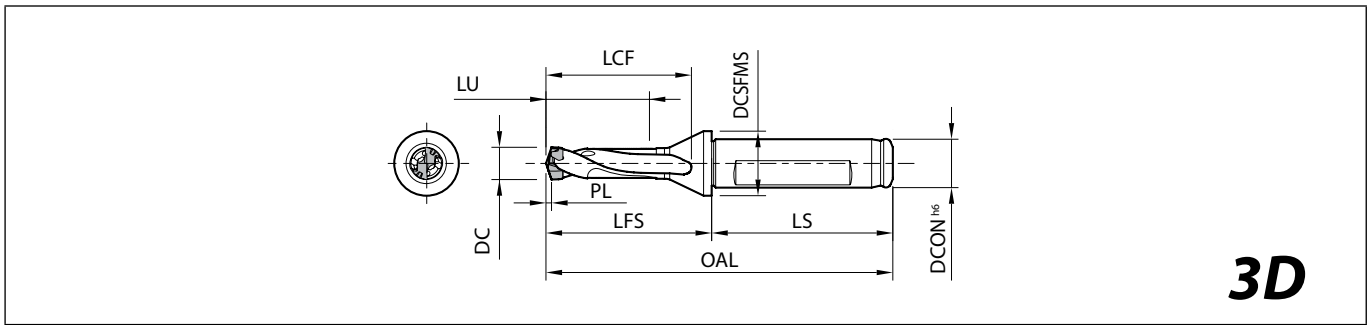
Spare parts

Chamfering holder	Tightening torque [N·m]	Adjusting screw (1)	Drill fitting screw (2)	Insert mounting screw (3)	Hexagon wrench (4)	Wrench (5)
S20-CH10	10	AJ-6X38	FS-10	MT-3	LW-3	DT-9
S32-CH12	15	AJ-8X44-9.5	FS-12	MT-4	LW-4	DT-15
S32-CH14	20	AJ-10X46	FS-14		LW-5	
S32-CH16	30		FS-16			
S32-CH18	45		FS-18			

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



SF-DRC (Drilling depth : 3 x DC)



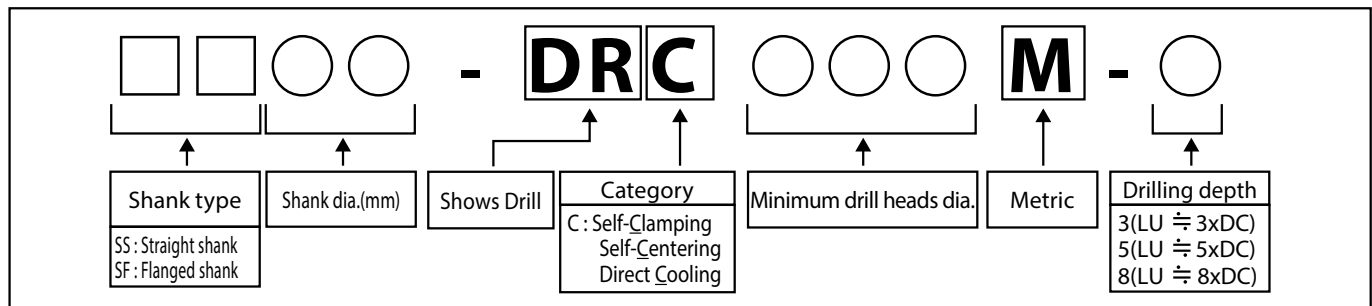
For PL indicates distance from drill point to corner edge K32~K34

Toolholder dimensions

Description	Availability	Dimension (mm)										Coolant hole	Spare parts	
		DC min.	DC max.	DCON	OAL	LFS	LCF	LU	LS	DCSFMS	Wrench		Applicable drill heads K32~K34	
SF12- DRC080M-3 DRC085M-3 DRC090M-3 DRC095M-3	●	7.94	8.49	12	86	41	35	26	45	16	Yes	WDRRC17 <small>*(Included wrench : WDRRC8)</small>	DC0794M-SC~DC0840M-SC	
	●	8.5	8.99		88	43	37	27					DC0850M-SC~DC0890M-SC	
	●	9	9.49		90	45	39	29					DC0900M-SC~DC0940M-SC	
	●	9.5	9.99		92	47	41	30					DC0950M-SC~DC0990M-SC	
SF16- DRC100M-3 DRC105M-3 DRC110M-3 DRC115M-3 DRC120M-3 DRC125M-3 DRC130M-3 DRC135M-3 DRC140M-3 DRC145M-3	●	10	10.49	16	97	49	43	32	48	20	Yes	WDRRC17 <small>*(Included wrench : WDRRC10)</small>	DC1000M-SC~DC1040M-SC	
	●	10.5	10.99		99	51	45	33					DC1050M-SC~DC1090M-SC	
	●	11	11.49		101	53	47	35				DC1100M-SC~DC1140M-SC		
	●	11.5	11.99		103	55	49	36				DC1150M-SC~DC1190M-SC		
	●	12	12.49		106	58	52	38				DC1200M-SC~DC1240M-SC		
	●	12.5	12.99		108	60	54	39				DC1250M-SC~DC1290M-SC		
	●	13	13.49		110	62	56	41				DC1300M-SC~DC1340M-SC		
	●	13.5	13.99		112	64	58	42				DC1350M-SC~DC1390M-SC		
	●	14	14.49		114	66	60	44				DC1400M-SC~DC1440M-SC		
	●	14.5	14.99		116	68	62	45				DC1450M-SC~DC1490M-SC		
SF20- DRC150M-3 DRC160M-3 DRC170M-3	●	15	15.99	20	122	72	66	48	50	25	Yes	WDRRC17 <small>*(Included wrench : WDRRC14)</small>	DC1500M-SC~DC1580M-SC	
	●	16	16.99		126	76	70	51					DC1600M-SC~DC1690M-SC	
	●	17	17.99		131	81	75	54					DC1700M-SC~DC1790M-SC	
SF25- DRC180M-3 DRC190M-3 DRC200M-3 DRC210M-3 DRC220M-3 DRC230M-3 DRC240M-3 DRC250M-3	●	18	18.99	25	141	85	79	57	56	32	Yes	WDRRC17	DC1800M-SC~DC1890M-SC	
	●	19	19.99		145	89	83	60					DC1900M-SC~DC1990M-SC	
	●	20	20.99		149	93	87	63					DC2000M-SC~DC2099M-SC	
	●	21	21.99		153	97	91	66					DC2100M-SC~DC2150M-SC	
	●	22	22.99		158	102	96	69					DC2200M-SC~DC2250M-SC	
	●	23	23.99		162	106	100	72					DC2300M-SC~DC2350M-SC	
	●	24	24.99		166	110	104	75					DC2400M-SC~DC2450M-SC	
	●	25	25.99		170	114	108	78					DC2500M-SC~DC2599M-SC	

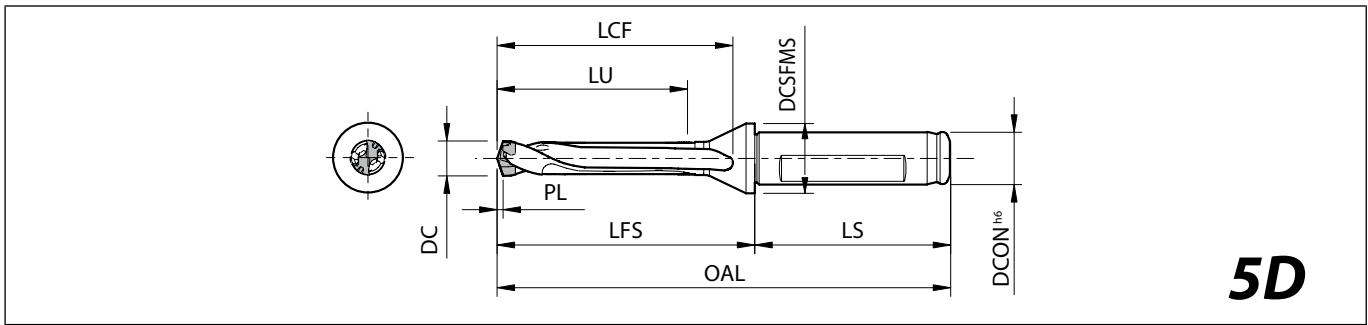
* Choose „WDRRC17“, when purchasing wrench only.

Description Identification System (Toolholder)



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SF-DRC (Drilling depth : 5 x DC)



For PL indicates distance from drill point to corner edge K32~K34

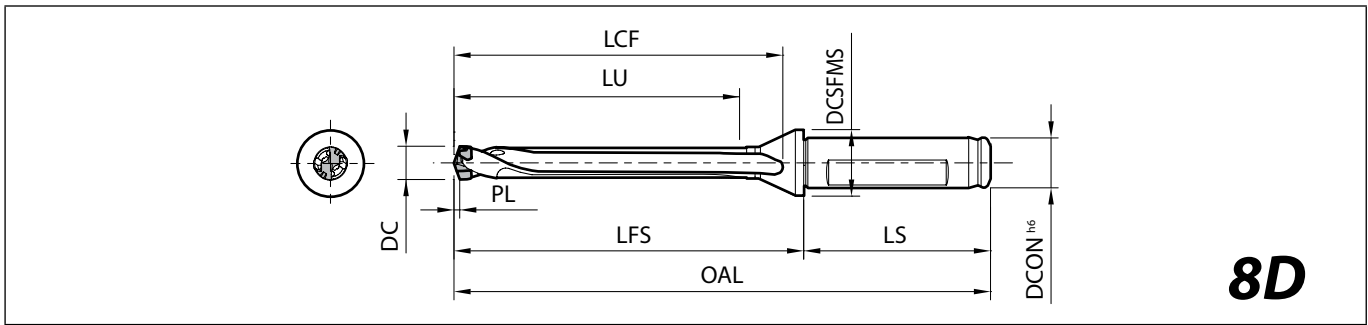
Toolholder dimensions

Description	Availability	Dimension (mm)										Coolant hole	Spare parts	
		DC min.	DC max.	DCON	OAL	LFS	LCF	LU	LS	DCSFMS	Wrench		Applicable drill heads K32~K34	
SF12- DRC080M-5 DRC085M-5 DRC090M-5 DRC095M-5	●	7.94	8.49	12	104	59	53	43	45	16	Yes	WDR17 *(Included wrench : WDR8)	DC0794M-SC~DC0840M-SC	
	●	8.5	8.99		107	62	56	45					DC0850M-SC~DC0890M-SC	
	●	9	9.49		110	65	59	48					DC0900M-SC~DC0940M-SC	
	●	9.5	9.99		114	69	63	50					DC0950M-SC~DC0990M-SC	
SF16- DRC100M-5 DRC105M-5 DRC110M-5 DRC115M-5 DRC120M-5 DRC125M-5 DRC130M-5 DRC135M-5 DRC140M-5 DRC145M-5	●	10	10.49	16	120	72	66	53	48	20	Yes	WDR17 *(Included wrench : WDR10)	DC1000M-SC~DC1040M-SC	
	●	10.5	10.99		123	75	69	55					DC1050M-SC~DC1090M-SC	
	●	11	11.49		126	78	72	58				DC1100M-SC~DC1140M-SC		
	●	11.5	11.99		129	81	75	60				DC1150M-SC~DC1190M-SC		
	●	12	12.49		132	84	78	63				DC1200M-SC~DC1240M-SC		
	●	12.5	12.99		135	87	81	65				DC1250M-SC~DC1290M-SC		
	●	13	13.49		138	90	84	68				DC1300M-SC~DC1340M-SC		
	●	13.5	13.99		142	94	88	70				DC1350M-SC~DC1390M-SC		
	●	14	14.49		145	97	91	73				DC1400M-SC~DC1440M-SC		
	●	14.5	14.99		148	100	94	75				DC1450M-SC~DC1490M-SC		
SF20- DRC150M-5 DRC160M-5 DRC170M-5	●	15	15.99	20	156	106	100	80	50	25	Yes	WDR17 *(Included wrench : WDR14)	DC1500M-SC~DC1580M-SC	
	●	16	16.99		162	112	106	85					DC1600M-SC~DC1690M-SC	
	●	17	17.99		169	119	113	90					DC1700M-SC~DC1790M-SC	
SF25- DRC180M-5 DRC190M-5 DRC200M-5 DRC210M-5 DRC220M-5 DRC230M-5 DRC240M-5 DRC250M-5	●	18	18.99	25	181	125	119	95	56	32	Yes	WDR17	DC1800M-SC~DC1890M-SC	
	●	19	19.99		187	131	125	100					DC1900M-SC~DC1990M-SC	
	●	20	20.99		193	137	131	105					DC2000M-SC~DC2099M-SC	
	●	21	21.99		200	144	138	110					DC2100M-SC~DC2150M-SC	
	●	22	22.99		206	150	144	115					DC2200M-SC~DC2250M-SC	
	●	23	23.99		212	156	150	120					DC2300M-SC~DC2350M-SC	
	●	24	24.99		218	162	156	125					DC2400M-SC~DC2450M-SC	
	●	25	25.99		225	169	163	130					DC2500M-SC~DC2599M-SC	

* Choose „WDR17“, when purchasing wrench only.



SF-DRC (Drilling depth : 8 x DC)



For PL indicates distance from drill point to corner edge K32~K34


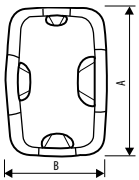

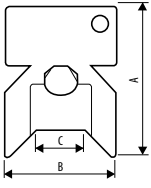

Toolholder dimensions

Description	Availability	Dimension (mm)										Coolant hole	Spare parts	
		DC min.	DC max.	DCON	OAL	LFS	LCF	LU	LS	DCSFMS	Wrench		Applicable drill heads K32~K34	
SF12- DRC080M-8 DRC085M-8 DRC090M-8 DRC095M-8	●	7.94	8.49	12	129	84	79	68	45	16	Yes	WDR17 *(Included wrench : WDR8)	DC0794M-SC~DC0840M-SC	
	●	8.5	8.99		134	89	83	72					DC0850M-SC~DC0890M-SC	
	●	9	9.49		138	93	88	76					DC0900M-SC~DC0940M-SC	
	●	9.5	9.99		144	99	93	80					DC0950M-SC~DC0990M-SC	
SF16- DRC100M-8 DRC105M-8 DRC110M-8 DRC115M-8 DRC120M-8 DRC125M-8 DRC130M-8 DRC135M-8 DRC140M-8 DRC145M-8	●	10	10.49	16	151	103	97	84	48	20	Yes	WDR17 *(Included wrench : WDR10)	DC1000M-SC~DC1040M-SC	
	●	10.5	10.99		156	108	102	88					DC1050M-SC~DC1090M-SC	
	●	11	11.49		160	112	107	92				DC1100M-SC~DC1140M-SC		
	●	11.5	11.99		165	117	111	96				DC1150M-SC~DC1190M-SC		
	●	12	12.49		169	121	116	100				DC1200M-SC~DC1240M-SC		
	●	12.5	12.99		174	126	120	104				DC1250M-SC~DC1290M-SC		
	●	13	13.49		178	130	124	108				DC1300M-SC~DC1340M-SC		
	●	13.5	13.99		184	136	130	112				DC1350M-SC~DC1390M-SC		
	●	14	14.49		188	140	134	116				DC1400M-SC~DC1440M-SC		
	●	14.5	14.99		193	145	139	120				DC1450M-SC~DC1490M-SC		
SF20- DRC150M-8 DRC160M-8 DRC170M-8	●	15	15.99	20	204	154	148	128	50	25	Yes	WDR17 *(Included wrench : WDR14)	DC1500M-SC~DC1580M-SC	
	●	16	16.99		213	163	157	136					DC1600M-SC~DC1690M-SC	
	●	17	17.99		223	173	167	144					DC1700M-SC~DC1790M-SC	
SF25- DRC180M-8 DRC190M-8 DRC200M-8 DRC210M-8 DRC220M-8 DRC230M-8 DRC240M-8 DRC250M-8	●	18	18.99	25	238	182	176	152	56	32	Yes	WDR17	DC1800M-SC~DC1890M-SC	
	●	19	19.99		247	191	185	160					DC1900M-SC~DC1990M-SC	
	●	20	20.99		256	200	194	168					DC2000M-SC~DC2099M-SC	
	●	21	21.99		266	210	204	176					DC2100M-SC~DC2150M-SC	
	●	22	22.99		275	219	213	184					DC2200M-SC~DC2250M-SC	
	●	23	23.99		284	228	222	192					DC2300M-SC~DC2350M-SC	
	●	24	24.99		293	237	231	200					DC2400M-SC~DC2450M-SC	
	●	25	25.99		303	247	241	208					DC2500M-SC~DC2599M-SC	

* Choose „WDR17“, when purchasing wrench only.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Wrench

Shape		Description	Dimension (mm)			Remarks
			A	B	C	
		WDR17	77	52	-	<ul style="list-style-type: none"> WDR17(Multiple type wrench) has four drill head entry points. If using an drill head ranging from DC1700M-SC to DC2099M-SC, use the entry point printed as "ø17.00~ø20.99". WDR17 can be used instead of WDR8~14 wrench.
		WDR8	43	33	ø10.2	
		WDR10			ø12.2	
		WDR12			ø14.2	
		WDR14			ø17.2	

Method to change MagicDrill DRC drill heads

How to attach drill heads



1. Fix drill holder on arbor. For drill head exchange, fix arbor on the machine or set on toolpresetter.
2. Use compressed air to remove dust.



3. Install drill head onto holder.
(Use gloves to protect your hand from any danger.)



4. Turn lightly in a clockwise direction.
(Use gloves to protect your hand from any danger.)



5. Align the wrench properly with the drill head.



6. Make sure the wrench is aligned with the wrench slots on the drill head.



(Improper alignment shown)

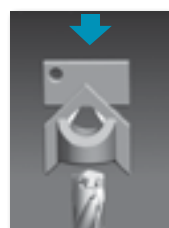


Slot for wrench



7. Turn the wrench in a slow counterclockwise direction.
8. Completed.

How to detach drill heads



1. Use compressed air to remove dust.
2. Align the wrench properly with the drill head.



3. Make sure the wrench is aligned with the wrench slots on the drill head.



4. Turn the wrench in a counterclockwise direction.



5. Once lock is released, drill head can be turned by fingers.
(Use gloves to protect your hand from any danger.)



6. Remove drill head.
(Use gloves to protect your hand from any danger.)

K



Drilling

Recommended cutting conditions

Workpiece material		Hardness (HB)	Cutting conditions		Drill dia. DC (mm)							Remarks	
			Vc (m/min)	n (min ⁻¹)	ø8	ø10	ø12	ø14	ø16	ø18	ø20		ø25
				f (mm/rev)									
Low carbon steel	C10E~C25	125	120-180	n (min ⁻¹)	4,780 - 7,170	3,820 - 5,730	3,180 - 4,780	2,730 - 4,090	2,390 - 3,580	2,120 - 3,180	1,910 - 2,870	1,530 - 2,290	
				f (mm/rev)	0.11 - 0.20	0.13 - 0.24	0.14 - 0.28	0.17 - 0.32	0.19 - 0.35	0.23 - 0.38	0.25 - 0.41	0.30 - 0.50	
Carbon steel	C30~C60 (Annealed)	190	100-150	n (min ⁻¹)	3,980 - 5,970	3,180 - 4,780	2,650 - 3,980	2,270 - 3,410	1,990 - 2,990	1,770 - 2,650	1,590 - 2,390	1,270 - 1,910	Coolant
				f (mm/rev)	0.13 - 0.24	0.15 - 0.29	0.17 - 0.33	0.19 - 0.36	0.22 - 0.41	0.25 - 0.46	0.28 - 0.48	0.32 - 0.60	
	C30~C60 (Heat treated)	250	80-120	n (min ⁻¹)	3,180 - 4,780	2,550 - 3,820	2,120 - 3,180	1,820 - 2,730	1,590 - 2,390	1,420 - 2,120	1,270 - 1,910	1,020 - 1,530	
				f (mm/rev)	0.13 - 0.21	0.15 - 0.25	0.18 - 0.31	0.21 - 0.39	0.23 - 0.45	0.25 - 0.53	0.28 - 0.61	0.38 - 0.64	
		300	50-75	n (min ⁻¹)	1,990 - 2,990	1,590 - 2,390	1,330 - 1,990	1,140 - 1,710	1,000 - 1,490	880 - 1,330	800 - 1,190	640 - 960	
				f (mm/rev)	0.11 - 0.19	0.12 - 0.23	0.16 - 0.28	0.21 - 0.32	0.23 - 0.35	0.25 - 0.41	0.28 - 0.41	0.32 - 0.45	
Alloy steel	(Annealed)	180	70-95	n (min ⁻¹)	2,790 - 3,780	2,230 - 3,030	1,860 - 2,520	1,590 - 2,160	1,390 - 1,890	1,240 - 1,680	1,110 - 1,510	890 - 1,210	
				f (mm/rev)	0.15 - 0.28	0.16 - 0.35	0.21 - 0.37	0.23 - 0.46	0.25 - 0.46	0.25 - 0.51	0.30 - 0.51	0.35 - 0.60	
	(Heat treated)	275	70-95	n (min ⁻¹)	2,790 - 3,780	2,230 - 3,030	1,860 - 2,520	1,590 - 2,160	1,390 - 1,890	1,240 - 1,680	1,110 - 1,510	890 - 1,210	
				f (mm/rev)	0.11 - 0.21	0.14 - 0.25	0.19 - 0.30	0.21 - 0.33	0.23 - 0.37	0.28 - 0.43	0.28 - 0.46	0.32 - 0.58	
		300	60-90	n (min ⁻¹)	2,390 - 3,580	1,910 - 2,870	1,590 - 2,390	1,360 - 2,050	1,190 - 1,790	1,060 - 1,590	960 - 1,430	760 - 1,150	
				f (mm/rev)	0.11 - 0.19	0.12 - 0.23	0.16 - 0.26	0.18 - 0.31	0.21 - 0.33	0.23 - 0.36	0.25 - 0.38	0.30 - 0.50	
		350	50-70	n (min ⁻¹)	1,990 - 2,990	1,590 - 2,390	1,330 - 1,990	1,140 - 1,710	1,000 - 1,490	880 - 1,330	800 - 1,190	640 - 960	
				f (mm/rev)	0.11 - 0.20	0.12 - 0.23	0.16 - 0.25	0.17 - 0.29	0.18 - 0.32	0.20 - 0.36	0.23 - 0.38	0.28 - 0.50	
Stainless steel	X5CrNi189 X5CrNiMo17122	220	60-80	n (min ⁻¹)	2,390 - 3,180	1,910 - 2,550	1,590 - 2,120	1,360 - 1,820	1,190 - 1,590	1,060 - 1,420	960 - 1,270	760 - 1,020	
				f (mm/rev)	0.11 - 0.19	0.12 - 0.23	0.16 - 0.26	0.18 - 0.31	0.21 - 0.33	0.23 - 0.36	0.25 - 0.38	0.28 - 0.42	
	X5CrNiCuNb16-4	300	50-70	n (min ⁻¹)	1,990 - 2,790	1,590 - 2,230	1,330 - 1,860	1,140 - 1,590	1,000 - 1,390	880 - 1,240	800 - 1,110	640 - 890	
				f (mm/rev)	0.11 - 0.20	0.12 - 0.23	0.16 - 0.25	0.17 - 0.29	0.18 - 0.32	0.20 - 0.36	0.23 - 0.38	0.25 - 0.40	
Gray cast iron	GG15~GG20	180	120-170	n (min ⁻¹)	4,780 - 6,770	3,820 - 5,410	3,180 - 4,510	2,730 - 3,870	2,390 - 3,380	2,120 - 3,010	1,910 - 2,710	1,530 - 2,170	
				f (mm/rev)	0.17 - 0.32	0.20 - 0.37	0.23 - 0.43	0.27 - 0.48	0.30 - 0.55	0.33 - 0.61	0.33 - 0.61	0.40 - 0.74	
	GG25~GG35	260	90-120	n (min ⁻¹)	3,580 - 4,780	2,870 - 3,820	2,390 - 3,180	2,050 - 2,730	1,790 - 2,390	1,590 - 2,120	1,430 - 1,910	1,150 - 1,530	
				f (mm/rev)	0.14 - 0.25	0.16 - 0.31	0.19 - 0.35	0.23 - 0.42	0.26 - 0.47	0.28 - 0.53	0.30 - 0.58	0.36 - 0.70	
Nodular cast iron	GGG40~GGG50	160	60-90	n (min ⁻¹)	2,390 - 3,580	1,910 - 2,870	1,590 - 2,390	1,360 - 2,050	1,190 - 1,790	1,060 - 1,590	960 - 1,430	760 - 1,150	
				f (mm/rev)	0.14 - 0.25	0.16 - 0.30	0.19 - 0.35	0.22 - 0.40	0.24 - 0.45	0.28 - 0.51	0.28 - 0.56	0.34 - 0.67	
	GGG60~GGG80	250	40-65	n (min ⁻¹)	1,590 - 2,590	1,270 - 2,070	1,060 - 1,730	910 - 1,480	800 - 1,290	710 - 1,150	640 - 1,040	510 - 830	
				f (mm/rev)	0.10 - 0.19	0.12 - 0.22	0.14 - 0.25	0.16 - 0.31	0.19 - 0.35	0.23 - 0.51	0.25 - 0.53	0.30 - 0.60	

As drilling depth increases (3D → 5D → 8D), feed rates should be reduced.

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Drilling

DRA

DRC

DRV

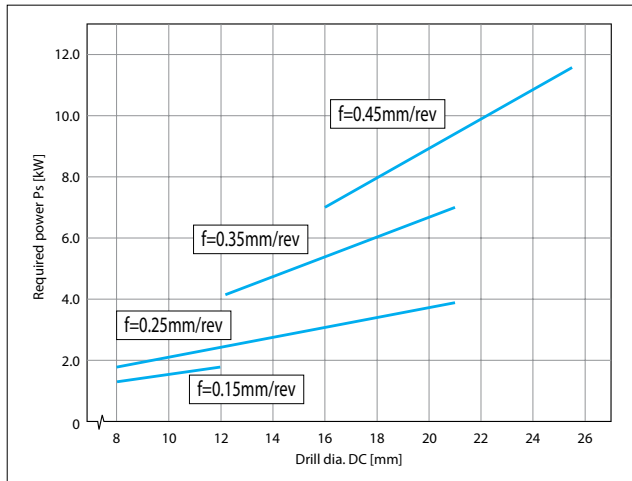
DRZ

DRW

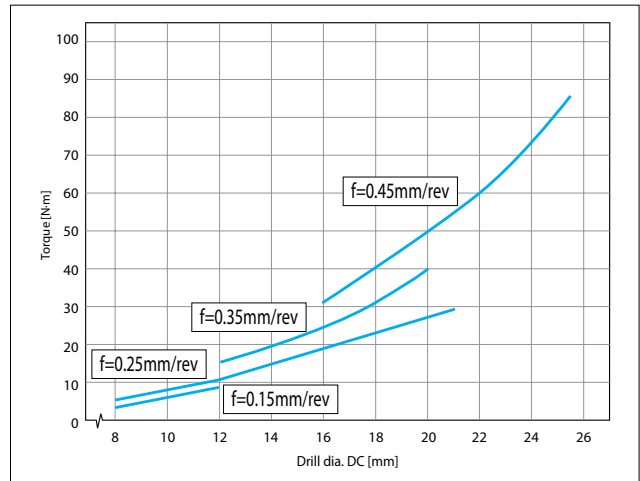
Reference charts

Cutting conditions: Workpiece material heat treated steel (Hardness 240HB) Vc = 80 m/min, wet

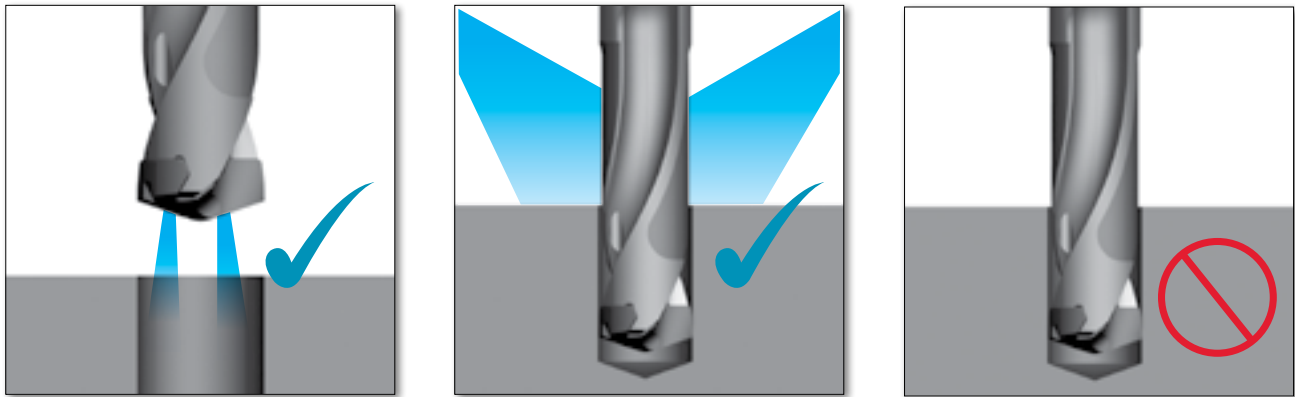
Required power



Torque



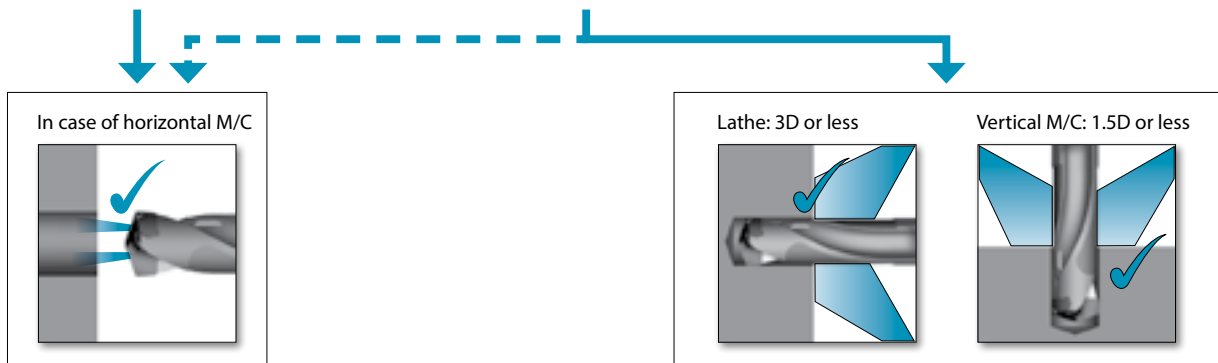
Coolant



1. Internal coolant is recommended.

2. In case of using external coolant system

3. Dry machining is not recommended.

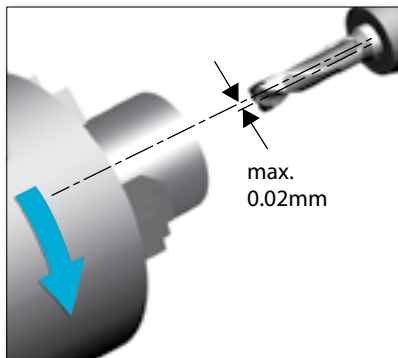


Internal coolant is recommended for horizontal machining center because external coolant may not sufficiently be applied to inside because the tool is revolving.

Precautions for use

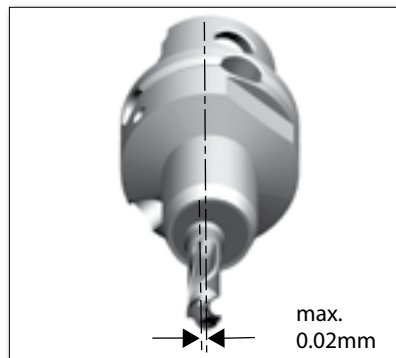
Core deviation

1. If drill is stationary



This can be used with a boring sleeve (Screw clamp) and collet chuck, please be sure to set deviation amount within 0.02mm between workpiece and drill.

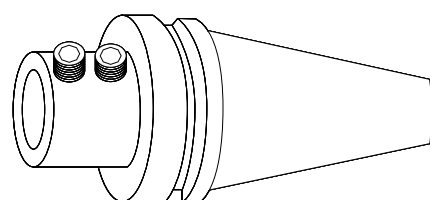
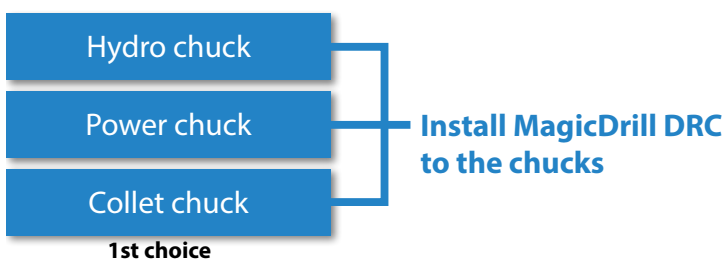
2. If drill is rotating



Make sure to use arbor that is not deformed. Center of arbor deviation must be within 0.02mm.

Cautions for installation on machining center

For installation of MagicDrill DRC,
1st choice hydro chuck, power chuck, collet chuck, etc.
2nd choice side lock arbor

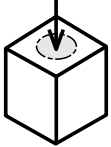
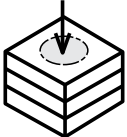
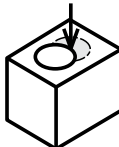
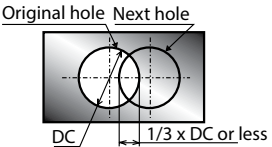


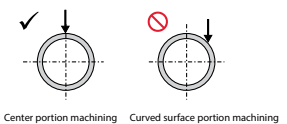


Example of side lock arbor
 2nd choice

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Drilling

Applicable workpieces

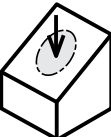
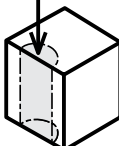
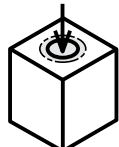
Applications	Shape of workpiece	Caution for machining
Plain surface		<ol style="list-style-type: none"> 1. Due to good chip control, step machining is not necessary for low carbon steel. 2. When machining X5CrNi18 10, for hole depths of more than 2.5D, utilize the step machining process. 3. In order to have smooth chip removal, we recommend internal coolant.
Stacked plates		<ol style="list-style-type: none"> 1. Fix stacked plates securely to ensure so that they do not slip while machining.
Hole expansion		<ol style="list-style-type: none"> 1. If the overlap amount is $1/3 \times DC$ or less, machining is possible. 
Concave surface		<ol style="list-style-type: none"> 1. When machining concave holes, set the feed rates at half or less than continuous hole machining.
Pipe material		<ol style="list-style-type: none"> 1. Hole machining above the centerline of the pipe is possible. 2. Do not machine on curved surface areas. 

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Drilling

Not recommended workpieces

Applications	Shape of workpiece
Slant surface	
Half cylindrical	
Cored hole	

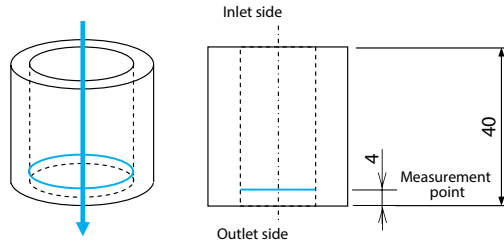
DRA
DRC
DRV
DRZ
DRW

Comparison of Machining Precision

Cutting Condition and Measurement Point

<Cutting Conditions>

Workpiece Material	C45
Vc	100m/min
f	0.2mm/rev, 0.3mm/rev
Drilling Depth H	Through hole (40mm)
Coolant	Wet (Internal coolant)
Tool	ø14-3D type
Machine	M/C



Roundness

1) Roundness (f=0.2mm/rev)

Indexable drill		Carbide solid drill		
Kyocera	Competitor F	Competitor B	Competitor C	Competitor N
Roundness : 5.5µm	Roundness : 22.5µm	Roundness : 6.4µm	Roundness : 9.8µm	Roundness : 5.2µm

(Internal evaluation)

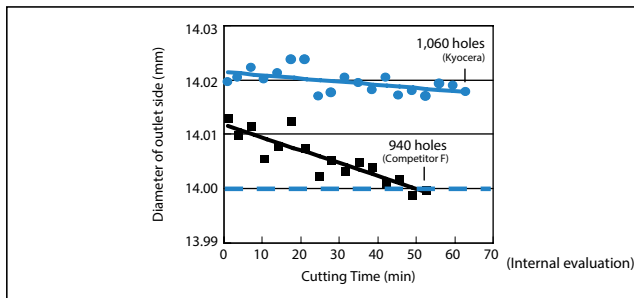
2) Roundness (f=0.3mm/rev)

Indexable drill		Carbide solid drill		
Kyocera	Competitor F	Competitor B	Competitor C	Competitor N
Roundness : 10.7µm	Roundness : 15.2µm	Roundness : 12.0µm	Roundness : 11.8µm	Roundness : 12.3µm

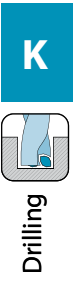
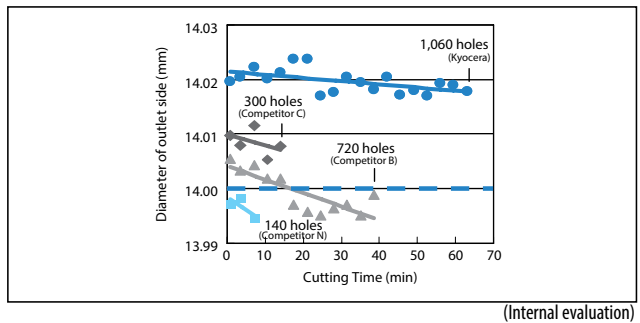
(Internal evaluation)

Comparison of Hole Dia. (f=0.3mm/rev)

1) Comparison with indexable drill



2) Comparison with carbide solid drill



High efficiency indexable insert drill

MagicDrill DRV

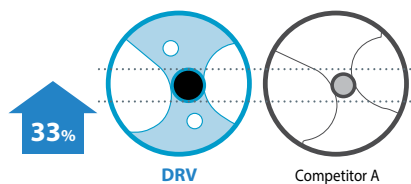
Economical inserts with 4 cutting edges.

Excellent chip evacuation with 6D maximum deep-hole drilling.

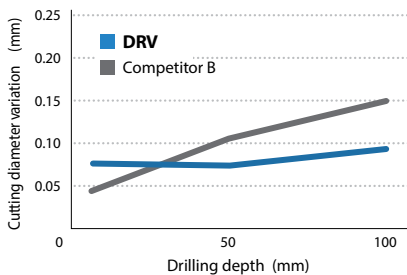
1 Excellent drilling precision with less variation in cutting diameter Up to 6D drilling capabilities with a low cutting force design

Optimal web thickness reduces chattering with a low cutting force design

Web thickness comparison (Internal evaluation)

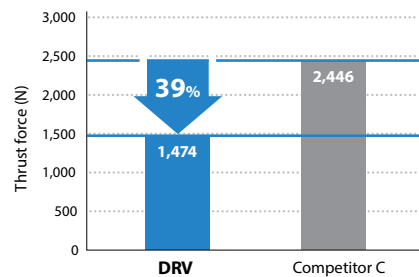


Comparison of cutting diameter variation (Internal evaluation)



Cutting conditions: $V_c = 150$ m/min, $f = 0.06$ mm/rev
Drill dia. $\varnothing 20(5D)$, wet Workpiece material: C50

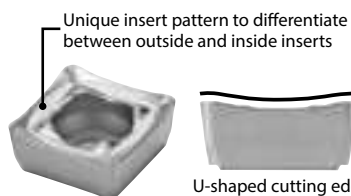
Cutting force comparison (Internal evaluation)



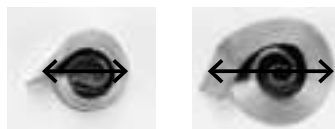
Cutting conditions: $V_c = 200$ m/min, $f = 0.12$ mm/rev
Drill dia. $\varnothing 20(3D)$, wet Workpiece material: C50

2 Unique insert design to control chip flow

Outer edge Smooth chip evacuation with compact chips



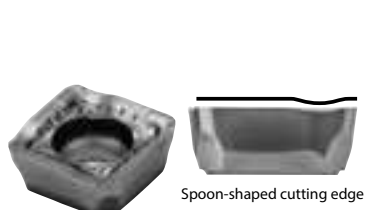
Chipshape comparison of outer insert cutting edge (Internal evaluation)



16%
Diameter of chips

Cutting conditions: $V_c = 150$ m/min, $f = 0.06$ mm/rev, Drill dia. $\varnothing 20(3D)$, wet workpiece material: C50

Inner edge Excellent chip evacuation as well as less wear resistance with reduced chips weight



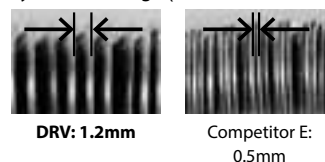
Weight per unit of length for chips generated by the inner edge (Internal evaluation)

DRV
80mg/mm

Competitor E
151mg/mm



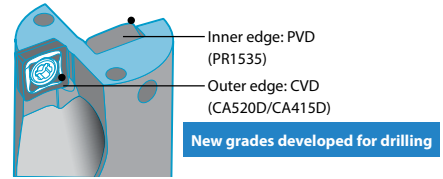
Pitch comparison of chips generated by the inner edge (Internal evaluation)



47%
Weight of chips

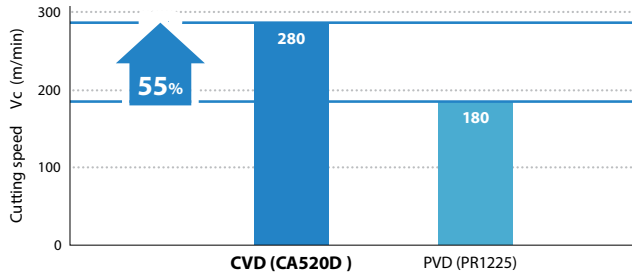
Cutting conditions: $V_c = 250$ m/min, $f = 0.08$ mm/rev, Drill dia. $\varnothing 20(5D)$, wet workpiece material: X5CrNi18 10

3 CVD insert on the outer edge for highly efficient drilling



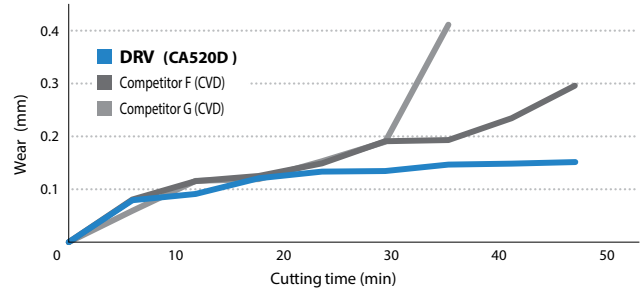
High speed and highly efficient machining available with the combination Of CVD (Outer edge) and PVD (Inner edge) inserts.

Recommended cutting speed (Maximum value)



Drill dia. $\varnothing 20(3D)$ workpiece material: C50

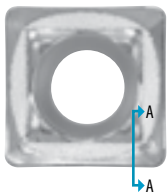
Wear resistance comparison (Internal evaluation)



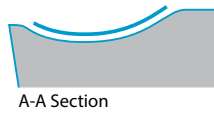
Cutting conditions: $V_c = 200$ m/min, $f = 0.12$ mm/rev, Drill dia. $\varnothing 20(3D)$, wet workpiece material: 41Cr4

4 Economical inserts with 4 cutting edges 4 types of chipbreakers for various machining applications

General purpose GM chipbreaker

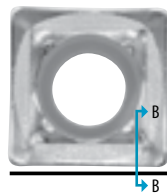


Chipbreaker for steel machining
Stable deep-hole machining with low cutting force

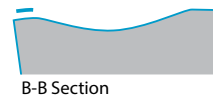


Edge shape optimized for various machining applications

Tough edge GH chipbreaker

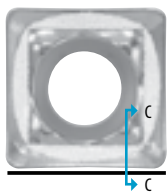


1st recommendation for machining cast iron
Good for continuous steel machining
Reduced breakages common in through-hole machining

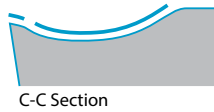


Negative land with Strong edge

For stainless steel machining SM chipbreaker



Stable chip control when machining gummy stainless steel.
Reduces chip clogging in the holder body



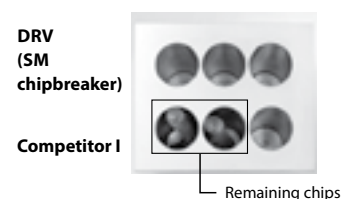
Sharp cutting and large rake angle

Chip control comparison (Internal evaluation)



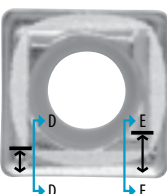
Cutting conditions: $V_c = 100$ m/min, $f = 0.1$ Mm/rev
drill dia. $\varnothing 20(3d)$, drilling depth 60mm
wet, workpiece material: X5CrNi18 10

Comparison of remaining chips (Internal evaluation)

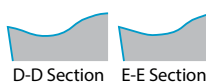


Cutting conditions: $V_c = 150$ m/min, $f = 0.08$ Mm/rev
drill dia. $\varnothing 25(5d)$,
drilling depth 98mm, wet,
workpiece material: X5CrNi18 10

For machining soft steel XM chipbreaker



Stable chip control of outer cutting edge



Excellent chip control
With the changing
Width of the chipbreaker

Chip control comparison (Internal evaluation)



Cutting conditions: $V_c = 200$ m/min, $f = 0.12$ mm/rev
Drill dia. $\varnothing 16(3D)$, Drilling depth 48 mm
Wet Workpiece material: ST44-2

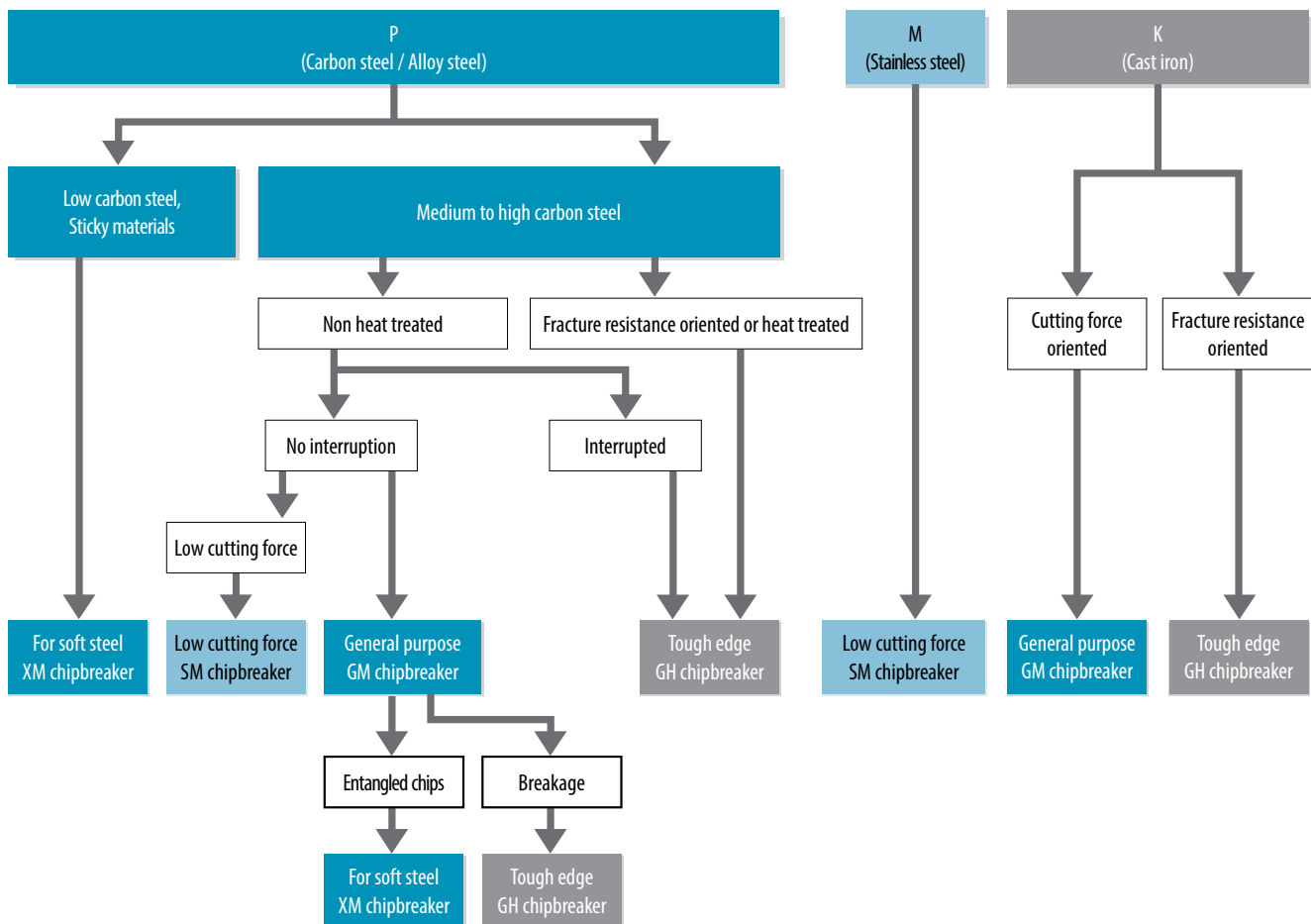
LCMT (outer edge)

Classification of usage		Carbon steel / Alloy steel		★☆☆		P							
		★☆☆		★☆☆									
★ : High speed and highly efficient drilling ☆☆ : Stable machining oriented		Stainless steel		★☆☆		M							
		★☆☆		★☆☆									
Insert		Description		Dimension (mm)					Angle (°)	Carbide			Applicable toolholder K54, K56 K58, K60 K62
				No. of edges	S	D1	RE	L		W1	AN	CVD	
PVD													
		LCMT 030203-GH-E	2	2	2.3	0.3	5.54	4.4	7	●	●	●	S20-DRV...M-03
		LCMT 030203-GM-E	2	2	2.3	0.3	5.54	4.4	7	●	●	●	
		LCMT 030203-SM-E	2	2	2.3	0.3	5.54	4.4	7	●	●	●	

Recommended cutting conditions K68~K69





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Chipbreaker selection chart



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SCMT (outer edge)


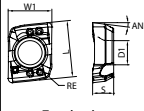

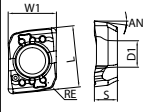

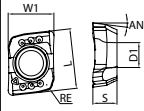
Classification of usage ★ : High speed and highly efficient drilling ☆ : Stable machining oriented		Carbon steel / Alloy steel		★ ☆		P								
		Mold and die steel		★ ☆										
Insert		Description		Dimension (mm)					Angle (°)		Carbide			Applicable toolholder K54~K62
				No. of edges	IC	S	D1	RE	AN	CVD	PVD	PR1225		
 Tough edge	SCMT 040205-GH-E	4	4.8										2.2	2.4
	SCMT 050205-GH-E	4	5.25	2.6	2.4	0.5	7	●	●	●	S..-DRV...M-○-05			
	SCMT 060205-GH-E	4	6.4	2.8	2.9	0.5	7	●	●	●	S..-DRV...M-○-06			
	SCMT 070305-GH-E	4	7.65	3.2	3.5	0.5	7	●	●	●	S..-DRV...M-○-07			
	SCMT 090405-GH-E	4	9.1	4.1	4	0.5	7	●	●	●	S..-DRV...M-○-09			
	SCMT 110406-GH-E	4	11	4.5	4.6	0.6	7	●	●	●	S..-DRV...M-○-11			
	SCMT 140508-GH-E	4	13.8	5	5.7	0.8	7	●	●	●	S..-DRV...M-○-14			
	SCMT 170608-GH-E	4	16.8	6.58	6.9	0.8	7	●	●	●	S..-DRV...M-○-17			
 General purpose	SCMT 040205-GM-E	4	4.8	2.2	2.4	0.5	7	●	●	●	S..-DRV...M-○-04			
	SCMT 050205-GM-E	4	5.25	2.6	2.4	0.5	7	●	●	●	S..-DRV...M-○-05			
	SCMT 060205-GM-E	4	6.4	2.8	2.9	0.5	7	●	●	●	S..-DRV...M-○-06			
	SCMT 070305-GM-E	4	7.65	3.2	3.5	0.5	7	●	●	●	S..-DRV...M-○-07			
	SCMT 090405-GM-E	4	9.1	4.1	4	0.5	7	●	●	●	S..-DRV...M-○-09			
	SCMT 110406-GM-E	4	11	4.5	4.6	0.6	7	●	●	●	S..-DRV...M-○-11			
	SCMT 140508-GM-E	4	13.8	5	5.7	0.8	7	●	●	●	S..-DRV...M-○-14			
	SCMT 170608-GM-E	4	16.8	6.58	6.9	0.8	7	●	●	●	S..-DRV...M-○-17			
 Stainless steel	SCMT 040205-SM-E	4	4.8	2.2	2.4	0.5	7	●	●	●	S..-DRV...M-○-04			
	SCMT 050205-SM-E	4	5.25	2.6	2.4	0.5	7	●	●	●	S..-DRV...M-○-05			
	SCMT 060205-SM-E	4	6.4	2.8	2.9	0.5	7	●	●	●	S..-DRV...M-○-06			
	SCMT 070305-SM-E	4	7.65	3.2	3.5	0.5	7	●	●	●	S..-DRV...M-○-07			
	SCMT 090405-SM-E	4	9.1	4.1	4	0.5	7	●	●	●	S..-DRV...M-○-09			
	SCMT 110406-SM-E	4	11	4.5	4.6	0.6	7	●	●	●	S..-DRV...M-○-11			
	SCMT 140508-SM-E	4	13.8	5	5.7	0.8	7	●	●	●	S..-DRV...M-○-14			
	SCMT 170608-SM-E	4	16.8	6.58	6.9	0.8	7	●	●	●	S..-DRV...M-○-17			
 Low carbon steel	SCMT 040205-XM-E	4	4.8	2.2	2.4	0.5	7	●	●	●	S..-DRV...M-○-04			
	SCMT 050205-XM-E	4	5.25	2.6	2.4	0.5	7	●	●	●	S..-DRV...M-○-05			
	SCMT 060205-XM-E	4	6.4	2.8	2.9	0.5	7	●	●	●	S..-DRV...M-○-06			
	SCMT 070305-XM-E	4	7.65	3.2	3.5	0.5	7	●	●	●	S..-DRV...M-○-07			
	SCMT 090405-XM-E	4	9.1	4.1	4	0.5	7	●	●	●	S..-DRV...M-○-09			
	SCMT 110406-XM-E	4	11	4.5	4.6	0.6	7	●	●	●	S..-DRV...M-○-11			
	SCMT 140508-XM-E	4	13.8	5	5.7	0.8	7	●	●	●	S..-DRV...M-○-14			
	SCMT 170608-XM-E	4	16.8	6.58	6.9	0.8	7	●	●	●	S..-DRV...M-○-17			

Recommended cutting conditions K68~K69



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

LCMT (inner edge)

		Carbon steel / Alloy steel							P	
		Mold and die steel							M	
		Stainless steel							K	
		Cast iron							K	
Insert	Description	No. of edges	Dimension (mm)					Angle (°)	Carbide	Applicable toolholder ● K54, K56 ● K58, K60 ● K62
			S	D1	RE	L	W1	AN		
 	LCMT 030205-GH-I Tough edge	2	2	2.3	0.5	5.37	4.16	7	●	S20-DRV...M-0-03
 	LCMT 030205-GM-I General purpose	2	2	2.3	0.5	5.37	4.16	7	●	
 	LCMT 030205-SM-I Stainless steel	2	2	2.3	0.5	5.37	4.16	7	●	

Recommended cutting conditions ● K68~K69

K



Drilling

DRA

DRC

DRV


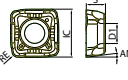

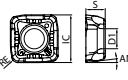

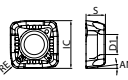

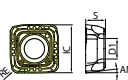
DRZ

DRW

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

K52

SCMT (inner edge)

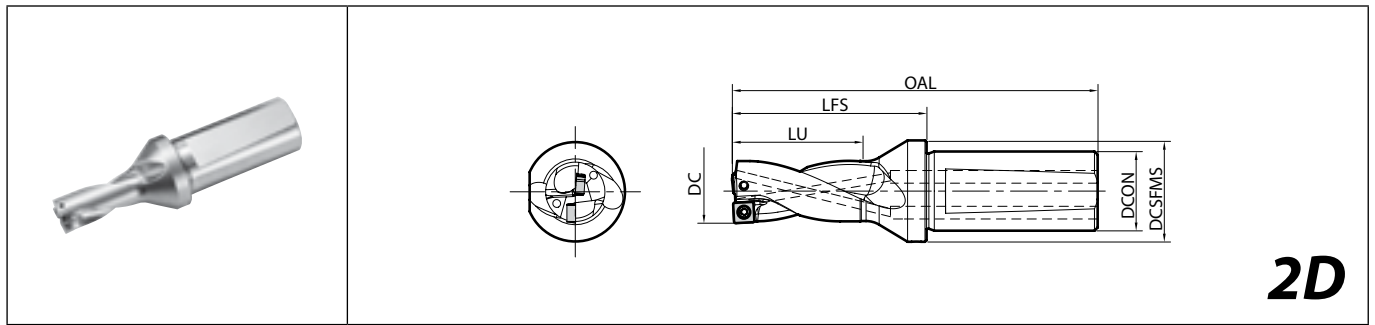
Insert		Description	Carbon steel / Alloy steel						Angle (°)	Carbide	Applicable toolholder ● K54~K62		
			Mold and die steel									P	
			Stainless steel										M
			Cast iron											K
No. of edges	Dimension (mm)					AN	PVD						
	IC	S	D1	RE	AN								
	 Tough edge	SCMT 040209-GH-I	4	5	2.2	2.4	0.9	7	●	S...DRV...M-○-04			
		SCMT 050210-GH-I	4	5.7	2.6	2.4	1	7	●	S...DRV...M-○-05			
		SCMT 060210-GH-I	4	6.9	2.8	2.9	1	7	●	S...DRV...M-○-06			
		SCMT 070310-GH-I	4	8.2	3.2	3.5	1	7	●	S...DRV...M-○-07			
		SCMT 090410-GH-I	4	9.8	4.1	4	1	7	●	S...DRV...M-○-09			
		SCMT 110410-GH-I	4	11.9	4.5	4.6	1	7	●	S...DRV...M-○-11			
		SCMT 140510-GH-I	4	14.9	5	5.7	1	7	●	S...DRV...M-○-14			
		SCMT 170610-GH-I	4	17.9	6.58	6.9	1	7	●	S...DRV...M-○-17			
	 General purpose	SCMT 040209-GM-I	4	5	2.2	2.4	0.9	7	●	S...DRV...M-○-04			
		SCMT 050210-GM-I	4	5.7	2.6	2.4	1	7	●	S...DRV...M-○-05			
		SCMT 060210-GM-I	4	6.9	2.8	2.9	1	7	●	S...DRV...M-○-06			
		SCMT 070310-GM-I	4	8.2	3.2	3.5	1	7	●	S...DRV...M-○-07			
		SCMT 090410-GM-I	4	9.8	4.1	4	1	7	●	S...DRV...M-○-09			
		SCMT 110410-GM-I	4	11.9	4.5	4.6	1	7	●	S...DRV...M-○-11			
		SCMT 140510-GM-I	4	14.9	5	5.7	1	7	●	S...DRV...M-○-14			
		SCMT 170610-GM-I	4	17.9	6.58	6.9	1	7	●	S...DRV...M-○-17			
	 Stainless steel	SCMT 040209-SM-I	4	5	2.2	2.4	0.9	7	●	S...DRV...M-○-04			
		SCMT 050210-SM-I	4	5.7	2.6	2.4	1	7	●	S...DRV...M-○-05			
		SCMT 060210-SM-I	4	6.9	2.8	2.9	1	7	●	S...DRV...M-○-06			
		SCMT 070310-SM-I	4	8.2	3.2	3.5	1	7	●	S...DRV...M-○-07			
		SCMT 090410-SM-I	4	9.8	4.1	4	1	7	●	S...DRV...M-○-09			
		SCMT 110410-SM-I	4	11.9	4.5	4.6	1	7	●	S...DRV...M-○-11			
		SCMT 140510-SM-I	4	14.9	5	5.7	1	7	●	S...DRV...M-○-14			
		SCMT 170610-SM-I	4	17.9	6.58	6.9	1	7	●	S...DRV...M-○-17			
	 Low carbon steel	SCMT 040209-XM-I	4	5	2.2	2.4	0.9	7	●	S...DRV...M-○-04			
		SCMT 050210-XM-I	4	5.7	2.6	2.4	1	7	●	S...DRV...M-○-05			
		SCMT 060210-XM-I	4	6.9	2.8	2.9	1	7	●	S...DRV...M-○-06			
		SCMT 070310-XM-I	4	8.2	3.2	3.5	1	7	●	S...DRV...M-○-07			
		SCMT 090410-XM-I	4	9.8	4.1	4	1	7	●	S...DRV...M-○-09			
		SCMT 110410-XM-I	4	11.9	4.5	4.6	1	7	●	S...DRV...M-○-11			
		SCMT 140510-XM-I	4	14.9	5	5.7	1	7	●	S...DRV...M-○-14			
		SCMT 170610-XM-I	4	17.9	6.58	6.9	1	7	●	S...DRV...M-○-17			

Recommended cutting conditions ● K68~K69



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRV (Drilling depth : 2 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)					Coolant hole	Radial offset max.	Spare parts				Applicable inserts K50~K53	
			DC	DCON	OAL	LFS	LU			DCSFMS	Screw	Wrench	Wrench		Wrench
S20- DRV120M-2-03 DRV125M-2-03 DRV130M-2-03 DRV135M-2-03	●	2	12	20	82	39	24	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□□-E (Outer) LCMT030205-□□-I (Inner)
	●		12.5		83	40	25			+0.2					
	●		13		84	41	26			+0.15					
	●		13.5		85	42	27			+0.1					
S20- DRV140M-2-04 DRV145M-2-04 DRV150M-2-04 DRV155M-2-04	●	2	14	20	92	49	28	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□□-E (Outer) SCMT040209-□□-I (Inner)
	●		14.5		93	50	29			+0.35					
	●		15		94	51	30			+0.3					
	●		15.5		95	52	31			+0.25					
S25- DRV160M-2-05 DRV165M-2-05 DRV170M-2-05 DRV175M-2-05 DRV180M-2-05 DRV185M-2-05	●	2	16	25	110	56	32	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□□-E (Outer) SCMT050210-□□-I (Inner)
	●		16.5		111	57	33			+0.35					
	●		17		112	58	34			+0.3					
	●		17.5		113	59	35			+0.25					
	●		18		114	60	36			+0.2					
	●		18.5		115	61	37			+0.15					
S25- DRV190M-2-06 DRV195M-2-06 DRV200M-2-06 DRV205M-2-06 DRV210M-2-06 DRV215M-2-06 DRV220M-2-06	●	2	19	25	113	59	38	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□□-E (Outer) SCMT060210-□□-I (Inner)
	●		19.5		114	60	39			+0.6					
	●		20		115	61	40			+0.55					
	●		20.5		116	62	41			0.5					
	●		21		117	63	42			+0.45					
	●		21.5		118	64	43			+0.35					
	●		22		119	65	44			+0.3					
	●		22.5		120	66	45			+0.9					
S25- DRV225M-2-07 DRV230M-2-07 DRV235M-2-07 DRV240M-2-07 DRV245M-2-07 DRV250M-2-07 DRV255M-2-07 DRV260M-2-07	●	2	22.5	25	120	66	45	32	Yes	+0.9	SB-3060TRP	DTPM-10	-	-	SCMT070305-□□-E (Outer) SCMT070310-□□-I (Inner)
	●		23		121	67	46			+0.8					
	●		23.5		122	68	47			+0.75					
	●		24		123	69	48			+0.7					
	●		24.5		124	70	49			+0.65					
	●		25		125	71	50			+0.6					
	●		25.5		126	72	51			+0.5					
	●		26		127	73	52			+0.45					
S32- DRV270M-2-09 DRV280M-2-09 DRV290M-2-09 DRV300M-2-09 DRV310M-2-09 DRV320M-2-09	●	2	27	32	136	77	54	41	Yes	+1.05	SB-3573TRP	DTPM-10	-	-	SCMT090405-□□-E (Outer) SCMT090410-□□-I (Inner)
	●		28		138	79	56			+0.95					
	●		29		140	81	58			+0.85					
	●		30		142	83	60			+0.75					
	●		31		144	85	62			+0.6					
	●		32		146	87	64			+0.5					





When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions K68
Trouble shooting K65

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

2xDC

Description	Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ● K51, K53
			DC	DON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
															
S40- DRV330M-2-11 DRV340M-2-11 DRV350M-2-11 DRV360M-2-11 DRV370M-2-11 DRV380M-2-11 DRV390M-2-11	●	2	33	40	161	92	66	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	●		34		163	94	68			+1.15					
	●		35		165	96	70			+1					
	●		36		167	98	72			+0.9					
	●		37		169	100	74			+0.8					
	●		38		171	102	76			+0.65					
	●		39		173	104	78			+0.55					
S40- DRV400M-2-14 DRV410M-2-14 DRV420M-2-14 DRV430M-2-14 DRV440M-2-14 DRV450M-2-14 DRV460M-2-14 DRV470M-2-14 DRV480M-2-14 DRV490M-2-14	●	2	40	40	181	112	80	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	●		41		183	114	82			+1.6					
	●		42		185	116	84			+1.5					
	●		43		187	118	86			+1.4					
	●		44		189	120	88			+1.3					
	●		45		191	122	90			+1.15					
	●		46		193	124	92			+1.05					
	●		47		195	126	94			+0.95					
	●		48		197	128	96			+0.8					
	●		49		199	130	98			+0.7					
	S40- DRV500M-2-17 DRV510M-2-17 DRV520M-2-17 DRV530M-2-17 DRV540M-2-17 DRV550M-2-17 DRV560M-2-17 DRV570M-2-17 DRV580M-2-17 DRV590M-2-17 DRV600M-2-17		●		2	50	40			198						129	100	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
●		51	200	131		102		+1.95							
●		52	202	133		104		+1.85							
●		53	204	135		106		+1.75							
●		54	206	137		108		+1.65							
●		55	208	139		110		+1.5							
●		56	210	141		112		+1.4							
●		57	212	143		114		+1.3							
●		58	214	145		116		+1.15							
●		59	216	147		118		+1.05							
●		60	218	149		120		+0.95							

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions ● K68
Trouble shooting ● K65

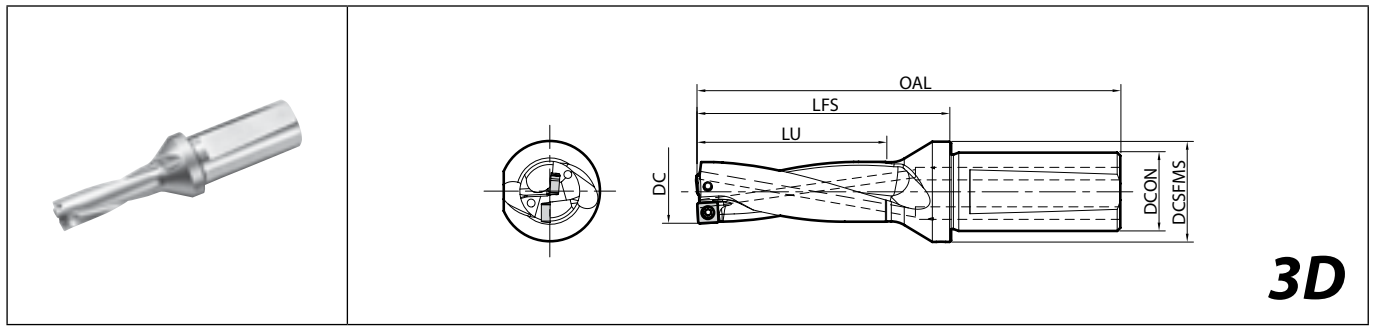
Hole Dia. Tolerance (2D type)

DC	Hole Dia. Tolerance (mm)
ø12 - ø60	+0.30 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.



DRV (Drilling depth : 3 x DC)



3D

Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)					Coolant hole	Radial offset max.	Spare parts				Applicable inserts K50~K53		
			DC	DCON	OAL	LFS	LU			DCSFMS	Screw	Wrench	Wrench		Wrench	
S20- DRV120M-3-03 DRV125M-3-03 DRV130M-3-03 DRV135M-3-03	●	2	12	20	94	51	36	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□-E (Outer) LCMT030205-□-I (Inner)	
	●		12.5		96	53	37.5									+0.2
	●		13		97	54	39									+0.15
	●		13.5		99	56	40.5									+0.1
S20- DRV140M-3-04 DRV145M-3-04 DRV150M-3-04 DRV155M-3-04	●	2	14	20	106	63	42	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□-E (Outer) SCMT040209-□-I (Inner)	
	●		14.5		108	65	43.5									+0.35
	●		15		109	66	45									+0.3
	●		15.5		111	68	46.5									+0.25
S25- DRV160M-3-05 DRV165M-3-05 DRV170M-3-05 DRV175M-3-05 DRV180M-3-05 DRV185M-3-05	●	2	16	25	126	72	48	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□-E (Outer) SCMT050210-□-I (Inner)	
	●		16.5		127	73	49.5									+0.35
	●		17		129	75	51									+0.3
	●		17.5		130	76	52.5									+0.25
	●		18		132	78	54									+0.2
	●		18.5		133	79	55.5									+0.15
S25- DRV190M-3-06 DRV195M-3-06 DRV200M-3-06 DRV205M-3-06 DRV210M-3-06 DRV215M-3-06 DRV220M-3-06	●	2	19	25	132	78	57	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□-E (Outer) SCMT060210-□-I (Inner)	
	●		19.5		134	80	58.5									+0.6
	●		20		135	81	60									+0.55
	●		20.5		137	83	61.5									+0.5
	●		21		138	84	63									+0.45
	●		21.5		140	86	64.5									+0.35
	●		22		141	87	66									+0.3
	●		22.5		142	88	67.5									+0.9
S25- DRV225M-3-07 DRV230M-3-07 DRV235M-3-07 DRV240M-3-07 DRV245M-3-07 DRV250M-3-07 DRV255M-3-07 DRV260M-3-07	●	2	22.5	25	142	88	67.5	32	Yes	+0.9	SB-3060TRP	DTPM-10	-	-	SCMT070305-□-E (Outer) SCMT070310-□-I (Inner)	
	●		23		144	90	69									+0.8
	●		23.5		145	91	70.5									+0.75
	●		24		147	93	72									+0.7
	●		24.5		148	94	73.5									+0.65
	●		25		150	96	75									+0.6
	●		25.5		151	97	76.5									+0.5
	●		26		153	99	78									+0.45





When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions **K68**
Trouble shooting **K65**



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

3xDC

Description	Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts K51, K53
			DC	DON	OAL	LFS	LU	DCSfMS			Screw	Wrench	Wrench	Wrench	
															
S32- DRV265M-3-09 DRV270M-3-09 DRV275M-3-09 DRV280M-3-09 DRV285M-3-09 DRV290M-3-09 DRV295M-3-09 DRV300M-3-09 DRV305M-3-09 DRV310M-3-09 DRV315M-3-09 DRV320M-3-09	●	2	26.5	32	161	102	79.5	41	Yes	+1.15	SB-3573TRP	DTPM-10	-	-	SCMT090405-□-E (Outer) SCMT090410-□-I (Inner)
	●		27		163	104	81			+1.05					
	●		27.5		164	105	82.5			+1					
	●		28		166	107	84			+0.95					
	●		28.5		167	108	85.5			+0.9					
	●		29		169	110	87			+0.85					
	●		29.5		170	111	88.5			+0.8					
	●		30		172	113	90			+0.75					
	●		30.5		173	114	91.5			+0.65					
	●		31		175	116	93			+0.6					
	●		31.5		176	117	94.5			+0.55					
	●		32		178	119	96			+0.5					
S40- DRV330M-3-11 DRV340M-3-11 DRV350M-3-11 DRV360M-3-11 DRV370M-3-11 DRV380M-3-11 DRV390M-3-11	●	2	33	40	194	125	99	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□-E (Outer) SCMT110410-□-I (Inner)
	●		34		197	128	102			+1.15					
	●		35		200	131	105			+1					
	●		36		203	134	108			+0.9					
	●		37		206	137	111			+0.8					
	●		38		209	140	114			+0.65					
	●		39		212	143	117			+0.55					
S40- DRV400M-3-14 DRV410M-3-14 DRV420M-3-14 DRV430M-3-14 DRV440M-3-14 DRV450M-3-14 DRV460M-3-14 DRV470M-3-14 DRV480M-3-14 DRV490M-3-14	●	2	40	40	221	152	120	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□-E (Outer) SCMT140510-□-I (Inner)
	●		41		224	155	123			+1.6					
	●		42		227	158	126			+1.5					
	●		43		230	161	129			+1.4					
	●		44		233	164	132			+1.3					
	●		45		236	167	135	+1.15							
	●		46		239	170	138	+1.05							
	●		47		242	173	141	+0.95							
	●		48		245	176	144	+0.8							
	●		49		248	179	147	+0.7							
	●									54					
S40- DRV500M-3-17 DRV510M-3-17 DRV520M-3-17 DRV530M-3-17 DRV540M-3-17 DRV550M-3-17 DRV560M-3-17 DRV570M-3-17 DRV580M-3-17 DRV590M-3-17 DRV600M-3-17	●	2	50	40	248	179	150	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□-E (Outer) SCMT170610-□-I (Inner)
	●		51		251	182	153			+1.95					
	●		52		254	185	156			+1.85					
	●		53		257	188	159			+1.75					
	●		54		260	191	162			+1.65					
	●		55		263	194	165			+1.5					
	●		56		266	197	168	+1.4							
	●		57		269	200	171	+1.3							
	●		58		272	203	174	+1.15							
	●		59		275	206	177	+1.05							
	●		60		278	209	180	+0.95							
	●									64					

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions  K68
Trouble shooting  K65

Hole Dia. Tolerance (3D type)

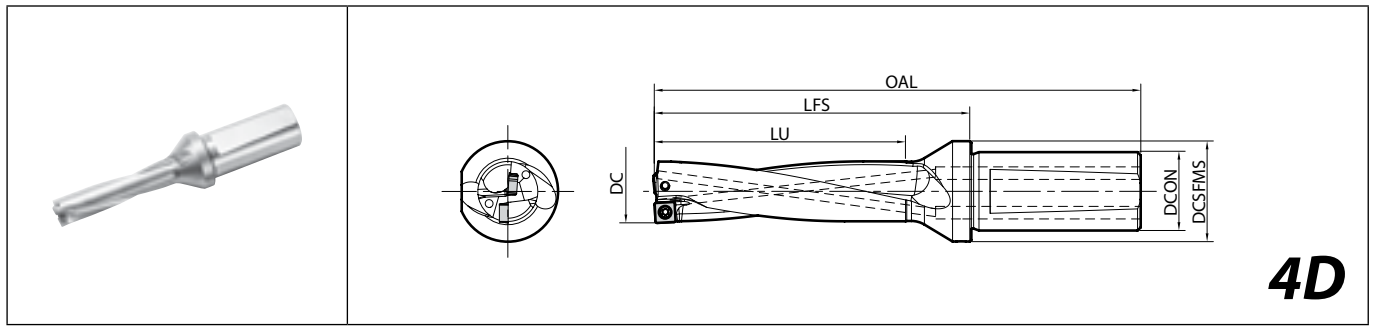
DC	Hole Dia. Tolerance (mm)
ø12 - ø60	+0.30 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



DRV (Drilling depth : 4 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)					Coolant hole	Radial offset max.	Spare parts				Applicable inserts K50~K53	
			DC	DCON	OAL	LFS	LU			DCSFMS	Screw	Wrench	Wrench		Wrench
S20- DRV120M-4-03 DRV125M-4-03 DRV130M-4-03 DRV135M-4-03	●	2	12	20	106	63	48	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□-E (Outer) LCMT030205-□-I (Inner)
	●		12.5		108	65	50			+0.2					
	●		13		110	67	52			+0.15					
	●		13.5		112	69	54			+0.1					
S20- DRV140M-4-04 DRV145M-4-04 DRV150M-4-04 DRV155M-4-04	●	2	14	20	120	77	56	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□-E (Outer) SCMT040209-□-I (Inner)
	●		14.5		122	79	58			+0.35					
	●		15		124	81	60			+0.3					
	●		15.5		126	83	62			+0.25					
S25- DRV160M-4-05 DRV165M-4-05 DRV170M-4-05 DRV175M-4-05 DRV180M-4-05 DRV185M-4-05	●	2	16	25	142	88	64	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□-E (Outer) SCMT050210-□-I (Inner)
	●		16.5		144	90	66			+0.35					
	●		17		146	92	68			+0.3					
	●		17.5		148	94	70			+0.25					
	●		18		150	96	72			+0.2					
	●		18.5		152	98	74			+0.15					
S25- DRV190M-4-06 DRV195M-4-06 DRV200M-4-06 DRV205M-4-06 DRV210M-4-06 DRV215M-4-06 DRV220M-4-06	●	2	19	25	151	97	76	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□-E (Outer) SCMT060210-□-I (Inner)
	●		19.5		153	99	78			+0.6					
	●		20		155	101	80			+0.55					
	●		20.5		157	103	82			+0.5					
	●		21		159	105	84			+0.45					
	●		21.5		161	107	86			+0.35					
	●		22		163	109	88			+0.3					
	●		22.5		165	111	90			+0.9					
S25- DRV225M-4-07 DRV230M-4-07 DRV235M-4-07 DRV240M-4-07 DRV245M-4-07 DRV250M-4-07 DRV255M-4-07 DRV260M-4-07	●	2	22.5	25	165	111	90	32	Yes	+0.8	SB-3060TRP	DTPM-10	-	-	SCMT070305-□-E (Outer) SCMT070310-□-I (Inner)
	●		23		167	113	92			+0.75					
	●		23.5		169	115	94			+0.7					
	●		24		171	117	96			+0.65					
	●		24.5		173	119	98			+0.6					
	●		25		175	121	100			+0.5					
	●		25.5		177	123	102			+0.45					
	●		26		179	125	104			+1.05					
S32- DRV270M-4-09 DRV280M-4-09 DRV290M-4-09 DRV300M-4-09 DRV310M-4-09 DRV320M-4-09	●	2	27	32	190	131	108	41	Yes	+0.95	SB-3573TRP	DTPM-10	-	-	SCMT090405-□-E (Outer) SCMT090410-□-I (Inner)
	●		28		194	135	112			+0.85					
	●		29		198	139	116			+0.75					
	●		30		202	143	120			+0.6					
	●		31		206	147	124			+0.5					
	●		32		210	151	128								





When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions K68
Trouble shooting K65

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

4xDC

Description	Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts K51, K53
			DC	DON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
															
S40- DRV330M-4-11 DRV340M-4-11 DRV350M-4-11 DRV360M-4-11 DRV370M-4-11 DRV380M-4-11 DRV390M-4-11	●	2	33	40	227	158	132	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□□-E (Outer) SCMT110410-□□-I (Inner)
	●		34		231	162	136			+1.15					
	●		35		235	166	140			+1					
	●		36		239	170	144			+0.9					
	●		37		243	174	148			+0.8					
	●		38		247	178	152			+0.65					
	●		39		251	182	156			+0.55					
S40- DRV400M-4-14 DRV410M-4-14 DRV420M-4-14 DRV430M-4-14 DRV440M-4-14 DRV450M-4-14 DRV460M-4-14 DRV470M-4-14	●	2	40	40	261	192	160	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)
	●		41		265	196	164			+1.6					
	●		42		269	200	168			+1.5					
	●		43		273	204	172			+1.4					
	●		44		277	208	176			+1.3					
	●		45		281	212	180			+1.15					
	●		46		285	216	184			+1.05					
	●		47		289	220	188			+0.95					
S50- DRV480M-4-14 DRV490M-4-14	●	2	48	50	293	224	192	59	Yes	+0.8	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	●		49		297	228	196			+0.7					
S50- DRV500M-4-17 DRV510M-4-17 DRV520M-4-17 DRV530M-4-17 DRV540M-4-17 DRV550M-4-17 DRV560M-4-17 DRV570M-4-17 DRV580M-4-17 DRV590M-4-17 DRV600M-4-17	●	2	50	50	298	229	200	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)
	●		51		302	233	204			+1.95					
	●		52		306	237	208			+1.85					
	●		53		310	241	212			+1.75					
	●		54		314	245	216			+1.65					
	●		55		318	249	220			+1.5					
	●		56		322	253	224	+1.4							
	●		57		326	257	228	+1.3							
	●		58		330	261	232	+1.15							
	●		59		334	265	236	+1.05							
	●		60		338	269	240	+0.95							

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions K68
Trouble shooting K65

Hole Dia. Tolerance (4D type)

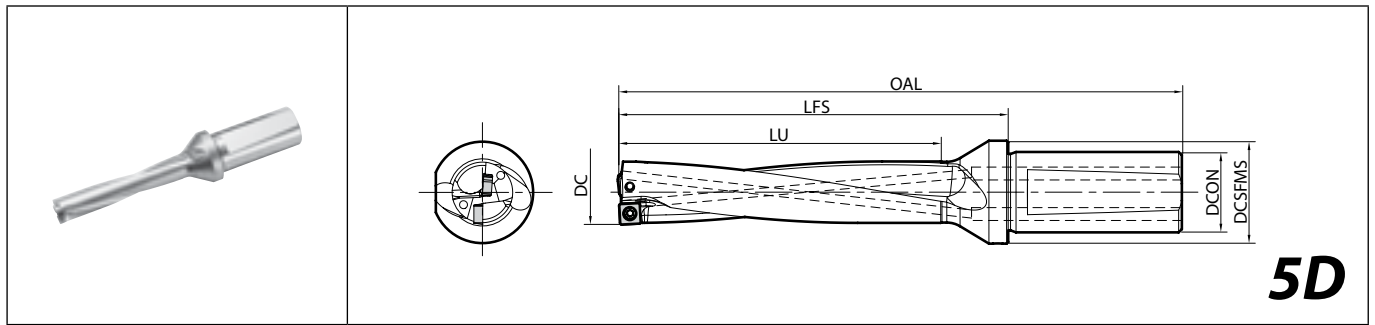
DC	Hole Dia. Tolerance (mm)
ø12 - ø39	+0.35 0
ø40 - ø60	+0.40 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



DRV (Drilling depth : 5 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)					Coolant hole	Radial offset max.	Spare parts				Applicable inserts K50~K53	
			DC	DCON	OAL	LFS	LU			DCSFMS	Screw	Wrench	Wrench		Wrench
S20- DRV120M-5-03 DRV130M-5-03	●	2	12	20	118	75	60	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□-E (Outer) LCMT030205-□-I (Inner)
	●		13		123	80	65			+0.15					
S20- DRV140M-5-04 DRV150M-5-04	●	2	14	20	134	91	70	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□-E (Outer) SCMT040209-□-I (Inner)
	●		15		139	96	75			+0.3					
S25- DRV160M-5-05 DRV170M-5-05 DRV180M-5-05	●	2	16	25	158	104	80	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□-E (Outer) SCMT050210-□-I (Inner)
	●		17		163	109	85			+0.3					
	●		18		168	114	90			+0.2					
S25- DRV190M-5-06 DRV200M-5-06 DRV210M-5-06 DRV220M-5-06	●	2	19	25	170	116	95	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□-E (Outer) SCMT060210-□-I (Inner)
	●		20		175	121	100			+0.55					
	●		21		180	126	105			+0.45					
	●		22		185	131	110			+0.3					
S25- DRV230M-5-07 DRV240M-5-07 DRV250M-5-07 DRV260M-5-07	●	2	23	25	190	136	115	32	Yes	+0.8	SB-3060TRP	DTPM-10	-	-	SCMT070305-□-E (Outer) SCMT070310-□-I (Inner)
	●		24		195	141	120			+0.7					
	●		25		200	146	125			+0.6					
	●		26		205	151	130			+0.45					
S32- DRV270M-5-09 DRV280M-5-09 DRV290M-5-09 DRV300M-5-09 DRV310M-5-09 DRV320M-5-09	●	2	27	32	217	158	135	41	Yes	+1.05	SB-3573TRP	DTPM-10	-	-	SCMT090405-□-E (Outer) SCMT090410-□-I (Inner)
	●		28		222	163	140			+0.95					
	●		29		227	168	145			+0.85					
	●		30		232	173	150			+0.75					
	●		31		237	178	155			+0.6					
S40- DRV330M-5-11 DRV340M-5-11 DRV350M-5-11 DRV360M-5-11 DRV370M-5-11 DRV380M-5-11 DRV390M-5-11	●	2	33	40	260	191	165	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□-E (Outer) SCMT110410-□-I (Inner)
	●		34		265	196	170			+1.15					
	●		35		270	201	175			+1					
	●		36		275	206	180			+0.9					
	●		37		280	211	185			+0.8					
	●		38		285	216	190			+0.65					
●	39	290	221	195	+0.55										

When offset drilling, reduce feed rate to 0.05 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions ● K69
Trouble shooting ● K65

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

K

Drilling

DRA

DRC

DRV

DRZ

DRW

Toolholder dimensions

5xDC

Description	Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ● K51, K53
			DC	DON	OAL	LFS	LU	DCSFMS			Screw	Wrench	Wrench	Wrench	
S40- DRV400M-5-14	●	2	40	40	301	232	200	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□□-E (Outer) SCMT140510-□□-I (Inner)	
DRV410M-5-14	●		41		306	237	205		+1.6						
DRV420M-5-14	●		42		311	242	210		+1.5						
DRV430M-5-14	●		43		316	247	215		+1.4						
DRV440M-5-14	●		44		321	252	220		+1.3						
DRV450M-5-14	●		45		326	257	225		+1.15						
DRV460M-5-14	●		46		331	262	230		+1.05						
DRV470M-5-14	●		47		336	267	235		+0.95						
S50- DRV480M-5-14	●	2	48	50	341	272	240	Yes	+0.8	SB-60130TRPH	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)	
DRV490M-5-14	●		49		346	277	245		+0.7						
S50- DRV500M-5-17	●	2	50	50	348	279	250	Yes	+2.1	SB-60130TRPH	-	-	TTP-20	SCMT170608-□□-E (Outer) SCMT170610-□□-I (Inner)	
DRV510M-5-17	●		51		353	284	255		+1.95						
DRV520M-5-17	●		52		358	289	260		+1.85						
DRV530M-5-17	●		53		363	294	265		+1.75						
DRV540M-5-17	●		54		368	299	270		+1.65						
DRV550M-5-17	●		55		373	304	275		+1.5						
DRV560M-5-17	●		56		378	309	280		+1.4						
DRV570M-5-17	●		57		383	314	285		+1.3						
DRV580M-5-17	●		58		388	319	290		+1.15						
DRV590M-5-17	●		59		393	324	295		+1.05						
DRV600M-5-17	●		60		398	329	300		+0.95						

When offset drilling, reduce feed rate to 0.05 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions ● K69
Trouble shooting ● K65

Hole Dia. Tolerance (5D type)

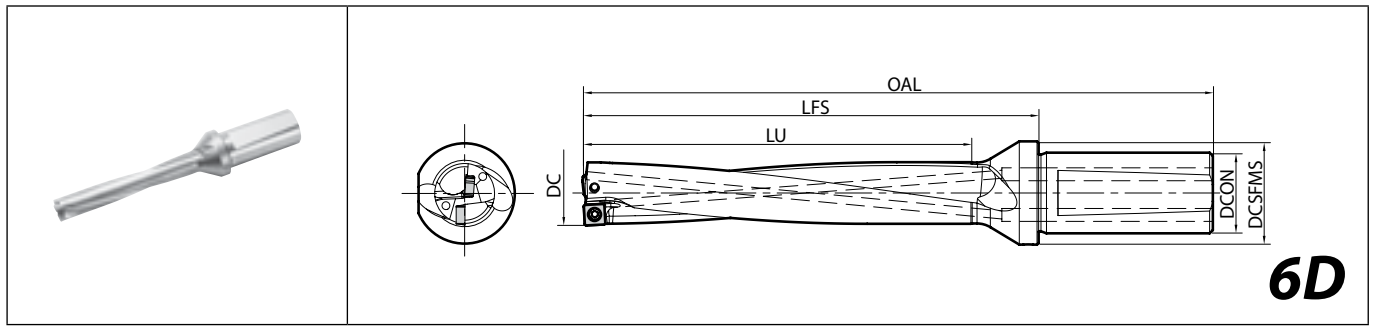
DC	Hole Dia. Tolerance (mm)
ø12 - ø39	+0.35 0
ø40 - ø60	+0.40 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



DRV (Drilling depth : 6 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)					Coolant hole	Radial offset max.	Spare parts				Applicable inserts K50~K53	
			DC	DCON	OAL	LFS	LU			DCSFMS	Screw	Wrench	Wrench		Wrench
S20- DRV120M-6-03 DRV130M-6-03	●	2	12	20	130	87	72	27	Yes	+0.25	SB-2037TRP	-	FTP-6	-	LCMT030203-□-E (Outer) LCMT030205-□-I (Inner)
	●		13		136	93	78			+0.15					
S20- DRV140M-6-04 DRV150M-6-04	●	2	14	20	148	105	84	27	Yes	+0.4	SB-2037TRP	-	FTP-6	-	SCMT040205-□-E (Outer) SCMT040209-□-I (Inner)
	●		15		154	111	90			+0.3					
S25- DRV160M-6-05 DRV170M-6-05 DRV180M-6-05	●	2	16	25	174	120	96	32	Yes	+0.4	SB-2041TRP	-	FTP-6	-	SCMT050205-□-E (Outer) SCMT050210-□-I (Inner)
	●		17		180	126	102			+0.3					
	●		18		186	132	108			+0.2					
S25- DRV190M-6-06 DRV200M-6-06 DRV210M-6-06 DRV220M-6-06	●	2	19	25	189	135	114	32	Yes	+0.65	SB-2555TRP	DTPM-8	-	-	SCMT060205-□-E (Outer) SCMT060210-□-I (Inner)
	●		20		195	141	120			+0.55					
	●		21		201	147	126			+0.45					
	●		22		207	153	132			+0.3					
S25- DRV230M-6-07 DRV240M-6-07 DRV250M-6-07 DRV260M-6-07	●	2	23	25	213	159	138	32	Yes	+0.8	SB-3060TRP	DTPM-10	-	-	SCMT070305-□-E (Outer) SCMT070310-□-I (Inner)
	●		24		219	165	144			+0.7					
	●		25		225	171	150			+0.6					
	●		26		231	177	156			+0.45					
S32- DRV270M-6-09 DRV280M-6-09 DRV290M-6-09 DRV300M-6-09 DRV310M-6-09 DRV320M-6-09	●	2	27	32	244	185	162	41	Yes	+1.05	SB-3573TRP	DTPM-10	-	-	SCMT090405-□-E (Outer) SCMT090410-□-I (Inner)
	●		28		250	191	168			+0.95					
	●		29		256	197	174			+0.85					
	●		30		262	203	180			+0.75					
	●		31		268	209	186			+0.6					
	●		32		274	215	192			+0.5					
S40- DRV330M-6-11 DRV340M-6-11 DRV350M-6-11 DRV360M-6-11 DRV370M-6-11 DRV380M-6-11 DRV390M-6-11	●	2	33	40	293	224	198	49	Yes	+1.25	SB-4086TRP	DTPM-15	-	-	SCMT110406-□-E (Outer) SCMT110410-□-I (Inner)
	●		34		299	230	204			+1.15					
	●		35		305	236	210			+1					
	●		36		311	242	216			+0.9					
	●		37		317	248	222			+0.8					
	●		38		323	254	228			+0.65					
	●		39		329	260	234			+0.55					
S40- DRV400M-6-14 DRV410M-6-14 DRV420M-6-14 DRV430M-6-14 DRV440M-6-14 DRV450M-6-14	●	2	40	40	341	272	240	49	Yes	+1.75	SB-50120TRPH	-	-	TTP-20	SCMT140508-□-E (Outer) SCMT140510-□-I (Inner)
	●		41		347	278	246			+1.6					
	●		42		353	284	252			+1.5					
	●		43		359	290	258			+1.4					
	●		44		365	296	264			+1.3					
	●		45		371	302	270			+1.15					
	●		46		377	308	276			+1.05					
S50- DRV500M-6-17 DRV550M-6-17 DRV600M-6-17	●	2	50	50	398	329	300	59	Yes	+2.1	SB-60130TRP	-	-	TTP-20	SCMT170608-□-E (Outer) SCMT170610-□-I (Inner)
	●		55		428	359	330			+1.5					
	●		60		458	389	360			+0.95					

When offset drilling, reduce feed rate to 0.04 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions K69
Trouble shooting K65

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

K

Drilling

DRA

DRC

DRV

DRZ

DRW

Hole Dia. Tolerance (6D type)

DC	Hole Dia. Tolerance (mm)
ø12 - ø39	+0.45 0
ø40 - ø60	+0.50 0

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

K



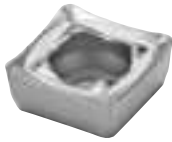
Drilling

Insert grade selection guide

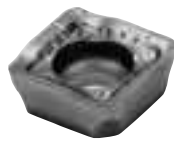
Select CVD for the outer edge when performing high speed and high efficiency drilling. Drilling for high efficiency, abrasion resistance and long tool life. Select PVD for the outer edge for stable drilling and a better surface finish. PVD is recommended for the outer edge when chattering occurs or drilling with lathe is not available, even if cutting conditions are increased.

High speed and high efficiency drilling

Outer edge: CVD (CA520D/CA415D)



Inner edge: PVD (PR1535).

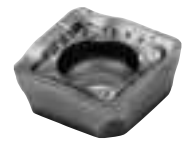


Stable machining oriented
(1st recommendation for lathe machining)

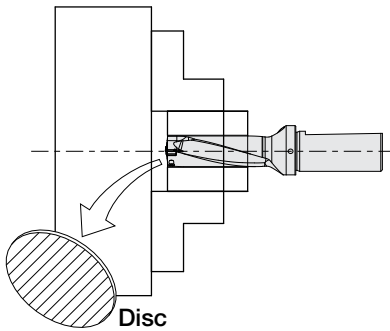
Outer edge: PVD (PR1225).



Inner edge: PVD (PR1535).



Caution



When drilling through the workpiece, a disk may be ejected. Proper machine guarding is necessary to prevent injury.

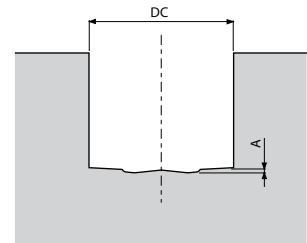
K



Drilling

DRV hole bottom shape (mm)

Insert size	DC	A	Insert size	DC	A	Insert size	DC	A	Insert size	DC	A					
03	12.0	0.70	06	19.0	1.2	09	26.5	1.2	14	40.0	1.9					
	12.5			19.5			27.0			41.0						
	13.0			20.0			27.5			42.0						
	04			13.5	1.0		20.5	1.3		28.0	1.3	43.0	2.0	44.0	2.1	
14.0		21.0		28.5			45.0									
14.5		21.5		29.0			46.0									
15.0		22.0	29.5	47.0												
05	15.5	1.1	07	22.5	1.2	11	30.0	1.4		17	48.0	2.2				
	16.0			23.0			30.5				49.0					
	16.5			23.5			31.0				50.0					
	05			17.0	1.2		24.0	1.3			31.5	1.5	51.0	2.1	52.0	2.1
				17.5			24.5				32.0		53.0			
				18.0			25.0		33.0		54.0					
18.5		25.5	34.0	55.0												
05	1.2	26.0	1.3	35.0	1.5	56.0	2.2	57.0	2.3							
		11		36.0		1.6		58.0			2.4					
				37.0				59.0								
				38.0			60.0									
				39.0												



Common for 2D, 3D, 4D, 5D, 6D type

* Above is numeric guideline. (Varies within ±0.1mm depending on workpiece materials and cutting conditions)

Trouble shooting (DRV / DRZ)

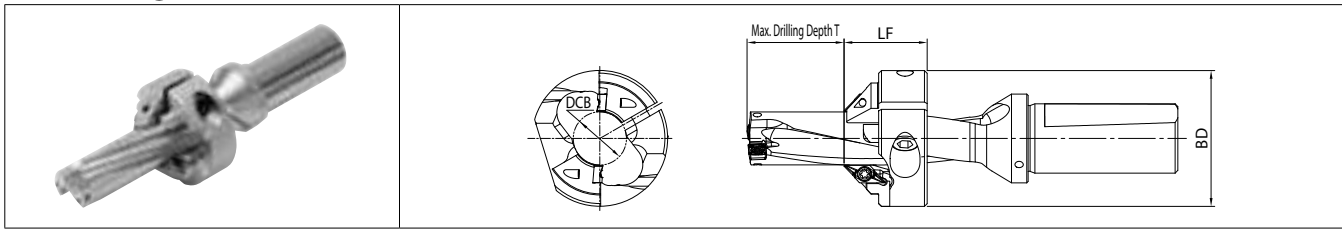
Trouble condition	Condition	Cause	Countermeasures
Hole diameter becomes smaller (At hole bottom)	<p>A (Inlet side) B (Bottom side) $A > B$</p>	Chip jam (External or internal edge chip stuck)	Change the cutting conditions · Increase the cutting speed · Lower the feed rate ● K68, K69, K85
Hole diameter becomes larger (At hole bottom)	<p>A (Inlet side) B' (Bottom side) $A < B'$</p>	Internal edge chip jam.	Change the cutting conditions · Increase the cutting speed · Lower the feed rate ● K68, K69, K85 Check the core height ● K72, K73 ● K86, K87
Hole diameter is small (From the hole inlet)		Inappropriate adjustment of hole diameter.	In case of using lathe machine, use X-axis and adjustment hole diameter. ● K72 ● K86
		No core at internal edge. (No core remains)	Adjust the center height. ● K72, K73 ● K86, K87



Indication of tool life of MagicDrill (DRV/ DRZ)

How to judge tool life	Indication of judging tool life
Judgement of tool condition and insert wear	<ul style="list-style-type: none"> When an insert is new, the toolholder is slightly bent to the side during drilling (therefore, the drill diameter is slightly bigger during drilling). Once drilling is finished, the toolholder will return back to normal size. No tool marks will appear on the finished surface (This depends on workpiece and cutting condition. Slight tool mark might appear if cutting force on external dia. is too low.) When an insert is at the end of its tool life, gradually the external corner part gets worn out. Also the toolholder does not bend slightly outwards, and it starts to bend inwards. After the drilling is finished, the toolholder returns to the normal position. When taking off a toolholder under this condition, the cutting edge of the insert creates external tool marks on the finished surface of the workpiece.
Checking hole diameter	When hole diameter is measured, suddenly it shows small diameter. In this case, a worn out insert can be the cause and it must be exchange.
Checking the surface on the outlet side	If insert wear progresses, the burrs of penetrated hole entrance becomes bigger. This is a clear indication that the tool must be exchanged.
Variation of drilling noise	Light drilling noise at the beginning turns to brady noise which contains vibration noise.
Variation of vibration	As the end of tool life is getting closer, there is more vibration and the drilling noise changes. However, when drilling smaller diameters these factors are difficult to detect.

Chamfering attachment



Dimensions

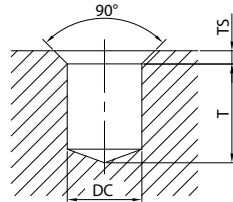
Description	Availability	Applicable drills	Dimension (mm)			Applicable inserts	Spare parts							
			BD	DCB	LF		Clamp Screw	Wrench	Clamp bolt	Wrench				
DRV-CH17	●	S25-DRV165M-○-05 S25-DRV170M-○-05	47	16.2	30	CH0503-45	SB-3080TR	FT-10	HH6X18	LW-5				
DRV-CH18	●	S25-DRV175M-○-05 S25-DRV180M-○-05	47	17.2	30									
DRV-CH19	●	S25-DRV185M-○-05 S25-DRV190M-○-06	49	18.2	30									
DRV-CH20	●	S25-DRV195M-○-06 S25-DRV200M-○-06	49	19.2	30									
DRV-CH21	●	S25-DRV205M-○-06 S25-DRV210M-○-06	49	20.2	30									
DRV-CH22	●	S25-DRV215M-○-06 S25-DRV220M-○-06	49	21.2	30									
DRV-CH23	●	S25-DRV225M-○-07 S25-DRV230M-○-07	51	22.2	30									
DRV-CH24	●	S25-DRV235M-○-07 S25-DRV240M-○-07	51	23.2	30									
DRV-CH25	●	S25-DRV245M-○-07 S25-DRV250M-○-07	53	24.2	30									
DRV-CH26	●	S25-DRV255M-○-07 S25-DRV260M-○-07	53	25.2	30									
DRV-CH27	●	S32-DRV265M-○-09 S32-DRV270M-○-09	64	26	35								HH8X20	LW-6

K



Drilling


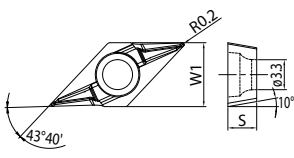
Max. drilling depth and chamfering dimension



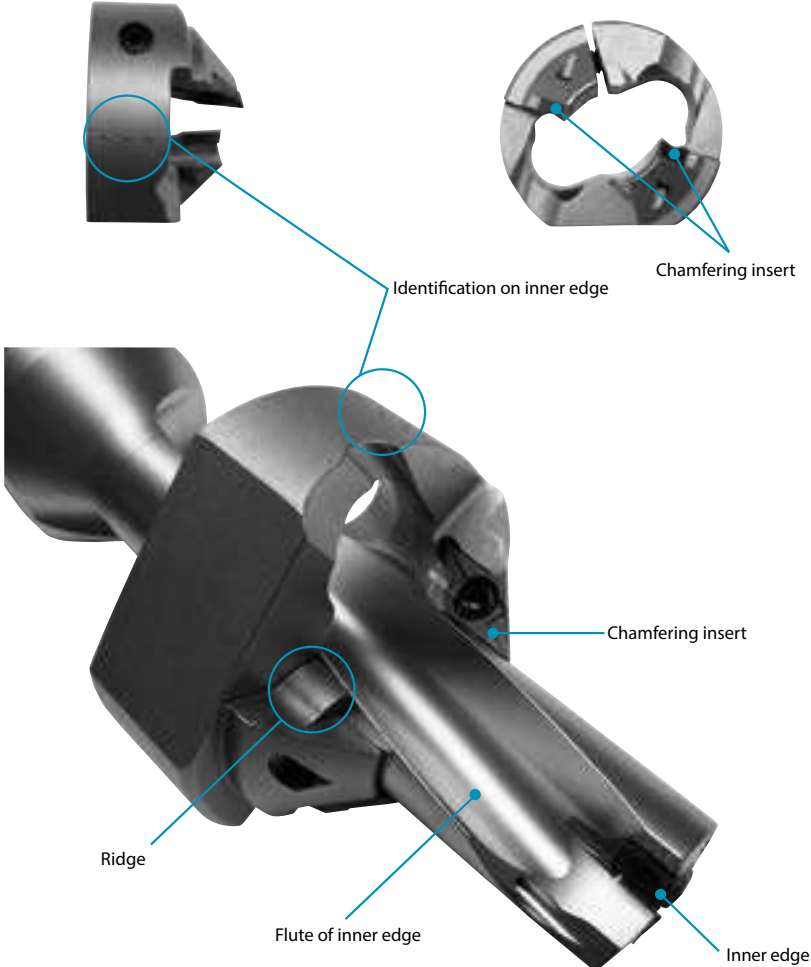
Drill dia. (mm)	Max. drilling depth T (mm)					Max. chamfering dimension (mm)	Applicable chamfering attachment
	DC	2D drill	3D drill	4D drill	5D drill			6D drill
ø16.5	0.5	17	33.5	-	-	2.5	DRV-CH17
ø17	1.5	18.5	35.5	52.5	69.5		DRV-CH18
ø17.5	2.5	20	37.5	-	-		DRV-CH19
ø18	3.5	21.5	39.5	57.5	75.5		DRV-CH20
ø18.5	4.5	23	41.5	-	-		DRV-CH21
ø19	5.5	24.5	43.5	62.5	81.5		DRV-CH22
ø19.5	6.5	26	45.5	-	-		DRV-CH23
ø20	7.5	27.5	47.5	67.5	87.5		DRV-CH24
ø20.5	8.5	29	49.5	-	-		DRV-CH25
ø21	9.5	30.5	51.5	72.5	93.5		DRV-CH26
ø21.5	10.5	32	53.5	-	-		DRV-CH27
ø22	11.5	33.5	55.5	77.5	99.5		
ø22.5	12.5	35	57.5	-	-		
ø23	13.5	36.5	59.5	82.5	105.5		
ø23.5	14.5	38	61.5	-	-		
ø24	15.5	39.5	63.5	87.5	111.5		
ø24.5	16.5	41	65.5	-	-		
ø25	17.5	42.5	67.5	92.5	117.5		
ø25.5	18.5	44	69.5	-	-		
ø26	19.5	45.5	71.5	97.5	123.5		
ø26.5	-	47	-	-	-		
ø27	16.5	43.5	75.5	97.5	124.5		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Applicable insert

Insert	Description	Dimension (mm)		MEGACOAT NANO	Applicable chamfering attachment
		W1	S	PR1535	
 	CH0503-45	7.05	3.18	●	DRV-CH○○

How to install chamfering attachment



Identification on inner edge

Chamfering insert

Clamp bolt

Ridge

Flute of inner edge


Inner edge

Chamfering insert

Instructions

1. Install the attachment over the DRV body so that "..." mark on the side of the attachment aligns with the inside flute edge (see image).
2. Adjust the position to avoid interference between the chamfering inserts, chamfering attachment ridges, and drill body flutes. Then fasten the clamp bolt with the recommended torque below.

K



Drilling

Recommended tightening torque

Description	Tightening torque (N m)	Clamp bolt	Wrench
DRV-CH17~CH26	10	HH6X18	LW-5
DRV-CH27	14	HH8X20	LW-6

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions DRV 2D-4D (Coolant)

Workpiece material	Recommended insert grades (Vc: m/min)										Drill dia. DC (mm)	Drill type												
	PVD coated carbide					CVD coated carbide						2D~3D				4D								
	PR1225					CA520D						CA415D					f (mm/rev)							
	GM	GH	XM	SM		GM	GH	XM	SM			GM	GH			GM	GH	XM	SM					
Low carbon steel	-	-	★	☆	-	-	-	★	☆	-	-	-	-	-	-	-	-	-						
			120-200	120-200				150-280	150-280															
Carbon steel	★	☆	☆	☆	★	☆	☆	☆	☆	-	-	-	-	-	-	-	-	-						
	100-180	100-180	100-180	100-180	150-280	150-280	150-280	150-280	150-280															
Alloy steel	★	☆	☆	-	★	☆	☆	☆	-	-	-	-	-	-	-	-	-	-						
	100-160	100-160	100-160		140-220	140-220	140-220	140-220																
Mold steel	☆	★	-	-	☆	★	-	-	-	-	-	-	-	-	-	-	-	-						
	80-150	80-150			130-210	130-210																		
Stainless steel (Austenitic related)	-	-	-	★	-	-	-	-	★	-	-	-	-	-	-	-	-	-						
				70-140					140-200															
Gray cast iron	☆	★	-	-	-	-	-	-	-	☆	★	-	-	-	-	-	-	-						
	100-150	100-150								150-220	150-220													
Nodular cast iron	☆	★	-	-	-	-	-	-	-	☆	★	-	-	-	-	-	-	-						
	80-120	80-120								120-180	120-180													

· Internal coolant is recommended

★: 1st recommendation ☆: 2nd recommendation



- DRA
- DRC
- DRV
- DRZ
- DRW

Recommended cutting conditions DRV 5D-6D (Coolant)

Workpiece material	Recommended insert grades (Vc: m/min)										Drill dia. DC (mm)	Drill type							
	PVD coated carbide				CVD coated carbide							5D				6D			
	PR1225				CA520D				CA415D			f (mm/rev)							
	GM	GH	XM	SM	GM	GH	XM	SM	GM	GH		GM	GH	XM	SM	GM	GH	XM	SM
Low carbon steel	-	-	★	☆	-	-	★	☆	-	-	-	-	-	-	-	-	-	-	
			120-200	120-200			150-280	150-280											
Carbon steel	★	☆	☆	☆	★	☆	☆	☆	-	-	-	-	-	-	-	-	-	-	
	100-180	100-180	100-180	100-180	150-280	150-280	150-280	150-280											
Alloy steel	★	☆	☆	-	★	☆	☆	-	-	-	-	-	-	-	-	-	-	-	
	100-160	100-160	100-160		140-220	140-220	140-220												
Mold steel	☆	★	-	-	☆	★	-	-	-	-	-	-	-	-	-	-	-	-	
	80-150	80-150			130-210	130-210													
Stainless steel (Austenitic related)	-	-	-	★	-	-	-	★	-	-	-	-	-	-	-	-	-	-	
				70-140				140-200											
Gray cast iron	☆	★	-	-	-	-	-	-	☆	★	-	-	-	-	-	-	-	-	
	100-150	100-150							150-220	150-220									
Nodular cast iron	☆	★	-	-	-	-	-	-	☆	★	-	-	-	-	-	-	-	-	
	80-120	80-120							120-180	120-180									

Internal coolant is recommended

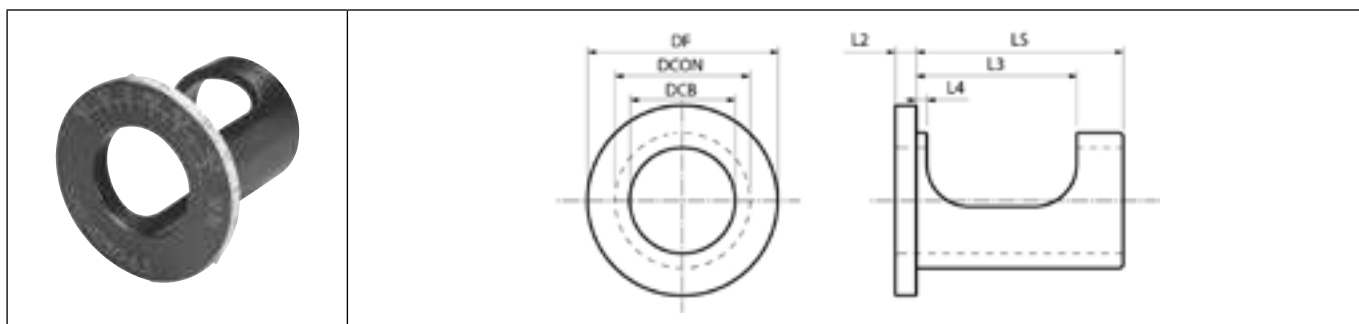
★: 1st recommendation ☆: 2nd recommendation



Cutting conditions by application

Applications	Plain surface	Slant surface	Half cylindrical	Hole expansion	Cored hole	Concave surface	Stacked plates
Shape of workpiece							
Vc (m/min)	See above	120 (PVD insert is recommended for outer edge)					Not available
f (mm/rev)	See above	Half of the above recommended conditions is recommended.				Concave surface: Use half of the above recommended conditions.	Not available
						Continuous part: See above.	
Coolant (Internal coolant)	Yes						Not available

SHE



Toolholder dimensions

Description	Availability	Dimension (mm)								* Drill Dia. Adjustable Range	Center Height Adjustable Range
		DCB	DCON	DF	L2	L3	L4	L5			
SHE 2025-43	●	20	25	41	4	36	3	43	+0.4~-0.2	+0.2~-0.15	
2532-48	●	25	32	49		38	2.5	48	+0.4~-0.2	+0.2~-0.15	
3240-53	●	32	40	58	6	43		53	+0.4~-0.2	+0.2~-0.15	
4050-63	●	40	50	74		49	3	63	+0.6~-0.2	+0.3~-0.2	

Diameter Adjustment Range adjusts the drill diameter.

K



Drilling

DRA

DRC

DRV

DRZ

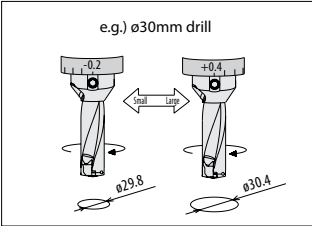
DRW

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

K70

1. Diameter adjustment ~For machining center~

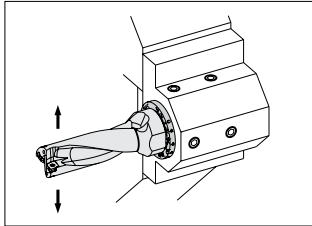
● Diameter adjustment range (mm)



Shank dia.	Adjustment range
ø20	+0.4~-0.2
ø25	
ø32	
ø40	+0.6~-0.2

2. Center height adjustment ~Fewer problems owing to height adjustment for lathes~

● Center height adjustment Range (mm)



Shank dia.	Adjustment range
ø20	+0.2~-0.15
ø25	
ø32	
ø40	+0.3~-0.2

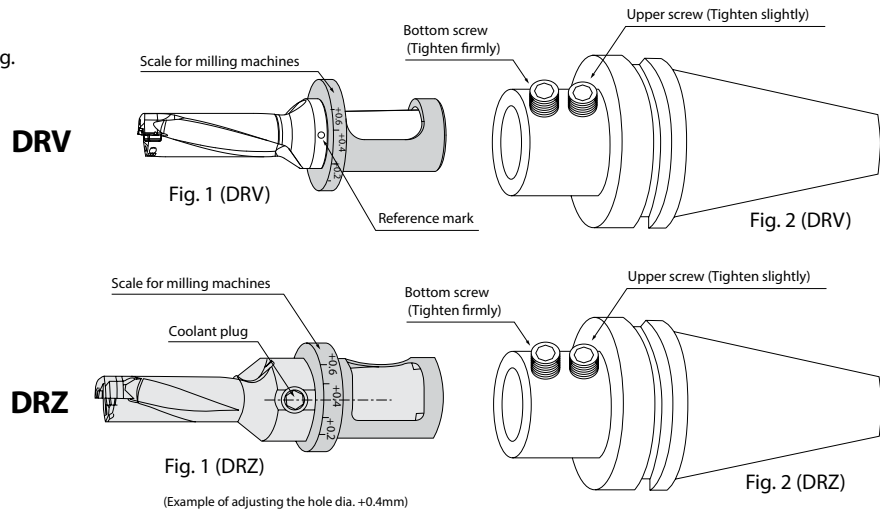
How to use the adjustable sleeve

1. Hole diameter adjustment when drilling

1. Adjust the scale at the flange periphery of the sleeve to the reference mark (DRV) or the center of coolant plug (DRZ). (Fig. 1)
 2. When making the hole diameter larger, rotate the sleeve in (+) direction and to make it smaller, rotate the sleeve in (-) direction.
 3. When rotating the sleeve, insert the wrench supplied with the drill into the hole on the flange periphery to rotate the sleeve.
 4. Using the bottom screw of the side-lock arbor, firmly tighten on the drill directly through the sleeve's window.
- The upper screw should be tightened slightly so that the sleeve will not be damaged.

Caution:

- Not applicable for collet chuck type arbor.
 - Scale on the sleeve is the reference value.
- Check the actual hole diameter after adjusting.



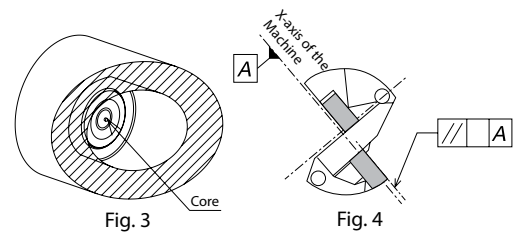
2. Center-height adjustment for lathes

Most lathe problem occur due to center height deviation. The center height is appropriate if a core approximately 0.5mm diameter remains at the center of the end face. (Fig. 3) Center-height adjustment is necessary for the case as follows:

- ◆ No core remains or
- ◆ core diameter is more than 1mm

1. Align the drill with the outer insert face parallel to the x-axis of the tool turret. (Fig. 4)
2. Adjust the scale at the flange periphery of the sleeve to the reference mark (DRV) or the center of coolant plug (DRZ).
3. When no core remains, rotate the sleeve to (+) direction to make the core larger, and when the core diameter is 1mm or more, rotate the sleeve to (-) direction to make the core smaller.
4. When rotating the sleeve, insert the wrench supplied with the drill into the hole on the flange periphery to rotate the sleeve.
5. After completing the adjustment, firmly tighten on the drill directly through the sleeve's window.

Note: depending on amount of the center height adjustment, the hole diameter may change. It is recommended that the hole diameter is checked after the center height adjustment.



Lathe installation

1. The top face of the outer insert should be parallel to the X-axis to allow for offset cutting. (Drill diameter can be changed by moving X-axis.)
2. It is recommended to set the outer insert as shown in Fig. 1 with the outer insert facing the operator. (Fig. 1)
(It is also possible to use it by setting it in 180° reverse position)
If the lathe has two turrets, when installing the drill into the lower turret, the outer insert should be set to face the operator.
(It is also possible to use it by setting at 180° reverse position)

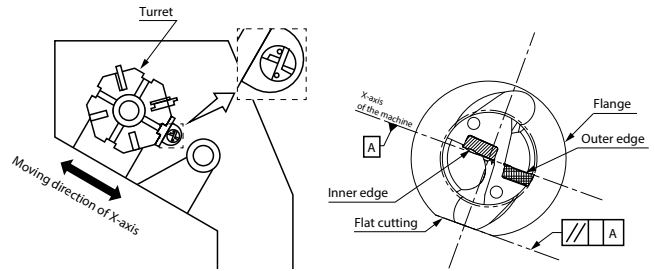


Fig. 1 Installed into the lathe

Drill diameter adjustment

1. Drill diameter adjustment

1. Drill diameter is adjusted by moving X-axis.
The moving direction of the X-axis depends on the position of the toolholder.
2. In case of making the hole diameter larger, slide the tool along the X-axis toward the outer insert side. (Fig. 2, Fig. 3)
For making the hole diameter smaller, slide the tool along the X-axis in the opposite direction.
(This movement of the axis is called "Offset")
However, be sure not to make the hole diameter smaller than the drill diameter by 0.2mm or more. Otherwise, the toolholder will interfere with the drilled hole. (Fig. 4)
e.g.) In case of using $\varnothing 20$ drill, the hole diameter must not be smaller than 19.8mm.

2. Offset Limit of the Drill Diameter

For the maximum limit of the drill diameter, refer to "Max. Offset (Radial)" in the toolholder dimensions table.
(The figure in the table shows how much it is possible the offset the drill in the radial direction.)
When using $\varnothing 20$ drill, for example, it is possible to make a hole up to $\varnothing 21.1$ since "Max. offset (Radial)" is +0.55mm.

K

Drilling

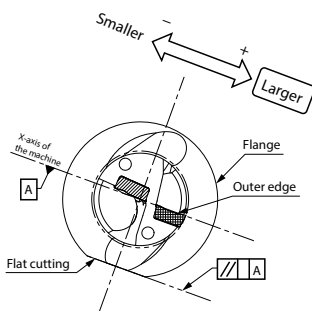


Fig. 2 Outer insert facing up

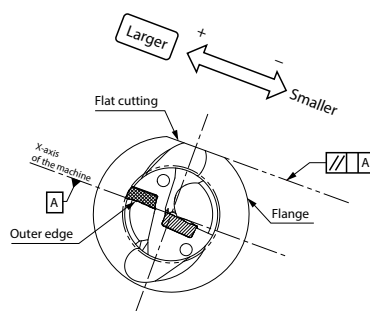


Fig. 3 Outer insert facing down

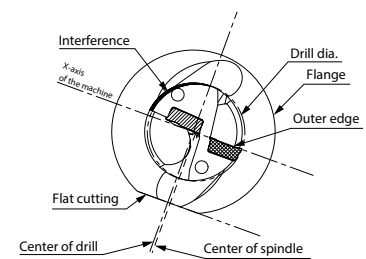


Fig. 4 Excessive offset (For smaller hole diameter)

Center height adjustment

1. Center Height of the Inner Insert

When installing inner insert as shown in Fig. 1, it will be set around 0.05mm below the center of spindle. (Fig. 5)
This is the normal position of the center height and the drill is designed to be handled in this condition.
However, in case that the turret of the lathe is out of the center of spindle, sometimes the inner insert may be set above the center, or excessively below the center.
For stable drilling, it is essential to check the center height carefully.

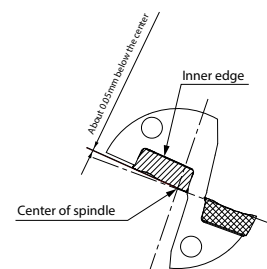


Fig. 5 Front view of the drill

2. How to Check the Center Height

For checking the center height of the inner insert, see the core which remains at the center of the end face of the drilled hole. (Fig. 6)
If the center height is in the normal position, a core about 0.5mm in diameter, will remain after machining.
Adjustment of center height is required if a large core diameter of 1mm or more remains.
* The drilled hole for verification purposes needs to be machined at approximately 10mm in depth and at a feed rate of 0.1mm/rev or lower.

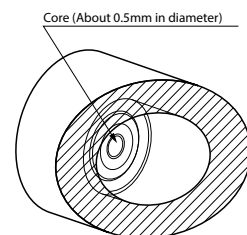


Fig. 6 Center core

3. Center height adjustment

a) When there are no remaining cores and insert breakage near the center of the drill.
This happens when the inner insert is set above the center height. (Fig. 7)

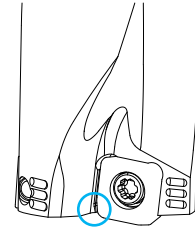


Fig. 7 Insert breakage near the center of the drill

[How to adjust]

1. Install the drill rotated 180°. Most problems will be solved by this method. (Fig. 8)

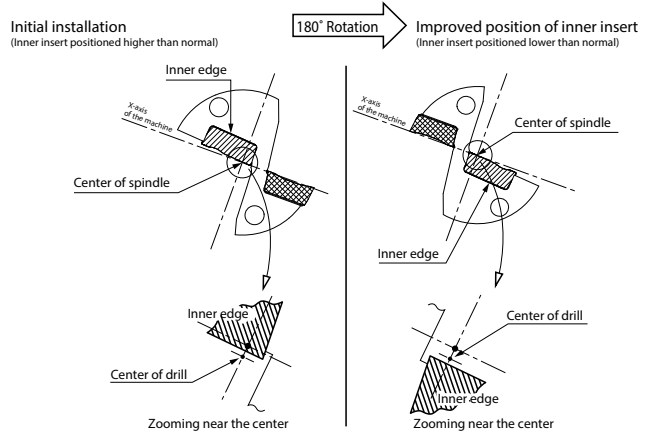


Fig. 8

[How to adjust]

2. If the core diameter becomes too large after the above adjustment, install the drill by rotating 90° counter-clockwise as shown in Fig. 9 (outer insert is positioned lower) and adjust the center height by moving the tool in the X-axis direction. (However, this will make it impossible to adjust the cutting diameter.)
Caution: In case of installing the drill in the reverse direction (outer insert is positioned above), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
The best solution is to readjust the center position of the turret itself.

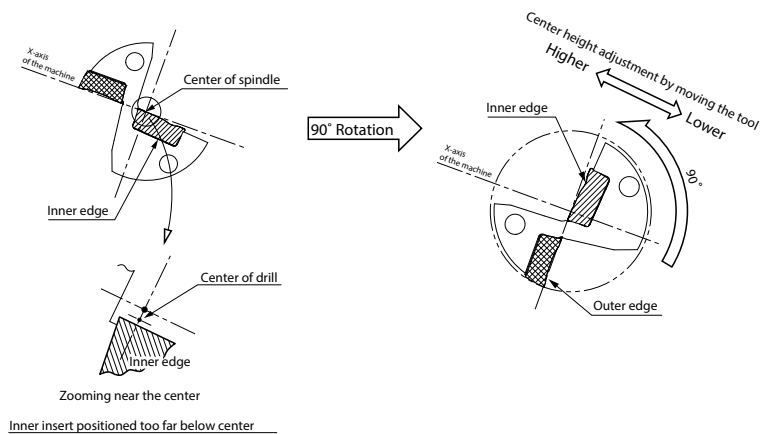


Fig. 9

b) Core with excessively large diameter (More than 1mm)
This occurs when the inner insert is excessively below the center.
This condition causes poor chip evacuation and an adjustment is required.

[How to adjust]

- Install the drill rotating 90° as shown in Fig. 10 (outer insert is positioned on the upper side) and adjust the center height by moving tool in the X-axis direction. (However, this will make it impossible to adjust the cutting diameter.)
Caution: In case of installing the drill in the opposite direction (outer insert is positioned lower), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole.
The best solution is to readjust the center position of the turret itself.

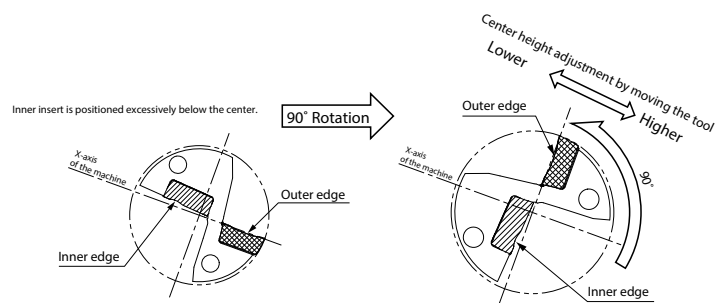

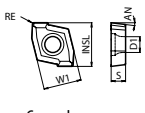



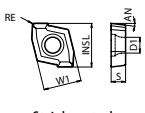


Fig. 10

ZCMT

		Carbon steel / Alloy steel		● ○		P						
		Mold and die steel		● ○		P						
		Stainless steel		● ○		M						
		Cast iron		● ○		K						
		Non-ferrous metals		● ○		N						
Insert	Description	Dimension (mm)					Angle (°)	Carbide			Applicable toolholder ● K76~K83	
		S	D1	RE	INSL	W1	AN	PVD	-			
								PRI210	PRI225	PRI230	KW10	
  General purpose	ZCMT 050203	2.38	2.3	0.3	5.9	5	7	●	●	●	●	S..-DRZ....-05
	ZCMT 06T204	2.8	2.5	0.4	7	6	7	●	●	●	●	S..-DRZ....-06
	ZCMT 080304	3.18	2.9	0.4	9.7	8.2	7	●	●	●	●	S..-DRZ....-08
	ZCMT 10T304	3.97	4.4	0.4	12	10.4	7	●	●	●	●	S..-DRZ....-10
	ZCMT 12T306	3.97	5.6	0.6	14.3	12.8	7	●	●	●	●	S..-DRZ....-12
	ZCMT 150408	4.76	5.6	0.8	17.8	15.8	7	●	●	●	●	S..-DRZ....-15
	ZCMT 200608	6.35	6.5	0.8	22.8	20.3	7	●	●	●	●	S..-DRZ....-20
  Deep drilling / Low cutting force	ZCMT 050203SP	2.38	2.3	0.3	5.9	5	7	●	●	●	●	S..-DRZ....-05
	ZCMT 06T204SP	2.8	2.5	0.4	7	6	7	●	●	●	●	S..-DRZ....-06
	ZCMT 080304SP	3.18	2.9	0.4	9.7	8.2	7	●	●	●	●	S..-DRZ....-08
	ZCMT 10T304SP	3.97	4.4	0.4	12	10.4	7	●	●	●	●	S..-DRZ....-10
	ZCMT 12T304SP	3.97	5.6	0.4	14.3	12.8	7	●	●	●	●	S..-DRZ....-12
	ZCMT 150406SP	4.76	5.6	0.6	17.8	15.8	7	●	●	●	●	S..-DRZ....-15
	ZCMT 200608SP	6.35	6.5	0.8	22.8	20.3	7	●	●	●	●	S..-DRZ....-20
  Stainless steel	ZCMT 050203SU	2.38	2.3	0.3	5.9	5	7	●	●	●	●	S..-DRZ....-05
	ZCMT 06T204SU	2.8	2.5	0.4	7	6	7	●	●	●	●	S..-DRZ....-06

Features of SP Chipbreaker

1. Less cutting force with large rake angle
2. Suitable for chip control of sticky materials such as stainless steel or soft steel.
3. Larger size inserts have smaller corner-R(RE) than standard chipbreaker type and can reduce burrs.

Recommended cutting conditions ● K85



- DRA
- DRC
- DRV
- DRZ
- DRW

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Suitable chipbreaker (ZCMT)

Workpiece material	Insert size		ZCMT05									ZCMT06									ZCMT08						
	Chipbreaker		Standard			SP			SU			Standard			SP			SU			Standard			SP			
	Drilling depth		2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	2D	3D	4D	
Low carbon steel	☆	☆	-	★	★	★	-	-	-	☆	☆	-	★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	-	★	★	★
Carbon steel	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	☆	★
Alloy steel	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	☆	★
Mold steel	★	★	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	★	-	-	-	★	★	☆	☆	☆	☆	☆	★
Stainless steel	☆	☆	-	★	★	★	☆	☆	-	-	-	-	☆	☆	☆	★	★	★	☆	☆	-	★	★	★	★	★	★
Cast iron	★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	☆	☆
Aluminum alloys	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	★	★	★
Brass	★	★	★	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	☆	-	-	-	★	★	★	☆	☆	☆	☆	☆
Titanium alloys	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	-	-	-	☆	☆	☆	★	★	★	★	★	★

Workpiece material	Insert size		ZCMT10								ZCMT12								ZCMT15								ZCMT20					
	Chipbreaker		Standard				SP				Standard				SP				Standard				SP				Standard					
	Drilling depth		2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D	5D	2D	3D	4D			
Low carbon steel	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★
Carbon steel	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	☆	★	★	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★	★	
Alloy steel	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	☆	★	★	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★	★	
Mold steel	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	☆	★	★	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★	★	
Stainless steel	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	☆	☆	-	-	★	★	★	★	☆	☆	-	-	★	★	★	★	
Cast iron	★	★	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	
Aluminum alloys	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★	★	★	★	
Brass	★	★	★	★	☆	☆	☆	☆	★	★	★	☆	☆	☆	☆	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	
Titanium alloys	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	☆	☆	☆	★	★	★	★	☆	☆	☆	☆	★	★	★	★	★	★	★	★	

Standard chipbreakers (Without symbol) may function better when interrupted drilling.

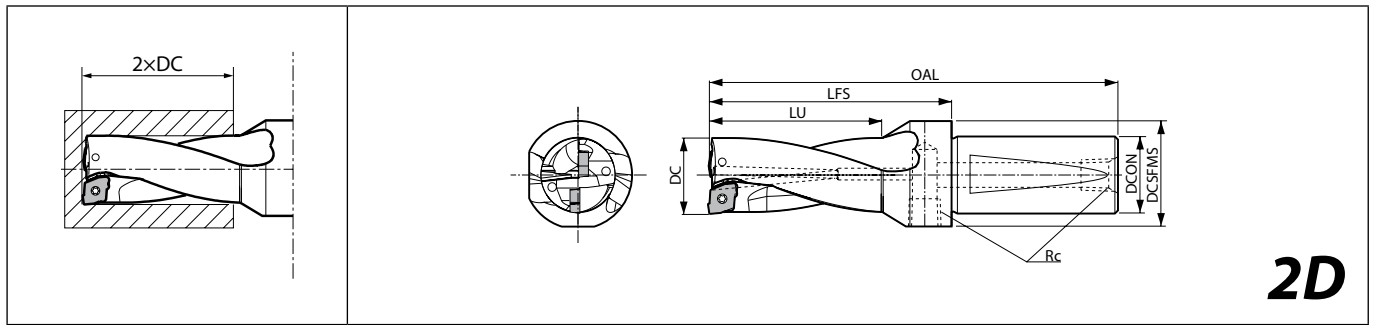
When drilling aluminum alloys, chips become long and difficult to be discharged at the depth over 2D.

5D type is the same as 4D type.

★: 1st choice ☆: 2nd choice



DRZ (Drilling depth : 2 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts				Applicable inserts K74	
			DC	DCON	OAL	LFS	LU	DC5FMS	Rc			Plug	Screw	Wrench	Wrench		
S20- DRZ1326-05 DRZ135270-05 DRZ1428-05 DRZ145290-05 DRZ1530-05 DRZ155310-05	●	2	13	20	95	52	26	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU	
	●		13.5														28
	●		14														
	●		14.5		100	57	30										
	●		15														
	●		15.5														
S25- DRZ1632-06 DRZ165330-06 DRZ1734-06 DRZ175350-06 DRZ1836-06 DRZ185370-06 DRZ1938-06 DRZ195390-06 DRZ2040-06 DRZ205410-06 DRZ2142-06	●	2	16	25	115	61	32	32	Rc1/8	Yes	+1.1	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU	
	●		16.5														33
	●		17														
	●		17.5	116	62	35											
	●		18														
	●		18.5				118										64	37
	●		19														
	●		19.5	120	66	39											
	●		20														
	●		20.5				123										69	40
	●		21														
	●		21	125	71	41											
	●		21														
●	21																
S25- DRZ215430-08 DRZ2244-08 DRZ225450-08 DRZ2346-08 DRZ235470-08 DRZ2448-08 DRZ245490-08 DRZ2550-08 DRZ255510-08 DRZ2652-08 DRZ265530-08	●	2	21.5	25	128	74	43	33	Rc1/8	Yes	+1.8	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP	
	●		22														44
	●		22.5														
	●		23		130	76	46										
	●		23.5														
	●		24														131	77	48
	●		24.5														
	●		25	133	79	50											
	●		25.5														
	●		26				135										81	52
	●		26.5														
	●		26.5														

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions K85
Trouble shooting K65

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Toolholder dimensions

2xDC

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts				Applicable inserts ● K74
			DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench	
S32- DRZ2754-10 DRZ275550-10 DRZ2856-10 DRZ285570-10 DRZ2958-10 DRZ295590-10 DRZ3060-10 DRZ305610-10 DRZ3162-10 DRZ315630-10 DRZ3264-10 DRZ325650-10	● ● ● ● ● ● ● ● ● ● ● ●	2	27 27.5 28 28.5 29 29.5 30 30.5 31 31.5 32 32.5	32	149 151 153 154 155 158	90 92 94 95 96 99	54 55 56 57 58 59 60 61 62 63 64 65	42 45	Rc1/4	Yes	+2.5 +2.3 +2.2 +2.1 +2 +1.8 +1.7 +1.5 +1.5 +1.3 +1.2 +1	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP
S40- DRZ3366-12 DRZ3468-12 DRZ3570-12 DRZ3672-12 DRZ3774-12 DRZ3876-12 DRZ3978-12 DRZ4080-12	● ● ● ● ● ● ● ●	2	33 34 35 36 37 38 39 40	40	173 176 177 180 181 183 185	104 107 108 111 112 114 116	66 68 70 72 74 76 78 80	55	Rc1/4	Yes	+2.9 +2.7 +2.4 +2.2 +1.9 +1.7 +1.4 +1.2	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
S40- DRZ4182-15 DRZ4284-15 DRZ4386-15 DRZ4488-15 DRZ4590-15 DRZ4692-15 DRZ4794-15 DRZ4896-15 DRZ4998-15 DRZ50100-15 DRZ51102-15 DRZ52104-15 DRZ53106-15	● ● ● ● ● ● ● ● ● ● ● ● ●	2	41 42 43 44 45 46 47 48 49 50 51 52 53	40	186 188 190 192 198 201 203 204	117 119 121 123 129 132 134 135	82 84 86 88 90 92 94 96 98 100 102 104 106	55 60	Rc1/4	Yes	+4 +3.7 +3.5 +3.2 +3 +2.7 +2.5 +2.2 +2 +1.7 +1.2 +1 +0.7	GP-2	SB-5085TR	DT-20	-	ZCMT150406SP ZCMT150408
S40- DRZ54108-20 DRZ55110-20 DRZ56112-20 DRZ57114-20 DRZ58116-20 DRZ59118-20	● ● ● ● ● ●	2	54 55 56 57 58 59	40	214 215 217 219 221 223	145 146 148 150 152 154	108 110 112 114 116 118	65	Rc1/4	Yes	+5 +4.7 +4.4 +4.1 +3.8 +3.5	GP-2	SB-60120TR	DT-25	-	ZCMT200608

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions ● K85
Trouble shooting ● K65

Hole Dia. Tolerance (2D type)

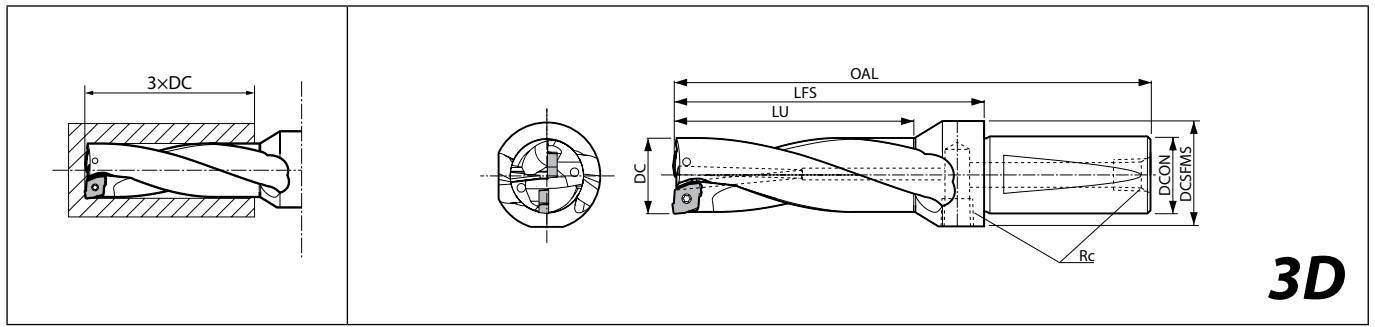
DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.20 -0.10
ø27~ø40	+0.25 -0.15
ø41~ø59	+0.30 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



DRZ (Drilling depth : 3 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts				Applicable inserts ➔ K74										
			DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench											
S20- DRZ1339-05 DRZ135405-05 DRZ1442-05 DRZ145435-05 DRZ1545-05 DRZ155465-05	●	2	13	20	108	65	39	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU										
	●		13.5														69	42								
	●		14																72	45						
	●		14.5																		46.5					
	●		15																							
S25- DRZ1648-06 DRZ165495-06 DRZ1751-06 DRZ175525-06 DRZ1854-06 DRZ185555-06 DRZ1957-06 DRZ195585-06 DRZ2060-06 DRZ205615-06 DRZ2163-06	●	2	16	25	131	77	48	32	Rc1/8	Yes	+1.1	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU										
	●		16.5														79	51								
	●		17																82	54						
	●		17.5																		55.5					
	●		18																			57				
	●		18.5																				58.5			
	●		19																					60		
	●		19.5																						61.5	
	●		20																							63
	●		20.5																							
	●		21																							
S25- DRZ215645-08 DRZ2266-08 DRZ225675-08 DRZ2369-08 DRZ235705-08 DRZ2472-08 DRZ245735-08 DRZ2575-08 DRZ255765-08 DRZ2678-08 DRZ265795-08	●	2	21.5	25	147	93	64.5	33	Rc1/8	Yes	+1.8	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP										
	●		22														96	66								
	●		22.5																70.5							
	●		23																	72						
	●		23.5																		73.5					
	●		24																			75				
	●		24.5																				76.5			
	●		25																					78		
	●		25.5																						79.5	
	●		26																							
	●		26.5																							

When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions ➔ K85
Trouble shooting ➔ K65

Hole Dia. Tolerance (3D type)

DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.20 -0.10
ø27~ø40	+0.25 -0.15
ø41~ø59	+0.30 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

K

Drilling

DRA

DRC





DRV

DRZ

DRW

Toolholder dimensions

3xDC

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts				Applicable inserts ● K74			
			DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench				
																			
S32- DRZ2781-10 DRZ275825-10 DRZ2884-10 DRZ285855-10 DRZ2987-10 DRZ295885-10 DRZ3090-10 DRZ305915-10 DRZ3193-10 DRZ315945-10 DRZ3296-10 DRZ325975-10	●	2	27	32	173	114	81	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP			
	●		27.5								82.5						+2.3		
	●		28								84						+2.2		
	●		28.5		85.5	+2.1													
	●		29		87	+2													
	●		29.5		88.5	+1.8													
	●		30	45	181	122	90	55			Rc1/4						Yes	+1.7	
	●		30.5															91.5	+1.5
	●		31															93	+1.5
	●		31.5		94.5	+1.3													
	●		32		96	+1.2													
	●		32.5		97.5	+1													
S32- DRZ3399-12 DRZ34102-12 DRZ35105-12 DRZ36108-12 DRZ37111-12 DRZ38114-12 DRZ39117-12 DRZ40120-12	●	2	33	32	193	134	99	55	Rc1/4	Yes		+2.9	GP-2	SB-5085TR	DT-20	-		ZCMT12T304SP ZCMT12T306	
	●		34									102							+2.7
	●		35									105							+2.4
	●		36		108	+2.2													
	●		37		111	+1.9													
	●		38		114	+1.7													
	●		39		117	+1.4													
	●		40		120	+1.2													
S40- DRZ3399-12 DRZ34102-12 DRZ35105-12 DRZ36108-12 DRZ37111-12 DRZ38114-12 DRZ39117-12 DRZ40120-12	●	2	33	40	203	134	99	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306			
	●		34								102						+2.7		
	●		35								105						+2.4		
	●		36		108	+2.2													
	●		37		111	+1.9													
	●		38		114	+1.7													
	●		39		117	+1.4													
	●		40		120	+1.2													
S40- DRZ41123-15 DRZ42126-15 DRZ43129-15 DRZ44132-15 DRZ45135-15 DRZ46138-15 DRZ47141-15 DRZ48144-15 DRZ49147-15 DRZ50150-15 DRZ51153-15 DRZ52156-15 DRZ53159-15	●	2	41	40	224	155	123	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	-	ZCMT150406SP ZCMT150408			
	●		42								126						+3.7		
	●		43								129						+3.5		
	●		44		132	+3.2													
	●		45		135	+3													
	●		46		138	+2.7													
	●		47	60	245	176	141	65			Rc1/4						Yes	+2.5	
	●		48															144	+2.2
	●		49															147	+2
	●		50		150	+1.7													
	●		51		153	+1.2													
	●		52		156	+1													
	●		53		159	+0.7													
S40- DRZ54162-20 DRZ55165-20 DRZ56168-20 DRZ57171-20 DRZ58174-20 DRZ59177-20	●	2	54	40	266	197	162	65	Rc1/4	Yes		+5	GP-2	SB-60120TR	DT-25	-		ZCMT200608	
	●		55									165							+4.7
	●		56									168							+4.4
	●		57		171	+4.1													
	●		58		174	+3.8													
	●		59		177	+3.5													

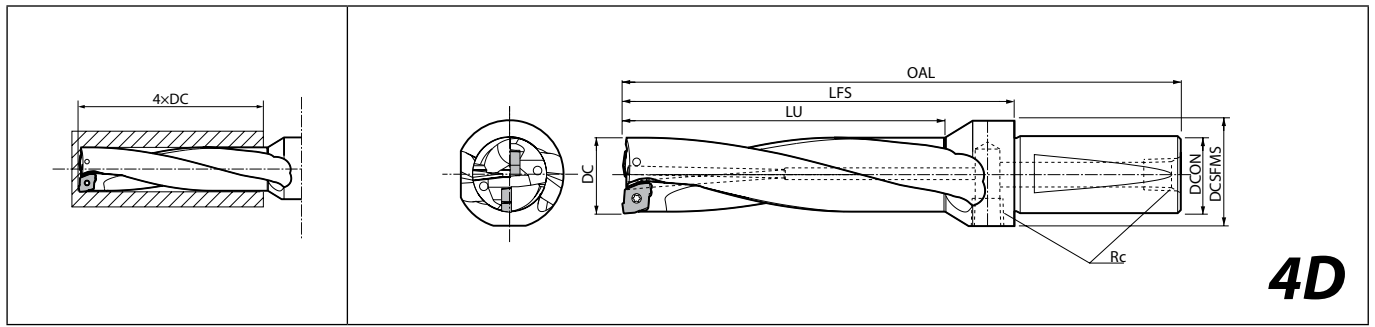
When offset drilling, reduce feed rate to 0.08 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions ● K85
Trouble shooting ● K65



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRZ (Drilling depth : 4 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts				Applicable inserts ➔ K74											
			DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench												
S20- DRZ1352-05	●	2	13	20	121	78	52	27	Rc1/8	Yes	+0.5	GP-1	SB-2045TR	-	FT-6	ZCMT050203 ZCMT050203SP ZCMT050203SU											
DRZ135540-05	●		13.5														126	83	56								
DRZ1456-05	●		14																	130	87	60					
DRZ145580-05	●		14.5		62																						
DRZ1560-05	●		15			62																					
DRZ155620-05	●		15.5																								
S25- DRZ1664-06	●	2	16	25	147	93	64	32	Rc1/8	Yes	+1.1	GP-1	SB-2260TR	DT-7	-	ZCMT06T204 ZCMT06T204SP ZCMT06T204SU											
DRZ165660-06	●		16.5														149	95	68								
DRZ1768-06	●		17																	153	99	72					
DRZ175700-06	●		17.5		74	76	78																				
DRZ1872-06	●		18														78										
DRZ185740-06	●		18.5		78																						
DRZ1976-06	●		19			80																					
DRZ195780-06	●		19.5		82																						
DRZ2080-06	●		20			84																					
DRZ205820-06	●		20.5		84																						
DRZ2184-06	●		21																								
S25- DRZ215860-08	●		2		21.5	25	169										115	86	33	Rc1/8	Yes	+1.8	GP-1	SB-2570TR	DT-8	-	ZCMT080304 ZCMT080304SP
DRZ2288-08	●				22																							173	119	88
DRZ225900-08	●	22.5		92	96			98																			
DRZ2392-08	●	23							98																		
DRZ235940-08	●	23.5		100																							
DRZ2496-08	●	24			102																						
DRZ245980-08	●	24.5		104																							
DRZ25100-08	●	25			106																						
DRZ2551020-08	●	25.5																									
DRZ26104-08	●	26																									
DRZ2651060-08	●	26.5																									

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions ➔ K85
Trouble shooting ➔ K65

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

K

Drilling

DRA

DRC

DRV

DRZ

DRW

Toolholder dimensions

4xDC

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts				Applicable inserts K74
			DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	Wrench	
S32- DRZ27108-10 DRZ2751100-10 DRZ28112-10 DRZ2851140-10 DRZ29116-10 DRZ2951180-10 DRZ30120-10 DRZ3051220-10 DRZ31124-10 DRZ3151260-10 DRZ32128-10 DRZ3251300-10	●	2	27	32	200	141	108	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	-	ZCMT10T304 ZCMT10T304SP
	●	27.5	+2.3													
	●	28	+2.2													
	●	28.5	+2.1													
	●	29	+2													
	●	29.5	+1.8													
	●	30	+1.7													
	●	30.5	211	152	120	45	+1.5									
	●	31					+1.3									
	●	31.5					+1.2									
	●	32	214	155	124		+1.2									
	●	32.5					+1									
	●	32.5	219	160	130		+1									
●	32.5	+1														
S32- DRZ33132-12 DRZ34136-12 DRZ35140-12 DRZ36144-12 DRZ37148-12 DRZ38152-12 DRZ39156-12 DRZ40160-12	●	2	33	32	226	167	132	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
	●	34	+2.7													
	●	35	+2.4													
	●	36	+2.2													
	●	37	+1.9													
	●	38	+1.7													
	●	39	+1.4													
	●	40	+1.2													
	S40- DRZ33132-12 DRZ34136-12 DRZ35140-12 DRZ36144-12 DRZ37148-12 DRZ38152-12 DRZ39156-12 DRZ40160-12	●	2		33	40	236				167						132	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	-	ZCMT12T304SP ZCMT12T306
●		34	+2.7													
●		35	+2.4													
●		36	+2.2													
●		37	+1.9													
●		38	+1.7													
●		39	+1.4													
●		40	+1.2													
S40- DRZ41164-15 DRZ42168-15 DRZ43172-15 DRZ44176-15 DRZ45180-15 DRZ46184-15 DRZ47188-15 DRZ48192-15 DRZ49196-15 DRZ50200-15		●	2	41	40		265	196	164	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	-				ZCMT150406SP ZCMT150408
	●	42	+3.7													
	●	43	+3.5													
	●	44	+3.2													
	●	45	+3													
	●	46	+2.7													
	●	47	+2.5													
	●	48	+2.2													
	●	49	+2													
	●	50	301	232		200	60	+1.7								
	●	50						+1.7								

When offset drilling, reduce feed rate to 0.06 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions K85
Trouble shooting K65

Hole Dia. Tolerance (4D type)

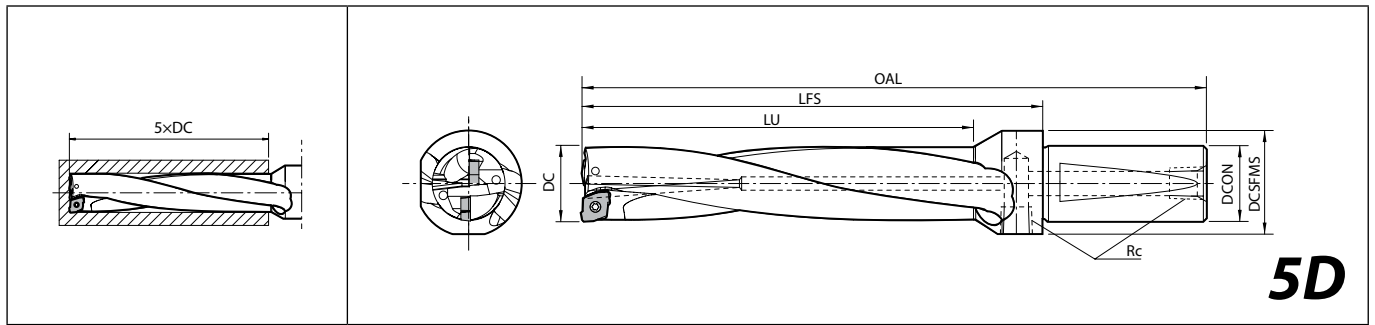
DC	Hole Dia. Tolerance (mm)
ø13~ø26.5	+0.25 -0.10
ø27~ø40	+0.30 -0.15
ø41~ø50	+0.35 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



DRZ (Drilling depth : 5 x DC)



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)							Coolant hole	Radial offset max.	Spare parts			Applicable inserts K74
			DC	DCON	OAL	LFS	LU	DCSFMS	Rc			Plug	Screw	Wrench	
S32- DRZ27135-10 DRZ28140-10 DRZ29145-10 DRZ30150-10 DRZ31155-10 DRZ32160-10	●	2	27	32	277	168	135	42	Rc1/4	Yes	+2.5	GP-2	SB-4085TR	DT-15	ZCMT10T304 ZCMT10T304SP
	●		28		232	173	140				+2.2				
	●		29		237	178	145				+2				
	●		30		241	182	150				+1.7				
	●		31		245	186	155				+1.5				
	●		32		251	192	160				+1.2				
S40- DRZ33165-12 DRZ34170-12 DRZ35175-12 DRZ36180-12 DRZ37185-12 DRZ38190-12 DRZ39195-12 DRZ40200-12	●	2	33	40	269	200	165	55	Rc1/4	Yes	+2.9	GP-2	SB-5085TR	DT-20	ZCMT12T304SP ZCMT12T306
	●		34		275	206	170				+2.7				
	●		35		279	210	175				+2.4				
	●		36		285	216	180				+2.2				
	●		37		289	220	185				+1.9				
	●		38		294	225	190				+1.7				
	●		39		299	230	195				+1.4				
	●		40		302	233	200				+1.2				
S40- DRZ41205-15 DRZ42210-15 DRZ43215-15 DRZ44220-15 DRZ45225-15 DRZ46230-15 DRZ47235-15 DRZ48240-15 DRZ49245-15 DRZ50250-15	●	2	41	40	306	237	205	55	Rc1/4	Yes	+4	GP-2	SB-5085TR	DT-20	ZCMT150406SP ZCMT150408
	●		42		311	242	210				+3.7				
	●		43		316	247	215				+3.5				
	●		44		321	252	220				+3.2				
	●		45		324	255	225				+3				
	●		46		333	264	230				+2.7				
	●		47		339	270	235				+2.5				
	●		48		344	275	240				+2.2				
	●		49		349	280	245				+2				
	●		50		351	282	250				+1.7				

When offset drilling, reduce feed rate to 0.05 mm/rev or less.
See page K70 for Adjustable Sleeve (SHE).

Recommended cutting conditions K85
Trouble shooting K65

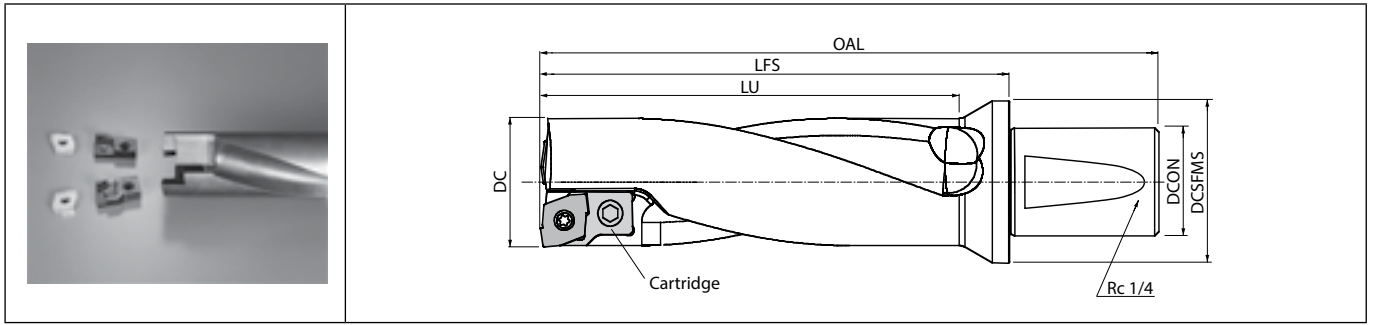
Hole Dia. Tolerance (5D type)

DC	Hole Dia. Tolerance (mm)
ø27~ø40	+0.35 -0.15
ø41~ø50	+0.40 -0.20

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRZ-CR



Toolholder dimensions

Description	Availability	No. of inserts	Dimension (mm)						Coolant hole	Radial offset max.	Spare parts				Applicable inserts ➔ K74
			DC	DCON	OAL	LFS	LU	DCSFMS			Cartridge (inner edge)	Cartridge (outer edge)	Screw	Wrench	
S50- DRZ60180-20CR DRZ65195-20CR DRZ70210-20CR	MTO	2	60	286	217	195	75	Yes	+3	DR20CR-IN (1pc)	DR20CR-OUT (1pc)	SB-60120TR	DT-25	ZCMT200608	
	MTO		65	50	296	227			206						+1.5
	MTO		70	308	239	220			+0.2						
S50- DRZ75225-12CR DRZ80240-12CR	MTO	4	75	50	330	261	225	80	Yes	Offset N.A.	DR12CR-IN (2pcs)	DR12CR-OUT (2pcs)	SB-5085TR	DT-20	ZCMT12T304SP ZCMT12T306
	MTO		80	340	271	240									

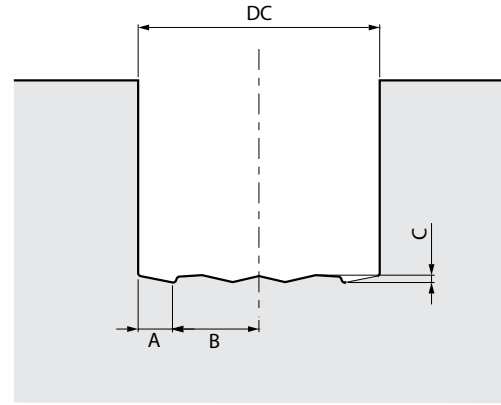
Clamp screws for cartridges are included in toolholders : HH6X12 for DR20CR and HH4X12 for DR12CR.

Recommended cutting conditions ➔ K85



DRZ hole bottom shape (Common for 2D, 3D, 4D, 5D) (mm)

DC	A	B	C	DC	A	B	C	DC	A	B	C
13.0		4.4		21.5		7.7		33.0		10.8	
13.5		4.7	0.4	22.0		7.9		34.0		11.3	
14.0	2.1	4.9		22.5		8.2	0.6	35.0		11.8	0.8
14.5		5.2		23.0		8.4		36.0	5.7	12.3	
15.0		5.4	0.5	23.5	3.1	8.7		37.0		12.8	
15.5		5.7		24.0		8.9		38.0		13.3	
16.0		5.3		24.5		9.2		39.0		13.8	0.9
16.5		5.6		25.0		9.4		40.0		14.3	
17.0		5.8	0.6	25.5		9.7	0.7	41.0		14.0	
17.5		6.1		26.0		9.9		42.0		14.5	
18.0		6.3		26.5		10.2		43.0		15.0	
18.5	2.7	6.6		27.0		9.5		44.0		15.5	1.0
19.0		6.8		27.5		9.8		45.0		16.0	
19.5		7.1	0.7	28.0		10.0		46.0		16.5	
20.0		7.3		28.5		10.3	0.7	47.0	6.5	17.0	
20.5		7.6		29.0		10.5		48.0		17.5	
21.0		7.8	0.8	29.5	4.0	10.8		49.0		18.0	1.1
				30.0		11.0		50.0		18.5	
				30.5		11.3		51.0		19.0	
				31.0		11.5		52.0		19.5	
				31.5		11.8	0.8	53.0		20.0	
				32.0		12.0		54.0		18.5	1.2
				32.5		12.3		55.0		19.0	
								56.0	8.5	19.5	
								57.0		20.0	
								58.0		20.5	
								59.0		21.0	



* Above is numeric guideline.
(Varies within ±0.1mm depending on workpiece materials and cutting conditions)

K



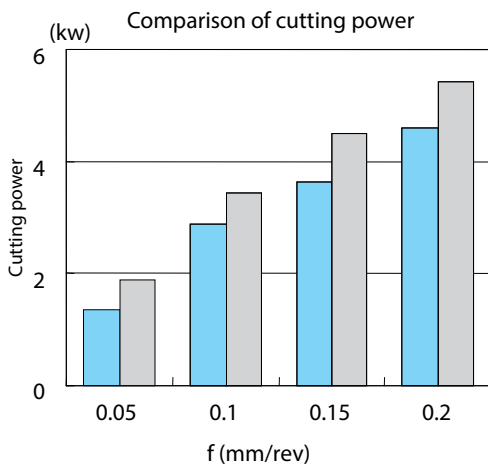
Drilling

Cutting power

ø20 cutting power comparison

- Magic Drill DRZ
- Competitor A

Vc=100m/min, (n=1,600min⁻¹)
ø20 indexable drill
15CrMo4 wet (Internal coolant)



Case studies

MagicDrill dia.	ø16	ø27	ø50				
Machine	Competitor A	Competitor B	Competitor C	Competitor D			
Machine power	AC 5.5/7.5 kW	AC 5.5/7.5 kW	AC 5.5/7.5 kW	AC 7.5/11 kW			
Cutting conditions	Vc (mm/min)	150	130	150	120	110	157
	f (mm/rev)	0.06	0.13		0.1	0.08	0.12
Workpiece material	ST44-2	34CrMo4		15CrMo4	ST44-2		
Required power (Load meter values)	60%	80%	95%	100%	60%	100%	
Remarks	-	-		With conventional drill, limited up to ø40	-		

Formula for calculating required power (Approximate value)

Recommended cutting conditions (Coolant)

Workpiece material	Recommended insert grades (Vc: m/min)				DC (mm)	Drill type (Drilling depth)			
	MEGACOAT			Carbide		2D	3D	4D	5D
	PR1230	PR1225	PR1210	KW10					
	Standard SP SU	Standard SP SU	Standard	Standard SP		f (mm/rev)			
Low carbon steel	★ 120~220	☆ 120~220	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Carbon steel	★ 100~160	☆ 100~160	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Alloy steel	★ 80~140	☆ 80~140	-	-	ø13~ø15.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.15	0.08~0.15	0.06~0.12	-
					ø27~ø50	0.08~0.18	0.08~0.15	0.06~0.12	0.05~0.09
					ø50~	0.08~0.18	0.08~0.15	0.06~0.12	-
Mold steel	★ 70~130	☆ 70~130	-	-	ø13~ø15.5	0.04~0.08	0.04~0.08	0.03~0.07	-
					ø16~ø26.5	0.08~0.12	0.06~0.10	0.06~0.08	-
					ø27~ø50	0.08~0.15	0.06~0.12	0.06~0.10	0.04~0.07
					ø50~	0.08~0.15	0.06~0.12	0.06~0.10	-
Stainless steel (Austenitic related)	☆ 60~120	★ 60~120	-	-	ø13~ø15.5	0.04~0.08	0.04~0.08	0.03~0.06	-
					ø16~ø26.5	0.06~0.10	0.06~0.10	0.04~0.08	-
					ø27~ø50	0.06~0.10	0.06~0.12	0.04~0.10	0.04~0.07
					ø50~	0.06~0.12	0.06~0.12	0.04~0.10	-
Gray cast iron	-	-	★ 100~150	☆ 100~120	ø13~ø15.5	0.08~0.12	0.08~0.10	0.06~0.08	-
					ø16~ø26.5	0.10~0.18	0.10~0.15	0.08~0.12	-
					ø27~ø50	0.10~0.20	0.10~0.18	0.08~0.15	0.06~0.10
					ø50~	0.10~0.20	0.10~0.18	0.08~0.15	-
Nodular cast iron	-	-	★ 80~120	☆ 80~100	ø13~ø15.5	0.08~0.12	0.08~0.10	0.06~0.08	-
					ø16~ø26.5	0.10~0.18	0.10~0.15	0.08~0.12	-
					ø27~ø50	0.10~0.20	0.10~0.18	0.08~0.15	0.06~0.10
					ø50~	0.10~0.20	0.10~0.18	0.08~0.15	-
Non-ferrous metals	-	-	-	★ 200~600	ø13~ø15.5	0.06~0.12	0.06~0.10	0.04~0.08	-
					ø16~ø26.5	0.08~0.18	0.08~0.15	0.06~0.15	-
					ø27~ø50	0.08~0.20	0.08~0.18	0.06~0.15	0.05~0.10
					ø50~	0.08~0.20	0.08~0.18	0.06~0.15	-
Titanium alloys	-	-	-	★ 40~70	ø13~ø15.5	0.05~0.06	0.05~0.06	0.05~0.06	-
					ø16~ø26.5	0.05~0.07	0.05~0.07	0.05~0.07	-
					ø27~ø50	0.06~0.08	0.06~0.08	0.06~0.08	0.04~0.05
					ø50~	0.06~0.08	0.06~0.08	0.06~0.08	-

Apply a sufficient amount of coolant.

★: 1st recommendation ☆: 2nd recommendation



Cutting conditions by application

[Workpiece material: C50]

Applications	Plain surface	Slant surface	Half cylindrical	Hole expansion	Concave surface	Cored hole	Stacked plates
Shape of workpiece							
DRZ	Cutting speed Vc (m/min)	120	120	120	120	120	Not available
	f (mm/rev)	0.1	0.05	0.05	0.05	Concave surface 0.05 Continuous part 0.1	*0.05 Not available
Coolant (Internal)	Yes	Yes	Yes	Yes	Yes	Yes	Not available

* Cutting width (Torus-shaped part) when drilling cored hole. (Same as when using a boring bar).

Drill type	2D ~ 3D	4D ~ 5D
Cutting width (Torus-shaped part)	0.1 x DC or less	Not recommended

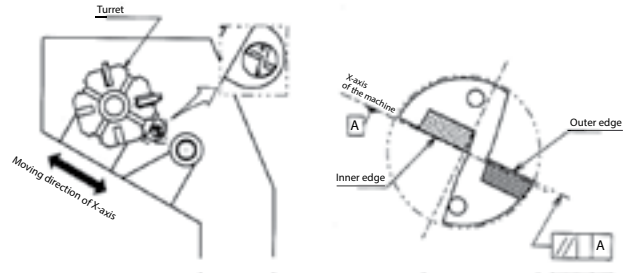
e.g.) In case of drilling using DRZ3090-10 (3 x DC)
 1. For milling, pre-drilled hole should be cut ø24 (ø30 - 0.1 x 30 x 2) or bigger
 2. For turning, ap should be set ap = 3mm (0.1 x 30) or under

Max. depth for drilling with external coolant

In case of using external coolant system, chip evacuation will be bad. Therefore ap should be measured within 1.5 times (1.5 x DC) of drill diameter (DC).

Lathe installation (DRZ)

1. The top face of the outer insert should be parallel to the X-axis to allow for offset machining.
Drill diameter can be changed by moving X-axis.
2. It is recommended to set the outer insert as shown in Fig. 1 with the outer insert facing the operator.
(It is also possible to use it by setting it in 180° reverse position)
If the lathe has two turrets, when installing the drill into the lower turret, the outer insert should be set to face the operator.
(It is also possible to use it by setting at 180° reverse position)



(Fig. 1) Installed to the lathe

Drill diameter adjustment

1. Drill diameter adjustment

1. Drill diameter is adjusted by moving X-axis.
The moving direction of the X-axis depends on the position of the toolholder.
2. In case of making the hole diameter larger, slide the tool along the X-axis toward the outer insert side. (Fig. 2, Fig. 3)
For making the hole diameter smaller, slide the tool along the X-axis in the opposite direction.
(This movement of the axis is called "Offset")
However, be sure not to make the hole diameter smaller than the drill diameter by 0.2mm or more. Otherwise, the toolholder will interfere with the drilled hole. (Fig. 4)
e.g.) In case of using $\phi 20$ drill, the hole diameter must not be smaller than 19.8mm.

2. Offset limit of the drill diameter

For the maximum limit of the drill diameter, refer to "Max. Offset (Radial)" in the Toolholder Dimensions table.
(The figure in the table shows how much it is possible the offset the drill in the radial direction.)
e.g.) In case of using $\phi 20$ drill, it is possible to make a hole up to $\phi 21$ since "Max. Offset (Radial)" is +0.5mm.

K

Drilling

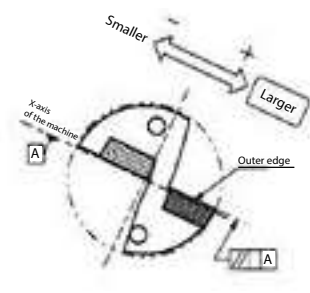
DRA

DRC

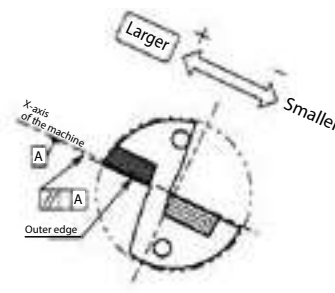
DRV

DRZ

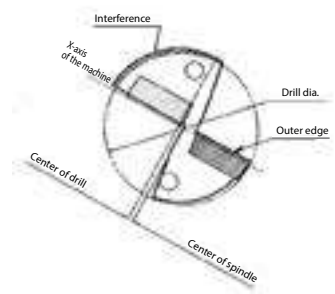
DRW



(Fig. 2) Outer insert facing up



(Fig. 3) Outer insert facing down



(Fig. 4) Excessive offset (For smaller hole diameter)

Center height adjustment

1. Center height of the inner insert

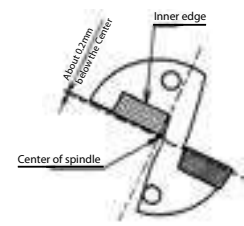
When installing inner insert as shown in Fig. 1, it will be set around 0.2mm below the Center of Spindle. (Fig. 5)
This is the normal position of the center height and the drill is designed to be handled in this condition.
However, in case that the turret of the lathe is out of the center of Spindle, sometimes the inner insert may be set above the center, or excessively below the center.
For stable drilling, it is essential to check the Center Height carefully.

2. How to check the center height

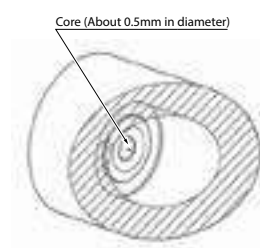
For checking the center height of the inner insert, see the core which remains at the center of the end face of the drilled hole. (Fig. 6)
If the center height is in the normal position, a core about 0.5mm in diameter, will remain after machining.
In the following cases, it is necessary to adjust the center height.

- No core remains
- Core diameter is more than 1mm

* The drilled hole for verification purposes needs to be machined at approximately 10mm in depth and at a feed rate of 0.1mm/rev or lower.



(Fig. 5) Front view of the drill

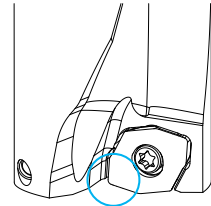


(Fig. 6) Center core

3. Center height adjustment

a) No core remains / Core with Excessively Small Diameter

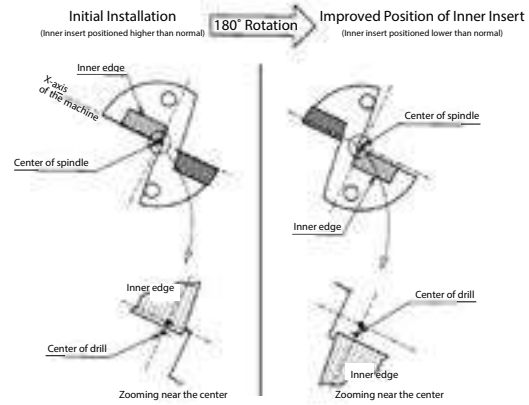
This happens when the inner insert is set above the center height. In this case, adjustment is necessary since insert breakage will be probable at the center of the drill. (Fig. 7)



(Fig. 7) Insert breakage near the center of the drill

[How to adjust]

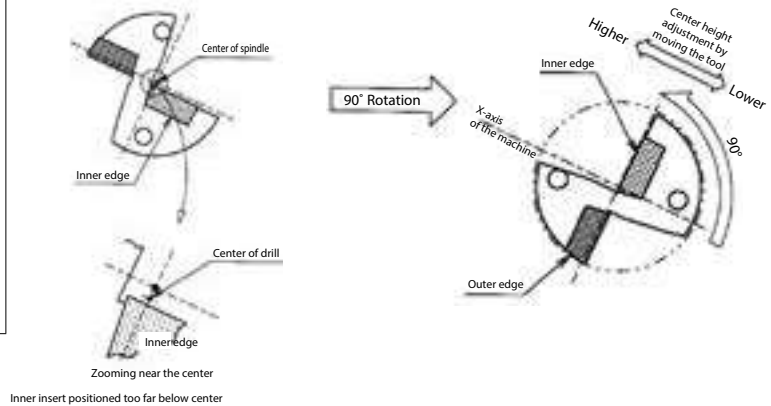
1. Install the drill rotated 180°. Most problems will be solved by this method. (Fig. 8)



(Fig. 8)

[How to adjust]

2. If the core diameter becomes too large after the above adjustment, install the drill by rotating 90° counter-clockwise as shown in Fig. 9 (outer insert is positioned lower) and adjust the center height by moving the tool in the X-axis direction. (However, this makes it impossible to adjust the drill diameter)
- Caution: In case of installing the drill in the reverse direction (outer insert is positioned above), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole. The best solution is to readjust the center position of the turret itself.



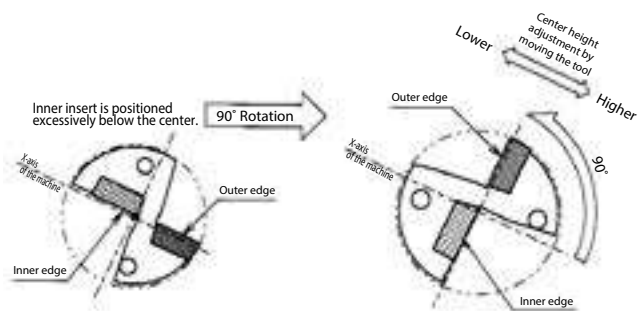
(Fig. 9)

b) Core with excessively large diameter (More than 1mm)

This occurs when the inner insert is excessively below the center. This condition causes poor chip evacuation and an adjustment is required.

[How to adjust]

- Install the drill rotating 90° as shown in Fig. 10 (outer insert is positioned on the upper side) and adjust the center height by moving tool in the X-axis direction. (However, this makes it impossible to adjust the drill diameter)
- Caution: In case of installing the drill in the opposite direction (outer insert is positioned lower), the hole diameter will become smaller, which may cause the drill body to interfere with the drilled hole. The best solution is to readjust the center position of the turret itself.



(Fig. 10)



Large diameter indexable drill

MagicDrill DRW

Sharp cutting and enhanced chip evacuation.
Superior fracture resistance and long tool life with
MEGACOAT NANO PR1535 grade.



Applicable diameter: $\phi 60 \sim \phi 100$ mm

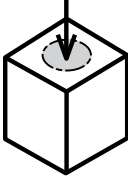
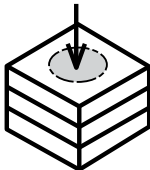
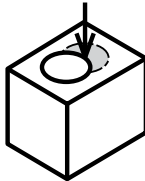

Drilling depth: 1D, 2D, 3D

Use single type of insert.



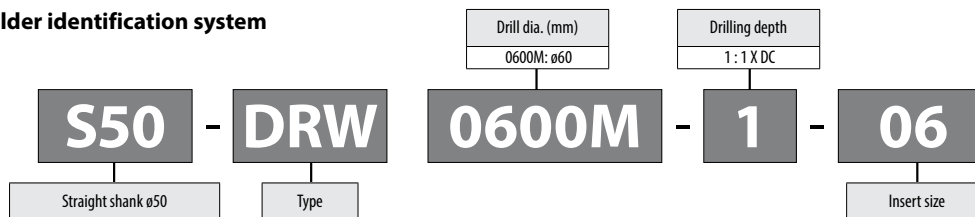
K

Applicable workpiece


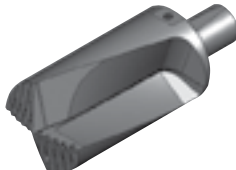

Plain surface	Stacked plates	Hole expansion	Slant surface
			

* Hole expansion: Overlap amount of through hole must be 0.2 x DC or less.
Expansion of blind holes is not possible because chips are built up in the next hole and will cause chip biting.


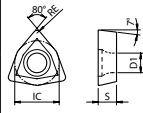
Toolholder identification system



DRW custom-order item (Applicable drill diameter: $\phi 22 \sim \phi 200$ mm)

 BT integral arbor type is also available.	 Max. $\phi 200$ is applicable	 Standard item Straight shank (1D~3D)
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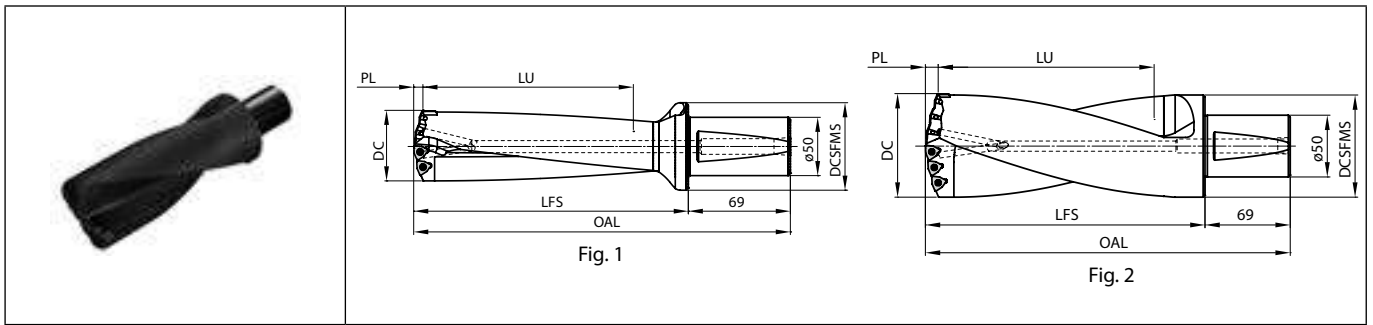
WCMT

		Carbon steel / Alloy steel		●		●		P		
		Mold and die steel		●		●		P		
		Stainless steel		●		○		M		
		Cast iron		●		●		K		
		Non-ferrous metals		●		●		N		
Insert	Description	No. of edges	Dimension (mm)				Carbide			Applicable toolholder K90~K93
			IC	S	D1	RE	CVD	PVD		
							CA6535	PR1230	PR1535	
 	WCMT 050308	3	7.94	3.18	3.2	0.8	●			-
	WCMT 06T308	3	9.525	3.97	3.7	0.8	●	●		S50-DRW...-06





● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

DRW



Toolholder dimensions (Drilling depth : 1 x DC)

Description	Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts ➔ K89
			DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
													
S50- DRW0600M-1-06	MTO	4	60	175	106	60	63	7.6	Yes	2	SB-3592TR	DT-10	WCMT06T308
DRW0610M-1-06	MTO		61	176	107	61		7.7					
DRW0620M-1-06	MTO		62	178	109	62		7.8					
DRW0630M-1-06	MTO		63	179	110	63		7.9					
DRW0640M-1-06	MTO		64	182	113	64		8					
DRW0650M-1-06	MTO		65	184	115	65		8.2					
DRW0660M-1-06	MTO		66	185	116	66	8.3	8.3					
DRW0670M-1-06	MTO		67	187	118	67	8.4	8.4					
DRW0680M-1-06	MTO		68	189	120	68	8.5	8.5					
DRW0690M-1-06	MTO		69	190	121	69	8.6	8.6					
DRW0700M-1-06	MTO		70	192	123	70	8.7	8.7					
DRW0710M-1-06	MTO		71	193	124	71	8.8	8.8					
DRW0720M-1-06	MTO		72	195	126	72	9	9					
DRW0730M-1-06	MTO		73	198	129	73	9.1	9.1					
DRW0740M-1-06	MTO		74	199	130	74	9.2	9.2					
S50- DRW0750M-1-06	MTO		6	75	201	132	75	9.3						Yes	2	SB-3592TR	DT-10	WCMT06T308
DRW0760M-1-06	MTO	76		203	134	76	9.4						
DRW0770M-1-06	MTO	77		204	135	77	9.5						
DRW0780M-1-06	MTO	78		206	137	78	9.7						
DRW0790M-1-06	MTO	79		207	138	79	9.8						
DRW0800M-1-06	MTO	80		210	141	80	9.9						
DRW0810M-1-06	MTO	81				81							
DRW0820M-1-06	MTO	82				82							
DRW0830M-1-06	MTO	83				83							
DRW0840M-1-06	MTO	84		84	82	82	2						

Offset Drilling



Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).

Do not set it to a negative value to make the diameter smaller.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order



Toolholder dimensions (Drilling depth : 1 x DC)

Description	Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts K89
			DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
													
S50- DRW0850M-1-06	MTO	6	85	211	142	85	83	Yes	2	SB-3592TR	DT-10	WCMT06T308	
DRW0860M-1-06	MTO		86	213	144	86	84						
DRW0870M-1-06	MTO		87	215	146	87	85						
DRW0880M-1-06	MTO		88	216	147	88	86						
DRW0890M-1-06	MTO		89	218	149	89	87						
DRW0900M-1-06	MTO		90	219	150	90	88						
DRW0910M-1-06	MTO		91	220	151	91	89						
DRW0920M-1-06	MTO		92	222	153	92	90						
DRW0930M-1-06	MTO		93	223	154	93	91						
DRW0940M-1-06	MTO		94	225	156	94	92						
DRW0950M-1-06	MTO		95	226	157	95	93						
DRW0960M-1-06	MTO		96	228	159	96	94						
DRW0970M-1-06	MTO		97			97	95						
DRW0980M-1-06	MTO		98	230	161	98	96						
DRW0990M-1-06	MTO		99	231	162	99	97						
DRW1000M-1-06	MTO		100	232	163	100	98						

Offset Drilling



Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).

Do not set it to a negative value to make the diameter smaller.



Drilling

Toolholder dimensions (Drilling depth : 2 x DC)

Description	Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts K89
			DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
													
S50- DRW0600M-2-06	●	4	60	235	166	120	63	7.6	Yes	SB-3592TR	DT-10	WCMT06T308	
DRW0610M-2-06	MTO		61	237	168	122		7.7					
DRW0620M-2-06	MTO		62	240	171	124		7.8					
DRW0630M-2-06	MTO		63	242	173	126		7.9					
DRW0640M-2-06	MTO		64	246	177	128		8					
DRW0650M-2-06	●		65	249	180	130		8.2					
DRW0660M-2-06	MTO		66	251	182	132	64	8.3					
DRW0670M-2-06	MTO		67	254	185	134	65	8.4					
DRW0680M-2-06	MTO		68	257	188	136	66	8.5					
DRW0690M-2-06	MTO		69	259	190	138	67	8.6					
DRW0700M-2-06	●		70	262	193	140	68	8.7					
DRW0710M-2-06	MTO		71	264	195	142	69	8.8					
DRW0720M-2-06	MTO		72	267	198	144	70	9					
DRW0730M-2-06	MTO		73	271	202	146	71	9.1					
DRW0740M-2-06	●	74	273	204	148	72	9.2						
S50- DRW0750M-2-06	●	6	75	276	207	150	73	9.3	Yes	SB-3592TR	DT-10	WCMT06T308	
DRW0760M-2-06	MTO		76	279	210	152	74	9.4					
DRW0770M-2-06	MTO		77	281	212	154	75	9.5					
DRW0780M-2-06	MTO		78	284	215	156	76	9.7					
DRW0790M-2-06	MTO		79	286	217	158	77	9.8					
DRW0800M-2-06	●		80	287	218	160	78	9.9					2
DRW0810M-2-06	MTO		81	289	220	162	79						2
DRW0820M-2-06	MTO		82	292	223	164	80						2
DRW0830M-2-06	MTO		83	293	224	166	81						2
DRW0840M-2-06	MTO		84	294	225	168	82						2
DRW0850M-2-06	●		85	296	227	170	83						2
DRW0860M-2-06	MTO		86	299	230	172	84	2					
DRW0870M-2-06	MTO		87	302	233	174	85	10.5					2
DRW0880M-2-06	MTO		88	304	235	176	86	2					
DRW0890M-2-06	MTO		89	307	238	178	87	2					
DRW0900M-2-06	●		90	309	240	180	88	11					2
DRW0910M-2-06	MTO		91	311	242	182	89						2
DRW0920M-2-06	MTO		92	314	245	184	90						2
DRW0930M-2-06	MTO		93	316	247	186	91						2
DRW0940M-2-06	●		94	319	250	188	92						2
DRW0950M-2-06	●		95	321	252	190	93						2
DRW0960M-2-06	MTO		96	324	255	192	94	2					
DRW0970M-2-06	MTO		97	325	256	194	95	11.6					2
DRW0980M-2-06	MTO		98	328	259	196	96	2					
DRW0990M-2-06	MTO		99	330	261	198	97	2					
DRW1000M-2-06	●		100	332	263	200	98	12.2					2

Offset Drilling
 Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
 Do not set it to a negative value to make the diameter smaller.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order



Drilling

- DRA
- DRC
- DRV
- DRZ
- DRW

Toolholder dimensions (Drilling depth : 3 x DC)

Description	Availability	No. of inserts	Dimension (mm)						Coolant hole	Fig.	Spare parts		Applicable inserts K89
			DC	OAL	LFS	LU	DCSFMS	PL			Screw	Wrench	
													
S50- DRW0600M-3-06	●	4	60	295	226	180	63	7.6	Yes	SB-3592TR	DT-10	WCMT06T308	
DRW0610M-3-06	MTO		61	298	229	183		7.7					
DRW0620M-3-06	MTO		62	302	233	186		7.8					
DRW0630M-3-06	MTO		63	305	236	189		7.9					
DRW0640M-3-06	MTO		64	310	241	192		8					
DRW0650M-3-06	●		65	314	245	195	8.2	2					
DRW0660M-3-06	MTO		66	317	248	198	64	8.3					2
DRW0670M-3-06	MTO		67	321	252	201	65	8.4					2
DRW0680M-3-06	MTO		68	325	256	204	66	8.5					2
DRW0690M-3-06	MTO		69	328	259	207	67	8.6					2
DRW0700M-3-06	●		70	332	263	210	68	8.7					2
DRW0710M-3-06	MTO		71	335	266	213	69	8.9					2
DRW0720M-3-06	MTO		72	339	270	216	70	9					2
DRW0730M-3-06	MTO		73	344	275	219	71	9.1					2
DRW0740M-3-06	●	74	347	278	222	72	9.2	2					
S50- DRW0750M-3-06	●	6	75	351	282	225	73	9.3	Yes	SB-3592TR	DT-10	WCMT06T308	
DRW0760M-3-06	MTO		76	355	286	228	74	9.4					
DRW0770M-3-06	MTO		77	358	289	231	75	9.5					
DRW0780M-3-06	MTO		78	362	293	234	76	9.7					
DRW0790M-3-06	MTO		79	365	296	237	77	9.8					
DRW0800M-3-06	●		80	367	298	240	78	9.9					2
DRW0810M-3-06	MTO		81	370	301	243	79						2
DRW0820M-3-06	MTO		82	374	305	246	80						2
DRW0830M-3-06	MTO		83	376	307	249	81						2
DRW0840M-3-06	MTO		84	378	309	252	82						2
DRW0850M-3-06	●		85	381	312	255	83	10.5					2
DRW0860M-3-06	MTO		86	385	316	258	84						2
DRW0870M-3-06	MTO		87	389	320	261	85						2
DRW0880M-3-06	MTO		88	392	323	264	86						2
DRW0890M-3-06	MTO		89	396	327	267	87						2
DRW0900M-3-06	●		90	399	330	270	88	11					2
DRW0910M-3-06	MTO		91	402	333	273	89						2
DRW0920M-3-06	MTO		92	406	337	276	90						2
DRW0930M-3-06	MTO		93	409	340	279	91						2
DRW0940M-3-06	●		94	413	344	282	92						2
DRW0950M-3-06	●	95	416	347	285	93	11.6	2					
DRW0960M-3-06	MTO	96	420	351	288	94		2					
DRW0970M-3-06	MTO	97	422	353	291	95		2					
DRW0980M-3-06	MTO	98	426	357	294	96		2					
DRW0990M-3-06	MTO	99	429	360	297	97		2					
DRW1000M-3-06	●	100	432	363	300	98	12.2	2					

Offset Drilling
 Offset for DRW should be 0 ~ +0.15 mm in radius (0 ~ +0.3 mm in diameter).
 Do not set it to a negative value to make the diameter smaller.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

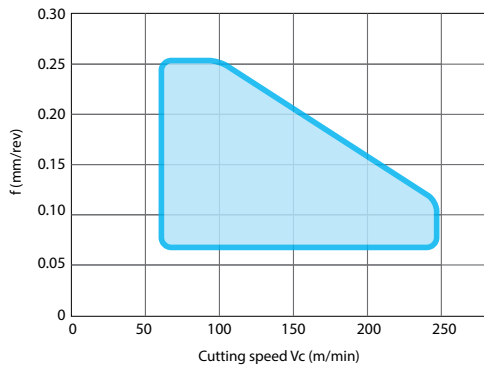


Recommended cutting conditions

Workpiece material	Vc (m/min)	f (mm/rev)
Carbon steel	80~200	0.07~0.25
Alloy steel	80~160	0.07~0.25
Mold steel	70~150	0.06~0.20
Gray cast iron	100~240	0.07~0.30
Nodular cast iron	80~150	0.07~0.25


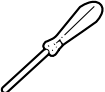
- Apply enough amount of coolant (Internal supply).
- Feed rate should be calculated as single insert.

Application map (Carbon steel / Alloy steel)



Drilling

Spare parts

Description	Clamp screw	Wrench
		
S50-DRW...-06	SB-3592TR	DT-10

Hole dia. tolerance

DC	Hole diameter tolerance (mm)
ø60~ø100	0~+0.4

* Above is numeric guideline.
It may vary depending on machines / workpieces / clamping status / cutting conditions.

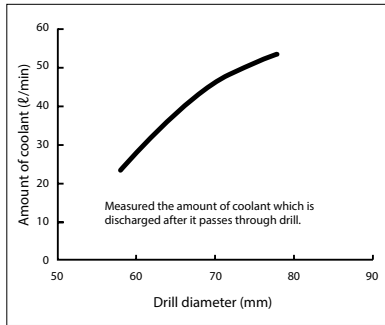
Offset drilling

Offset for DRW should be 0~+0.15 mm in radius
(0~+0.3mm in diameter).
Do not set it to a negative value to make the diameter smaller.

External coolant is not recommended because the amount of chips will be enormous.
Use internal coolant.
See the graph of "Drill diameter and coolant amount".

Higher output is preferable.
What is important is enough torque rather than high spindle rate.
See the examples of required power as below.

Drill diameter and coolant amount



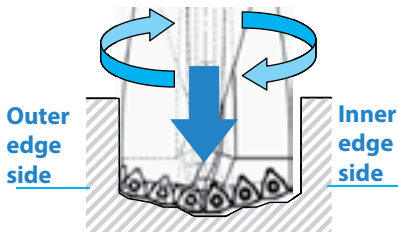
Drill dia.	Workpiece material	Machine	Cutting conditions	Spindle power	*Required power
ø75 (2D)	15CrMo4	M/C	Vc=130m/min (n=550min ⁻¹) f=0.12mm/rev (Vf=66mm/min)	22kW	60%
ø85 (2D)	Alloy steel	M/C	Vc=150m/min (n=560min ⁻¹) f=0.1mm/rev (Vf=56mm/min)	30kW	85%
ø94 (2D)	C45	NC lathe	Vc=120m/min (n=410min ⁻¹) f=0.1mm/rev (Vf=41mm/min)	20kW	100%
ø94 (2D)	X5CrNi18 10	NC lathe	Vc=80m/min (n=270min ⁻¹) f=0.2mm/rev (Vf=54mm/min)	20kW	40%

* The required power was read on the load meter.

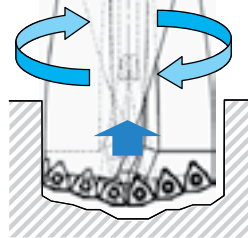
During processing, force of deflection is applied to the center of the drill.
If the drill is just pulled out from the position where processing is finished, tool markings will be made.
To prevent tool markings, perform offset before pulling out the drill.

How to prevent tool markings

1. Drilling the hole (The spindle revolves)



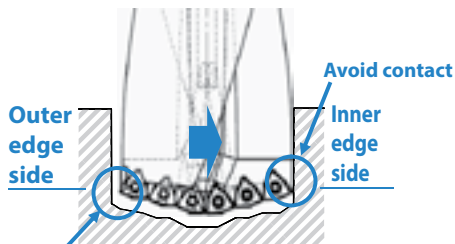
2. Turn back approximately 0.5 mm (The spindle revolves)



Chips are adhering to the bottom when drilling stops.

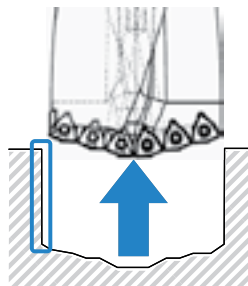
- Without turning back, chips remains adhering to the bottom.
- If offset (3) is performed without turning back, the bottom of drill contacts with the inner surface of hole.
- Turning back is necessary for blind holes but not for through holes.

3. Stop revolution and perform offset (The spindle stops)



Make a clearance to prevent the tool from contacting when pulling out. (Approximately 0.1~0.2 mm)

4. Pull out the drill



Tool markings are not made (or are only slight even if made).

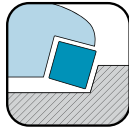
Example of drilling program

```
G90G54G0G43X0Y0Z100.0H10
S477M03
Z2.5M8
G01Z -80.0F48
Z -79.5M19 ← The spindle stops at the specified position
X0.2Y0.2
Z100.0M9
```

* The M code and X and Y moving directions are unique to the equipment.

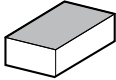
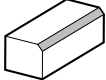
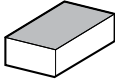
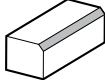











M



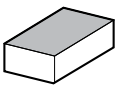

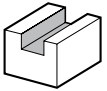
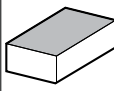

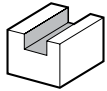







Introduction		M2
Cutting edge angle 45°/66°/70°		M12
MB45		M12
MFPN45		M22
MFPN66		M30
MFSE45		M36
MFLN	MFLN45 / MFLN70	M42
MFK	MFK / MFK-SF	M48
Cutting edge angle 75°		M58
MSRS15		M58
Cutting edge angle 88°/90°		M62
MA90		M62
MEW		M74
MEC	MEC / MECX	M86
MEV		M104
MEWH		M112
MECH		M116
MECHT		M126
MFWN		M130
MFWN-Mini		M138
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MFLN		M150
MSRS90		M156
MSR	MSR / MSR-BT50	M163
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MFAH		M174
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	MFH Boost	M208
	MFH Mini	M217
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MEY		M230
Slott mill		M236
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	MSTB	M242
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MRF	MRF / MRFW	M258
MRW		M262
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MCSE	Chamfering end mill	M280
MEF	Bolt countersink end mill	M283
METS	T-Slot mill	M287
MGI	Grooving end mill for M/C	M290
MVG	Ring grooving end mill for M/C	M292
Other inserts		M294

Cutting edge angle 45°/66°/70°/75°













Cutting edge angle	Applications	Facing	Chamfering	Cutting edge angle	Applications	Facing	Chamfering
							
Shape				Shape			
45°	 MB45 M16~M18	<ul style="list-style-type: none"> Economical double-sided 8-edge insert Delivers the "low cutting force" benefits of positive inserts and the "fracture resistance" benefits of negative inserts End mills have ø32 cylindrical shank 		45°	 MFLN45 M44	<ul style="list-style-type: none"> For heavy milling Tough 4-edge vertical inserts For large depths of cut and high feed rates Max. ap 12 mm 	
	 MFPN45 M12~M25	<ul style="list-style-type: none"> 10-edge pentagonal inserts (double-sided) Low cutting force with helical cutting-edge design Dual cutting edge design (High toughness) End mills have ø32 cylindrical shank 					
	 MFSE45 With Wiper Insert M38	<ul style="list-style-type: none"> Roughing condition (fz = 0.25 mm/t) Provides Excellent surface finish (0.8 µmRa or less) * (*Based on internal evaluation with wiper insert installed.) Maintains long tool life with high-precision inserts Newly developed chipbreakers for steel, stainless steel, and aluminum Improved productivity with excellent chip control 					
66°	 MFPN66 M31~M33	<ul style="list-style-type: none"> Double-sided 10-edge insert Cutting edge angle 66° Reduces chattering with low cutting force design End mills have ø32 cylindrical shank 		70°	 MFLN70 M45	<ul style="list-style-type: none"> For heavy milling Tough 4-edge vertical inserts For large depths of cut and high feed rates Max. ap 17 mm 	
	 MSRS15 M59	<ul style="list-style-type: none"> For heavy milling Max. ap 12 mm High chip evacuation rate per unit 					
					 MFK M50	<ul style="list-style-type: none"> High efficiency multi-edge cutter for cast iron 10-edge pentagonal inserts (double-sided) Low cutting force with helical cutting-edge design Improved surface finish, minimizing chattering and prevented burr formation Dual cutting edge design (High toughness) 	
75°				 MFK-SF M52	<ul style="list-style-type: none"> For cast iron Adjustable cutting edge height High speed and high precision machining of cast iron by combining ceramic insert and CBN wiper insert 		

M
Milling

Cutting edge angle 88°/90° (Double-sided insert)

Cutting edge angle	Applications	Facing	Shouldering	Slotting	Cutting edge angle	Applications	Facing	Shouldering	Slotting
									
Shape					Shape				
90°	<p>MA90</p>  <p>➔ M66~M68</p> <ul style="list-style-type: none"> Economical double-sided 4-edge insert Original tangential 90° end mill Newly designed inserts high quality surface finish and excellent wall accuracy Supports multi-functional machining such as 3D milling 				90°	<p>MFWN</p>  <p>➔ M131, M132, M134</p> <ul style="list-style-type: none"> Economical double-sided 6-edge insert Superior fracture resistance with thick edge design "Large slant edge" design reduces shock when cutting edge enters the workpiece Low cutting force and reduce chattering End mills have ø32 cylindrical shank 			
	<p>MA90 head (Modular type)</p>  <p>➔ M69</p>					<p>MFWN Mini</p>  <p>➔ M139, M140</p> <ul style="list-style-type: none"> Can be used up to 5 mm D.O.C. Good cost performance Economical double-sided 6-edge insert Superior fracture resistance with thick edge design "Large slant edge" design reduces shock when cutting edge enters the workpiece Low cutting force and reduce chattering End mills have ø25, ø32 cylindrical shank 			
	<p>MEW</p>  <p>➔ M76~M78</p> <ul style="list-style-type: none"> Economical double-sided 4-edge insert Obtuse edge increases cutting edge toughness Smooth surface wall with low cutting force and reduced chattering 				88°	<p>MFSN88</p>  <p>➔ M145, M147</p> <ul style="list-style-type: none"> Economical double-sided 8-edge insert Reduces chattering with low cutting force design Contribute to cost-cutting for Shoulder Roughing End mills have ø32, ø40 cylindrical shank 			
	<p>MEW head (Modular type)</p>  <p>➔ M79</p>								

Cutting edge angle 90°

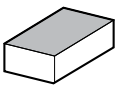
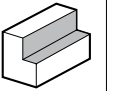
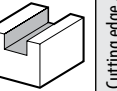
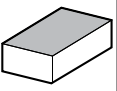
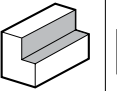
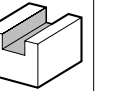










Cutting edge angle	Shape	Applications			Cutting edge angle	Shape	Applications			
		Facing	Shouldering	Slotting			Facing	Shouldering	Slotting	
90°	MEC	  	<ul style="list-style-type: none"> • Good squareness • Low cutting force • The silver coating prevents chip wear on the tool body • With coolant hole (Over shank size $\varnothing 16$) • The twisted cutting edge improves cutting performance • Smooth surface of shoulder wall 	  M86~M89	  M106, M107	<ul style="list-style-type: none"> • Newly developed vertical triangle inserts • Economical 3-edge insert • The MEV can perform a wide variety of machining processes 				
							MEC head (Modular type)	 M90	MEV head (Modular)	 M108
							MECX	<ul style="list-style-type: none"> • Good squareness • Small size insert with multi-edge specification • Recommended for small machines: low cutting force and high strength design • The silver coating prevents chip wear on the tool body • With coolant hole 	  M98, M99	DMC-H	M171	• High Rake • For small milling machine and M/C
					DMC-SX	 M170	<ul style="list-style-type: none"> • For small milling machine and M/C 			

M





Milling


Cutting edge angle 90° (Heavy milling)

Cutting edge angle	Applications	Facing	Shouldering	Slotting	Cutting edge angle	Applications	Facing	Shouldering	Slotting	
										
Shape					Shape					
90° (Long cutting edge)	 <p>MEWH</p> <p>➔ M112</p> <ul style="list-style-type: none"> • Low cutting force and sharp cutting performance • Excellent surface finish quality • Economical double-sided 4-edge insert • High quality and stable machining with heavy milling 				90° (Long cutting edge)	 <p>MECH</p> <p>➔ M116</p> <ul style="list-style-type: none"> • Notched insert improves higher productivity 				
	 <p>MEWH shell mill</p> <p>➔ M113</p> <ul style="list-style-type: none"> • MEWH shell mill 					 <p>MECH shell mill</p> <p>➔ M117</p> <ul style="list-style-type: none"> • MECH shell mill 				
	 <p>MSRS90</p> <p>➔ M159</p> <ul style="list-style-type: none"> • High efficiency, low cutting force and stable machining without chatter • Various expansive possibilities with combining neutral insert and custom-ordered cutter 					 <p>MECH-BT50 MECH-BT50SA</p> <p>➔ M118, M119</p> <ul style="list-style-type: none"> • Highly rigid BT50 Arbor integrated for MECH • Head exchangeable type is available (MECH-BT50SA) 				
	 <p>MSR</p> <p>➔ M165</p> <ul style="list-style-type: none"> • Low cutting force and restrain chattering with notched insert • Chipbreaker design with specialized notches improves chip evacuation • Chipbreaker achieves stabilized machining for heavy milling 					 <p>MECHT</p> <p>➔ M127</p> <ul style="list-style-type: none"> • Excellent chattering resistance and good chip control with special design for titanium alloys • End mills have ø32, cylindrical shank 				
	 <p>MSR-BT50</p> <p>➔ M166</p> <ul style="list-style-type: none"> • Highly rigid BT50 Arbor integrated for MSR 									
	 <p>MFLN90</p> <p>➔ M152</p> <ul style="list-style-type: none"> • For heavy milling • Tough 4-edge vertical inserts • For large depths of cut and high feed rates • Max. ap 20 mm • Chamfered corner type available • Prevents chattering and insert fracturing 									

Cutting edge angle 90° (For aluminum alloys)

Cutting edge angle	Applications	Facing	Shouldering	Slotting
		Shape		
90°	MFAH 	<ul style="list-style-type: none"> High efficiency milling cutter for finishing aluminum alloys Light-weight hybrid body with internal coolant available/Steel body Adjustable cutting edge height 3 different cutting edge design 		
	MEAS 	<ul style="list-style-type: none"> High efficiency milling cutter for finishing aluminum alloys Excellent scatter prevention to ensure stable 		

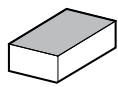

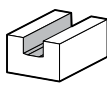
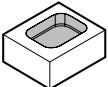


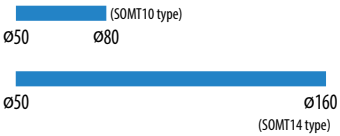





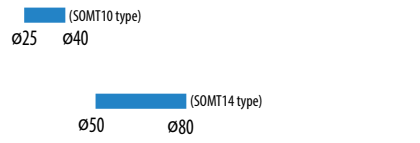

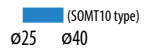




















For finishing operations

Applications	Facing
	Shape
MFF 	<ul style="list-style-type: none"> High-quality surface finish Molded wiper insert Cutter body design provides excellent reliability Easy-to-adjust cutting edge

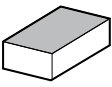



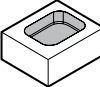
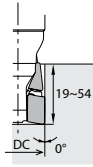


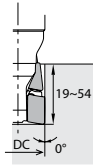



Milling

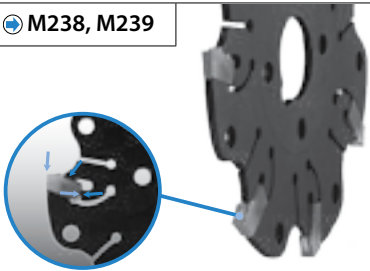
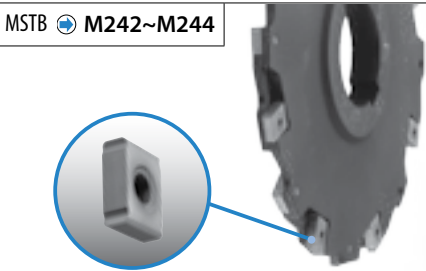
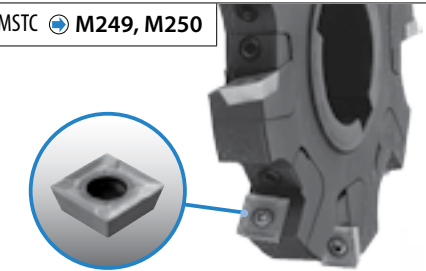
High feed cutter

Applications	Facing	Shouldering	Slotting	Pocketing	Cutting diameter DC
					
Shape					
MFH Harrier (Face mill)  M198, M199	<ul style="list-style-type: none"> Various applications with 4 types of inserts 				
MFH Harrier (End mill)  M200, M201	 GM type (General purpose)  GH type (Tough edge)  LD type (Large D.O.C.) MAX. ap = 5mm  FL type (With wiper edge) Roughing and finishing				
MFH Harrier (Modular type)  M202	<ul style="list-style-type: none"> 3D convex cutting edge reduces shock of biting workpiece Multi-functional cutter for ramping, helical milling vertical milling (plunging) etc. (GM/GH type) 				
MFH Boost (Face mill)  M212	<ul style="list-style-type: none"> Economical double-sided 4-edge insert High feed milling with large depth of cut capabilities 				
MFH Boost (End mill)  M211	 GM type (General purpose)				
MFH Boost (Modular type)  M213	<ul style="list-style-type: none"> Achieves high efficiency machining in various shouldering, slotting, helical milling, and ramping applications 				
MFH mini (Face mill)  M219	<ul style="list-style-type: none"> Economical double-sided 4-edge insert 				
MFH mini (End mill)  M218	 GM type (General purpose)  GH type (Tough edge)				
MFH mini (Modular type)  M220	<ul style="list-style-type: none"> High efficiency and high feed machining at small dia. machining and small machining center 				
MFH micro (end mill)  M226	<ul style="list-style-type: none"> Micro diameter cutter for high feed machining High efficiency machining with low cutting force and reduced chattering 				
MFH micro (modular type)  M227					

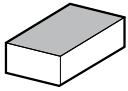
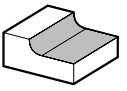
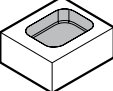

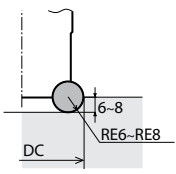


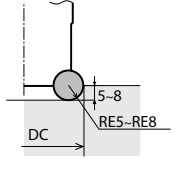


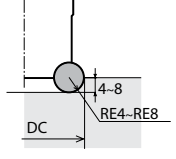


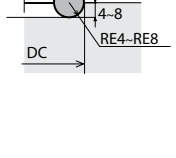

Multi-function machining end mill

Applications	Facing	Shouldering	Slotting	Deep slotting	Pocketing	Drilling	Lead angle and max. ap	Cutting dia. DC
	Shape							
MEY	<ul style="list-style-type: none"> Multi-function machining (Drilling/Ramping/Shouldering/Grooving) High efficiency mold machining Low cutting force, Good chip evacuation 		<ul style="list-style-type: none"> Full 2-insert structure and high stability Good chip control when Ramping 		<ul style="list-style-type: none"> Cutting diameters that are larger than the shank diameters enables wall shouldering The silver coating prevents chip wear on the tool body 			
	<ul style="list-style-type: none"> Multi-function machining (Drilling/Ramping/Shouldering/Grooving) High efficiency mold machining Low cutting force, Good chip evacuation 		<ul style="list-style-type: none"> Full 2-insert structure and high stability Good chip control when Ramping 		<ul style="list-style-type: none"> Cutting diameters that are larger than the shank diameters enables wall shouldering The silver coating prevents chip wear on the tool body 			


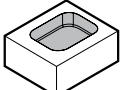
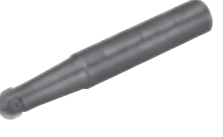
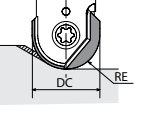


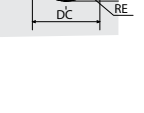

Slot mill MST

MSTA → M238, M239	MSTB → M242~M244	MSTC → M249, M250
		
<ul style="list-style-type: none"> Self-clamping type Remove insert with appropriate wrench 	<ul style="list-style-type: none"> Easy screw on tangential clamped insert 	<ul style="list-style-type: none"> Adjustable slotting width due to unique cam adjustment structure

Radius

Applications / Shape	Facing	Shouldering	Pocketing	Lead angle and max. ap	Cutting dia. DC								
					ø12 ø16 ø32 ø40 ø50 ø63 ø80 ø100 ø125								
MRW  M264 M266	<ul style="list-style-type: none"> High efficiency radius cutter with double-sided insert Combine sharpness and cutting edge strength (A.R. Max. +12°) Prevent insert rotation during machining with flat lock structure Wide application range from steel to heat-resistant alloys 												
MRX face mill  M271	<ul style="list-style-type: none"> Low cutting force and high performance radius cutter Low cutting force with helical cutting-edge design (A.R. Max. +10°) Prevent insert rotation during machining with flat lock structure Wide application from facing, grooving, pocketing to plunging 												
MRX end mill  M274	<ul style="list-style-type: none"> Wide application range from steel to heat-resistant alloys 												
MRX head (Modular type)  M275													

Ball-nose end mill

Applications / Shape	Contouring/Profiling	Pocketing	Lead angle and max. ap	Cutting dia. DC			
				ø8 ø25 ø50 ø80			
MRF  M258	<ul style="list-style-type: none"> For high quality mold finishing High R-accuracy (Insert's R-accuracy: ±0.01mm or under) The bushing ensures insert installation accuracy 						
MRFW  M259	<ul style="list-style-type: none"> Carbide shank For high quality mold finishing High R-accuracy (Insert's R-accuracy: ±0.01mm or under) The bushing ensures insert installation accuracy Superior to anti vibration, and stable machining is possible with long overhang length without chattering 						



Milling

Chamfering

Applications		Chamfering	Back chamfering	V shape slotting	Countersinking	Lead angle and max. ap
		Shape				
MCSE	 M280	<ul style="list-style-type: none"> For 30°, 45°, 60° chamfering Economical 4-edge insert Available back chamfering 				

Bolt countersinking

Applications		Bolt countersinking	Facing	Shouldering	Lead angle and max. ap
		Shape			
MEF	 M284	<ul style="list-style-type: none"> Countersink for hexagon socket bolt (M6 ~ M30) Economical 4-edge insert 			

T-Slotting

Applications		T-Slotting	Back side milling	Lead angle and max. ap
		Shape		
METS	 M287	<ul style="list-style-type: none"> T-Slotting Recommended for high feed machining with 2 flute design Economical 4-edge insert 		

Grooving

Applications		Internal grooving	Ring grooving	Lead angle and max. ap
		Shape		
MGI	 M290	<ul style="list-style-type: none"> Edge width 1.0 ~ 4.0mm Grooving for M/C 		
MVG	 M292	<ul style="list-style-type: none"> Cutting dia. $\phi 30 \sim \phi 75$ Edge width 4.0 ~ 4.9mm O-Ring grooving 		

M



Milling

Milling inserts identification system

Symbol	Shape
H	Hexagon
O	Octagon
P	Pentagon
S	Square
T	Triangle
C	80° Rhombic
D	55° Rhombic
E	75° Rhombic
F	50° Rhombic
M	86° Rhombic
V	35° Rhombic
W	Trigon
L	Rectangle
A	85° Parallelogram
B	82° Parallelogram
K	55° Parallelogram
R	Round

Shown angle stands for acute angle for rhombic and parallelogram inserts.

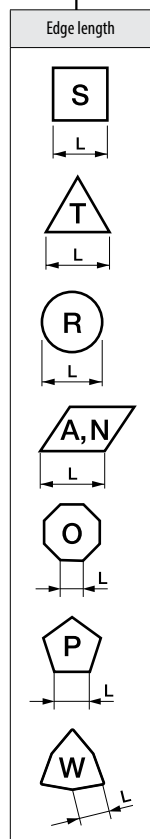
Symbol	Relief angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other angles

Symbol (Class)	Tolerance (mm)		
	Corner Height	Thickness	I.C. Size
A	±0.005	±0.025	±0.025
F	±0.013		±0.013
C			±0.025
H			±0.013
E	±0.025	±0.13	±0.025
G	±0.025	±0.13	±0.025
J				±0.005
K*	±0.013	±0.025	±0.05~±0.15
L*	±0.025		
M*	±0.08~±0.18	±0.13	±0.08~±0.25
N*	±0.13~±0.38	±0.025	
U*		±0.13	

Insert's periphery is as fired.
*Tolerance difference is depending on insert size.

Symbol	Shape
W	No chipbreaker, with hole
T	Single-sided chipbreaker, with hole
F	Double-sided chipbreakers, without hole
N	No chipbreaker, without hole
R	Single-sided chipbreaker, without hole
M	Single-sided chipbreaker, with hole
A	No chipbreaker, with hole

Symbol	Shape
F	Sharp edge
E	R-honed
T	Chamfered
S	Chamfered + R-honed



Thickness

Symbol	Thickness (mm)
02	2.38
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35

Cutting edge angle

Symbol	Cutting edge angle
A	45°
D	60°
E	75°
F	85°
H	87°
P	90°
X	65°

Relief angle

Symbol	Relief angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
R	10°
S	14°
T	22°
U	23°

Hand of tool

Symbol	Hand of tool
R	Right-hand
L	Left-hand
N	Neutral

Manufacturer's option
Chipbreaker, etc.

In case of indicating corner-R(RE)

Corner-R (RE) (mm)

04	0.4
08	0.8
12	1.2
16	1.6
20	2.0



New 45° General purpose milling series

MB45

Provides high quality and high performance machining solutions with long tool life
 Delivers the “low cutting force” benefits of positive inserts and the “fracture resistance” benefits of negative inserts, and provides excellent surface finish

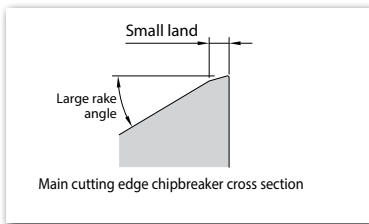
1 “Versatility” + “Quality” Large insert lineup
 Supports a wide variety of machining applications

Five types of inserts for various machining applications
 Economical inserts with 8 cutting edges
 General purpose GM insert with E-Class and M-Class options based on required machining accuracy

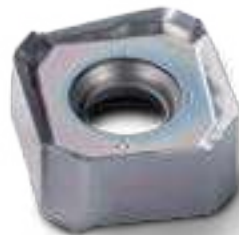
Low cutting force **SM** (E-Class)



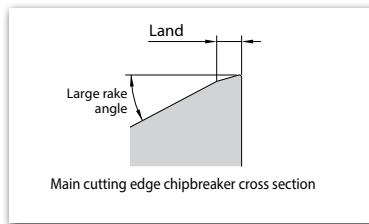
Sharpness oriented with a low cutting force design
 -10% cutting resistance compared to general purpose GM insert
 Recommended for small machines (BT30)



General **GM** (E-Class / M-Class)



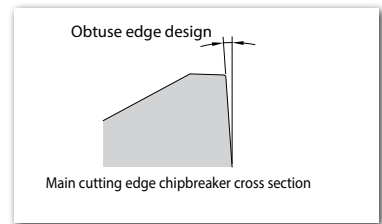
1st recommendation for steel machining
 Low cutting force and fracture resistance
 E-Class or M-Class selectable



Tough edge **GH** (M-Class)



Tough cutting edge and excellent fracture resistance
 Obtuse edge design is resistant to chipping
 Recommended for intermittent machining



Wiper insert **W** (E-Class)

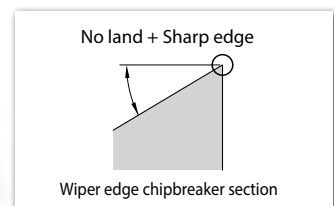
Ultra-long wiper edge (Wiper edge length approx. 8 mm)



* Double-sided 2-edge insert

for Aluminum Alloys **AM**

No land + Sharp edge specifications
 Excellent sharpness



M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

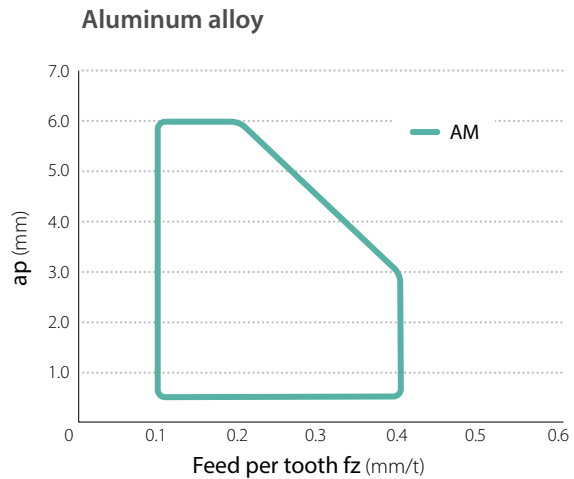
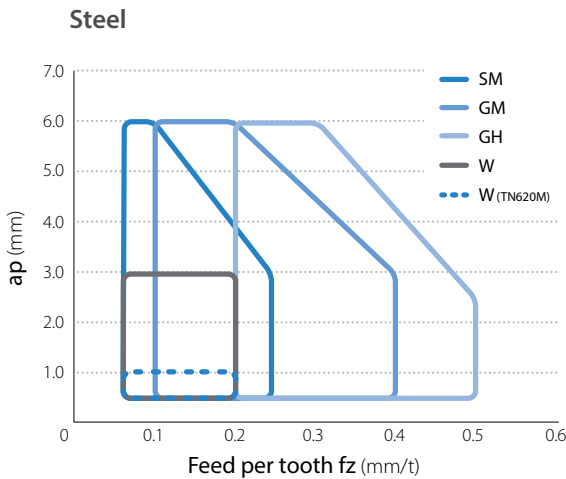
Multi-Function

Slot Mill

Ball-nose Radius

Others

Applicable insert range



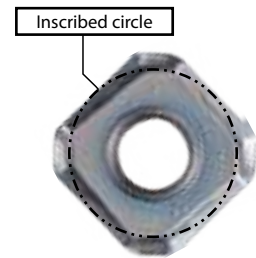
When to use GM (Class E/M)

Selection by machining application

- Surface finish oriented : GM (E-Class)
- Cost-effective and surface finish oriented : GM (M-Class)
- Efficiency and surface roughness oriented: W (E-Class)

Criteria	GM (E-Class)	GM (M-Class)	W (E-Class) * Wiper
Tolerance	Inscribed circle tolerance ±0.013mm	Inscribed circle tolerance ±0.005mm	Inscribed circle tolerance ±0.013mm
Surface finish	○ Approx. 1.6µmRa	△ Approx. 3.2µmRa	◎ Approx. 0.8µmRa or less
(Gloss)	(○)	(◎)	(◎)
Machining efficiency	○	○	◎
Economy	○	◎	△

*Surface finish is based on internal assessment and varies depending on the machining environment



M



Milling

Toolholder Lineup

Coarse pitch	Fine pitch	Extra fine pitch	Shank type
Recommended for workpieces or machines with low rigidity (such as sheet machining or BT30) Economical	1st recommendation Good balance of stability, machining accuracy and efficiency Supports a wide range of machining areas	Recommended for high rigid workpiece and machine	Compatible with milling chucks (face mill recommended basically) *Shank size: ø32
Cutting diameter ø80 to ø315 (inch spec) Cutting diameter ø40 to ø315 (metrics) *ø315: Made to order	Cutting diameter ø80 to ø315 (inch spec) Cutting diameter ø40 to ø315 (metrics) *ø315: Made to order	Cutting diameter ø80 to ø250 (inch spec) Cutting diameter ø40 to ø250 (metrics)	Cutting diameter ø40 to ø80

2 "Versatility" + "Long tool life" Large lineup of insert grades
 Steel, stainless steel, cast iron, heat-resistant alloys to aluminum alloy machining

For steel, stainless steel and cast iron ■ ■ ■

PR1825/PR1835/PR1810 New development MEGACOAT NANO EX

PR1825 P **PR1835** M **PR1810** K

For Steel (Wear resistance oriented) For Steel (Stability oriented)
 1st Recommendation for stainless steel For Cast iron

Workpiece	P Steel					M Stainless steel					K Cast iron				
	01	10	20	30	40	01	10	20	30	40	01	10	20	30	40
ISO															
Grade			Wear resistance oriented PR1825					1st Recommendation PR1835					1st Recommendation PR1810		
			Stability oriented PR1835												

For hardened material ■

For steel Surface finish oriented ■

PR015S MEGACOAT HARD PVD coating

TN620M Cermet

For stainless steel and heat-resistant alloys ■ ■ For aluminum machining ■

CA6535 CVD coating

PDL025 DLC coating

GW25 Non-coated carbide

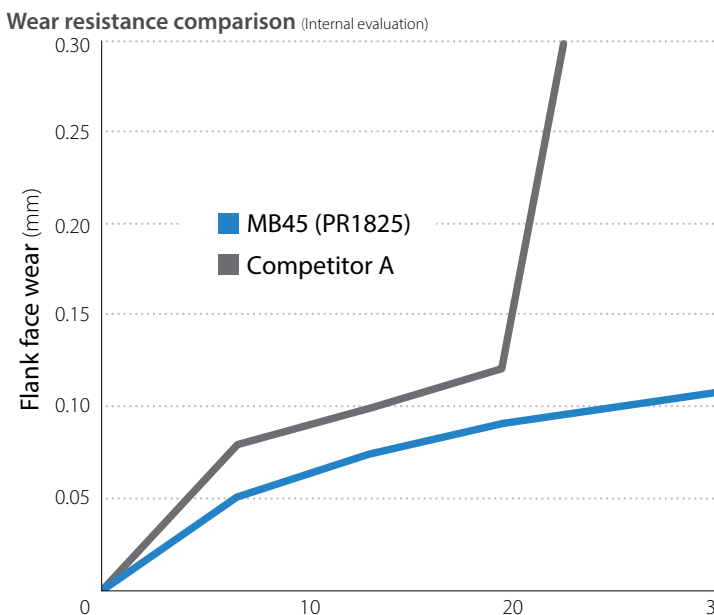
M



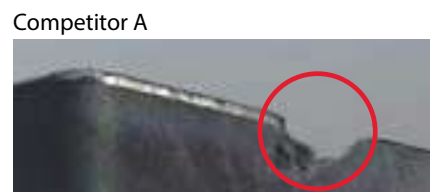
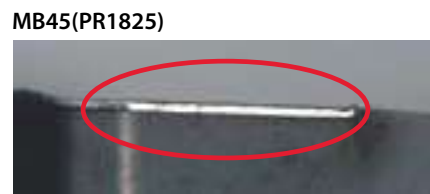
Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

PR1825 with PVD coating MEGACOAT NANO EX provides long tool life



Cutting edge condition (after 20 min machining)



Cutting conditions: Vc = 120 m/min, ap = 2.0 mm, ae/DC = 80 %, fz = 0.20 mm/t, Dry, Workpiece material: X153CrMoV12, ø125 BT50

3

“Versatility” + “High Performance” New design utilizes unique technology
Low cutting force and excellent fracture resistance with excellent surface finish

Low cutting force and excellent fracture resistance

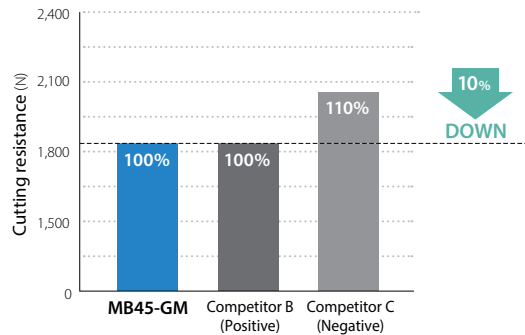
Unique helical cutting edge and double-edge structure

A unique helical cutting edge



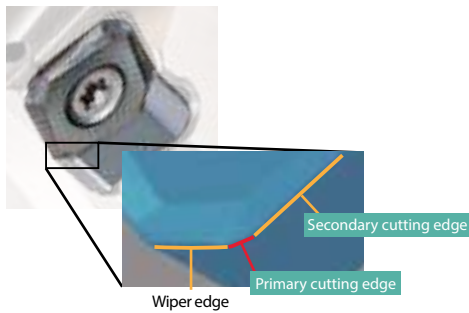
A.R. Ensures a maximum of 13° and suppresses chatter with low cutting force.

Cutting resistance comparison (Internal evaluation)



Cutting conditions: $V_c = 180$ m/min, $a_p = 3.0$ mm, $a_e/DC = 80\%$ Center cut, $f_z = 0.30$ mm/t, Workpiece material: C50

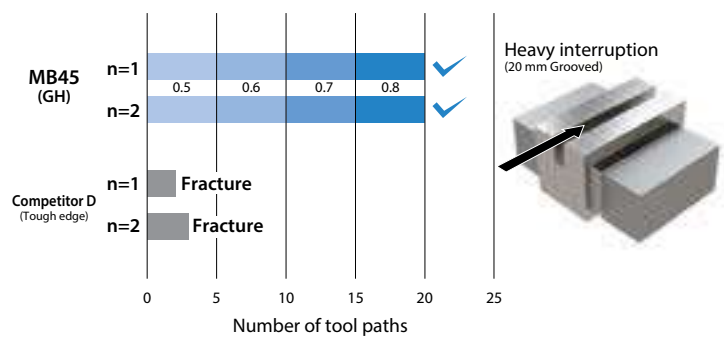
Double edge structure



Primary cutting edge generates thin chips
Reduces impact load and greatly reduces vibration when exiting the part

Fracture resistance comparison (Internal evaluation)

$f_z = 0.5 \sim 0.8$ mm/t



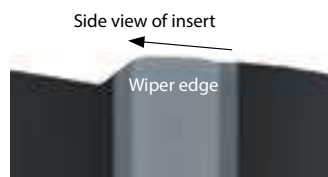
Cutting conditions: $V_c = 100$ m/min, $a_p \times a_e = 2 \times 100$ mm Center cut, BT50 Workpiece material: 42CrMo4 $\phi 125$ (10 inserts)

High quality

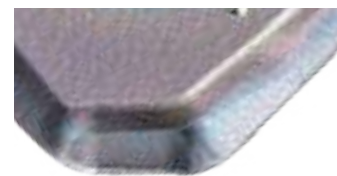
Long arc wiper edge utilizing unique technology

Unique long arc wiper edge

Reduces variation in mounting accuracy and provides superior finished surface quality

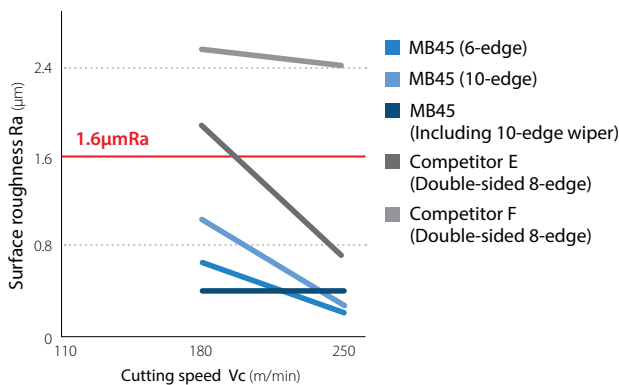


Convex curved shape with wiper edge protruding upward
*GM/SM/AM (E-Class)



Complex arc shape

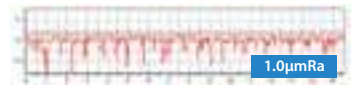
Surface roughness comparison (Internal evaluation)



Cutting conditions: $a_p \times a_e = 1 \times 100$ mm (Center cut), $f_z = 0.20$ mm/t, Dry Workpiece material: C50 $\phi 125$ (6 inserts/10 inserts) GM (PR1825) BT50

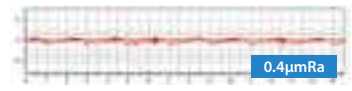
Finishing surface condition ($V_c = 180$ m/min)

MB45(10-edge)



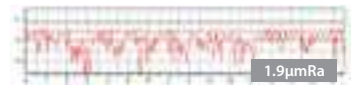
MB45

(Including 10-edge wiper)



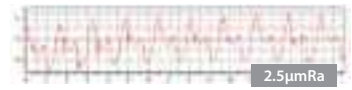
Competitor E

(Double-sided 8-edge)



Competitor F

(Double-sided 8-edge)



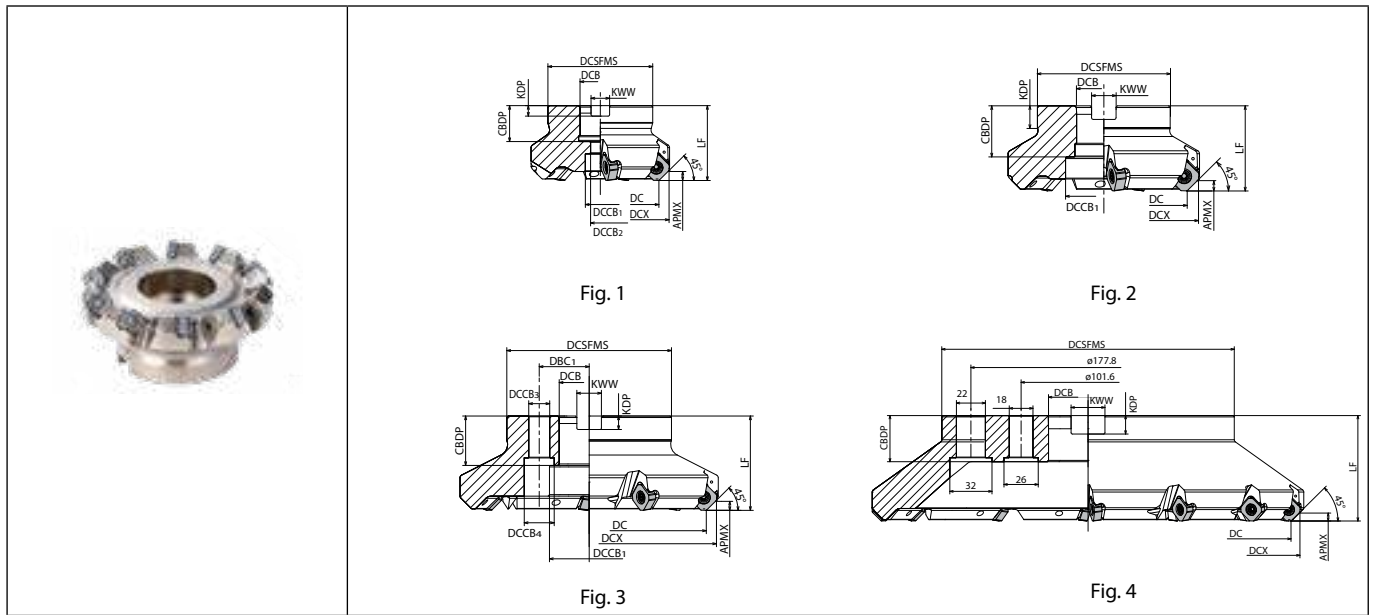
Proprietary long arc wiper edge provides excellent finishing surface quality

M



Milling

MB45 (Face mill)



Toolholder dimensions

Description	Availability	Dimension (mm)														A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M20	
		Inserts	DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DCCB3	DCCB4	DBC1	LF	CBDP	KDP	KWW								APMX
Coarse pitch	●	2	40	54	38	16	13.5	9				40	19	5.6	8.4	6	+13	-12	Yes	12700	0.4	1	SN=U1406...
		3	50	64	48	22	18	11				40	21	6.3	10.4					11400	0.5		
		4	63	77	50							40	24	7	12.4					10100	0.7		
		5	80	94	70	27	20	13				50	30	8	14.4					9000	1.4		
		6	125	139	89	40	55					63	33	9	16.4					8000	1.9		
		7	160	174	110				14	20	66.7									7200	3.2		
		8	200	214					18	26	101.6									6300	5.1		
		10	250	264	142	60	110					63	35	14	25.7					5700	7.3		
		10	250	264								80								5100	10.5		
		MTO	14	315	329	222						80								4500	19.4			4
Fine pitch	●	3	40	54	38	16	13.5	9				40	19	5.6	8.4	6	+13	-12	Yes	12700	0.3	1	SN=U1406...
		4	50	64	48	22	18	11				40	21	6.3	10.4					11400	0.4		
		5	63	77	50							40	24	7	12.4					10100	0.6		
		6	80	94	70	27	20	13				50	30	8	14.4					9000	1.4		
		8	100	114	78	32	45					63	33	9	16.4					8000	1.8		
		10	125	139	89	40	55					63								7200	3		
		12	160	174	110				14	20	66.7									6300	4.9		
		14	200	214					18	26	101.6									5700	7		
		16	250	264	142	60	110					63	35	14	25.7					5100	10.2		
		MTO	18	315	329	222						80								4500	19.2			4
Extra fine pitch	●	4	40	54	38	16	13.5	9				40	19	5.6	8.4	6	+13	-12	Yes	12700	0.3	1	SN=U1406...
		5	50	64	48	22	18	11				40	21	6.3	10.4					11400	0.4		
		6	63	77	50							40	24	7	12.4					10100	0.6		
		8	80	94	70	27	20	13				50	30	8	14.4					9000	1.3		
		10	100	114	78	32	45					63	33	9	16.4					8000	1.7		
		13	125	139	89	40	55					63								7200	2.9		
		16	160	174	110				14	20	66.7									6300	4.8		
		18	200	214					18	26	101.6									5700	6.9		
		20	250	264	142	60	110					63	35	14	25.7					5100	10.1		

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

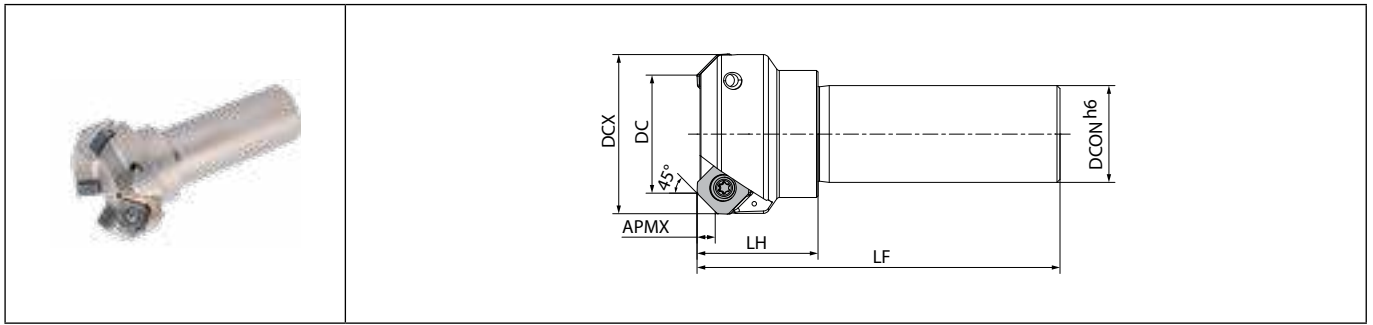
Multi-Function

Slot Mill

Ball-nose Radius

Others

MB45 (End mill)



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)							A.R. max.(°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts			Applicable inserts ➔ M20
			DC	DCX	DCON	LF	LH	APMX	Anti-seize compound						Screw	Wrench		
MB45- 40S32-14T2C	●	2	40	54	32	120	40	6	+13	-12	Yes	12700	0.9	P-37	SB-50110TRP	TTP-20	SN□U1406...	
50S32-14T3C	●	3	50	64								11400	1					
63S32-14T4C	●	4	63	77								10100	1.1					
80S32-14T5C	●	5	80	94								9000	1.5					

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.



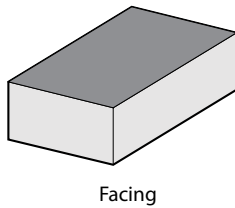
Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Precautions

Applications



Facing

How to mount inserts

1. Completely eliminate chips and dust from the insert mounting side.
2. Coat anti-seize compound thinly on portion of taper and thread of clamp screw prior to installation.
3. After mounting a clamp screw on the top edge of wrench, tighten the screw while keeping the insert pushed against the shim seat surface and holder surface (Fig.1).
4. Tighten the wrench in a direction parallel to the clamp screw.
Recommended tightening torque ··· 4.5 N·m
5. After tightening, check that there is no gap between the contact surface of the insert and the surface of the shim, or between the side surface of insert and the holder surface.

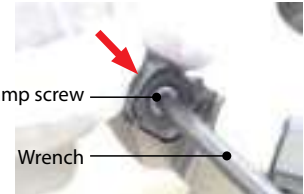


Fig.1

Defining the machining diameter (DC)

With respect to the machining diameter (DC) specified in ISO*, the numerical value of the machining diameter (Fig. 2) where the plane surface is finished depends on the insert. Please be careful.

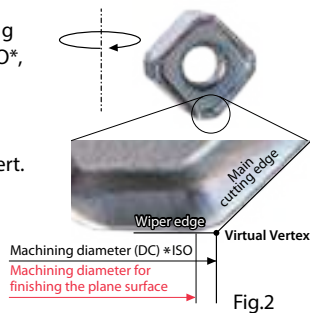


Fig.2

Machining diameter at which the plane surface is finished (for $\phi 125\text{mm}$)

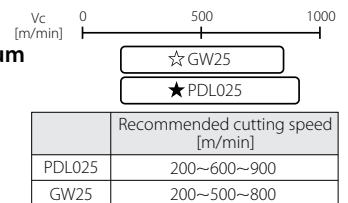
	GM	GH	SM	AM
Difference to machining diameter (DC)	-1.1	-2.0	-1.1	-1.1
Machining diameter (mm) at which the plane surface is finished *Dimensional tolerance $0_{-0.2}$	123.9	123.0	123.9	123.9

* GH has a larger double-edge size, so the machining diameter at which the plane surface is finished is smaller than other inserts.

Precautions when machining

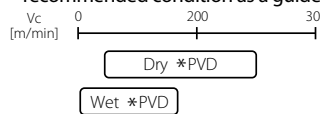
Precautions when machining aluminum

- Be sure to use within recommended conditions.
- Do not rotate more than the maximum speed listed on the main unit.
- * The number of revolutions listed on the holder is the maximum number of revolutions without load.



Precautions for wet machining of steel

For wet machining, select PR1835 and use a cutting speed of 70% or less of the recommended condition as a guide.



MB45-125R-14T10C

SCREW:SB-50110TRP WRENCH:

MAX 7,200 RPM

Rotating at maximum speed is prohibited.



How to use a wiper insert

1. Use when the feed amount per revolution [mm/rev] becomes large. The table below shows the standard feed amount per revolution and the number of wipers installed.

Feed per rotation	Number of wiper inserts	Pocket for wiper insert
$2.0 < f [mm/rev] \leq 4.0$	1 pc	Pocket with "Single dot" (Fig. 3)
$4.0 < f [mm/rev]$	2 pcs	"Single dot" and "Double dots" pockets (Figs. 3, 4) * Only holders with 12 or more inserts have "Double dots"

Fig.3



Fig.4



"Double dots" are placed in the diagonal pocket of "Single dot"
* For only holders with 12 or more inserts

2. Chipbreaker recommended for use with wiper insert

	GM chipbreaker	GH chipbreaker	SM chipbreaker	AM chipbreaker
Wiper insert	✓	Not recommended	✓	Not recommended

3. Install the wiper insert correctly as shown in Fig. 5.

* Fig. 6 shows the insert incorrectly attached to the holder.

Fig.5



Fig.6



M



Milling

SNMU/SNEU

Insert		Description	No. of edges	Dimension (mm)					Carbide						Applicable toolholder M16 M17 M18	
				IC	S	D1	BCH	BS	CVD		DLC		PVD			Cermet
									CA6535	PDL025	PR0155	PR1810	PR1825	PR1835			GW25	TN620M
<p>Classification of usage</p> <p>★: Roughing / 1st Choice ☆: Roughing / 2nd Choice ■: Finishing / 1st Choice □: Finishing / 2nd Choice (In case hardness is 45HRC or under)</p>		Carbon steel / Alloy steel								★	☆	■			P	
		Mold and die steel								★	☆	■			P	
		Austenitic stainless steel										☆	★			M
		Martensitic stainless steel							★				☆			
		Precipitation hardening stainless steel											★			
		Gray cast iron											★			K
		Nodular cast iron											★			
		Non-ferrous metals							★					☆		N
		Heat-resistant alloy							★					☆		S
		Titanium alloy												★		
		Hard materials									★					H
		SNMU 1406ANER-GM	8	14.7	6.07	5.8	0.8	2.3	●			●	●	●	●	MB45-...
		SNMU 1406ANER-GH	8	14.7	5.89	5.8	1.4	1.7	●			●	●	●	●	MB45-...
		SNEU 1406ANER-GM	8	14.7	6.07	5.8	0.8	2.3	●			●	●	●	●	MB45-...
		SNEU 1406ANER-SM	8	14.7	6.07	5.8	0.8	2.3	●			●	●			MB45-...
		SNEU 1406ANFR-AM	8	14.7	6.07	5.8	0.8	2.3	●					●		MB45-...
		SNEU 1406ANEN-W	2	14.7	6.15	5.8	1.1	8.8	●			●	●	●	●	MB45-...

Recommended cutting conditions **M21**

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

SNEU1406ANEN-W inserts are sold in 5 piece boxes

M20

Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t) () : TN620M	Recommended insert grades (Vc: m/min)							
			MEGACOAT(PVD coated carbide)				PVD coated carbide	Cermet	DLC coated carbide	Carbide
			PR1835	PR1825	PR1810	PR015S	CA6535	TN620M	PDL025	GW15
GM	Carbon steel	0.1~ 0.2 ~0.4 (0.06~ 0.12 ~0.20)	☆ 120~ 180 ~250	★ 120~ 180 ~250	-	-	-	★ 200~ 250 ~300	-	-
	Alloy steel	0.1~ 0.2 ~0.4 (0.06~ 0.12 ~0.20)	☆ 100~ 160 ~220	★ 100~ 160 ~220	-	-	-	★ 180~ 220 ~250	-	-
	Mold steel	0.1~ 0.2 ~0.35 (0.06~ 0.08 ~0.15)	☆ 80~ 140 ~180	★ 80~ 140 ~180	-	-	-	★ 150~ 180 ~220	-	-
	Stainless steel (Austenitic related)	0.1~ 0.2 ~0.4	☆ 100~ 160 ~200	☆ 100~ 160 ~200	-	-	-	-	-	-
	Stainless steel (Martensitic related)	0.1~ 0.2 ~0.4	☆ 150~ 200 ~250	-	-	-	☆ 180~ 240 ~300	-	-	-
	Stainless steel (Precipitation hardening)	0.1~ 0.2 ~0.3	★ 90~ 120 ~150	-	-	-	-	-	-	-
	Gray cast iron	0.1~ 0.2 ~0.4	-	-	★ 120~ 180 ~250	-	-	-	-	-
	Nodular cast iron	0.1~ 0.2 ~0.35	-	-	★ 100~ 150 ~200	-	-	-	-	-
	Ni-base heat-resistant alloys	0.1~ 0.12 ~0.2	☆ 20~ 30 ~50	-	-	-	★ 20~ 30 ~50	-	-	-
SM	Carbon steel	0.06~ 0.12 ~0.25	☆ 120~ 180 ~250	☆ 120~ 180 ~250	-	-	-	-	-	-
	Alloy steel	0.06~ 0.12 ~0.25	☆ 100~ 160 ~220	☆ 100~ 160 ~220	-	-	-	-	-	-
	Mold steel	0.06~ 0.1 ~0.2	☆ 80~ 140 ~180	☆ 80~ 140 ~180	-	-	-	-	-	-
	Stainless steel (Austenitic related)	0.06~ 0.12 ~0.25	★ 100~ 160 ~200	☆ 100~ 160 ~200	-	-	-	-	-	-
	Stainless steel (Martensitic related)	0.06~ 0.12 ~0.25	☆ 150~ 200 ~250	-	-	-	★ 180~ 240 ~300	-	-	-
	Stainless steel (Precipitation hardening)	0.06~ 0.12 ~0.25	☆ 90~ 120 ~150	-	-	-	-	-	-	-
	Gray cast iron	0.06~ 0.12 ~0.25	-	-	☆ 120~ 180 ~250	-	-	-	-	-
	Nodular cast iron	0.06~ 0.1 ~0.2	-	-	☆ 100~ 150 ~200	-	-	-	-	-
	Ni-base heat-resistant alloys	0.06~ 0.1 ~0.15	☆ 20~ 30 ~50	-	-	-	☆ 20~ 30 ~50	-	-	-
	Titanium alloys	0.06~ 0.08 ~0.15	★ 40~ 60 ~80	-	-	-	-	-	-	-
GH	Carbon steel	0.2~ 0.3 ~0.5	☆ 120~ 180 ~250	☆ 120~ 180 ~250	-	-	-	-	-	-
	Alloy steel	0.2~ 0.3 ~0.5	☆ 100~ 160 ~220	☆ 100~ 160 ~220	-	-	-	-	-	-
	Mold steel	0.2~ 0.3 ~0.45	☆ 80~ 140 ~180	☆ 80~ 140 ~180	-	-	-	-	-	-
	Stainless steel (Austenitic related)	0.2~ 0.3 ~0.4	☆ 100~ 160 ~200	☆ 100~ 160 ~200	-	-	-	-	-	-
	Stainless steel (Martensitic related)	0.2~ 0.3 ~0.4	☆ 150~ 200 ~250	-	-	-	☆ 180~ 240 ~300	-	-	-
	Stainless steel (Precipitation hardening)	0.2~ 0.3 ~0.4	☆ 90~ 120 ~150	-	-	-	-	-	-	-
	Gray cast iron	0.2~ 0.3 ~0.5	-	-	☆ 120~ 180 ~250	-	-	-	-	-
	Nodular cast iron	0.2~ 0.3 ~0.45	-	-	☆ 100~ 150 ~200	-	-	-	-	-
	Ni-base heat-resistant alloys	0.1~ 0.2 ~0.3	☆ 20~ 30 ~50	-	-	-	☆ 20~ 30 ~50	-	-	-
	Hard materials (40HRC or less)	0.05~ 0.1 ~0.2	-	-	-	★ 50~ 80 ~100	-	-	-	-
AM	Aluminum alloys	0.1~ 0.2 ~0.4	-	-	-	-	-	★ 200~ 600 ~900	☆ 200~ 500 ~800	-

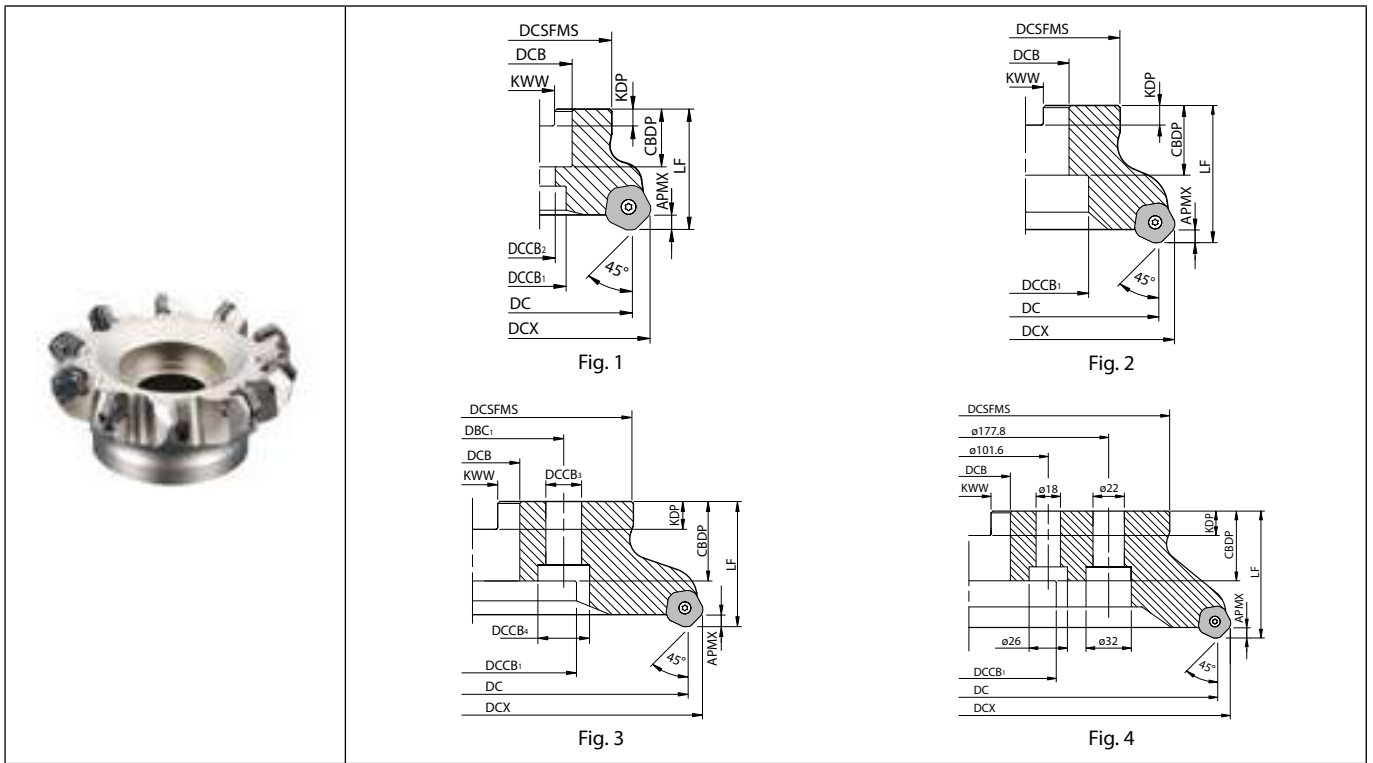
★: 1st Recommendation ☆: 2nd Recommendation

The **bold-faced** number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation. Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys. When choosing wet machining for other workpieces, reduce the cutting speed to 70% or less. When machining aluminum, be sure to use within recommended conditions. Do not rotate more than the maximum speed listed on the main unit. Dry machining is recommended for cermet.



Milling

MFPN45 (Face mill)



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)															A.R. max. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts M26						
			R	L	DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DCCB3	DCCB4	DBC1	LF	CBDP	KDP	KWW							APMX					
Metric Coarse pitch	MFPN	45063R-4T-M	●	4	63	76	47	22	19	11							40	21	6.3	10.4	6	+10	-10	No	0.5	1	PN□U1205ANER..		
		45080R-5T-M	●	5	80	93	60	27	22	13							50	24	7	12.4			-8		1.1	1			
		45100R-6T-M	●	6	100	113	70	32	48								30	8	8	14.4					1.4	2			
		45125R-7T-M	●	7	125	138	87	40	58								32	9	16.4						2.6	2			
		45160R-8T-M	●	8	160	173	102	60	68			14	20	66.7			63									3.8		3	
		45200R-10T-M	●	10	200	213	142																					6.4	3
		45250R-12T-M	●	12	250	263						18	26	101.6			40	14	25.7									9.1	3
		45315R-14T-M	MTO	14	315	328	220									80												21.3	4
		Metric Fine pitch	MFPN	45063R-5T-M	●	5	63	76	47	22	19	11						40	21	6.3	10.4	6	+10	-10	No	0.5		1	PN□U1205ANER..
				45080R-6T-M	●	6	80	93	60	27	22	13						50	24	7	12.4							1	
45100R-8T-M	●			8	100	113	70	32	48							30	8	14.4							1.4	2			
45125R-10T-M	●			10	125	138	87	40	58							32	9	16.4								2.5	2		
45160R-12T-M	●			12	160	173	102	60	68			14	20	66.7			63										3.8	3	
45200R-14T-M	●			14	200	213	142																				6.5	3	
45250R-16T-M	●			16	250	263						18	26	101.6			40	14	25.7								9.1	3	
45315R-18T-M	MTO			18	315	328	220									80											21.7	4	
Metric Extra fine pitch	MFPN			45063R-6T-M	●	6	63	76	47	22	19	11						40	21	6.3	10.4	6	+10	-10	No	0.5	1	PN□U1205ANER..	
				45080R-8T-M	●	8	80	93	60	27	22	13						50	24	7	12.4						1.1		
		45100R-10T-M	●	10	100	113	70	32	48							30	8	14.4							1.3	2			
		45125R-13T-M	●	13	125	138	87	40	58							63	32	9	16.4						2.6	2			

APMX : 6 mm (GM, SM, GH chipbreakers), 5 mm (GL chipbreaker), 3 mm (Wiper insert)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function


Slot Mill

Ball-nose Radius

Others

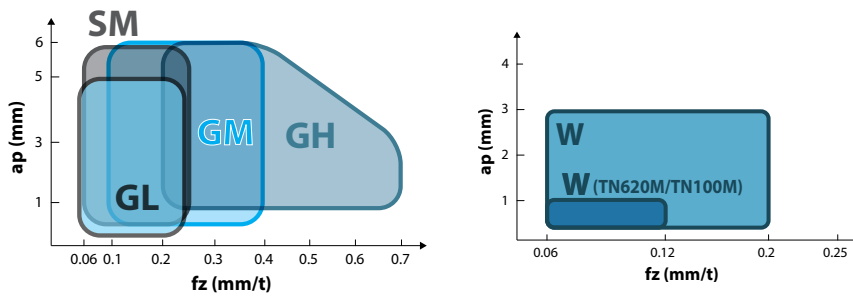
Spare parts (common to Metric / Inch spec)

Description		Spare parts							
		Clamp screw	Wrench		Shim	Shim screw	Wrench	Anti-seize compound	Mounting bolt
			TTW	DTM					
Coarse pitch	MFPN 45063R-4T-M	SB-50140TR	TTW-15	-	MFPN-45	SPW-7050	LW-5	P-37	HH10X30
	MFPN 45080 ⁹ /L-5T(-M)								HH12X35
	MFPN 45100 ⁹ /L-6T(-M)								-
	45315R-14T(-M)								-
Fine pitch	MFPN 45063R-5T-M	SB-50140TR	TTW-15	-	-	-	-	P-37	HH10X30
	MFPN 45080R-6T(-M)								HH12X35
	MFPN 45100R-8T(-M)								-
	45315R-18T(-M)								-
Extra fine pitch	MFPN 45063R-6T-M	SB-40140TRN	-	DTM-15	-	-	-	P-37	HH10X30
	MFPN 45080R-8T(-M)								HH12X35
	MFPN 45100R-10T(-M)								-
	45250R-20T								-

 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

M

Applicable chipbreaker range



Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

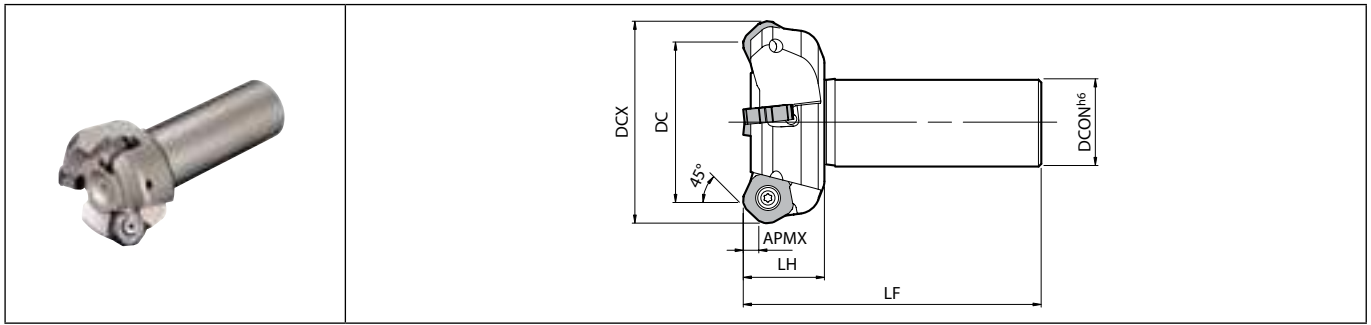
Multi-Function

Slot Mill

Ball-nose Radius

Others

MFPN45



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)						A.R. max.(°)	R.R. (°)	Coolant hole	Spare parts			Applicable inserts ➔ M26
			R	DC	DCX	DCON	LF	LH				Anti-seize compound	Screw	Wrench	
MFPN 45050R-S32-3T	●	3	50	63				-12	No	P-37	SB-50140TR	TTW-15	PN□U1205ANER-..		
45063R-S32-4T	●	4	63	76	32	110	30	+10						-10	
45080R-S32-5T	●	5	80	93										-8	

APMX : 6 mm (GM, SM, GH chipbreakers), 5 mm (GL chipbreaker), 3 mm (Wiper insert)
 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

PNMU/PNEU

Insert		Description	No. of edges	Dimension (mm)					Carbide						Cermet	Applicable toolholder M22 M23 M25
				S	D1	INSL	BCH	BS	CVD		PVD					
									CA6535	PR0155	PR1510	PR1525	PR1535	PR1810			PR1825	PR1835	TN100M	TN620M
<p>Classification of usage</p> <p>★: Roughing / 1st Choice ☆: Roughing / 2nd Choice ■: Finishing / 1st Choice □: Finishing / 2nd Choice (In case hardness is 45HRC or under)</p>		Carbon steel / Alloy steel				☆				★	☆	■		P		
		Mold and die steel				☆				★	☆	■		P		
		Austenitic stainless steel						☆		☆	★			M		
		Martensitic stainless steel	★								☆			M		
		Precipitation hardening stainless steel						☆			★			M		
		Gray cast iron						☆			★			K		
		Nodular cast iron						☆			★			K		
		Non-ferrous metals												N		
		Heat-resistant alloy	★									☆		S		
		Titanium alloy							☆			★		S		
		Hard materials						★						H		
	 General purpose	PNMU 1205ANER-GM	10	5.56	6.2	17.88	2	2	●	●	●	●	●	●	●	MFPN45...R..
	 General purpose	PNMU 1205ANEL-GM	10	5.56	6.2	17.88	2	2	●	●	●	●	●	●	●	MFPN45...L..
	 Low cutting force	PNMU 1205ANER-SM	10	5.56	6.2	17.88	2	2	●	●	●	●	●	●	●	MFPN45...R..
	 Tough edge	PNMU 1205ANER-GH	10	6.17	6.2	17.98	2	2	●	●	●	●	●	●	●	MFPN45...R..
	 Surface finish oriented	PNEU 1205ANER-GL	10	5.56	6.2	17.51	2.7	2.7	●	●	●	●	●	●	●	MFPN45...R..
	 Surface finish oriented	PNEU 1205ANEL-GL	10	5.56	6.2	17.51	2.7	2.7	●	●	●	●	●	●	●	MFPN45...L..
	 2-edge / With wiper edge	PNEU 1205ANER-W	2	5.56	6.2	17.85	2.3	8.1	●	●	●	●	●	●	●	MFPN45...R..

Recommended cutting conditions M27

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

PNEU1205ANER-W inserts are sold in 5 piece boxes

Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t) (): TN620M	Recommended insert grades (Vc: m/min)					
			Cermet	MEGACOAT(PVD coated carbide)			CVD coated carbide	
			TN620M	PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1810)	PR0155	CA6535
GM	Carbon steel	0.1~ 0.2 ~0.4 (0.06~ 0.12 ~0.20)	★ 200~ 250 ~300	☆ 120~ 180 ~250	★ 120~ 180 ~250	-	-	-
	Alloy steel	0.1~ 0.2 ~0.4 (0.06~ 0.12 ~0.20)	★ 180~ 220 ~250	☆ 100~ 160 ~220	★ 100~ 160 ~220	-	-	-
	Mold steel	0.1~ 0.2 ~0.35 (0.06~ 0.08 ~0.15)	★ 150~ 180 ~220	☆ 80~ 140 ~180	★ 80~ 140 ~180	-	-	-
	Stainless steel (Austenitic related)	0.1~ 0.2 ~0.4	-	☆ 100~ 160 ~200	☆ 100~ 160 ~200	-	-	-
	Stainless steel (Martensitic related)	0.1~ 0.2 ~0.4	-	☆ 150~ 200 ~250	-	-	-	☆ 180~ 240 ~300
	Stainless steel (Precipitation hardening)	0.1~ 0.2 ~0.3	-	★ 90~ 120 ~150	-	-	-	-
	Gray cast iron	0.1~ 0.2 ~0.4	-	-	-	★ 120~ 180 ~250	-	-
	Nodular cast iron	0.1~ 0.2 ~0.35	-	-	-	★ 100~ 150 ~200	-	-
	Ni-base heat-resistant alloys	0.1~ 0.12 ~0.2	-	☆ 20~ 30 ~50	-	-	-	★ 20~ 30 ~50
SM *1GL	Carbon steel	0.06~ 0.12 ~0.25 (0.06~ 0.10 ~0.15)	★ 200~ 250 ~300	☆ 120~ 180 ~250	☆ 120~ 180 ~250	-	-	-
	Alloy steel	0.06~ 0.12 ~0.25 (0.06~ 0.10 ~0.15)	★ 180~ 220 ~250	☆ 100~ 160 ~220	☆ 100~ 160 ~220	-	-	-
	Mold steel	0.06~ 0.1 ~0.2 (0.06~ 0.08 ~0.12)	★ 150~ 180 ~220	☆ 80~ 140 ~180	☆ 80~ 140 ~180	-	-	-
	Stainless steel (Austenitic related)	0.06~ 0.12 ~0.25	-	★ 100~ 160 ~200	☆ 100~ 160 ~200	-	-	-
	Stainless steel (Martensitic related)	0.06~ 0.12 ~0.25	-	☆ 150~ 200 ~250	-	-	-	★ 180~ 240 ~300
	Stainless steel (Precipitation hardening)	0.06~ 0.12 ~0.25	-	☆ 90~ 120 ~150	-	-	-	-
	Gray cast iron	0.06~ 0.12 ~0.25	-	-	-	☆ 120~ 180 ~250	-	-
	Nodular cast iron	0.06~ 0.1 ~0.2	-	-	-	☆ 100~ 150 ~200	-	-
	Ni-base heat-resistant alloys	0.06~ 0.1 ~0.15	-	☆ 20~ 30 ~50	-	-	-	☆ 20~ 30 ~50
Titanium alloys	0.06~ 0.08 ~0.15	-	★ 40~ 60 ~80	-	-	-	-	
*2GH	Carbon steel	0.2~ 0.4 ~0.7	-	☆ 120~ 180 ~250	☆ 120~ 180 ~250	-	-	-
	Alloy steel	0.2~ 0.4 ~0.6	-	☆ 100~ 160 ~220	☆ 100~ 160 ~220	-	-	-
	Mold steel	0.2~ 0.35 ~0.5	-	☆ 80~ 140 ~180	☆ 80~ 140 ~180	-	-	-
	Stainless steel (Austenitic related)	0.2~ 0.3 ~0.4	-	☆ 100~ 160 ~200	☆ 100~ 160 ~200	-	-	-
	Stainless steel (Martensitic related)	0.2~ 0.3 ~0.4	-	☆ 150~ 200 ~250	-	-	-	☆ 180~ 240 ~300
	Stainless steel (Precipitation hardening)	0.2~ 0.3 ~0.4	-	☆ 90~ 120 ~150	-	-	-	-
	Gray cast iron	0.2~ 0.4 ~0.7	-	-	-	☆ 120~ 180 ~250	-	-
	Nodular cast iron	0.2~ 0.35 ~0.5	-	-	-	☆ 100~ 150 ~200	-	-
	Ni-base heat-resistant alloys	0.2~ 0.3 ~0.4	-	☆ 20~ 30 ~50	-	-	-	☆ 20~ 30 ~50
	Hard materials (60HRC or less)	0.05~ 0.1 ~0.2	-	-	-	-	★ 50~ 80 ~100	-

★: 1st Recommendation ☆: 2nd Recommendation

The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation. Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

- *1. GL chipbreaker: Recommended for surface finish oriented milling.
 *2. GH chipbreaker: Fine pitch → fz ≤ 0.4 (mm/t)
 Extra fine pitch → Not recommended



Cutter type and chipbreaker selection

Milling purpose	Cutter type			Chipbreaker				
	Coarse pitch	Fine pitch	Extra fine pitch	GM	SM	GH	GL	W
General milling for steel and alloy steel		●		●				
Steel and alloy steel (At chattering due to low rigidity machine or poor clamping power)	●				●			
Productivity oriented (Running cost decrease) (ap=4mm or over, fz=0.35mm/t or over)	●					●		
Surface finish oriented	●	●					●	
General milling of stainless steel		●			●			
Stainless steel (To prevent chattering due to low rigidity machine or poor clamping power)	●				●			
Cast iron (For processing efficiency improvement)			●	●				
Cast iron (ap=4mm or over, fz=0.35mm/t or over)	●					●		
Improved surface finish in high efficiency milling		●	●					●

How to use wiper insert

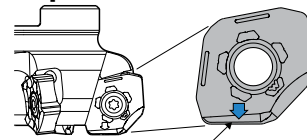
1. Please use one wiper insert on one cutter.
(If you use 2 inserts or more on one cutter, the workpiece surface may be muddy white.)
2. Combination of wiper insert with other chipbreakers

Combination	Chipbreaker		
	GM	SM	W
Recommended combination	●		●
Recommended combination		●	●

The combinations of GH+W and GL+W are not recommended.

3. For checking the protrusion amount of the wiper insert, use tool presetter. (Appropriate protrusion: 0.1mm)

How to attach wiper inserts on MFPN cutter



↓ The down arrow symbol indicates wiper cutting edge.
↓ When attaching inserts, make sure that the arrow symbol points downward.

Applicable chipbreaker

Cutter type	Chipbreaker		
	GM	SM (GL)	GH
Coarse pitch (With shim)	✓	✓	✓
Fine pitch (Without shim)	✓	✓	△ (Feed rate is recommended fz=0.4mm/t or under)
Extra fine pitch (Without shim)	✓	✓	Not recommended

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

Precautions for use (How to mount an insert)

1. Be sure to remove dust and chips from the insert mounting pocket.
2. After applying anti-seize compound on portion of taper and thread, while pressing the insert against the constraint surfaces, put the screw into the hole of the insert and tighten the screw with appropriate torque. (Ref. to Fig. 1 and Fig. 2)
Recommended tightening torque: The torque for coarse pitch (using M5 screw) is 4.2 N·m
The torque for extra fine pitch (using M4 screw) is 3.5 N·m.
3. After tightening the screw, make sure that there is no clearance between the insert seat surface and the bearing surface of the toolholder and between the insert side surfaces and the constraint surface of the toolholder. (Fig. 3)
4. To change the cutting edge of the insert, turn the insert counterclockwise. (Fig. 3)
Insert corner identification number is stamped on the top surface of insert. (Fig. 4) To protect the wiper edge, use the corners of insert in the sequence of corner numbers.

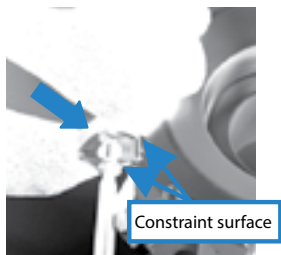


Fig. 1

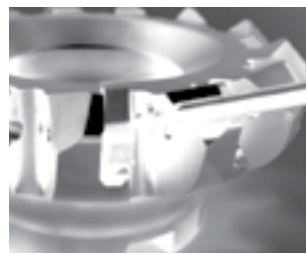


Fig. 2



Fig. 3

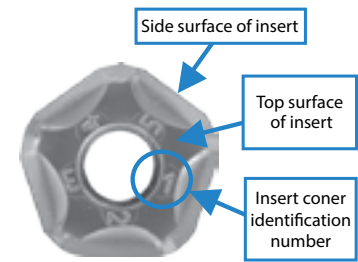


Fig. 4 (Right-hand insert)

How to replace a shim (for coarse pitch)

1. Be sure to remove dust and chips from the insert mounting pocket.
2. The shim must be mounted in the proper direction. While aligning the surface of the shim with the mark on it to the corresponding constraint surface (ref. to Fig. 5) and lightly pressing the shim toward the constraint surface, insert the screw into the hole of the shim and tighten it (ref. to Fig. 6).
When tightening the screw, make sure that the screw is vertical to the bearing surface. Recommended tightening torque is 6.0 N·m.
3. After tightening the screw, make sure that there is no clearance between the shim seat surface and the bearing surface. If there is any clearance, remove the insert and mount it again according to the above steps.

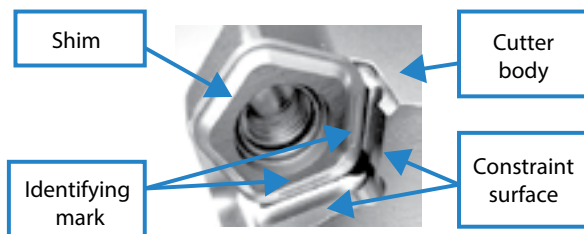


Fig. 5

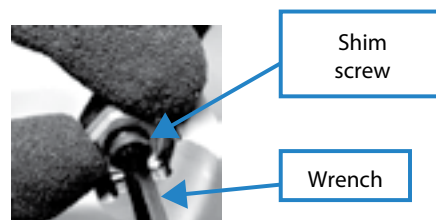


Fig. 6

Cutting edge angle 66°

MFPN66

Economical double-sided 10-edge insert reduces chattering with low cutting force design
Reduces cutting costs when machining auto parts and other general purpose machining applications

- 1 Economical double-sided 10-edge insert**
Applicable to various machining applications with wide size range from ø32

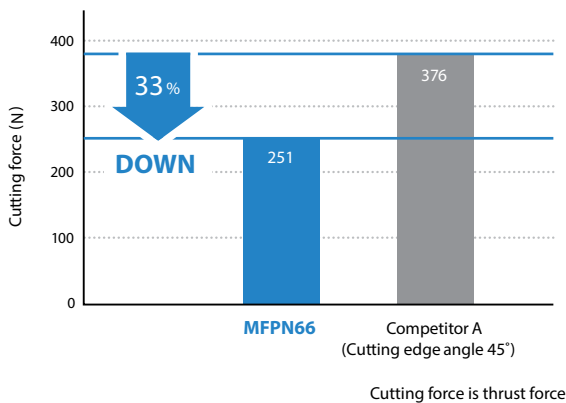
Cost reduction in various applications from general parts to automotive parts machining

- 2 Reduces chattering with low cutting force design**
Available for application from small ap to medium ap

Suppresses vibration for excellent surface finish with 66° cutting edge angle

M
Milling
Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

Cutting force comparison (Internal evaluation)



Cutting conditions: Vc=200 m/min, ap=3 mm, fz=0.15 mm/t
 Cutter dia. ø63 Workpiece material: C50

Surface finish (Machining with workpiece overhang length of 80mm)



Excellent surface finish with low workpiece clamping rigidity

Cutting conditions: Vc=200 m/min, ap=0.5 mm, fz=0.2 mm/t
 Cutter dia. ø63 Workpiece material: C50

- 3 Extended tool life by MEGACOAT NANO technology**
Insert lineup also contains cermet grade for better surface finish



General purpose
GM chipbreaker

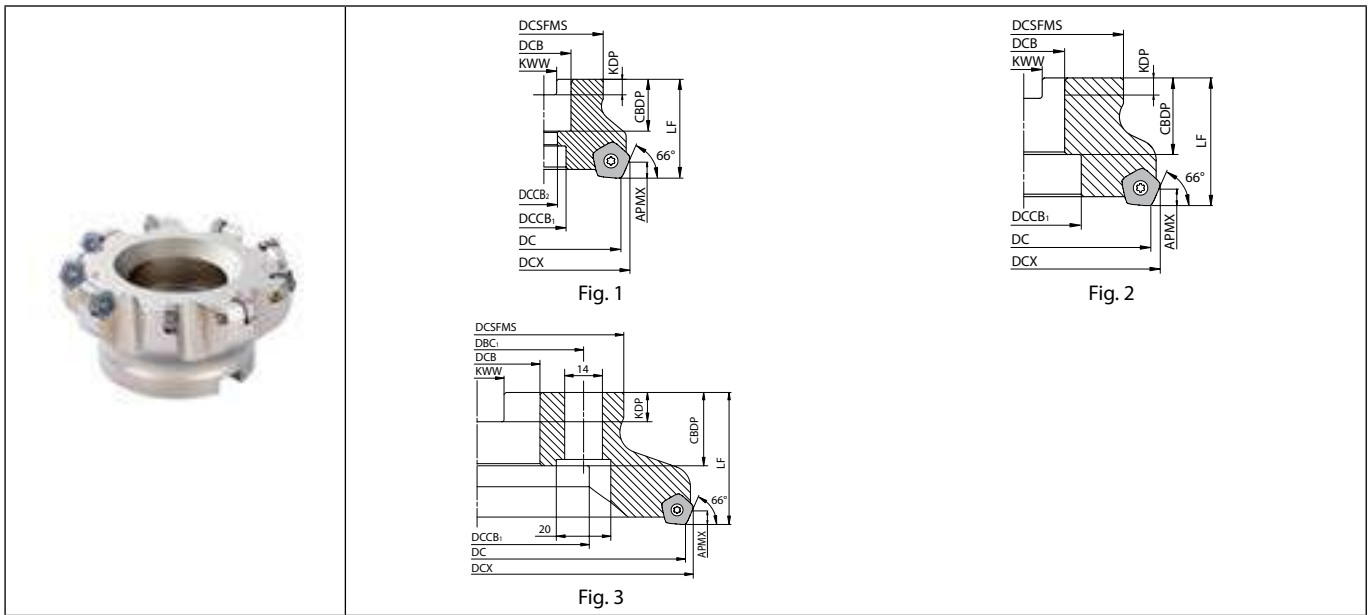


Tough edge
GH chipbreaker



For stainless steel
SM chipbreaker

MFPN66



Toolholder dimensions





Description		Availability	Dimension (mm)											A.R. max.(°)	R.R.(°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts M34	
			Inserts	DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DBG	LF	CBDP	KDP							KWW
Metric	Fine pitch	MFPN 66050R-4T-M-G	●	4	50	58	48	22	18	11	-	40	21	6.3	10.4	+12	-9	No	0.3	PNMU0905...
		MFPN 66063R-5T-M-G	●	5	63	71	48	22	18	11	-	40	21	6.3	10.4	+12	-8	No	0.5	
		MFPN 66080R-6T-M-G	●	6	80	88	70	27	20	13	-	50	24	7	12.4	+12	-7	No	1.2	
		MFPN 66100R-7T-M-G	●	7	100	107	78	32	45	-	-	50	30	8	14.4	+12	-6	No	1.6	
		MFPN 66125R-9T-M-G	●	9	125	132	89	40	55	-	-	63	33	9	16.4	+12	-6	No	2.8	
		MFPN 66160R-11T-M-G	●	11	160	167	89	40	55	66.7	-	63	33	9	16.4	+12	-6	No	3.8	
Metric	Extra fine pitch	MFPN 66050R-5T-M-G	●	5	50	58	48	22	18	11	-	40	21	6.3	10.4	+12	-9	No	0.4	PNMU0905...
		MFPN 66063R-7T-M-G	●	7	63	71	48	22	18	11	-	40	21	6.3	10.4	+12	-8	No	0.5	
		MFPN 66080R-9T-M-G	●	9	80	88	70	27	20	13	-	50	24	7	12.4	+12	-7	No	1.2	
		MFPN 66100R-11T-M-G	●	11	100	107	78	32	45	-	-	50	30	8	14.4	+12	-6	No	1.6	
		MFPN 66125R-13T-M-G	●	13	125	132	89	40	55	-	-	63	33	9	16.4	+12	-6	No	3	
		MFPN 66160R-15T-M-G	●	15	160	167	89	40	55	66.7	-	63	33	9	16.4	+12	-6	No	4	
Bore dia. inch spec	Fine pitch	MFPN 66080R-6T-G	□	6	80	88	70	25.4	20	13	-	50	27	6	9.5	+12	-7	No	1.2	PNMU0905...
		MFPN 66100R-7T-G	□	7	100	107	78	31.75	45	-	-	50	34	8	12.7	+12	-6	No	1.7	
		MFPN 66125R-9T-G	□	9	125	132	89	38.1	55	-	-	63	38	10	15.9	+12	-6	No	2.9	
		MFPN 66160R-11T-G	□	11	160	167	110	50.8	72	-	-	63	38	11	19.1	+12	-6	No	4.5	
		MFPN 66080R-9T-G	□	9	80	88	70	25.4	20	13	-	50	27	6	9.5	+12	-7	No	1.2	
Bore dia. inch spec	Extra fine pitch	MFPN 66100R-11T-G	□	11	100	107	78	31.75	45	-	-	50	34	8	12.7	+12	-6	No	1.7	PNMU0905...
		MFPN 66125R-13T-G	□	13	125	132	89	38.1	55	-	-	63	38	10	15.9	+12	-6	No	3	
		MFPN 66160R-15T-G	□	15	160	167	110	50.8	72	-	-	63	38	11	19.1	+12	-6	No	4.8	


APMX : 5 mm (GM, SM, GH chipbreakers, Coated cabide), 3 mm (GM chipbreaker, Cermet)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Spare parts (common to Metric / Inch spec)

Description		Clamp screw	Wrench	Anti-seize compound	Mounting bolt
					
Fine pitch	MFPN	SB-4090TRP	DTPM-15	P-37	HH10X30
	66050R-4T(-M)-G				HH10X30
	66063R-5T(-M)-G				HH12X35
	66080R-6T(-M)-G				-
	66100R-7T(-M)-G				-
	66125R-9T(-M)-G				-
66160R-11T(-M)-G	-				
<div style="border: 1px solid black; padding: 2px;">Recommended tightening torque for insert clamp 3.5N·m</div>					
Extra fine pitch	MFPN	SB-4090TRP	DTPM-15	P-37	HH10X30
	66050R-5T(-M)-G				HH10X30
	66063R-7T(-M)-G				HH12X35
	66080R-9T(-M)-G				-
	66100R-11T(-M)-G				-
	66125R-13T(-M)-G				-
66160R-15T(-M)-G	-				
<div style="border: 1px solid black; padding: 2px;">Recommended tightening torque for insert clamp 3.5N·m</div>					

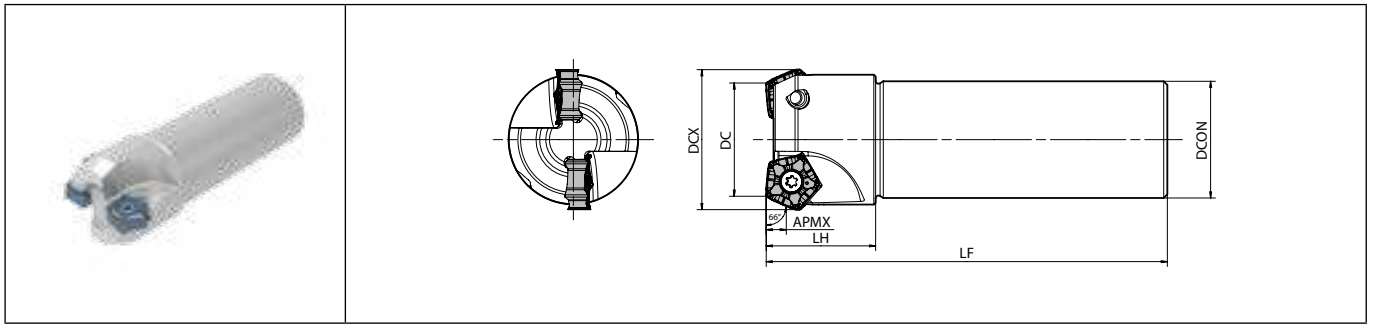
 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.



Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

MFPN66



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)							A.R. max.(°)	R.R.(°)	Coolant hole	Spare parts			Applicable inserts M34
			DC	DCX	DCON	LF	LH	Anti-seize compound	Screw				Wrench			
														R		
MFPN 66032R-S32-2T-G	●	2	32	39.5	32	110	30	+12	-14	No	P-37	SB-4090TRP	DTPM-15	PNMU0905...		
66040R-S32-3T-G	●	3	40	47.5	32	110	30	+12	-12	No	P-37	SB-4090TRP	DTPM-15			

APMX : 5 mm (GM, SM, GH chipbreakers, Coated cabide), 3 mm (GM chipbreaker, Cermet)

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Recommended tightening torque for insert clamp : 3.5N-m



PNMU

Insert		Description	No. of edges	Dimension (mm)					Carbide						Applicable toolholder M31 M33		
				S	D1	INSL	BCH	BS	PVD								
									PR015S	PR1510	PR1525	PR1535	PR1810	PR1825		PR1835	TN620M
		PNMU 0905XNER-GM	10	5.56	4.7	14.6	2	2	●	●	●	●	●	●	●	●	MFPN66...
		PNMU 0905XNER-SM	10	5.56	4.7	14.6	2	2	●	●	●	●	●	●	●	●	MFPN66...
		PNMU 0905XNER-GH	10	5.56	4.7	14.6	2	2	●	●	●	●	●	●	●	●	MFPN66...

Recommended cutting conditions M35

Classification of usage

- ★: Roughing / 1st Choice
- ☆: Roughing / 2nd Choice
- : Finishing / 1st Choice
- : Finishing / 2nd Choice
- (In case hardness is 45HRC or under)

Carbon steel / Alloy steel	☆	★	■	P
Mold and die steel	☆	★	■	P
Austenitic stainless steel	☆	★	■	M
Martensitic stainless steel	☆	★	■	M
Precipitation hardening stainless steel	☆	★	■	M
Gray cast iron	☆	★	■	K
Nodular cast iron	☆	★	■	K
Non-ferrous metals				N
Heat-resistant alloy			☆	S
Titanium alloy		☆	★	S
Hard materials	★			H



Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

Recommended cutting conditions

Coated carbide

Chipbreaker	Workpiece material	Feed (fz: mm/t)	Recommended insert grades (Vc: m/min)			
			MEGACOAT (PVD coated carbide)			
			PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)	PR0155
GM	Carbon steel	0.1~ 0.2 ~0.3	120~ 180 ~250	120~ 180 ~250	-	-
	Alloy steel	0.1~ 0.2 ~0.3	100~ 160 ~220	100~ 160 ~220	-	-
	Mold steel	0.1~ 0.18 ~0.25	80~ 140 ~180	80~ 140 ~180	-	-
	Stainless steel (Austenitic related)	0.1~ 0.18 ~0.25	100~ 150 ~200	100~ 150 ~200	-	-
	Stainless steel (Martensitic related)	0.1~ 0.18 ~0.25	100~ 150 ~200	-	-	-
	Stainless steel (Precipitation hardening)	0.1~ 0.18 ~0.25	90~ 120 ~150	-	-	-
	Gray cast iron	0.1~ 0.2 ~0.3	-	-	120~ 180 ~250	-
	Nodular cast iron	0.1~ 0.18 ~0.25	-	-	100~ 150 ~200	-
	Ni-base heat-resistant alloys	0.1~ 0.12 ~0.2	20~ 30 ~50	-	-	-
SM	Carbon steel	0.06~ 0.12 ~0.2	-	120~ 180 ~250	-	-
	Alloy steel	0.06~ 0.12 ~0.2	-	100~ 160 ~220	-	-
	Mold steel	0.06~ 0.1 ~0.15	-	80~ 140 ~180	-	-
	Stainless steel (Austenitic related)	0.06~ 0.12 ~0.2	100~ 150 ~200	100~ 150 ~200	-	-
	Stainless steel (Martensitic related)	0.06~ 0.12 ~0.2	100~ 150 ~200	-	-	-
	Stainless steel (Precipitation hardening)	0.06~ 0.12 ~0.2	90~ 120 ~150	-	-	-
	Gray cast iron	0.06~ 0.12 ~0.2	-	-	120~ 180 ~250	-
	Nodular cast iron	0.06~ 0.1 ~0.15	-	-	100~ 150 ~200	-
	Ni-base heat-resistant alloys	0.06~ 0.08 ~0.15	20~ 30 ~50	-	-	-
	Titanium alloys	0.06~ 0.08 ~0.15	40~ 60 ~80	-	-	-
GH	Carbon steel	0.15~ 0.25 ~0.35	-	120~ 180 ~250	-	-
	Alloy steel	0.15~ 0.25 ~0.35	-	100~ 160 ~220	-	-
	Mold steel	0.1~ 0.2 ~0.3	-	80~ 140 ~180	-	-
	Gray cast iron	0.15~ 0.25 ~0.35	-	-	120~ 180 ~250	-
	Nodular cast iron	0.1~ 0.2 ~0.3	-	-	100~ 150 ~200	-
	Hard materials (60HRC or less)	0.05~ 0.08 ~0.16	-	-	-	50~ 80 ~100

★: 1st Recommendation ☆: 2nd Recommendation



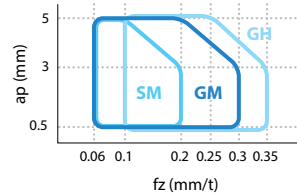
Cermet

Chipbreaker	Workpiece material	Feed (fz: mm/t)	Recommended insert grades Vc: m/min
			Cermet
GM	Carbon steel	0.06~ 0.12 ~0.15	TN620M ★ 200~ 250 ~300
	Alloy steel	0.06~ 0.12 ~0.15	★ 180~ 220 ~250
	Mold steel	0.06~ 0.1 ~0.13	★ 150~ 180 ~220

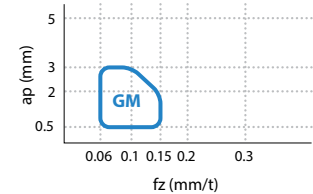
★: 1st Recommendation

Applicable chipbreaker range

Coated carbide



Cermet



Applicable chipbreaker

Cutter type	Chipbreaker		
	GM	SM	GH
Fine pitch	✓	✓	✓
Extra fine pitch	✓	✓	△ (Feed rate is recommended fz=0.2mm/t or under)

High precision and high efficiency high rake cutter

MFSE45


Rough and finish in 1 pass with excellent surface finish

Roughing condition (fz = 0.25 mm/t) provides excellent surface finish (0.8 μmRa or less)

1 The MFSE45 milling solution

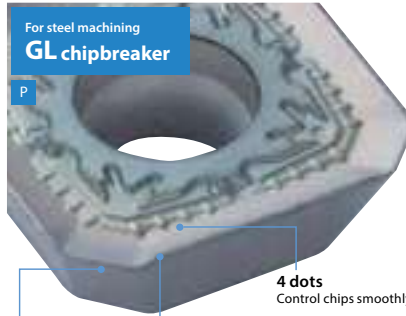
Delivers high-quality surfaces by roughing and finishing simultaneously

Kyocera's newly developed unique molded chipbreaker



Large A.R. design
(A.R. + 22°)

with wiper insert
(MFF technology)



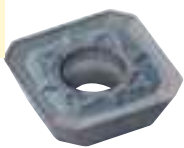
For steel machining
GL chipbreaker

P

Wiper edge
Excellent sharpness

Two-step land
Has both sharpness and cutting edge strength

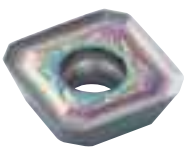
4 dots
Control chips smoothly



For stainless steel machining
SL chipbreaker

M

Micro-horning



For aluminum machining
AL chipbreaker

N

Sharp edge

M

Milling

Machining comparison simulation (example)

MFSE45 1 Pass and cutting time was cut by 1/3, with a good surface finish (0.8 μmRa or less)

fz = 0.25 mm/t (ap = 1.0 mm)

Cutting conditions: Vc = 300 m/min, Dry C50 (Internal evaluation)



SOLUTION

1 Pass

Time = 1/3

Surface finish ✓

Conventional machining

Two separate passes for roughing and finishing. Cutting time is longer due to low feed rates during finishing

fz = 0.15 mm/t (ap = 0.8 mm)

fz = 0.125 mm/t (ap = 0.2 mm)



Cutting time

Roughing

Finishing

CG image

2 Beautiful surface finish and long tool life

Strict control of insert inscribed circle tolerance

Improved surface finish quality and longer tool life with reducing front edge runout



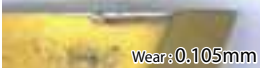

Excellent front edge runout accuracy

Advantage 1 Theoretical reduction of roughness on finished surface, excellent surface roughness

Front edge runout: Small ⇒
Surface roughness: Good

Advantage 2 Insert wear progresses evenly and tool life can be improved

Effect on wear (User evaluation)

	Average corner examples	Heavily damaged corner examples	
MFSE45	 Wear: 0.145mm	 Wear: 0.172mm	Variation : Small
Competitor A	 Wear: 0.105mm	 Wear: 0.911mm	Variation : Large

Cutting conditions : Vc = 270 m/min, ap = ~ 1.5 mm, fz = 0.2 mm/t, Wet ST44-2 ø 250 (15 inserts) SL chipbreaker (PR1535)

Due to the high wear rate of the insert, all inserts need to be replaced, which may result in shorter tool life.

3 Various holders available for multiple applications

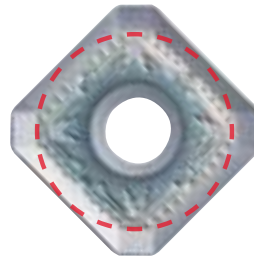
In addition to styles with a wiper insert, the standard type with only the standard inserts are also available

Toolholder Specifications

Type	With wiper insert 	Standard 
Surface roughness	Approx. 0.8µmRa	Approx. 1.6µmRa
Recommended feed	fz = 0.25 mm/t 	fz = 0.12 mm/t (Finish machining time)
Application	High efficiency finishing	General purpose (Uses 1 insert style)

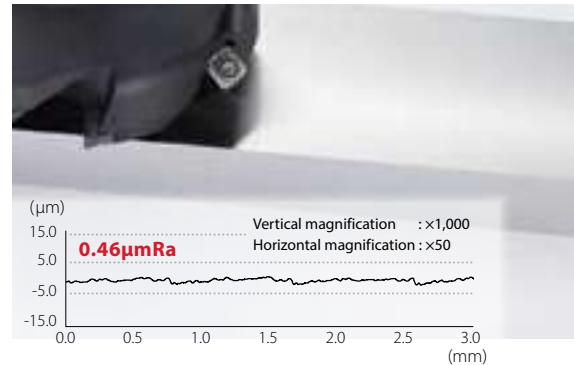


Using wiper insert for MFF
(Cutting edge adjustment mechanism with excellent operability)



Inscribed circle tolerance
± 0.015 mm or less
(Class E standard ± 0.025 mm or less)

Surface roughness in stainless steel machining (Internal evaluation)









Cutting conditions : Vc = 250 m/min, ap x ae = 1.0 x 100 mm, fz = 0.15 mm/t, Wet X5CrNi18 10 ø125 (Standard 6 inserts) SL chipbreaker










Spare parts

Common


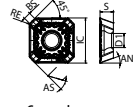

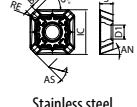

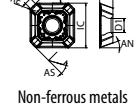
Clamp Screw	Wrench	Shim	Shim screw	Wrench	Anti-seize compound
					
SB-35120TRP	DTPM-15	MFSE-105	SPW-5035	LW-3.5	P-37
Recommended tightening torque for insert clamp 4N·m		Recommended tightening torque for shim clamp 5N·m			

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

For Wiper insert

Clamp screw	Wrench	Wedge	Cartridge	Cartridge clamp screw	Wrench	Adjustment Screw
						
SB-3592TR	DTM-10	AD-MFF	CR-MFF	HHSX15L	TTW-15	W6X18N
Recommended tightening torque for wiper insert clamp 1.2N·m						

SEET

Insert		Description	No. of edges	Dimension (mm)					Angle (°)		Carbide					Applicable toolholder M38			
				IC	S	D1	RE	BS	AN	AS	CVD	DLC	PVD						
												CA6535	PD1025	PRI1525	PRI1535	PRI1825	PRI1835		
  General purpose		SEET 13T3AGSN-GL	4	13.4	3.97	4.2	1.5	2.1	20	29	●		●	●	●	●			MFSE45...
  Stainless steel		SEET 13T3AGSN-SL	4	13.4	3.97	4.2	1.5	2.1	20	29	●		●	●	●	●			MFSE45...
  Non-ferrous metals		SEET 13T3AGFN-AL	4	13.4	3.97	4.2	1.5	2.1	20	29		●							MFSE45...

Classification of usage


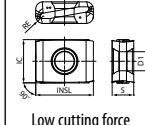

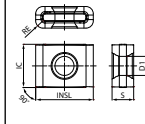
★ : Roughing / 1st Choice
 ☆ : Roughing / 2nd Choice
 ■ : Finishing / 1st Choice
 □ : Finishing / 2nd Choice
 (In case hardness is 45HRC or under)

M



Milling

LNGX

Insert		Description	No. of edges	Dimension (mm)					Carbide		Cermet	Applicable toolholder M38 M193	
				IC	S	D1	RE	INSL	PVD	PVD	PVD		
  Low cutting force		LNGX 120916R-TT	4	9.525	4.76	4.2	1.6	12.7	MTO	MTO	MTO		MFSE45...-W MFSE45...-W-M MFF...-SF
 		LNGX 120916	4	9.525	4.76	4.2	1.6	12.7	MTO	MTO	MTO		MFSE45...-W MFSE45...-W-M MFF...-SF

Recommended cutting conditions M41

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

M40

Recommended cutting conditions

Chipbreaker	Workpiece	Feed (fz: mm/t)	Recommended insert grade (Vc: m/min)			
			MEGACOAT NANO EX (MEGACOAT NANO)		CVD coating	DLC coated carbide
			PR1835 (PR1535)	PR1825 (PR1525)	CA6535	PDL025
GL	Carbon steel	0.1 – 0.15 – 0.3	150 – ★200 – 300	150 – ☆200 – 300	150 – ☆200 – 300	–
	Alloy steel	0.1 – 0.15 – 0.3	150 – ★200 – 300	150 – ☆200 – 300	150 – ☆200 – 300	–
	Mold steel	0.1 – 0.15 – 0.25	100 – ☆150 – 250	100 – ★150 – 250	100 – ☆150 – 250	–
	Stainless steel (Austenitic related)	0.1 – 0.15 – 0.25	100 – ★200 – 250	100 – ☆200 – 250	100 – ☆200 – 250	–
	Stainless steel (Martensitic related)	0.1 – 0.15 – 0.25	100 – ★200 – 250	100 – ☆200 – 250	100 – ☆200 – 250	–
	Gray cast iron	0.1 – 0.15 – 0.25	100 – ☆200 – 250	100 – ☆200 – 250	100 – ☆200 – 250	–
	Nodular cast iron	0.1 – 0.15 – 0.25	100 – ☆200 – 250	100 – ☆200 – 250	100 – ★200 – 250	–
SL	Carbon steel	0.1 – 0.12 – 0.15	150 – ☆200 – 300	150 – ☆200 – 300	150 – ☆200 – 300	–
	Alloy steel	0.1 – 0.12 – 0.15	150 – ☆200 – 300	150 – ☆200 – 300	150 – ☆200 – 300	–
	Mold steel	–	–	–	–	–
	Stainless steel (Austenitic related)	0.1 – 0.15 – 0.2	100 – ★200 – 250	100 – ☆200 – 250	100 – ☆200 – 250	–
	Stainless steel (Martensitic related)	0.1 – 0.15 – 0.2	100 – ★200 – 250	100 – ☆200 – 250	100 – ☆200 – 250	–
AL	Aluminum alloys (Si Ratio 13% or less)	0.1 – 0.15 – 0.3	–	–	–	★200 – 400 – 500

★ : 1st recommendation ☆ : 2nd recommendation

The number in **bold font** is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

M



Milling

Face mills for heavy milling

MFLN

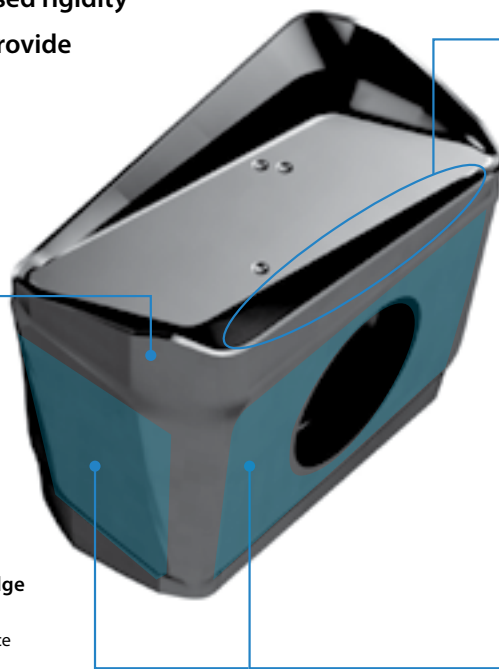
Tough 4-edge tangential inserts provide high reliability on heavy milling at large depths of cut and high feed rates.

Three cutting edge angles (incl. MFLN90) optimized for various machining applications.

1 Tough and reliable inserts for stable heavy milling

22 mm long inserts offer increased rigidity

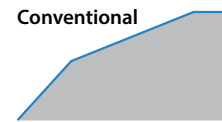
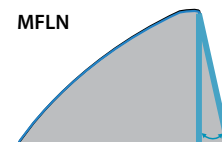
Tangentially mounted inserts provide
2 cutting edges on both sides



Obtuse edge design

Increases the cutting edge angle only at the tip to maintain both strength and sharpness

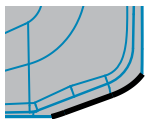
Cross-section view of cutting edge



Corner chamfer

only available on MFLN90

Both general corner-R type and chamfered corner type available
Prevents chattering and insert fracturing

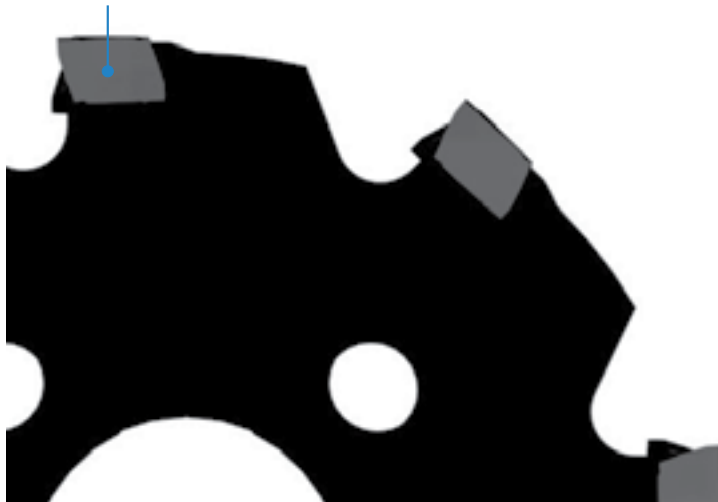


Convex cutting edge ridge
Reduced impact forces when entering the workpiece

Wide flat mounting surface

Hold an insert firmly in heavy milling

Tangentially mounted inserts increase rigidity



M



Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

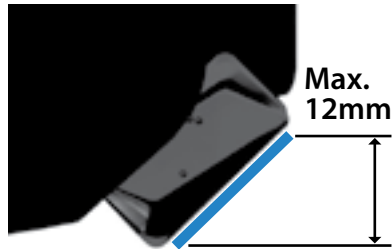
Slot Mill

Ball-nose Radius

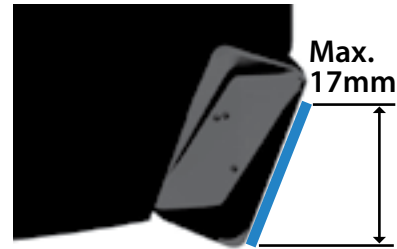
Others

2 Large D.O.C. and high feed rates

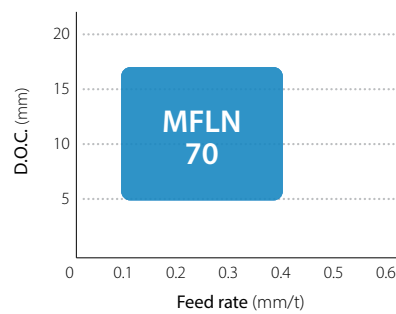
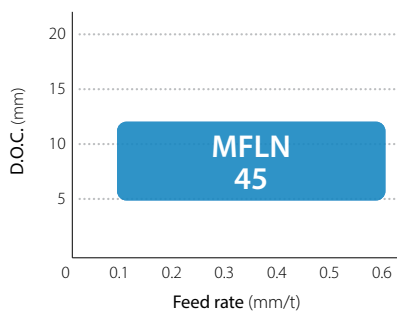
MFLN45
Cutting edge angle 45°



MFLN70
Cutting edge angle 70°



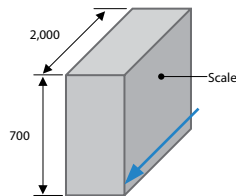
Applicable range



Case Studies

Forging Die for Automotive Parts

Vc = 90 m/min
ap × ae = ~10 × ~80 mm
fz = 0.36 mm/t Dry
MFLN45080R-4T-M (ø80-4 flutes)
LOGU221616ER-GM PR1535



Chip Evacuation Rate

MFLN45
(ø80-4 flutes)

Q=416 cc/min

Machining efficiency
↑
x1.2

Competitor H
(ø100-5 flutes)

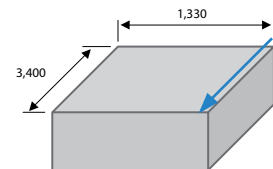
Q=336 cc/min

MFLN achieved 1.2 times machining efficiency.
Quieter machining and good chip shapes.

(User Evaluation)

Machining base GGG60

Vc = 120 m/min
ap = 11×165 mm
fz = 0.65 mm/t Dry
XMFLN70250R-13T-OH-M (ø250-13 flutes)
Fine pitch, internal coolant, custom holder
LOGU221616ER-GM PR1525



Chip Evacuation Rate

MFLN70

Roughing

Q=2,340 cc/min

Finishing

Q=2,340 cc/min

Machining efficiency
↑
x1.1

Competitor

Q=2,100 cc/min

Roughing (Competitor F)

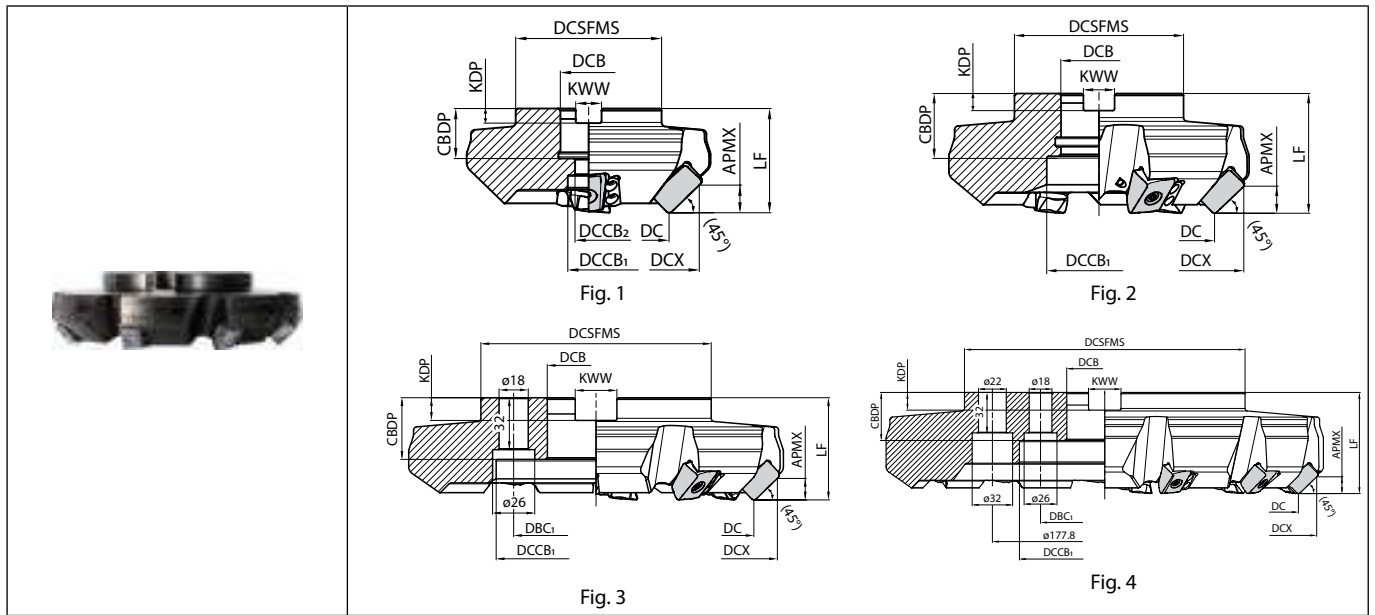
Q=1,970 cc/min

MFLN improved machining efficiency with lower cutting force.
Also it can be used both for roughing and finishing.

(User Evaluation)



MFLN45



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)													A.R. max.(°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M46
			DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	DBC ₁	LF	CBDP	KDP	KWW	APMX								
Metric	●	4	80	104	70	27	20	13	-	50	24	7	12.4	12	+2	-15.5	Yes	5970	2	1	LOGU221616ER-GM	
		4	100	124	78	32	45	-	30	8	14.4	4780	2.7					2				
		6	125	149	89	40	55	-	33	9	16.4	3820	4.6					2				
		7	160	184	110	90	66.7	63	38	14	25.7	2990	6.7					3				
		8	200	224	142	124	101.6	80	1910	16.9	3											
		10	250	274	222	160	1520	25.1	4													
		MT0	315	339	215	80	1520	25.1	4													
Bore dia. inch spec	□	4	80	104	70	25.4	20	13	-	50	27	6	9.5	12	+2	-15.5	Yes	5970	2	1	LOGU221616ER-GM	
		4	100	124	78	31.75	45	-	34	8	12.7	4780	2.7					2				
		6	125	149	89	38.1	55	-	10	15.9	3820	4.6	2									
		7	160	184	110	50.8	90	-	11	19.1	2990	6.8	2									
		8	200	224	142	124	101.6	80	1910	10	3											
		10	250	274	222	160	1520	17.1	3													
		MT0	315	339	215	80	1520	25.3	4													

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M44

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

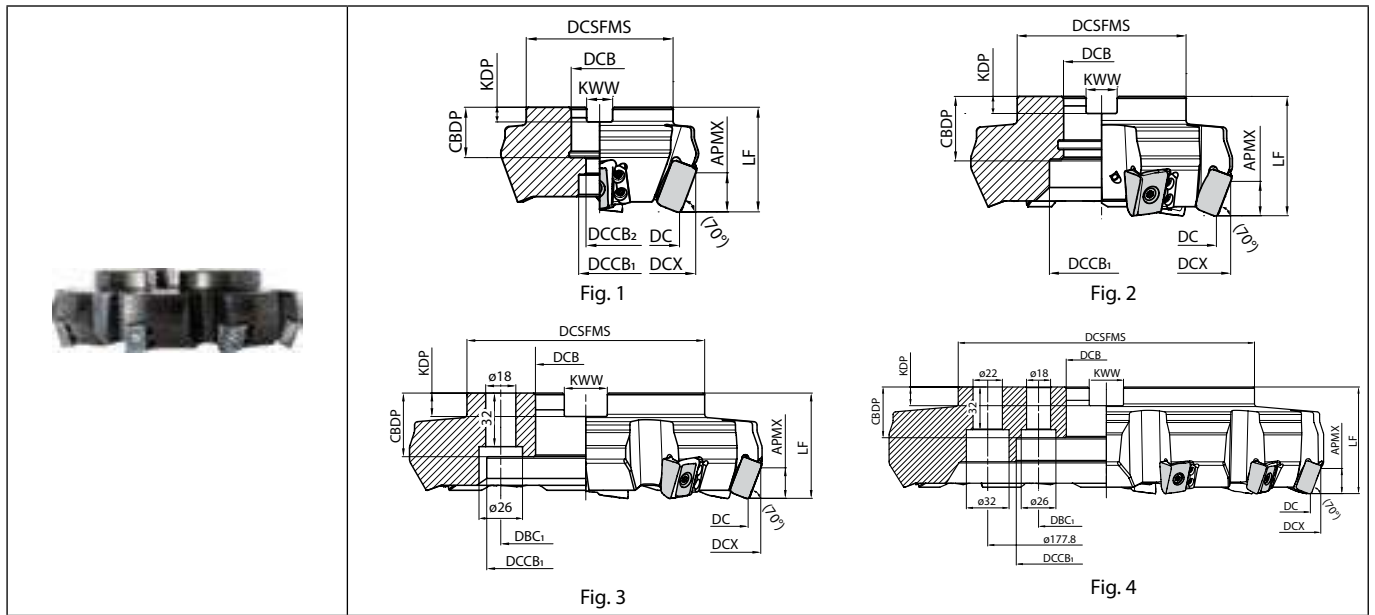
Multi-Function

Slot Mill

Ball-nose Radius

Others

MFLN70



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)													A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M46
			R	DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	DBC ₁	LF	CDBP	KDP	KWW	APMX							
Metric	●	4	80	93	70	27	20	13	-	50	24	7	12.4	17	+1	-16.5	Yes	5970	1.4	1	LOGU221616ER-GM	
		6	100	113	78	32	45	-	30	8	14.4	4780	1.9					2				
		6	125	138	89	40	55	-	33	9	16.4	3820	3.4					2				
		7	160	173	110	90	66.7	63	38	14	25.7	2990	5.3					3				
		8	200	213	142	120	101.6	80	38	14	25.7	2390	8.2					3				
		10	250	263	222	60	160	101.6	38	14	25.4	1910	14.8					3				
		12	315	328	222	215	80	1520	21.9	4												
Bore dia. inch spec	□	4	80	93	70	25.4	20	13	-	50	27	6	9.5	17	+1	-16.5	Yes	5970	1.4	1	LOGU221616ER-GM	
		6	100	113	78	31.75	45	-	34	8	12.7	4780	2					2				
		6	125	138	89	38.1	55	-	10	15.9	3820	3.5	2									
		7	160	173	110	50.8	70	-	11	19.1	2990	5.8	2									
		8	200	213	142	120	101.6	80	38	14	25.4	2390	8.5					3				
		10	250	263	222	47.625	160	101.6	38	14	25.4	1910	15.1					3				
		12	315	328	222	215	80	1520	22.2	4												

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Spare parts


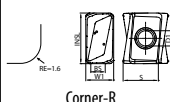
Description	Parts						
	Clamp screw	Wrench	Shim	Clamp screw	Wrench	Coat anti-seize compound	Arbor bolt


Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



LOGU

Classification of usage		Carbon steel / Alloy steel		☆	★	☆	P						
		Mold and die steel		☆	★	☆							
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Austenitic stainless steel					M						
		Martensitic stainless steel											
		Precipitation hardening stainless steel					K						
		Gray cast iron		☆	★	☆							
		Nodular cast iron		☆	★	☆	N						
		Non-ferrous metals											
		Heat-resistant alloy					S						
		Titanium alloy											
		Hard materials					H						
Insert	Description	No. of edges	Dimension (mm)						Carbide			Applicable toolholder M44 M45 M152	
			S	D1	RE	W1	INSL	BS	PVD				
									PRI1525	PRI1535	PRI1835		
	 Corner-R	LOGU 221616ER-GM	4	16.6	6.8	1.6	12.5	22.8	6.3	●	●	●	MFLN45... MFLN70... MFLN90...

Recommended cutting conditions  M47

About applicable insert

	LOGU221616ER-GM (Corner-R)	LOGU2216PAER-GM (Corner Chamfer)
MFLN 45	✓	not applicable
MFLN 70	✓	not applicable



Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M46

Recommended cutting conditions

	Workpiece	D.O.C. (mm)		fz: mm/t	Recommended insert grades (Vc: m/min)	
		Width of cut $\leq 0.5 \times DC$	Width of cut $> 0.5 \times DC$		MEGACOAT NANO EX (MEGACOAT NANO)	
					PR1825 (PR1525)	PR1835 (PR1535)
MFLN 45	Carbon steel	~10	~8	0.1 - 0.3 - 0.6	★ 100 - 150 - 180	☆ 80 - 120 - 150
	Alloy steel				★ 100 - 150 - 180	☆ 80 - 120 - 150
	Mold steel	★ 80 - 120 - 150	☆ 70 - 100 - 120			
	Gray cast iron	~12	~10		★ 100 - 150 - 180	☆ 80 - 120 - 150
	Nodular cast iron				★ 100 - 150 - 180	☆ 80 - 120 - 150
MFLN 70	Carbon steel	~15	~12	0.1 - 0.2 - 0.4	★ 100 - 150 - 180	☆ 80 - 120 - 150
	Alloy steel				★ 100 - 150 - 180	☆ 80 - 120 - 150
	Mold steel				★ 80 - 120 - 150	☆ 70 - 100 - 120
	Gray cast iron	~17	~15		★ 100 - 150 - 180	☆ 80 - 120 - 150
	Nodular cast iron				★ 100 - 150 - 180	☆ 80 - 120 - 150

The table above provides recommendations based on product specifications. Before using the product, check the machine's specifications such as power. The number in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation. Dry machining is recommended.

★ : 1st recommendation ☆ : 2nd recommendation

How to mount an insert

1. Completely eliminate chips and dust from the insert mounting side.
2. After mounting a clamp screw on the top edge of wrench, tighten the screw while keeping the insert pushed against the shim seat surface and holder surface (Fig.1,2)
3. Make sure that the identification on the top of the insert is the same in each pocket.(Fig.3)
4. Tighten the wrench (TTP-20) in while holding parallel to the clamp screw.
5. Tighten the insert clamp screw at an appropriate torque. (Recommended torque: 6.0 N-m)
6. After tightening, check that there is no gap between the insert and the surface of the shim, or between the side surface of insert and the holder surface. If there is a gap, remount the insert using the directions above.

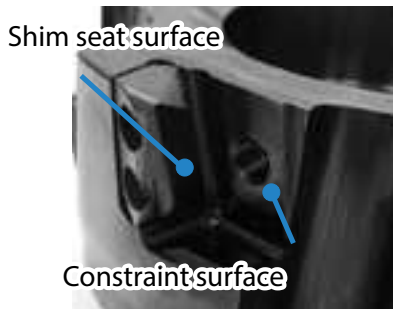


Fig.1

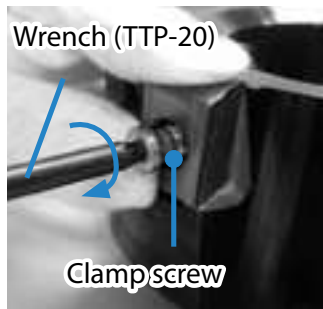


Fig.2



Fig.3

How to replace a shim

1. Completely eliminate chips and dust from the shim mounting side.
2. Coat medium strength screw locking adhesive on the screws.
3. Tighten the screw keeping the shim pushed against the pocket surface of toolholder.
4. After tightening both screws temporarily, tighten them with appropriate torque. (Recommended torque:3.5 N-m)
Perform temporarily tightening and tightening in the order of (1) and (2) (See Figs. 2 and 3).
5. Please check that there is no gap between the shim and the pocket surfaces of toolholder.

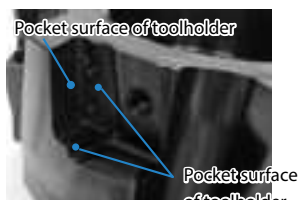


Fig.1

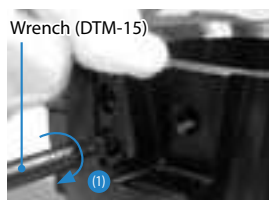


Fig.2



Fig.3



Fig.4



High efficiency cast iron machining

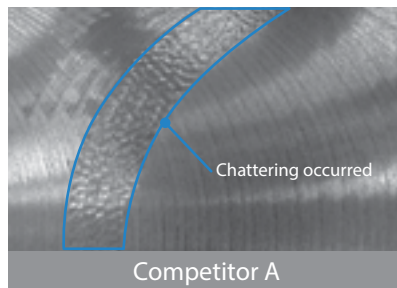
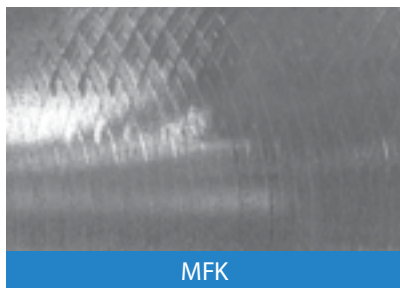
MFK

10-edge pentagonal inserts for stable and economical machining

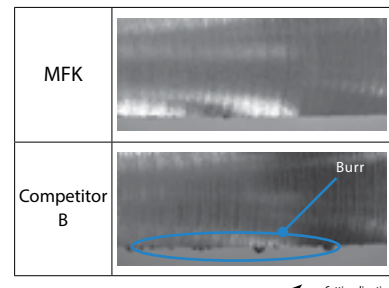


MFK reduces cutting force by good balanced design
Excellent surface finish by controlling chattering

Surface finish comparison (Internal evaluation)



Burr comparison (Internal evaluation)



Cutting conditions:
Workpiece material: GGG60, Dry, $V_c=180$ m/min, $a_{pxae}=3 \times 78$ mm, $f_z=0.3$ mm/t

Sharp cutting prevents burr formation

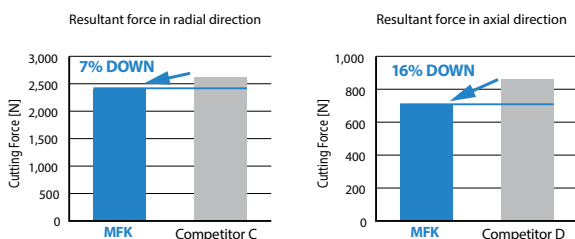
Two special insert structures reduce cutting force and improve edge strength

1 Low cutting force with helical cutting-edge design



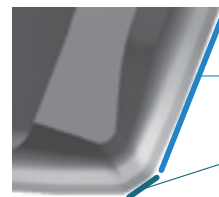
A.R. max. +15°

Cutting force comparison (Internal evaluation)



Cutting conditions:
Workpiece material: GGG60, dry, $\phi 125$
 $V_c=180$ m/min, $a_{pxae}=3.0 \times 62$ mm, $f_z=0.3$ mm/t

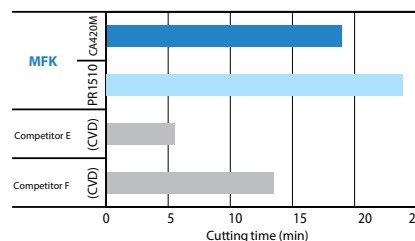
2 Dual cutting edge design (High toughness)



Second main cutting edge

First main cutting edge

Fracture resistance comparison (Internal evaluation)



Cutting conditions:
Workpiece material: GGG45 with 4 bores
 $V_c=300$ m/min
 $a_p=2.0$ mm
 $f_z=0.5$ mm/t
Wet

Reducing impact load when biting into the workpiece

M
Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

Toolholder lineup to meet various applications

Fine pitch type and extra fine pitch type are available
Choose most suitable cutter for your application



Fine pitch (Example: ϕ 125 12 flutes)

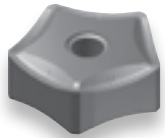
- Recommended for low rigid workpiece
- For wide application range



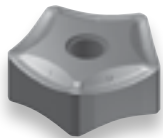
Extra fine pitch (Example: ϕ 125 18 flutes)

- Recommended for high rigid workpiece
- For high efficiency machining

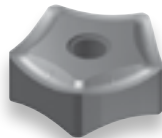
Applicable to various applications with wide range lineup of chipbreakers



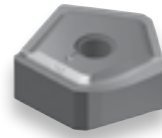
General purpose:
GM chipbreaker



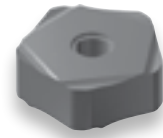
Tough edge:
GH chipbreaker



Finishing:
GL ground chipbreaker

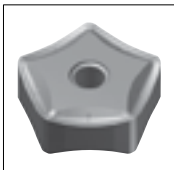


With wiper edge:
W ground chipbreaker

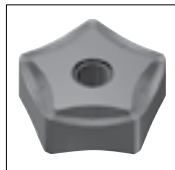


High speed machining:
Ceramic with chipbreaker

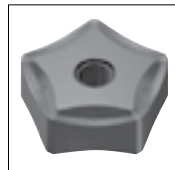
Insert grade lineup



Long tool life
(1st Recommendation)
CA420M
(CVD)



Stable machining
PR1510
(PVD)



Fracture resistance oriented
PR1525
(PVD)



High speed machining
KS6050/CS7050
(Ceramic)

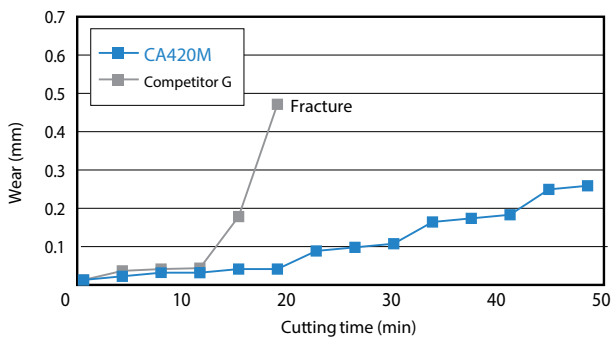


High speed and high precision machining
KBN475
(CBN wiper insert)

Use CBN wiper inserts together with ceramic (KS6050/CS7050) inserts.











Wear resistance comparison (Internal evaluation)



Cutting conditions:
Workpiece material: GGG45, dry
Vc=200 m/min, apxae=2.0x80 mm, fz=0.3 mm/t

Spare parts and applicable inserts (MFK)









Description	Spare parts				Applicable inserts ➔ M54	Description	Spare parts				Applicable inserts ➔ M54															
	Wedge	Wedge screw	Wrench	Mounting bolt			Wedge	Wedge screw	Wrench	Mounting bolt																
																										
MFK 080R-11-8T-M 100R-11-10T-M 125R-11-12T-M 160R-11-16T-M 200R-11-20T-M 250R-11-24T-M 315R-11-28T-M	C09N	W6X18N	TT-15	HH12X35	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W	MFK 080R-11-8T 100R-11-10T 125R-11-12T 160R-11-16T 200R-11-20T 250R-11-24T 315R-11-28T	C09N	W6X18N	TT-15	HH16X40	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W															
MFK 080R-11-10T-M 100R-11-14T-M 125R-11-18T-M 160R-11-22T-M 200R-11-28T-M 250R-11-36T-M 315R-11-44T-M				C09N		W6X18N				TT-15		HH12X35	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W	MFK 080R-11-10T 100R-11-14T 125R-11-18T 160R-11-22T 200R-11-28T 250R-11-36T 315R-11-44T	C09N	W6X18N	TT-15	HH16X40	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W							

M



Milling

Spare parts and applicable inserts (MFK-SF)

Description	Spare parts								Applicable inserts ➔ M54
	Wedge 	Wedge screw 	Wrench 	Cartridge 	Cartridge clamp screw 	Wrench 	Adjustment screw 	Mounting bolt 	
MFK 080R-11-9T-M-SF	C09N	W6X18N	TT-15	CR-MFK70R	HH8X25	LW-6	AJ-519TR	HH12X35	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
100R-11-12T-M-SF								HH16X40	
125R-11-15T-M-SF								-	
160R-11-18T-M-SF								-	
200R-11-24T-M-SF								-	
250R-11-30T-M-SF								-	
315R-11-39T-M-SF								-	
MFK 080R-11-9T-SF	C09N	W6X18N	TT-15	CR-MFK70R	HH8X25	LW-6	AJ-519TR	HH16X40	PNMG1106XNEN-GM PNMG1106XNEN-GH PNEG1106XNEN-GL PNEG1106XNER-W PNEA1106XNTN-T01020 PNEG1106XNTR-T00515 PNEG1106XNTR-T01015W
100R-11-12T-SF								-	
125R-11-15T-SF								-	
160R-11-18T-SF								-	
200R-11-24T-SF								-	
250R-11-30T-SF								-	
315R-11-39T-SF								-	

M



Milling

Recommended cutting conditions (Ceramic/CBN)

Without chipbreaker

Workpiece material	Insert grades	Vc (m/min)	Edge preparation	fz(mm/t)				
				0.05	0.1	0.2	0.3	0.4
Gray cast iron	KS6050 ★ CS7050 ☆	600~900~1,200	0.10x20°					
Nodular cast iron	KS6050 ☆ CS7050 ★	400~600~900						

With chipbreaker

Workpiece material	Insert grades	Vc (m/min)	Edge preparation	fz(mm/t)				
				0.05	0.1	0.2	0.3	0.4
Gray cast iron	KS6050 ★ CS7050 ☆	600~900~1,200	0.05x15°					
Nodular cast iron	KS6050 ☆ CS7050 ★	400~600~900						

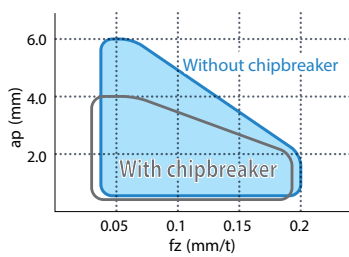
CBN wiper insert

Workpiece material	Insert grades	Vc (m/min)	Edge preparation	fz(mm/t)				
				0.05	0.1	0.2	0.3	0.4
Gray cast iron	KBN475	600~900~1,200	0.10x15°					
Nodular cast iron		400~600~900						

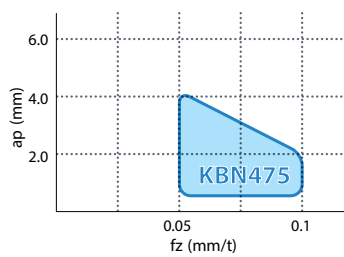
★ : 1st Recommendation ☆ : 2nd Recommendation

Recommended application range (Ceramic/CBN)

Workpiece material: Cast iron
(Ceramic)



Workpiece material: Cast iron
(CBN)



When using CBN wiper inserts

1. Please use CBN wiper inserts together with ceramic inserts. Feed rate should be fz=0.1mm/t or under.
2. The main cutting edge of CBN wiper insert is slightly higher than that of ceramic inserts. Therefore, the feed rate for the inserts next to CBN wiper inserts is double that of other inserts.



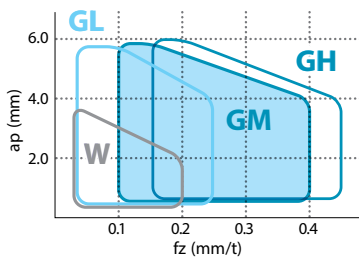
Recommended cutting conditions (Coated carbide)

Workpiece material	Insert grades	Vc (m/min)	Chipbreaker	fz(mm/t)				
				0.06	0.1	0.2	0.3	0.4
Gray cast iron	CA420M	170~230~300	GM ★			0.25		
	PR1810	120~180~250	GH ☆				0.3	
	PR1825		GL		0.12			
	PR1510	120~180~250	GH				0.3	
	PR1525		GL		0.12			
Nodular cast iron	CA420M	150~200~250	GM ★			0.2		
	PR1810	100~150~200	GH ☆				0.25	
	PR1825		GL		0.1			
	PR1510	100~150~200	GH				0.25	
	PR1525		GL		0.1			

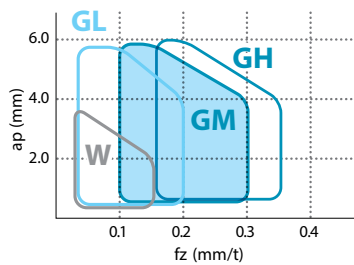
★ : 1st Recommendation ☆: 2nd Recommendation

Recommended application range

Workpiece material: Gray cast iron



Workpiece material: Nodular cast iron



Notes:

1. When using W, please use together with GM or GH.
2. If machining fz=0.2 or over, insert corner will be damaged. The main cutting edge of W insert is receding from that of GM and GH. Therefore, the feed rate for the insert next to W type is double of the other inserts.

M

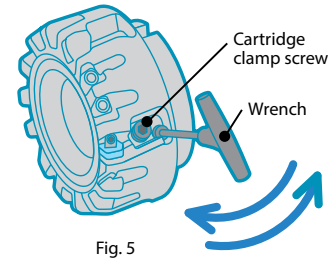
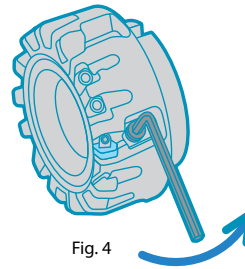
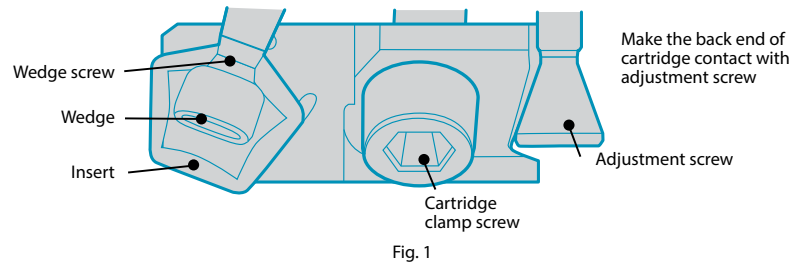


Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

How to adjust cutting edge height

1. Assemble all related parts into the cutter.
2. Make sure the back end of cartridge makes contact with adjustment screw (Fig. 1), and pull them lightly inwards (Fig. 2).
Tighten the cartridge clamp screw temporary.
3. Install the insert (Fig. 3), and tighten the wedge screw temporary.
Temporarily tighten the screw with a 40 to 45 degree rotation after the wedge contacts the insert.
4. Loosen the cartridge clamp screw. (Fig. 4)
5. Adjust the extruding amount with adjustment screw. (Fig. 5)
6. Tighten the wedge screw and firmly fix the insert.
(Recommended tightening torque: 6N·m)
7. Tighten the cartridge clamp screw firmly.
(Recommended tightening torque: 10N·m)



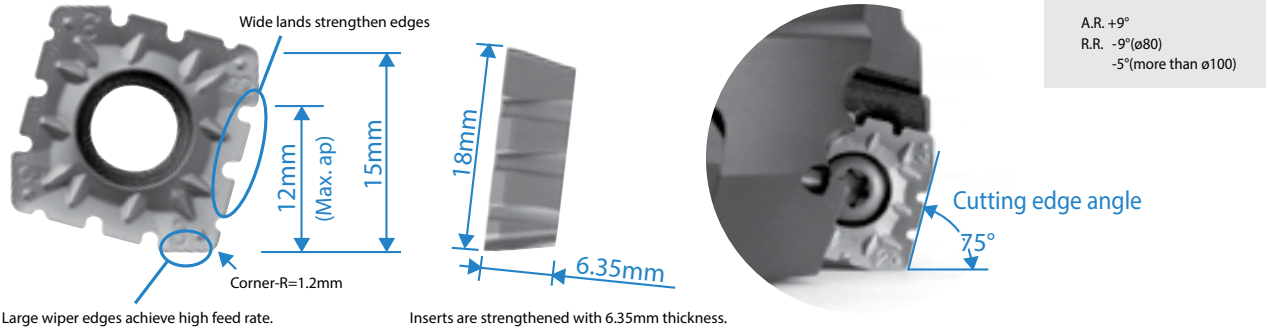
Notes:

1. Follow steps 1 ~ 7 above for adjustment.
2. To adjust the edge height adjust the wedge screw and loosen the cartridge clamp screw.
Tightening the adjustment screw with the clamp screw fixed firmly may damage the adjustment screw.
3. The adjusted edge height difference must be within 5 μ m.

MSRS15 face mill for heavy milling

Large depth of cut and high feed rate achieves high efficiency machining

Recommended ap: 5 ~ 10mm



Large wiper edges achieve high feed rate.

Inserts are strengthened with 6.35mm thickness.

Selection of chipbreaker

	Low cutting force	General purpose	Edge strength oriented
Insert type	NB2P(4-Notched) + NB3P(5-Notched)	NB2(2-Notched) + NB3(3-Notched)	NB2T(2-Notched) + NB3T(3-Notched)
Applications	When using long arbor or for machining of thin-plate workpieces	General purpose type with good balance of strength and cutting force	For interrupted machining and high load machining When feed rate is increased or workpiece material is cast iron
Edge preparation	As many as four (or five) notches help to alleviate the shock when biting into the workpiece	Strength, edge and chip control are all well balance	Strength is increased by the edge shape and moderate rake angle of the chamfer edge

A supplemental chipbreaker is used when it is necessary to increase strength and bite while focusing on resistance, as when machining welded areas.



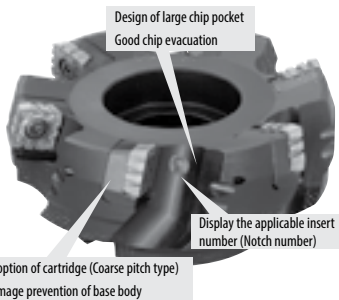
• About insert no. of NB2P (4-notched) and NB3P (5-notched)
In order to adjust applicable inserts on marked numbers on toolholders, "2+" is marked for NB2P (4-notched) and "3+" is marked on NB3P (5-notched).

M
Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

Features of toolholder

Coarse pitch



Fine pitch

Higher productivity with fine pitch design



Insert replacement identification



Insert number is transcribed as a result of the cutting tool load.



* Depending on the cutting conditions, marks are not transcribed.

SPMT

Insert		Description	No. of edges	Dimension (mm)					Angle (°)		Carbide			Applicable toolholder M59
				IC	S	D1	RE	BS	AN	AS	PVD			
											PRI1810	PRI1825	PRI1835	
<p>Classification of usage</p> <p>★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)</p>										★ ☆			P	
														M
														K
														N
												★		S
												★		H
		SPMT 1806EDER-NB2	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...
		SPMT 1806EDER-NB3	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...
		SPMT 1806EDER-NB2P	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...
		SPMT 1806EDER-NB3P	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...
		SPMT 1806EDSR-NB2T	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...
		SPMT 1806EDSR-NB3T	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...
		SPMT 1806EDER-V	4	18	6.35	6.8	1.2	3.1	11	15	●	●	●	MSRS15...

Handed insert shows Right-hand

Recommended cutting conditions M61

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M60

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter


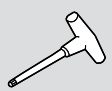
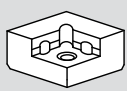

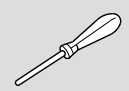
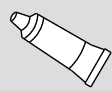

Multi-Function


Slot Mill

Ball-nose Radius

Others

Spare parts (common to Metric / Inch spec)

Description		Spare parts								
		Clamp screw	Wrench	Cartridge	Clamp screw	Wrench	Anti-seize compound	Mounting bolt		
										
Coarse pitch	MSRS 15080R-○○(M)	SB-60120TR	TT-25L	MAP-1806	SB-40140TR	DT-15	P-37	HH12X35		
	MSRS 15100R-○○(M)							Recommended tightening torque for insert clamp 7.5N·m	Recommended tightening torque for cartridge clamp 3.5N·m	-
	15315R-○○(M)									
Fine pitch	MSRS 15080R-○○(M)	SB-60120TR	TT-25L	-	-	-	P-37	HH12X35		
	MSRS 15100R-○○(M)							Recommended tightening torque for insert clamp 7.5N·m	-	
	15315R-○○(M)									

 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Recommended cutting conditions

Workpiece material	fz (mm/t)			Recommended insert grades (Vc: m/min)		
	NB2P + NB3P	NB2 + NB3	NB2T + NB3T	MEGACOAT NANO EX		
				PR1810	PR1825	PR1835
Carbon steel	0.15	0.2	0.3	-	★ 120~180~250	☆ 120~180~220
Alloy steel	0.15	0.2	0.3	-	★ 120~180~250	☆ 120~180~220
Mold steel	0.1	0.15	0.2	-	★ 100~160~220	☆ 100~160~200
Gray cast iron	0.2	0.25	0.35	★ 120~180~250	-	-
Nodular cast iron	0.15	0.2	0.3	★ 100~160~220	-	-
Stainless steel	Not recommended					
Aluminum/Copper	Not recommended					

★: 1st Recommendation ☆: 2nd Recommendation



Tangential 90° end mill with 4-edge inserts

MA90

Original tangential 90° end mill with economical 4-edge inserts. New grade PR18 Series and unique insert cutting edge design creates high-quality machining with longer tool life

1 The MA90 tangential end mills provide a large variety of machining operations

Challenges

- Conventional end mill**
- Sudden fractures can cause damage to the holder
 - Insert defects preventing use of all four corners
- Tangential end mill**
- Premature tool wear can quickly deteriorate the surface finish quality
 - Poor wall accuracy

SOLUTION

Kyocera's MA90 tangential end mill solves these problems with a unique insert shape and PR18 Series grade technology.

M



- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Large web thickness
High rigidity

Peripheral grinding specifications
Excellent wall accuracy

Special wiper edge
Large relief angle suppresses wear
High-quality surface finish



Multifunctional (G-class insert)
Supports 3-dimensional machining (Excluding R4-R6)

Unique cutting edge design
Excellent fracture resistance and low cutting force design

Newly developed insert grade
MEGACOAT NANO EX
PR18 Series delivers longer tool life

2 New insert grade PR18 Series provides a significantly longer tool life

Extensive lineup of insert grades covers a variety of machining materials and applications

Workpiece material	P Steel					M Stainless steel					K Cast iron				
	ISO	01	10	20	30	40	01	10	20	30	40	01	10	20	30	40
Lineup	1st recommendation PR1825 Wet					1st recommendation PR1835 High-speed machining					1st recommendation PR1810				
	PR1835					CA6535									
H Hard materials	PR015S (GH)					S Heat-resistant alloy CA6535 (PR1835)					Titanium alloy PR1835				

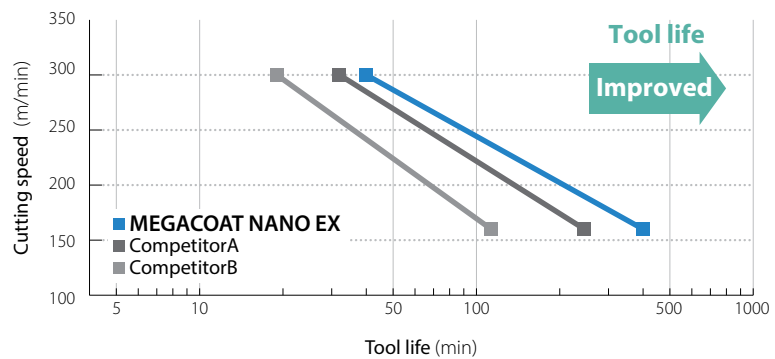
PR1825 Wear resistance comparison (Internal evaluation)

V-T graph

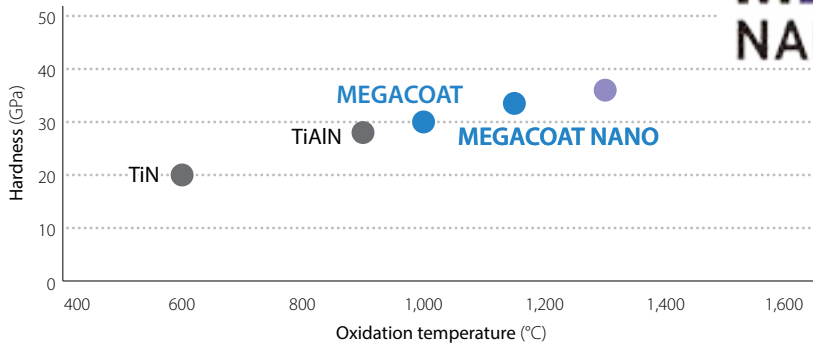
Life criteria:
Flank face wear = 0.10 mm

Cutting conditions:

Vc = 160/300 m/min
ap x ae = 2.0 x 110 mm, fz = 0.12 mm/t
42CrMo4 Dry
PNMU1205ANER-GM (MFPN)



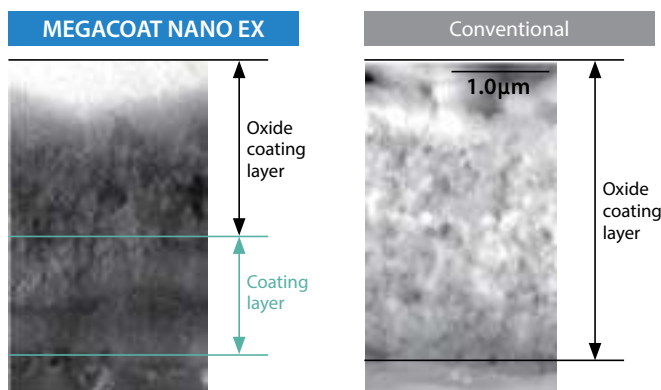
Coating characteristics (Internal evaluation)



MEGACOAT
NANO EX | Milling

Oxidation progression comparison (Internal evaluation)

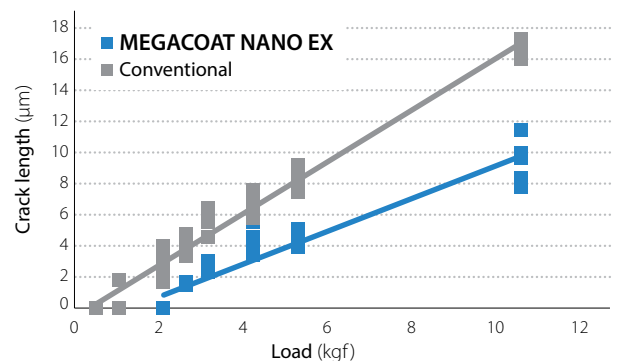
Suppresses oxidation progression with excellent oxidation resistance



*Section after holding at 1,200 degrees for 30 minutes in air

Coating layer toughness evaluation (Internal evaluation)

Excellent coating toughness with small crack length



*Micro-Vickers measurement

M
Milling

3 Achieve reliable results with an insert shape designed for high quality machining and long tool life

Unique cutting edge design delivers high fracture resistance and low cutting forces

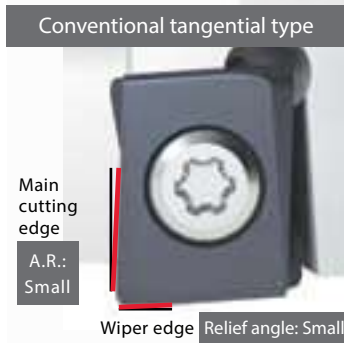
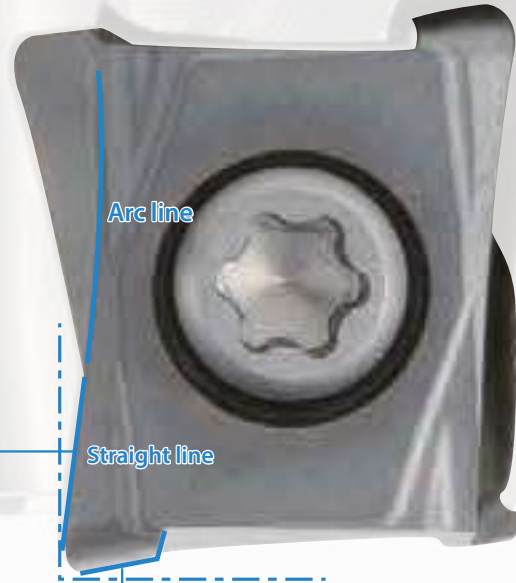
Special wiper edge and peripheral grinding specifications provide high quality finish and long tool life

Advantage

Both the A.R. and the relief angle of the wiper edge are large. Low resistance and excellent surface finish



Unique cutting edge design
Superior fracture resistance and low cutting force



Special wiper edge

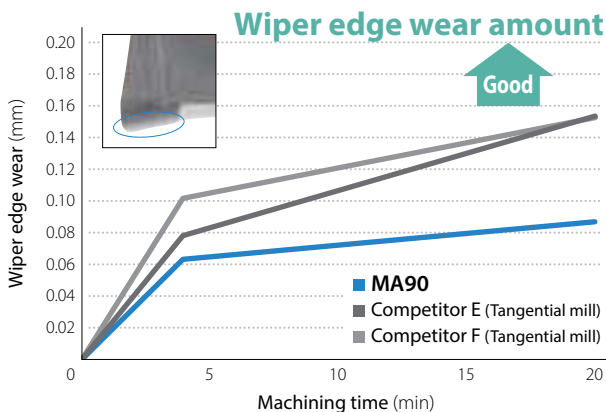
Large relief angle: Excellent surface finish and wear suppression
Stepped corners: Designed to prevent seat damage

Excellent Cutting edge angle 88°/90°

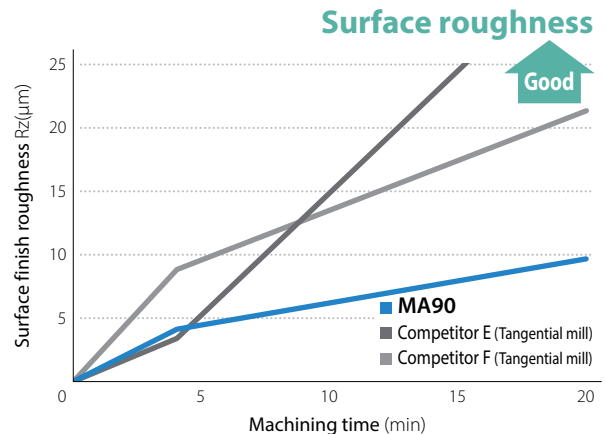
Special wiper edge design suppresses abrasion progress of the edge. Maintains high-quality finished surface

Wear and surface finish comparison (Internal evaluation)

Wiper edge wear



Surface finish roughness (Bottom surface)



Cutting conditions: Vc = 200 m/min, ap x ae = 1 x 37.5 mm, fz = 0.1/0.12 mm/t, Dry C50 ø50 (6/7 inserts) BT50



Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

Excellent wall accuracy

Excellent

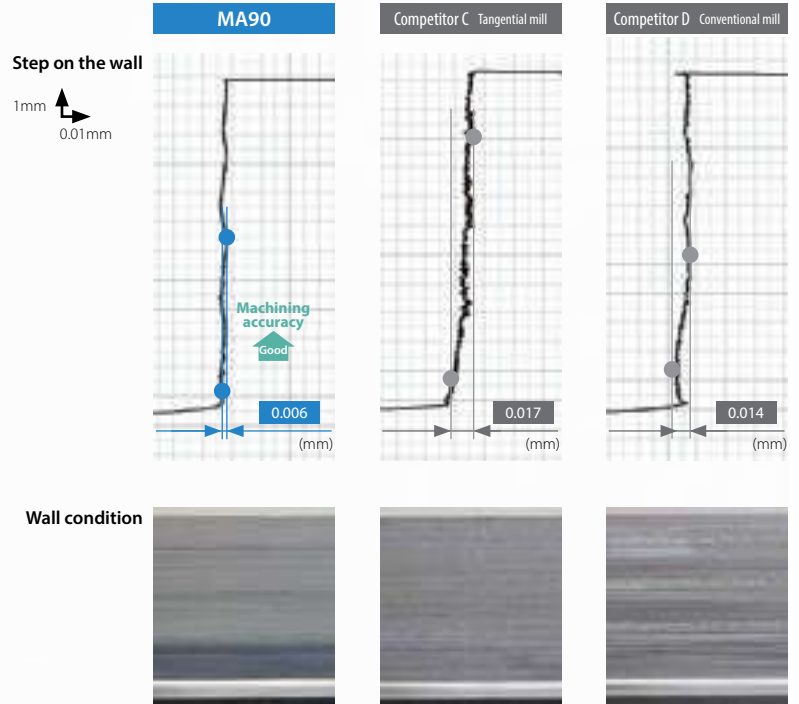
Peripheral grinding specifications

Unique, sloped, edge shape

Grounded peripheral provides higher precision



Wall accuracy comparison (Internal evaluation)



Cutting conditions: Vc = 150 m/min, ap x ae = 3 x 5 mm 4passes, fz = 0.1 mm/t, Dry C50 ø20 (3 inserts) BT50



Long tool life and high-speed machining

CASE Even if the main cutting edge is in good condition, the tool reached the end of life due to deterioration of the finished surface.



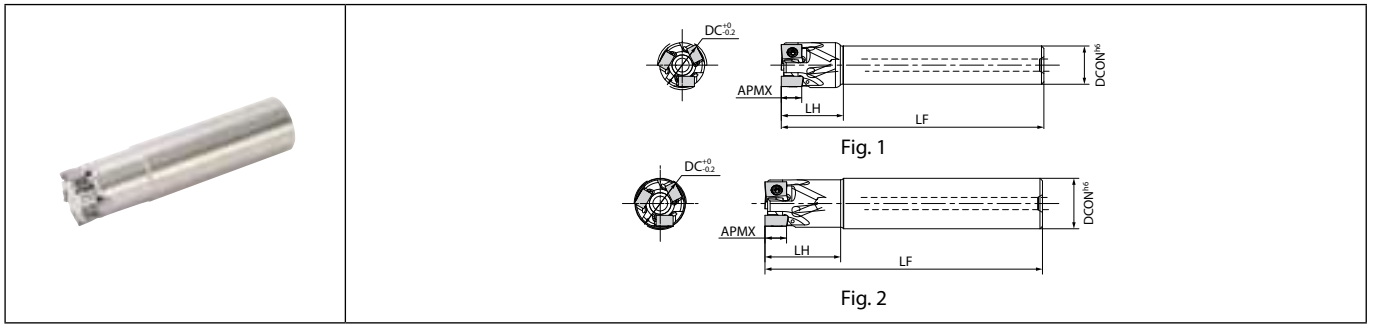
CASE Machined with reduced cutting speed because the surface finish deteriorated early.



Edge condition and finished surface (Internal evaluation)

		MA90	Competitor E Tangential	Competitor F Tangential
Wiper edge	After 3.8 min			
	After 6.5 min			
Main cutting edge		Abrasion progress: Small Good	Abrasion progress: Large Spark generation Good	Abrasion progress: Large Spark generation Good
Finished surface	After 13.1 min	Good 8.0µmRz (1.3µmRa)	Cloudy finish 20.6µmRz (2.2µmRa)	Surface finish deteriorating 14.9µmRz (3.0µmRa)
	Results	Main cutting edge: Good Wiper edge wear: Small wear Good finished surface and can continue to use	Main cutting edge: Good Wiper edge wear: Progressive Worse finished surface	Main cutting edge: Good Wiper edge wear: Progressive Worse finished surface

MA90 (End mill)



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)				Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts	
			DC	DCON	LF	LH					APMX	Anti-seize compound	Screw		Wrench
Cylindrical Standard shank	MA90	●	-16S12-09T2C	16	12	100	23	8	Yes	29500	0.1	P-37	SB-44865UTRP	DTPM-8	LOGU0904...
			-18S16-09T2C	18					27900						
			-20S16-09T2C	20	16				26600	0.2					
			-20S16-09T3C			110	26		25400						
			-22S20-09T3C	3	22				23900	0.3					
			-25S20-09T3C			20			22600						
			-25S20-09T4C	4	25	120	29		21900	0.5					
			-28S25-09T3C	3	28				21200						
			-30S25-09T4C	4	30	130	32		20300	0.9					
			-32S25-09T4C	5	32				19000	1					
			-32S25-09T5C			150	50		17000	0.9					
			-35S32-09T4C	4	35										
			-35S32-09T5C	5											
			-40S32-09T4C	4	40	32									
			-40S32-09T6C	6											
-50S32-09T5C	5	50	120	40											
-50S32-09T7C	7														
Same shank	MA90	●	-16S16-09T2C	16	16	100	26	8	Yes	29500	0.1	P-37	SB-44865UTRP	DTPM-8	LOGU0904...
			-20S20-09T2C	20	20	110	30		26600	0.2					
			-20S20-09T3C	3					23900	0.4					
			-25S25-09T3C			25	120	32		21200	0.7				
			-25S25-09T4C	4	25	25	130	40							
			-32S32-09T4C	5	32	32	130	40							
Long shank	MA90	●	-20S18-09T2CL	20	18	150	30	8	Yes	26600	0.3	P-37	SB-44880UTRP	DTPM-8	LOGU0904...
			-20S20-09T2CL				40		23900	0.6					
			-25S25-09T2CL	25	25	170	50		21200	1.1					
			-32S32-09T2CL	32	32	200	65								

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter




Multi-Function

Slot Mill

Ball-nose Radius

Others

Toolholder dimensions

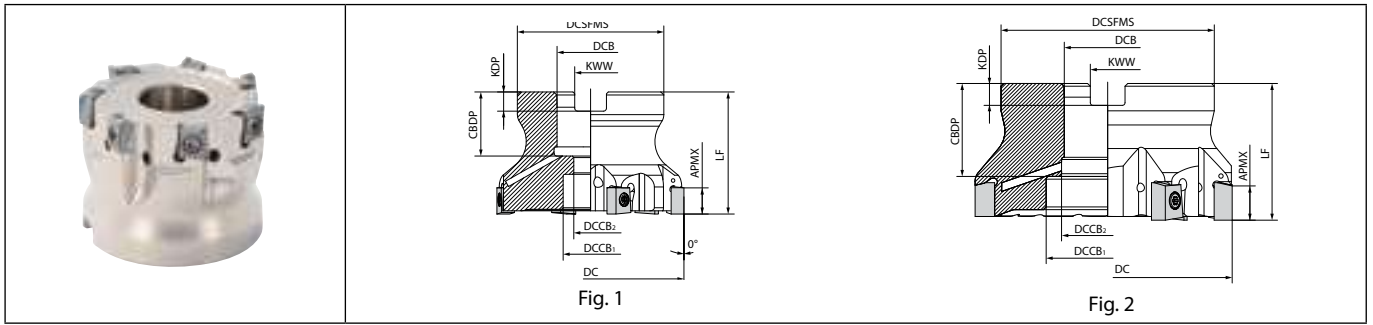
Description	Availability	Inserts	Dimension (mm)					Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts
			DC	D _{CON}	LF	LH	APMX					Anti-seize compound	Screw	Wrench	
															
Cylindrical Standard shank	●	2	25	20	120	29	12	Yes	18300	0.3	1	P-37	SB-40104TRP	DTPM-15	LOGT1206... LOGU1206...
			28						17300	0.4					
			30	25	130	32			16800	0.5					
			32						16300						
			35						15600						
			40	150	50				14600	0.9					
			50	120	40				13100	0.8					
			32												
			32												
			32												
			32												
			Same shank	●	2	25			25	120					
32	32	130				40	16300	0.7							
32															
Long shank	●	2	25	25	170	50	12	Yes	18300	0.6	2	P-37	SB-40104TRP	DTPM-15	LOGT1206... LOGU1206...
			32	32	200	65			16300	1.1					

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MT0 : Made to order

MA90 (Face mill)



Toolholder dimensions

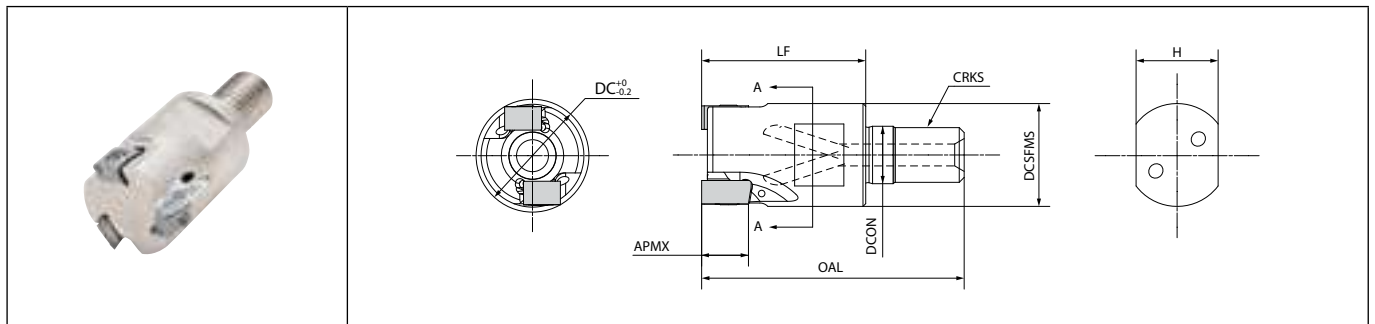
Description	Availability	Inserts	Dimension (mm)										Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts	
			R	DC	DCSFMS	DCB	DCCB1	DCCB2	LF	CBDP	KDP	KWW					APMX	Anti-seize compound	Screw		Wrench
Metric	MA90	● 4	40	38	16	15	9	19	5.6	8.4	8	Yes	26600	0.2	1	P-37	SB-44880TRP	DTPM-8	LOGU0904...		
		● 6	50				40					23900	0.4								
		● 5	50				40					23900	0.4								
		● 7	48	22	18	11	21	6.3	10.4			21200	0.5								
		● 6	63									21200	0.4								
		● 9	63																		
	MA90	● 3	40	38	16	14	9	19	5.6	8.4	12	Yes	14600	0.2	1	P-37	SB-40104TRP	DTPM-15	LOGT1206... LOGU1206...		
		● 4	50				40						13100	0.3							
		● 5	50				40						13100	0.3							
		● 6	48	22	18	11	21	6.3	10.4				11700	0.4							
		● 8	63										11700	0.4							
		● 7	80	70	27	20	13	24	7	12.4				10400						1.2	
Bore dia. inch spec	MA90	● 7	80	70	25.4	20	13	27	6	9.5	12	Yes	10400	1.2	1	P-37	SB-40104TRP	DTPM-15	LOGT1206... LOGU1206...		
		● 10	100	78	31.75	45	50	34	8	12.7			9300	1.5							
		● 9	100	78	31.75	45	50	34	8	12.7			9300	1.5							
		● 13	125	89	40	55	63	33	9	16.4			8300	2.5							
		● 12	125	89	38.1	55	63	38	10	15.9			8300	2.6							
		● 16	125	89	38.1	55	63	38	10	15.9			8300	2.6							



- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MA90 (Modular type)



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)								Coolant hole	Max. revolution (min ⁻¹)	Spare parts			Applicable inserts
			DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H			Anti-seize compound	Screw	Wrench	
MA90 -20M10-09T2C -20M10-09T3C -25M12-09T3C -25M12-09T4C -32M16-09T4C -32M16-09T5C	●	2	20	10.5	18.8	48	30		M10×1.5	15	19000	P-37	SB-44880UTRP	DTPM-8	LOGU0904...	
	●	3									17000					
	●	4	25	12.5	23	56	35	8	M12×1.75	19	Yes					15100
	●	5	32	17	30	62	40		M16×2.0	24						
	●	5	32	17	30	62	40		M16×2.0	24						
MA90 -25M12-12T2C -32M16-12T2C -32M16-12T3C	●	2	25	12.5	23	56	35		M12×1.75	19	18300	P-37	SB-40104TRP	DTPM-15	LOGT1206... LOGU1206...	
	●	3	32	17	30	62	40	12	M16×2.0	24	Yes					16300
	●	3	32	17	30	62	40		M16×2.0	24						

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability










LOGU

Classification of usage

- ★ : Roughing / 1st Choice
- ☆ : Roughing / 2nd Choice
- : Finishing / 1st Choice
- : Finishing / 2nd Choice
- (In case hardness is 45HRC or under)

Carbon steel / Alloy steel				★	☆	P
Mold and die steel				★	☆	
Austenitic stainless steel				☆	★	M
Martensitic stainless steel	★				☆	
Precipitation hardening stainless steel					★	
Stainless steel						K
Gray cast iron				★		
Nodular cast iron				★		
Non-ferrous metals						N
Heat-resistant alloy	★				☆	S
Titanium alloy					★	
Hard materials						H

Insert	Description	No. of edges	Dimension (mm)						Carbide					Applicable toolholder
			S	D1	RE	INSL	W1	BS	CVD		PVD			
									CA6535	PR0155	PR1810	PR1825	PR1835	
 General purpose	LOGU 090404ER-GM	4	6.77	3.33	0.4	8.89	4.3	1.29	●	●	●	●	MA90-...-09T...	
	090408ER-GM		6.71		0.8				●	●	●	●		
	090412ER-GM		6.65		1.2				●	●	●	●		
	090416ER-GM		6.59		1.6				●	●	●	●		
 Low cutting force	LOGU 090404ER-SM	4	6.77	3.33	0.4	8.89	4.3	1.29	●	●	●	●	MA90-...-09T...	
	090408ER-SM		6.71		0.8				●	●	●	●		
	090412ER-SM		6.65		1.2				●	●	●	●		
	090416ER-SM		6.59		1.6				●	●	●	●		
 Tough edge	LOGU 090408ER-GH	4	6.71	3.33	0.8	8.89	4.3	0.9	●	●	●	●	MA90-...-09T...	
 General purpose	LOGU 120604ER-GM	4	10.1	4.55	0.4	13.28	6.6	2.5	●	●	●	●	MA90-...-12T...	
	120608ER-GM		10.04		0.8			2.14	●	●	●	●		
	120612ER-GM		9.97		1.2			1.79	●	●	●	●		
	120616ER-GM		9.92		1.6			1.44	●	●	●	●		
	120620ER-GM		9.85		2			1.08	●	●	●	●		
	120624ER-GM		9.79		2.4			0.72	●	●	●	●		
	120630ER-GM		9.69		3			0.2	●	●	●	●		
 General purpose (Single-sided)	LOGT 120640ER-GM	2	9.56	4.55	4	13.28	6.6	1.69	●	●	●	●	MA90-...-12T...	
	120650ER-GM		9.40		5			0.63	●	●	●	●		
	120660ER-GM		9.24		6			0.37	●	●	●	●		
 Low cutting force	LOGU 120604ER-SM	4	10.1	4.55	0.4	13.28	6.6	2.5	●	●	●	●	MA90-...-12T...	
	120608ER-SM		10.04		0.8			2.14	●	●	●	●		
	120612ER-SM		9.97		1.2			1.79	●	●	●	●		
	120616ER-SM		9.92		1.6			1.44	●	●	●	●		
	120620ER-SM		9.85		2			1.08	●	●	●	●		
	120624ER-SM		9.79		2.4			0.72	●	●	●	●		
	120630ER-SM		9.69		3			0.2	●	●	●	●		
 Tough edge	LOGU 120608ER-GH	4	10.16	4.55	0.8	13.25	6.6	2.26	●	●	●	MA90-...-12T...		

M



Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M70

Recommended cutting conditions

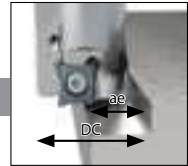
Chipbreaker	Workpiece material	Toolholder description and Feed fz (mm/t)				Recommended insert grade (Cutting speed Vc: m/min)				
		09 Size (LOGU09...)		12 Size (LOG□12...)		CVD coated carbide	MEGACOAT HARD	MEGACOAT NANO EX		
		MA90-16~18	MA90-20~50 MA90-040~063	MA90-25~30	MA90-32~50 MA90-040~125	CA6535	PR015S	PR1810	PR1825	PR1835
GM	Carbon steel	0.05 ~ 0.1 ~ 0.14	0.05 ~ 0.1 ~ 0.16	0.05 ~ 0.1 ~ 0.18	0.06 ~ 0.15 ~ 0.23	-	-	-	★ 120 ~ 180 ~ 250	☆ 120 ~ 180 ~ 250
	Alloy steel	0.05 ~ 0.08 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.05 ~ 0.1 ~ 0.16	0.06 ~ 0.13 ~ 0.2	-	-	-	★ 100 ~ 160 ~ 220	☆ 100 ~ 160 ~ 220
	Mold steel	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.1 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.06 ~ 0.12 ~ 0.18	-	-	-	★ 80 ~ 140 ~ 180	☆ 80 ~ 140 ~ 180
	Stainless steel (Austenitic related)	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.1 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.06 ~ 0.12 ~ 0.18	-	-	-	☆ 100 ~ 160 ~ 200	★ 100 ~ 160 ~ 200
	Stainless steel (Martensitic related)	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.1 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.06 ~ 0.12 ~ 0.18	★ 180 ~ 240 ~ 300	-	-	-	☆ 150 ~ 200 ~ 250
	Stainless steel (Precipitation hardening)	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.1 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.06 ~ 0.12 ~ 0.18	-	-	-	-	★ 90 ~ 120 ~ 150
	Gray cast iron	0.05 ~ 0.1 ~ 0.14	0.05 ~ 0.1 ~ 0.16	0.05 ~ 0.1 ~ 0.18	0.06 ~ 0.15 ~ 0.23	-	-	☆ 120 ~ 180 ~ 250	-	-
	Nodular cast iron	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.1 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.06 ~ 0.12 ~ 0.18	-	-	☆ 100 ~ 150 ~ 200	-	-
	Ni-base heat-resistant alloys	0.05 ~ 0.06 ~ 0.08	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.08 ~ 0.12	0.06 ~ 0.1 ~ 0.15	★ 20 ~ 30 ~ 50	-	-	-	☆ 20 ~ 30 ~ 50
	Titanium alloys	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.09 ~ 0.12	0.05 ~ 0.09 ~ 0.12	0.06 ~ 0.1 ~ 0.15	-	-	-	-	☆ 30 ~ 50 ~ 70
SM	Carbon steel	0.05 ~ 0.08 ~ 0.11	0.05 ~ 0.1 ~ 0.14	0.05 ~ 0.1 ~ 0.14	0.06 ~ 0.1 ~ 0.18	-	-	-	★ 120 ~ 180 ~ 250	☆ 120 ~ 180 ~ 250
	Alloy steel	0.05 ~ 0.07 ~ 0.1	0.05 ~ 0.08 ~ 0.12	0.05 ~ 0.08 ~ 0.12	0.06 ~ 0.1 ~ 0.14	-	-	-	★ 100 ~ 160 ~ 220	☆ 100 ~ 160 ~ 220
	Mold steel	0.05 ~ 0.07 ~ 0.1	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.08 ~ 0.12	0.06 ~ 0.1 ~ 0.14	-	-	-	★ 80 ~ 140 ~ 180	☆ 80 ~ 140 ~ 180
	Stainless steel (Austenitic related)	0.05 ~ 0.08 ~ 0.11	0.05 ~ 0.08 ~ 0.12	0.05 ~ 0.08 ~ 0.12	0.06 ~ 0.1 ~ 0.14	-	-	-	☆ 100 ~ 160 ~ 200	★ 100 ~ 160 ~ 200
	Stainless steel (Martensitic related)	0.05 ~ 0.08 ~ 0.11	0.05 ~ 0.08 ~ 0.12	0.05 ~ 0.08 ~ 0.12	0.06 ~ 0.1 ~ 0.14	★ 180 ~ 240 ~ 300	-	-	-	☆ 150 ~ 200 ~ 250
	Stainless steel (Precipitation hardening)	0.05 ~ 0.08 ~ 0.11	0.05 ~ 0.08 ~ 0.12	0.05 ~ 0.08 ~ 0.12	0.06 ~ 0.1 ~ 0.14	-	-	-	-	★ 90 ~ 120 ~ 150
	Ni-base heat-resistant alloys	0.05 ~ 0.06 ~ 0.08	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.08 ~ 0.1	0.06 ~ 0.08 ~ 0.12	★ 20 ~ 30 ~ 50	-	-	-	☆ 20 ~ 30 ~ 50
	Titanium alloys	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.08 ~ 0.12	0.05 ~ 0.08 ~ 0.12	0.06 ~ 0.09 ~ 0.12	-	-	-	-	★ 30 ~ 50 ~ 70
GH	Carbon steel	0.05 ~ 0.1 ~ 0.14	0.05 ~ 0.1 ~ 0.16	0.05 ~ 0.1 ~ 0.18	0.06 ~ 0.15 ~ 0.23	-	-	-	★ 120 ~ 180 ~ 250	☆ 120 ~ 180 ~ 250
	Alloy steel	0.05 ~ 0.08 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.05 ~ 0.1 ~ 0.16	0.06 ~ 0.13 ~ 0.2	-	-	-	★ 100 ~ 160 ~ 220	☆ 100 ~ 160 ~ 220
	Mold steel	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.1 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.06 ~ 0.12 ~ 0.18	-	-	-	★ 80 ~ 140 ~ 180	☆ 80 ~ 140 ~ 180
	Stainless steel (Austenitic related)	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.1 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.06 ~ 0.12 ~ 0.18	-	-	-	☆ 100 ~ 160 ~ 200	☆ 100 ~ 160 ~ 200
	Stainless steel (Martensitic related)	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.1 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.06 ~ 0.12 ~ 0.18	-	-	-	-	☆ 150 ~ 200 ~ 250
	Stainless steel (Precipitation hardening)	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.1 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.06 ~ 0.12 ~ 0.18	-	-	-	-	☆ 90 ~ 120 ~ 150
	Gray cast iron	0.05 ~ 0.1 ~ 0.14	0.05 ~ 0.1 ~ 0.16	0.05 ~ 0.1 ~ 0.18	0.06 ~ 0.15 ~ 0.23	-	-	★ 120 ~ 180 ~ 250	-	-
	Nodular cast iron	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.1 ~ 0.12	0.05 ~ 0.1 ~ 0.14	0.06 ~ 0.12 ~ 0.18	-	-	★ 100 ~ 150 ~ 200	-	-
	Ni-base heat-resistant alloys	0.05 ~ 0.06 ~ 0.08	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.08 ~ 0.12	0.06 ~ 0.1 ~ 0.15	-	-	-	-	☆ 20 ~ 30 ~ 50
	Titanium alloys	0.05 ~ 0.08 ~ 0.1	0.05 ~ 0.09 ~ 0.12	0.05 ~ 0.09 ~ 0.12	0.06 ~ 0.1 ~ 0.15	-	-	-	-	☆ 30 ~ 50 ~ 70

★: 1st Recommendation ☆: 2nd Recommendation

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
 * Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys. When choosing wet machining for other workpiece materials, reduce the cutting speed to 70% or less.
 * Face milling does not recommend slotting or pocketing. We recommend setting the ae to 75% or less. We recommend the small number insert type for ae of 30% or more.
 * Working above recommended conditions or long-term use can damage the screws. It is recommended to replace the screws regularly.
 * Ramping and Helical milling are not recommended if the corner R is R4.0/R5.0/R6.0.



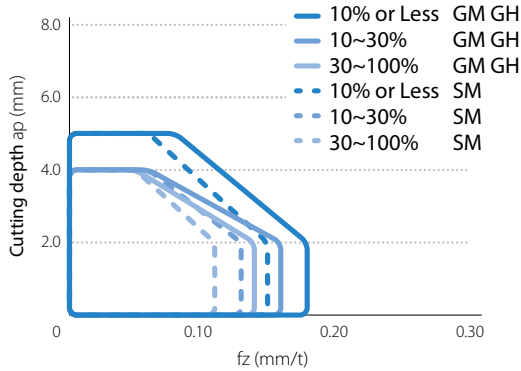
Cutting Performance



09 Size (LOGU09...) Machining for Steel (Dry)

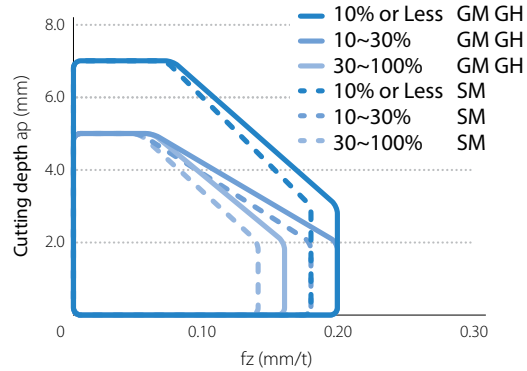
Cutting Dia. DC : $\phi 16 \sim \phi 18$

ae/DC



Cutting Dia. DC : $\phi 20 \sim \phi 63$

ae/DC

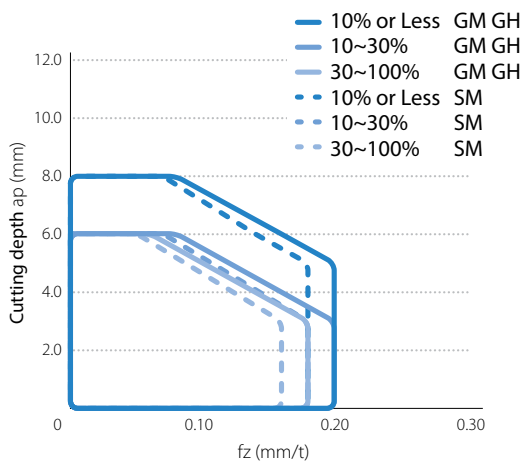


For other workpiece material, set ap and fz appropriately for each ae.

12 Size (LOG12...) Machining for Steel (Dry)

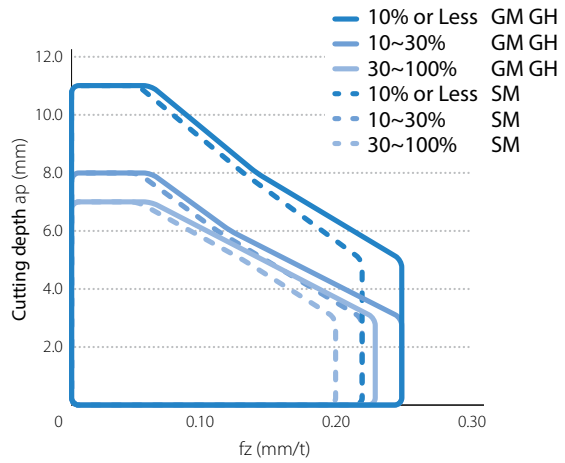
Cutting Dia. DC : $\phi 25 \sim \phi 30$

ae/DC



Cutting Dia. DC : $\phi 32 \sim \phi 125$

ae/DC



For other workpiece material, set ap and fz appropriately for each ae.

M
Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Case studies

Brake parts GGG50

Vc = 135 m/min
n = 535 min⁻¹
ap x ae = 3.4 x 25 mm
fz = 0.15 mm/t
Vf = 560 mm/min
Wet
MA90-080R-12T7C-M
LOGU120616ER-GM (PR1810)



Number of Workpieces

MA90 (7 inserts) **1,000 pcs**

Competitor G (7 inserts) **600 pcs**

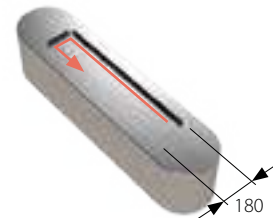
Tool life
x1.6

MA90 showed good cutting edge condition and stable machining. Achieved 1.6 times longer tool life.

(User evaluation)

Mold parts Stainless steel

Vc = 125 m/min
n = 1,600 min⁻¹
ap x ae = 1.0 x 25 mm
fz = 0.12 mm/t
Vf = 570 mm/min
Dry
MA90-25S20-09T3C
LOGU090408ER-GM (PR1835)



Machining efficiency

MA90 (3 inserts) **Q = 14.5 cc/min**

Competitor H (3 inserts) **Q = 9.5 cc/min**

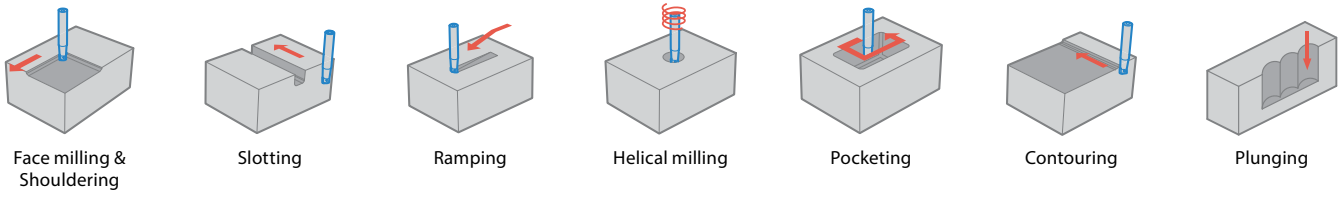
Machining efficiency
x1.5

MA90 showed 1.5 times higher machining efficiency than its competitors. Improved tool life (3 to 4 pcs)

(User evaluation)

Notes

Applications



Ramping reference table

Description	Cutter diameter DC (mm)	16	20	25	32	40	50
MA...-09-...	Max. ramping angle RMPX	1.16°	0.97°	0.64°	0.4°	0.23°	0.11°
	tan RMPX	0.020	0.017	0.011	0.007	0.004	0.002
Description	Cutter diameter DC (mm)	25	28	30	32	35	40
MA...-12-...	Max. ramping angle RMPX	2°	1.7°	1.6°	1.5°	1.2°	1°
	tan RMPX	0.034	0.030	0.027	0.026	0.021	0.017

Decrease the angle of inclination when the chips extend longer.
Ramping is not recommended if the corner R is R4.0/R5.0/R6.0.

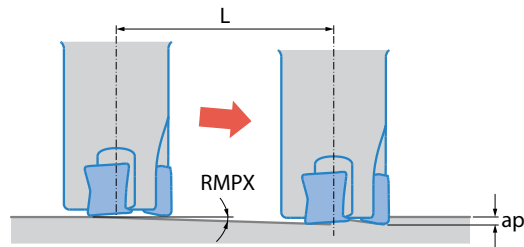
Guide for Ramping

Ramping angle should be under RMPX.
Reduce recommended feed rate by 70%

Formula of the cutting length "L" at Max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$

Ramping is not recommended if the corner R is R4.0/R5.0/R6.0.

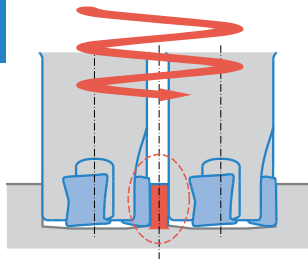


Guide for Helical milling

For helical milling, use between Min. cutting dia. and Max. cutting dia.

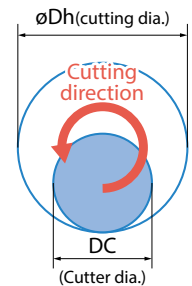
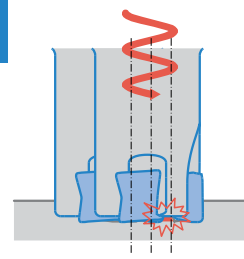
Exceeding Max. cutting dia.

Center core part remains after machining



Under Min. cutting dia.

Center core part interferes with toolholder

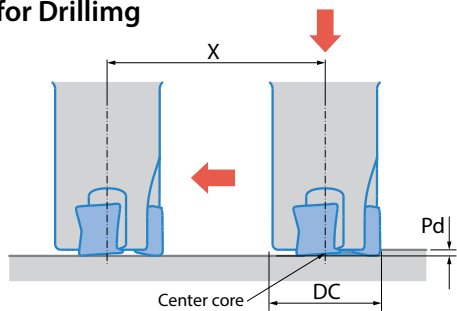


Unit : mm

Description	Min. cutting dia. øDh1	Max. cutting dia. øDh2
MA...-09-...	2×DC-4	2×DC-2
MA...-12-...	2×DC-6	2×DC-2

Helical milling is not recommended if the corner R is R4.0/R5.0/R6.0.

Guide for Drilling

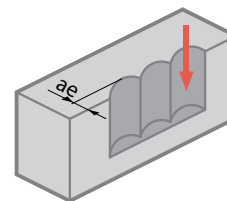


Unit : mm

Description	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MA...-09-...	0.25	DC-3
MA...-12-...	0.5	DC-5

It is recommended to reduce feed by 25% of recommendation until the center core is removed when traversing after drilling.

Guide for Plunging



Available for vertical milling (plunging)
Feed should be set within fz = 0.1 (mm/t) when plunging.

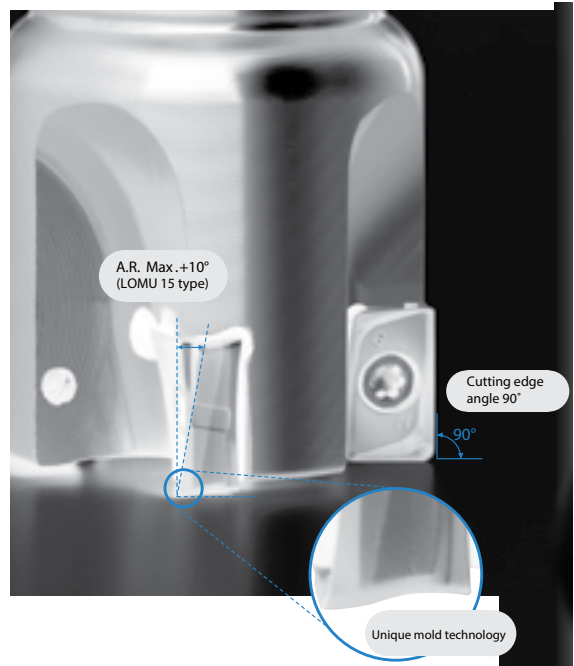
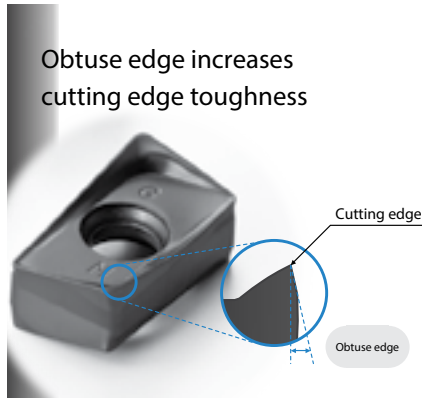
Unit : mm

Description	Maximum width of cut (ae)
MA...-09-...	2
MA...-12-...	3

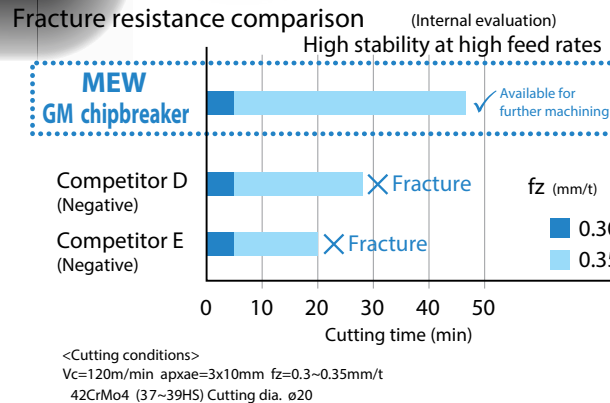
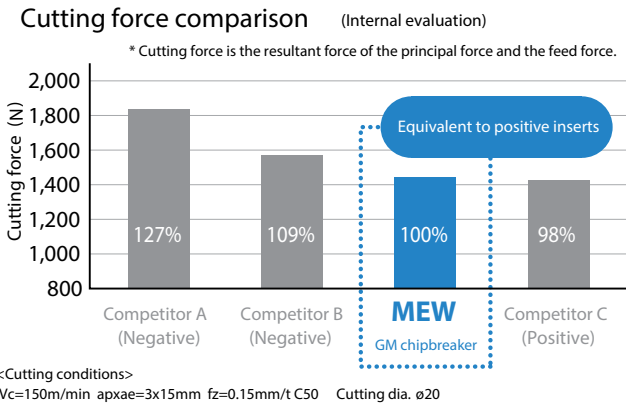
Double-sided 4-edge insert

MEW

Kyocera's unique mold technology reduces cutting force equivalent to positive inserts

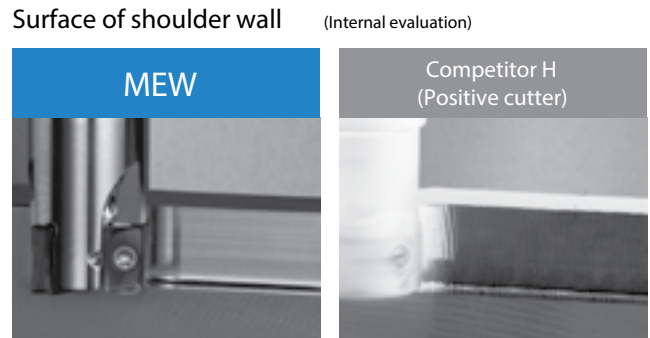


Low cutting force equivalent to positive inserts



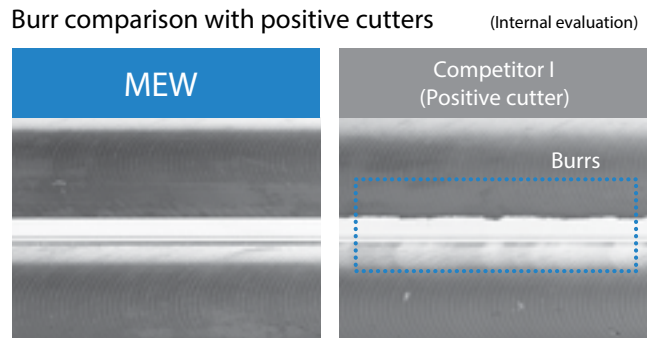
Improved surface finish, minimizing chattering

Sharp cutting and superior resistance to chattering and burrs with helical cutting edge and optimum axial rake design



Smooth surface of MEW without chattering

<Cutting conditions>
Vc=240m/min apxae= 4 (3passes) x5mm fz=0.12mm/t Dry S5400 Cutting dia. ø20



Sharp cutting enables less burrs than positive cutters

<Cutting conditions>
Vc=250m/min apxae=4x5mm fz=0.1mm/t Dry C50 Cutting dia. ø20

MEW GM chipbreaker	Competitor F (Negative)	Competitor G (Positive)
+20°	+17°	+17°

Large actual rake angle lowers cutting force

M

Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Long tool life by MEGACOAT NANO technology

Stable and longer tool life by special nano coating layer "MEGACOAT NANO EX"

PR1825

For steel and stainless steel (austenitic related)

PR1810

For cast iron

PR1835(PR1535)

For heat-resistant alloys, titanium and stainless steel (precipitation hardening)

CA6535

CVD coated carbide for heat-resistant alloys and stainless steel (martensitic)

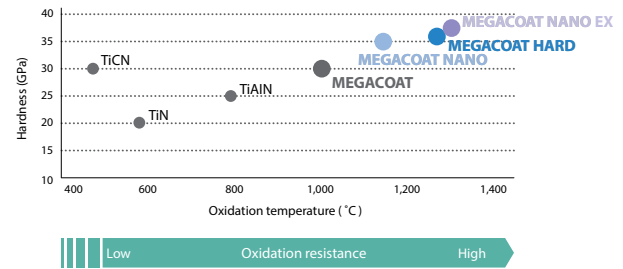
PDL025

DLC coated carbide for non-ferrous metals

GW25

Carbide for non-ferrous metals

Properties of coating



Prevents wear and fracture with high hardness (35GPa) and superior oxidation resistance (Oxidation temperature: 1,150°C)

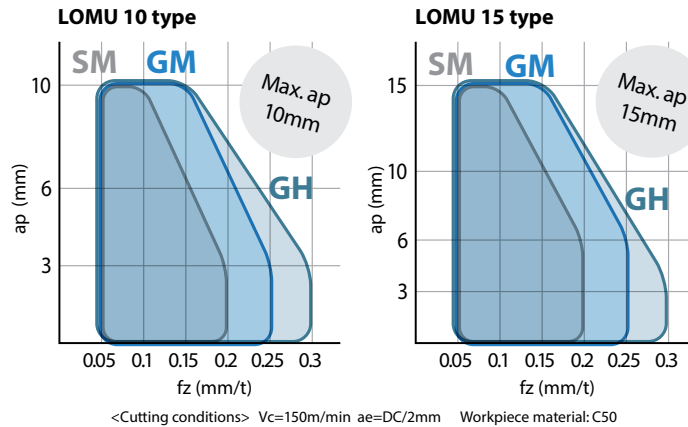
PR015S

MEGACOAT HARD for hard materials

Various chipbreaker lineup

Newly developed 4 chipbreakers for various applications
Applicable to a wide range of application

Chipbreaker	Applications	Insert
GM	General purpose	
SM	Low cutting force	
GH	For heavy milling	
AM	For non-ferrous metals	



M



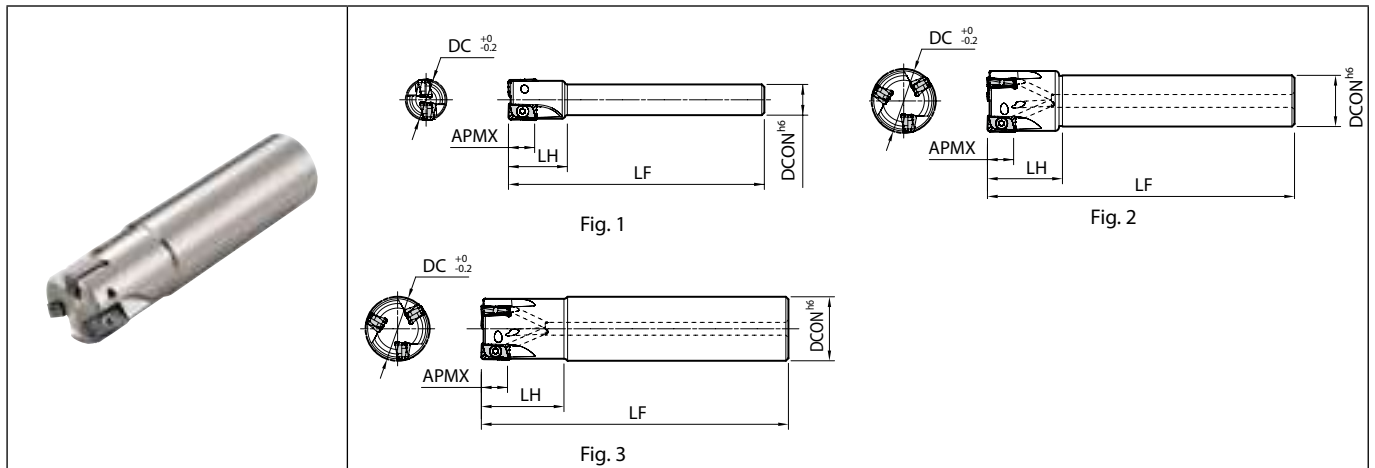
Milling

Lineup of corner-R(RE)

Corner-R(RE) 0.4, 1.0, 1.2, 1.6 and 2.0 added to GM chipbreaker lineup

LOMU100404ER-GM LOMU150504ER-GM	LOMU100408ER-GM LOMU150508ER-GM	LOMU150510ER-GM	LOMU100412ER-GM LOMU150512ER-GM	LOMU100416ER-GM LOMU150516ER-GM	LOMU100420ER-GM LOMU150520ER-GM

MEW



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)				A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Fig.	Spare parts			Applicable inserts M81
			DC	DCON	LF	APMX						Anti-seize compound	Screw	Wrench	
Standard shank	MEW	●	16	12	23	10	+7	-22	No	43750	1	P-37	SB-3065TRP	DTPM-8	LOGT1004... LOMU1004...
			18	100	25				43000	2					
			20	16	110				26	41000	2				
			22	20	110				26	39600	2				
			25	20	120				29	37500	2				
			28	28	120				29	35800	2				
			30	30	130				32	34800	2				
			32	32	130				32	33900	2				
			40	40	150				50	30000	2				
			50	50	120				40	22500	2				
Cylindrical	Same shank	●	16	16	100	26	10	+7	-22	43750	3	P-37	SB-3065TRP	DTPM-8	LOGT1004... LOMU1004...
			20	20	110	30				41000	3				
			25	25	120	32				37500	3				
			32	32	130	40				33900	3				
			20	20	150	40				41000	3				
			25	25	170	50				37500	3				
			25	20	120	29				35000	2				
			32	25	130	32				30000	2				
Standard shank	MEW	●	40	32	150	50	15	+10	-22	25000	2	P-37	SB-4090TRP	DTPM-15	LOGT1505... LOMU1505...
			50	120	40	17000				2					
			25	25	120	32				35000	3				
			32	32	130	40				30000	3				
Same shank	MEW	●	25	25	120	32	15	+10	-22	35000	3	P-37	SB-4090TRP	DTPM-15	LOGT1505... LOMU1505...
			32	32	130	40				30000	3				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

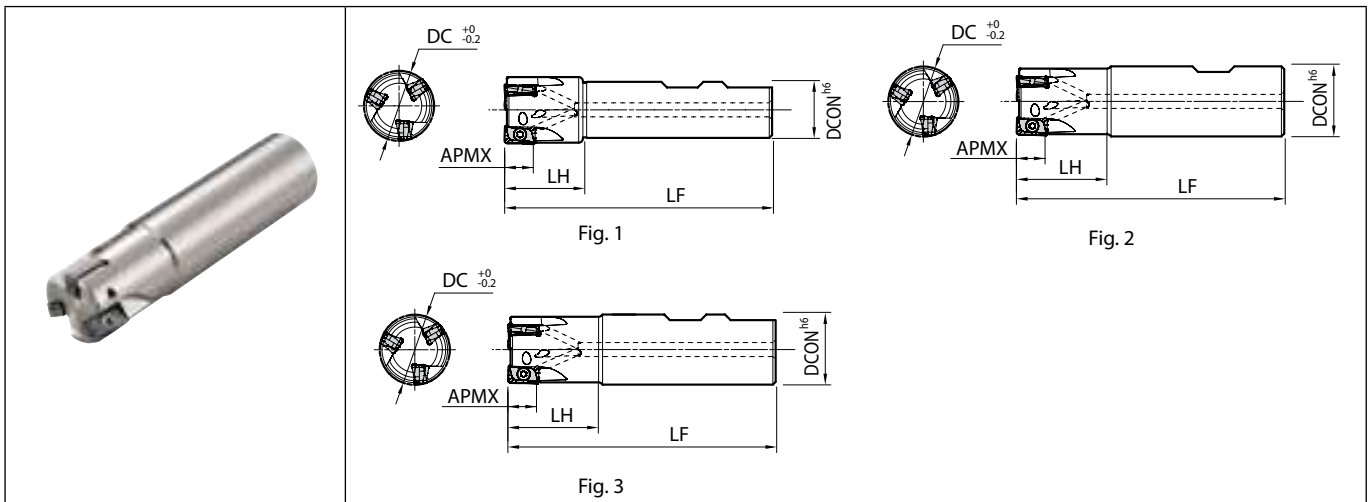
Multi-Function

Slot Mill

Ball-nose Radius

Others

MEW



Toolholder dimensions

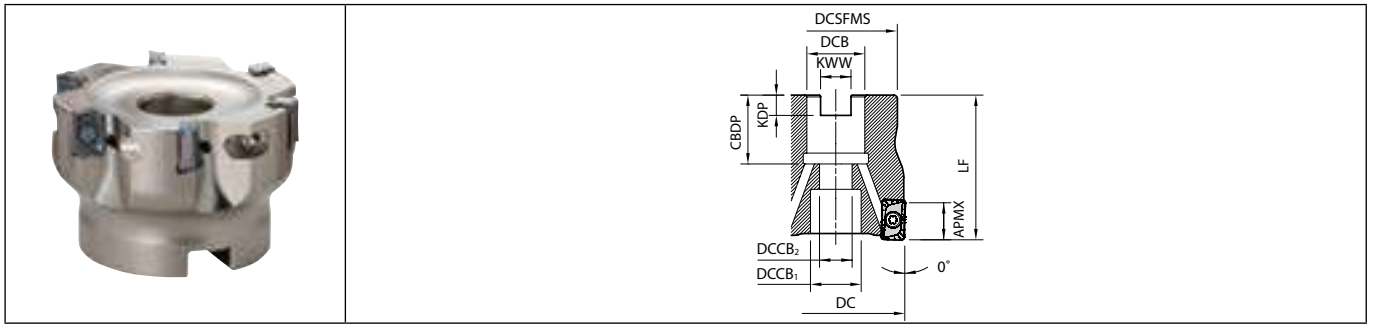
Description	Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Fig.	Spare parts			Applicable inserts ➔ M81			
			DC	DCON	LF	LH	APMX						Anti-seize compound	Screw	Wrench				
Weldon	Standard shank	MEW	40-W32-10-5T	MTO	5	40	32	111	50	10	+7	-19	Yes	30000	1	P-37	SB-3065TRP	DTPM-8	LOGT1004..., LOMU1004...
		MEW	40-W32-15-4T	MTO	4	40	32	111	50	15	+10	-21	Yes	25000	1	P-37	SB-4090TRP	DTPM-15	LOGT1505..., LOMU1505...
	Same Shank	MEW	16-W16-10-2T	MTO	2	16	16	75	25	10	+7	-20	Yes	43750	2	P-37	SB-3065TRP	DTPM-8	LOGT1004... LOMU1004...
			20-W20-10-2T	MTO	2	20	20	77						41000	2				
		20-W20-10-3T	MTO	3	25	25	90	32	37500	3									
		25-W25-10-3T	MTO	3					33900	3									
		32-W32-10-4T	MTO	4	32	32	102	40	33900	3									
		MEW	25-W25-15-2T	MTO	2	25	25	90	32	15	+10	-22	Yes	35000	3	P-37	SB-4090TRP	DTPM-15		LOGT1505... LOMU1505...
	32-W32-15-3T		MTO	3	32	32	102	40	30000	3									

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.



Milling

MEW



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)										A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Applicable inserts ➔ M81			
			R	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW							APMX		
MEW 032R-10-4T-M 040R-10-5T-M 050R-10-5T-M 063R-10-6T-M	●	4	32	30	16	14	9	35	19	5.6	8.4	10	+7	-20	Yes	33900	0.1	LOGT1004... LOMU1004...			
	●	5	40	34																	
	●	5	50	45	22	18	11	40	21	6.3	10.4										
	●	6	63	47															-19	22500	0.4
MEW 040R-15-4T-M 050R-15-4T-M 063R-15-5T-M 080R-15-6T-M 080R-15-6T	●	4	40	34	16	14	9	19	5.6	8.4	15	+10	-21	Yes	25000	0.2	LOGT1505... LOMU1505...				
	●		50	45														22	18	11	40	21	6.3	10.4
	●	5	63	47	27	20	13	50	25	7															12.4
	●	6	80	60														25.4	20	13	50	27	6	9.5		-20	12000	1
	●	6	80	60	27	20	13	50	27	6								9.5			
	●	6	80	60	27	20	13	50	27	6								9.5			

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Spare parts and applicable inserts (End mill/face mill)

Description	Spare parts				Applicable inserts ➔ M81			
	Clamp screw	Wrench	Anti-seize compound	Mounting bolt				
MEW ...-10-_T					General purpose	Low cutting force	Tough edge (For heavy milling)	Non-ferrous metals
MEW 032R-10-_M 040R-10-_M 050R-10-_M 063R-10-_M	SB-3065TRP	DTPM-8	P-37	HH8X25 HH10X30	LOMU10...-GM	LOMU10...-SM	LOMU10...-GH	LOGT10...-AM
MEW ...-15-_T								
MEW 040R-15-_M 050R-15-_M 063R-15-_M 080R-15_(-M)	SB-4090TRP	DTPM-15	P-37	HH8X25 HH10X30 HH12X35	LOMU15...-GM	LOMU15...-SM	LOMU15...-GH	LOGT15...-AM

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

About wrench specifications

- Wrenches and clamp screws are "Torx Plus".
- 1. Ref. to Fig. 1 for "Torx Plus" Wrench. (Purple grip)
- 2. Ref. to Fig. 2 for "Torx" Wrench. (Black grip)

A "Torx Plus" Wrench and a "Torx" Wrench have different top shapes.

Please use a "Torx Plus" Wrench.

* If a "Torx" Wrench is used to tighten, the screw head might become damaged and then the screw cannot be removed.

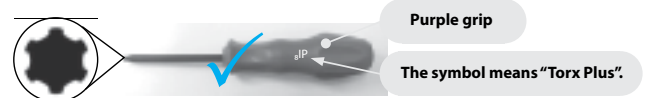


Fig. 1 "Torx Plus" Wrench (For MEW)

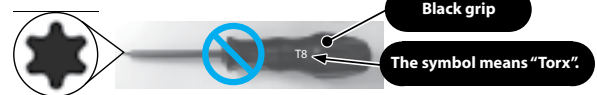
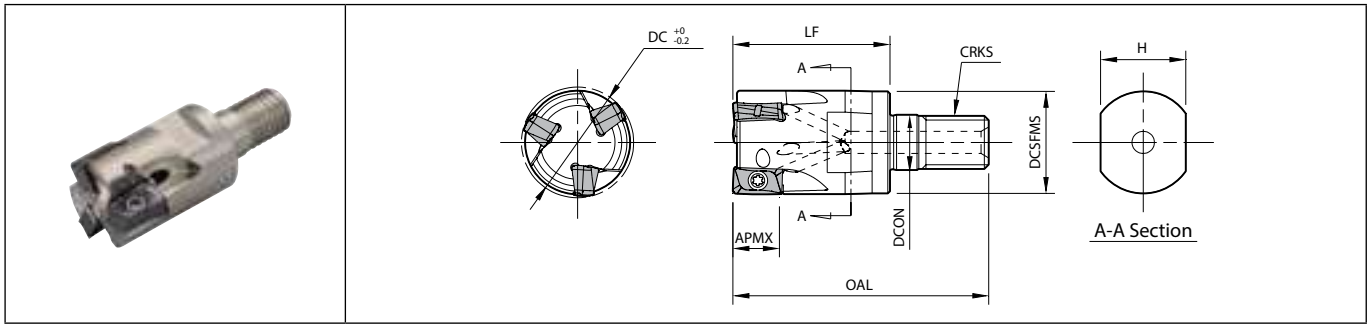


Fig. 2 "Torx" Wrench (Do NOT use it for MEW)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MEW



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)								A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Applicable inserts M81	
			DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H						
MEW 16-M08-10-2T 20-M10-10-2T 20-M10-10-3T 25-M12-10-3T 32-M16-10-4T	●	2	16	8.5	14.7	42	25			M8x1.25	12	-22	Yes	43750	LOGT1004... LOMU1004...	
	●	3	20	10.5	18.7	48	30			M10x1.5	15	+7	-20	41000		
	●		25	12.5	23	56	35			M12x1.75	19		37500			
	●		32	17	30	62	40			M16x2.0	24		33900			
	MEW 25-M12-15-2T 32-M16-15-3T	●	2	25	12.5	23	56	35			M12x1.75	19	+10	-22		Yes
●		3	32	17	30	62	40			M16x2.0	24			30000		

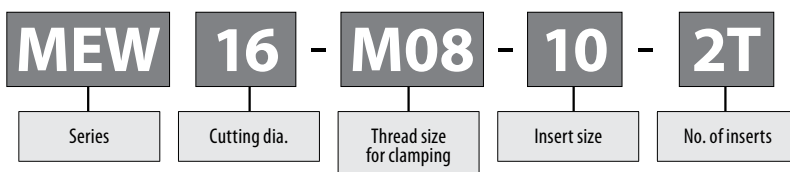
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load. See page M82 for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

Spare parts and applicable inserts (MEW modular type)

Description	Spare parts			Applicable inserts M81				
	Clamp screw	Wrench	Anti-seize compound					
MEW 16-M08-10-2T 20-M10-10-2T 20-M10-10-3T 25-M12-10-3T 32-M16-10-4T								
	SB-3065TRP		DTPM-8	P-37	General purpose	Low cutting force	Tough edge (For heavy milling)	Non-ferrous metals
	Recommended tightening torque for insert clamp 1.2N-m				LOMU10...-GM	LOMU10...-SM	LOMU10...-GH	LOGT10...-AM
MEW 25-M12-15-2T 32-M16-15-3T								
	SB-4090TRP		DTPM-15	P-37	General purpose	Low cutting force	Tough edge (For heavy milling)	Non-ferrous metals
Recommended tightening torque for insert clamp 3.5N-m			LOMU15...-GM		LOMU15...-SM	LOMU15...-GH	LOGT15...-AM	

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Modular end mill head identification system

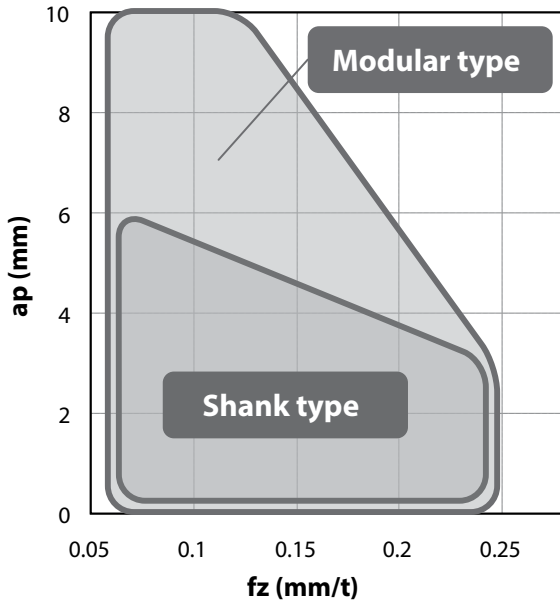


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Feature of modular type

Applicable to a wide range of applications



<Cutting conditions>

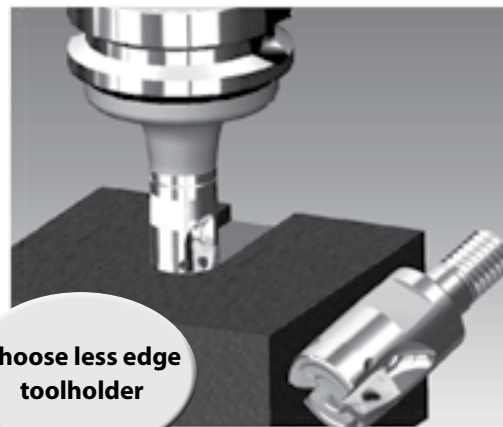
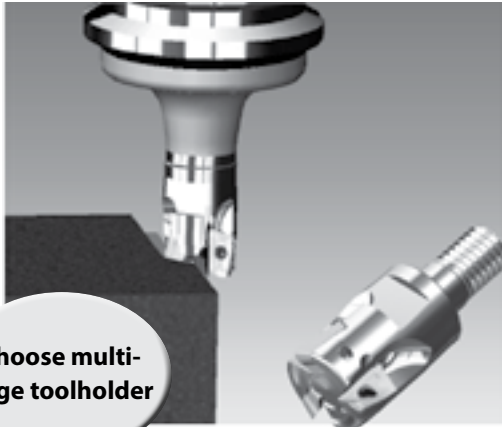
- Cutting speed: $V_c=150\text{m/min}$ ($n=2,390\text{min}^{-1}$)
- Width of cut: $a_e=10\text{mm}$ (Shouldering)
- Workpiece material: C55, Dry
- **Machine: BT30 M/C**
- <Cutting tool>
- Modular type
 - Head: MEW20-M10-10-3T
 - Arbor: BT30K-M10-45
 - Insert: LOMU100408ER-GM (PR1525)
- Shank type
 - Toolholder: MEW20-S20-10-3T
 - Arbor: BT30 Milling Chuck (Double-face clamping)
 - Insert: LOMU100408ER-GM (PR1525)

A wide range of applications even in BT30 M/C with the superior anti-chattering performance

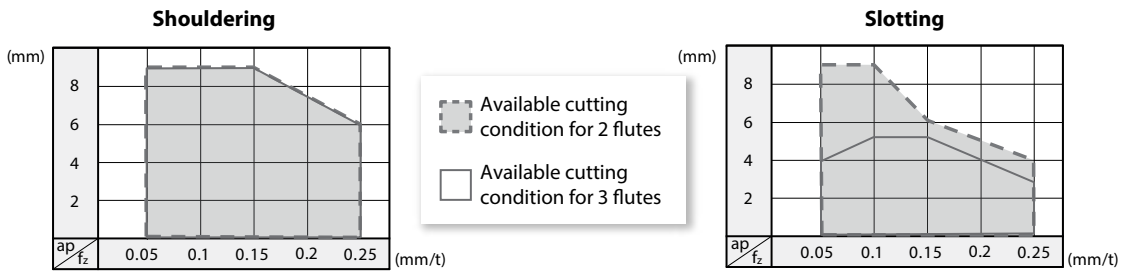
How to select multi-edge or less edge toolholder

Shouldering ($a_e=10\text{mm}$)

Slotting



Available cutting condition of modular type



Choose multi-edge toolholder for shouldering; higher efficiency in machining by higher feed rate. For grooving, choose less edge toolholder to lower cutting force.

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

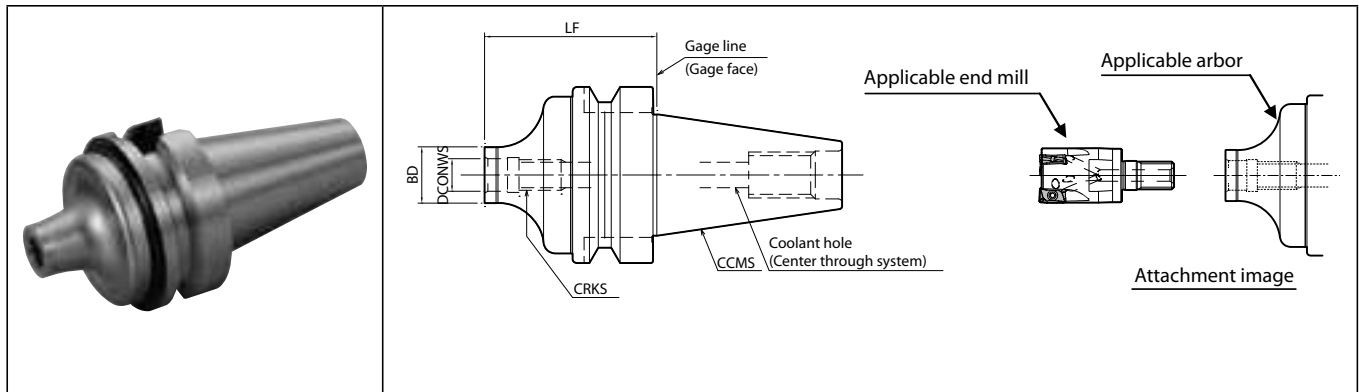
Multi-Function

Slot Mill

Ball-nose Radius

Others

BT Arbor (for exchangeable head / double-face clamping spindle)



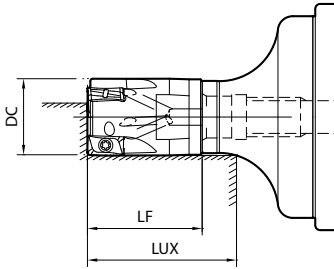
Dimensions

Description	Availability	Dimension (mm)				Coolant hole	Arbor (Double-face clamping)	Applicable end mill (Head) MA90, MEW, MEC, MEV, MFH Harrier, MFH Boost, MFH Mini, MFH Micro, MRX M69(MA90), M79(MEW), M90(MEC) M108(MEV), M202(MFH Harrier) M213(MFH Boost), M220(MFH Mini) M227(MFH Micro), M275(MRX)
		LF	BD	DCONWS	CRKS			
BT30K- M08-45	●	45	14.7	8.5	M8×1.25	Yes	BT30	(MEW/MEC/MFH/MRX)..-M08-..
	●		18.7	10.5	M10×1.5			(MA90/MEW/MEC/MEV/MFH/MRX)..-M10-..
	●		23	12.5	M12×1.75			(MA90/MEW/MEC/MEV/MFH/MRX)..-M12-..
BT40K- M08-55	●	55	14.7	8.5	M8×1.25	Yes	BT40	(MEW/MEC/MFH/MRX)..-M08-..
	●	60	18.7	10.5	M10×1.5			(MA90/MEW/MEC/MEV/MFH/MRX)..-M10-..
	●	55	23	12.5	M12×1.75			(MA90/MEW/MEC/MEV/MFH/MRX)..-M12-..
	●	65	30	17	M16×2.0			(MA90/MEW/MEC/MEV/MFH/MRX)..-M16-..



Actual end mill depth (See page M227 for MFH Micro)

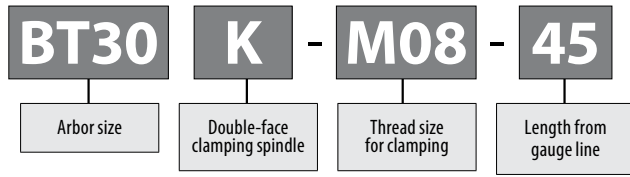
Arbor description	Applicable end mill (Head)			Actual end mill depth (mm)	
	Description	Dimension (mm)		LUX	
		DC	LF		
BT30K- M08-45	...16-M08-...	16	25	31.8	
	...17-M08-...	17		33.2	
	...18-M08-...	18		34.2	
	M10-45	...20(-)M10-...	20	30	36.8
		...22-M10-...	22		39.2
		M12-45	...25(-)M12-...		25	35	42.8
...28-M12-...	28		45.5		
BT40K- M08-55	...16-M08-...	16	25	31.7	
	...17-M08-...	17		33.2	
	...18-M08-...	18		34.3	
	M10-60	...20(-)M10-...	20	30	38.7
		...22-M10-...	22		44.5
		M12-55	...25(-)M12-...		25	35	44.6
	...28-M12-...		28	47.6	
	M16-65		...32(-)M16-...	32	40		51.2
		...35-M16-...	35	60.2	
		...40-M16-...	40	64	



- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Arbor identification system



How to attach head

1. When clamping the head on the arbor, make sure there is no dust or chips inside (Fig. 1).
Do NOT put lubricant on the clamping portion.

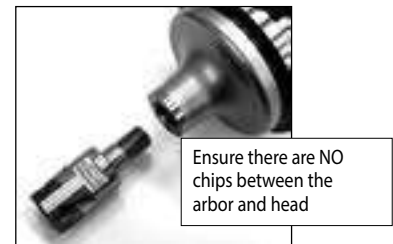


Fig. 1

2. Attach the head on the arbor and fix it using the wrench (Fig. 2).
Ref. to the Table 1 for Recommended tightening torque.
Note: The wrench is NOT included in the products.



Fig. 2

Table 1 Recommended head tightening torque

Thread size for clamping	Wrench double width [mm]	Recommended tightening torque [N·m]
M8	12	23
M10	15	46
M12	19	80
M16	24	90

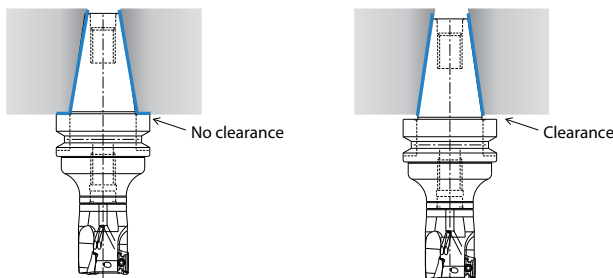
3. Confirm that the head is fixed firmly on the arbor. (Fig. 3)



Fig. 3

Frequently asked question

Q: Can the double-face clamping arbor be mounted on a general BT spindle?
A: Yes. It can be used as a general BT arbor with a general BT spindle.



Double-face clamping arbor mounted on double-face clamping spindle

Double-face clamping arbor mounted on general spindle

It can be used as a general BT arbor, though the advantage of the double-face clamping will not be shown.



How to mount an insert

1. Be sure to remove dust and chips from the insert mounting pocket.
2. Clamp screw
 1. Apply anti-seize compound on portion of taper and thread of clamp screw.
 2. Attach the screw (magnetic head) to the front end of the wrench. While lightly pressing the insert against the constraint surfaces, put the screw into the hole of the insert and tighten. (Ref. to Fig. 1)
Tighten M3 screws (SB-3065TRP) slightly inclined from the insert surface.(Ref. to Fig. 2)
3. When tightening the screw, make sure that the wrench is parallel to the screw.
4. After tightening the screw, make sure that there is no clearance between the insert seat surface and the bearing surface of the toolholder or between the insert side surfaces and the constraint surface of the toolholder. If there is any clearance, remove the insert and mount it again according to the above steps.

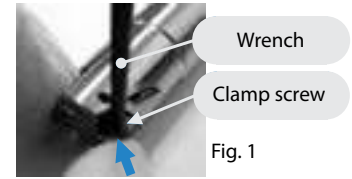


Fig. 1

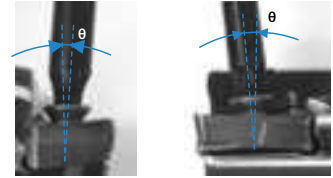


Fig. 2

Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)				
		Toolholder description		MEGACOAT (PVD coated carbide)				
		MEW16~MEW18	MEW20~MEW40 MEW40R~MEW80R	PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)	PR015S	CVD coated carbide CA6535
GM	Carbon steel	0.06~ 0.1 ~0.2	0.08~ 0.15 ~0.25	120~ 180 ~250	120~ 180 ~250	-	-	-
	Alloy steel	0.06~ 0.1 ~0.14	0.08~ 0.15 ~0.2	100~ 160 ~220	100~ 160 ~220	-	-	-
	Mold steel	0.06~ 0.08 ~0.12	0.08~ 0.12 ~0.2	80~ 140 ~180	80~ 140 ~180	-	-	-
	Stainless steel (Austenitic related)	0.06~ 0.08 ~0.12	0.08~ 0.12 ~0.15	100~ 160 ~200	100~ 160 ~200	-	-	-
	Stainless steel (Martensitic related)	0.06~ 0.08 ~0.12	0.08~ 0.12 ~0.2	150~ 200 ~250	-	-	-	★ 180~ 240 ~300
	Stainless steel (Precipitation hardening)	0.06~ 0.08 ~0.12	0.08~ 0.12 ~0.2	90~ 120 ~150	-	-	-	-
	Gray cast iron	0.06~ 0.1 ~0.17	0.08~ 0.18 ~0.25	-	-	★ 120~ 180 ~250	-	-
	Nodular cast iron	0.06~ 0.08 ~0.12	0.08~ 0.15 ~0.2	-	-	★ 100~ 150 ~200	-	-
	Ni-base heat-resistant alloys	0.06~ 0.08 ~0.12	0.08~ 0.12 ~0.15	★ 20~ 30 ~50	-	-	-	★ 20~ 30 ~50
	Titanium alloys	0.06~ 0.08 ~0.12	0.08~ 0.15 ~0.2	★ 40~ 60 ~80	-	☆ 30~ 50 ~70	-	-
SM	Carbon steel	0.06~ 0.1 ~0.17	0.08~ 0.15 ~0.2	120~ 180 ~250	120~ 180 ~250	-	-	-
	Alloy steel	0.06~ 0.08 ~0.12	0.08~ 0.12 ~0.18	100~ 160 ~220	100~ 160 ~220	-	-	-
	Mold steel	0.06~ 0.08 ~0.12	0.08~ 0.1 ~0.15	80~ 140 ~180	80~ 140 ~180	-	-	-
	Stainless steel (Austenitic related)	0.06~ 0.08 ~0.12	0.08~ 0.1 ~0.15	100~ 160 ~200	100~ 160 ~200	-	-	-
	Stainless steel (Martensitic related)	0.06~ 0.08 ~0.12	0.08~ 0.1 ~0.15	150~ 200 ~250	-	-	-	★ 180~ 240 ~300
	Stainless steel (Precipitation hardening)	0.06~ 0.08 ~0.12	0.08~ 0.1 ~0.15	90~ 120 ~150	-	-	-	-
	Ni-base heat-resistant alloys	0.06~ 0.08 ~0.1	0.08~ 0.1 ~0.12	★ 20~ 30 ~50	-	-	-	★ 20~ 30 ~50
Titanium alloys	0.06~ 0.08 ~0.12	0.08~ 0.12 ~0.15	★ 40~ 60 ~80	-	☆ 30~ 50 ~70	-	-	
GH	Carbon steel	0.06~ 0.1 ~0.2	0.08~ 0.2 ~0.3	120~ 180 ~250	120~ 180 ~250	-	-	-
	Alloy steel	0.06~ 0.1 ~0.14	0.08~ 0.2 ~0.25	100~ 160 ~220	100~ 160 ~220	-	-	-
	Mold steel	0.06~ 0.08 ~0.12	0.08~ 0.15 ~0.22	80~ 140 ~180	80~ 140 ~180	-	-	-
	Stainless steel (Austenitic related)	0.06~ 0.08 ~0.12	0.08~ 0.12 ~0.15	100~ 160 ~200	100~ 160 ~200	-	-	-
	Stainless steel (Martensitic related)	0.06~ 0.08 ~0.12	0.08~ 0.12 ~0.2	150~ 200 ~250	-	-	-	☆ 180~ 240 ~300
	Stainless steel (Precipitation hardening)	0.06~ 0.08 ~0.12	0.08~ 0.12 ~0.2	90~ 120 ~150	-	-	-	-
	Gray cast iron	0.06~ 0.1 ~0.2	0.08~ 0.22 ~0.3	-	-	☆ 120~ 180 ~250	-	-
	Nodular cast iron	0.06~ 0.08 ~0.15	0.08~ 0.18 ~0.25	-	-	☆ 100~ 150 ~200	-	-
	Ni-base heat-resistant alloys	0.06~ 0.08 ~0.12	0.08~ 0.12 ~0.15	★ 20~ 30 ~50	-	-	-	☆ 20~ 30 ~50
	Titanium alloys	0.06~ 0.08 ~0.12	0.08~ 0.15 ~0.2	★ 40~ 60 ~80	-	☆ 30~ 50 ~70	-	-
Hard materials (60HRC or less)	0.06~ 0.08 ~0.12	0.08~ 0.15 ~0.22	-	-	-	★ 60~ 80 ~100	-	
Chipbreaker	Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)				
		Toolholder description		DLC coated carbide		Carbide		
		MEW16~MEW18	MEW20~MEW40 MEW40R~MEW80R	PDL025	GW25			
AM	Aluminum alloys	0.06~ 0.1 ~0.2	0.08~ 0.15 ~0.25	★ 200~ 600 ~900	☆ 200~ 500 ~800			

★ : 1st Recommendation

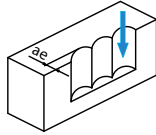
☆ : 2nd Recommendation

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

Ramping, helical milling and vertical milling (Plunging)

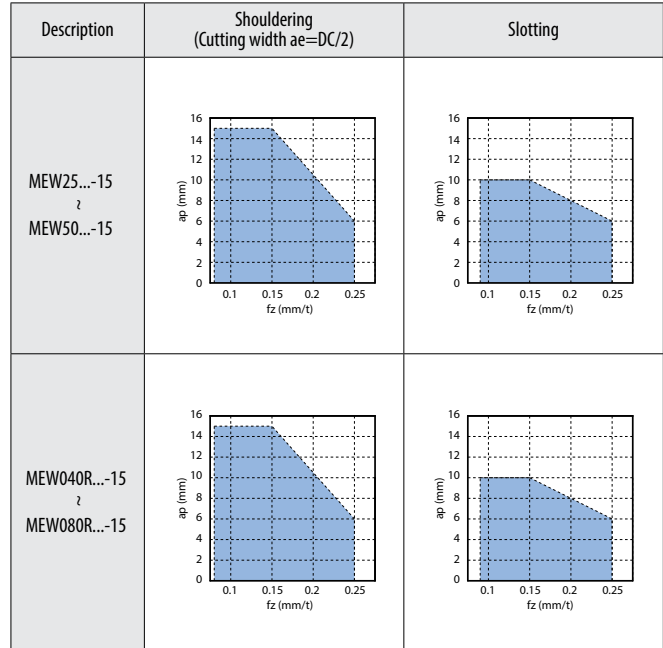
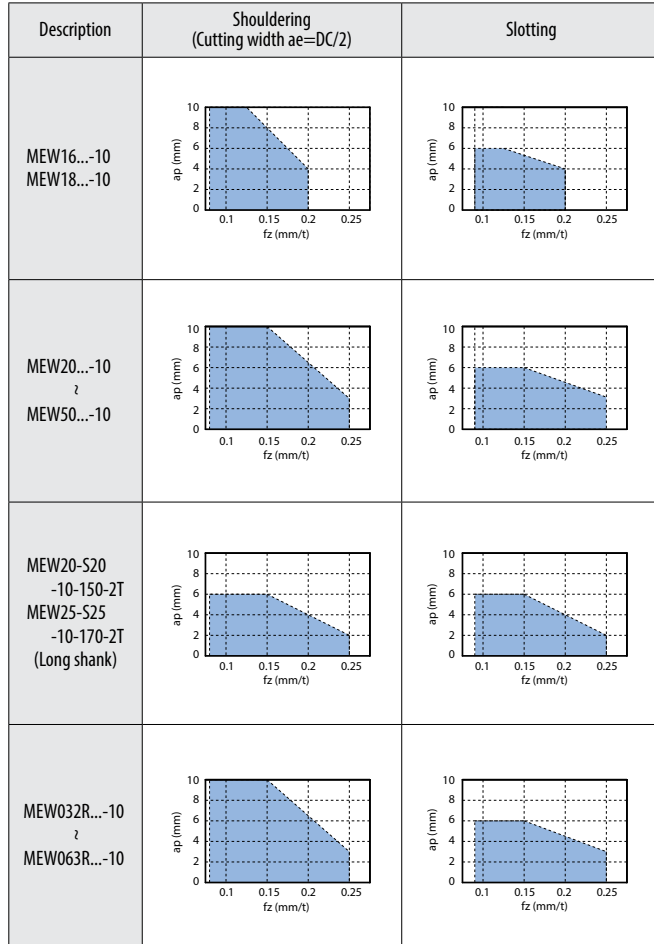
1. Available for vertical milling (plunging).
2. NOT available for ramping and helical milling, because interference between workpiece and insert may occur.

Vertical milling (Plunging)



Insert description	Max. width of cut
LOMU10 type	5mm
LOMU15 type	7mm

Cutting performance




- <Cutting conditions>
- $V_c=180\text{m/min}$
 - GM chipbreaker
 - Workpiece material: C50
 - Overhang length
 - 1. End mill: Same length as LH of the dimension
 - 2. Face mill: LF of the dimension + minimum overhang length of the arbor



Case studies

ST44-2

- Construction machine part
- $V_c=250\text{m/min}$
- $a_{pxae}=4 \times 20\text{mm}$
- $f_z=0.14\text{mm/t}$ ($V_f=1,350\text{mm/min}$)
- Wet
- MEW32-S32-10-4T(4 flutes)
- LOMU100408ER-GM (PR1525)



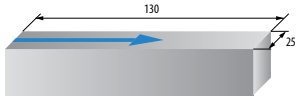
PR1525	Chip evacuation rate = 108cc/min
Competitor A (Positive cutter)	Chip evacuation rate = 72cc/min

MEW showed stable milling without chattering at higher feed, improving the machining efficiency by 150%. Burrs are prevented and excellent surface finish is achieved.

(User Evaluation)

15-5PH (42HRC)

- Aircraft part
- $V_c=180\text{m/min}$
- $a_{pxae}=2 \times 25\text{mm}$
- $f_z=0.1\text{mm/t}$ ($V_f=716\text{mm/min}$)
- Wet
- MEW32-S32-10-4T(4 flutes)
- LOMU100408ER-GM (PR1525)

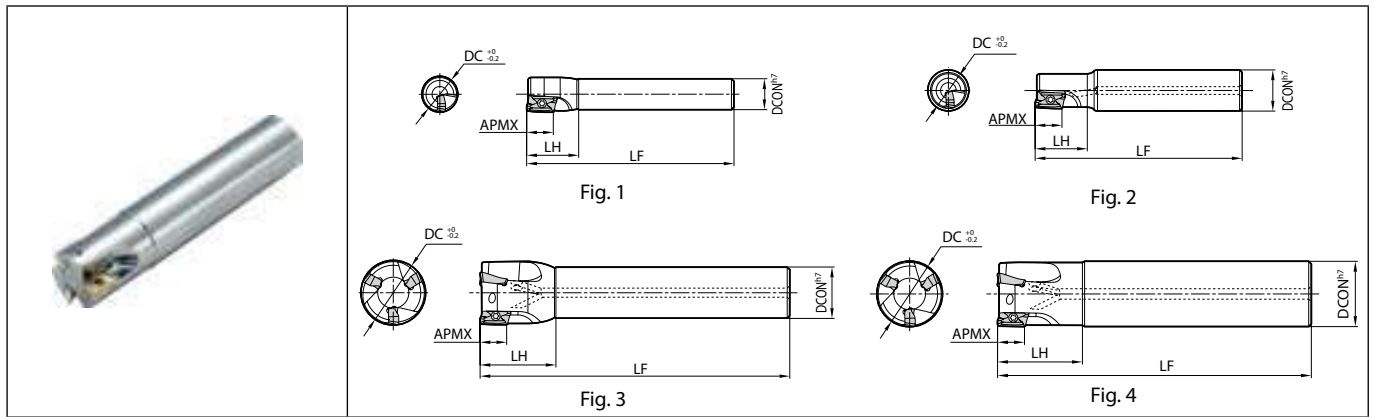


PR1525	Chip evacuation rate = 35.8cc/min (Further machining possible)
Competitor B (Positive cutter)	Chip evacuation rate = 26.8cc/min (Unable to continue machining)

No chattering and more stable milling is possible with MEW. Despite the milling difficulty because of the properties of the material (42HRC), PR1525 kept good cutting edge form, minimizing wear and adhesion.

(User evaluation)

MEC



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Fig.	Spare parts			Applicable inserts M91	
			DC	DCON	LF	LH	APMX						Anti-seize compound	Screw	Wrench		
Cylindrical Standard shank	●	1	10	10	80	17	10	+10	-24	No	54800	1	P-37	SB-254STR	DTM-8	BDMT1103...	
				16													
				10													
				12													
				12													
				16													
				16													
		13															
		12															
		14															
		16															
		16	12	100	23	10	+18	-14	No	43750	1	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...		
		17															
		18															
	16																
	19																
	20																
	21																
	22																
	24	20															
	25																
	25	120	29														
	28																
	30																
	30	25															
	32																
	32	130	32														
	40																
	40	32	150	50													
	50																
Cylindrical Same shank	●	2	16	16	100	30	10	+18	-14	No	43750	4	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...	
				20													
				20													
		25	25	120	32												
		25															
		32															
		32	32	130	40												

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

For more details, see „Warning“ on page M93.

Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Fig.	Spare parts			Applicable inserts M91			
			DC	DCON	LF	LH	APMX						Anti-seize compound	Screw	Wrench				
Cylindrical Long shank	MEC	●	2	18	170	30	10	+20	-10	Yes	41000	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...				
																20	140	60	3
				22	23	210		32	3										
											25					160	60	4	
				25	25	210		65	3										
											28					30	250	40	4
				32	32	200		65	3										
											35					32	250	40	4
				40	240	65		3											
									32		200					65	4		
				32	250	40		4											
35	32	250	40				3												
				40	240	65		3											
20	20	150	60				4												
				25	25	170		32	4										
30	180	32	3																
				32	32	200	65	4											
32	32	200	65						4										
				40	240	65	4												
25	25	120	36					3											
				32	25	130	40		3										
40	32	150	50					3											
				50	50	150	50		3										
25	25	120	36					4											
				32	32	130	40		4										
32	200	65	4																
				32	250	40	3												
35	32	250	40					3											
				40	240	65	3												
32	32	250	65					4											
				40	32	250	65		3										
50	42	64	3																

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

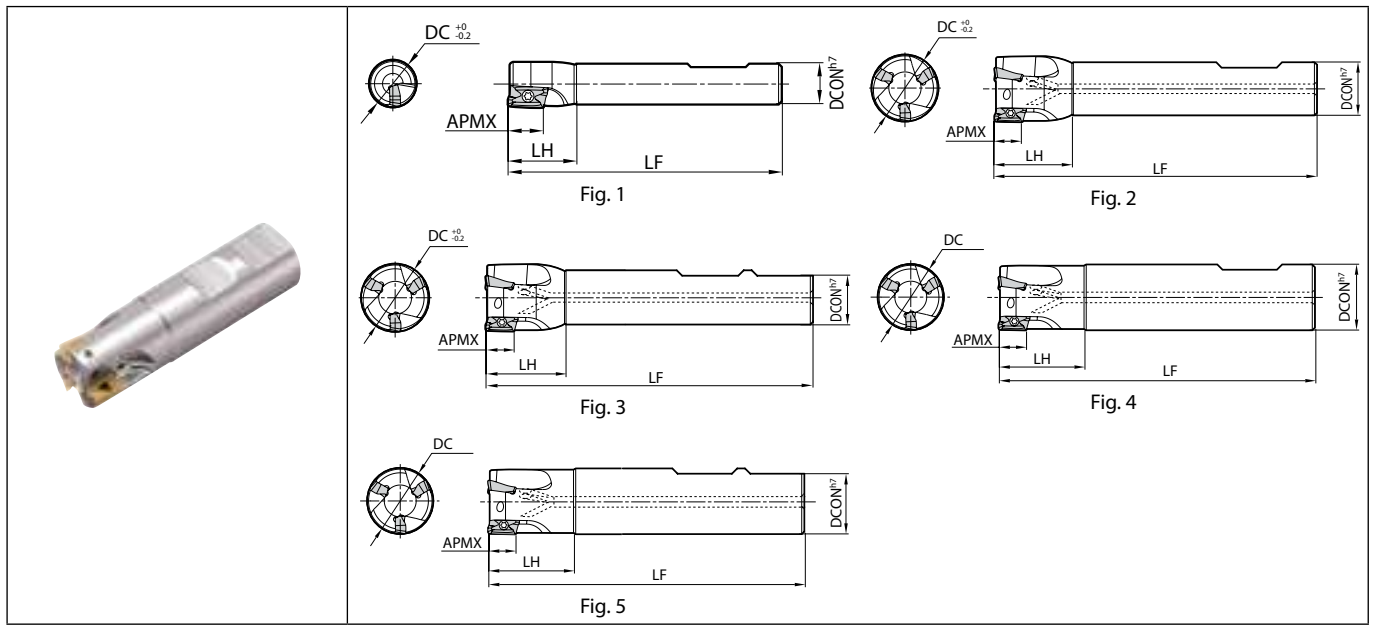
For more details, see „Warning“ on page M93.

Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.



Milling

MEC



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Fig.	Spare parts			Applicable inserts ➔ M91			
			DC	DCON	LF	LH	APMX						Anti-seize compound	Screw	Wrench				
Weldon	Standard shank	MEC	●	2	16	12	68	23	18	14	No	43750	1	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...		
					18	16												20	20	19	13	43000	2
			●	3	20	81	25	10	21	10	Yes	39600	2						
					22													26	22	37500	2
			●	4	25	88	32	23	9	23	9	35800	3						
					30													25	23	34800	3
	●	4	32	100	40	23	9	23	9	33900	3								
			32									32	23	33900	3				
	Same shank	MEC	●	2	16	16	68	25	18	14	Yes	43750	4	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...		
					20	20	81	30	20	10								41000	4
			●	3	25	88	32	10	21	10	Yes	37500	5						
					25													25	21	37500	5
●	4	32	100	40	23	9	23	9	33900	5									
		32									32	23	33900	5					
Standard shank	MEC	●	2	25	20	86	36	16	-11	Yes	35000	3	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...			
				32	25	92	36	15.7	17								7	30000	3
				40	32	110	50	19	7								25000	3	
Same shank	MEC	●	2	25	25	92	36	16	11	Yes	35000	5	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...			
				32	32	100	40	15.7	17								7	30000	5

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

For more details, see „Warning“ on page M93.

Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

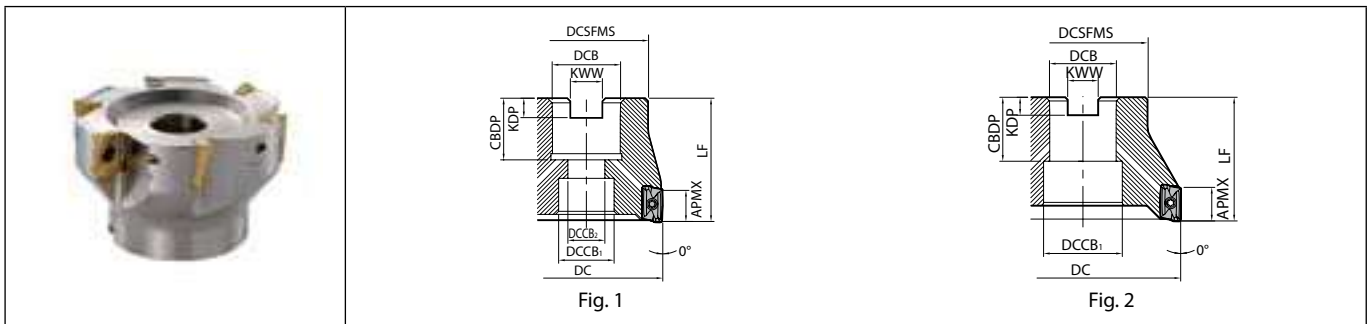
Multi-Function

Slot Mill

Ball-nose Radius

Others

MEC



Toolholder dimensions

Description	Availability	R	Dimension (mm)										A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts M91	
			DC	DCSfMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX							Anti-seize compound	Screw	Wrench		
Metric Coarse pitch	MEC 040R-11-5T-M	●	5	40	34	16	14	8.5		20	5.6	8.5	10	+23	-7	Yes	30000	0.2	1	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...
	MEC 050R-11-5T-M	●	5	40	22	18	12	40	22	6.3	10.4	22500					0.3	1					
	MEC 063R-11-6T-M	●	6	63								20500					0.7	1					
	MEC 080R-11-7T-M	●	7	80	52.5	27	20	14	50	26	7	12.4					18500	1	1				
	MEC 100R-11-9T-MN	●	9	100	65	32	26	17.6	55		8	14.4					17000	1.6	1				
	MEC 125R-11-11T-M	●	11	125	85	40	45	32	63	33	9.5	16.4					15000	3.1	1				
Fine pitch	MEC 032R-11-5T-M	●	5	32	30	16	11.5	8.5	35	20	5.6	8.4	10	+23	-7	Yes	33900	0.1	1	P-37	SB-2555TRG	DTM-8	BDGT11T3... BDMT11T3...
	MEC 040R-11-6T-M	●	6	40	34	16	14	8.5	40	22	6.3	10.4					30000	0.2	1				
	MEC 050R-11-7T-M	●	7	50	40	22	18	12	40	22	6.3	10.4					22500	0.4	1				
	MEC 063R-11-8T-M	●	8	63													20500	0.6	1				
	MEC 080R-11-10T-M	●	10	80	52.5	27	20	14	50	26.5	7	12.4					18500	0.9	1				
	MEC 100R-11-11T-M	●	11	100	65	32	26	17.6	55	26	8	14.4					17000	1.7	1				
Coarse pitch	MEC 040R-17-4T-M	●	4	40	34	16	14	8.5		20	5.6	8.5	15.7	+19	-7	Yes	25000	0.3	1	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...
	MEC 050R-17-4T-M	●	5	50													17000	0.4	1				
	MEC 063R-17-5T-M	●	6	63	40	22	18	12	40	22	6.3	10.4					14500	0.6	1				
	MEC 080R-17-6T-M	●	8	80	52.5	27	20	14	50	26	7	12.4					12000	1	1				
	MEC 100R-17-7T-MN	●	10	100	65	32	26	17.6	55		8	14.4				10500	1.8	1					
	MEC 125R-17-9T-M	●	12	125	85	40	45	32	63	33	9.5	16.4				8900	3.1	1					
	MEC 160R-17-12T-M	●	16	160	110	40	68	-								7400	4.5	2					
	MEC 170R-17-12T-M	●	17	170	110	40	68	-								7400	4.5	2					
Fine pitch	MEC 050R-17-5T-M	●	5	50	40	22	18	12	40	22	6.3	10.4	15.7	+19	-7	Yes	17000	0.4	1	P-37	SB-4070TRN	DTM-15	BDGT1704... BDMT1704...
	MEC 063R-17-6T-M	●	6	63									14500	0.6	1	No	7400	4.5	2				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

For more details, see „Warning“ on page M93.

Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.

When using center-through air/Coolant/Mist

If center through air (Coolant, Mist) is used, please use appropriate arbor and clamp with mounting bolt (Table1)

For good shoulder finishes by MEC multistage ap.

In order to obtain smooth machining wall surface by multiple passes of MEC milling cutter, please keep ap 5.5 mm or less for 11T3 type and also keep ap 9 mm or less for 1704 type.

Table 1

Description	Mounting bolt (Attachment)	Wrench
MEC032R.....M	SP8X35	LW-5 (Double width 5 mm)
MEC040R.....M	HH8X25H	LW-5 (Double width 5 mm)
MEC050R.....M MEC063R.....M	HH10X30H	LW-6 (Double width 6 mm)
MEC063R.... MEC080R....(-M)	HH12X35H	LW-8 (Double width 8 mm)
MEC100R....N/M	HH16X52H	LW-12 (Double width 12 mm)
MEC125R....	HF20X53H	LW-14 (Double width 14 mm)
MEC160R....	HF24X60H	LW-17 (Double width 17 mm)

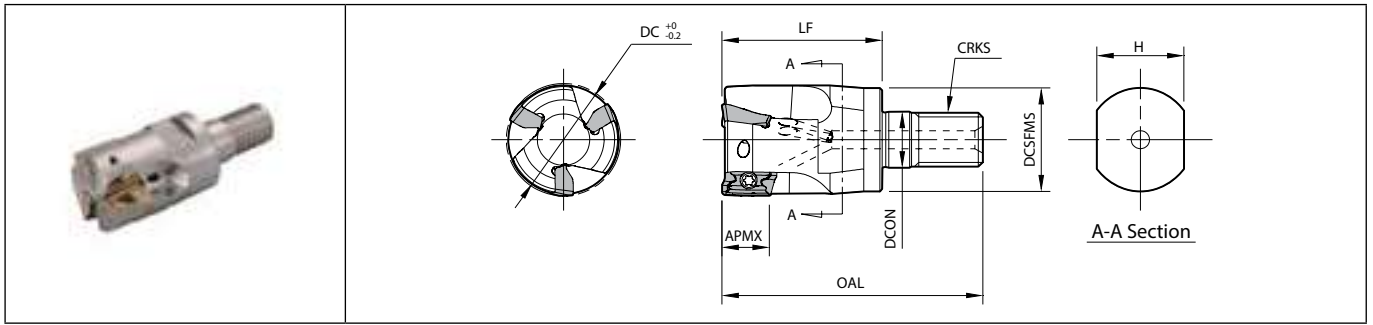
Wrench is not attached. Please purchase it separately.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Milling

MEC



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)										Coolant hole	Max. revolution (min ⁻¹)	Applicable inserts M91
			DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H	A.R. max. (°)	R.R. (°)			
MEC 16-M08-11T-2T 20-M10-11T-2T 20-M10-11T-3T 25-M12-11T-3T 32-M16-11T-4T	●	2	16	8.5	14.7	42	25	10	M8x1.25	12	+18	-14	Yes	43750	BDGT11T3... BDMT11T3...
	●		20	10.5	18.7	48	30		M10x1.5	15	+20	-10		41000	
	●	3	25	12.5	23	56	35		M12x1.75	19	+21	-9		37500	
	●		32	17	30	62	40		M16x2.0	24	+23	-9		33900	
	●		25	12.5	23	56	35		M12x1.75	19	+16	-11		35000	
MEC 25-M12-17-2T 32-M16-17-3T	●	2	25	12.5	23	56	35	15.7	M12x1.75	19	+16	-11	Yes	35000	BDGT1704... BDMT1704...
	●	3	32	17	30	62	40	M16x2.0	24	+17	-7	30000			

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

For more details, see „Warning“ on page M93.

See page M82 for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)



Milling

Spare parts (MEC modular type)


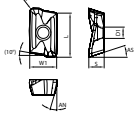

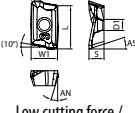

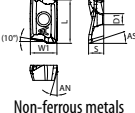

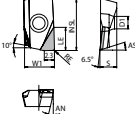
Description	Spare parts		
	Clamp screw	Wrench	Anti-seize compound
MEC 16-M08-11T-2T 20-M10-11T-2T 20-M10-11T-3T 25-M12-11T-3T 32-M16-11T-4T	SB-2555TRG Recommended tightening torque for insert clamp 1.2N·m	DTM-8	P-37
MEC 25-M12-17-2T 32-M16-17-3T	SB-4070TRN Recommended tightening torque for insert clamp 3.5N·m	DTM-15	P-37

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

BDGT/BDMT

Insert		Description	Dimension (mm)										Angle (°)		Carbide						Cermec	PCD	Applicable toolholder M86~M90						
			No. of edges	S		D1		RE		L		INSL		LE		W1		AN	AS	CVD				DLC	PVD		-	-	-
				2	3	2.8	0.2	0.4	0.8	11	-	-	6.3	15	18	●	●	●	●	●				●	●	●	●	●	●
 		BDMT 110302ER-JT 110304ER-JT 110308ER-JT	2	3	2.8	0.2 0.4 0.8	11	-	-	6.3	15	18	●	●	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-11		
		BDMT 11T302ER-JT 11T304ER-JT 11T308ER-JT 11T312ER-JT 11T316ER-JT 11T320ER-JT 11T324ER-JT 11T331ER-JT	2	3.8	2.8	0.2 0.4 0.8 1.2 1.6 2 2.4 3.1	11	-	-	6.7	13	18	●	●	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-11T(...) MEC...-11-...		
		BDMT 170404ER-JT 170408ER-JT 170412ER-JT 170416ER-JT 170420ER-JT 170424ER-JT 170431ER-JT 170440ER-JT	2	4.9	4.4	0.4 0.8 1.2 1.6 2 2.4 3.1 4	17	-	-	9.6	13	18	●	●	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-17(...) MEC...-17-...		
  <p>Low cutting force / Stainless steel</p>		BDMT 110302ER-JS 110304ER-JS 110308ER-JS	2	3	2.8	0.2 0.4 0.8	11	-	-	6.3	15	18	●	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-11			
		BDMT 11T302ER-JS 11T304ER-JS 11T308ER-JS	2	3.8	2.8	0.2 0.4 0.8	11	-	-	6.7	13	18	●	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-11T(...) MEC...-11-...			
		BDMT 170404ER-JS 170408ER-JS	2	4.9	4.4	0.4 0.8	17	-	-	9.6	13	18	●	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-17(...) MEC...-17-...			
  <p>Non-ferrous metals</p>		BDGT 11T302FR-JA 11T304FR-JA 11T308FR-JA	2	3.8	2.8	0.2 0.4 0.8	11	-	-	6.7	13	18	●	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-11T(...) MEC...-11-...			
		BDGT 170404FR-JA 170408FR-JA 170420FR-JA 170431FR-JA	2	4.9	4.4	0.4 0.8 2 3.1	17	-	-	9.6	13	18	●	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-17(...) MEC...-17-...			
		BDGT 11T302FR 11T304FR 11T308FR	1	3.8	2.8	0.2 0.4 0.8	-	11.5	3.8	6.7	13	18	●	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-11T(...) MEC...-11-...			
 		BDGT 11T302FR-LE 11T304FR-LE 11T308FR-LE	1	3.8	2.8	0.2 0.4 0.8	-	11.5	5.2	6.7	13	18	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-11T(...) MEC...-11-...				
		BDMT 11T302FR 11T304FR	1	3.8	2.8	0.2 0.4	-	11	3.6	6.7	13	18	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-11T(...) MEC...-11-...				
		BDMT 170402FR 170404FR	1	4.9	4.4	0.2 0.4	-	17	4.4	9.6	13	18	●	●	●	●	●	●	●	●	●	●	●	●	MEC...-17(...) MEC...-17-...				

Handed insert shows Right-hand

Recommended cutting conditions M92, M93

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

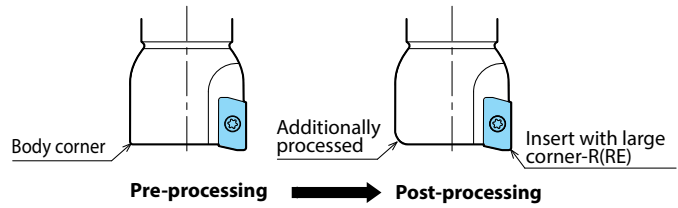
CBN & PCD Inserts are sold in 1 piece boxes



When using inserts with corner-R(RE) 1.6 or larger, additional modifications of the cutter body will be necessary. Ref. to the chart below for the recommended modifications. (Additional grind off is not necessary when corner-R(RE) is 1.2 mm or less.)

* Round-shaped additional processing is recommended.
When applying chamfer shaped additional processing, do not cut away too much.

Insert corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
1.6	R1.0
2.0	
2.4	R1.2
3.1	R1.6
4.0	R2.5



Recommended cutting conditions

JT chipbreaker

Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)				
	Toolholder description		Cermet	MEGACOAT NONA EX (MEGACOAT NANO)			CVD coated carbide
	MEC10~MEC19	MEC20~MEC40 MEC032R~MEC160R	TN100M	PR1835 (PR1535)	PR1825	PR1810	CA6535
Carbon steel	0.06 ~ 0.1 ~ 0.15	0.08 ~ 0.15 ~ 0.25	☆ 120 ~ 160 ~ 200	☆ 120 ~ 180 ~ 250	★ 120 ~ 180 ~ 250	-	-
Alloy steel	0.06 ~ 0.1 ~ 0.12	0.08 ~ 0.15 ~ 0.2	☆ 100 ~ 140 ~ 180	☆ 100 ~ 160 ~ 220	★ 100 ~ 160 ~ 220	-	-
Mold steel	0.06 ~ 0.08 ~ 0.1	0.08 ~ 0.12 ~ 0.2	☆ 80 ~ 120 ~ 150	☆ 80 ~ 140 ~ 180	★ 80 ~ 140 ~ 180	-	-
Stainless steel (Austenitic related)	0.06 ~ 0.08 ~ 0.1	0.08 ~ 0.12 ~ 0.15	-	☆ 100 ~ 160 ~ 200	☆ 100 ~ 160 ~ 200	-	-
Stainless steel (Martensitic related)	0.06 ~ 0.08 ~ 0.1	0.08 ~ 0.12 ~ 0.2	-	☆ 150 ~ 200 ~ 250	-	-	★ 180 ~ 240 ~ 300
Stainless steel (Precipitation hardening)	0.06 ~ 0.08 ~ 0.1	0.08 ~ 0.12 ~ 0.2	-	★ 90 ~ 120 ~ 150	-	-	-
Gray cast iron	0.06 ~ 0.1 ~ 0.15	0.08 ~ 0.18 ~ 0.25	-	-	-	★ 120 ~ 180 ~ 250	-
Nodular cast iron	0.06 ~ 0.08 ~ 0.1	0.08 ~ 0.15 ~ 0.2	-	-	-	★ 100 ~ 150 ~ 200	-
Ni-base heat-resistant alloys	0.06 ~ 0.08 ~ 0.1	0.08 ~ 0.12 ~ 0.15	-	☆ 20 ~ 30 ~ 50	-	-	★ 20 ~ 30 ~ 50
Titanium alloys	0.06 ~ 0.08 ~ 0.1	0.08 ~ 0.15 ~ 0.2	-	☆ 40 ~ 60 ~ 80	-	-	-

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

★ : 1st Recommendation ☆ : 2nd Recommendation

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

JS chipbreaker

Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)			
	Toolholder description		MEGACOAT NONA EX (MEGACOAT NANO)			CVD coated carbide
	MEC10~MEC19	MEC20~MEC40 MEC032R~MEC160R	PR1835 (PR1535)	PR1825	PR1810	CA6535
Carbon steel	0.06~ 0.1 ~0.12	0.08~ 0.15 ~0.18	☆ 120~ 180 ~250	★ 120~ 180 ~250	-	-
Alloy steel	0.06~ 0.08 ~0.1	0.08~ 0.12 ~0.15	☆ 100~ 160 ~220	★ 100~ 160 ~220	-	-
Mold steel	0.06~ 0.08 ~0.1	0.08~ 0.1 ~0.12	☆ 80~ 140 ~180	★ 80~ 140 ~180	-	-
Stainless steel (Austenitic related)	0.06~ 0.08 ~0.1	0.08~ 0.1 ~0.12	★ 100~ 160 ~200	☆ 100~ 160 ~200	-	-
Stainless steel (Martensitic related)	0.06~ 0.08 ~0.1	0.08~ 0.1 ~0.12	☆ 150~ 200 ~250	-	-	★ 180~ 240 ~300
Stainless steel (Precipitation hardening)	0.06~ 0.08 ~0.1	0.08~ 0.1 ~0.12	☆ 90~ 120 ~150	-	-	-
Ni-base heat-resistant alloys	0.06~ 0.08 ~0.1	0.08~ 0.1 ~0.12	☆ 20~ 30 ~50	-	-	★ 20~ 30 ~50
Titanium alloys	0.06~ 0.08 ~0.1	0.08~ 0.1 ~0.12	★ 40~ 60 ~80	-	-	-

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

★ : 1st Recommendation ☆: 2nd Recommendation

JA chipbreaker

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)	
		DLC coated carbide	Carbide
		PDL025	GW25
Aluminum alloys (Si 13% or less)	0.05~0.3	200~1,000	200~800
Aluminum alloys (Si 13% and over)	0.05~0.2	200~300	200~300

PCD

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)	
		PCD	
		KPD230 (KPD001)	
Aluminum alloys (Si 13% or less)	0.05~0.2	500~1,500	
Aluminum alloys (Si 13% and over)	0.05~0.15	300~1,000	

M



Milling

Warning

Please observe below precautions fully. Failure to observe the precautions may cause serious damage to human body.

Warning about Max. Revolution indicated on main body

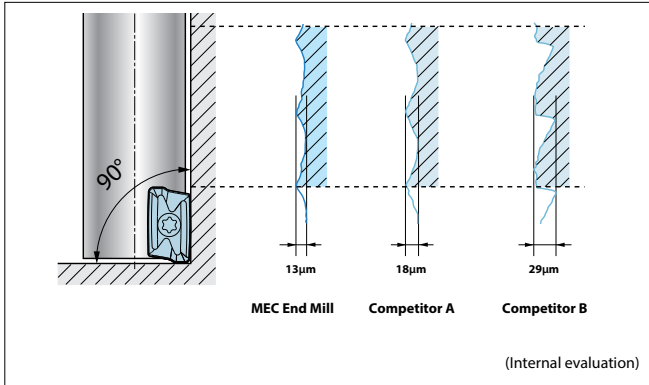
- Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter or the body may be damaged even under no load.
- For actual practical revolution, please set within recommended cutting condition.
- When using at a higher revolution (over 10,000min⁻¹), refer to the table to adjust the balance of MEC and suitable arbor.

Revolution (min ⁻¹)	Balance quality grade G ISO 1940-1/8621 (JIS B9905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

Features of MEC

Good squareness

Cutting Surface Comparison



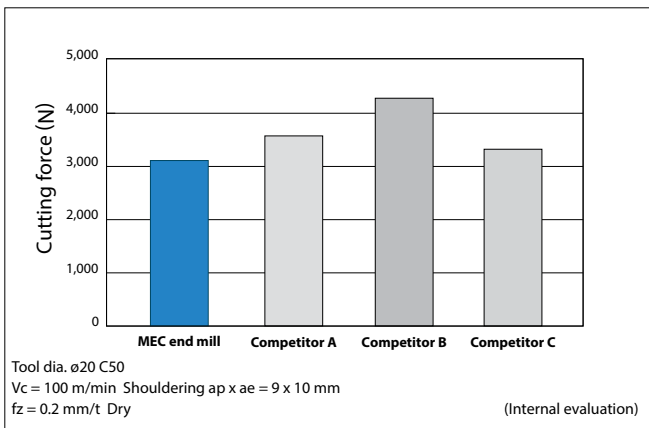
Cutting performance of mec end mill

1. Cutting edge length 10mm type (Standard/Same shank with JT chipbreaker)

Cutting dia.	Description	Overhang length LPR (mm)		Shape
		Standard	Same shank	
ø10	MEC10-S10-11	17	-	
ø12	MEC12-S16-11	20	30	
ø16	MEC16-S16-11T	30	45	
ø20	MEC20-S20-11T	30	45	
ø25	MEC25-S25-11T	32	48	
ø32	MEC32-S32-11T	40	60	

Low cutting force

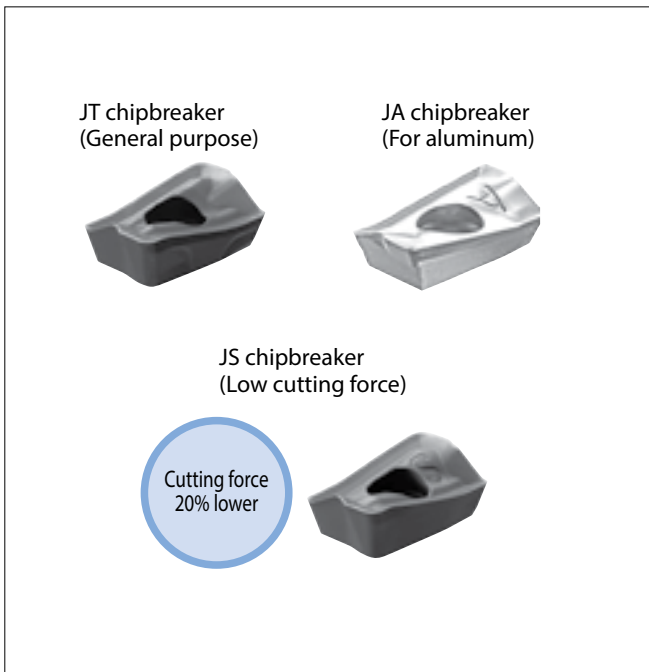
Cutting force comparison



(Vc=120m/min Workpiece material: C50)

Description	Shouldering (Cutting width ae=DC/2)	Slotting Ramping and helical milling
MEC10-S10-11		
MEC12-S16-11		
MEC16-S16-11T		
MEC20-S20-11T		
MEC25-S25-11T		
MEC32-S32-11T		

Chipbreaker



M
Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

2. Cutting edge length 10 mm type (Long shank with JT chipbreaker)

Cutting dia.	Description	Overhang length LPR (mm)		Shape
ø20 Long shank	MEC20-S20-140-11T	60	90	
ø25 Long shank	MEC25-S25-160-11T	60	100	
ø32 Long shank	MEC32-S32-200-11T	100	130	
ø40 Long shank	MEC40-S32-240-11T	100	130	

3. Cutting edge length 15.7 mm type (JT chipbreaker)

Cutting dia.	Description	Overhang length LPR (mm)		Shape
ø25	MEC25-S25-17	36	54	
ø32	MEC32-S32-17	40	60	
ø40	MEC40-S32-17	50	75	
ø25 Long shank	MEC25-S25-160-17	60	100	
ø32 Long shank	MEC32-S32-200-17	100	130	
ø40 Long shank	MEC40-S32-240-17	100	130	

(Vc = 120 m/min Workpiece material: C50)

Description	Shouldering Cutting width ae = DC/2		Slotting Ramping and helical milling	
	ap (mm)		ap (mm)	
MEC20-S20-140-11T Long shank				
MEC25-S25-160-11T Long shank				
MEC32-S32-200-11T Long shank				
MEC40-S32-240-11T Long shank				

(Vc = 120 m/min Workpiece material: C50)

Description	Shouldering Cutting width ae = DC/2		Slotting Ramping and helical milling	
	ap (mm)		ap (mm)	
MEC25-S25-17				
MEC32-S32-17				
MEC40-S32-17				
MEC25-S25-160-17 Long shank				
MEC32-S32-200-17 Long shank				
MEC40-S32-240-17 Long shank				



Milling

Cutting performance of MEC face mill

Cutting edge length 10 mm type (JT chipbreaker)

(Vc = 120 m/min Workpiece material: C50)

Cutting dia.	Description	Overhang length LPR (mm)
ø32	MEC032R-11-5T-M	110
ø40	MEC040R-11-T-OM	115
ø50	MEC050R-11-OT-M	100
ø63	MEC063R-11-OT	95
	MEC063R-11-OT-M	
ø80	MEC080R-11-OT	95
	MEC080R-11-OT-M	
ø100	MEC100R-11-9TN	108
	MEC100R-11-9T-MN	
ø125	MEC125R-11-11T	
	MEC125R-11-11T-M	

Shape

Description	Shouldering (Cutting width ae=DC/2)	Slotting
MEC040R-11-OT-M		
MEC050R-11-OT-M ∓ MEC100R-11-9TN(-MN)		
MEC125R-11-11T(-M)		

Cutting edge length 15.7 mm type (JT chipbreaker)

(Vc = 120 m/min Workpiece material: C50)

Cutting dia.	Description	Overhang length LPR (mm)
ø40	MEC040R-17-4T-M	115
ø50	MEC050R-17-OT-M	100
ø63	MEC063R-17-OT	95
	MEC063R-17-OT-M	
ø80	MEC080R-17-OT	95
	MEC080R-17-OT-M	
ø100	MEC100R-17-OTN	108
	MEC100R-17-OT-MN	
ø125	MEC125R-17-9T	
	MEC125R-17-9T-M	
ø160	MEC160R-17-12T	
	MEC160R-17-12T-M	

Shape

Description	Shouldering (Cutting width ae=DC/2)	Slotting
MEC040R-17-4T-M		
MEC050R-17-OT-M		
MEC063R-17-OT(-M) ∓ MEC100R-17-OTN(-MN)		
MEC125R-17-9T(-M) MEC160R-17-12T(-M)		

M

Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Ramping, helical milling and vertical milling (Plunging)

Ramping/Helical milling			
Ramping angle is recommended under RMPX. Refer to each tool's cutting performance list for sinking depth per revolution when helical milling. Use compressed air when during machining.	Cutting dia.	Applicable inserts	Max. ramping angle (RMPX)
	ø16~ø18	BDMT11T3 type BDGT11T3 type	3°
	ø19~ø21		5°
	ø22~ø25		2.5°
	ø28~ø32		1.5°
	ø40	BDMT1704 type BDGT1704 type	0.7°
	ø50 and over		Not recommended
	ø25		8°
	ø32		5°
	ø40		2.5°
ø50 and over	Not recommended		

BDMT1103 type is not recommended for ramping and helical milling.

Vertical milling (Plunging)			
	Cutting dia.	Applicable inserts	Max. width of cut (ae)
	ø16 ~ ø19	BDMT11T3 type BDGT11T3 type	1.5 mm
	ø20 ~ ø160	BDMT11T3 type BDGT11T3 type	5 mm
	ø25 ~ ø160	BDMT1704 type BDGT1704 type	8 mm

BDMT1103 type is not recommended for vertical milling (plunging).

Guidance of minimum cutting dia. by helical milling

MEC	Cutting dia.	ø16	ø18	ø20	ø22	ø25	ø28	ø30	ø32	ø40	ø50
BD_T11T3 type	Guidance of minimum cutting dia. by helical milling	ø21	ø25	ø29	ø33	ø39	ø45	ø49	ø53	ø69	Helical milling is not recommended.
	Guidance of minimum cutting dia. in case of flattening bottom after helical milling.	ø28	ø32	ø36	ø40	ø46	ø52	ø56	ø60	ø76	
BD_T1704 type	Guidance of minimum cutting dia. by helical milling	ø25	ø32	ø40	ø50					Helical milling is not recommended.	
	Guidance of minimum cutting dia. in case of flattening bottom after helical milling.	ø34	ø48	ø64							

Case studies

RC55 (Pre-hardened Tool Steel)	
<ul style="list-style-type: none"> • Test piece (54~56HRC) • Vc = 50 m/min (n = 800 min⁻¹) • ap x ae = 2 x 14 mm • fz = 0.125 mm/t (Vf = 300 mm/min) • Dry • MEC20-S20-11T • 3 flutes • BDMT11T308ER-JT (PR830) 	
MEC	Chip removal amount = 71.3cm ³ (Further machining possible)
Competitor's end mill A	Chip removal amount = 2.9 cm ³ (Chipping occurred)
Competitor's end mill A (a25 (2 flutes) Vc = 40 m/min fz = 0.075 mm/t ap x ae = 2 x 3 mm) had chipping occurred in 10 minutes and had loud machining sound. MEC could increase the feed rate, and the cutting edge remained in extremely good condition and is still sustainable for further machining. (User evaluation)	

ST44-2	
<ul style="list-style-type: none"> • Plate • Vc = 88 m/min (n = 1,400min⁻¹) • ap = 5 mm x 2 passes • fz = 0.12 mm/t (Vf = 500 mm/min) • Dry • MEC20-S20-11T • 3 flutes • BDMT11T308ER-JT (PR830) 	
MEC	23 pcs/edge
Competitor's end mill B	10~11pcs/edge
MEC extended the tool life for more than twice. (User evaluation)	

X5CrNi18 10	
<ul style="list-style-type: none"> • Plate • Vc = 125 m/min (n = 1,600 min⁻¹) • ap = 9.0 mm • fz = 0.1 mm/t (Vf = 320 mm/min) • Dry • MEC25-2S-17 • 2 flutes • BDMT170408ER-JT (PR830) 	
MEC	4pcs/edge or more
Competitor's end mill C	1pc/edge or less
Competitor's end mill C (indexable end mill) had high cutting force and had insert breakage, but MEC had no insert breakage and was still usable for further machining after machining 4 pieces (16 points). (User evaluation)	

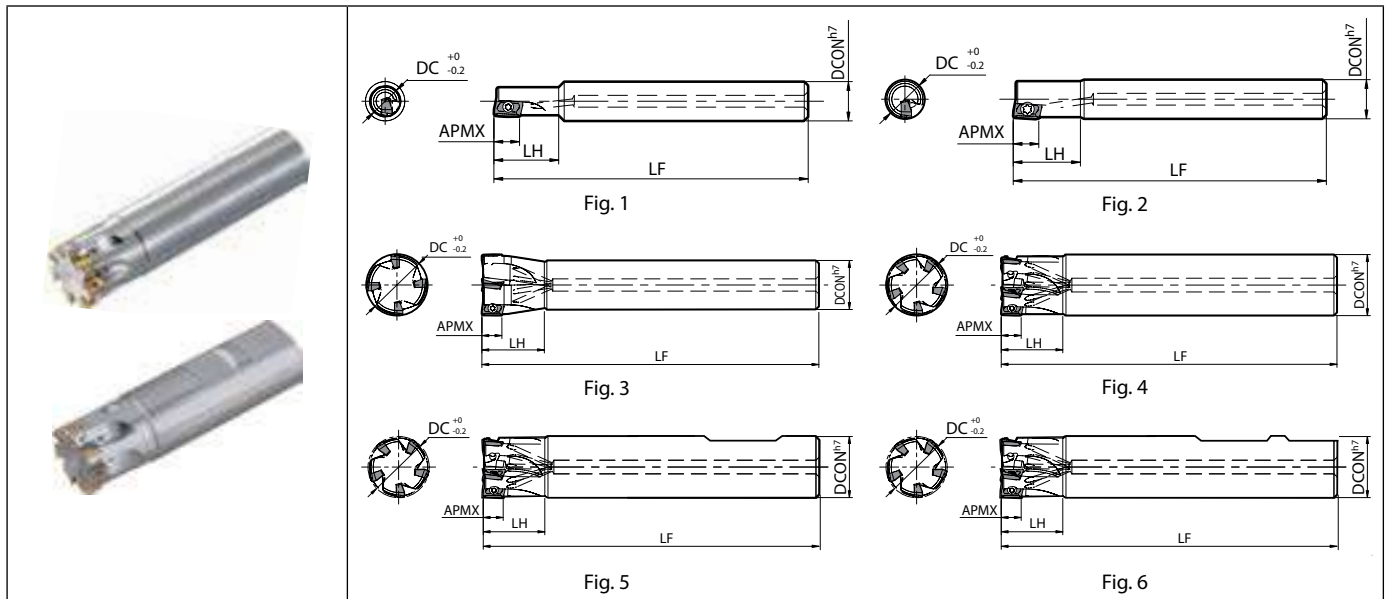
DAC10 (Hot work tool steel)	
<ul style="list-style-type: none"> • Mold • Vc = 130 m/min (n = 1,040 min⁻¹) • ap x ae = (~3) x (~5) (Varies depending on machining point) • fz = 0.18 mm/t (Vf = 936 mm/min) • Dry (Air blow) • MEC40-S32-11T - 5 flutes • BDMT11T308ER-JT (PR830) 	
MEC	2 hours (Small wear: extendible)
Competitor's end mill D	2 hours (Halted due to insert breakage)
MEC had better cutting performance/insert life comparing to competitor's end mill D, and the insert had only small wear and was usable for further machining after used for machining of the same duration as competitor's end mill D. Competitor's end mill D (6 flutes type) was used with Vf = 936 mm/min (fz = 0.15 mm/t). (User evaluation)	

20CrMo5	
<ul style="list-style-type: none"> • Knuckle Steering • Vc = 150 m/min (n = 1,200 min⁻¹) • ap = 0.5~5 mm (Shouldering) • fz = 0.1 mm/t (Vf = 478 mm/min) • Dry • MEC40-S32-17 • 4 flutes • BDMT170408ER-JT (PR830) 	
MEC	150 pcs/edge
Competitor's end mill E	40pcs/edge
MEC had a better finished surface comparing to competitor's end mill E and also improved the tool life by more than 3 times. (User evaluation)	

Ni-base heat-resistant alloys	
<ul style="list-style-type: none"> • Turbine parts • Vc = 15 m/min (n = 120 min⁻¹) • ap = 0.5 mm • fz = 0.08 mm/t (Vf = 38 mm/min) • Wet • MEC040R-17-4T-M • 4 flutes • BDMT170408ER-JS (PR1025) 	
MEC	9pcs/edge
Competitor's end mill F	1pc/edge or less
Competitor's end mill F (Coated carbide Insert) could not finish machining of 1 workpiece, but MEC could cut 9pcs/edge and the finished surface was good. (User evaluation)	



MECX



Toolholder dimensions

Description	Availability	Dimension (mm)						A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Fig.	Spare parts			Applicable inserts M100
		Inserts		LF	LH	APMX	Anti-seize compound						Screw	Wrench		
		DC	D/CON													
Standard shank Standard	MECX	●	1	8	10	16	6	+11.7	-24	Yes	48100	1	P-37	SB-2035TRG	DTM-6	BDMT0703...-JT BDMT0703...-JS
			2	14	12	18		-12.1	44800		3					
			3	17	16	100		-11	42400		3					
			4	18	16	20		-10.9	41600		3					
			5	20	20	110		-10.4	40200		3					
			6	21	20	25		-10.1	39500		3					
		●	7	25	25	120	25	-9.7	37000	3						
			8	26	25	120	25	-9.5	36500	3						
			9	33	32	130	30	-8.8	33100	3						
			●	10	20	16	110	20	-10.4	40200	3					
				11	25	20	120	25	-9.7	37000	3					
			Same shank Standard	MECX	●	1	10	10	17	6	+12.8	-18.7		Yes	47100	
2	12	12				18	+14.3	-13.7	46200		4					
3	16	16				100	20	-11.3	43200		4					
4	20	20				110	25	-10.4	40200		4					
5	25	25				120	25	-9.7	37000		4					
6	32	32				130	30	-8.9	33600		4					
●	7	16			16	100	20	-11.3	43200	4						
	8	20			20	110	25	-10.4	40200	4						
	9	25			25	120	25	-9.7	37000	4						
	10	32			32	130	30	-8.9	33600	4						
	●	11			17	16	130	20	-11	42400	3					
		12			21	20	140	20	-10.1	39500	3					
●	13	26	25	160	25	-9.5	36500	3								
	Weldon Standard	MECX	3	16	16	68.5	6	+16.3	-11.3	Yes	43200	5	P-37	SB-2042TRG	DTM-6	BDMT0703...-JT BDMT0703...-JS
			4	20	20	81		-10.4	40200		5					
5			25	25	88	-9.7		37000	6							
Weldon Fine pitch	MECX	●	4	16	16	68.5	6	+16.3	-11.3	Yes	43200	5	P-37	SB-2042TRG	DTM-6	BDMT0703...-JT BDMT0703...-JS
			5	20	20	81		-10.4	40200		5					
		●	6	25	25	88		25	-9.7		37000	6				
			7	25	25	88		25	-9.7		37000	6				

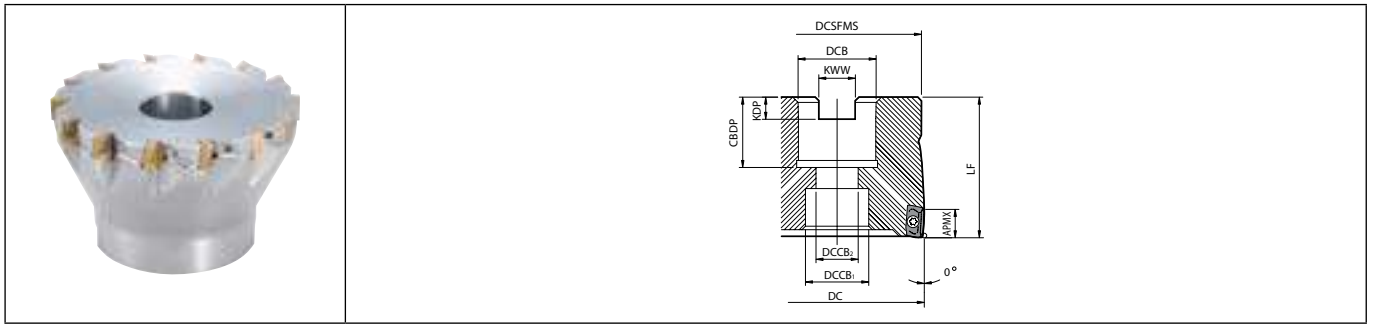
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load. For more details, see "Warning" on page M101.

For good shoulder finishes by MECX multistage ap. In order to obtain smooth machining wall surface by MECX multistage ap set ap within 5mm for each cut.

Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MECX



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)										A.R. MAX. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts			Applicable inserts ➔ M100
			R	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW						APMX	Anti-seize compound	Screw		Wrench
MECX 032R-07-8T-M 040R-07-10T-M	●	8	32	30	16	14	8.5	40	20	5.5	8.5	6	+7	-8.9	Yes	33600	0.15	P-37	SB-2042TRG	DTM-6	BDMT0703...-JT BDMT0703...-JS
	●	10	40	38	22	18	12	40	22	6.3	10.4	6	+7	-8.4	Yes	30500	0.25				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

For more details, see „Warning“ on page M101.

For good shoulder finishes by MECX multistage ap.

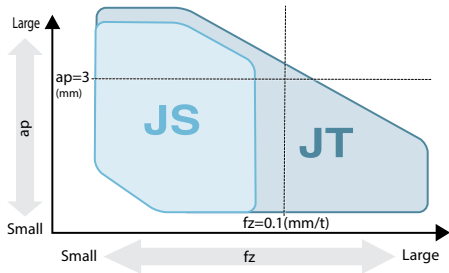
In order to obtain smooth machining wall surface by MECX multistage ap set ap within 5mm for each cut.

Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.

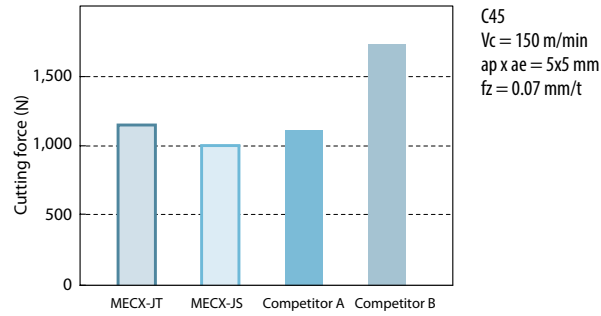
MECX032R comes with mounting bolt (HH8X25H) and MECX040R comes with mounting bolt (HH10X30H).



Chipbreaker selection



Cutting force comparison (Internal evaluation)



Warning Please observe below precautions fully. Failure to observe the precautions may cause serious damage to human body.

Warning about max. revolution indicated on main body

- Do not use the end mill or cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter or the body may be damaged even under no load.
- For actual practical revolution, please set within recommended cutting condition.
- When using at a higher revolution (over 10,000min⁻¹), refer to the table to adjust the balance of MECX and suitable arbor.

Revolution (min ⁻¹)	Balance quality grade G ISO 1940-1/8821 (JIS B0905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

Recommended cutting conditions

Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)			
	JS chipbreaker	JT chipbreaker	MEGACOAT NANO EX (MEGACOAT NANO)			CVD coated carbide
			PR1835 (PR1535)	PR1825	PR1810	CA6535
Carbon steel	0.04~ 0.08 ~0.1	0.06~ 0.1 ~0.12	☆ 120~ 180 ~250	★ 120~ 180 ~250	-	-
Alloy steel	0.04~ 0.06 ~0.08	0.06~ 0.08 ~0.1	☆ 100~ 160 ~220	★ 100~ 160 ~220	-	-
Mold steel	0.04~ 0.06 ~0.08	0.06~ 0.08 ~0.1	☆ 80~ 140 ~180	★ 80~ 140 ~180	-	-
Stainless steel (Austenitic related)	0.03~ 0.04 ~0.05	0.05~ 0.06 ~0.07	★ 100~ 160 ~200	☆ 100~ 160 ~200	-	-
Stainless steel (Martensitic related)	0.03~ 0.04 ~0.05	0.05~ 0.06 ~0.1	☆ 150~ 200 ~250	-	-	★ 180~ 240 ~300
Stainless steel (Precipitation hardening)	0.03~ 0.04 ~0.05	0.05~ 0.06 ~0.1	★ 90~ 120 ~150	-	-	-
Gray cast iron	0.04~ 0.08 ~0.1	0.08~ 0.1 ~0.15	-	-	★ 120~ 180 ~250	-
Nodular cast iron	0.04~ 0.06 ~0.08	0.08~ 0.1 ~0.12	-	-	★ 100~ 150 ~200	-
Ni-base heat-resistant alloys	0.03~ 0.04 ~0.05	0.05~ 0.06 ~0.07	☆ 20~ 30 ~50	-	-	★ 20~ 30 ~50
Titanium alloys	0.04~ 0.06 ~0.08	0.08~ 0.1 ~0.12	★ 40~ 60 ~80	-	-	-

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

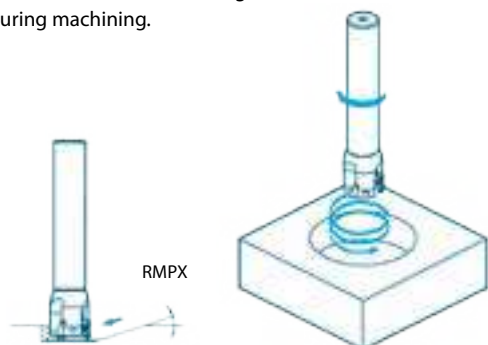
★: 1st Recommendation ☆: 2nd Recommendation



Ramping/Helical milling

Ramping angle is recommended under RMPX.

Refer to each tool's cutting performance list for sinking depth per revolution when helical milling. Use compressed air during machining.



Cutting dia.	Applicable inserts	Max. ramping angle (RMPX)
ø8	BDMT0703 type	Not recommended
ø10		1.5°
ø12,ø14		2°
ø16		3°
ø17,ø18		1.5°
ø20		2°
ø21		1.8°
ø25		1.3°
ø26		1.2°
ø32		0.8°
ø33		0.5°

Guidance of minimum cutting dia. by helical milling

MECX	Cutting dia.	ø8	ø10	ø12	ø14	ø16	ø17	ø18	ø20
BDMT0703 type	Guidance of minimum cutting dia. by helical milling	Helical milling is not recommended	ø14	ø18	ø22	ø26	ø28	ø30	ø34
	Guidance of minimum cutting dia. in case of flattening bottom after helical milling		ø17	ø21	ø25	ø29	ø31	ø33	ø37

MECX	Cutting dia.	ø21	ø25	ø26	ø32	ø33
BDMT0703 type	Guidance of minimum cutting dia. by helical milling	ø36	ø44	ø46	ø58	ø60
	Guidance of minimum cutting dia. in case of flattening bottom after helical milling	ø39	ø47	ø49	ø61	ø63



Milling

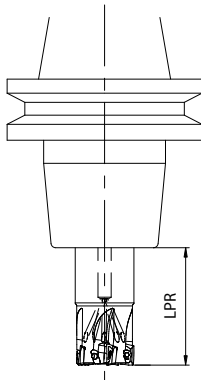
Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

Cutting performance of MECX end mill

(Vc = 150 m/min Workpiece material: C50)

Cutting dia.	Description	Overhang length LPR (mm)	
ø8	MECX08-S10-07-1T	16	-
ø10	MECX10-S10-07-1T	17	-
ø12	MECX12-S12-07-2T	18	30
ø16	MECX16-S16-07-3T	20	40
ø20	MECX20-S20-07-4T	20	40
ø25	MECX25-S25-07-5T	25	50
ø32	MECX32-S32-07-6T	30	50

Shape



- * Machining with extended Overhang length is not recommended for ø8 and ø10.
 - * The cutting performance list shows applicable range of JT chipbreaker with Standard flute-number type.
- For multi-edge type, use with 70% or less of ap.
- * Cutting conditions of JS chipbreaker
1. For MECX08~MECX12
Decrease the feed rate by 25% according to cutting capability list.
 2. For MECX16 and over
Decrease the feed rate and ap by 30% according to cutting capability list.

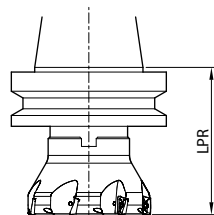
Description	Shouldering (Cutting width ae = DC/2)	Slotting Ramping and helical milling
MECX08-S10-07-1T		
MECX10-S10-07-1T		
MECX12-S12-07-2T		
MECX16-S16-07-3T		
MECX20-S20-07-4T		
MECX25-S25-07-5T		
MECX32-S32-07-6T		

Cutting performance of MECX face mill

(Vc = 150 m/min Workpiece material: C50)

Cutting dia.	Description	Overhang length LPR (mm)
ø32	MECX032R-07-8T-M	100
ø40	MECX040R-07-10T-M	

Shape



Description	Shouldering (Cutting width ae=DC/2)
MECX032R-07-8T-M MECX040R-07-10T-M	

- * Use JT chipbreaker.
- * Slotting is not recommended.



High performance milling

MEV

Newly developed triangular inserts providing low cutting force and increased toolholder rigidity. High performance, economical, and multi-functional milling solutions.

1 High performance: low cutting force and high rigidity

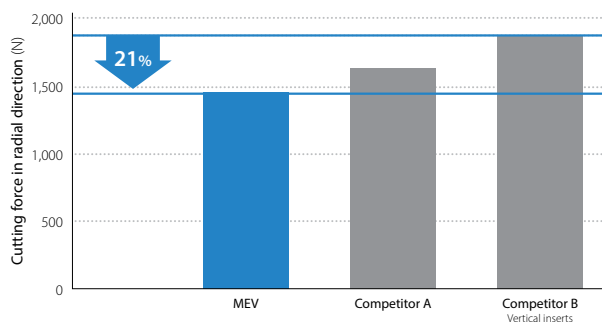
Newly developed vertical triangle inserts with 3 cutting edges achieve stable machining with reduced chattering.

MEV vs. competitor

	MEV Vertical triangle inserts	Conventional end mill Positive inserts	Conventional end mill Vertical inserts
Cutting force	A.R.: Large A.R. Max. +17° Low cutting force	A.R.: Large Low cutting force	A.R.: small High cutting force
Toolholder's rigidity	Web thickness: large about 120% Web thickness High rigidity	Web thickness: small Low rigidity	Web thickness: large High rigidity
	Cutting force: Low Toolholder's rigidity: High	Cutting force: Low Toolholder's rigidity: Low	Cutting force: High Toolholder's rigidity: High

Keeping A.R. max. at 17°, provides lower cutting force than the positive insert types of competitors

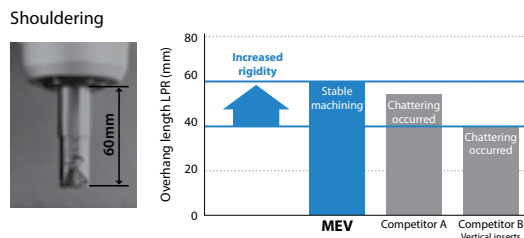
Cutting force comparison (internal evaluation)



Cutting conditions: $V_c = 200$ m/min, $a_p \times a_e = 3 \times 18$ mm, $f_z = 0.10$ mm/t, $\phi 20$ (3 inserts), Dry, Workpiece material: 42CrMo4

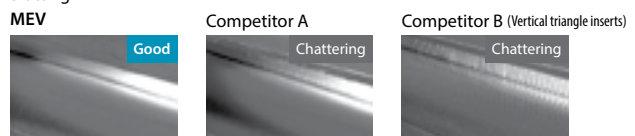
Low cutting force and large optimal web thickness provides excellent chattering resistance

Chattering resistance comparison (internal evaluation)



Cutting conditions: $V_c = 200$ m/min, $a_p \times a_e = 3 \times 18$ mm, $f_z = 0.10$ mm/t, $\phi 20$ (3 inserts), Dry, Workpiece material: 42CrMo4

Slotting



Cutting conditions: $V_c = 220$ m/min, $a_p = 3$ mm (Slotting), $f_z = 0.10$ mm/t, $\phi 20$ (3 inserts), Dry, Workpiece material: 42CrMo4

M

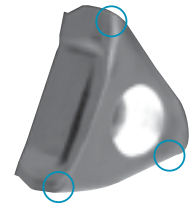
Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

2 The economical choice: 3 cutting edge insert with long tool life

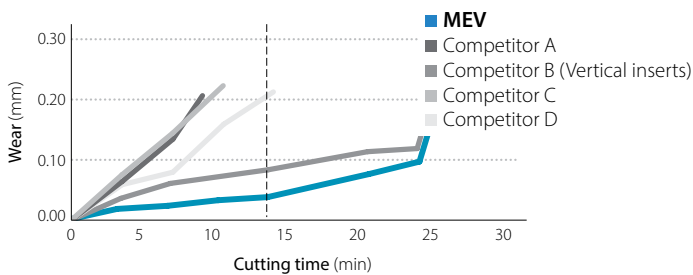
Insert

Unique triangle inserts with 3 cutting edges. PR15 series utilizes MEGACOAT NANO coating technology with excellent wear and adhesion resistance.



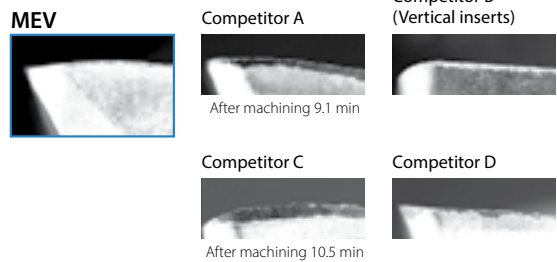
Long tool life with excellent wear resistance

Wear resistance comparison (internal evaluation)

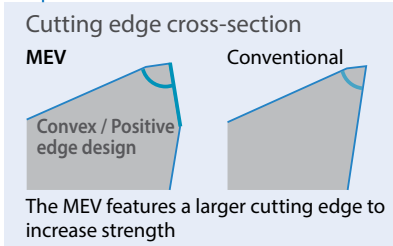


Cutting conditions: Vc = 180 m/min, ap x ae = 3 x 10 mm, fz = 0.1 mm/t, ø20, Dry, Workpiece material: X153CrMoV12 (30~35HS)

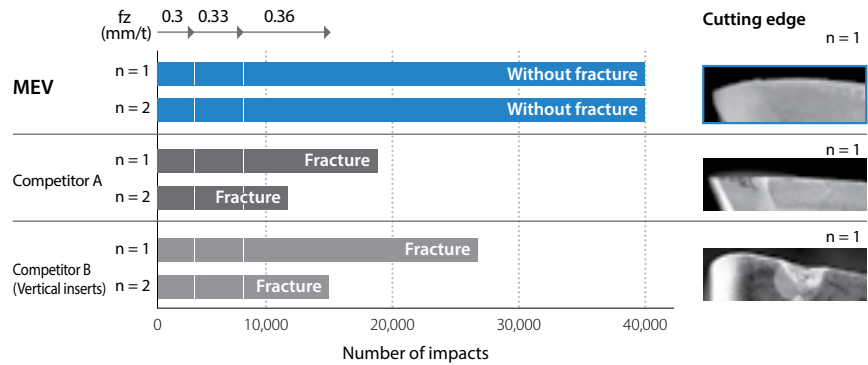
Cutting edge (after machining 14 min)



Improved stability with superior fracture resistance



Wear resistance comparison (internal evaluation)



Cutting conditions: Vc = 120 m/min, ap x ae = 2 x 10 mm, fz = 0.3 - 0.36 mm/t, ø20 (1 insert), Dry, Workpiece material: 42CrMo4 (37~39HS)



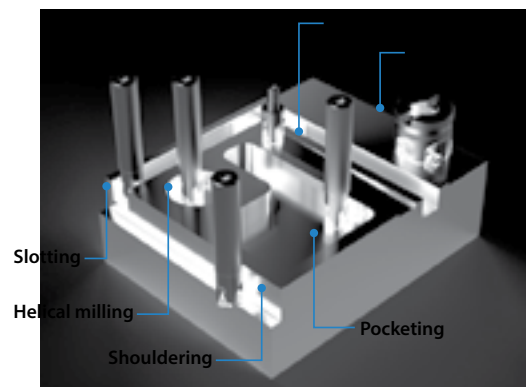
3 Multi-functional: The MEV can perform a wide variety of machining processes

Great performance in shouldering, slotting, and ramping applications (D.O.C. 6 mm or less)

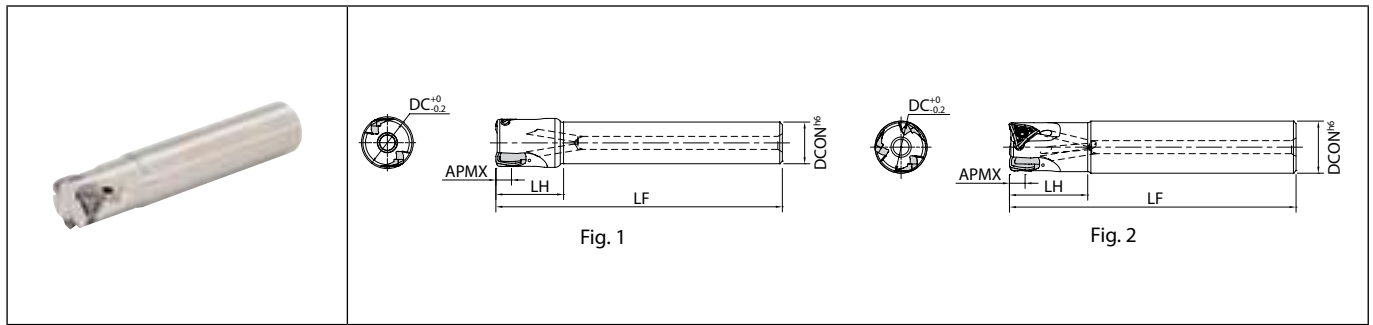
Chip example (slotting)



Cutting conditions: Vc = 150 m/min, ap = 6 mm (Slotting), fz = 0.2 mm/t, ø20 (3 insert), Dry, Workpiece material: ST44-2



MEV



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts M109							
			DC	DCON	LF	LH	APMX							Anti-seize compound	Screw	Wrench								
			Illustrations of spare parts: Anti-seize compound, Screw, Wrench.																					
Standard shank	MEV	20-S16-06-2T	●	2	20	16	110	26	6	+17	-38	32000	0.2	1	P-37	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM						
		22-S20-06-3T	●		22	20				-37	29000	0.2	1											
		25-S20-06-3T	●	3	25		120	29		-36	25000	0.3	1											
		28-S25-06-3T	●		28					Yes	23000	0.4	1											
		30-S25-06-4T	●	4	30	25	130	32		-36	21500	0.5	1											
		32-S25-06-4T	●		32					Yes	20000	0.5	1											
		40-S32-06-5T	●	5	40		150	50		+16	16000	1	1											
		50-S32-06-5T	●		50	32	120	40			13000	0.9	1											
		Recommended tightening torque for insert clamp 2.0N·m																						
		Cylindrical Same shank	MEV	20-S20-06-2T	●	2	20	20		110	30	6	+17	-38					32000	0.2	2	P-37	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM
20-S20-06-3T	●			3					-37	25000	0.4		2											
25-S25-06-2T	●			2	25	25	120	32	-36	20000	0.7		2											
25-S25-06-3T	●			3					Yes				2											
32-S32-06-3T	●			3	32	32	130	40	-36				2											
32-S32-06-4T	●			4					Yes				2											
Cylindrical Long shank	MEV	20-S18-06-150-2T	●	2	20	18	30	6	+17	-38	32000	0.3	1	P-37	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM							
		20-S18-06-150-3T	●	3		150			-37	25000	0.6	2												
		20-S20-06-150-2T	●	2		40			-36	20000	1.1	2												
		20-S20-06-150-3T	●	3					Yes			2												
		25-S25-06-170-2T	●	2		25	25		170	50	-37							2						
		25-S25-06-170-3T	●	3							Yes							2						
		32-S32-06-200-2T	●	2		32	32		200	65	-36							2						
		32-S32-06-200-3T	●	3							-35							2						
		Recommended tightening torque for insert clamp 2.0N·m																						

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

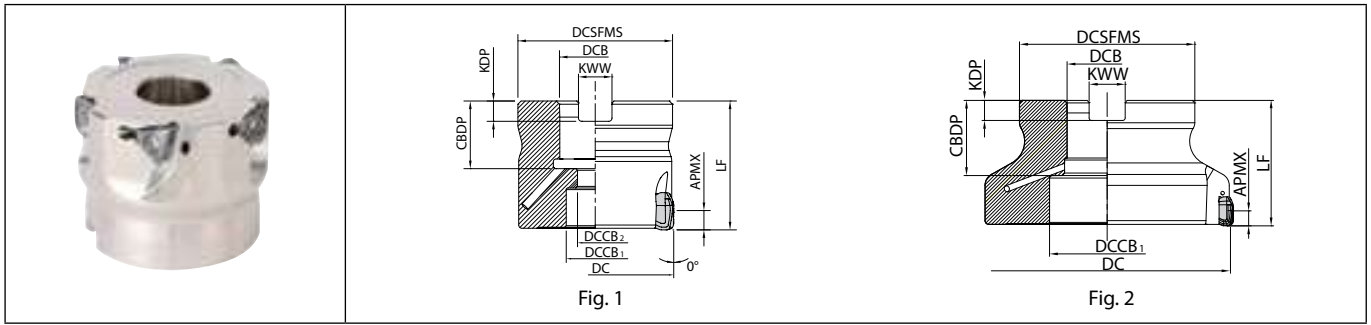
Ball-nose Radius

Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M106

MEV



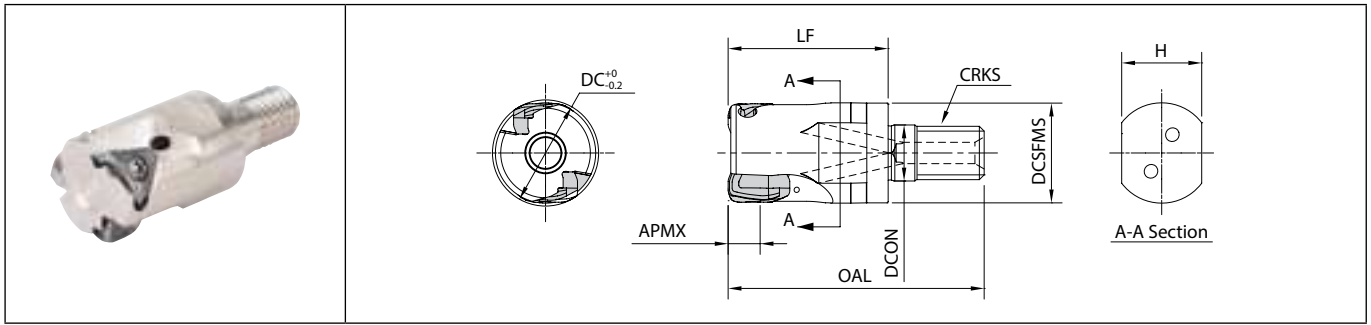
Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)											A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts				Applicable inserts M109
			R	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX							Anti-seize compound	Mounting bolt	Screw	Wrench	
MEV 032R-06-4T-M	●	4	32	30	16	13.5	9	35	19	5.6	8.4	6	+17	-36	Yes	20000	0.1	1	P-37	HH8X25	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM	
040R-06-5T-M	●	5	40	38	22	18	11	40	21	6.3	10.4		16000			0.2	1							
050R-06-5T-M	●	5	50	48	27	20	13	50	24	7	12.4	6	+16	-35	Yes	13000	0.4	1	P-37	HH10X30	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM	
063R-06-6T-M	●	6	63	48	27	20	13	50	24	7	12.4		10000			0.6	1							
080R-06-7T-M	●	7	80	60	27	20	13	50	24	7	12.4	6	+15	-35	Yes	7900	1.1	1	P-37	HH12X35	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM	
080R-06-7T	●	7	80	60	25.4	20	13	50	27	6	9.5		1			1								
100R-06-9T-M	●	9	100	70	32	46	-	50	30	8	14.4	6	+15	-35	Yes	6300	1.4	2	P-37	-	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM	
100R-06-9T	●	9	100	70	31.75	46	-	63	34	8	12.7		2			2								

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.



MEV



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)								A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Spare parts			Applicable inserts ➔ M109
			DC	DCON	DCSFMS	OAL	LF	APMX	CRKS	H					Anti-seize compound	Screw	Wrench	
			MEV 20-M10-06-2T	●	2	20	10.5	18.7	48	30					6	M10x1.5	15		-38	Yes	32000	P-37	SB-3076TRP	DTPM-10	TOMT0605...-GM TOMT0605...-SM
20-M10-06-3T	●	3	25	12.5	23	56	35	M12x1.75	19	-37	25000							
25-M12-06-3T	●	3	25	12.5	23	56	35	M12x1.75	19	-37	25000							
32-M16-06-4T	●	4	32	17	30	62	40	M16x2.0	24	-36		20000						

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

See page M82 for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)



Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M108

Recommended cutting conditions

Chipbreaker	Workpiece	Feed (fz: mm/t)	Recommended insert grade (Vc: m/min)			
			MEGACOAT NANO			CVD coating
			PR1535	PR1525	PR1510	CA6535
GM	Carbon steel	0.08 – 0.15 – 0.25	120 – 180 – 250 ☆	120 – 180 – 250 ★	–	–
	Alloy steel	0.08 – 0.15 – 0.2	100 – 160 – 220 ☆	100 – 160 – 220 ★	–	–
	Mold steel	0.08 – 0.12 – 0.2	80 – 140 – 180 ☆	80 – 140 – 180 ★	–	–
	Stainless steel (Austenitic related)	0.08 – 0.12 – 0.15	100 – 160 – 200 ☆	100 – 160 – 200 ★	–	–
	Stainless steel (Martensitic related)	0.08 – 0.12 – 0.2	150 – 200 – 250 ☆	–	–	180 – 240 – 300 ★
	Stainless steel (Precipitation hardening)	0.08 – 0.12 – 0.2	90 – 120 – 150 ★	–	–	–
	Gray cast iron	0.08 – 0.18 – 0.25	–	120 – 180 – 250 ☆	120 – 180 – 250 ★	–
	Nodular cast iron	0.08 – 0.15 – 0.2	–	100 – 150 – 200 ☆	100 – 150 – 200 ★	–
	Ni-base heat-resistant alloy	0.08 – 0.12 – 0.15	20 – 30 – 50 ☆	–	–	20 – 30 – 50 ★
	Titanium alloy	0.08 – 0.15 – 0.2	40 – 60 – 80 ☆	–	30 – 50 – 70 ☆	–
SM	Carbon steel	0.08 – 0.15 – 0.2	120 – 180 – 250 ☆	120 – 180 – 250 ★	–	–
	Alloy steel	0.08 – 0.12 – 0.18	100 – 160 – 220 ☆	100 – 160 – 220 ★	–	–
	Mold steel	0.08 – 0.1 – 0.15	80 – 140 – 180 ☆	80 – 140 – 180 ★	–	–
	Stainless steel (Austenitic related)	0.08 – 0.1 – 0.15	100 – 160 – 200 ★	100 – 160 – 200 ☆	–	–
	Stainless steel (Martensitic related)	0.08 – 0.1 – 0.15	150 – 200 – 250 ☆	–	–	180 – 240 – 300 ★
	Stainless steel (Precipitation hardening)	0.08 – 0.1 – 0.15	90 – 120 – 150 ☆	–	–	–
	Ni-base heat-resistant alloy	0.08 – 0.1 – 0.12	20 – 30 – 50 ☆	–	–	20 – 30 – 50 ★
	Titanium alloy	0.08 – 0.12 – 0.15	40 – 60 – 80 ★	–	–	–

The number in **bold font** is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
Cutting with coolant is recommended for ni-base heat resistant alloy and titanium alloy.
Cutting with coolant is recommended to get good finished surface.

★ : 1st recommendation ☆ : 2nd recommendation



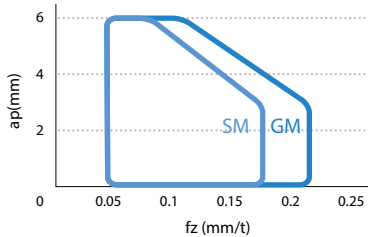
Milling

Recommended chipbreaker range

GM type for General purpose: Edge shape optimized for various machining applications
SM type with low cutting force design: Sharp cutting and large rake angle

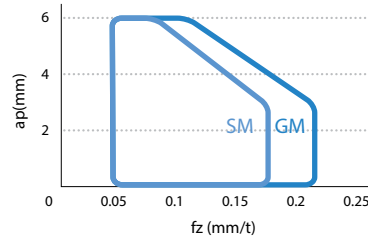
DC : ø20~ø50

Shouldering



Cutting conditions : Vc = 150 m/min, ae = DC/2 mm, Workpiece material : C50

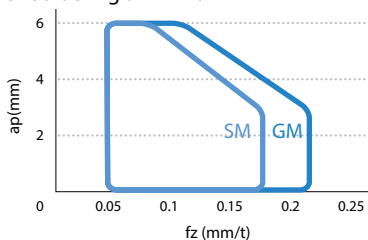
Slotting



Cutting conditions : Vc = 150 m/min, ae = DC mm, Workpiece material : C50

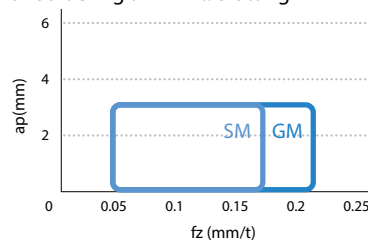
DC : ø63~ø100

Shouldering (ae ≤ DC/4)



Cutting conditions : Vc = 150 m/min, ae = DC/4 mm, Workpiece material : C50

Shouldering (ae > DC/4), Slotting



Cutting conditions : Vc = 150 m/min, ae = DC mm, Workpiece material : C50

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

Reference data for Ramping

Description	Cutter Dia. DC (mm)	20	22	25	28	30	32	40	50
MEV...-06-...	Max. Ramping Angle RMPX	1.00°	0.80°	0.65°	0.60°	0.55°	0.50°	0.40°	0.30°
	tan RMPX	0.017	0.014	0.011	0.010	0.010	0.009	0.007	0.005

Decrease ramping angle if chips become excessively long.

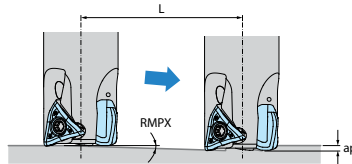
Guide for Ramping (Slant Milling)

Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.

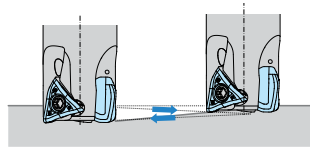
Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length "L" at Max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$



For two-way ramping, the ramping angle should be half of RMPX.

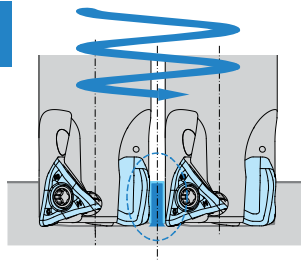


Guide for Helical milling

For helical milling, use between Min. cutting dia. and Max. cutting dia.

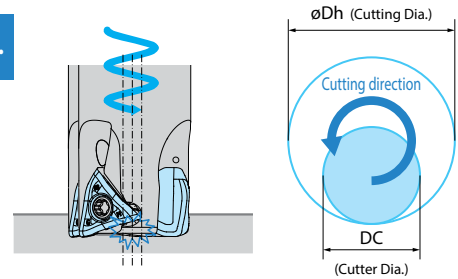
Exceeding Max. Cutting Dia.

Center core part remains after machining



Under Min. Cutting Dia.

Center core part interferes with toolholder

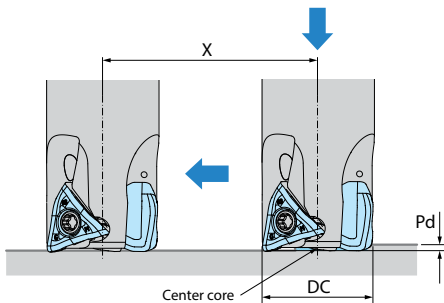


Unit : mm

Description	Min. Cutting Dia.	Max. Cutting Dia.
MEV...-06-...	2×DC-5	2×DC-2

For helical milling, use between Min. cutting dia. and Max. cutting dia. Keep machine depth (h) per rotation less than max. ap (S) in the cutter dimensions chart. Use caution to eliminate incidences caused by producing long chips.

Guide for Drilling

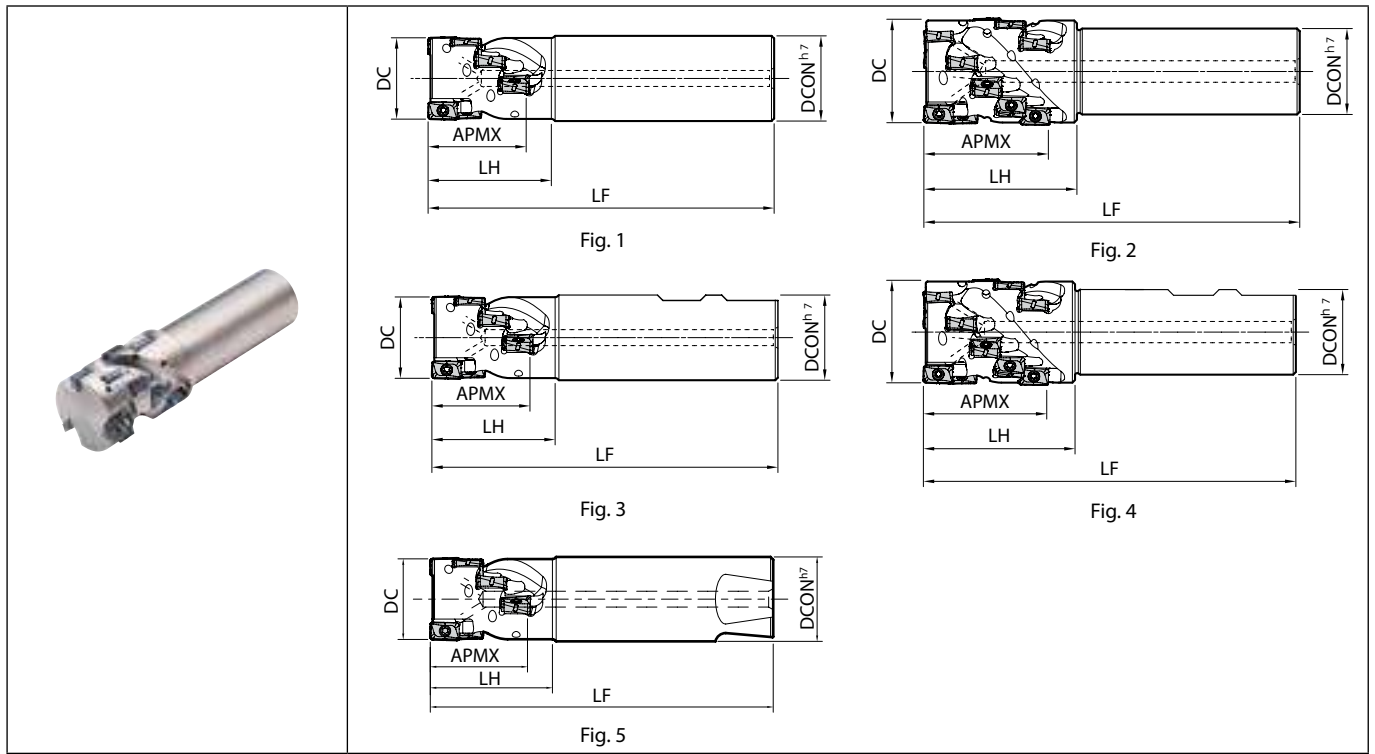


Unit : mm

Description	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MEV...-06-...	0.25	DC-3

It is recommended to reduce feed by 25% of recommendation until the center core is removed when traversing after drilling. Axial feed rate recommendation per revolution is $f < 0.1\text{mm/rev}$.

MEWH



Toolholder dimensions

Description	Availability	Inserts	Flutes	Stages	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts ➔ M114
					DC	DCON	LF	LH	APMX					Anti-seize compound	Screw	Wrench	
MEWH 025-S25-10-3-2T 032-S32-10-4-2T 040-S32-10-5-2T 040-S32-10-5-3T	●	6	2	3	25	25	120	37	28	+13	-20	Yes	1	P-37	SB-3065TRP	DTPM-8	LOMU1004...
	●	8			4	32	130	46	37								
	●	10	5	40	32	140	57	46									
	●	15							2									2	Recommended tightening torque for insert clamp 1.2N·m
MEWH 040-S32-15-4-2T 050-S42-15-4-2T 050-S42-15-4-3T	●	8	2	4	40	32	160	63	53	+13	-20	Yes	2	P-37	SB-4090TRP	DTPM-15	LOMU1505...
	●	12			50	42											
	●	12	3	2	2	Recommended tightening torque for insert clamp 3.5N·m											
MEWH 025-W25-10-3-2T 032-W32-10-4-2T 040-W32-10-5-2T 040-W32-10-5-3T	●	6	2	3	25	25	95	37	28	+13	-20	Yes	3	P-37	SB-3065TRP	DTPM-8	LOMU1004...
	●	8			4	32	108	46	37								
	●	10	5	40	32	119	57	46									
	●	15							4									4	Recommended tightening torque for insert clamp 1.2N·m
MEWH 040-W32-15-4-2T 050-W40-15-4-2T 050-W40-15-4-3T	●	8	2	4	40	32	125	63	53	+13	-20	Yes	4	P-37	SB-4090TRP	DTPM-15	LOMU1505...
	●	12			50	40	135										
	●	12	3	4	4	Recommended tightening torque for insert clamp 3.5N·m											
MEWH 025S25-10-3-2TXT 032S32-10-4-2TXT	☐	6	2	3	25	25	118	37	28	+13	-20	Yes	5	P-37	SB-3065TRP	DTPM-8	LOMU1004...
	☐	8			4	32	32	133	46									37	Recommended tightening torque for insert clamp 1.2N·m

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
MEWH...XT Shank (X-Treme Shank) is for NIKKEN X-Treme chuck.

● : Standard item R : Right-hand only L : Left-hand only ☐ : Check availability

M112

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

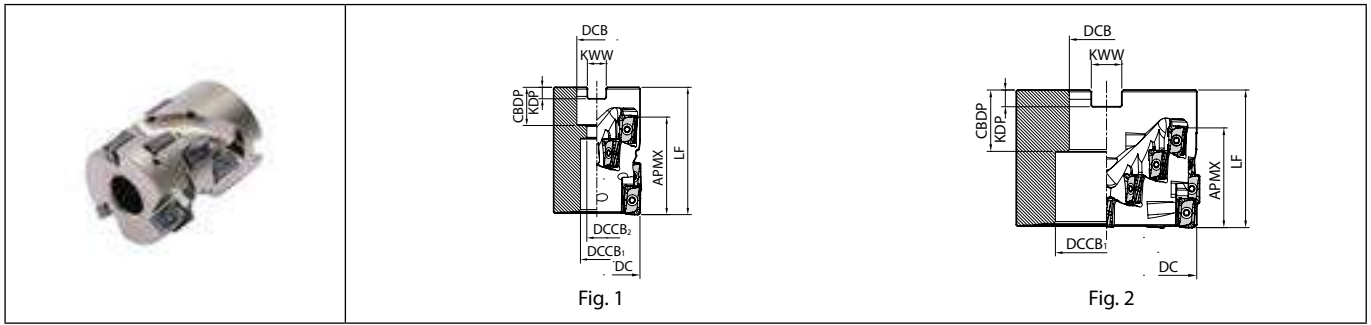
Multi-Function

Slot Mill

Ball-nose Radius

Others

MEWH



Toolholder dimensions

Description	Availability	Inserts	Flutes	Stages	Dimension (mm)								A.R. max. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts				Applicable inserts ● M114					
					DC	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KOP	KWW					APMX	Anti-seize compound	Mounting bolt	Screw		Wrench				
MEWH 040R-10-4-3T-M	●	12	3	4	40	16	15	9	53	19	5.6	8.4	37	+13	-20	No	1	P-37	HH8X25	SB-3065TRP	DTPM-8	LOMU1004...				
MEWH 050R-10-5-3T-M	●	15		5	50	22	18	11	64	21	6.3	10.4	46				1		HH10X30	Recommended tightening torque for insert clamp 1.2N·m						
MEWH 050R-15-4-3T-M	●	12	3	4	50	22	18	11	70	21	6.3	10.4	53	+13	-20	No	1	P-37	HH10X30	SB-4090TRP	DTPM-15	LOMU1505...				
MEWH 063R-15-3-3T-M	●	9	3	3	63	27	20	13	58	24	7	12.4	41						1				HH12X35			
MEWH 080R-15-4-4T-M	●	16	4	4	80	32	26	18	70	28	8	14.4	53						1				HH16X45			
MEWH 100R-15-4-5T-M	●	20	5	4	100	40	55	-	74	33	9	16.4	53						2	-					Recommended tightening torque for insert clamp 3.5N·m	

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Guidance of applicable inserts for MEWH

Insert location indication	Toolholder description											
	MEWH...10...					MEWH...15...						
	Corner-R(RE) (mm)					Corner-R(RE) (mm)						
Bottom inserts	0.4	0.8	1.2	1.6	2.0	0.4	0.8	1.0	1.2	1.6	2.0	
*Middle inserts	0.4 / 0.8	0.4 / 0.8	0.4 / 0.8	0.4	0.4	0.4~1.6	0.4~1.6	0.4~1.6	0.4~1.6	0.4~1.6	0.4~1.6	0.4~1.6

* For middle inserts, it is not recommended to use the insert with larger corner-R(RE) than shown in the table, because it will make finished surface uneven.

M



Milling

LOMU

Insert		Description	Dimension (mm)						Carbide						Applicable toolholder M112 M113		
			S	D1	RE	L	W1	BS	PVD								
									C6935	PR0155	PR1510	PR1525	PR1535	PR1810		PR1825	PR1835
Classification of usage ★: Roughing / 1st Choice ☆: Roughing / 2nd Choice ■: Finishing / 1st Choice □: Finishing / 2nd Choice (In case hardness is 45HRC or under)		Carbon steel / Alloy steel							☆				★	☆	P		
		Mold and die steel							☆					★		☆	
		Austenitic stainless steel									☆			☆		★	M
		Martensitic stainless steel							★							☆	
		Precipitation hardening stainless steel									☆					★	
		Gray cast iron									☆			★			K
		Nodular cast iron									☆			★			
		Non-ferrous metals															N
		Heat-resistant alloy							★						☆		
		Titanium alloy										☆			★	S	
		Hard materials								★							
																H	



Handed insert shows Right-hand

Recommended cutting conditions M115

Cutting performance

LOMU1004 type

Cutting dia.	Description	2 flute		3 flute	
		ap x ae		ap x ae	
ø25	MEWH025 -S25-10-3-2T			-	
ø32	MEWH032 -S32-10-4-2T			-	
ø40	MEWH040 -S32-10-5-2T			MEWH040 -S32-10-5-3T	

LOMU1505 type

Cutting dia.	Description	2 flute		3 flute	
		ap x ae		ap x ae	
ø40	MEWH040 -S32-15-4-2T			-	
ø50	MEWH050 -S42-15-4-2T			MEWH050 -S42-15-4-3T	

Cutting conditions>
 • Vc = 120 m/min
 • fz = 0.08-0.12 mm/t
 • GM chipbreaker
 • Workpiece material: 34CrMo4
 • Overhang length
 End mill: Overhang length is "LH" of the dimension list

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

M114

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)			
		Toolholder description	MEGACOAT NANO EX (MEGACOAT NANO)			CVD coated carbide
		MEWH025~MEWH050 (Helical end mill)	PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)	CA6535
GM	Carbon steel	0.06~ 0.1 ~0.2	120~ [☆] 180 ~250	120~ [★] 180 ~250	-	-
	Alloy steel	0.06~ 0.1 ~0.14	100~ [☆] 160 ~220	100~ [★] 160 ~220	-	-
	Mold steel	0.06~ 0.08 ~0.12	80~ [☆] 140 ~180	80~ [★] 140 ~180	-	-
	Stainless steel (Austenitic related)	0.06~ 0.08 ~0.12	100~ [☆] 160 ~200	100~ [☆] 160 ~200	-	-
	Stainless steel (Martensitic related)	0.06~ 0.08 ~0.1	150~ [☆] 200 ~250	-	-	180~ [★] 240 ~300
	Stainless steel (Precipitation hardening)	0.06~ 0.08 ~0.1	90~ [★] 120 ~150	-	-	-
	Gray cast iron	0.06~ 0.1 ~0.17	-	-	120~ [★] 180 ~250	-
	Nodular cast iron	0.06~ 0.08 ~0.12	-	-	100~ [★] 150 ~200	-
	Ni-base heat-resistant alloys	0.06~ 0.08 ~0.1	20~ [☆] 30 ~50	-	-	20~ [★] 30 ~50
	Titanium alloys	0.06~ 0.08 ~0.12	40~ [☆] 60 ~80	-	30~ [☆] 50 ~70	-
SM	Carbon steel	0.06~ 0.1 ~0.17	120~ [☆] 180 ~250	120~ [★] 180 ~250	-	-
	Alloy steel	0.06~ 0.08 ~0.12	100~ [☆] 160 ~220	100~ [★] 160 ~220	-	-
	Mold steel	0.06~ 0.08 ~0.12	80~ [☆] 140 ~180	80~ [★] 140 ~180	-	-
	Stainless steel (Austenitic related)	0.06~ 0.08 ~0.12	100~ [★] 160 ~200	100~ [☆] 160 ~200	-	-
	Stainless steel (Martensitic related)	0.06~ 0.08 ~0.1	150~ [☆] 200 ~250	-	-	180~ [★] 240 ~300
	Stainless steel (Precipitation hardening)	0.06~ 0.08 ~0.1	90~ [☆] 120 ~150	-	-	-
	Ni-base heat-resistant alloys	0.06~ 0.08 ~0.1	20~ [☆] 30 ~50	-	-	20~ [★] 30 ~50
	Titanium alloys	0.06~ 0.08 ~0.12	40~ [★] 60 ~80	-	30~ [☆] 50 ~70	-
GH	Carbon steel	0.06~ 0.1 ~0.2	120~ [☆] 180 ~250	120~ [★] 180 ~250	-	-
	Alloy steel	0.06~ 0.1 ~0.14	100~ [☆] 160 ~220	100~ [★] 160 ~220	-	-
	Mold steel	0.06~ 0.08 ~0.12	80~ [☆] 140 ~180	80~ [★] 140 ~180	-	-
	Stainless steel (Austenitic related)	0.06~ 0.08 ~0.12	100~ [☆] 160 ~200	100~ [☆] 160 ~200	-	-
	Stainless steel (Martensitic related)	0.06~ 0.08 ~0.1	150~ [☆] 200 ~250	-	-	180~ [☆] 240 ~300
	Stainless steel (Precipitation hardening)	0.06~ 0.08 ~0.1	90~ [☆] 120 ~150	-	-	-
	Gray cast iron	0.06~ 0.1 ~0.2	-	-	120~ [☆] 180 ~250	-
	Nodular cast iron	0.06~ 0.08 ~0.15	-	-	100~ [☆] 150 ~200	-
	Ni-base heat-resistant alloys	0.06~ 0.08 ~0.1	20~ [☆] 30 ~50	-	-	20~ [☆] 30 ~50
	Titanium alloys	0.06~ 0.08 ~0.12	40~ [☆] 60 ~80	-	30~ [☆] 50 ~70	-

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

* Machining with coolant is recommended for Stainless steel, Ni-base heat-resistant alloys and titanium alloys with MEWH.

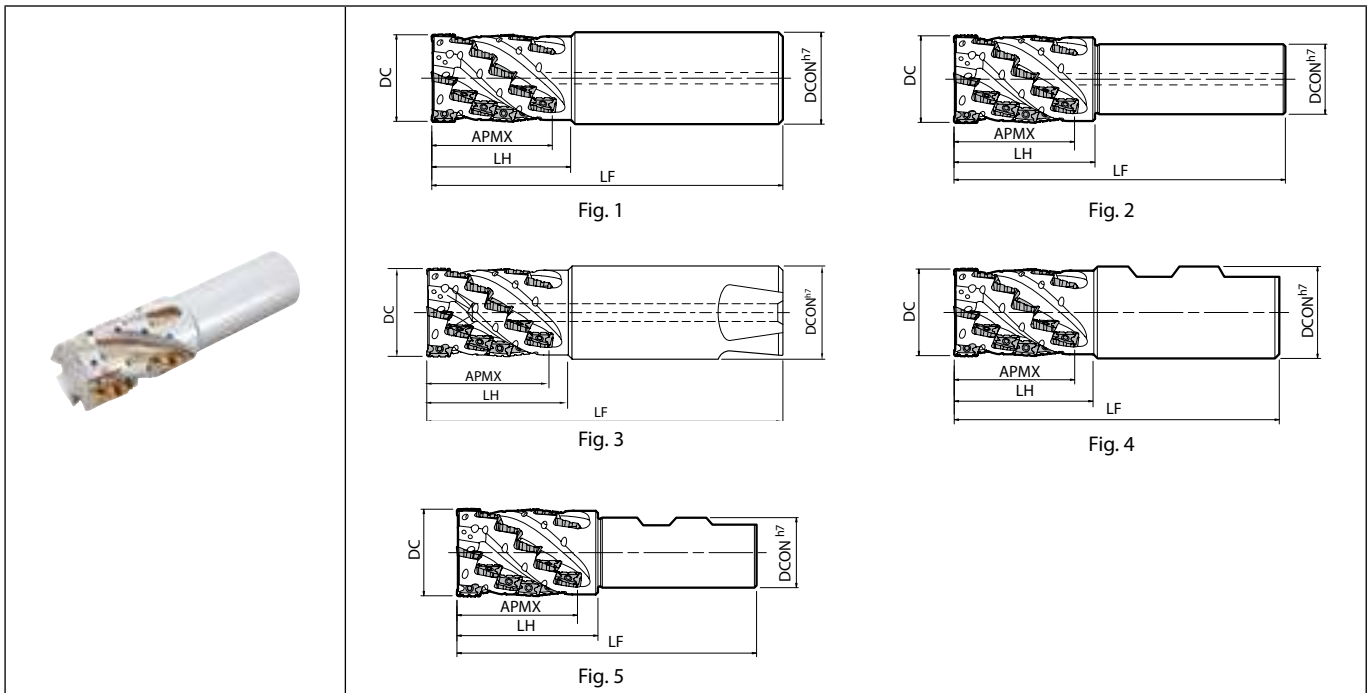
★ : 1st Recommendation

☆ : 2nd Recommendation



Milling

MECH End Mill (with coolant hole for bottom insert)



Toolholder dimensions

M	Description	Availability	Inserts	Flutes	Stages	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts M121
						DC	DCON	LF	LH	APMX					Anti-seize compound	Screw	Wrench	
Milling	MECH 025-S25-11-4-2T	●	8	2	4	25	25	120	46	37	+21	-10	Yes	1	P-37	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
	MECH 032-S32-11-5-2T	●	10			5	32	32	140	55	46									-9
	MECH 032-S32-11-5-4T	●	20	6	40																150	64	55	+23	-8
	MECH 040-S32-11-6-4T	●	24			7	50	160	75	64		-7						
	MECH 040-S42-11-6-4T	●	24	6	40														172	75	64
	MECH 050-S42-11-7-4T	●	28			7	50	42	172	75	64							
	MECH 050-S42-11-7-6T	●	42															
Milling	MECH 040-S32-17-4-2T	●	8	2	4	40	32	160	73	59	+19	-7	Yes	2	P-37	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4
	MECH 040-S42-17-4-2T	●	8				5	50	42	185	88	74							-6
	MECH 050-S42-17-5-4T	●	20															
Cutter for Finishing	MECH 025-W25-11-4-2T	●	8	2	4	25	25	104	46	37	+21	-10	Yes	4	P-37	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
	MECH 032-W32-11-5-2T	●	10																5	32	32	117	55	46		-9
	MECH 032-W32-11-5-4T	●	20	6	40	40	126	64	55	+23	-8							
	MECH 040-W32-11-6-4T	●	24									7							50	50	147	75	64	-7
	MECH 050-W40-11-7-4T	●	28															
Slot Mill	MECH 040-W32-17-4-2T	●	8	2	4	40	32	136	73	59	+19	-7	Yes	5	P-37	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4
	MECH 050-W40-17-5-4T	●	20															
Ball-nose Radius	MECH 025S25-11-4-2TXT	□	8	2	4	25	25	127	46	37	+21	-10	Yes	3	P-37	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
	MECH 032S32-11-5-2TXT	□	10																5	32	32	142	55	46	+23	-9
	MECH 032S32-11-5-4TXT	□	20															

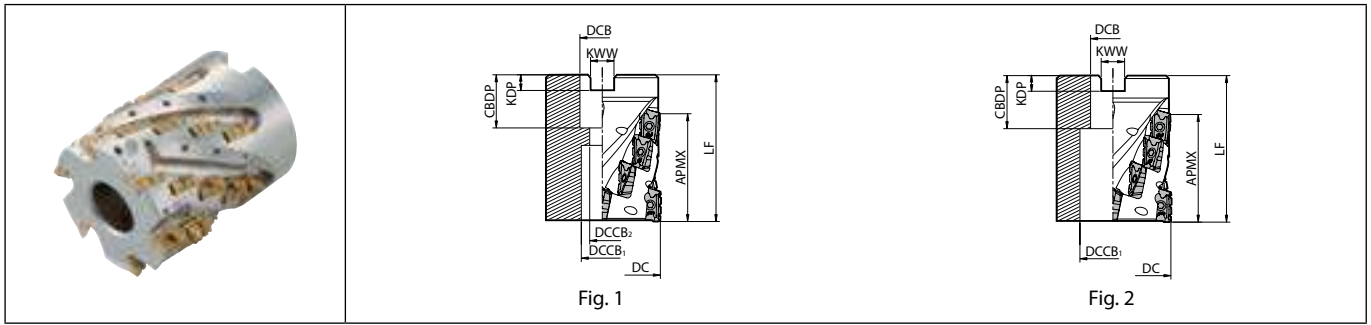
For installation of notched insert, see page M122.

MECH...XT Shank (X-Treme Shank) is for NIKKEN X-Treme chuck.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MECH Shell Mill (without coolant hole)



Toolholder dimensions

Description	Availability	Inserts	Flutes	Stages	Dimension (mm)										A.R. max. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts				Applicable inserts ➔ M121
					DC	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX	Anti-seize compound					Mounting bolt	Screw	Wrench		
MECH 040R-11-4-4T-M	●	16	4	4	40	16	15	9	50	19	5.6	8.4	37	+23	-8	No	1	P-37	HH8X25	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3	
MECH 050R-11-5-6T-M	●	30	6	5	50	22	18	11	63	21	6.3	10.4	46				1		HH10X30				
MECH 050R-17-2-4T-M	●	8	4	2	50	22	18	11	52	21	6.3	10.4	30	+19	-7	No	1	P-37	HH10X30	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4	
MECH 050R-17-4-4T-M	●	16		4	4	78	21	78	21	6.3	10.4	59	1										
MECH 063R-17-3-4T-M	●	12		3	63	27	20	14	70	24	7	12.4	45						1				
MECH 080R-17-4-6T-M	●	24		6	4	80	32	26	18	85	28	8	14.4						59				1
MECH 100R-17-4-6T-M	●	24	6	4	100	40	56	-	85	30	9	16.4	59	2				-					
MECH 063R-17-3-4T	□	12	4	3	63	25.4	20	14	70	26	6	9.5	45	+19	-7	No	1	P-37	HH12X35	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4	
MECH 080R-17-4-6T	□	24	6	4	80	31.75	26	18	85	32	8	12.7	59						1				
MECH 100R-17-4-6T	□	24	6	4	100	38.1	56	-	85	38	10	15.9	59						2				

For installation of notched insert, see page M122.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

X-Treme Chuck [NIKKEN]

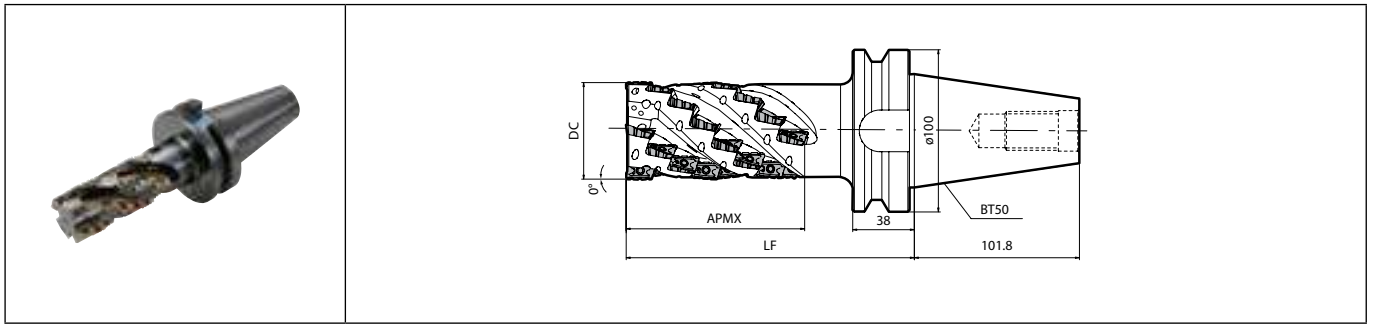
Description	See Page	Shank Dia. (DCON)	X-Treme Chuck			
			BT		HSK	
			BT40	BT50	HSK63A	HSK100A
MEWH 025S25-10-3-2TXT	M112	25.0	-	NBT50-C25EX-116	-	HSK100A-C25EX-116
032S32-10-4-2TXT		32.0	-	NBT50-C32EX-121	-	HSK100A-C32EX-121
MECH 025S25-11-4-2TXT	M116	25.0	-	NBT50-C25EX-116	-	HSK100A-C25EX-116
032S32-11-5-○TXT		32.0	-	NBT50-C32EX-121	-	HSK100A-C32EX-121

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Milling

MECH-BT50 (Integral Arbor type, without coolant hole)



Toolholder dimensions

Description	Availability	Inserts	Flutes	Stages	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Weight (kg)	Spare parts			Applicable inserts ➔ M121
					DC	LF	APMX	Anti-seize compound	Screw					Wrench			
MECH 050R11-8-4T-BT50	●	32	4	8	50	143	73	+23	-7	No	4.8	P-37	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3		
MECH 050R17-7-4T-BT50	●	28	4	7	50	173	104	+19	-7	No	4.9	P-37	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4		
MECH 063R17-7-4T-BT50	●				63						5.9						
MECH 080R17-7-4T-BT50	●				80						7.8						
MECH 100R17-7-6T-BT50	●				100						10.2						

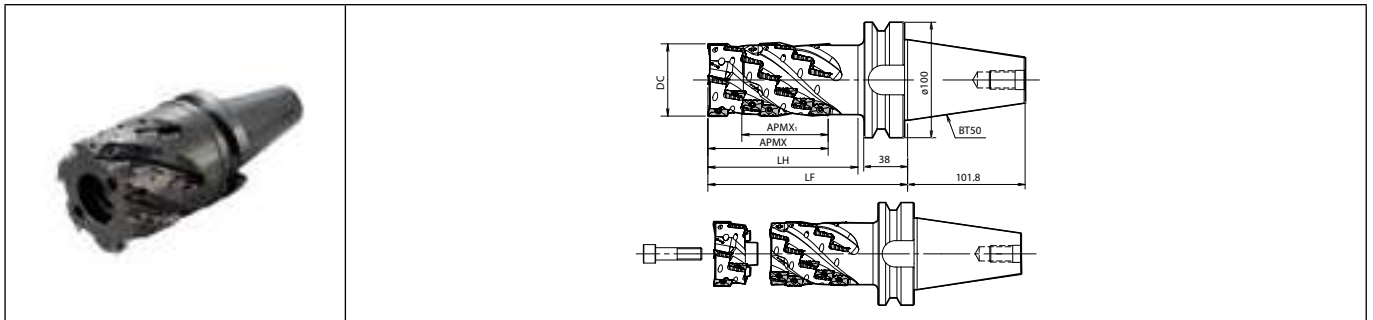
For installation of notched insert, see page M122.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

M

Milling

MECH-BT50SA (without coolant hole) Arbor Integral Type (Base unit + 1 Front piece + Clamp bolt)



Toolholder dimensions

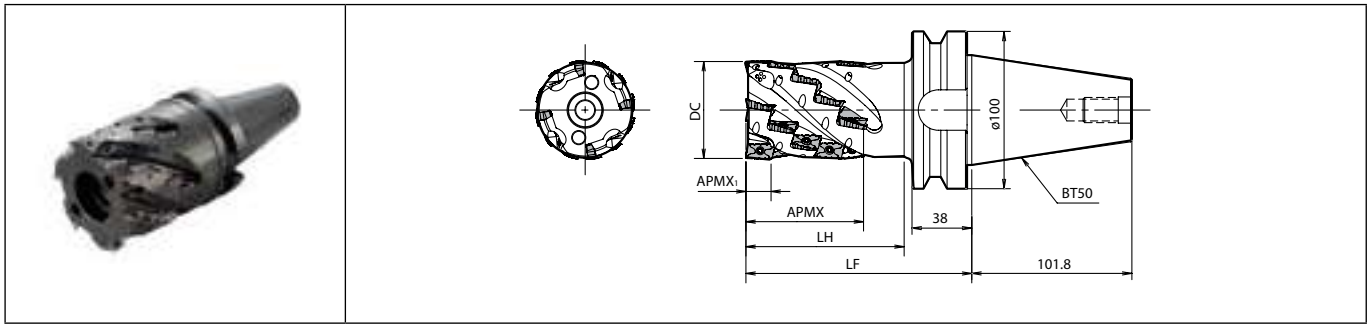
Description	Availability	Inserts	Flutes	Stages	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Weight (kg)	Spare parts					Applicable inserts ➔ M121
					DC	LF	LH	APMX	APMX1					Anti-seize compound	Mounting bolt	Wrench (for Mounting bolt)	Screw	Wrench	
MECH 050R11-4T-BT50SA	MTO	32	4	8	50	143	99	73	55	+23	-7	No	4.8	P-37	HH12X35	LW-10	SB-2555TRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
MECH 063R17-4T-BT50SA	MTO	28	4	7	63	173	130	104	75	+19	-7	No	5.8	P-37	HH16X40	LW-14	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4
MECH 080R17-4T-BT50SA	MTO				80								7.6						
MECH 100R17-6T-BT50SA	MTO				100								9.8							HH20X40	LW-17

For installation of notched insert, see page M122.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MTO : Made to order

MECH-BT50-A (without coolant hole) Base unit



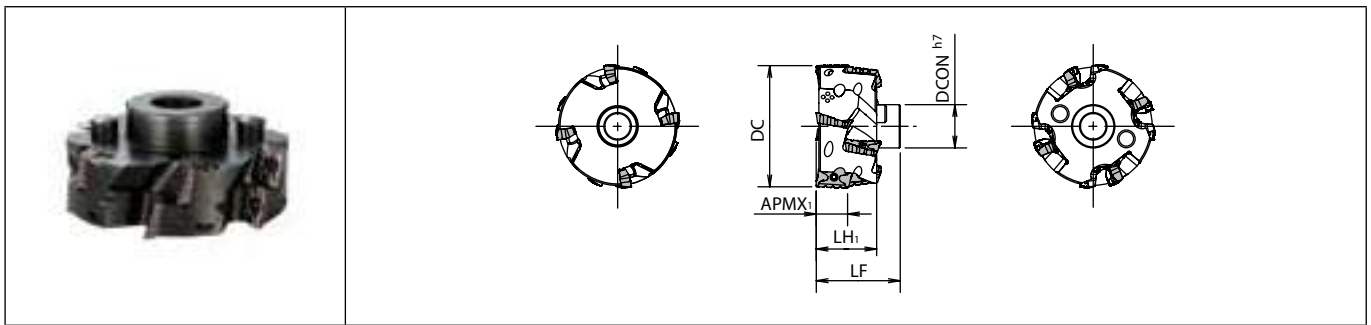
Toolholder dimensions

Description	Availability	Inserts	Flutes	Stages	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Weight (kg)	Spare parts					Applicable inserts ➔ M121
					DC	LF	LH	APMX	APMX1					Anti-seize compound	Mounting bolt	Wrench (for Mounting bolt)	Screw	Wrench	
MECH 050R11-4T-BT50-A	MT0	24	4	6	50	125	81	55	10	+23	-7	No	4.6	P-37	HH12X35	LW-10	SB-255STRG	DTM-8	BDMT11T3...-N2 + BDMT11T3...-N3
MECH 063R17-4T-BT50-A 080R17-4T-BT50-A 100R17-6T-BT50-A	MT0	20	4	5	63	143	100	75	16	+19	-7	No	5.4	P-37	HH12X40	LW-10	SB-4070TRN	DTM-15	BDMT1704...-N3 + BDMT1704...-N4
	MT0				80								6.8		HH16X40	LW-14			
	MT0	30	6	100	8.5								HH20X40		LW-17				

For installation of notched insert, see page M122.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

MECH-F (without coolant hole) Front piece



Toolholder dimensions

Description	Availability	Inserts	Flutes	Stages	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Weight (kg)	Spare parts		Applicable inserts ➔ M121
					DC	LF	LH	APMX1	DCON					Anti-seize compound	Screw	
MECH 050R11-4T-F	●	8	4	2	50	32	18	10	22	+23	-7	No	0.2	P-37	SB-255STRG	BDMT11T3...-N2 + BDMT11T3...-N3
MECH 063R17-4T-F 080R17-4T-F 100R17-6T-F	●	8	4	2	63	44	30	16	22	+19	-7	No	0.4	P-37	SB-4070TRN	BDMT1704...-N3 + BDMT1704...-N4
	●				80				0.8							
	●	12	6	100	45				1.3							

For installation of notched insert, see page M122.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MT0 : Made to order

M







Milling

Toolholder structure

End Mill			Base Unit  M119			Front Piece (1pc)  M119			Clamp Bolt	
MECH	050R11-4T-BT50SA	=	MECH050R11-4T-BT50-A		+	MECH050R11-4T-F		+	HH12X35	
	063R17-4T-BT50SA		MECH063R17-4T-BT50-A			MECH063R17-4T-F			HH12X40	
	080R17-4T-BT50SA		MECH080R17-4T-BT50-A			MECH080R17-4T-F			HH16X40	
	100R17-6T-BT50SA		MECH100R17-6T-BT50-A			MECH100R17-6T-F			HH20X40	

Applicable Inserts

End Mill		Base Unit  M119	Front Piece  M119	Applicable Inserts  M121
MECH	050R11-4T-BT50SA	MECH050R11-4T-BT50-A	MECH050R11-4T-F	BDMT11T308ER-N2 + BDMT11T308ER-N3
	063R17-4T-BT50SA	MECH063R17-4T-BT50-A	MECH063R17-4T-F	BDMT170408ER-N3 + BDMT170408ER-N4
	080R17-4T-BT50SA	MECH080R17-4T-BT50-A	MECH080R17-4T-F	
	100R17-6T-BT50SA	MECH100R17-6T-BT50-A	MECH100R17-6T-F	

· For installation of notched insert, see page  M122



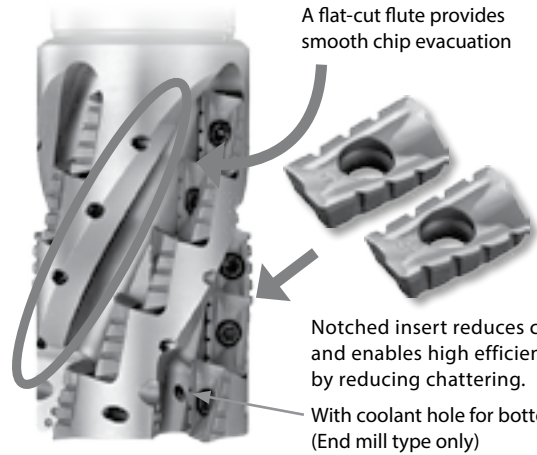
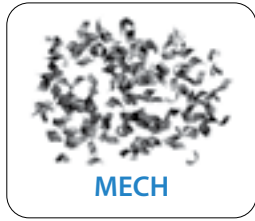
Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

Smooth chip evacuation

Smooth chip evacuation

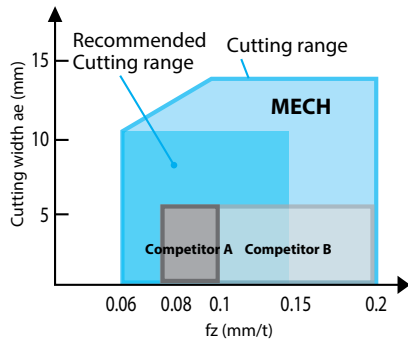
Notched insert breaks chips into small pieces



Workpiece material: ST44-2
 Vc=120m/min
 apxae=40mmx10mm
 fz=0.12mm/t
 MECH032-S32-11-5-4T

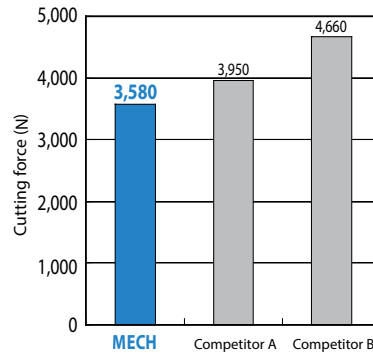
Low cutting force

Low cutting force due to notched inserts



Workpiece material: C50
 Vc=120m/min
 apxae=40 mmx5~13mm
 fz=0.06 ~ 0.2mm/t
 MECH032-S32-11-5-4T

Cutting force comparison (Principal force)



Workpiece material: C50
 Vc = 120 m/min
 ap x ae = 40 mm x 10 mm
 fz = 0.1 mm/t
 MECH032-S32-11-5-4T

(Internal evaluation)

Number of inserts installed

Description	No. of flutes	No. of inserts	No. of inserts			
			BDMT11T308ER-		BDMT170408ER-	
			N2	N3	N3	N4
MECH 025-S25-11-4-2T 032-S32-11-5-2T 032-S32-11-5-4T 040-S32-11-6-4T 040-S42-11-6-4T	2	8	4	4	-	-
		10	5	5	-	-
	4	20	10	10	-	-
		24	12	12	-	-
		28	14	14	-	-
MECH 040-S32-17-4-2T 040-S42-17-4-2T	2	8	-	-	4	4
		20	-	-	10	10
MECH 040R-11-4-4T-M 050R-11-5-6T-M	4	16	8	8	-	-
		30	15	15	-	-
MECH 050R-17-2-4T-M 050R-17-4-4T-M 063R-17-3-4T-M 080R-17-4-6T-M 100R-17-4-6T-M	4	8	-	-	4	4
		16	-	-	8	8
	6	12	-	-	6	6
		24	-	-	12	12
		24	-	-	12	12
MECH 063R-17-3-4T 080R-17-4-6T 100R-17-4-6T	4	12	-	-	6	6
		24	-	-	12	12
	6	24	-	-	12	12

Description	No. of flutes	No. of inserts	No. of inserts			
			BDMT11T308ER-		BDMT170408ER-	
			N2	N3	N3	N4
MECH 050R11-8-4T-BT50 050R17-7-4T-BT50 063R17-7-4T-BT50 080R17-7-4T-BT50 100R17-7-6T-BT50	32	16	16	-	-	
		28	-	-	14	14
	4	42	-	-	21	21
		32	16	16	-	-
		28	-	-	14	14
MECH 050R11-4T-BT50SA 063R17-4T-BT50SA 080R17-4T-BT50SA	4	32	16	16	-	-
		28	-	-	14	14
	6	42	-	-	21	21
MECH 050R11-4T-BT50-A 063R17-4T-BT50-A 080R17-4T-BT50-A	4	24	12	12	-	-
		20	-	-	10	10
	6	30	-	-	15	15
MECH 050R11-4T-F 063R17-4T-F 080R17-4T-F 100R17-6T-F	4	8	4	4	-	-
		8	-	-	4	4
	6	12	-	-	6	6
		12	-	-	6	6

Caution when installing notched insert

1. Install notched inserts by cutting the insert with the number of marks on the toolholder body.

<Insert number and toolholder marks>

Insert size	11 type		17 type	
	2	3	3	4
Insert no.				
Marks				

* Using the cutter with the inserts installed incorrectly will damage the toolholder.

2. When installing notched inserts in flute line, ensure that the number on the insert is the same as the insert in first stage. (Ref. to Fig. 1, 2 and 3)

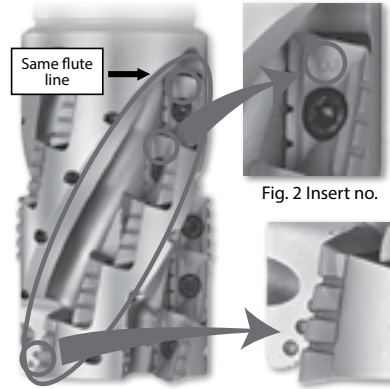


Fig. 1 Same flute line

Fig. 3 Marks

Recommended cutting conditions (When using a notched insert)

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)			
		MEGACOAT NANO	MEGACOAT NANO EX		
		PR1535	PR1810	PR1825	PR1835
Carbon steel	0.08~0.1~0.15	☆ 120~180~250	-	★ 120~180~250	☆ 120~180~250
Alloy steel	0.08~0.1~0.15	☆ 100~160~220	-	★ 100~160~220	☆ 100~160~220
Mold steel	0.08~0.1~0.15	☆ 80~140~180	-	★ 80~140~180	☆ 80~140~180
Gray cast iron	0.08~0.15~0.18	-	★ 120~180~250	-	-
Nodular cast iron	0.08~0.15~0.18	-	★ 100~150~200	-	-
*Titanium alloys	0.08~0.1~0.15	☆ 40~60~80	-	-	★ 40~60~80

* Machining with coolant is recommended for titanium alloys.

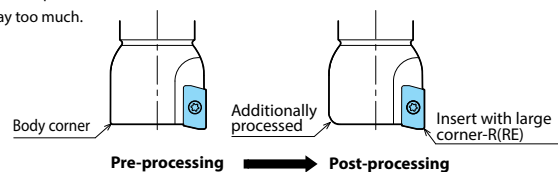
★ : 1st Recommendation ☆ : 2nd Recommendation

- The recommended cutting conditions above are for notched inserts.
- If using an insert without notch, the cutting depth (ap) and width (ae) should be 60% or less of those of a notched insert.

When using inserts with corner-R(RE) 1.6 or larger, additional modifications of the cutter body will be necessary. Ref. to the chart below for the recommended modifications. (Additional grind off is not necessary when corner-R(RE) is 1.2mm or less.)

Insert Corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
1.6	R1.0
2.0	
2.4	R1.2
3.1	R1.6
4.0	R2.5

* Round- shaped additional processing is recommended. When applying chamfer shaped additional processing, do not cut away too much.

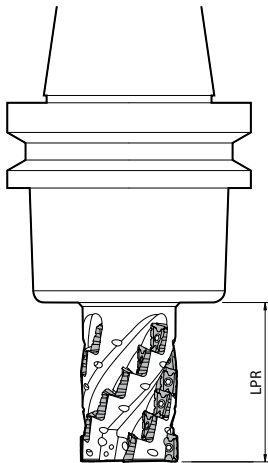


Cutting performance (Used machine: Machining center equivalent to AC15/18.5kW)

MECH end mill

Cutting dia.	Description	Overhang length LPR (mm)
∅25	MECH025-S25-11-4-2T	48
∅32	MECH032-S32-11-5-2T	57
	MECH032-S32-11-5-4T	
∅40	MECH040-S42-11-6-4T	65
	MECH040-S42-11-6-4T	
∅50	MECH050-S42-11-7-4T	76
	MECH050-S42-11-7-6T	
∅40	MECH040-S32-17-4-2T	74
	MECH040-S42-17-4-2T	
∅50	MECH050-S42-17-5-4T	89

Shape



2 flute type

(Workpiece material: C50)

Description	Shouldering	Slotting
	Cutting speed: $V_c = 100 \sim 180$ m/min Feed: $f_z = 0.08 \sim 0.15$ mm/t	Cutting speed: $V_c = 100 \sim 120$ m/min Feed: $f_z = 0.08 \sim 0.12$ mm/t
MECH025-S25-11-4-2T		
MECH032-S32-11-5-2T		
MECH040-S32-17-4-2T MECH040-S42-17-4-2T		

4 flute/6 flute type

MECH032-S32-11-5-4T	
MECH040-S32-11-6-4T MECH040-S42-11-6-4T	
MECH050-S42-11-7-4T	
MECH050-S42-11-7-6T	
MECH050-S42-17-5-4T	

4 flute/6 flute type are not recommended for slotting.



Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

Multi-
Function

Slot Mill

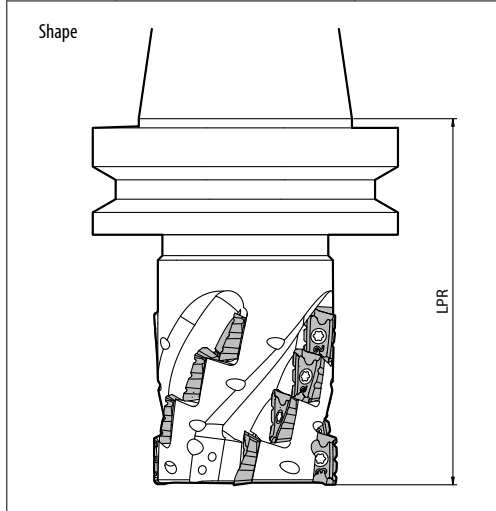
Ball-nose
Radius

Others

MECH shell mill

(Workpiece material: C50)

Cutting dia.	Description	Overhang length LPR (mm)
ø40	MECH040R-11-4-4T-M	125
ø50	MECH050R-11-5-6T-M	123
	MECH050R-17-2-4T-M	112
	MECH050R-17-4-4T-M	138
ø63	MECH063R-17-3-4T-□	115
ø80	MECH080R-17-4-6T-□	130
ø100	MECH100R-17-4-6T-□	130

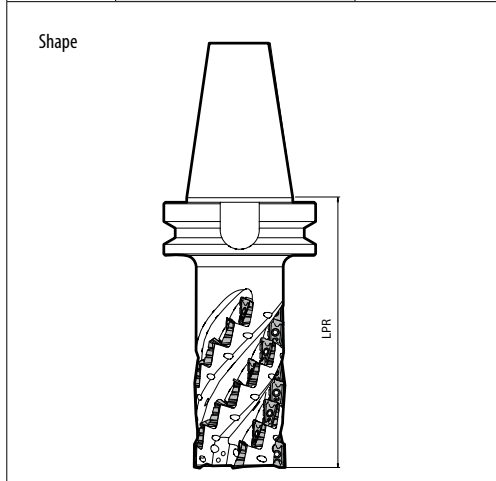


Shouldering			
Cutting speed: $V_c = 100 \sim 180$ m/min Feed: $f_z = 0.08 \sim 0.15$ mm/t			
MECH040R-11-4-4T-M		MECH063R-17-3-4T-□	
MECH050R-11-5-6T-M		MECH080R-17-4-6T-□	
MECH050R-17-2-4T-M		MECH100R-17-4-6T-□	
MECH050R-17-4-4T-M		Slotting is not recommended.	

MECH-BT50 (Integral arbor type)
MECH-BT50SA (Head exchangeable type/Integral arbor type)

(Workpiece material: C50)

Cutting dia.	Description	Overhang length LPR (mm)
ø50	MECH050R11-8-4T-BT50 MECH050R11-4T-BT50SA	173
	MECH050R17-7-4T-BT50	
ø63	MECH063R17-7-4T-BT50 MECH063R17-4T-BT50SA	
ø80	MECH080R17-7-4T-BT50 MECH080R17-4T-BT50SA	
ø100	MECH100R17-7-6T-BT50 MECH100R17-6T-BT50SA	



Shouldering			
Cutting speed: $V_c = 100 \sim 180$ m/min Feed: $f_z = 0.08 \sim 0.15$ mm/t			
MECH050R11-8-4T-BT50 MECH050R11-4T-BT50SA		MECH080R17-7-4T-BT50 MECH080R17-4T-BT50SA	
MECH050R17-7-4T-BT50		MECH100R17-7-6T-BT50 MECH100R17-6T-BT50SA	
MECH063R17-7-4T-BT50 MECH063R17-4T-BT50SA		Slotting is not recommended.	



Helical end mill for titanium alloy machining

MECHT

Insert size combination improves roughing capabilities

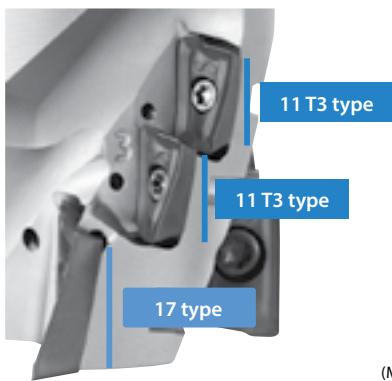
Maintains stable machining and long tool life

1 Developed to reduce chattering and chip recutting issues

Unique insert combination

The larger bottom inserts are positioned to handle larger cutting forces (excluding $\phi 32$)

Stable machining with improved fracture resistance



(MECHT50R-1711 type)

New design for higher reliability

Bottom inserts are held in place by double-faced contacts

Holding surface 1
Wide holding surface



Holding surface 2
Additional hold in the axial direction

Bore dia.

Larger bore diameter improves fastening power and reduces chattering $\phi 50$ mm cutter with a $\phi 27$ mm bore (conventional bore: $\phi 22$ mm)

Toolholder hardness Hardened 15% more than conventional holders

Toolholder spec Custom ordering available
Custom number of inserts and stages

Excellent chip evacuation

New flute design

Large, smooth flutes prevent chip clogging

MECHT ($\phi 50$ -4T 3 stages)

Conventional ($\phi 50$ -4T 4 stages)

Large flute



Smooth design

All inserts have coolant holes

Optimized hole diameter controls flow amount and pressure

Smooth chip evacuation as well as superior cooling of the cutting edge



Chips example

2 Longer tool life with low-resistance JS chipbreaker and tough PVD coating

Low cutting force

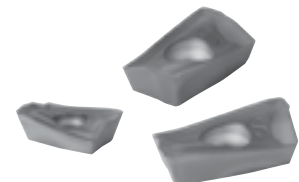
JS chipbreaker

Heat at the cutting edge is suppressed due to sharp cutting performance. Long tool life

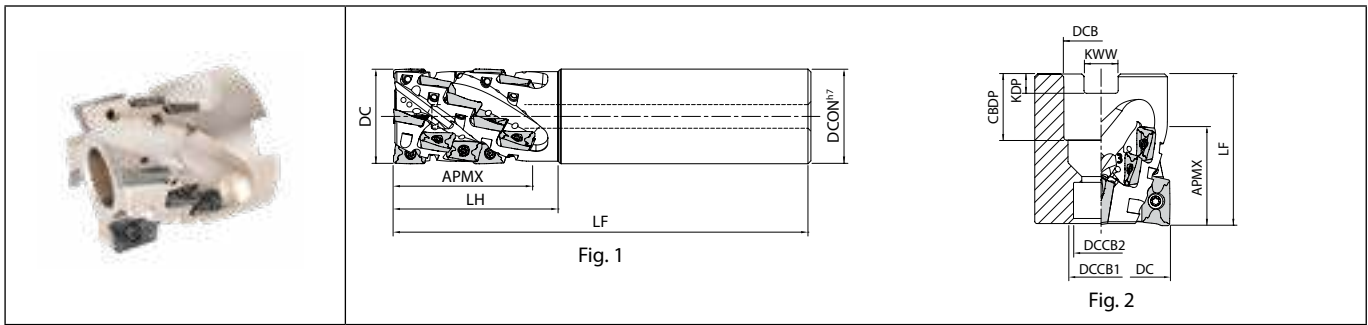
Greater toughness

PR1835

Fracture resistant with a tough substrate and high heat-resistant MEGACOAT NANO EX coating technology



MECHT



Toolholder dimensions


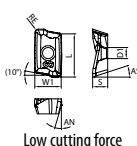
Description	Availability	Inserts	Flutes	Stages	Dimension (mm)											A.R. max. (°)	R.R. max. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts ➔ M128	
					DC	DCON	DCB	DCCB ₁	DCCB ₂	LF	LH	CDDP	KDP	KWW	APMX					Mounting bolt	Screw	Wrench	Stages	
																								1st	2nd or higher
MECHT 32-S32-11-5-4T	●	20	4	5	32	32	-	-	-	140	55	-	-	-	46	+23	-9	Yes	1	-	SB-2555TRG	DTM-8	BDMT11T3..	BDMT11T308..
MECHT 50R-1711-3-4T-M	●	12	4	3	50	-	-	-	-	55	-	-	-	34	-	-	-	Yes	2	HH12X40	SB-2555TRG	DTM-8	BDMT1704..	BDMT11T308..
50R-1711-4-5T-M	●	20	5	4	63	-	27	20	14	65	-	24	7	12.4	43	+19	-7	Yes	2	HH12X50	SB-4070TRN	DTM-15	BDMT1704..	BDMT11T308..
63R-17-4-5T-M	●	20	5	4	63	-	-	-	-	65	-	24	7	12.4	43	+19	-7	Yes	2	HH12X65	SB-4070TRN	DTM-15	BDMT1704..	BDMT170408..
80R-17-4-6T-M	●	24	6	6	80	32	26	17	80	80	-	28	8	14.4	60	-	-	Yes	2	HH16X65	SB-4070TRN	DTM-15	BDMT1704..	BDMT170408..

Use inserts with Corner-R of 0.8 or less for the 2nd or higher stages
 Machining with coolant is recommended (Internal coolant pressure 1.5 MPa or higher)
 Coat Anti-seize Compound(P-37) thinly on portion of taper and thread when insert is fixed.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

BDMT

Classification of usage		Carbon steel / Alloy steel		P								
		Mold and die steel		M								
★: Roughing / 1st Choice ☆: Roughing / 2nd Choice ■: Finishing / 1st Choice □: Finishing / 2nd Choice (In case hardness is 45HRC or under)		Austenitic stainless steel		M								
		Martensitic stainless steel		K								
		Precipitation hardening stainless steel		N								
		Gray cast iron		S								
		Nodular cast iron		H								
		Non-ferrous metals										
		Heat-resistant alloy										
		Titanium alloy		☆ ★								
		Hard materials		H								
Insert	Description	No. of edges	Dimension (mm)					Angle (°)		Carbide	PVD	Applicable toolholder M127
			S	D1	RE	L	W1	AN	AS				PRI535	PRI835
 	BDMT 11T302ER-JS 11T304ER-JS 11T308ER-JS	2	3.8	2.8	0.2 0.4 0.8	11	6.7	13	18	● ● ● ● ● ●	MECHT...11...	
	BDMT 170404ER-JS 170408ER-JS	2	4.9	4.4	0.4 0.8	17	9.6	13	18	● ● ● ● ● ●	MECHT...17...	

Handed insert shows Right-hand

Recommended cutting conditions M129



Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

M128

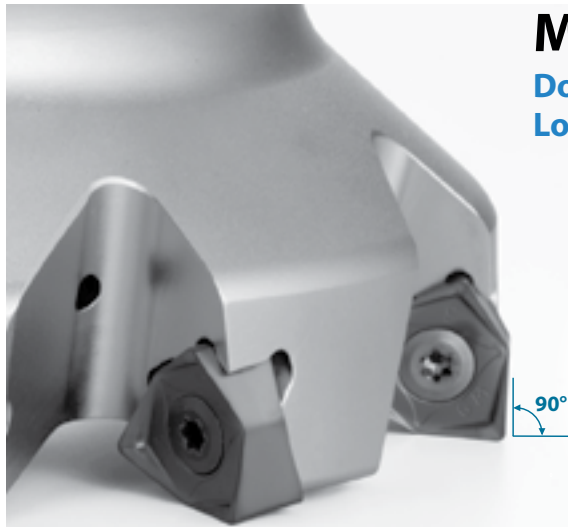
Recommended cutting conditions

Workpiece	Applications	Depth of cut (mm)		fz (mm/t)	Recommended insert grade (Vc: m/min)
		ap	ae		MEGACOAT NANO EX (MEGACOAT NANO)
					PR1835 (PR1535)
Titanium alloy (Ti6Al4V)	Shouldering	~Length of cut (APMX)	~0.5DC	0.10 ~ 0.12 ~ 0.16	30 ~ 40 ~ 60
	Slotting	~0.5DC	1DC	0.05 ~ 0.07 ~ 0.09	30 ~ 40 ~ 50

M

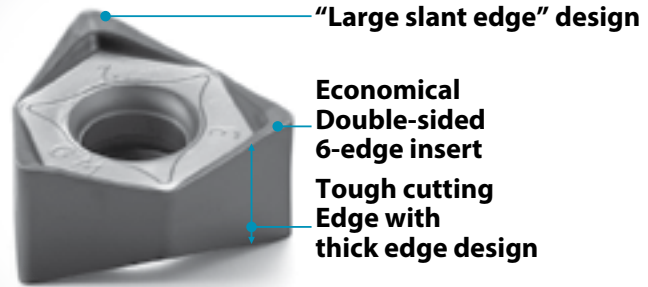


Milling



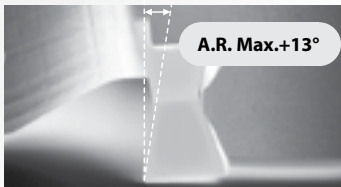
MFWN

Double-sided, 6-edge insert, 90° cutters
Low cutting force and reduced chattering

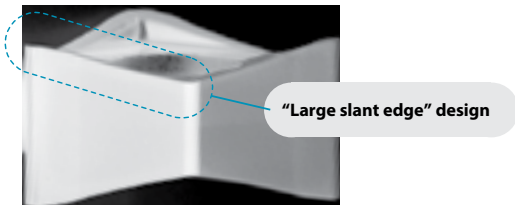


1 Sharp cutting with low cutting force

Sharp cutting by large rake angle

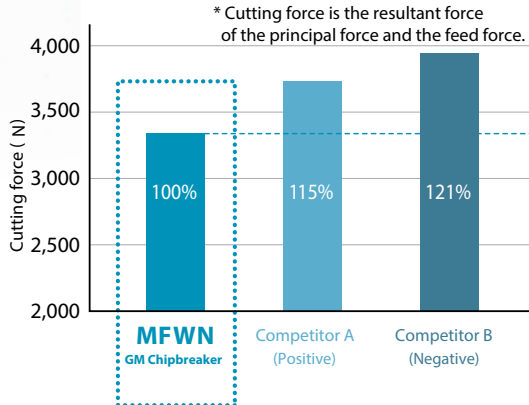


"Large slant edge" design reduces shock when cutting edge enters the workpiece



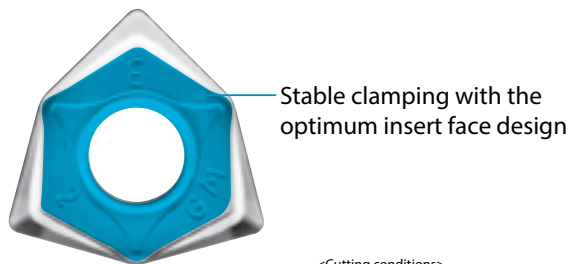
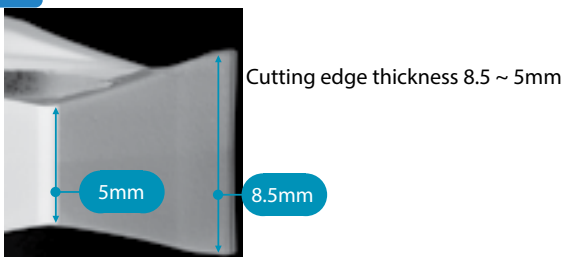
Cutting force comparison (Internal evaluation)

<Cutting conditions>
Vc = 180m/min
apxae = 7×110mm
fz = 0.2mm/t
Workpiece material: C50
ø125mm Cutter



* Cutting force is the resultant force of the principal force and the feed force.

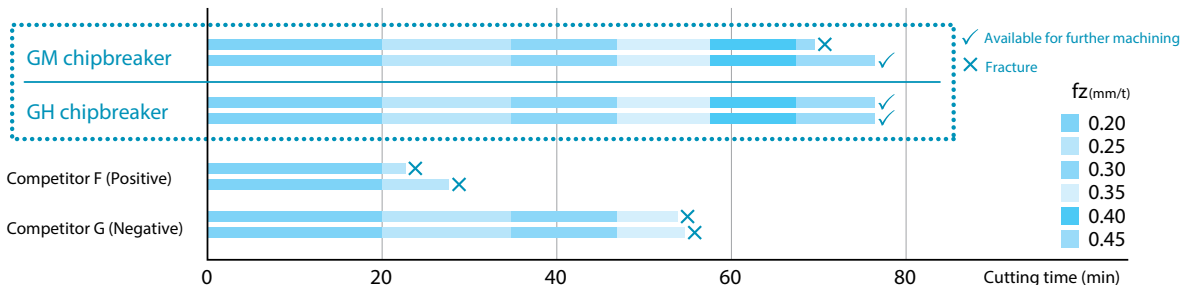
2 Superior fracture resistance with thick edge design



<Cutting conditions>

Workpiece material : 42CrMo4(38-42H5) Interruption with a slot on the workpiece
Vc = 100m/min apxae = 2×100mm fz = 0.2 ~ 0.45 mm/t Dry

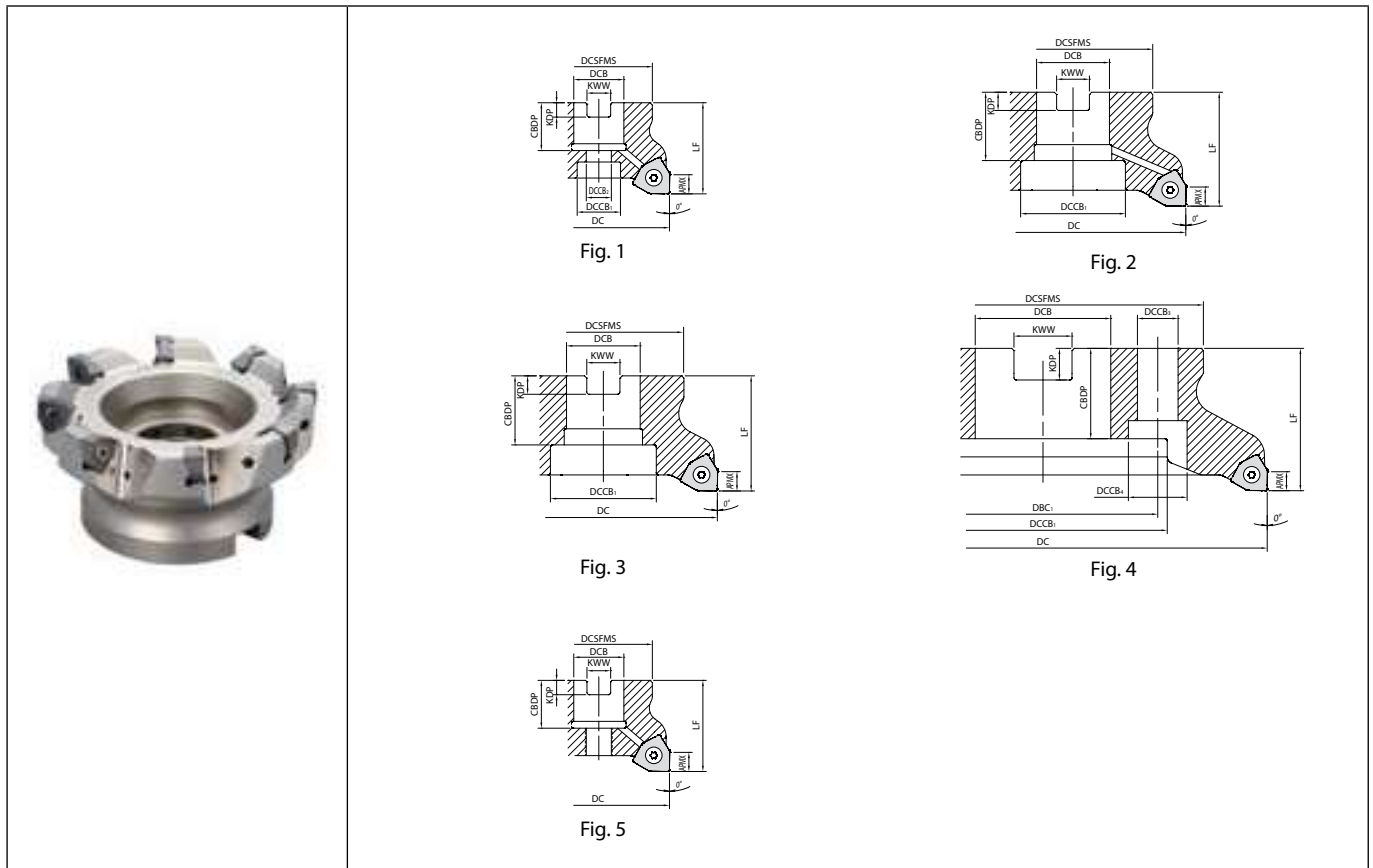
Fracture resistance comparison (Internal evaluation)



M
Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

MFWN



Toolholder dimensions

Description	Availability	Dimension (mm)														A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M135
		Inserts	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	DCCB ₃	DCCB ₄	DBC ₁	LF	CDBP	KDP	KWW	APMX							
Coarse pitch	MFWN	90050R-4T-MC-KUA	● 4	50	45	22	-	-	-	-	40	21	6.3	10.4	8	-6	-12	Yes	18500	0.35	5	WNEU0806... WNGT0806... WNMU0806...
		90063R-3T-M	● 3	63	47	22	19	11	-	-	40	21	6.3	10.4		-10	-8		14000	0.5	1	
		90080R-4T-M	● 4	80	60	27	20	13	-	-	50	24	7	12.4		-9	-8		12000	1	1	
		90100R-5T-M	● 5	100	70	32	46	-	-	-	30	8	14.4	-		-7.5	10500		1.3	2		
		90125R-6T-M	● 6	125	87	40	55	-	-	-	33	9	16.4	-		-7	9500		2.5	2		
		90160R-8T-M	● 8	160	102	68	-	14	20	66.7	63	32	9	16.4		-	-7		8000	3.8	4	
		90200R-10T-M	● 10	200	142	60	110	-	-	-	40	14	25.7	-		-7	7500		6	4		
90250R-12T-M	● 12	250	142	60	110	18	26	101.6	63	40	14	25.7	-	-7	6500	8.4	4					
Metric	MFWN	90063R-4T-M	● 4	63	47	22	19	11	-	-	40	21	6.3	10.4	8	-10	-7.5	Yes	16000	0.5	1	WNEU0806... WNGT0806... WNMU0806...
		90080R-5T-M	● 5	80	60	27	20	13	-	-	50	24	7	12.4		-9	-8		13500	1	1	
		90100R-7T-M	● 7	100	70	32	46	-	-	-	30	8	14.4	-		-7.5	12000		1.3	2		
		90125R-8T-M	● 8	125	87	40	55	-	-	-	33	9	16.4	-		-7	10500		2.6	2		
		90160R-10T-M	● 10	160	102	68	-	14	20	66.7	63	32	9	16.4		-	-7		9000	3.9	4	
		90200R-12T-M	● 12	200	142	60	110	-	-	-	40	14	25.7	-		-7	8000		6.3	4		
		90250R-14T-M	● 14	250	142	60	110	18	26	101.6	63	40	14	25.7		-	-7		7000	8.7	4	
Extra fine pitch	MFWN	90063R-5T-M	● 5	63	47	22	19	11	-	-	40	21	6.3	10.4	8	-10	-7.5	Yes	16000	0.5	1	WNEU0806... WNGT0806... WNMU0806...
		90080R-7T-M	● 7	80	60	27	20	13	-	-	50	24	7	12.4		-9	-8		10500	1.1	1	
		90100R-9T-M	● 9	100	70	32	46	-	-	-	30	8	14.4	-		-7.5	9500		1.3	2		
		90125R-12T-M	● 12	125	87	40	55	-	-	-	33	9	16.4	-		-7	8000		2.6	2		
		90160R-14T-M	● 14	160	102	68	-	14	20	66.7	63	32	9	16.4		-	-7		7000	3.9	4	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Milling

Toolholder dimensions

Description		Availability		Dimension (mm)																	A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M135
		R	Inserts	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	DCCB ₃	DCCB ₄	DBC ₁	LF	CBDP	KOP	KWW	APMX											
Bore dia. inch spec	Coarse pitch	MFWN 90080R-4T	<input type="checkbox"/>	4	80	60	25.4	20	13	-	-	-	50	27	6	9.5	8	+13	-9	Yes	12000	1	1	WNEU0806... WNGT0806... WNMU0806...			
		MFWN 90100R-5T	<input type="checkbox"/>	5	100	70	31.75	46	-	-	-	50	34	8	12.7	-8			10500		1.3	2					
		MFWN 90125R-6T	<input type="checkbox"/>	6	125	87	38.1	55	-	-	-	63	38	10	15.9	-7.5			9500		2.6	2					
		MFWN 90160R-8T	<input type="checkbox"/>	8	160	102	50.8	72	-	-	-	63	11	19.1	-7	8000			3.9		3						
		MFWN 90200R-10T	<input type="checkbox"/>	10	200	142	47.625	110	18	26	101.6	40	14	25.4	-7	7500			6.3		4						
		MFWN 90250R-12T	<input type="checkbox"/>	12	250	-	-	-	-	-	-	40	14	25.4	-7	6500			8.7		4						
	Fine pitch	MFWN 90080R-5T	<input type="checkbox"/>	5	80	60	25.4	20	13	-	-	-	50	27	6	9.5	8	+13	-9	Yes	13500	1	1				
		MFWN 90100R-7T	<input type="checkbox"/>	7	100	70	31.75	46	-	-	-	50	34	8	12.7	-8			12000		1.4	2					
		MFWN 90125R-8T	<input type="checkbox"/>	8	125	87	38.1	55	-	-	-	63	38	10	15.9	-7.5			10500		2.7	2					
		MFWN 90160R-10T	<input type="checkbox"/>	10	160	102	50.8	72	-	-	-	63	11	19.1	-7	9000			4		3						
		MFWN 90200R-12T	<input type="checkbox"/>	12	200	142	47.625	110	18	26	101.6	40	14	25.4	-7	8000			6.6		4						
		MFWN 90250R-14T	<input type="checkbox"/>	14	250	-	-	-	-	-	-	40	14	25.4	-7	7000			8.9		4						
	Extra fine pitch	MFWN 90080R-7T	<input type="checkbox"/>	7	80	60	25.4	20	13	-	-	-	50	27	6	9.5	8	+13	-9	Yes	10500	1.1	1				
		MFWN 90100R-9T	<input type="checkbox"/>	9	100	70	31.75	46	-	-	-	50	34	8	12.7	-8			9500		1.3	2					
		MFWN 90125R-12T	<input type="checkbox"/>	12	125	87	38.1	55	-	-	-	63	38	10	15.9	-7.5			8000		2.7	2					
		MFWN 90160R-14T	<input type="checkbox"/>	14	160	102	50.8	72	-	-	-	63	11	19.1	-7	7000			4.1		3						
		MFWN 90200R-16T	<input type="checkbox"/>	16	200	142	47.625	110	18	26	101.6	40	14	25.4	-7	6500			6.7		4						
		MFWN 90250R-18T	<input type="checkbox"/>	18	250	-	-	-	-	-	-	40	14	25.4	-7	5500			9.1		4						

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.











Milling


- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

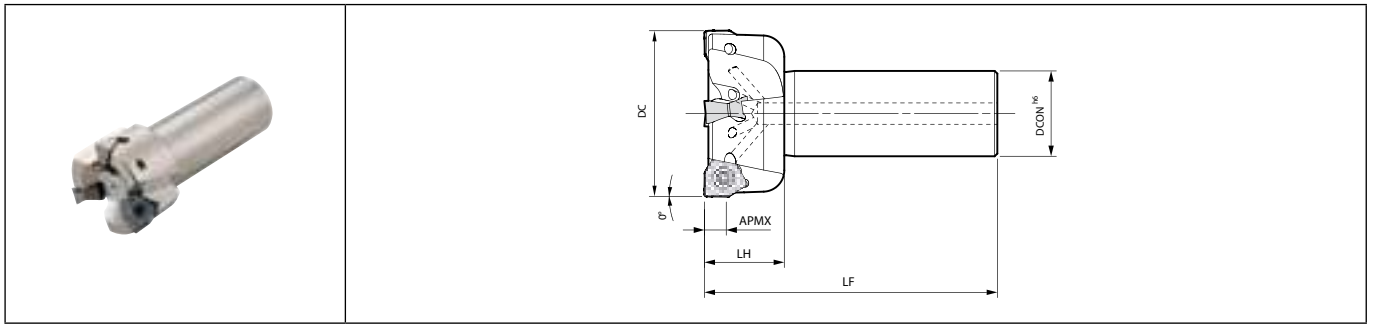
M132

Spare parts

Description		Spare parts							
		Clamp screw	Wrench		Shim	Shim screw	Wrench	Anti-seize compound	Mounting bolt
			TTW	DTM					
									
Coarse pitch	MFWN 90063R-3T-M	SB-50140TR	TTW-15	-	MFWN-90	SPW-7050	LW-5	P-37	HH10X30
	MFWN 90080R-4T(-M)								HH12X35
	MFWN 90100R-5T(-M) ? 90250R-12T(-M)								Recommended tightening torque for insert clamp 4.2N·m
Fine pitch	MFWN 90063R-4T-M	SB-50140TR	TTW-15	-	-	-	-	P-37	HH10X30
	MFWN 90080R-5T(-M)								HH12X35
	MFWN 90100R-7T(-M) ? 90250R-14T(-M)								Recommended tightening torque for insert clamp 4.2N·m
Extra fine pitch	MFWN 90063R-5T-M	SB-50140TR	TTW-15	-	-	-	-	P-37	HH10X30
	MFWN 90080R-7T(-M)	SB-40140TRN	-	DTM-15					HH12X35
	MFWN 90100R-9T(-M) ? 90250R-18T	Recommended tightening torque for insert clamp 3.5N·m	-	-					-

 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

MFWN



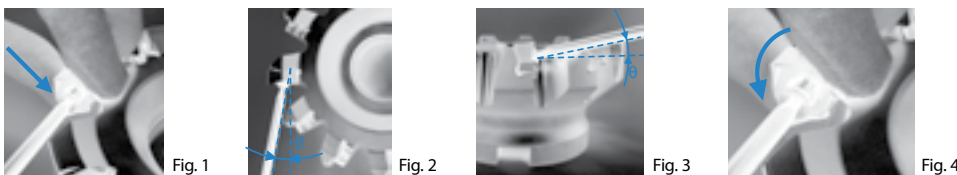
Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)						A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Spare parts			Applicable inserts M135
			R	DC	DCON	LF	LH	APMX					Screw	Wrench	Anti-seize compound	
MFWN 90050R-S32-3T	●	3	50						-12	18500	SB-50140TR	TTW-15		WNEU0806... WNGT0806... WNMU0806...		
90063R-S32-4T	●	4	63	32	110	30	8	+13	-10	16000	Recommended tightening torque for insert clamp 4.2N·m		P-37			
90080R-S32-5T	●	5	80						-9	13500						

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

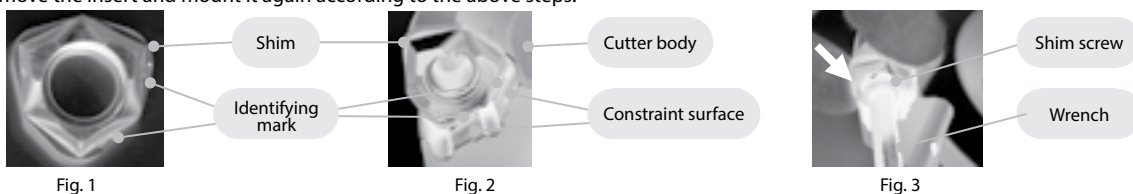
How to mount an insert

1. Be sure to remove dust and chips from the insert mounting pocket.
2. After applying anti-seize compound on portion of taper and thread, attach the screw to the front end of the wrench. While lightly pressing the insert against the constraint surfaces, put the screw into the hole of the insert and tighten. (Ref. to Fig. 1)
3. When tightening the screw, make sure that the wrench is parallel to the screw.
Remember that the screw hole of the toolholder for Extra fine pitch is inclined to the bearing surface. (Ref. to Fig. 2 and Fig. 3)
4. Be careful not to tighten the screw with excessive torque.
Recommended tightening torque is 4.2N·m for M5 screw (SB-50140TR) and 3.5N·m for M4 screw (SB-40140TRN).
5. After tightening the screw, make sure that there is no clearance between the insert seat surface and the bearing surface of the toolholder or between the insert side surfaces and the constraint surface of the toolholder. If there is any clearance, remove the insert and mount it again according to the above steps.
6. To change the cutting edge of the insert, turn the insert counterclockwise (Ref. to Fig. 4). The insert corner identification number is stamped on the top surface of the insert.



How to replace a shim (For coarse pitch)

1. Be sure to remove dust and chips from the insert mounting pocket.
2. The shim must be mounted in the proper direction. While aligning the surface of the shim with the mark on it to the corresponding constraint surface (Ref. to Fig. 1) and lightly pressing the shim toward the constraint surface (Ref. to Fig. 2), insert the screw into the hole of the shim and tighten (Ref. to Fig. 3). When tightening the screw, make sure that the screw is vertical to the bearing surface (Recommended tightening torque is 6.0N·m).
3. After tightening the screw, make sure that there is no clearance between the shim seat surface and the bearing surface. If there is any clearance, remove the insert and mount it again according to the above steps.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M134

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t) ():TN620M	Recommended insert grades (Vc: m/min)							
			Cermet TN620M	MEGACOAT (PVD coated carbide)			CVD coated carbide CA6535	DLC coated carbide PDL025	Carbide GW25	
				PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)				PR015S
GM	Carbon steel	0.1~0.2~0.3 (0.06~0.10~0.15)	★ 200~250~300	☆ 120~180~250	★ 120~180~250	-	-	-	-	-
	Alloy steel	0.1~0.2~0.3 (0.06~0.10~0.15)	★ 180~220~250	☆ 100~160~220	★ 100~160~220	-	-	-	-	-
	Mold steel	0.1~0.15~0.25 (0.06~0.10~0.13)	★ 150~180~220	☆ 80~140~180	☆ 80~140~180	-	-	-	-	-
	Stainless steel (Austenitic related)	0.1~0.15~0.25	-	☆ 100~160~200	☆ 100~160~200	-	-	-	-	-
	Stainless steel (Martensitic related)	0.1~0.15~0.25	-	☆ 150~200~250	-	-	-	☆ 180~240~300	-	-
	Stainless steel (Precipitation hardening)	0.1~0.15~0.25	-	★ 90~120~150	-	-	-	-	-	-
	Gray cast iron	0.1~0.2~0.3	-	-	-	★ 120~180~250	-	-	-	-
	Nodular cast iron	0.1~0.15~0.25	-	-	-	★ 100~150~200	-	-	-	-
Ni-base heat-resistant alloys	0.1~0.12~0.2	-	☆ 20~30~50	-	-	-	★ 20~30~50	-	-	
SM *1GL	Carbon steel	0.06~0.12~0.2 (0.06~0.08~0.12)	★ 200~250~300	☆ 120~180~250	☆ 120~180~250	-	-	-	-	-
	Alloy steel	0.06~0.12~0.2 (0.06~0.08~0.12)	★ 180~220~250	☆ 100~160~220	☆ 100~160~220	-	-	-	-	-
	Mold steel	0.06~0.08~0.15 (0.06~0.08~0.10)	★ 150~180~220	☆ 80~140~180	☆ 80~140~180	-	-	-	-	-
	Stainless steel (Austenitic related)	0.06~0.12~0.2	-	★ 100~160~200	☆ 100~160~200	-	-	-	-	-
	Stainless steel (Martensitic related)	0.06~0.12~0.2	-	☆ 150~200~250	-	-	-	☆ 180~240~300	-	-
	Stainless steel (Precipitation hardening)	0.06~0.12~0.2	-	☆ 90~120~150	-	-	-	-	-	-
	Gray cast iron	0.06~0.12~0.2	-	-	-	☆ 120~180~250	-	-	-	-
	Nodular cast iron	0.06~0.08~0.15	-	-	-	☆ 100~150~200	-	-	-	-
	Ni-base heat-resistant alloys	0.06~0.1~0.15	-	☆ 20~30~50	-	-	-	☆ 20~30~50	-	-
	Titanium alloys	0.06~0.08~0.15	-	★ 40~60~80	-	-	-	-	-	-
*2GH	Carbon steel	0.2~0.3~0.4	-	☆ 120~180~250	☆ 120~180~250	-	-	-	-	-
	Alloy steel	0.2~0.3~0.4	-	☆ 100~160~220	☆ 100~160~220	-	-	-	-	-
	Mold steel	0.15~0.2~0.3	-	☆ 80~140~180	☆ 80~140~180	-	-	-	-	-
	Stainless steel (Austenitic related)	0.2~0.25~0.3	-	☆ 100~160~200	☆ 100~160~200	-	-	-	-	-
	Stainless steel (Martensitic related)	0.2~0.25~0.3	-	☆ 150~200~250	-	-	-	☆ 180~240~300	-	-
	Stainless steel (Precipitation hardening)	0.2~0.25~0.3	-	☆ 90~120~150	-	-	-	-	-	-
	Gray cast iron	0.2~0.3~0.4	-	-	-	☆ 120~180~250	-	-	-	-
	Nodular cast iron	0.15~0.2~0.3	-	-	-	☆ 100~150~200	-	-	-	-
	Ni-base heat-resistant alloys	0.15~0.2~0.25	-	☆ 20~30~50	-	-	-	☆ 20~30~50	-	-
	Hard materials (60HRC or less)	0.05~0.1~0.2	-	-	-	-	★ 80~100~120	-	-	-
AM	Non-ferrous metals	0.1~0.2~0.3	-	-	-	-	-	★ 200~600~900	☆ 200~500~800	

The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

*1. GL Chipbreaker is recommended for Surface finish oriented milling.

*2. GH Chipbreaker: Fine pitch → fz≤0.3 (mm/t)

Extra fine pitch → Not recommended

★: 1st Recommendation

☆: 2nd Recommendation

M



Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

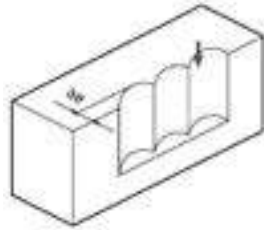
Ball-nose Radius

Others

Applicable chipbreaker

Cutter type	Chipbreaker			
	GM	SM (GL)	GH	AM
Coarse pitch (With shim)	●	●	●	●
Fine pitch (Without shim)	●	●	△ (Feed rate is recommended fz=0.3mm/t or under)	●
Extra fine pitch (Without shim)	●	●	Not recommended	Not recommended

Vertical milling (Plunging)



Cutting dia.	Max. width of cut (ae)
All items	8mm

Cutter type and chipbreaker selection

Milling purpose	Cutter type			Chipbreaker				
	Coarse pitch	Fine pitch	Extra fine pitch	GM	SM	GH	GL	AM
General milling for steel and alloy steel		●		●				
Steel and alloy steel (At chattering due to low rigidity machine or poor clamping power)	●				●			
Productivity oriented (Running cost decrease) (ap=4 mm and over, fz=0.25 mm/t and over)	●					●		
Surface finish oriented	●	●					●	
General milling of stainless steel		●			●			
Stainless steel (At chattering due to low rigidity machine or poor clamping power)	●				●			
Cast iron (For processing efficiency improvement)			●	●				
Cast iron (ap=4 mm and over, fz=0.25 mm/t and over)	●					●		
General milling of aluminum alloys		●						●
Aluminum alloys (at chattering due to low rigidity machine or poor clamping power)	●							●

Case studies

GG30

Machine part
 Vc=170m/min
 apxae=2.5x130mm
 fz=0.183mm/t (Vf=500mm/min)
 Wet
 MFWN90160R-8T (8 flutes)
 WNMU080608EN-GM (PR1510)

PR1510	Chip evacuation rate = 163cc/min
Competitor A (Positive cutter)	Chip evacuation rate = 68cc/min

Competitor A proceeded machining under low cutting conditions, as the workpiece was slipping because of the unstable chucking. With MFWN, stable machining was possible at higher cutting conditions. (User evaluation)

Manganese Steel

Construction machine part
 Vc=150m/min
 apxae=1x100mm
 fz=0.2mm/t (Vf=668mm/min)
 Dry
 MFWN90100R-7T (7 flutes)
 WNMU080608EN-GM (PR1525)

PR1525	Machining efficiency: 2 pcs/edge
Competitor B (Negative cutter) (Vertical inserts)	1 pc/edge

Despite instability with the long overhang of the workpiece, MFWN doubled tool life, improving the efficiency by 150%. (User evaluation)



Low cutting force 90° milling cutter

MFWN Mini

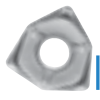
Economical small diameter MFWN series milling cutters
Additional fine pitch, small diameter toolholders available

1 Cost-efficient 6-edge inserts

Smaller insert design technology maintains original MFWN cutting performance
Can be used up to 5 mm depth of cut.

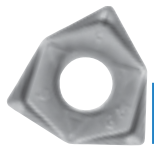
Smaller insert size

MFWN Mini
05 size



D.O.C. ~5 mm

MFWN
08 size



D.O.C. ~8 mm

Increased versatility

Large small-diameter lineup

High-efficiency machining with fine pitch styles

1 ~ 3 additional flutes



Expanded lineup of smaller diameters

Face Mill ø50
End Mill ø25 ~ ø40

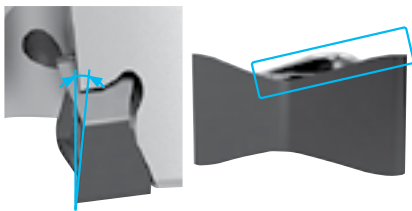


M 2 Inherits previous MFWN series design elements and features

Low cutting force and high chattering-resistance

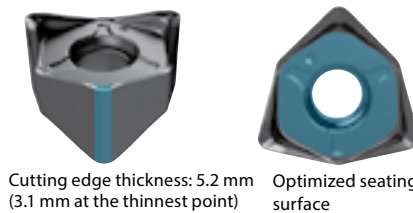
Sharp cutting by large rake angle
"Large slant edge" design reduces shock when cutting edge enters the workpiece

A.R. Max +11° "Large slant edge" design



Superior fracture resistance with thick edge design

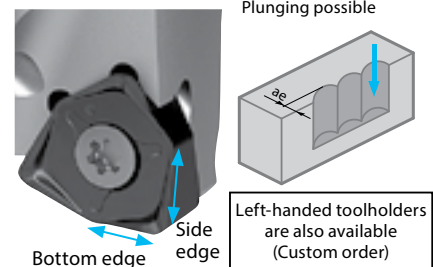
Stable clamping strength with unique insert face Design



Cutting edge thickness: 5.2 mm (3.1 mm at the thinnest point) Optimized seating surface

Neutral inserts for various uses

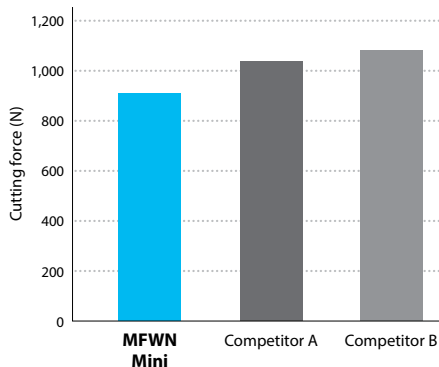
Symmetrical side and bottom cutting edges provide a wide range of machining applications



Plunging possible

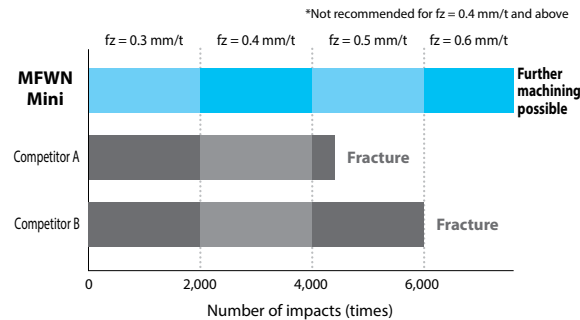
Left-handed toolholders are also available (Custom order)

Cutting force comparison (Internal evaluation)



Cutting conditions : Vc = 150 m/min, fz = 0.15 mm/t, ap × ae = 1.5 × 35 mm, Dry, Cutting dia. ø63, Workpiece material: 42CrMo4

Fracture resistance comparison (Internal evaluation)

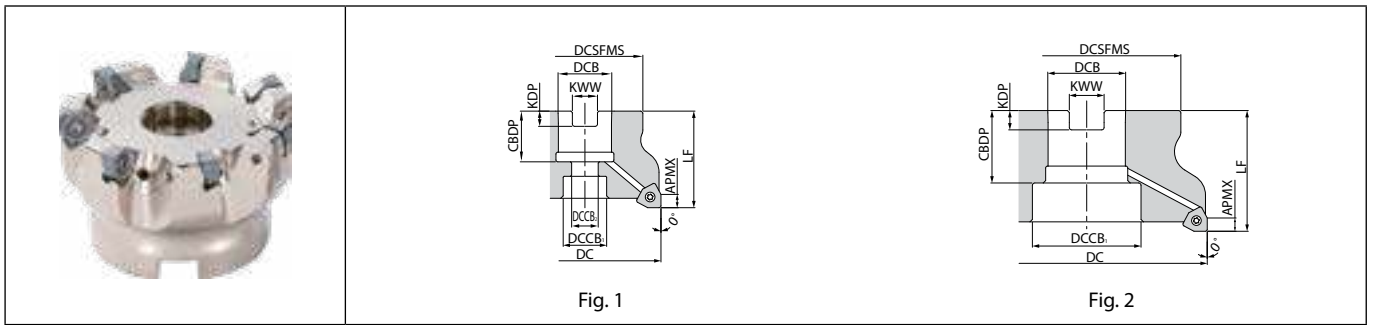


Cutting conditions : Vc = 120 m/min, ap × ae = 1.5 × 30 mm, Dry, Cutting dia. ø63, Workpiece material: Mold steel 37~43HRC

Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

MFWN Mini



Toolholder dimensions

Description		Availability		Dimension (mm)											A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M141		
		R	Inserts	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX										
Metric	Fine pitch	MFWN	90050R-05-5T-M	●	5	50	48	22	17.5	11	40	21	6.3	10.4	5	+11	-9	-8	Yes	13800	0.4	1	WNMU0504...
		MFWN	90063R-05-6T-M	●	6	63			18											12300	0.5	1	
		MFWN	90080R-05-7T-M	●	7	80	70	27	20	13	50	24	7	12.4						10900	1.2	1	
		MFWN	90100R-05-8T-M	●	8	100	78	32	45	-		30	8	14.4						9700	1.6	2	
		MFWN	90125R-05-11T-M	●	11	125	89	40	55	-		63	33	9						16.4	8700	2.8		2
Metric	Extra fine pitch	MFWN	90050R-05-6T-M	●	6	50	48	22	17.5	11	40	21	6.3	10.4	5	+11	-9	-8	Yes	13800	0.4	1	WNMU0504...
		MFWN	90063R-05-7T-M	●	7	63			18											12300	0.5	1	
		MFWN	90080R-05-9T-M	●	9	80	70	27	20	13	50	24	7	12.4						10900	1.2	1	
		MFWN	90100R-05-11T-M	●	11	100	78	32	45	-		30	8	14.4						9700	1.5	2	
		MFWN	90125R-05-14T-M	●	14	125	89	40	55	-		63	33	9						16.4	8700	2.7		2
Bore dia. inch spec	Fine pitch	MFWN	90080R-05-7T	□	7	80	70	25.4	20	13	50	27	6	9.5	5	+11	-7	Yes	10900	1.3	1	WNMU0504...	
		MFWN	90100R-05-8T	□	8	100	78	31.75	45	-		34	8	12.7					9700	1.6	2		
		MFWN	90125R-05-11T	□	11	125	89	38.1	55	-		63	38	10					15.9	8700	2.9		2
	Extra fine pitch	MFWN	90080R-05-9T	□	9	80	70	25.4	20	13	50	27	6	9.5	5	+11	-7	Yes	10900	1.2	1	WNMU0504...	
MFWN	90100R-05-11T	□	11	100	78	31.75	45	-		34	8	12.7	9700	1.6					2				
MFWN	90125R-05-14T	□	14	125	89	38.1	55	-		63	38	10	15.9	8700					2.8	2			

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Spare parts

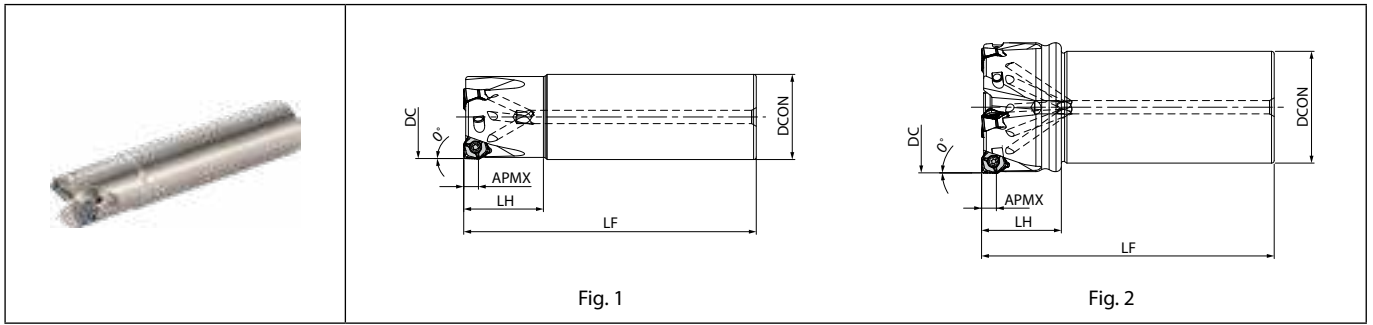
Description		Clamp Screw	Wrench	Anti-seize Compound	Mounting bolt	
Fine pitch	MFWN	90050R-05-5T-M	SB-3065TRP	DTPM-8	P-37	HH10X30
	MFWN	90063R-05-6T-M				HH10X30
	MFWN	90080R-05-7T(-M)				HH12X35
	MFWN	90100R-05-8T(-M)				-
	MFWN	90125R-05-11T(-M)				-
Extra fine pitch	MFWN	90050R-05-6T-M	SB-3065TRP	DTPM-8	P-37	HH10X30
	MFWN	90063R-05-7T-M				HH10X30
	MFWN	90080R-05-9T(-M)				HH12X35
	MFWN	90100R-05-11T(-M)				-
	MFWN	90125R-05-14T(-M)				-

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



MFWN Mini



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)						A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Fig.	Spare parts			Applicable inserts ➔ M141		
			R	DC	DCON	LF	LH	APMX						Screw	Wrench	Anti-seize compound			
																		Dimension (mm)	
MFWN 90025R-S25-05-2T	●	2	25	25	120	32	5	+11	Yes	-14.5	19500	1	SB-306STRP	DTPM-8	P-37	WNMU0504...			
90032R-S32-05-3T	●	3	32		130	40											-12	17200	1
90040R-S32-05-4T	●	4	40		150	50											-10	15400	2
90050R-S32-05-5T	●	5	50	32													-9	13800	2
90063R-S32-05-6T	●	6	63		110	30											-8	12300	2
90080R-S32-05-7T	●	7	80														-7	10900	2

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.



Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M140

Recommended cutting conditions

Chipbreaker	Workpiece material	fz (mm/t)	Recommended insert grades (Vc : m/min)			
			MEGACOAT NANO EX (MEGACOAT NANO)			MEGACOAT HARD
			PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)	PR015S
GM	Carbon steel	0.1 – 0.2 – 0.25	☆ 120 – 180 – 250	★ 120 – 180 – 250	-	-
	Alloy steel		☆ 100 – 160 – 220	★ 100 – 160 – 220	-	-
	Mold steel	0.1 – 0.15 – 0.2	☆ 80 – 140 – 180	★ 80 – 140 – 180	-	-
	Stainless steel (Austenitic related)		☆ 100 – 160 – 200	☆ 100 – 160 – 200	-	-
	Stainless steel (Martensitic related)	0.1 – 0.15 – 0.2	☆ 150 – 200 – 250	-	-	-
	Stainless steel (Precipitation Hardening)		★ 90 – 120 – 150	-	-	-
	Gray cast iron	0.1 – 0.2 – 0.25	-	-	★ 120 – 180 – 250	-
	Nodular cast iron	0.1 – 0.15 – 0.2	-	-	★ 100 – 150 – 200	-
	Ni-base heat-resistant alloys	0.1 – 0.12 – 0.16	☆ 20 – 30 – 50	-	-	-
SM	Carbon steel	0.06 – 0.12 – 0.2	☆ 120 – 180 – 250	☆ 120 – 180 – 250	-	-
	Alloy steel		☆ 100 – 160 – 220	☆ 100 – 160 – 220	-	-
	Mold steel	0.06 – 0.08 – 0.15	☆ 80 – 140 – 180	☆ 80 – 140 – 180	-	-
	Stainless steel (Austenitic related)		★ 100 – 160 – 200	★ 100 – 160 – 200	-	-
	Stainless steel (Martensitic related)	0.06 – 0.12 – 0.2	☆ 150 – 200 – 250	-	-	-
	Stainless steel (Precipitation Hardening)		☆ 90 – 120 – 150	-	-	-
	Gray cast iron	0.06 – 0.12 – 0.2	-	-	☆ 120 – 180 – 250	-
	Nodular cast iron	0.06 – 0.08 – 0.15	-	-	☆ 100 – 150 – 200	-
	Ni-base heat-resistant alloys	0.06 – 0.08 – 0.15	★ 20 – 30 – 50	-	-	-
Titanium alloys	0.06 – 0.08 – 0.15	★ 40 – 60 – 80	-	☆ 40 – 60 – 80	-	
GH	Carbon steel	0.15 – 0.2 – 0.3	☆ 120 – 180 – 250	☆ 120 – 180 – 250	-	-
	Alloy steel		☆ 100 – 160 – 220	☆ 120 – 160 – 220	-	-
	Mold steel	0.15 – 0.2 – 0.25	☆ 80 – 140 – 180	☆ 80 – 140 – 180	-	-
	Stainless steel (Austenitic related)		☆ 100 – 160 – 200	☆ 100 – 160 – 200	-	-
	Stainless steel (Martensitic related)	0.15 – 0.2 – 0.25	☆ 150 – 200 – 250	-	-	-
	Stainless steel (Precipitation Hardening)		☆ 90 – 120 – 150	-	-	-
	Gray cast iron	0.15 – 0.2 – 0.3	-	☆ 120 – 180 – 250	☆ 120 – 180 – 250	-
	Nodular cast iron	0.15 – 0.2 – 0.25	-	☆ 100 – 150 – 200	☆ 100 – 150 – 200	-
	Ni-base heat-resistant alloys	0.1 – 0.15 – 0.2	☆ 20 – 30 – 50	-	-	-
Hardened Material (60 HRC or less)	0.05 – 0.08 – 0.16	-	-	-	★ 50 – 80 – 100	

The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

When using GH chipbreaker in fine pitch cutters, recommended feed is fz ≤ 0.2 (mm/t).

GH chipbreaker is not recommended for extra fine pitch cutters.

★ : 1st Recommendation

☆ : 2nd Recommendation



Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

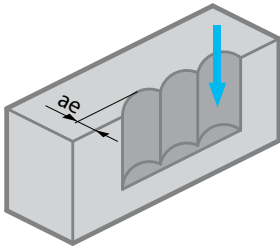
Multi-Function

Slot Mill

Ball-nose Radius

Others

Vertical milling (Plunging)



Available for vertical milling (Plunging)

Cutting Dia.	Maximum width of cut (ae)
All Description	5 mm

Ramping and helical milling are not recommended due to interference between workpiece and flank face

Applicable chipbreaker

Cutter type	Chipbreaker		
	GM	SM	GH
Fine pitch	✓	✓	✓
Extra fine pitch	✓	✓	(Feed rate is recommended fz=0.2 mm/t or under)

How to mount an insert

1. Completely eliminate chips and dust from the insert mounting side.
2. Clamp Screw
 - Apply anti-seize compound on portion of taper and thread of clamp screw.
 - After mounting a clamp screw on the top edge of wrench, tighten the screw while keeping the insert pushed against the shim seat surface and holder surface (Fig.1)
3. When tightening the screw, make sure that the wrench is parallel to the screw.
Recommended tightening torque . . . 1.2N·m
4. After tightening, check that there is no gap between the insert and the surface of the shim, or between the side surface of insert and the holder surface.
If there is a gap, remount the insert using the directions above.

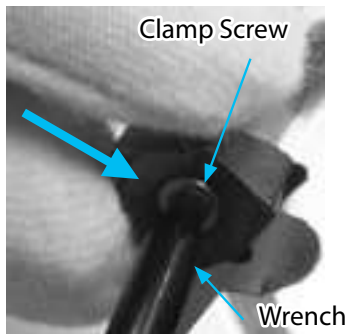


Fig. 1

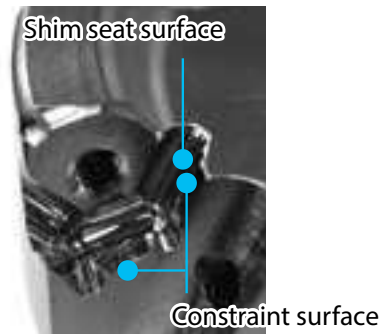


Fig. 2

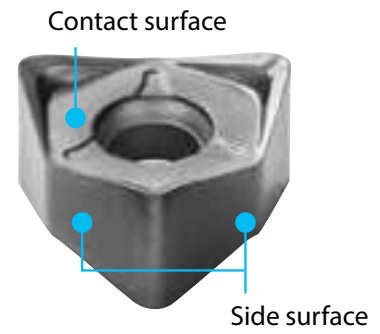


Fig. 3

Cutting edge angle 88°, high efficiency cutter

MFSN88

Economical double-sided 8-edge insert suitable for shoulder roughing

Reduces chattering with a low cutting force design

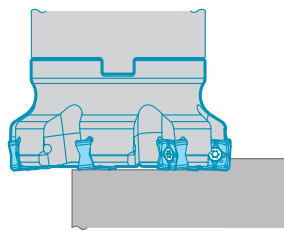
Applicable to various types of machining with product lineup from ø32

1 Economical double-sided 8-edge insert suitable for shoulder roughing

Cost reduction in approximately 90° corner cutting

Shoulder roughing

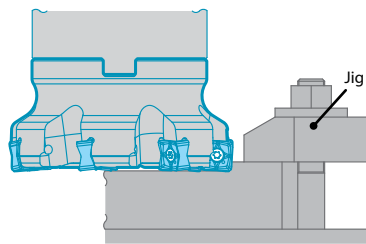
Cost reduction by switching from 90° cutter with positive inserts



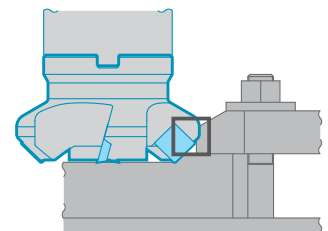
See page M149 for unmachined corner portion

Facing without interfering with fixtures

MFSN88



Conventional 45° cutter

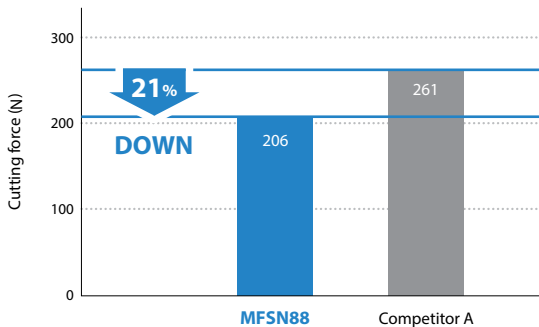


M
Milling

2 Reduces chattering with a low cutting force design

Chatter resistant medium to roughing machining range

Cutting force comparison (Internal evaluation)



Cutting force is thrust force

Cutting conditions: Vc = 200 m/min, ap = 3mm, fz = 0.15mm/t
Cutter dia. ø63: Workpiece material: C50

3 Extended tool life by MEGACOAT NANO EX

Insert grade and chipbreaker lineup for various machining application



1st Recommendation (General purpose) GM chipbreaker

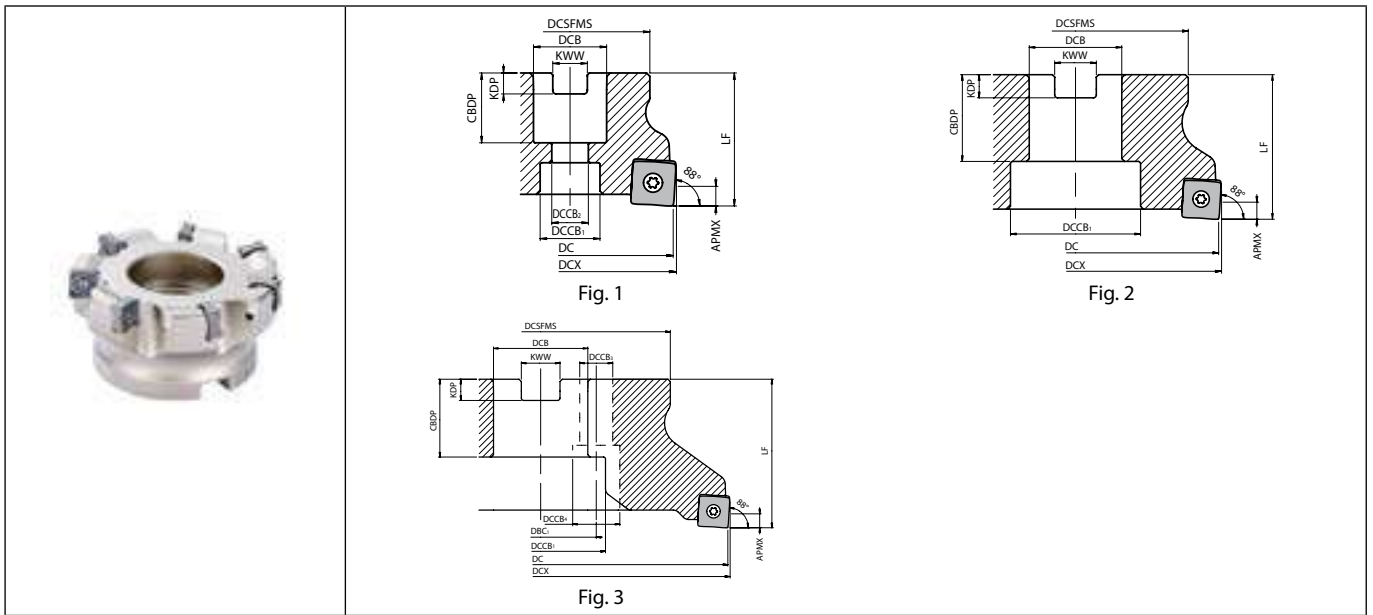


Tough edge GH chipbreaker



For stainless steel SM chipbreaker

MFSN88



Toolholder dimensions





Description		Availability	Dimension (mm)													A.R. max. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts M148		
			Inserts	DC	DCX	DCSFMS	DCB	DCCB1	DCCB2	DCCB3	DCCB4	DBC1	LF	CBDP	KDP							KWW	
Metric	Fine pitch	MFSN	●	4	50	52	48	22	17.5	11					40	21	6.3	10.4	-12		0.3	1	SNMU1305...
			●	5	63	65			18						50	24	7	12.4	-10		0.4	1	
			●	6	80	82	70	27	20	13	-	-	-		50	24	7	12.4	-9	No	1.1	1	
			●	7	100	102	78	32	45						30	8	8	14.4	-8		1.4	2	
			●	9	125	127	89	40	55	-					63	33	9	16.4	-7.5		2.4	2	
		●	11	160	162	110				14	20	66.7		63	33	9	16.4	-7.5		4.2	3		
	Extra fine pitch	MFSN	●	5	50	52	48	22	17.5	11					40	21	6.3	10.4	-12		0.3	1	
			●	7	63	65			18						50	24	7	12.4	-10		0.4	1	
			●	9	80	82	70	27	20	13	-	-	-		50	24	7	12.4	-9	No	1.1	1	
			●	11	100	102	78	32	45						30	8	8	14.4	-8		1.4	2	
		●	13	125	127	89	40	55	-					63	33	9	16.4	-7.5		2.5	2		
Bore dia. inch spec	Fine pitch	MFSN	□	6	80	82	70	25.4	20	13					50	27	6	9.5	-9		1.1	1	SNMU1305...
			□	7	100	102	78	31.75	45						34	8	12.7	-8		1.5	2		
			□	9	125	127	89	38.1	55	-	-	-			63	38	10	15.9	-7.5	No	2.5	2	
			□	11	160	162	110	50.8	70						63	38	11	19.1	-7		4.1	2	
		Extra fine pitch	MFSN	□	9	80	82	70	25.4	20	13					50	27	6	9.5	-9		1.1	
			□	11	100	102	78	31.75	45						34	8	12.7	-8		1.5	2		
			□	13	125	127	89	38.1	55	-	-	-			63	38	10	15.9	-7.5	No	2.6	2	
			□	15	160	162	110	50.8	70						63	38	11	19.1	-7		4.3	2	


APMX : 5 mm (GM, SM, GH chipbreakers, Coated cabide), 3 mm (GM chipbreaker, Cermet)

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Spare parts (common to Metric / Inch spec)

Description		Clamp screw	Wrench	Anti-seize compound	Mounting bolt
					
Fine pitch	MFSN 88050R-4T-M-G	SB-4090TRP	DTPM-15	P-37	HH10X30
	88063R-5T-M-G				HH10X30
	88080R-6T(-M)-G				HH12X35
	88100R-7T(-M)-G				-
	88125R-9T(-M)-G				-
	88160R-11T(-M)-G				-
Extra fine pitch	MFSN 88050R-5T-M-G	SB-4090TRP	DTPM-15	P-37	HH10X30
	88063R-7T-M-G				HH10X30
	88080R-9T(-M)-G				HH12X35
	88100R-11T(-M)-G				-
	88125R-13T(-M)-G				-
	88160R-15T(-M)-G				-

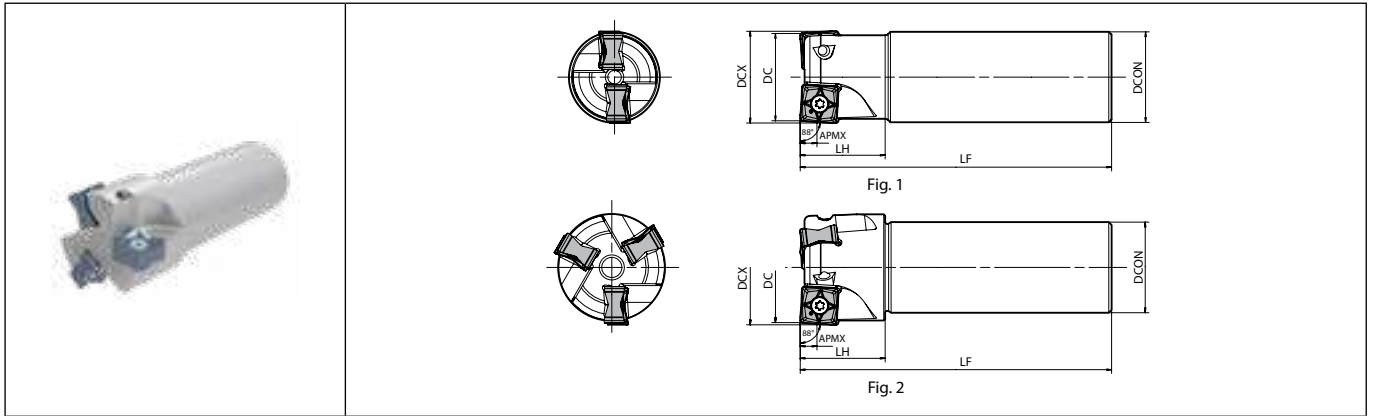
 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.



Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

MFSN88



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)						A.R. max. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts M148
			R	DC	DCX	DCON	LF	LH					Screw	Wrench	Anti-seize compound	
MFSN 88032R-S32-2T-G	●	2	32	34	32	110	30	+10	-15.5	No	1				SNMU1305...	
88040R-S32-3T-G	●	3	40	42	32	110	30	+10	-13	No	2	SB-4090TRP	DTPM-15	P-37		

APMX : 5 mm (GM, SM, GH chipbreakers, Coated carbide), 3 mm (GM chipbreaker, Cermet)

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Recommended tightening torque for insert clamp : 3.5N·m



Milling

SNMU

Insert		Description	Dimension (mm)					Carbide						Cement	Applicable toolholder M145 M147	
			IC	S	D1	RE	BS	PVD								
								PR0155	PR1510	PR1525	PR1535	PR1810	PR1825			PR1835	TNG20M
<p>Classification of usage</p> <p>★: Roughing / 1st Choice ☆: Roughing / 2nd Choice ■: Finishing / 1st Choice □: Finishing / 2nd Choice (In case hardness is 45HRC or under)</p>			Carbon steel / Alloy steel	☆				★	☆	■						P
			Mold and die steel	☆				★	☆	■						P
			Austenitic stainless steel			☆			☆	★						M
			Martensitic stainless steel							☆						M
			Precipitation hardening stainless steel			☆				★						M
			Gray cast iron	☆				★								K
			Nodular cast iron	☆				★								K
			Non-ferrous metals													N
			Heat-resistant alloy							☆						S
			Titanium alloy					☆		★						S
			Hard materials	★												H
		SNMU 130508EN-GM	13	5.51	4.7	0.8	1	●	●	●	●	●	●	●	●	MFSN88...
		SNMU 130508EN-SM	13	5.51	4.7	0.8	1	●	●	●	●	●	●	●	●	MFSN88...
		SNMU 130508EN-GH	13	5.51	4.7	0.8	1	●	●	●	●	●	●	●	●	MFSN88...

Recommended cutting conditions M149

M



Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

●: Standard item R: Right-hand only L: Left-hand only □: Check availability

M148

Recommended cutting conditions

Coated carbide

Chipbreaker	Workpiece material	Feed (fz: mm/t)	Recommended insert grades (Vc: m/min)			
			MEGACOAT (PVD Coated carbide)			
			PR1835 (PR1535)	PR1825 (PR1525)	PR1810 (PR1510)	PR015S
GM	Carbon steel	0.1~ 0.2 ~0.3	120~ 180 ~250	120~ 180 ~250	-	-
	Alloy steel	0.1~ 0.2 ~0.3	100~ 160 ~220	100~ 160 ~220	-	-
	Mold steel	0.1~ 0.15 ~0.25	80~ 140 ~180	80~ 140 ~180	-	-
	Stainless steel (Austenitic related)	0.1~ 0.15 ~0.25	100~ 150 ~200	100~ 150 ~200	-	-
	Stainless steel (Martensitic related)	0.1~ 0.15 ~0.25	100~ 150 ~200	-	-	-
	Stainless steel (Precipitation hardening)	0.1~ 0.15 ~0.25	90~ 120 ~150	-	-	-
	Gray cast iron	0.1~ 0.2 ~0.3	-	-	120~ 180 ~250	-
	Nodular cast iron	0.1~ 0.15 ~0.25	-	-	100~ 150 ~200	-
	Ni-base heat-resistant alloys	0.1~ 0.12 ~0.2	20~ 30 ~50	-	-	-
SM	Carbon steel	0.06~ 0.12 ~0.2	-	120~ 180 ~250	-	-
	Alloy steel	0.06~ 0.12 ~0.2	-	100~ 160 ~220	-	-
	Mold steel	0.06~ 0.08 ~0.15	-	80~ 140 ~180	-	-
	Stainless steel (Austenitic related)	0.06~ 0.12 ~0.2	100~ 150 ~200	100~ 150 ~200	-	-
	Stainless steel (Martensitic related)	0.06~ 0.12 ~0.2	100~ 150 ~200	-	-	-
	Stainless steel (Precipitation hardening)	0.06~ 0.12 ~0.2	90~ 120 ~150	-	-	-
	Gray cast iron	0.06~ 0.12 ~0.2	-	-	120~ 180 ~250	-
	Nodular cast iron	0.06~ 0.1 ~0.15	-	-	100~ 150 ~200	-
	Ni-base heat-resistant alloys	0.06~ 0.08 ~0.15	20~ 30 ~50	-	-	-
	Titanium alloys	0.06~ 0.08 ~0.15	40~ 60 ~80	-	-	-
GH	Carbon steel	0.15~ 0.25 ~0.35	-	120~ 180 ~250	-	-
	Alloy steel	0.15~ 0.25 ~0.35	-	100~ 160 ~220	-	-
	Mold steel	0.1~ 0.2 ~0.3	-	80~ 140 ~180	-	-
	Gray cast iron	0.15~ 0.25 ~0.35	-	-	120~ 180 ~250	-
	Nodular cast iron	0.1~ 0.2 ~0.3	-	-	100~ 150 ~200	-
	Hard materials (60HRC or less)	0.1~ 0.2 ~0.3	-	-	-	50~ 80 ~100

* The bold-faced number indicates a center value of recommended cutting condition.
Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

★: 1st Recommendation
☆: 2nd Recommendation

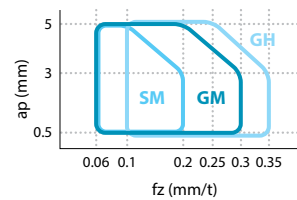
Cermet

Chipbreaker	Workpiece material	Feed (fz: mm/t)	Recommended insert grades (Vc: m/min)
			Cermet TN620M
GM	Carbon steel	0.06~ 0.12 ~0.15	200~ 250 ~300
	Alloy steel	0.06~ 0.12 ~0.15	180~ 220 ~250
	Mold steel	0.06~ 0.1 ~0.13	150~ 180 ~220

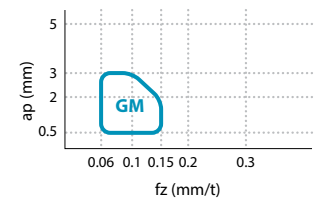
★: 1st Recommendation

Applicable chipbreaker range

Coated carbide



Cermet



Applicable chipbreaker

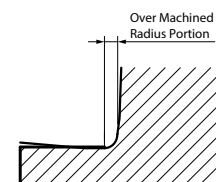
Cutter type	Chipbreaker		
	GM	SM	GH
Fine pitch	✓	✓	✓
Extra fine pitch	✓	✓	△ (Feed rate is recommended fz=0.2mm/t or under)

Not available for vertical milling (plunging).

Reference data of Over Machined Radius Portion

ap	1 mm	2 mm	3 mm	4 mm	5 mm
Over Machined Radius Portion	0.12 mm	0.24 mm	0.27 mm	0.31 mm	0.34 mm

Over machined radius portion to 90°cutter



Face mills for heavy milling

MFLN

Tough 4-edge tangential inserts provide high reliability on heavy milling at large depths of cut and high feed rates.

Three cutting edge angles (incl. MFLN45 and MFLN70) optimized for various machining applications.

1 Tough and reliable inserts for stable heavy milling

22 mm long inserts offer increased rigidity

Tangentially mounted inserts provide

2 cutting edges on both sides

Obtuse edge design
Increases the cutting edge angle only at the tip to maintain both strength and sharpness

Cross-section view of cutting edge

MFLN

Conventional

Corner chamfer
only available on MFLN90

Both general corner-R type and chamfered corner type available
Prevents chattering and insert fracturing

Wide flat mounting surface
Hold an insert firmly in heavy milling

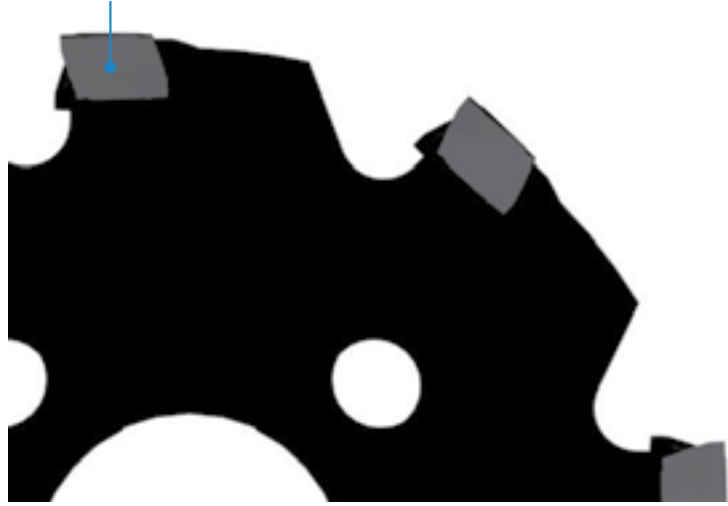
Convex cutting edge ridge
Reduced impact forces when entering the workpiece

M

Milling

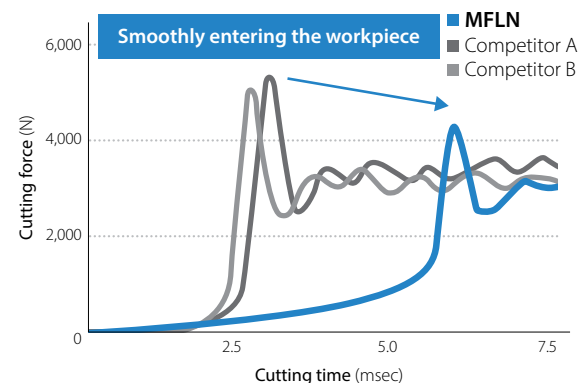
- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Tangentially mounted inserts increase rigidity



Cutting forces when entering the workpiece (internal evaluation)

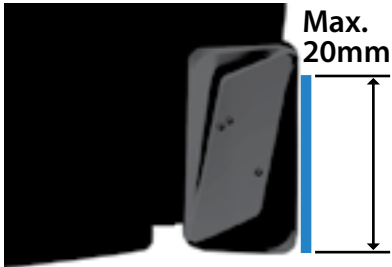
MFLN90: Insert - chamfered corner type



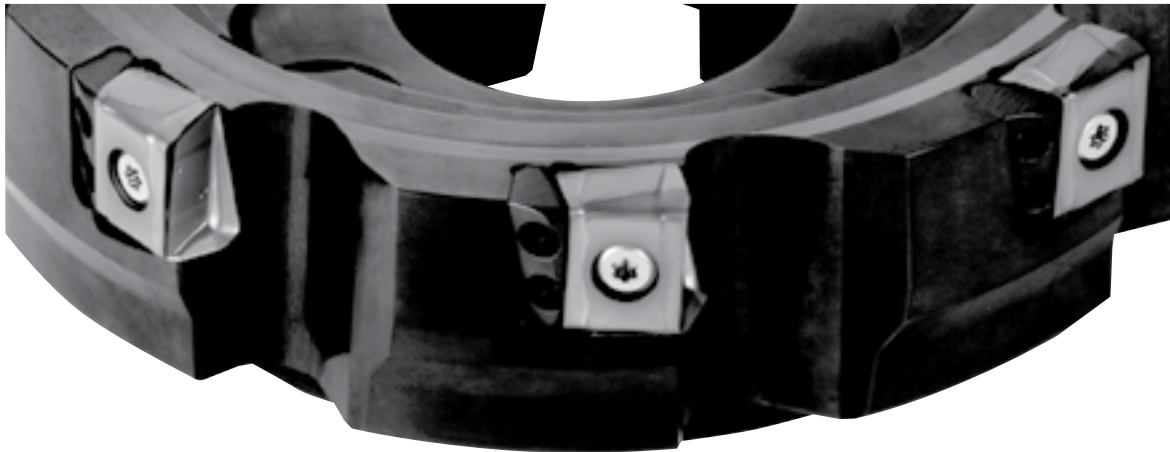
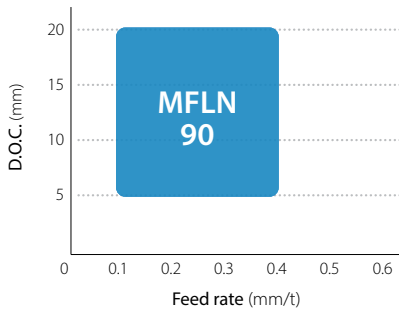
Cutting conditions: Vc = 150 m/min, ap x ae = 5 x 75 mm, fz = 0.3 mm/t ø125 (1 insert), dry, workpiece: C50

2 Large D.O.C. and high feed rates

MFLN90
Cutting edge angle 90°



Applicable range

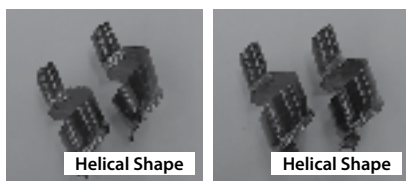


M
Milling

Chip comparison (Internal evaluation)

Helix-shaped chips prevent chip recutting and provide stable machining at high feed rates.

MFLN90 Stable



fz = 0.3 mm/t

fz = 0.4 mm/t

Competitor A Unstable



fz = 0.3 mm/t

fz = 0.4 mm/t

Competitor B Unstable

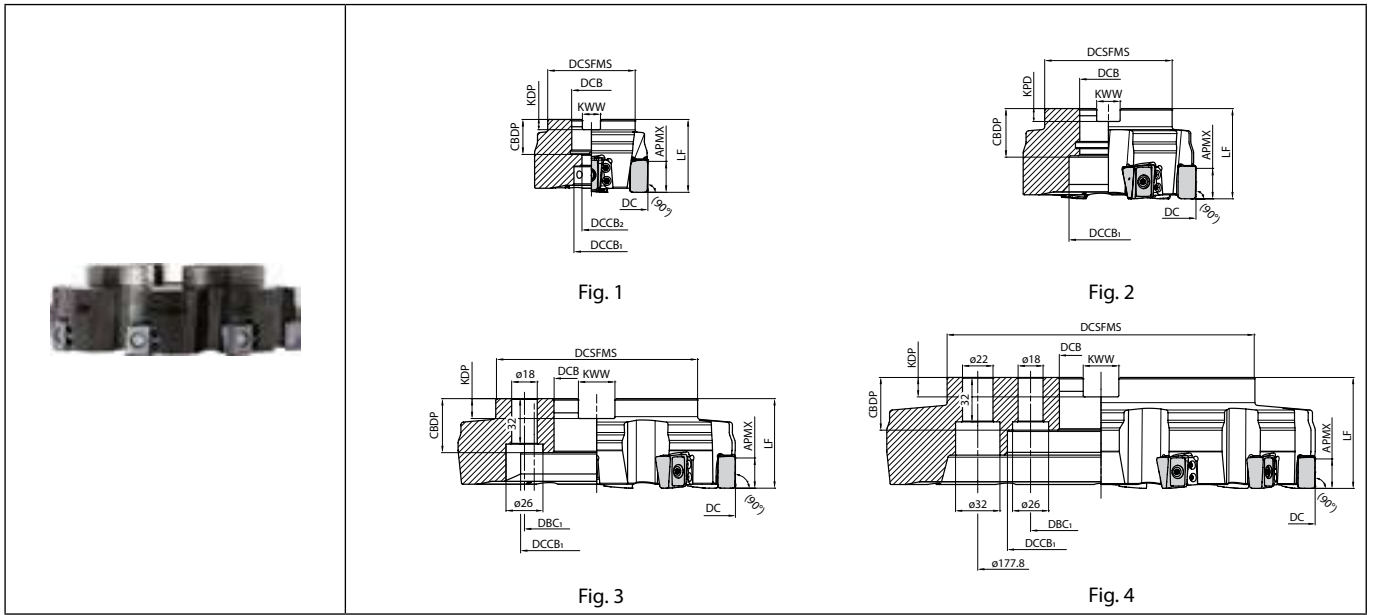


fz = 0.3 mm/t

fz = 0.4 mm/t

Cutting conditions: Vc = 150 m/min. ap × ae = 10 × 100 mm. fz = 0.3, 0.4 mm/t. ø125 (1 insert). drv. workpiece: C50

MFLN90



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)											A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M153
			DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	DBG ₁	LF	CBDP	KDP	KWW	APMX							
Metric	●	4	80	60	27	24	13	-	50	24	7	12.4	20	+4.5	-13.5	No	5970	1	1	LOGU221616ER-GM LOGU2216PAER-GM
	●	4	100	70	32	45	-	50	30	8	14.4	4780					1.5	2		
	●	6	125	89	40	55	-	63	33	9	16.4	3820					2.9	2		
	●	7	160	110	40	90	66.7	63	38	14	25.7	2990					4.5	3		
	●	8	200	142	60	132	101.6	63	38	14	25.7	2390					6.9	3		
	●	10	250	184	60	172	101.6	80	38	14	25.7	1910					10.3	3		
Bore dia. inch spec	□	4	80	60	25.4	24	13	-	50	27	6	9.5	20	+4.5	-13.5	Yes	5970	1	1	LOGU221616ER-GM LOGU2216PAER-GM
	□	4	100	70	31.75	45	-	50	34	8	12.7	4780					1.6	2		
	□	6	125	89	38.1	55	-	63	33	9	16.4	3820					3	2		
	□	7	160	110	50.8	90	66.7	63	38	14	25.7	2990					4.6	2		
	□	8	200	142	60	132	101.6	63	38	14	25.4	2390					7.2	3		
	□	10	250	184	47.625	172	101.6	80	38	14	25.4	1910					10.5	3		

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Spare parts

Description	Parts						
	Clamp screw	Wrench	Shim	Clamp screw	Wrench	Coat anti-seize compound	Arbor bolt
MFLN							
○080R-4T(-M)	SB-60200TRP	TTP-20	MAP-2216	SB-40140TR	DTM-15	P-37	HH12X35
○100R-4T(-M)	Tightening torque for clamping insert 6.0 N·m		Tightening torque for clamping shim 3.5 N·m				-
○315R-12T(-M)	Tightening torque for clamping insert 6.0 N·m		Tightening torque for clamping shim 3.5 N·m				-

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M152

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter


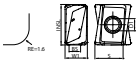

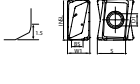
Multi-Function

Slot Mill

Ball-nose Radius

Others

LOGU

Insert		Description	Dimension (mm)						Carbide				Applicable toolholder M152 M44 M45
			S	D1	RE	W1	INSL	BS	PVD				
									PRI1525	PRI1535	PRI1825	PRI1835	
		LOGU 221616ER-GM	16.6	6.8	1.6	12.5	22.8	6.3	●	●	●	●	MFLN90... MFLN45... MFLN70...
		LOGU 2216PAER-GM	16.9	6.8	-	12.5	22.8	4.8	●	●	●	●	MFLN90...

Recommended cutting conditions M154

About applicable insert

	LOGU221616ER-GM (Corner-R)	LOGU2216PAER-GM (Corner chamfer)
MFLN 90	✓	✓

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Recommended cutting conditions

	Workpiece	D.O.C. (mm)		fz: mm/t	Recommended insert grades (Vc: m/min)	
		Width of cut ≤0.5×DC	Width of cut >0.5×DC		MEGACOAT NANO EX (MEGACOAT NANO)	
					PR1825 (PR1525)	PR1835 (PR1535)
MFLN 90	Carbon steel	~18	~15	0.1 – 0.2 – 0.4	★ 100 – 150 – 180	☆ 80 – 120 – 150
	Alloy steel				★ 100 – 150 – 180	☆ 80 – 120 – 150
	Mold steel				★ 80 – 120 – 150	☆ 70 – 100 – 120
	Gray cast iron	~20	~18	0.1 – 0.2 – 0.4	★ 100 – 150 – 180	☆ 80 – 120 – 150
	Nodular cast iron				★ 100 – 150 – 180	☆ 80 – 120 – 150

The table above provides recommendations based on product specifications.
Before using the product, check the machine's specifications such as power.

★ : 1st recommendation ☆ : 2nd recommendation

The number in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
Dry machining is recommended.

M



Milling

Cutting edge angle
45°~70°Cutting edge angle
75°Cutting edge angle
88°/90°Cutter for
FinishingHigh Feed
CutterMulti-
Function

Slot Mill

Ball-nose
Radius

Others

How to mount an insert

1. Completely eliminate chips and dust from the insert mounting side.
2. After mounting a clamp screw on the top edge of wrench, tighten the screw while keeping the insert pushed against the shim seat surface and holder surface (Fig.1,2)
3. Make sure that the identification on the top of the insert is the same in each pocket.(Fig.3)
4. Tighten the wrench (TTP-20) in while holding parallel to the clamp screw.
5. Tighten the insert clamp screw at an appropriate torque. (Recommended torque: 6.0 N·m)
6. After tightening, check that there is no gap between the insert and the surface of the shim, or between the side surface of insert and the holder surface. If there is a gap, remount the insert using the directions above.

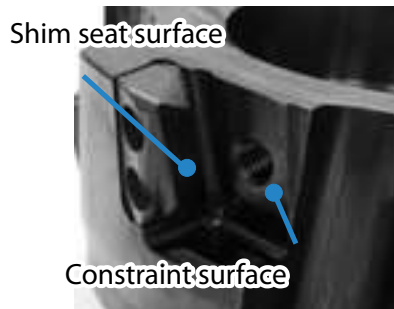


Fig.1

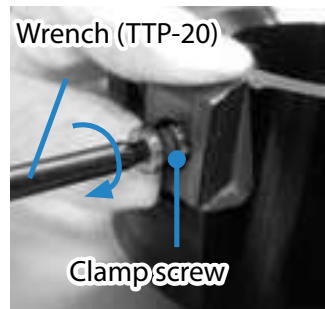


Fig.2

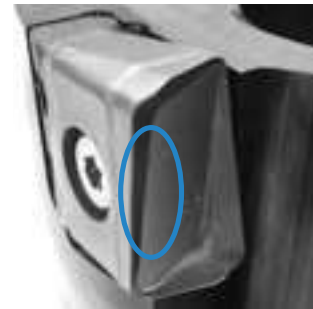


Fig.3

How to replace a shim

1. Completely eliminate chips and dust from the shim mounting side.
2. Coat medium strength screw locking adhesive on the screws.
3. Tighten the screw keeping the shim pushed against the pocket surface of toolholder.
4. After tightening both screws temporarily, tighten them with appropriate torque. (Recommended torque:3.5 N·m)
5. Please check that there is no gap between the shim and the pocket surfaces of toolholder.

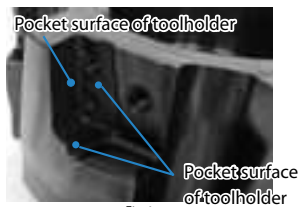


Fig.1

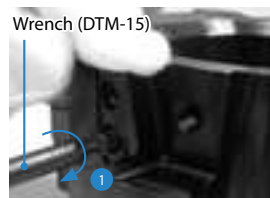


Fig.2



Fig.3



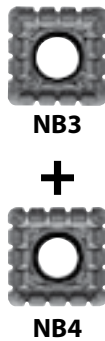
Fig.4

M



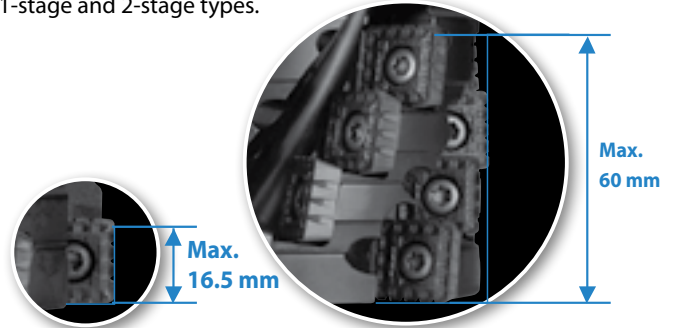
Milling

Face mill for heavy milling MSRS90



Wide selection of cutting edge length according to cutting conditions

4-stage type (ø80, ø100) is added to the standard lineup as well as 1-stage and 2-stage types.



High efficiency, low cutting force and stable machining without chattering
Neutral and corner-R insert

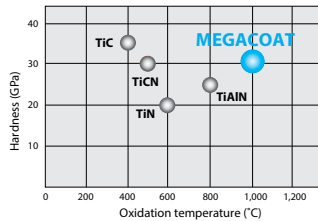
Applicable to shouldering (Cutting edge angle: 90°), high feed milling (Cutting edge angle: 30°), plunging, and side cutter.

Custom-ordered milling cutter with high performance notched neutral inserts provides various applications



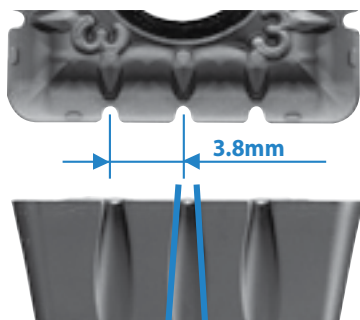
Neutral insert with corner-R is available to various applications

Long tool life: MEGACOAT



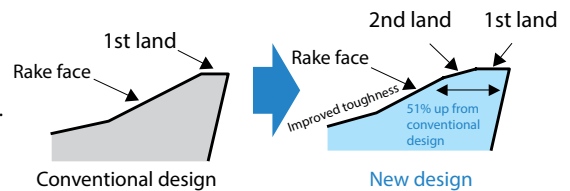
High hardness and high oxidation resistance long tool life: MEGACOAT

Notched insert SPMT180616EN



The notched insert breaks chips into small pieces and reduces cutting force. The second land near the cutting edge improves edge strength.

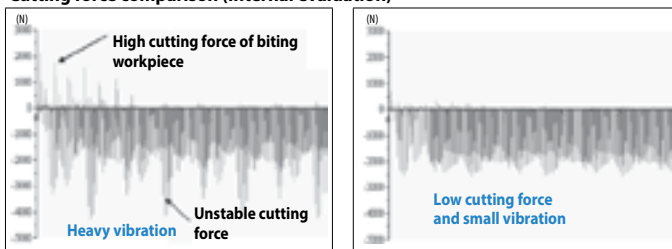
For neutral (Right/Left) hand
 Applicable for various cutting edge angle.
 Cutting edge length: 18mm



Edge preparation

Low cutting force (Notched insert benefit)

Cutting force comparison (Internal evaluation)



Competitor A








MSRS90

Notched insert realizes lower cutting force and smaller vibration

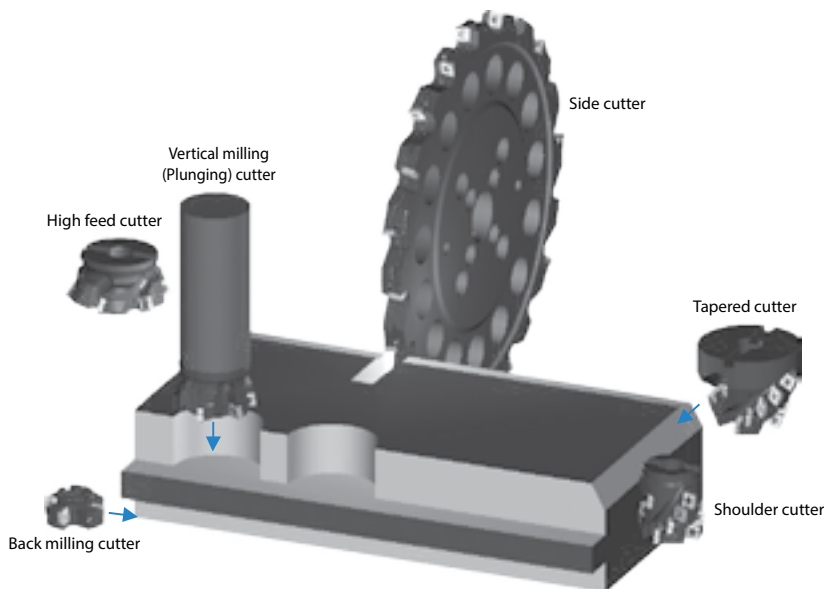
M
Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Applicable inserts: Available for various applications

Applications	Chipbreaker selection	3-notched		4-notched	Without notch
General purpose	Standard	 NB3	+	 NB4	
Low cutting force	Low cutting force	 NB3P	+	 NB4P	
Edge strength oriented	Without notch (Usable with notched inserts)	( NB3	or	 NB4)	+ 

Various expansive possibilities (Custom-ordered and standard milling cutter)



The custom-ordered milling cutter can be customized for your requirements such as diameter, Cutting edge angle, number of insert stages.

M



Milling

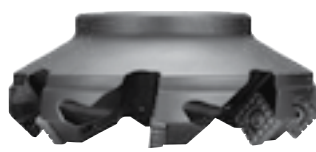
Shaft length determination



Tapered cutter



Vertical milling (Plunging) cutter



45° Face mill



High feed cutter



Shoulder cutter

MSRS90

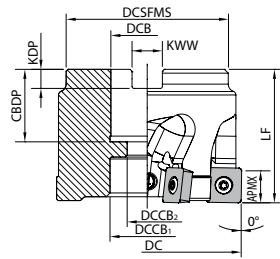


Fig. 1

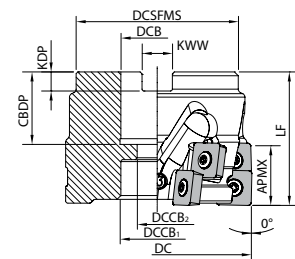


Fig. 2

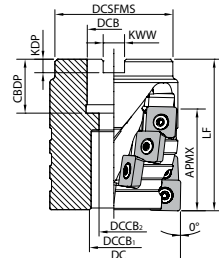


Fig. 3

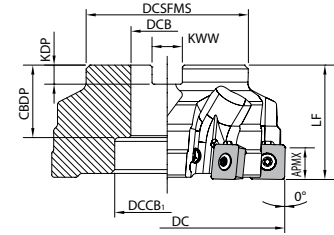


Fig. 4

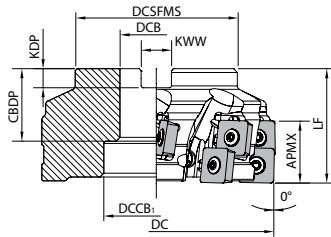


Fig. 5

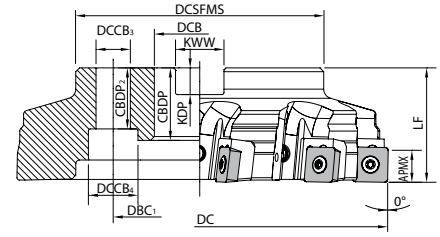


Fig. 6

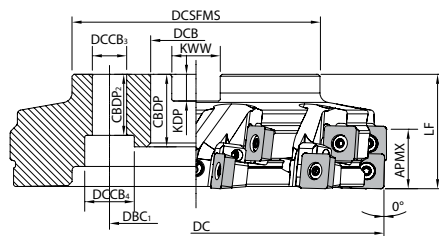


Fig. 7

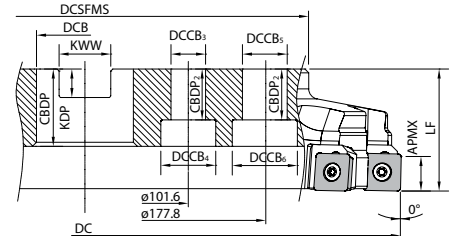


Fig. 8

M



Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

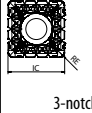
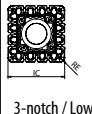
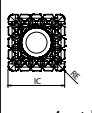
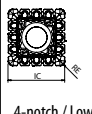
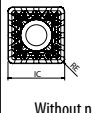
Multi-Function

Slot Mill

Ball-nose Radius

Others

SPMT

Insert		Description	No. of edges	Dimension (mm)				Angle (°)	Carbide	Applicable toolholder
				IC	S	D1	RE				AN
 <p>3-notch</p>		SPMT 180616EN-NB3	4	18	6.35	6.8	1.6	11	● ●	MSRS90...
 <p>3-notch / Low cutting force</p>		SPMT 180616EN-NB3P	4	18	6.35	6.8	1.6	11	● ●	MSRS90...
 <p>4-notch</p>		SPMT 180616EN-NB4	4	18	6.35	6.8	1.6	11	● ●	MSRS90...
 <p>4-notch / Low cutting force</p>		SPMT 180616EN-NB4P	4	18	6.35	6.8	1.6	11	● ●	MSRS90...
 <p>Without notch</p>		SPMT 180616EN-V	4	18	6.35	6.8	1.6	11	● ●	MSRS90...

Classification of usage

- ★ : Roughing / 1st Choice
- ☆ : Roughing / 2nd Choice
- : Finishing / 1st Choice
- : Finishing / 2nd Choice
- (In case hardness is 45HRC or under)

Carbon steel / Alloy steel	★	P
Mold and die steel	★	
Austenitic stainless steel		M
Martensitic stainless steel		
Precipitation hardening stainless steel		
Gray cast iron	★	K
Nodular cast iron	★	
Non-ferrous metals		N
Heat-resistant alloy		S
Titanium alloy		
Hard materials		H

Recommended cutting conditions ➔ M161

M



Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

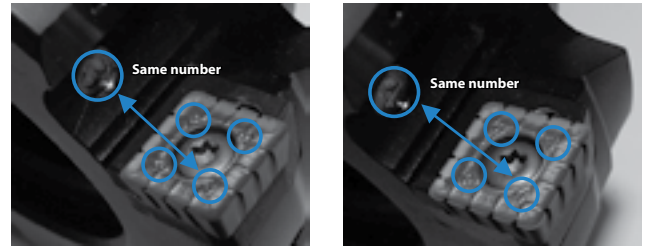
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M160

Caution when installing notched insert

It is important to install the appropriate notched insert into the correct position. If it is installed in incorrect position, the tool cannot cut the workpiece and it may damage the toolholder body. For MSRS90, notched insert location indicator is marked at insert installed pocket of the cutter body.

When installing the inserts, match the number on the top surface of insert to the number of the cutter body.



Description	No. of inserts	No. of flutes	No. of stages	No. of inserts	
				Notched	
				NB3(P)	NB4(P)
MSRS 90100R-1-6T	6	6	1	3	3
90100R-2-6T	12		2	6	6
90100R-4-6T	24		4	12	12

Spare parts

Description	Spare parts									
	Clamp screw	Wrench	Cartridge		Clamp screw	Wrench	Anti-seize compound	Mounting bolt		
			MAP-1806M	MAP-1806S (Bottom edge only)						
Without cartridge MSRS 90080R-○-4T-M 90100R-○-6T-M 90125R-○-8T-M	SB-60120TR	TT-25L	-	-	-	-	P-37	HH12X35		
With cartridge MSRS 90160R-○-8T-M 90315R-○-14T-M			MAP-1806M*1	MAP-1806S*2	SB-40140TR	DT-15		-		
Recommended tightening torque for cartridge clamp 3.5N·m										
Without cartridge MSRS 90080R-○-4T 90100R-○-6T 90125R-○-8T			Recommended tightening torque for insert clamp 7.5N·m		-	-		-	-	HH16X45 HH20X55
With cartridge MSRS 90160R-○-8T 90315R-○-14T					MAP-1806M*1	MAP-1806S*2		SB-40140TR	DT-15	-
Recommended tightening torque for cartridge clamp 3.5N·m										

Notes: *1: MAP-1806M is only for the bottom edge (1st stage) of MSRS90..R-1.

*2: MAP-1806S is only for the bottom edge (1st stage) of MSRS90..R-2... Use it only for the bottom edge (1st stage).

How to attach the cartridge: You need to tighten 2 clamp screws to fix the cartridge. Tighten the slant screw first and then tighten the other screw.



Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Recommended cutting conditions

Workpiece material	fz (mm/t)		Vc (m/min)	
	Standard NB3+NB4	Low cutting force NB3P+NB4P	MEGACOAT NANO EX	
			PR1810	PR1835
Soft steel	0.1~0.2~0.25	0.1~0.2~0.25	-	★ 120~150~220
Carbon steel	0.1~0.2~0.25	0.1~0.2~0.25	-	★ 100~150~200
Alloy steel	0.1~0.15~0.2	0.1~0.15~0.2	-	★ 100~150~200
Mold steel	0.1~0.15~0.2	0.1~0.12~0.15	-	★ 100~150~180
Gray cast iron	0.1~0.2~0.3	0.1~0.2~0.25	★ 100~180~250	-
Nodular cast iron	0.1~0.2~0.25	0.1~0.18~0.2	★ 100~180~220	-
Stainless steel	Not recommended			
Aluminum/Copper	Not recommended			

★ : 1st Recommendation ☆ : 2nd Recommendation



Cutting conditions (Shouldering)

In case of MSRS90100R-1-6T

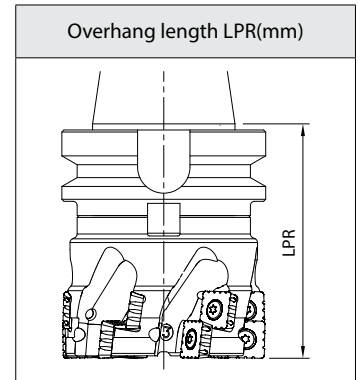
Workpiece material	Overhang length LPR(mm)	Cutting conditions		(ap × ae)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Cast iron	Less than 120mm	180	0.2	15 × 80	826
	120~200mm	180	0.2	15 × 40	413
	201mm and over	230	0.1	15 × 40	263
Carbon steel	Less than 120mm	150	0.2	15 × 80	689
	120~200mm	150	0.2	15 × 40	344
	201mm and over	200	0.1	15 × 40	229

In case of MSRS90100R-2-6T

Workpiece material	Overhang length LPR(mm)	Cutting conditions		(ap × ae)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Cast iron	Less than 120mm	180	0.2	30 × 50	1,032
	120~200mm	180	0.2	30 × 30	619
	201mm and over	230	0.1	30 × 25	329
Carbon steel	Less than 120mm	150	0.2	30 × 50	861
	120~200mm	150	0.2	30 × 30	517
	201mm and over	200	0.1	30 × 25	287

In case of MSRS90100R-4-6T

Workpiece material	Overhang length LPR(mm)	Cutting conditions		(ap × ae)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Cast iron	Less than 140mm	180	0.2	60 × 20	826
	140~200mm	180	0.2	60 × 10	413
	201mm and over	230	0.1	60 × 10	263
Carbon steel	Less than 140mm	150	0.2	60 × 20	689
	140~200mm	150	0.2	60 × 10	344
	201mm and over	200	0.1	60 × 10	229



Case studies

Nodular Cast Iron

<p>Industrial parts</p> <ul style="list-style-type: none"> Vc=150m/min ap x ae=6 x 65mm fz=0.15mm/t (Vf=430mm/min) <p>MSRS90100R-1-6T(ø100 -6 flutes) SPMT180616EN-NB3/NB4 (PR1210)</p>	<p>Machined portion</p>
MSRS90(PR1210)	Chip evacuation rate = 258cc/min
Competitor B	107cc/min
<ul style="list-style-type: none"> MSRS90 more than doubled the machining efficiency compared with competitor B. Competitor B machined with 2 passes (ap x ae=3 x 65mm). MSRS90 machined with only 1 pass. Cutting time was reduced. <p style="text-align: right;">(User evaluation)</p>	

20CrM05

<p>Construction machine part</p> <ul style="list-style-type: none"> Vc=200m/min ap x ae=10 x 50mm fz=0.1mm/t (Vf=400mm/min) <p>MSRS90125R-1-8T(ø125 -8 flutes) SPMT180616EN-NB3/NB4 (PR1230)</p>	<p>500 mm</p>
MSRS90(PR1230)	Chip evacuation rate = 200cc/min
Competitor C	153cc/min
<ul style="list-style-type: none"> MSRS90 improved the machining efficiency to 1.3 times that of competitor C. Competitor C machined with ap x ae=5 x 50mm Tool cost is reduced to 1/3 although competitor C is expensive using 2-corner insert. MSRS90 reduced machining cost as well as improved machining efficiency. <p style="text-align: right;">(User evaluation)</p>	

Mold steel

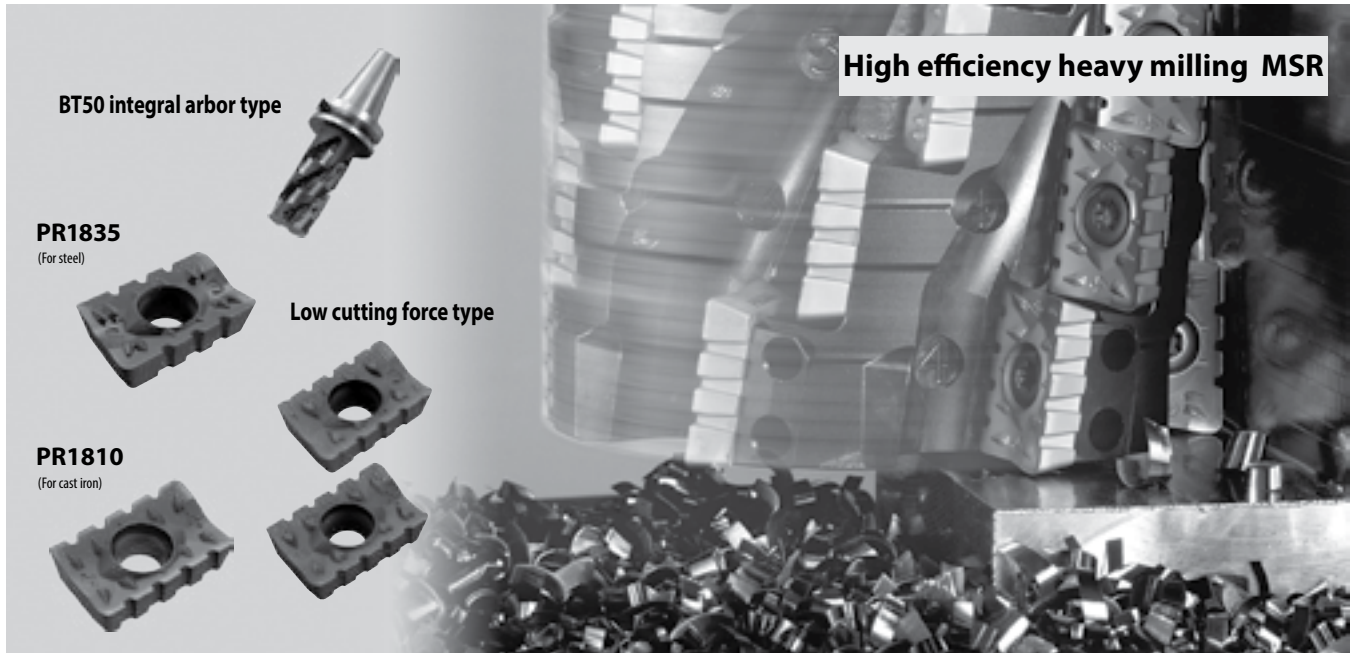
<p>Shipbuilding parts</p> <ul style="list-style-type: none"> Vc=150m/min ap x ae=10 x 10~50mm fz=0.1mm/t (Vf=240mm/min) <p>MSRS90160R-1-8T(ø160 -8 flutes) SPMT180616EN-NB3/NB4 (PR1230)</p>	<p>2,000mm</p> <p>Machined portion</p> <p>50</p>
MSRS90(PR1230)	Chip evacuation rate = 120cc/min
Competitor D	60cc/min
<ul style="list-style-type: none"> MSRS90 more than doubled the machining efficiency compared with competitor D. Competitor D machined with ap x ae=5 x 10~50mm Low cutting force of MSRS90 enabled twice as large ap as that of competitor. It can double the ap as well as increase the cutting speed (Vc=100 → 150). Machining efficiency was improved by MSRS90 (by achieving reduction in cutting time). <p style="text-align: right;">(User evaluation)</p>	

Alloy steel

<p>Power generation parts</p> <ul style="list-style-type: none"> Vc=160m/min ap x ae=10 x 0~20mm fz=0.15mm/t (Vf=500mm/min) <p>MSRS90125R-1-8T(ø125 -8 flutes) SPMT180616EN-NB3/NB4 (PR1230)</p>	<p>740</p> <p>100</p> <p>100</p> <p>ø800</p>
MSRS90(PR1230)	12 surfaces/edge
Competitor E	8 surfaces/edge
<ul style="list-style-type: none"> MSRS90 showed 1.5 times longer tool life than that of competitor E. Competitor E machined with 2 passes on a side (ap x ae=12 x 0 to 10mm). Competitor E was poor in feed rate (Vf=400mm/min). Machining efficiency was improved by MSRS90 (by achieving reduction in cutting time). Although competitor E is load due to high cutting force. MSRS90 operates fairly quietly. <p style="text-align: right;">(User evaluation)</p>	

Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others



BT50 integral arbor type

PR1835
(For steel)

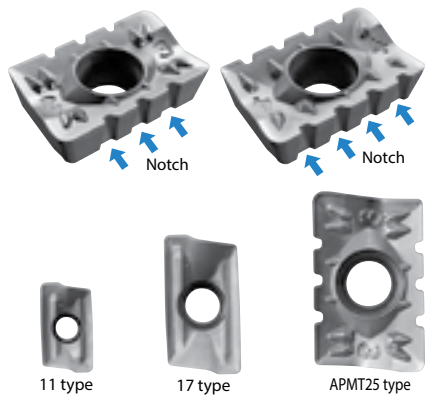
Low cutting force type

PR1810
(For cast iron)

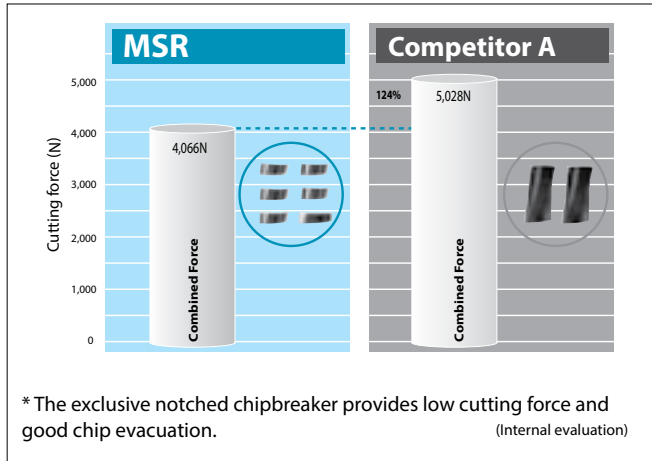
Notched insert reduces cutting force, and enables high feed rates by reducing chattering. Improved chip evacuation and low cutting force with the special chipbreaker. Enables heavy milling and deep cutting, and also drastically improves machining efficiency. (Reduction of cutting time)

Notched insert

Size comparison (full-scale)



Cutting force comparison



MSR

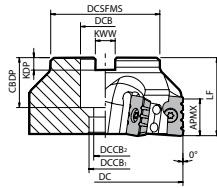


Fig. 1

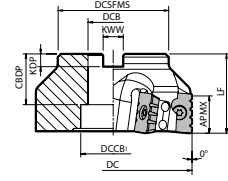


Fig. 2

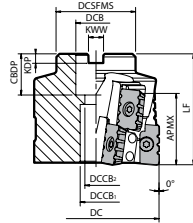


Fig. 3

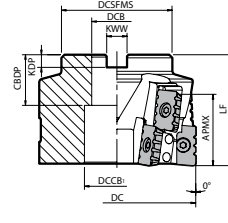


Fig. 4

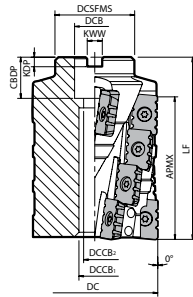


Fig. 5

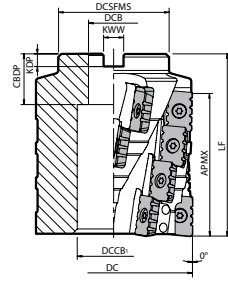


Fig. 6

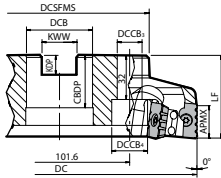


Fig. 7

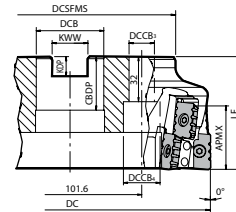


Fig. 8

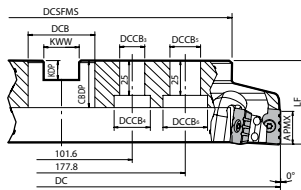


Fig. 9

M



Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

Toolholder dimensions

Description	Availability	Inserts	Flutes	Stages	Dimension (mm)													A.R. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Applicable inserts M167
					DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	DCCB ₃	DCCB ₄	DCCB ₅	DCCB ₆	LF	CBDP	KOP	KWW							APMX
Metric	MSR	063R-1M	● 4	1	63	50										65				23.5	0.7	1	APMT2506...
		063R-2M	● 8	2	63	50										85				45	0.9	3	
		080R-1M	● 4	4	1			27	20	14						50	22	7.2	12.4	23.5	1	1	
		080R-2M	● 8	2	2	80	55									70				45	1.5	3	
		080R-4M	● 16	4	4											115				90	2.5	5	
		100R-1M	● 6	1	1											50				23.5	1.5	2	
		100R-2M	● 12	2	2	100	70	32	42		-	-				70	28	8	14.4	45	2	4	
		100R-4M	● 24	4	4											115				90	3.2	6	
		125R-1M	● 6	6	1											60				23.5	3.4	2	
		125R-2M	● 12	2	2	125	85									70		9		45	3.7	4	
		125R-4M	● 24	4	4			40								115	30		16.4	90	6	6	
		160R-1M	● 8	8	1	160	100									60		10		23.5	6.1	2	
		160R-2M	● 16	2	2	160	100									70				45	6.8	4	
		200R-1M	● 10	10	1	200										60				23.5	7	7	
		200R-2M	● 20	2	2	200										80				45	9.9	8	
		250R-1M	● 12	12	1	250		130	60			18	26			60	38	15	25.4	23.5	10.3	7	
		250R-2M	● 24	2	2	250										80				45	14.2	8	
	315R-1M	MT0	14	14	1	315	230								60	35			23.5	15.5	9		
Bore dia. inch spec	MSR	063R-1	□ 4	1	63	50										65				23.5	0.8	1	APMT2506...
		063R-2	□ 8	2	63	50										85				45	1	3	
		080R-1	□ 4	1	1			25.4	20	14						50	26	6	9.5	23.5	1.1	1	
		080R-2	□ 8	4	2			55								70				45	1.6	3	
		080R-2-31.75	□ 8	2	2	80	70	31.75	27	18						32	8	12.7		45	1.7	3	
		080R-4	□ 16	4	4			55	25.4	20	14					115	26	6	9.5	90	2.6	5	
		080R-4-31.75	□ 16	4	4											115				90	2.7	5	
		100R-1	□ 6	6	1			70	31.75							50				23.5	1.6	2	
		100R-2	□ 12	2	2	100				42						70	32	8	12.7	45	2.2	4	
		100R-4	□ 24	4	4											115				90	3.6	6	
		125R-1	□ 6	6	1											60				23.5	3.5	2	
		125R-2	□ 12	2	2	125	85	38.1	54							70		10	15.9	45	3.8	4	
		125R-4	□ 24	4	4											115				90	6.1	6	
		160R-1	□ 8	8	1											60				23.5	5.8	2	
		160R-2	□ 16	8	2	160	100	50.8	68							70		11	19	45	6.4	4	
		160R-4	□ 32	4	4											115	38			90	10.7	6	
		200R-1	□ 10	10	1	200										60				23.5	7.5	7	
	200R-2	□ 20	2	2	200										80				45	10.4	8		
	250R-1	□ 12	12	1	250		130	47.625			18	26			60		14	25.4	23.5	10.9	7		
	250R-2	□ 24	2	2	250										80				45	14.7	8		
	315R-1	MT0	14	14	1	315	220								60	35			23.5	16	9		

Spare Parts (Bore Dia. : common to Metric type / Inch type)

Description	Spare Parts					
	Clamp Screw	Wrench	Shim	Clamp Screw	Wrench	Anti-seize Compound
MSR 063R-□			-	-	-	
MSR 080R-□	SB-60120TR	TT-25L	MAP-2506	SB-40140TR	DT-15	P-37
315R-□	for Insert Clamp		for Shim Clamp			

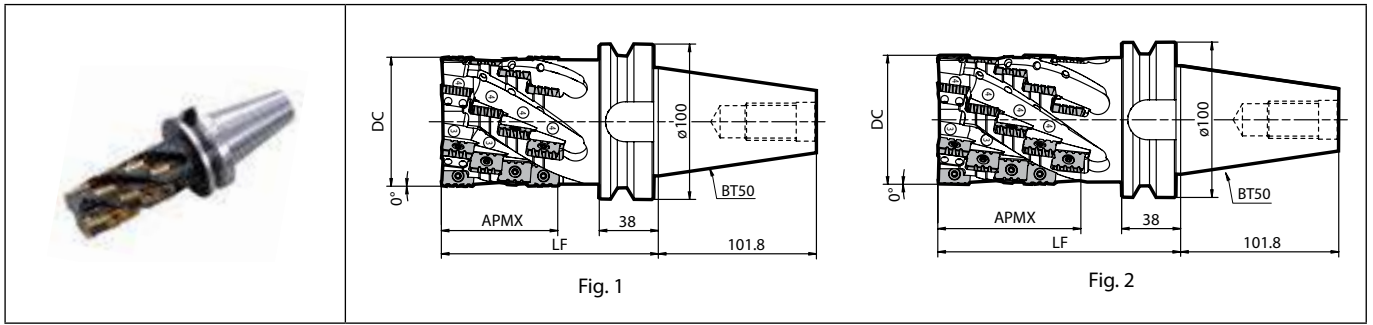
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Shim is not available for MSR063R (DC=63).
 Mounting bolt (HH12X35) is included for MSR063R / MSR080R (Metric).
 Mounting bolt (HH12X40) is included for MSR063R / MSR080R (Bore dia. inch spec).
 Mounting bolt (HH16X45) is included for MSR080R-□-31.75.
 It is not recommended using only top edge part (under ap=30mm) for 4 stages type.
 If ap is small, use 1 stage or 2 stages type.
 Deep slotting is not recommended for this cutter.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MT0 : Made to order



MSR



Toolholder dimensions

Description	Availability	Inserts	Flutes	Stages	Dimension (mm)			A.R. (°)	R.R. (°)	Coolant hole	Weight (kg)	Fig.	Spare parts						Applicable inserts ➔ M167
					DC	LF	APMX						Anti-seize compound	Cartridge	Screw	Wrench	Screw	Wrench	
MSR 063R-BT50-4	●	16	4	4	63	160	90	+9	-8	No	5.7	1	P-37	-	-	-	SB-60120TR	TT-25L	APMT2506...
MSR 063R-BT50-5	●	20		5	180	111	6.2													2
MSR 080R-BT50-4	●	16	4	4	80	160	90	+9	-8	No	6.9	1	P-37	-	-	-	SB-60120TR	TT-25L	APMT2506...
MSR 080R-BT50-5	●	20		5	180	111	7.4													2
MSR 100R-BT50-4	●	24	6	4	100	160	90	-5	-	-	9.6	1	P-37	MAP-2506	SB-40140TR	DT-15	SB-60120TR	TT-25L	APMT2506...
MSR 100R-BT50-5	●	30		5	180	111	10.5													2

Shim is not available for MSR063R (DC=63).

It is not recommended using only top edge part (under ap=30mm) for 4 stages / 5 stages type. If ap is small, use previous page's 1 stage type or 2 stages type.

Deep slotting is not recommended for this cutter.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.



Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M166

APMT

Classification of usage		Carbon steel / Alloy steel		★		P					
		Mold and die steel		★							
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)		Austenitic stainless steel				M					
		Martensitic stainless steel									
		Precipitation hardening stainless steel									
		Gray cast iron		★		K					
		Nodular cast iron		★							
		Non-ferrous metals				N					
		Heat-resistant alloy				S					
		Titanium alloy									
		Hard materials				H					
Insert	Description	No. of edges	Dimension (mm)					Angle (°)		Carbide PVD PR1810 PR1835	Applicable toolholder M165 M166
			S	D1	RE	L	W1	AN	AS		
	APMT 250608ER-NB3 250616ER-NB3 250640ER-NB3	2	6.35	6.5	0.8 1.6 4	25	15.875	11	15	●●	MSR...
	APMT 250616EL-NB3	2	6.35	6.5	1.6	25	15.875	11	15	●	-
	APMT 250608ER-NB4 250616ER-NB4 250640ER-NB4	2	6.35	6.5	0.8 1.6 4	25	15.875	11	15	●●	MSR...
	APMT 250616EL-NB4	2	6.35	6.5	1.6	25	15.875	11	15	●	-
	APMT 250616ER-NB3P	2	6.35	6.5	1.6	25	15.875	11	15	●●	MSR...
	APMT 250616ER-NB4P	2	6.35	6.5	1.6	25	15.875	11	15	●●	MSR...

Handed insert shows Right-hand

Recommended cutting conditions M166

Caution when installing notched insert (MSR)

It is important to install the appropriate notched insert into the correct position. If it is installed in incorrect position, the tool cannot cut the workpiece and it may damage the toolholder body. For MSR, notched insert location indicator is marked at insert installed area.

Please bear the following in mind when installing inserts to toolholders.

(Indication is marked near the insert pocket for MSR.)

- (3) is for APMT250608ER-NB3
- (4) is for APMT250616ER-NB4

(No. of inserts – example)

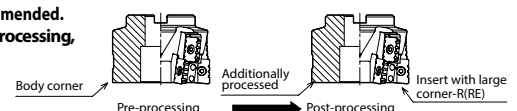
Description	No. of inserts	No. of flutes	No. of inserts	
			Notched	
			NB3	NB4
MSR 100R-1	6	6	3	3
100R-2	12		6	6
100R-4	24		12	12

Caution when installing the insert with corner-R(RE) 4.0

When using inserts with corner-R(RE) 4.0mm, additional modifications of the cutter body will be necessary. Ref. to the table below for the recommended modifications.

Insert corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
4.0	R2.0

* Round-shaped additional processing is recommended. When applying chamfer shaped additional processing, do not cut away too much.



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Recommended cutting conditions

Workpiece material	fz (mm/t)		Recommended insert grades (Cutting speed Vc: m/min)	
	Low cutting force	General purpose	MEGACOAT NANO EX	
	NB3P+NB4P	NB3+NB4	PR1810	PR1835
Carbon steel	0.15	0.2	-	★ 100~150~200
Cast iron	0.15	0.2	★ 100~150~200	-
Stainless steel	Not recommended			
Aluminum/Copper	Not recommended			

* For MSR, cutting speed should be carefully adjusted depending on the length of toolholder protruding from the end of machine spindle.
 • When the overhang length of toolholder is small, → set the cutting speed to slightly higher than the recommended cutting conditions.
 • When the overhang length of toolholder is long, → set the cutting speed to slightly lower than the recommended cutting conditions.

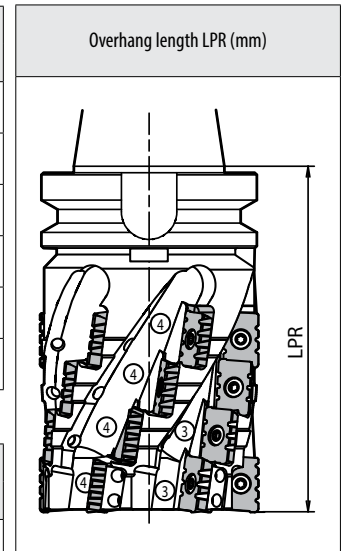
★: 1st Recommendation
 ☆: 2nd Recommendation

Cutting conditions

1. Shouldering

In case of MSR100R-1

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 100mm	150	0.2	20 x 80	920
	100~200mm	150	0.2	20 x 40	460
	201mm and over	100	0.2	20 x 30	228
Cast iron	Less than 100mm	180	0.2	20 x 80	1,100
	100~200mm	180	0.2	20 x 40	550
	201mm and over	120	0.2	20 x 30	276



In case of MSR100R-2

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 130mm	150	0.2	40 x 40	920
	130~230mm	150	0.2	40 x 20	460
	231mm and over	100	0.2	40 x 20	304
Cast iron	Less than 130mm	180	0.2	40 x 40	1,100
	130~230mm	180	0.2	40 x 20	550
	231mm and over	120	0.2	40 x 20	368

In case of MSR100R-4

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 180mm	150	0.2	75 x 20	863
	180~280mm	150	0.2	75 x 10	431
	281mm and over	100	0.2	75 x 10	285
Cast iron	Less than 180mm	180	0.2	75 x 20	1,035
	180~280mm	180	0.2	75 x 10	518
	281mm and over	120	0.2	75 x 10	345



- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

2. Slotting**In case of MSR100R-1**

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 100mm	150	0.2	7 x 100	403
	100~200mm	120	0.2	4 x 100	184
	201mm and over	100	0.2	3 x 100	114
Cast iron	Less than 100mm	180	0.2	14 x 100	966
	100~200mm	150	0.2	7 x 100	403
	201mm and over	120	0.2	4 x 100	184

In case of MSR100R-2

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 130mm	150	0.2	7 x 100	403
	130~230mm	120	0.2	4 x 100	184
	231mm and over	100	0.2	3 x 100	114
Cast iron	Less than 130mm	180	0.2	14 x 100	966
	130~230mm	150	0.2	7 x 100	403
	231mm and over	120	0.2	4 x 100	184

In case of MSR160R-1

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 100mm	150	0.2	5 x 160	384
	100~200mm	120	0.2	3 x 160	182
	201mm and over	100	0.2	2 x 160	102
Cast iron	Less than 100mm	180	0.2	10 x 160	928
	100~200mm	150	0.2	5 x 160	384
	201mm and over	120	0.2	4 x 160	243

In case of MSR160R-2

Workpiece material	Overhang length LPR (mm)	Cutting conditions		ap x ae (mm)	Chip evacuation rate (cc/min)
		Cutting speed Vc (m/min)	Feed fz (mm/t)		
Carbon steel	Less than 130mm	150	0.2	5 x 160	384
	130~230mm	120	0.2	3 x 160	182
	231mm and over	100	0.2	2 x 160	102
Cast iron	Less than 130mm	180	0.2	10 x 160	928
	130~230mm	150	0.2	5 x 160	384
	231mm and over	120	0.2	4 x 160	243

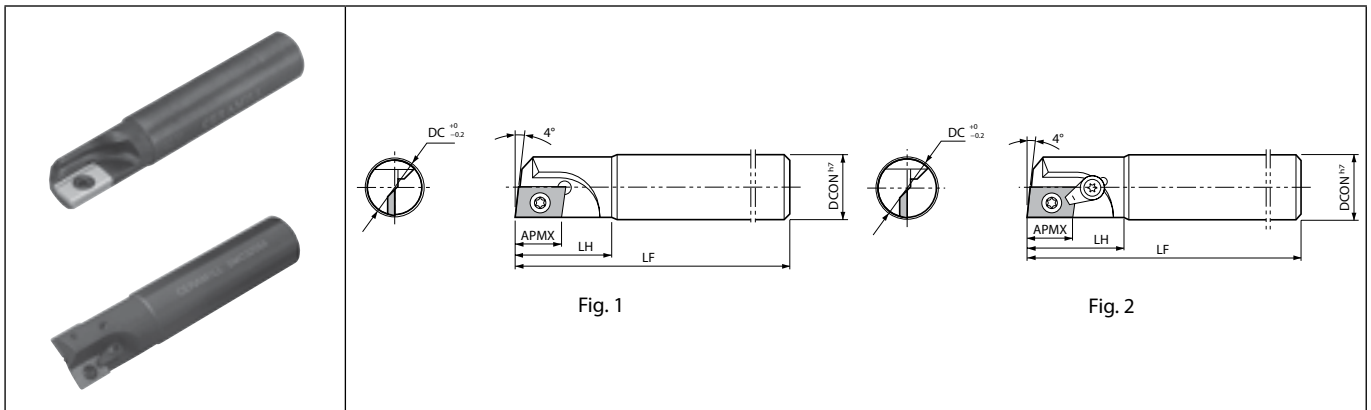
Notes: MSR...-4 (No. of stage)
Slotting is not recommended.

M



Milling

DMC-SX



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)					A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts M172
			DC	DCON	LF	LH	APMX					Clamp set	Screw	Wrench	
DMC 316SXT 320SX 325SX 332SX 340SX	●	1	16	16	90	30		-3	No	1	-	SB-4060TR	FT-15	NDCT1503... NDCW1503...	
	●	2	25	25	120	14				0	2	CPS-2TR			SB-4065TR
	●	2	32	32	130	40		-2	No	2	-	SB-4065TR	FT-15		
	●		40		150					2					
	●		20		20					200					50	14	+3	0	1
DMC 320SX-200 325SX-220 332SX-250	●	1	20	20	200	50	+3	-2	No	1	-	SB-4065TR	FT-15	NDCT1503... NDCW1503...	
	●	2	25	25	220	60	14	-2	No	1	-	SB-4065TR	FT-15		
	●		32	32	250	80				0					1



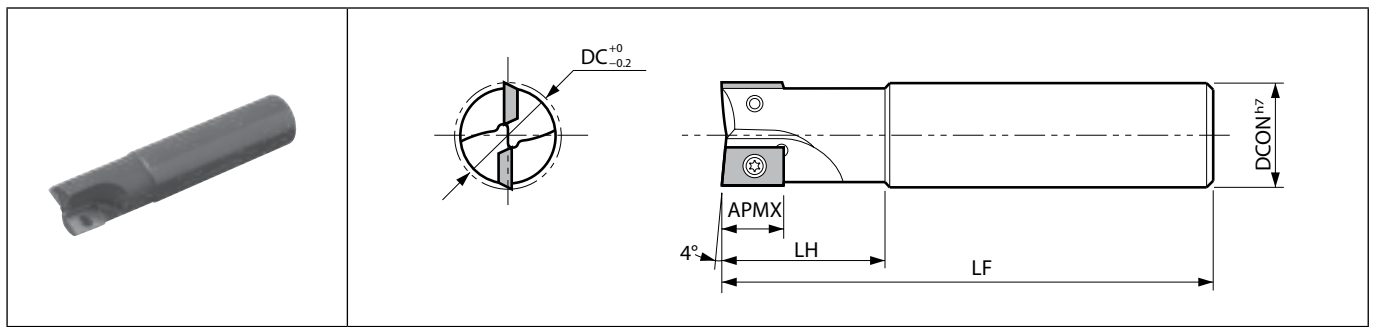
Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M170

DMC-H



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)					A.R. (°)	R.R. (°)	Coolant hole	Spare parts		Applicable inserts ➔ M172
			DC	DCON	LF	LH	APMX				Screw	Wrench	
											SB-4060TR	FT-15	
DMC 316H	●	1	16	16	90	30	+5	-3.5	No	SB-4060TR	FT-15	NDCT1503...X NDCW1503...X...	
DMC 320H	●		20	20	110		+6	-2					
DMC 325H	●		25	25	120	14							
DMC 332H	●	2	32		130		+8	0		SB-4065TR			
DMC 340H	●		40	32	150								

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



NDCT/NDCW

Insert		Description	No. of edges	Dimension (mm)									Angle (°)		Carbide	Cermets	PCD	Applicable toolholder ● M170 ● M171										
				IC	S	D1	RE	L	INSL	LE	W1	AN	AS															
				Classification of usage																								
<p>Classification of usage</p> <p>★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)</p>		<p>Carbon steel / Alloy steel</p> <p>Mold and die steel</p> <p>Austenitic stainless steel</p> <p>Martensitic stainless steel</p> <p>Precipitation hardening stainless steel</p> <p>Gray cast iron</p> <p>Nodular cast iron</p> <p>Non-ferrous metals</p> <p>Heat-resistant alloy</p> <p>Titanium alloy</p> <p>Hard materials</p>															P		M		K		N		S		H	
				NDCT 150308FR	2	9.525	3.18	4.5	0.8	15	-	-	-	15	-	●	-	-	DMC...SX(...)									
				NDCT 150308TRX	2	9.525	3.18	4.4	0.8	15	-	-	-	15	-	●	-	-	DMC...SX(...) DMC...H									
				NDCW 150302TR 150304TR 150308TR 150320TR 150330TR 150340TR	2	9.525	3.18	4.5	0.2 0.4 0.8 2 3 4	15	-	-	-	15	-	●	●	●	●	DMC...SX(...)								
				NDCW 150308TRX	2	9.525	3.18	4.4	0.8	15	-	-	-	15	-	●	-	-	DMC...SX(...) DMC...H									
				NDCW 150302FRX 150302FRX-NE	1	-	3.18	4.4	0.2	-	15	5.7 5.1	9.525	-	15	●	●	●	DMC...SX(...) DMC...H									

Handed insert shows Right-hand

Recommended cutting conditions ● M173

- M
- Milling
- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

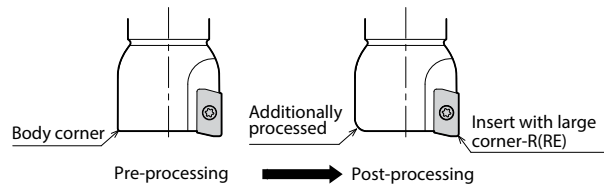
M172

Recommended cutting conditions (DMC-SX)

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)		Max. ap (mm)		
		Cermet	Carbide	Cutting dia. (DC)	Slotting (ap)	Shouldering (apxae)
		TN100M	KW10			
Carbon steel	~0.2	★ 120~200		ø16~	3	9x3
Alloy steel	~0.2	★ 100~180		ø16~	3	9x3
Mold steel	~0.15	★ 100~180		ø16~	3	9x3
Stainless steel	~0.15	☆ 120~200		ø16~	2	6x2
Cast iron	~0.2		★ 80~150	ø16~	3	9x3
Non-ferrous metals	~0.2		★ 100~300	ø16~	3	9x3

When using inserts with corner-R(RE) 2.0 or larger, additional modifications of the cutter body will be necessary. Additional modifications for the body will be necessary. Ref. to the chart below for the recommended modifications. (Additional grind off is not necessary when corner-R(RE) is 0.8 mm or less.)

Insert corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
2.0	R1.0
3.0	R1.6
4.0	R2.0



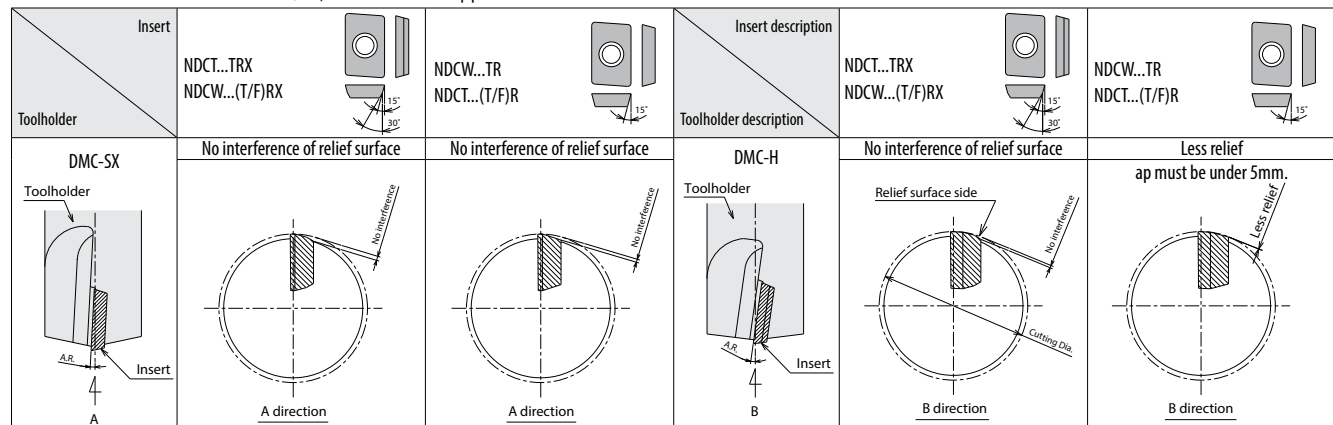
* Round-shaped additional processing is recommended. When applying chamfer shaped additional processing, do not cut away too much.

Recommended cutting conditions (DMC-H)

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)				Max. ap (mm)		
		Cermet	Carbide	PCD		Cutting Dia. (DC)	Slotting (ap)	Shouldering (apxae)
		TN100M	KW10	KPD230 (KPD001)	KPD010			
Carbon steel	~0.2	★ 120~200				~ø20	4	8x4
						ø25~	8	14x6
Alloy steel	~0.2	★ 100~180				~ø20	4	8x4
						ø25~	8	13x6
Mold steel	~0.15	★ 100~180				~ø20	3	5x2
						ø25~	6	10x3
Stainless steel	~0.15	☆ 120~200				~ø20	3	6x2
						ø25~	6	13x3
Cast iron	~0.2		★ 80~150			~ø20	4	8x4
						ø25~	6	14x6
Non-ferrous metals	~0.2		★ 100~300	★ 300~500	☆ 300~500	~ø20	4	8x4
						ø25~	6	14x6

★ : 1st Recommendation ☆ : 2nd Recommendation

NDCW1503○○TR and NDCT1503○○(T/F)R inserts are not applicable for DMC-H end mill.



High efficiency milling cutter for finishing aluminum alloys

MFAH

Low cutting force minimizes burrs and chipping for high quality machining

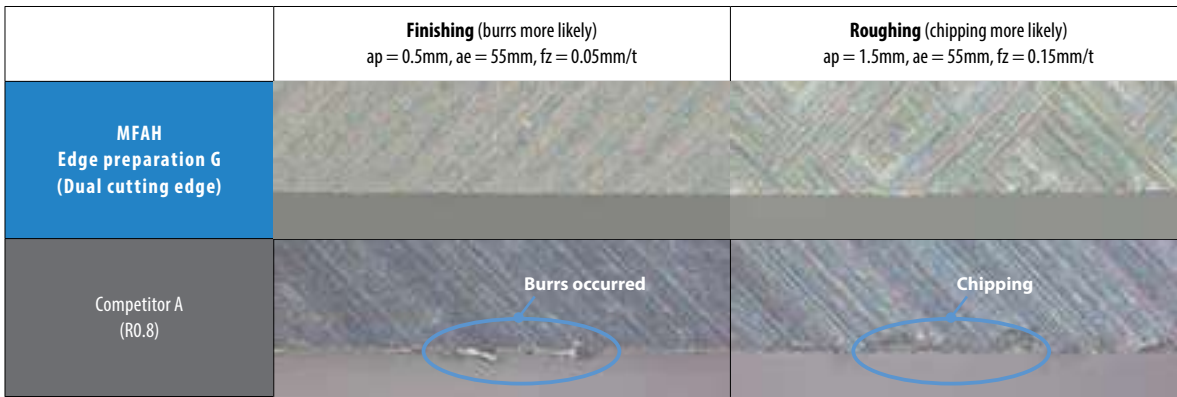
Easily adjust blade runout

2 body types and 3 inserts for a variety of milling applications

1 Low cutting force minimizes burrs for high quality machining

Large true rake angle and dual cutting edge insert designs

Burr and chipping comparison (Internal evaluation)

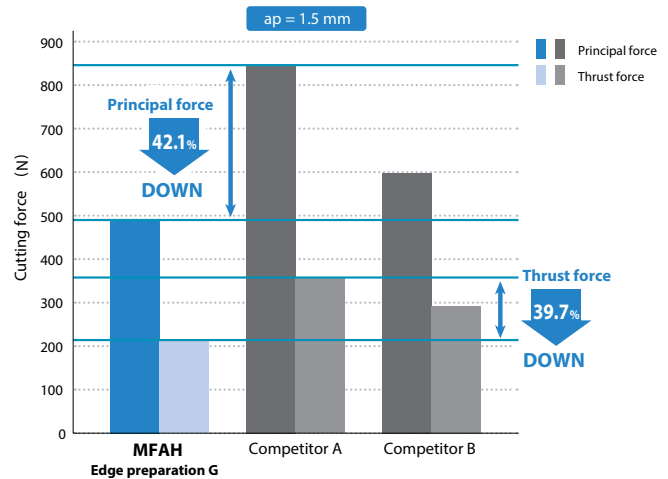
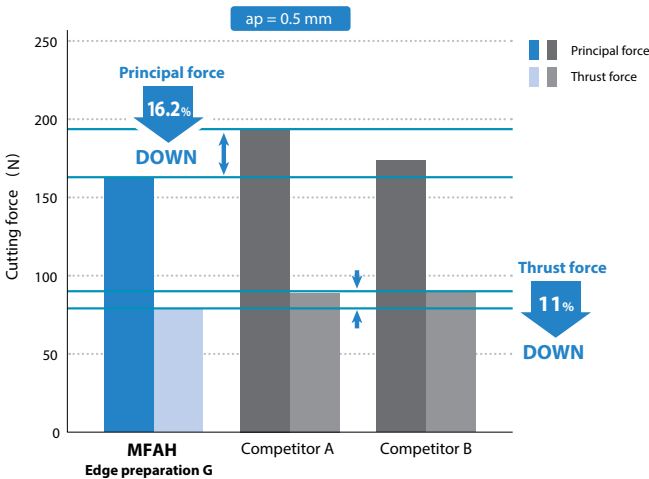


Cutting conditions: Vc = 2,500 m/min, Wet, Cutter dia. ø80
MFAH080RS-10T-SF, ENET0905PAER-G KPD001
Workpiece material: ADC12

2 Low cutting force design

Low cutting force, reduced chattering and high efficiency machining

Cutting force comparison (Internal evaluation)



Cutting conditions: Vc = 2,500 m/min, ae = 55 mm, fz = 0.1 mm/t, Wet, Cutter dia. ø80
MFAH080RS-10T-SF, ENET0905PAER-G KPD001
Workpiece material: ADC12

M
Milling

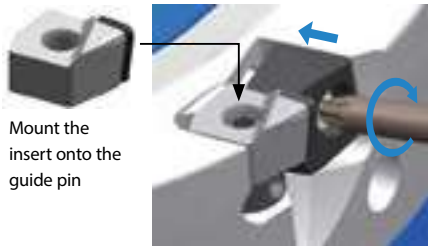
- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

3 Adjustable blade runout

Easily install inserts and adjust blade runout

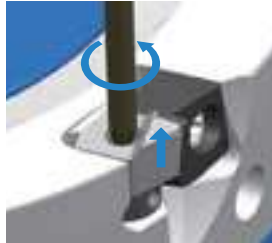
Easy insert installment

Guide pin allows for easier positioning



Easily adjust blade runout

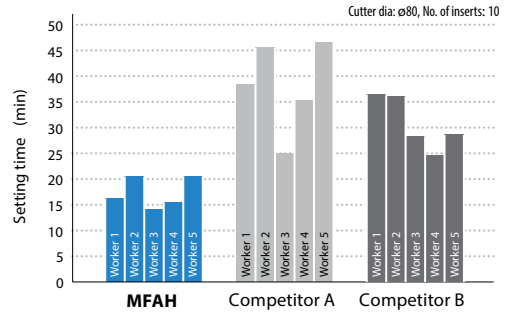
Adjustable from both the front and outer periphery



Blade runout setting time comparison

(Internal evaluation)

* Operation Time of 5 Workers Comparison



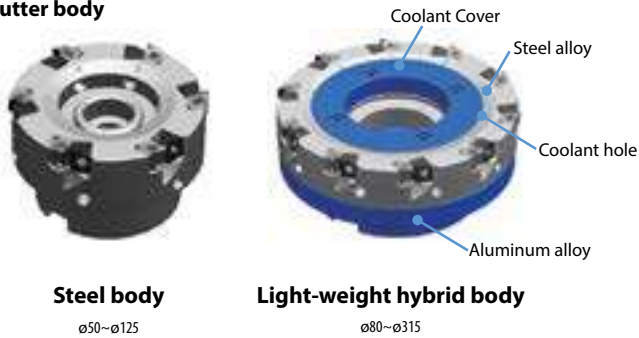
The MFAH can drastically shorten the setting time

4 Large tooling lineup

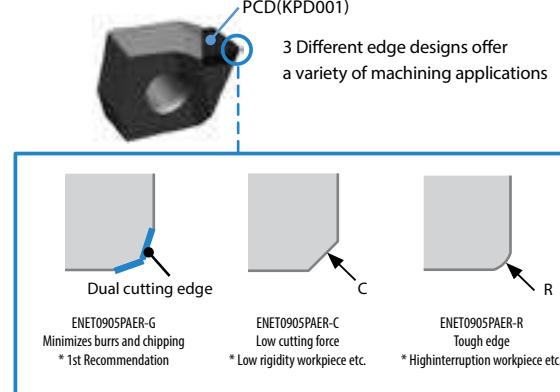
Steel body and light-weight hybrid body with internal coolant available

3 different edge designs offer a variety of machining applications

Cutter body



Insert (Edge design)

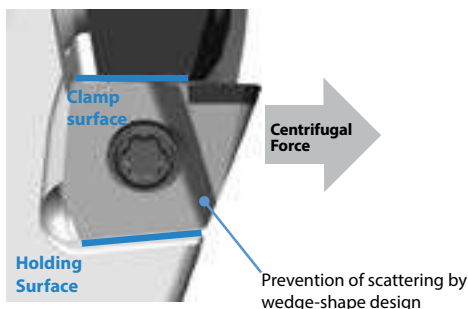


5 Safety enhancements during high-speed revolution

Scattering prevention mechanism

1 Prevention of scattering by wedge-shape design

New wedge-shape feature holds insert firmly in place and reduces chattering

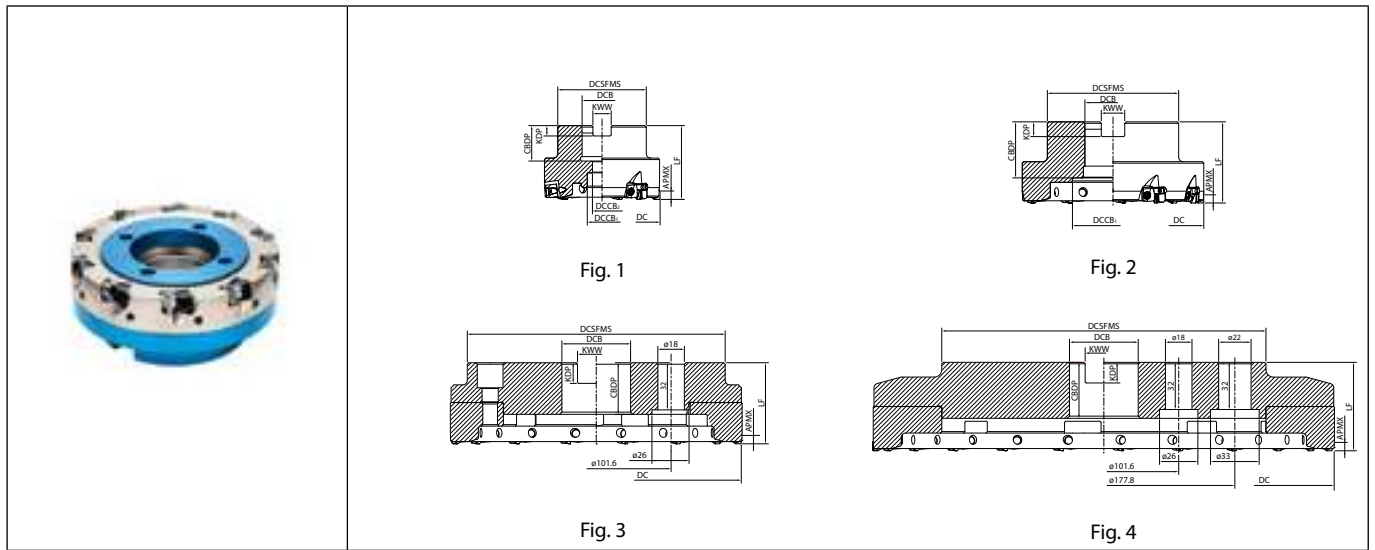


2 Prevention of scattering with guide pin

Guide pins improve safety during high-speed rotation



MFAH (Light-weight Hybrid body)



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)											Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➔ M179	
			R	DC	DCSFMS	DCB	DCCb1	DCCb2	LF	CBDP	KDP	KWW	APMX					Mounting bolt (Attachment)	Coolant cover (Attachment)	Coolant cover (sold separately)		
																						DC	DCSFMS	DCB	DCCb1	DCCb2	LF	CBDP	KDP	KWW	APMX
Metric	MFAH	080RA-6T-M-SF	●	6	80	62	27	20	13	50	27	7	12.4	4.6	Yes	14600	0.82	1	HH12X35HC	-	-	ENET0905PAER-G ENET0905PAER-C ENET0905PAER-R
		080RA-10T-M-SF	●	10																		
		100RA-8T-M27-SF	●	8	100	62	27	20	13	50	24	7	12.4	4.6	Yes	13000	1.2	1	HH12X35HC	-	-	
		100RA-8T-M-SF	●	8																			85	32	42	-	30	8	14.4
		100RA-12T-M27-SF	●	12	100	62	27	20	13	50	24	7	12.4	4.6	Yes	13000	1.15	1	HH12X35HC	-	-	
		100RA-12T-M-SF	●	12																			85	32	42	-	30	8	14.4
		125RA-10T-M27-SF	●	10	125	60	27	20	13	55	24	7	12.4	4.6	Yes	11400	1.8	1	HH12X35H	CC-125-MFAH	-	
		125RA-10T-M-SF	●	10																			94	40	55	-	33	9	16.4
		125RA-16T-M27-SF	●	16	125	60	27	20	13	50	24	7	12.4	4.6	Yes	11400	1.73	1	HH12X35H	CC-125-MFAH	-	
		125RA-16T-M-SF	●	16																			94	40	55	-	33	9	16.4
		160RA-12T-M-SF	●	12	160	125	40	57	-	-	33	9	16.4	4.6	Yes	8000	3.5	2	HF20X53HA	CC-160-MFAH	-	
		160RA-20T-M-SF	●	20																		

Confirm the total weight of the cutter and the arbor is within the machine's acceptable range.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MT0 : Made to order

M176

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

Toolholder dimensions

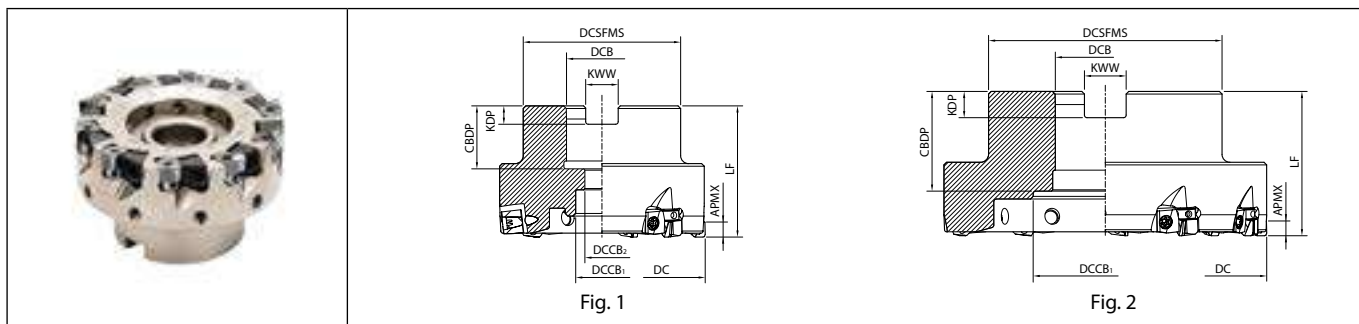
Description	Availability		Dimension (mm)													Coolant hole			Spare parts			Applicable inserts ➔ M179
	R	Inserts	DC	DCS/FMS	DCB	DCB ₁	DCB ₂	LF	CBDP	KDP	KWW	APMX	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Mounting bolt (Attachment)	Coolant cover (Attachment)	Coolant cover (sold separately)				
Bore dia. inch spec	MFAH	<input type="checkbox"/>	6	80	62	25.4	20	13	50	27	6	9.5	14600	0.83	1	HH12X35HC						
		<input type="checkbox"/>	10												0.78				1			
		<input type="checkbox"/>	8	100	62	25.4	20	13	50	24	6	9.5	13000	1.21	1	HH12X35HC						
		<input type="checkbox"/>	8												1.33				2	HF16X44HC		
		<input type="checkbox"/>	12	125	62	25.4	20	13	50	24	6	9.5	11400	1.16	1	HH12X35HC						
		<input type="checkbox"/>	12												1.29				2	HF16X44HC		
		<input type="checkbox"/>	10	16	60	25.4	20	13	55	24	6	9.5	8000	1.8	1	HH12X35H	CC-125-MFAH					
		<input type="checkbox"/>	10												2				2	HF20X53HA		
		<input type="checkbox"/>	16	125	60	25.4	20	13	50	24	6	9.5	11400	1.74	1	HH12X35H	CC-125-MFAH					
		<input type="checkbox"/>	16												1.95				2	HF20X53HA		
		<input type="checkbox"/>	12	160	130	50.8	70			38	11	19.1	8000	3.4	2	HF24X60HA	CC-160-MFAH					
		<input type="checkbox"/>	20												3.3				2			
			MTO	16	200	175		126	55				5600	4.9	3			CC-200-MFAH				
			MTO	24											4.8				3			
			MTO	20	250	140	47.625	165		35	14	25.4	4500	7	3			CC-250-MFAH				
			MTO	32											6.9				3			
			MTO	24	315	220		220	60	38			3500	11.7	4			CC-315-MFAH				
			MTO	40											11.5				4			

Confirm the total weight of the cutter and the arbor is within the machine's acceptable range.



● : Standard item R : Right-hand only L : Left-hand only ☐ : Check availability MTO : Made to order

MFAH (Steel body)



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)										Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M179			
			DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CDBP	KOP	KWW	APMX								
Metric	●	4	50	48	16	13.6	9	40	19	5.6	8.4	4.6	No	19200	0.44	1	ENET0905PAER-G ENET0905PAER-C ENET0905PAER-R			
		5	63	61	22	23	11		21	6.3	10.4				16800	0.69		1		
		6	80	60	27	20	13		24	7	12.4				14600	1.16		1		
		6	●	10	100	70	32	45	50	30	8	14.4	4.6	No	13000	1.56		2		
		12								34	8	12.7				13000		1.51	2	
		10	●	16	125	89	40	55	55	33	9	16.4	4.6	No	11400	2.6		2		
		16								38	10	15.9				11400		2.5	2	
		Bore dia. inch spec	□	6	80	50	25.4	20	13	50	27	6	9.5	4.6	No	14600		1.02	1	
				8	100	70	31.75	45	34		8	12.7	13000					1.59	2	
				10	125	89	38.1	55	38		10	15.9	11400					2.63	2	
				10	□	16	125	89	38.1	55	55	38	10	15.9	4.6	No		11400	2.56	2
				16								38	10	15.9					11400	2.56	2



- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Spare parts

Description	Wedge	Wedge screw	Wrench	Adjust screw	Wrench	Anti-seize compound	Applicable inserts
Light-weight hybrid body	MFAH080RA- ... MFAH315RA- ...						
Steel body	MFAH050RS- ... MFAH125RS- ...						

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

ENET

Classification of usage			Material					PCD	Applicable toolholder M176~M178	
			Carbon steel / Alloy steel	Mold and die steel	Austenitic stainless steel	Martensitic stainless steel	Precipitation hardening stainless steel			Gray cast iron	Nodular cast iron	Non-ferrous metals	Heat-resistant alloy	Titanium alloy	Hard materials
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)			Dimension (mm)					RPD001		
			S	L	LE	W1	BS			
Insert	Description		S	L	LE	W1	BS			
			ENET 0905PAER-G	7.9	6.02	5.6	9.61	2.6	●	MFAH...RA...-SF MFAH...RS...-SF
			ENET 0905PAER-C	7.9	6.02	5.6	9.61	3	●	MFAH...RA...-SF MFAH...RS...-SF
			ENET 0905PAER-R	7.9	6.02	5.6	9.61	3.1	●	MFAH...RA...-SF MFAH...RS...-SF

Recommended cutting conditions M180

M



Milling

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

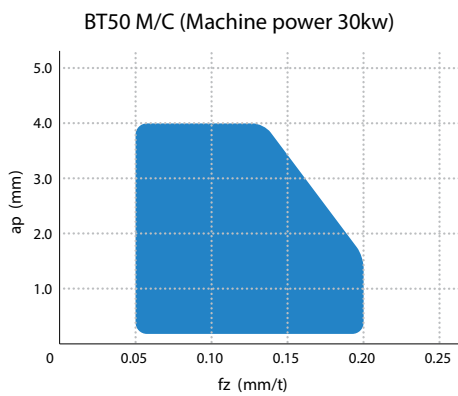
CBN & PCD Inserts are sold in 1 piece boxes

Recommended cutting conditions

Workpiece material	Property	Vc (m/min)	fz (mm/t)	Recommended insert grades
Aluminum alloys	Si Ratio 12.5% or less	1,000 - 2,500 - 3,000	0.05 - 0.10 - 0.20	KPD001
	Si Ratio 12.5% and over	400 - 600 - 800	0.05 - 0.10 - 0.20	

Recommended cutting conditions are reference values. Please adjust cutting speed and feed rate according to actual machining conditions taking into account machine and workpiece rigidity. Do not use the cutter at speeds exceeding the maximum cutting speed limit.

Cutting performance



Cutting conditions: Vc = 2,500 m/min, ae = 55mm, Wet, Cutter dia. ø80
MFAH080RS-10T-SF ENET0905PAER-G KPD001 Workpiece material: ADC12



Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

Cautions

While in use

! Caution

Please use within recommended cutting conditions

Do not run the cutter at revolutions exceeding the printed maximum revolution limit of the cutter body
 Inserts or cutter body may be damaged due to the centrifugal force and cutting load

Please do not use under the following conditions:

- When cutter is not fully loaded with inserts
- If the body and/or clamp is damaged
- If a clamp or clamp screw is removed
- If inserts that have different regrind amounts are mounted

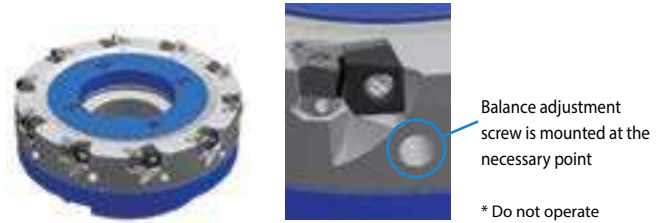
Please wear protective equipment such as protective glove when changing inserts or adjusting edge fluctuation
 Injury can occur when touching the cutting edge

Dynamic balance

Balance adjustment on the cutter is completed before shipping
 Balance adjustment has been made with special high precision inserts to be ISO balance quality grade (ISO 1940-1) G2.5

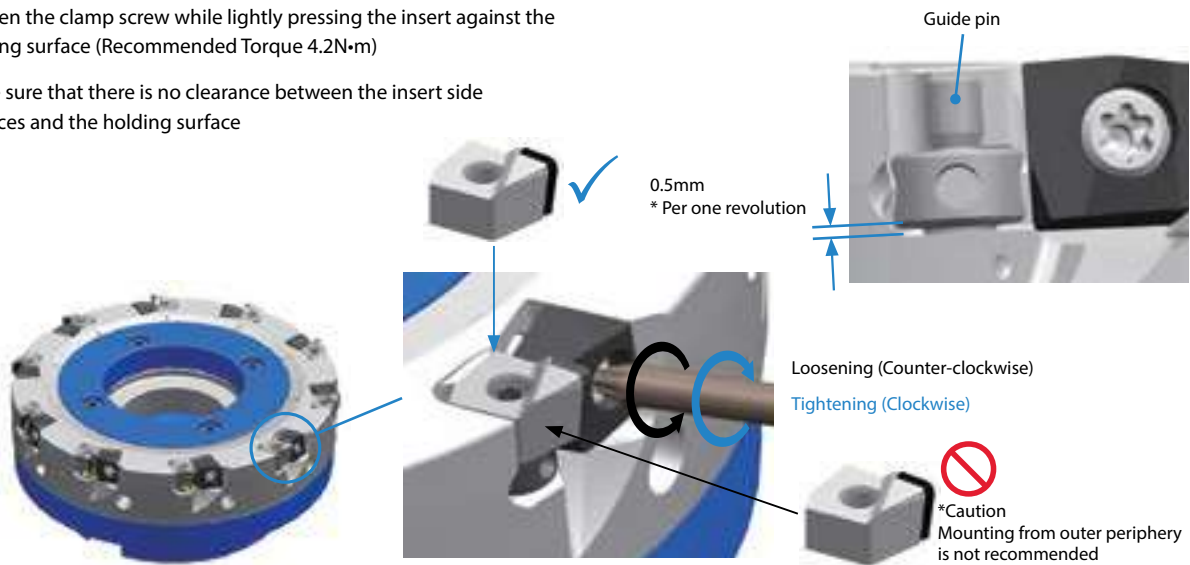
Do not operate the balance adjustment screw at the outer periphery of cutter

- This could lead to improper dynamic balance
- Do not completely remove clamp and clamp screw from cutter
- This requires additional balance adjustment



How to mount insert

- 1 Adjust the clearance between adjustment screw for cutting edge and the surface of insert to be 0.5mm
- 2 Mount insert on guide pin
 (Be sure to install from the head. Mounting from outer periphery is not recommended)
- 3 Tighten the clamp screw while lightly pressing the insert against the holding surface (Recommended Torque 4.2N·m)
- 4 Make sure that there is no clearance between the insert side surfaces and the holding surface



How to adjust blade runout

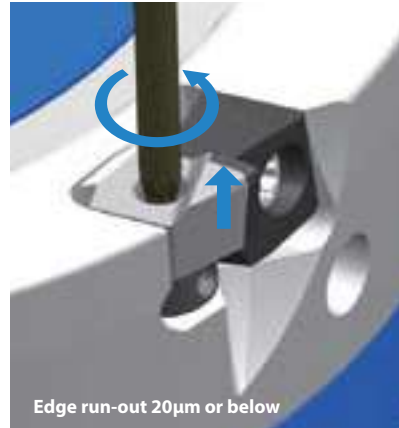
1 Install an insert



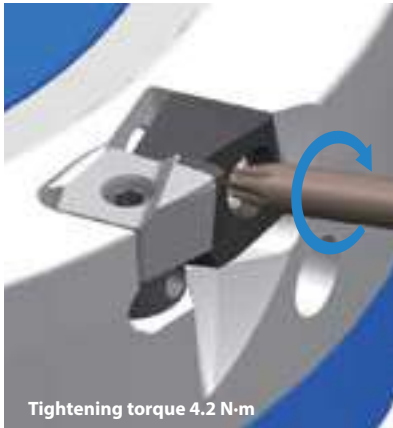
2 Partially tighten



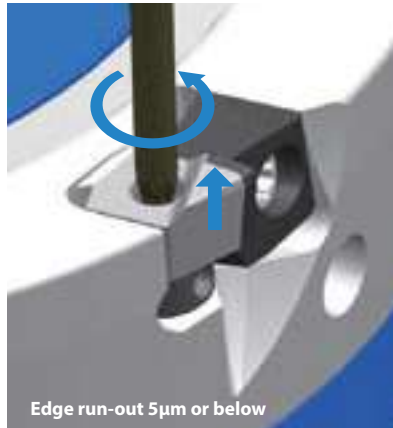
3 Adjustable blade runout



4 Fully tighten



5 Adjustable blade runout

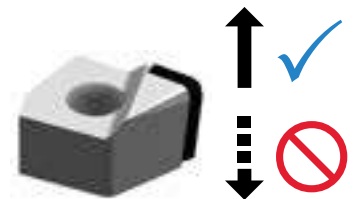


M



Milling

- 1 Install inserts into all pockets
- 2 Partially tighten the clamp screw (Recommended Torque 2.0N·m)
- 3 Turn the screw with the wrench to adjust and make sure that all screw heights are within 20µm of each other (Recommended)
- 4 Fully tighten the clamp screw with tightening torque 4.2 N·m
- 5 Slightly adjust position of cutting edge (Recommended position difference: 5µm or below)
* All inserts should be fine-tuned



* Caution
Do not adjust cutting edge to lower position

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

Precaution for changing clamp

How to mount a clamp on a holder

1 Attach clamp screw into clamp first



Attaching clamp screw into clamp
(about 1 revolution)

2 Mounting



Mount it to the holder

3 Fastening



Fasten with recommended torque
(Completed)

Mount position of clamp screw



Right position

(Screw head does not come out)



Wrong position

(Screw head comes out)



Confirm if clamp screw is not coming out after fastening clamp screw with recommended torque

Re-mount if the clamp screw is coming out

Adjust the balance is needed after mounting in case removing a clamp screw completely such as clamp change

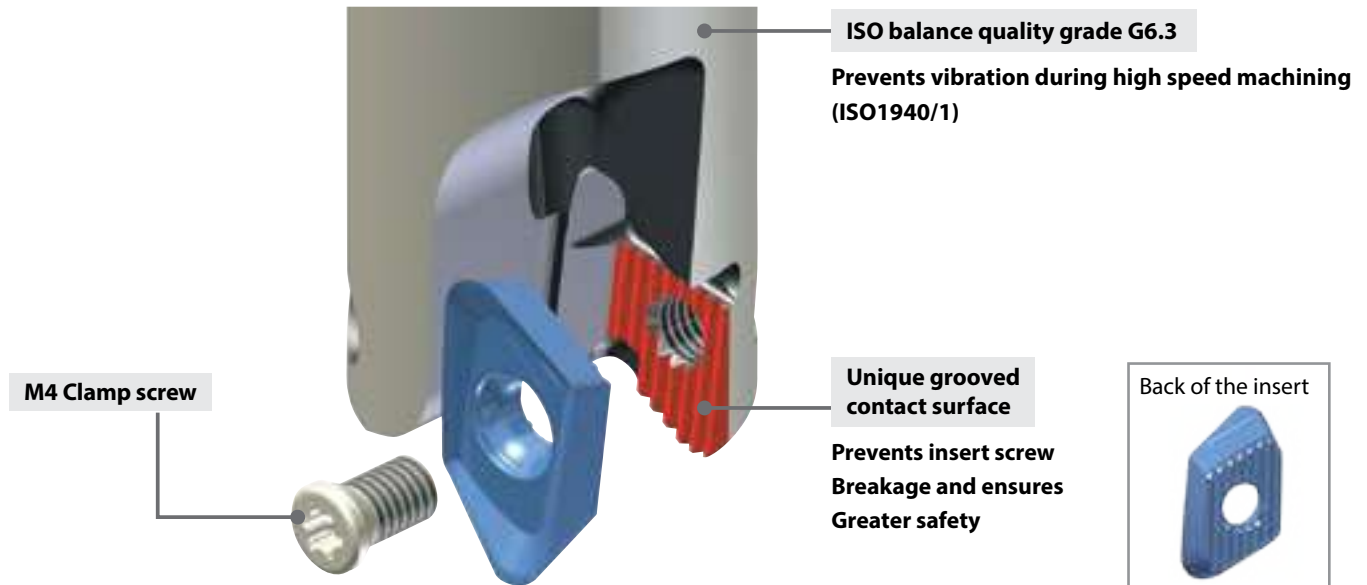
For aluminum alloys high efficiency end mill

MEAS

Excellent scatter prevention to ensure stable, high speed aluminum machining
 Large ramping angle delivers a wide range of machining applications

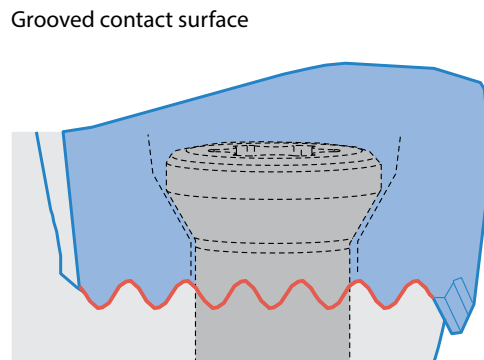
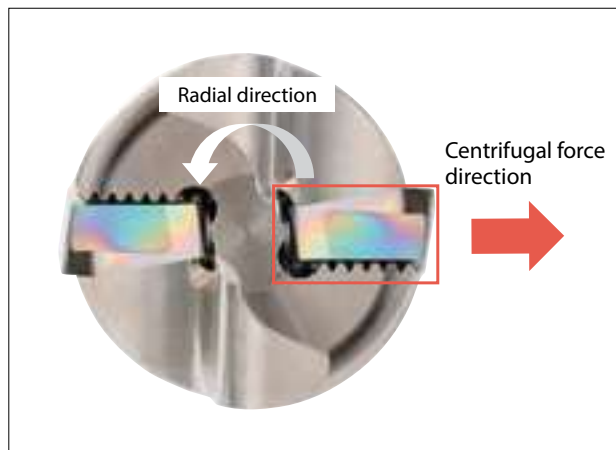
1 High reliability and high efficiency machining

Grooved connection between the insert and holder
 Provides high speed aluminum machining (ø32: Recommended max. cutting speed Vc = 3,000m/min)



Grooved insert pocket

Centrifugal force is applied across the grooved surface to reduce pressure on the insert screw
 Prevents insert screw breakage and safely secures the insert during high-speed revolutions



M

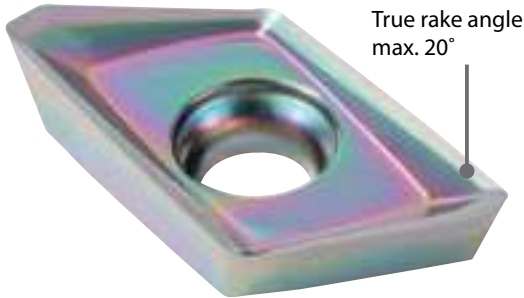
Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

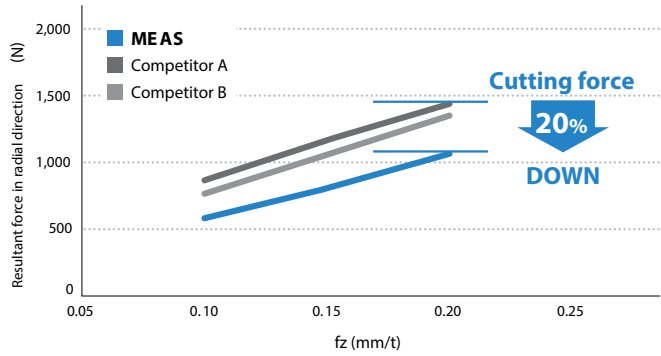
2 Low cutting force with sharp cutting edge

True rake angle max. 20°

Low cutting force and excellent chattering resistance



Cutting force comparison (Internal evaluation)

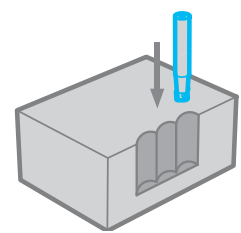
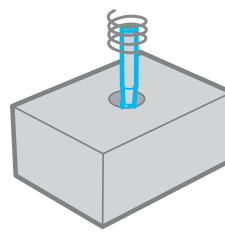
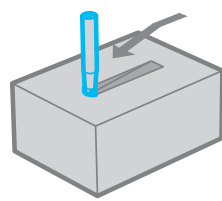
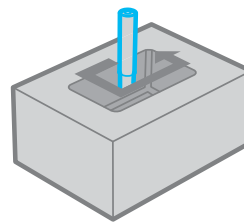
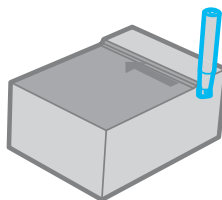
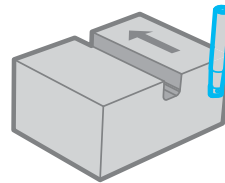
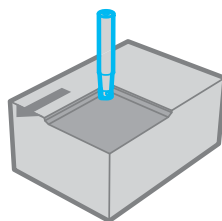


Cutting conditions: Vc = 390 m/min, ap × ae = 8 × 5mm, Dry
Cutter dia. ø25mm (2 Flutes) Workpiece material: AlZnMgCu 1.5

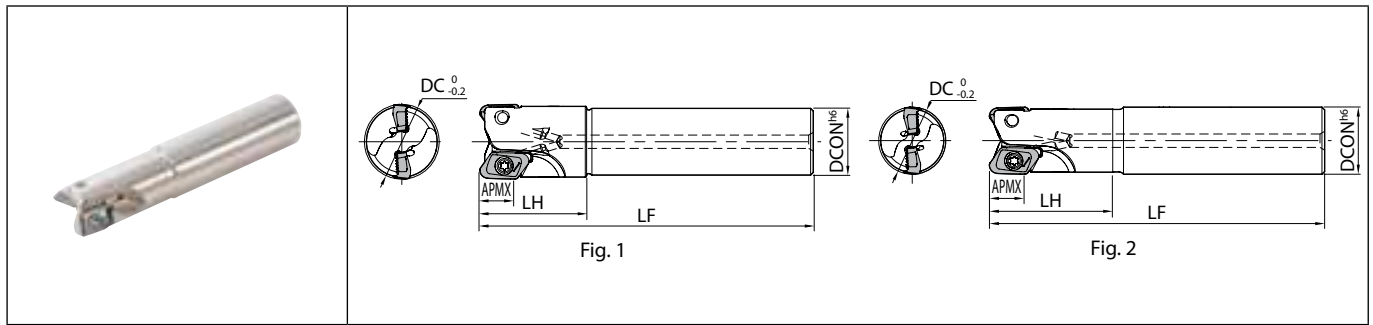
3 Applicable to a wide range of application

Max. ramping angle 20° (ø25)

The MEAS can be used for shouldering, slotting, ramping, and helical milling applications



MEAS



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)					A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➔ M187	
			DC	DCON	LF	LH	APMX							Anti-seize compound	Screw	Wrench		
Cylindrical Standard shank	●	2	28	25	125	40	12	+10	-13	Yes	54000	0.4	1	P-37	SB-4090TRP	DTPM-15	KCGT1305...	
			35	32	150	50					46000	0.9						1
			40								42000							
Same shank	●	2	25	25	125	49	12	+10	-14	Yes	59000	0.4	2	P-37	SB-4075TRP SB-4090TRP	DTPM-15	KCGT1305...	
			32	32	150	69					49000	0.8						2
Long shank	●	2	25	25	170	89	12	+10	-13	Yes	49000	0.5	2	P-37	SB-4075TRP SB-4090TRP	DTPM-15	KCGT1305...	
			32	32	200	119					39000	1.1						2

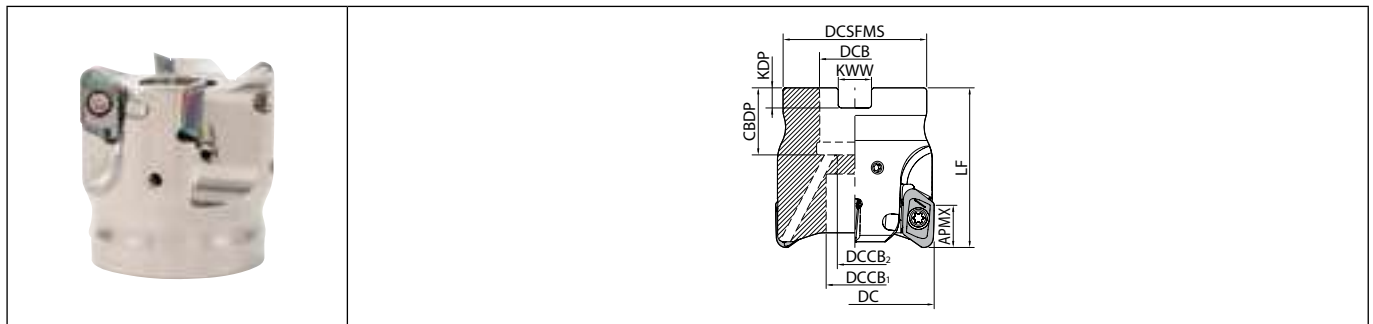
When using inserts with a corner-R(RE) of 3.2 or larger, additional modifications (R3.5 mm or larger) on the corner of cutter body is necessary.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Recommended tightening torque for insert clamp : 3.5N·m

M

MEAS



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)										A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts				Applicable inserts ➔ M187
			DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDB	KDP	KWW	APMX						Anti-seize compound	Mounting bolt	Screw	Wrench	
MEAS 040R-13-3T-M-KUA	●	3	40	38	16	14	9	40	18	5.6	8.4	12	+10	-11	Yes	44000	0.3	P-37	HH10X30H	SB-4090TRP	DTPM-15	KCGT1305...
MEAS 050R-13-4T-M	●	4	50	45	22	18	11	50	21	6.3	10.4					36000	0.4					
MEAS 063R-13-5T-M-KUA	●	5	63	47												28000	0.6					
MEAS 080R-13-5T-M-KUA	●	5	80	60	27	20	13	63	22	7	12.4					22000	1.0					

When using inserts with a corner-R(RE) of 3.2 or larger, additional modifications (R3.5 mm or larger) on the corner of cutter body is necessary.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Recommended tightening torque for insert clamp : 3.5N·m

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M186



Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

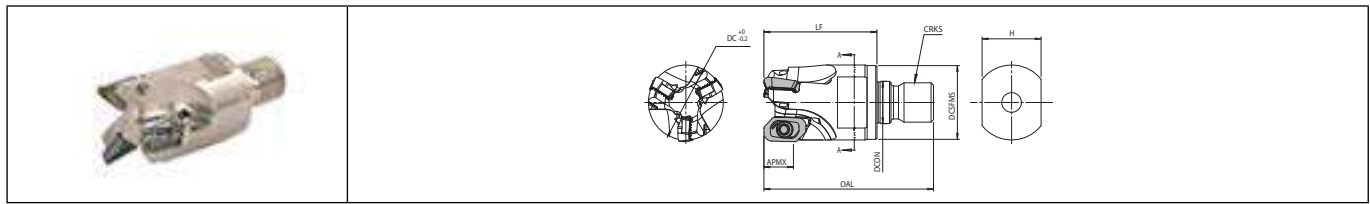
Multi-Function

Slot Mill

Ball-nose Radius

Others

MEAS



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)									A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Spare parts			Applicable inserts ➔ M187
			DC	DCSFMS	DCON	OAL	LF	CRKS	H	APMX	Anti-seize compound					Screw	Wrench		
MEAS 25-M12-13-2T-KUA	●	2	25	23	12.5	63	40	M12xP1.75	19	12	+10	-11	Yes	49000	P-37	SB-4075TRP SB-4090TRP	DTPM-15	KCGT1305...	
32-M16-13-3T-KUA	●	3	32	30	17	69	46	M16xP2.0	24				39000						

When using inserts with a corner-R (RE) of 3.2 or larger, additional modifications (R3.5 mm or larger) on the corner of cutter body is necessary. If corner-radius is 3.0 mm or smaller, additional modifications are not needed. Recommended torque for insert clamp 3.5 N·m. Coat Anti-seize compound (P-37) thinly on portion of taper and thread when insert is fixed.

KCGT

Classification of usage		Non-ferrous metals		★	N				
★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice (In case hardness is 45HRC or under)									
Insert	Description	No. of edges	Dimension (mm)					Carbide	Applicable toolholder ➔ M186
			S	D1	RE	L	W1		
 Handed insert shows Right-hand Non-ferrous metals	KCGT 130504FR-AL	2	5.1	4.4	0.4	14.1	9.9	●	MEAS...
	130508FR-AL				0.8	13.9			
	130512FR-AL				1.2	13.8			
	130516FR-AL				1.6	13.3			
	130520FR-AL				2	13.3			
	130524FR-AL				2.4	13.3			
	130530FR-AL				3	13.3			
	130532FR-AL				3.2	12.8			
 Handed insert shows Right-hand Tough edge	KCGT 130504ER-AM	2	5.1	4.4	0.4	13.7	9.9	●	MEAS...
	130508ER-AM				0.8	13.7			
	130516ER-AM				1.6	13.3			
	130525ER-AM				2.5	13.3			
	130530ER-AM				3	13.3			
	130540ER-AM				4	12.8			

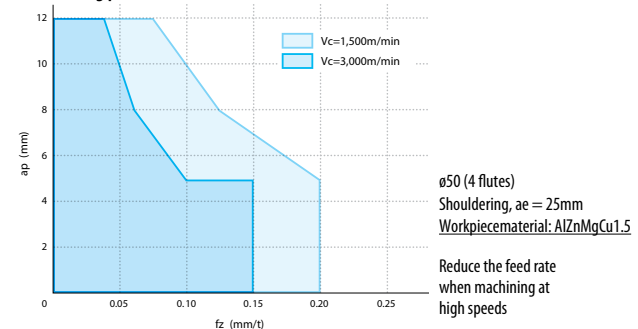
Recommended cutting conditions

Workpiece	Chipbreaker	Vc (m/min)	ae (mm)	fz (mm/t)		
				ap = 0.5 mm (Reference value)		
				Cutting Dia. ø28 or less	Cutting Dia. ø32 or more	
Aluminum alloys	Si Ratio 12.5% or less	AL	200~1,000~3,000	≤ 0.5DC	0.05~0.15~0.25	
			0.5DC <			
		AM	200~1,000~5,000	≤ 0.5DC	0.05~0.15~0.3	0.05~0.2~0.35
			0.5DC <	0.05~0.15~0.25	0.05~0.15~0.3	
	Si Ratio 12.5% and over	AL	200~300~400	≤ 0.5DC	0.05~0.1~0.2	
			0.5DC <			
		AM	200~300~800	≤ 0.5DC	0.05~0.15~0.3	0.05~0.2~0.35
			0.5DC <	0.05~0.15~0.25	0.05~0.15~0.3	

- Recommended cutting conditions are reference values. Please adjust cutting speed and feed rate according to actual machining conditions taking into account machine and workpiece rigidity
- Do not use the cutter at speeds exceeding the maximum cutting speed limit (See page M189)
- Regularly changing the insert clamp screw is recommended
- Use appropriate safety covers to protect from tool breakage and chip scattering
- When using at a higher revolution (10,000min⁻¹ or over), refer to the table below to adjust the balance of the MEAS and arbor

Revolution (min ⁻¹)	ISO balance quality grade | ISO 1940-1/8821 | (JIS B0905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5

MEAS Cutting performance



● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

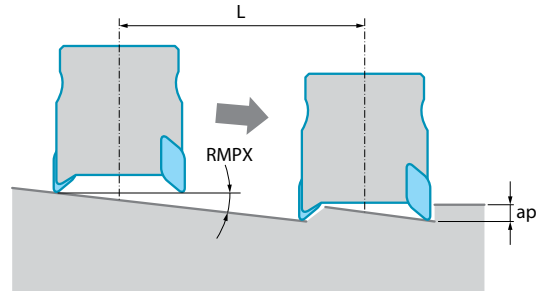


Reference data for ramping

Cutter dia. DC (mm)	25	28	32	35	40	50
Max. ramping angle RMPX	20°	16°	12.5°	11°	8.5°	6°
tan RMPX	0.363	0.287	0.221	0.194	0.149	0.105

Guide for ramping (Slant milling)

Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
Reduce recommended feed rate by 50%



Formula of the cutting length "L" at Max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$

Vertical milling (Plunging)

* For vertical milling (plunging), reduce feed rate to fz=0.1mm/t or less.

Insert description	Max. width of cut (ae)
KCGT13 type	8mm

M

Helical milling

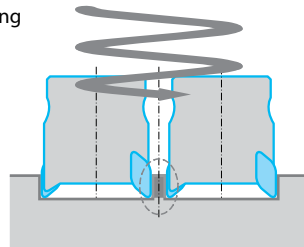
For helical milling, use between min. cutting dia. and max. cutting dia.



Milling

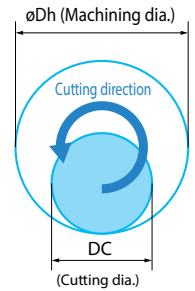
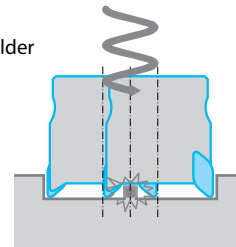
Over max. cutting dia.

Center core part remains after machining



Under min. cutting dia.

Center core part interferes with toolholder



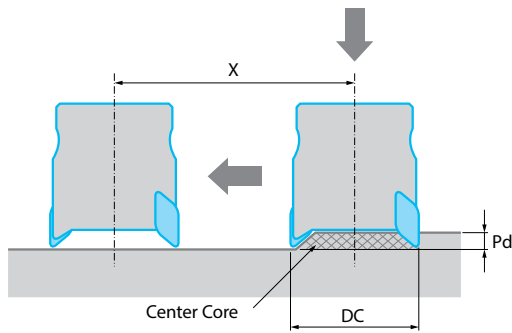
Description	Min. cutting dia.	Max. cutting dia.	Maximum ramping depth per cycle
MEAS...13...	2×DC-16	2×DC-3	3.5

Unit: mm

- Down-cut milling is recommended (refer to the figure above)
- Feed rate should be under 50% of the recommended cutting conditions
- Use caution to eliminate incidences caused by producing long chips

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

Guide for drilling



Drilling depth

Please refer to Pd (Max. drilling depth) in the chart.

Traversing after drilling

1. It is recommended to reduce feed by $f_z = 0.15$ (mm/t) or less until the center core is removed.
2. When drilling, reduce feed rate per revolution to $f = 0.1$ mm/rev or under.

Description	Max. Cutting depth Pd	Min. cutting length X for flat bottom surface
MEAS...-13-...	3.5	DC-16

Unit: mm

How to mount inserts

1. Be sure to remove dust and chips from the insert mounting pocket.
2. Insert screw
 - Coat anti-seize compound thinly on portion of taper and thread.
 - Attach screw to the magnetized wrench tip and tighten while gently pressing the outside edge of the insert toward the insert pocket surface (grooved surface) (see the picture on the right) (Recommended Torque 3.5N·m)

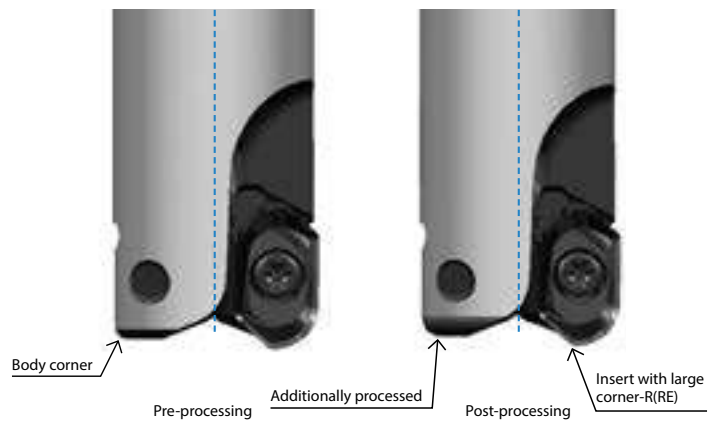


When using inserts with a corner-R(RE) of 3.2 or larger

When using inserts with corner-R(RE) 3.2 or larger, additional modifications of the cutter body will be necessary. Additional modifications for the body will be necessary. Ref. to the chart below for the recommended modifications. (If corner-R is 3.0 mm or smaller, additional modifications are not needed)

Insert Corner-R(RE) (mm)	Additional processing dimension to body corner (mm)
3.2	R2.0
4.0	R2.5
5.0	R3.0

* Round- shaped additional processing is recommended. When applying chamfer shaped additional processing, do not cut away too much.



Cautions

While in Use



Please use within recommended cutting conditions

Do not run the cutter at revolutions exceeding the printed maximum revolution limit of the cutter body

Do not use the end mill at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Please do not use under the following conditions :

- When cutter is not fully loaded with inserts
- If the body is damaged

Please wear protective equipment such as protective glove when changing inserts

Injury can occur when touching the cutting edge

Dynamic balance

Balance adjustment on the cutter is completed before shipping

Balance adjustment to be ISO balance quality grade (ISO 1940-1) G6.3

When using at a higher revolution (10,000min⁻¹ or over), refer to the table below to adjust the balance of MEAS and arbor

Do not operate the balance adjustment screw on the outer periphery of the cutter. This could lead to improper dynamic balance

Revolution (min ⁻¹)	ISO balance quality grade
	ISO 1940-1/8821 (JIS B0905)
~20,000	G16
~30,000	G6.3
30,000~	G2.5



High-precision cutter for finishing applications

MFF

Cutter body design provides excellent reliability
Molded wiper inserts increases machining efficiency

1 Our solution for finishing operations

Designed with a unique insert combination of semi-finishing and finishing, the MFF drastically improves productivity by reducing quality issues.



SOLUTION

- Increase feed to $f = 5.0$ mm/rev
- Achieved $0.8 \mu\text{m}$ Ra surface finish
- No grinding required
- Achieved $5 \mu\text{m}$ flatness

The above is the result of a field test. Actual results will depend on machining environment, workpiece rigidity, machine, etc.

M

Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

MFF Machining solutions

Can be used on a wide variety of parts and workpieces

Part name	Workpiece material	Industry
Plate / Frame / Case Cylinder pump / Rail Turbine housing Casing / Mold base	Rolled Steel for general structure / Gray cast iron / Spheroidal graphite cast iron Ni-resist cast iron Mold steel Carburized and hardened steel (60 HRC)	Industrial machining / Machine tools Shipbuilding / Automotive Construction machinery / Molds



2 Molded wiper insert for high-quality surface finish



Kyocera's unique molded insert technology realizes high feed rates and excellent surface finish

Low cutting force with special edge preparation

Micro-honing
Good sharpness

Wiper edge

Large S-curve shape developed for higher feed rates

Edge temperature simulation comparison (Internal evaluation)

MFF Conventional tool After 2 sec machining

MEGACOAT NANO Cermet **PV60M**

For high-speed machining
Recommended $V_c \sim 350$ m/min

High-quality surface finish

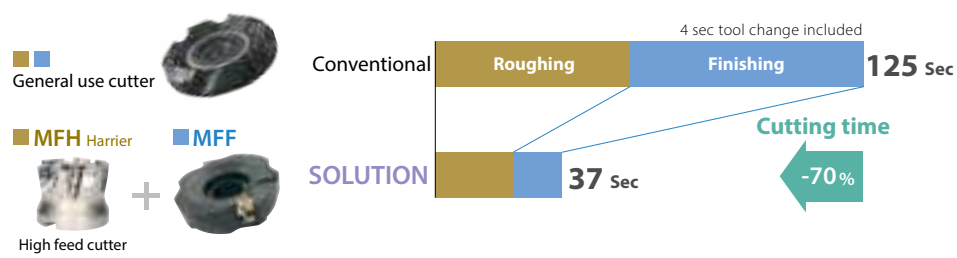
Molded **TT chipbreaker**

Reduces chip clogging
High feed machining

M
Milling

Comprehensive machining solutions From roughing to finishing machining improvements (Internal evaluation)

Combine with Kyocera's MFH high feed cutter to improve quality and efficiency



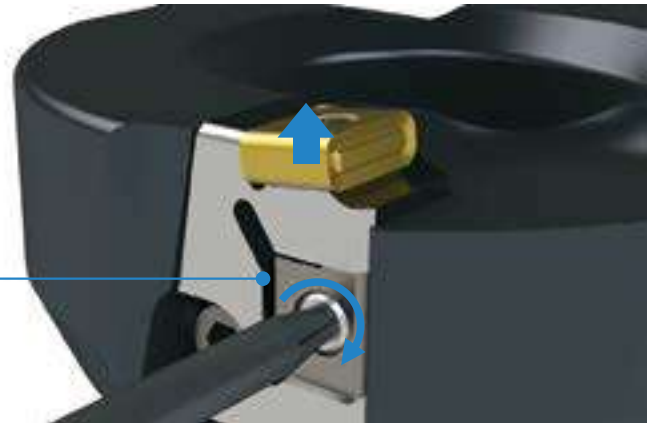
Cutting Conditions	
Conventional	ø200 (6 inserts)
V_c	200 m/min
Roughing	$V_f = 286$ mm/min ($f_z = 0.15$ mm/t), $a_p = 1.2$ mm
Finishing	$V_f = 230$ mm/min ($f_z = 0.12$ mm/t), $a_p = 0.3$ mm
SOLUTION	
Roughing	MFH Harrier ø63 (6 inserts)
V_c	200 m/min
Finishing	MFF ø200 (2 inserts)
V_f	7,300 mm/min ($f_z = 1.2$ mm/t), $a_p = 0.7$ mm
V_c	300 m/min
Finishing	$V_f = 2,400$ mm/min ($f = 5.0$ mm/rev), $a_p = 0.1$ mm

Surface finish quality after machining



3 Adjustable cutting edge for increased usability

Cartridge height comes pre-adjusted and should not be necessary.
Adjustment is not required after replacing insert.



Included adjustment wrench

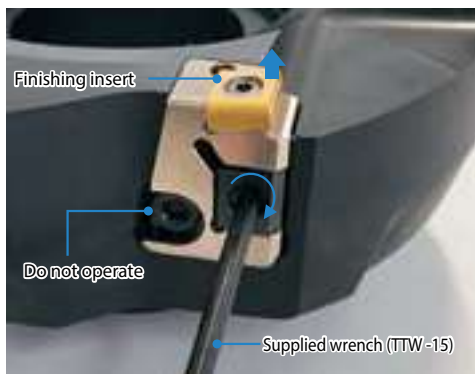
Easy-to-adjust cutting edge

Cutting edge height can be adjusted easily with one screw

Edge adjustment

If D.O.C. is ap 0.1 ~ 0.2 mm, no adjustment is necessary (Pre-adjusted before holder is shipped).
Cutting edge adjustment is NOT required when replacing inserts.

If D.O.C. is less than 0.1 mm or if you prefer a different edge height, use the following method:



Adjusting the cutting edge

Use the supplied TTW-15 wrench to rotate the screw and easily adjust the cutting edge position.

Procedure

To adjust, start with the screw turned counterclockwise about two rotations (lowering the cutting edge).
Tighten the screw clockwise (raising the cutting edge) to adjust the amount of protrusion.
*Use a dial gauge to measure protrusion amount.

Precautions

Make sure to lower the cutting edge below the desired height first (turning screw counterclockwise) and then raise the edge up to the final height (turning screw clockwise).
If cutting edge is simply lowered to the final edge height, chattering or loosening of the screw may occur due to backlash.
Make sure the measurement position of the cutting edge is the same machining diameter.

Standard Cutting Edge Height


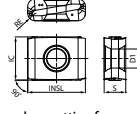

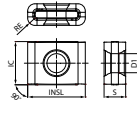
ap = 0.05 mm → protrusion against rough edge : 0.03 mm
ap = 0.10 mm ~ → protrusion against rough edge : 0.06 mm *Pre-adjusted before shipment

M

Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

LNGX

Insert	Description	No. of edges	Dimension (mm)					Cermat		Carbide		Applicable toolholder ● M193 M38
			IC	S	D1	RE	INSL	PVD	PVD			
								PV60M	PRT1525 PRT1825			
  Low cutting force	LNGX 120916R-TT	4	9.525	4.76	4.2	1.6	12.7	MT0	MT0	MT0	MFF...-SF MFSE45...-W MFSE45...-W-M	
 	LNGX 120916	4	9.525	4.76	4.2	1.6	12.7	MT0	MT0	MT0	MFF...-SF MFSE45...-W MFSE45...-W-M	

Recommended cutting conditions ● M195



Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability MT0 : Made to order

M194

Recommended cutting conditions

Chipbreaker	Workpiece material	f (mm/rev)	ap (mm)	Recommended insert grades (Vc : m/min)	
				PV60M	PR1825 (PR1525)
TT	Structural steel	1.5 – 4.0 – 5.0	0.03 – 0.1 – 0.3	★ 230 – 280 – 350	☆ 230 – 280 – 350
	Carbon steel	1.0 – 4.0 – 5.0		★ 200 – 250 – 350	☆ 200 – 250 – 350
	Alloy steel	1.0 – 4.0 – 5.0		★ 200 – 250 – 350	☆ 200 – 250 – 350
	Mold steel	1.0 – 2.0 – 4.0	0.03 – 0.1 – 0.2	☆ 120 – 200 – 250	★ 120 – 200 – 250
	Mold steel (50HRC ~)	0.6 – 1.0 – 1.2	0.03 – 0.05 – 0.1	-	★ 50 – 70 – 80
	Stainless steel (Austenitic related)*	1.0 – 2.0 – 4.0	0.03 – 0.1 – 0.2	☆ 120 – 200 – 250	★ 120 – 200 – 250
	Stainless steel (Martensitic related)*	1.0 – 3.0 – 4.0		☆ 150 – 200 – 300	★ 150 – 200 – 300
Standard	Gray cast iron	1.0 – 2.0 – 4.0	0.03 – 0.1 – 0.3	☆ 200 – 250 – 350	★ 200 – 250 – 350
	Nodular cast iron	1.5 – 2.0 – 4.0		☆ 150 – 250 – 300	★ 150 – 250 – 300

★: 1st Recommendation ☆: 2nd Recommendation

*Machining with coolant is recommended for stainless steel

The bold-faced number indicates a center value of recommended cutting condition.

Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

M



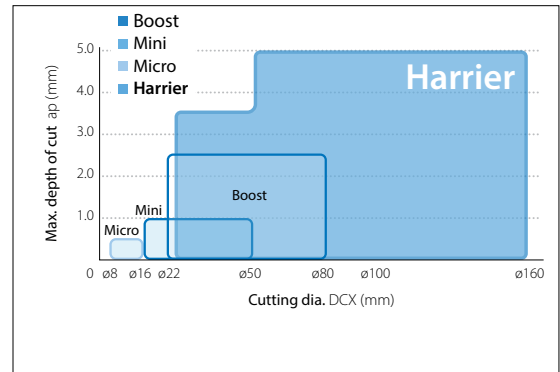
Milling

MFH Harrier

Anti chattering

Applicable to various applications with 4 types of inserts

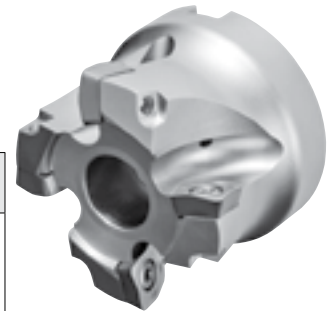
Increased chip evacuation and shortened cutting time



1 Large chipbreaker lineup for various machining applications

4 types of inserts according to your application

	GM type (General purpose)	GH type (Tough edge)	LD type (Large D.O.C.)	FL type (Low cutting force)
Shape				
Applications	1st recommendation for general purpose → Facing, Pocketing, Helical milling	Excellent fracture resistance → Available for facing, ramping and helical milling	Max. ap=5 mm → Applicable for scale removal at high efficiency	Wiper edge with low cutting force → Applicable for both roughing and finishing, for small machining center



M



Milling

2 3D convex cutting edge reduces shock of biting workpiece

Cutting force (Shock) comparison when biting workpiece (Internal evaluation)

Cutting with the ae that receives the maximum impact

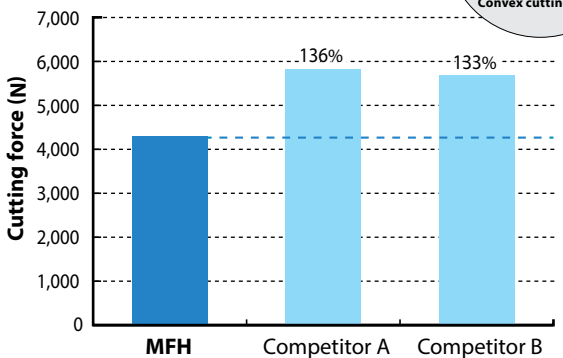
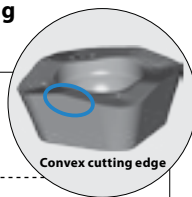
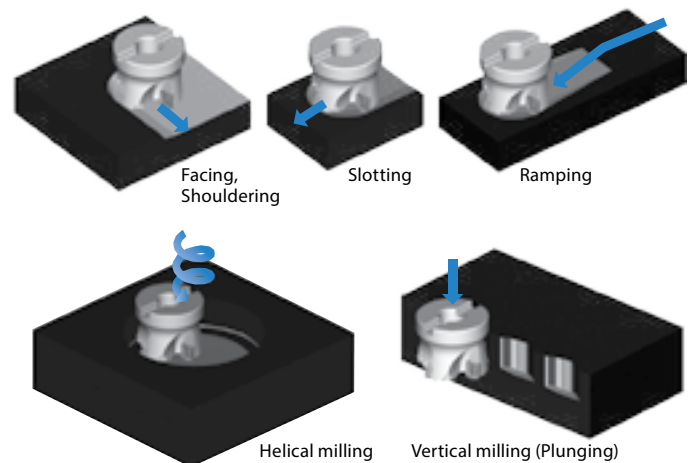


Chart shows resultant cutting force
Vc=150m/min, ap xae=1.5 x31.5mm, fz=1.5mm/t
C50, Dry, Cutter dia. ø63



3 Multi-functional cutter



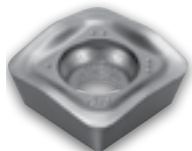
* GM type is applicable for all the above applications
* LD type and FL type are not applicable for helical milling, Plunging and contouring of rising wall (Please refer to M206, M207)

4 Applicable for variety of workpieces from steel to heat-resistant alloys



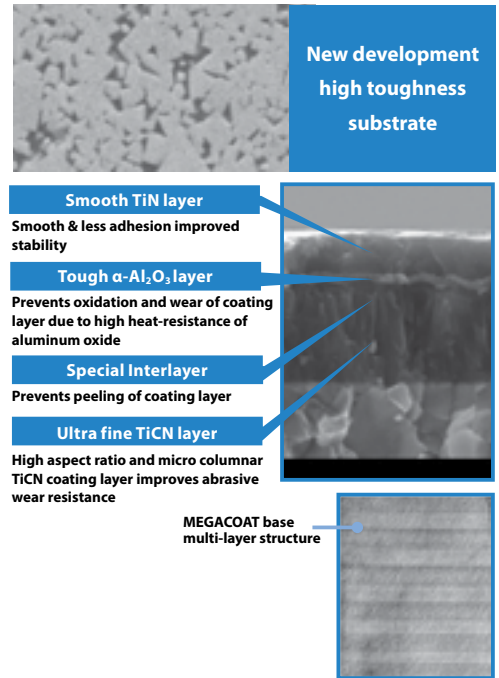
CA6535

For Martensitic stainless steel and Ni-base heat-resistant alloys high heat resistance and wear resistance with CVD coating
Improved stability due to thin layer coating technology



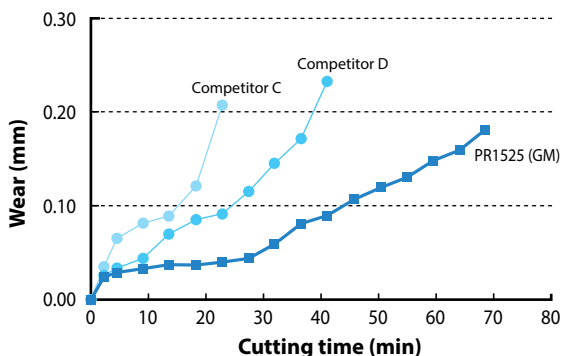
PR1835

For Ni-base heat-resistant alloys, titanium alloys and precipitation hardened stainless steel
Stable and longer tool life by special nano coating layer MEGACOAT NANO EX



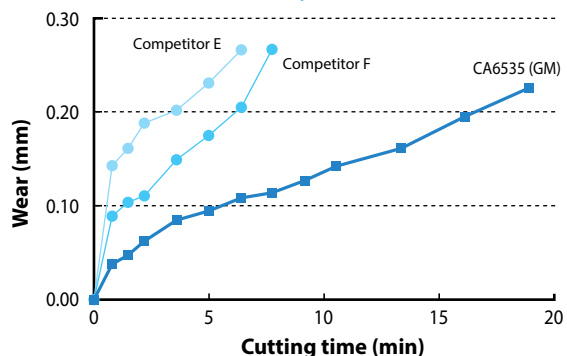
Wear resistance comparison (Internal evaluation)

X153CrMoV12



<Cutting conditions> Vc=150m/min, apxae=1.0x16mm, fz=1.5mm/t, Dry

Ni-base heat-resistant alloys



<Cutting conditions> Vc=30m/min, apxae=1.0x40mm, fz=0.8mm/t, Wet

Case studies

SFVAF22B (Forged alloy steel)

Machined portion

Machining efficiency 3 times increase

- Turbine parts • Vc=160m/min • apxae=1.5xmax.160mm
- fz=1.17mm/t • Dry
- MFH160R-14-8T (8 Flutes) • SOMT140520ER-GM (PR1525)

PR1525	Chip evacuation rate = 720cc/min
Competitor G	Chip evacuation rate = 240cc/min

- Small machining noise even at 3 times higher feed rate
- Good edge condition without chipping and stable machining

(User evaluation)

X5CrNi18 10

Chattering reduced
Machining efficiency 1.6 times

- Clutch • Vc=120m/min • apxae=1.0x20mm
- fz=1.2mm/t • Dry
- MFH32-S32-10-2T (2 Flutes) • SOMT100420ER-GM (PR1535)

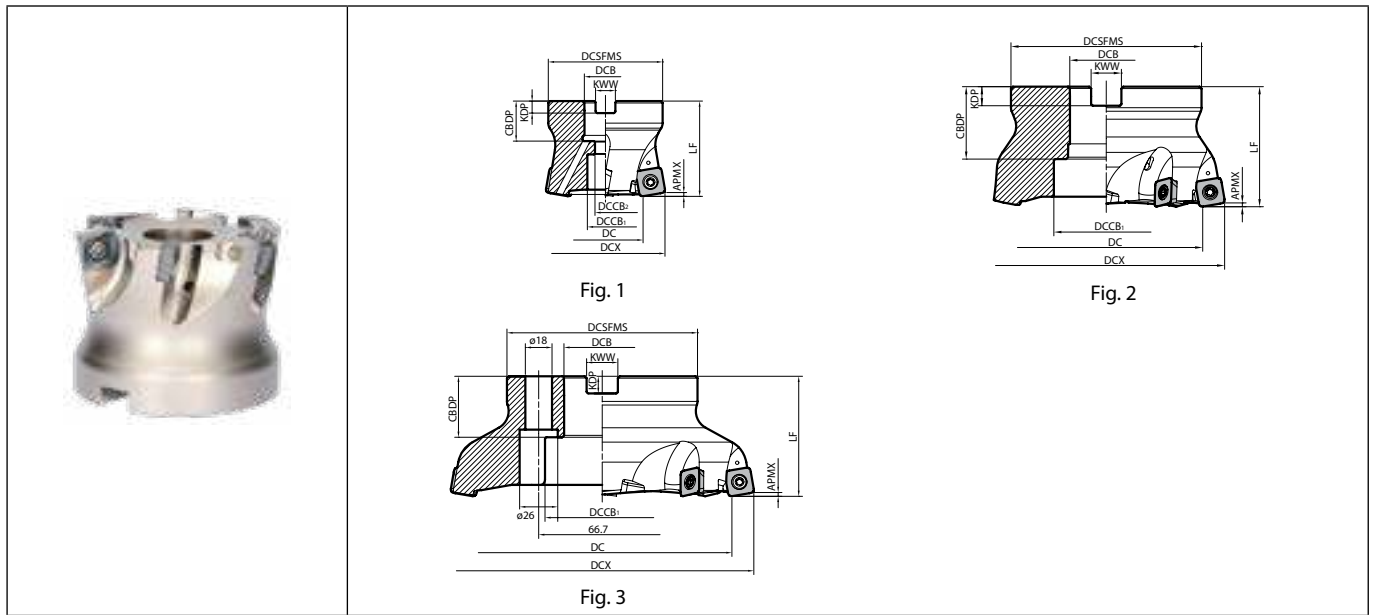
PR1535	Chip evacuation rate = 58cc/min
Competitor H	Chip evacuation rate = 36cc/min

- Competitor H caused chattering but MFH realized stable machining
- Good edge condition and long tool life

(User evaluation)



MFH Harrier



Toolholder dimensions

Description	Availability		Dimension (mm)													A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M203			
	R	Inserts	DCX	DC (GM/GH)	DC (LD)	DC (FL)	DCSFMS	DCB	DCB ₁	DCB ₂	LF	CDBP	KDP	KWW	APMX							APMX ₂		
																							DC	DC
Metric MFH 050R-10-4T-M 050R-10-5T-M 052R-10-4T-M 052R-10-5T-M 063R-10-5T-22M 063R-10-5T-27M 063R-10-6T-22M 063R-10-6T-27M 080R-10-7T-M	●	4	50	33	37.5	36.5	47	22	19	11	50	21	6.3	10.4	1.5 (3.5)	1.2	+10	Yes	10000	0.4	1	SOMT1004...		
	●	5	52	35	39.5	38.5																	27	20	13	24	7	12.4
	●	4	52	35	39.5	38.5	60	22	19	11	50	21	6.3	10.4	1.5 (3.5)	1.2	+10	Yes	8800	0.7	1			
	●	5	63	46	50.5	49.5																	27	20	13	24	7	12.4
	●	6	63	46	50.5	49.5	60	22	19	11	50	19	6.3	10.4	1.5 (3.5)	1.2	+10	Yes	8800	0.7	1			
	●	7	80	63	67.5	66.5	76	27	20	13	63	24	7	12.4	1.5 (3.5)	1.2	+10	Yes	7600	1.6	1			
	Bore dia. inch spec MFH 050R-10-4T 050R-10-5T 063R-10-5T 063R-10-6T 080R-10-7T	□	4	50	33	37.5	36.5	47	22.225	19	11	50	19	5	8.4	1.5 (3.5)	1.2	+10	Yes	10000	0.4		1	SOMT1004...
		□	5	63	46	50.5	49.5	60	22.225	19	11	50	19	5	8.4	1.5 (3.5)	1.2	+10	Yes	8800	0.7		1	
□		6	63	46	50.5	49.5	60	22.225	19	11	50	19	5	8.4	1.5 (3.5)	1.2	+10	Yes	8800	0.7	1			
□		7	80	63	67.5	66.5	76	31.75	26	17	63	32	8	12.7	1.5 (3.5)	1.2	+10	Yes	7600	1.3	1			
□		7	80	63	67.5	66.5	76	31.75	26	17	63	32	8	12.7	1.5 (3.5)	1.2	+10	Yes	7600	1.3	1			

For APMX₂, refer to the figure in M199

The values (APMX = 3.5) and (APMX₂ = 1.2) are valid in case of LD-Type usage.

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M198

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

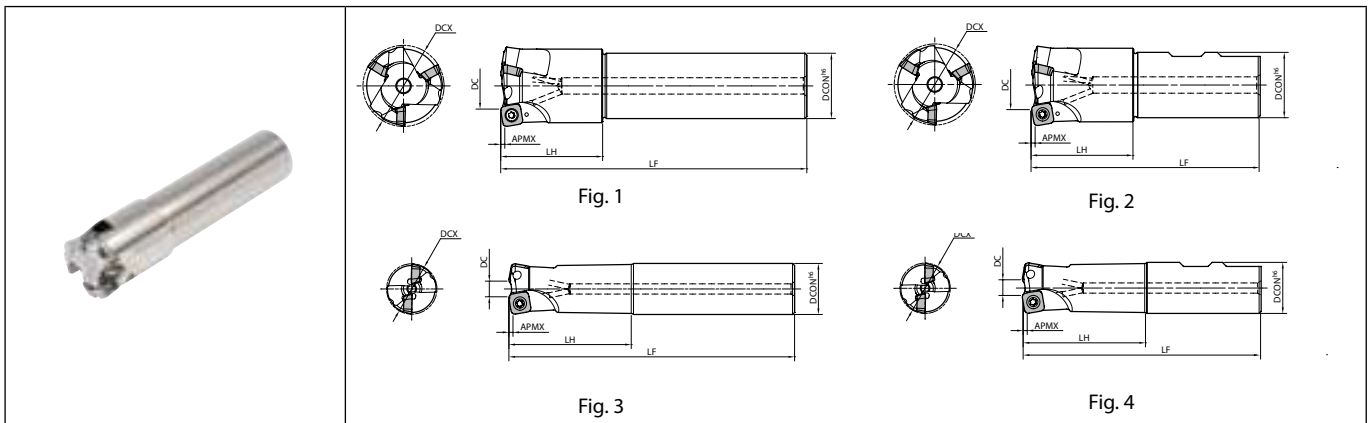
Multi-Function

Slot Mill

Ball-nose Radius

Others

MFH Harrier



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)								A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts M203	
			DCX	DCON	DC (GM/GH)	DC (LD)	DC (FL)	LF	LH	APMX						APMX ₂	Anti-seize compound	Screw		Wrench
Cylindrical MFH 25-S25-10-2T 28-S25-10-2T 32-S32-10-2T 32-S32-10-3T 35-S32-10-2T 35-S32-10-3T 40-S32-10-3T 40-S32-10-4T	●	2	25	25	8	12.5	11.5	140	60			17000	0.4	3	P-37 SB-4075TRP DTPM-15 Recommended tightening torque for insert clamp 3.5N·m	SOMT1004...				
	●	2	28	25	11	15.5	14.5	140	40			15500	0.5	1						
	●	3	32		15	19.5	18.5		70	1.5	1.2	+10	Yes	14000			0.8	3		
	●	3	32		15	19.5	18.5		70	1.5	1.2	+10	Yes	14000			0.8	3		
	●	2	35	32	18	22.5	21.5	150	50	1.5	1.2	+10	Yes	13000			1	1		
	●	3	35	32	18	22.5	21.5	150	50	1.5	1.2	+10	Yes	13000			1	1		
	●	4	40		23	27.5	26.5			1.5	1.2	+10	Yes	11500			0.9	1		
	●	4	40		23	27.5	26.5			1.5	1.2	+10	Yes	11500			0.9	1		
Weldon MFH 25-W25-10-2T 32-W32-10-3T 40-W32-10-3T 40-W32-10-4T	●	2	25	25	8	12.5	11.5	117	60	1.5	1.2	+10	Yes	17000	0.4	4	P-37 SB-4075TRP DTPM-15 Recommended tightening torque for insert clamp 3.5N·m	SOMT1004...		
	●	3	32		15	19.5	18.5	131	70	1.5	1.2	+10	Yes	14000	0.7	2				
	●	4	40	32	23	27.5	26.5	112	50	1.5	1.2	+10	Yes	11500	0.7	2				
	●	4	40		23	27.5	26.5	112	50	1.5	1.2	+10	Yes	11500	0.7	2				
Long Shank MFH 25-S25-10-2T-200 28-S25-10-2T-200 32-S32-10-2T-200 35-S32-10-2T-200 40-S32-10-4T-250	●	2	25	25	8	12.5	11.5		120	1.5	1.2	+10	Yes	17000	0.6	3	P-37 SB-4075TRP DTPM-15 Recommended tightening torque for insert clamp 3.5N·m	SOMT1004...		
	●	2	28	25	11	15.5	14.5		40	1.5	1.2	+10	Yes	15500	0.7	1				
	●	3	32		15	19.5	18.5		200	1.5	1.2	+10	Yes	14000	1	3				
	●	4	40	32	23	27.5	26.5	250	50	1.5	1.2	+10	Yes	11500	1.5	1				
Extra Long Shank MFH 25-S25-10-2T-300 28-S25-10-2T-300 32-S32-10-2T-300 35-S32-10-2T-300 40-S32-10-4T-300	●	2	25	25	8	12.5	11.5		180	1.5	1.2	+10	Yes	17000	1	3	P-37 SB-4075TRP DTPM-15 Recommended tightening torque for insert clamp 3.5N·m	SOMT1004...		
	●	2	28	25	11	15.5	14.5		40	1.5	1.2	+10	Yes	15500	1.1	1				
	●	3	32		15	19.5	18.5		300	1.5	1.2	+10	Yes	14000	1.6	3				
	●	4	40	32	23	27.5	26.5		180	1.5	1.2	+10	Yes	11500	1.8	1				

For APMX₂, refer to the figure in M199

The values (APMX = 3.5) and (APMX₂ = 1.2) are valid in case of LD-Type usage.

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M200

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter


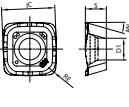

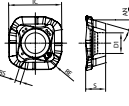

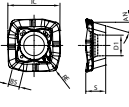

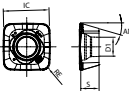
Multi-Function

Slot Mill

Ball-nose Radius

Others

SOMT

Insert		Description	No. of edges	Dimension (mm)					Angle (°)	Carbide						Applicable toolholder M198~M202		
				IC	S	D1	RE	BS		AN	PVD							
											CVD	PR0155	PR1510	PR1525	PR1535		PR1810	PR1825	PR1835
  General purpose		SOMT 100420ER-GM	4	10.3	4.58	4.6	2	-	16	●	●	●	●	●	●	●	●	MFH...-10-..
		SOMT 140520ER-GM	4	14.14	5.56	5.8	2	-	16	●	●	●	●	●	●	●	●	MFH...-14-..
  Large D.O.C.		SOMT 100420ER-LD	4	10.45	4.58	4.6	2	0.9	16	●	●	●	●	●	●	●	MFH...-10-..	
		SOMT 140520ER-LD	4	14.76	5.56	5.8	2	1.6	16	●	●	●	●	●	●	●	●	MFH...-14-..
  With wiper edge		SOMT 100420ER-FL	4	10.44	4.58	4.6	2	1.4	16	●	●	●	●	●	●	●	MFH...-10-..	
		SOMT 140514ER-FL	4	14.57	5.56	5.8	1.4	3.1	16	●	●	●	●	●	●	●	●	MFH...-14-..
  Tough edge		SOMT 100420ER-GH	4	10.43	4.57	4.55	2	-	16	●	●	●	●	●	●	●	MFH...-10-..	
		SOMT 140520ER-GH	4	14.17	5.56	5.8	2	-	16	●	●	●	●	●	●	●	●	MFH...-14-..

Handed insert shows Right-hand

Recommended cutting conditions M204, M205

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Recommended cutting conditions

Insert type	Workpiece material	Toolholder description and feed rate (fz: mm/t)			Recommended insert grades (Vc: m/min)					
		MFH25-...	MFH32-...	MFH40-...	MEGACOAT NANO EX (MEGACOAT NANO)			MEGACOAT HARD PR015S	CVD Coated carbide CA6535	
					PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)			
GM GH	Carbon steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	-	120~ ★ 180~250	120~ ☆ 180~250	-	-	
	Alloy steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	-	★ 100~ 160 ~220	☆ 100~ 160 ~220	-	-	
	Mold steel (~40HRC)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	☆ 80~ 140 ~180	☆ 80~ 140 ~180	GH ★ 80~ 140 ~180	-	
	Mold steel (40~50HRC)	0.15~ 0.3 ~0.5(ap≤1.0mm) 0.15~ 0.2 ~0.25(ap≤1.5mm)	0.2~ 0.5 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.45(ap≤1.5mm)	0.2~ 0.6 ~0.9(ap≤1.0mm) 0.2~ 0.5 ~0.7(ap≤1.5mm)	-	☆ 60~ 100 ~130	-	GH ★ 60~ 100 ~130	-	
	Mold steel (50~55HRC)	0.15~ 0.25 ~0.4(ap≤1.0mm)	0.15~ 0.35 ~0.6(ap≤1.0mm)	0.15~ 0.4 ~0.7(ap≤1.0mm)	-	☆ 50~ 70 ~100	-	GH ★ 50~ 70 ~100	-	
	Mold steel (55~60HRC)	0.03~ 0.06 ~0.1(ap≤1.0mm) Recommended only for GH chipbreaker			-	-	-	GH ☆ 50~ 60 ~70	-	
	Stainless steel (Austenitic related)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	GM ☆ 100~ 160 ~200	GM ☆ 100~ 160 ~200	-	-	
	Stainless steel (Martensitic related)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	-	☆ 150~ 200 ~250	-	★ 180~ 240 ~300	
	Stainless steel (Precipitation hardening)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	-	★ 90~ 120 ~150	-	-	
	Gray cast iron	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	★ 120~ 180 ~250	-	-	-	-	
	Nodular cast iron	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	★ 100~ 150 ~200	-	-	-	-	
	Ni-base heat-resistant alloys	0.2~ 0.4 ~0.6(ap≤1.0mm) 0.15~ 0.2 ~0.3(ap≤1.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.2~ 0.4 ~0.6(ap≤1.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.2~ 0.5 ~0.8(ap≤1.5mm)	-	-	☆ 20~ 30 ~50	-	★ 20~ 30 ~50	
	Titanium alloys	0.2~ 0.4 ~0.6(ap≤1.0mm) 0.15~ 0.2 ~0.3(ap≤1.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.2~ 0.4 ~0.6(ap≤1.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.2~ 0.5 ~0.8(ap≤1.5mm)	GM ☆ 30~ 50 ~70	-	GM ★ 40~ 60 ~80	-	-	
	LD	Carbon steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.06~ 0.15 ~0.3(ap≤3.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.06~ 0.2 ~0.3(ap≤3.5mm)	-	120~ ★ 180~250	120~ ☆ 180~250	-	-
Alloy steel		0.5~ 0.8 ~1.0(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.06~ 0.15 ~0.3(ap≤3.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.06~ 0.2 ~0.3(ap≤3.5mm)	-	★ 100~ 160 ~220	☆ 100~ 160 ~220	-	-	
Mold steel (~40HRC)		0.5~ 0.7 ~0.8(ap≤1.0mm) 0.06~ 0.08 ~0.15(ap≤3.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	-	★ 80~ 140 ~180	☆ 80~ 140 ~180	-	-	
Mold steel (40~50HRC)		0.2~ 0.3 ~0.5(ap≤1.0mm) 0.03~ 0.05 ~0.1(ap≤3.5mm)	0.2~ 0.5 ~0.8(ap≤1.0mm) 0.03~ 0.08 ~0.15(ap≤3.5mm)	0.2~ 0.6 ~0.9(ap≤1.0mm) 0.03~ 0.1 ~0.15(ap≤3.5mm)	-	★ 60~ 100 ~130	☆ 60~ 100 ~130	-	-	
Stainless steel (Austenitic related)		0.5~ 0.7 ~0.8(ap≤1.0mm) 0.06~ 0.08 ~0.15(ap≤3.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	-	☆ 100~ 160 ~200	★ 100~ 160 ~200	-	-	
Stainless steel (Martensitic related)		0.5~ 0.7 ~0.8(ap≤1.0mm) 0.06~ 0.08 ~0.15(ap≤3.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	-	-	☆ 150~ 200 ~250	-	★ 180~ 240 ~300	
Stainless steel (Precipitation hardening)		0.5~ 0.7 ~0.8(ap≤1.0mm) 0.06~ 0.08 ~0.15(ap≤3.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	-	-	★ 90~ 120 ~150	-	-	
Gray cast iron		0.5~ 0.8 ~1.0(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.06~ 0.15 ~0.3(ap≤3.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.06~ 0.2 ~0.3(ap≤3.5mm)	★ 120~ 180 ~250	-	-	-	-	
Nodular cast iron		0.5~ 0.7 ~0.8(ap≤1.0mm) 0.06~ 0.08 ~0.15(ap≤3.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.06~ 0.1 ~0.2(ap≤3.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.06~ 0.15 ~0.2(ap≤3.5mm)	★ 100~ 150 ~200	-	-	-	-	
Ni-base heat-resistant alloys		0.2~ 0.4 ~0.6(ap≤1.0mm) 0.03~ 0.05 ~0.1(ap≤3.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.03~ 0.08 ~0.15(ap≤3.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.03~ 0.1 ~0.15(ap≤3.5mm)	-	-	☆ 20~ 30 ~50	-	★ 20~ 30 ~50	
Titanium alloys		0.2~ 0.4 ~0.6(ap≤1.0mm) 0.03~ 0.05 ~0.1(ap≤3.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.03~ 0.08 ~0.15(ap≤3.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.03~ 0.1 ~0.15(ap≤3.5mm)	☆ 30~ 50 ~70	-	★ 40~ 60 ~80	-	-	
FL		Carbon steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	-	120~ ★ 180~250	120~ ☆ 180~250	-	-
		Alloy steel	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	-	★ 100~ 160 ~220	☆ 100~ 160 ~220	-	-
		Mold steel (~40HRC)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	★ 80~ 140 ~180	☆ 80~ 140 ~180	-	-
	Mold steel (40~50HRC)	0.15~ 0.3 ~0.5(ap≤1.0mm) 0.15~ 0.2 ~0.25(ap≤1.5mm)	0.2~ 0.5 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.45(ap≤1.5mm)	0.2~ 0.6 ~0.9(ap≤1.0mm) 0.2~ 0.5 ~0.7(ap≤1.5mm)	-	★ 60~ 100 ~130	☆ 60~ 100 ~130	-	-	
	Stainless steel (Austenitic related)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	☆ 100~ 160 ~200	★ 100~ 160 ~200	-	-	
	Stainless steel (Martensitic related)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	-	☆ 150~ 200 ~250	-	★ 180~ 240 ~300	
	Stainless steel (Precipitation hardening)	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	-	-	★ 90~ 120 ~150	-	-	
	Gray cast iron	0.5~ 0.8 ~1.0(ap≤1.0mm) 0.2~ 0.4 ~0.5(ap≤1.5mm)	0.5~ 1.0 ~1.5(ap≤1.0mm) 0.3~ 0.7 ~1.0(ap≤1.5mm)	0.5~ 1.2 ~1.8(ap≤1.0mm) 0.4~ 1.0 ~1.5(ap≤1.5mm)	★ 120~ 180 ~250	-	-	-	-	
	Nodular cast iron	0.5~ 0.7 ~0.8(ap≤1.0mm) 0.2~ 0.3 ~0.4(ap≤1.5mm)	0.5~ 0.8 ~1.2(ap≤1.0mm) 0.3~ 0.6 ~0.8(ap≤1.5mm)	0.5~ 1.0 ~1.6(ap≤1.0mm) 0.4~ 0.8 ~1.2(ap≤1.5mm)	★ 100~ 150 ~200	-	-	-	-	
	Ni-base heat-resistant alloys	0.2~ 0.4 ~0.6(ap≤1.0mm) 0.15~ 0.2 ~0.3(ap≤1.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.2~ 0.4 ~0.6(ap≤1.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.2~ 0.5 ~0.8(ap≤1.5mm)	-	-	☆ 20~ 30 ~50	-	★ 20~ 30 ~50	
	Titanium alloys	0.2~ 0.4 ~0.6(ap≤1.0mm) 0.15~ 0.2 ~0.3(ap≤1.5mm)	0.2~ 0.5 ~0.9(ap≤1.0mm) 0.2~ 0.4 ~0.6(ap≤1.5mm)	0.2~ 0.6 ~1.0(ap≤1.0mm) 0.2~ 0.5 ~0.8(ap≤1.5mm)	☆ 30~ 50 ~70	-	★ 40~ 60 ~80	-	-	

★: 1st Recommendation ☆: 2nd Recommendation

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

* The bold-faced number indicates a center value of recommended cutting condition.

Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

* When finishing with LD type and FL type inserts, recommended feed rate for SOMET14 LD type: f=1.5(mm/rev) or less/for SOMET10 LD type: f=0.9(mm/rev) or less for SOMET14 FL type: f=3.0(mm/rev) or less/for SOMET10 FL type: f=1.4(mm/rev) or less

* For machining center equivalent to BT30, reduce feed rate to 25% or less of the recommended condition.

* For slotting, internal coolant is recommended.



Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

Recommended cutting conditions

Insert type	Workpiece material	Toolholder description and feed rate (fz: mm/t)		Recommended insert grades (Vc: m/min)				
		MFH...R-10-...	MFH...R-14-...	MEGACOAT NANO EX (MEGACOAT NANO)			MEGACOAT HARD	CVD Coated carbide
				PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	PR0155	CA6535
GM GH	Carbon steel	0.5~1.5~2.0		-	★ 120~180~250	☆ 120~180~250	-	-
	Alloy steel	0.5~1.5~2.0		-	★ 100~160~220	☆ 100~160~220	-	-
	Mold steel (~ 40HRC)	0.5~1.2~1.8		-	☆ 80~140~180	☆ 80~140~180	GH★ 80~140~180	-
	Mold steel (40 ~ 50HRC)	0.2~0.7~1.0		-	☆ 60~100~130	-	GH★ 60~100~130	-
	Mold steel (50 ~ 55HRC)	0.2~0.5~0.8		-	☆ 50~70~100	-	GH★ 50~70~100	-
	Mold steel (55 ~ 60HRC)	0.03~0.06~0.1(ap≤1.0mm) Recommended only for GH chipbreaker		-	-	-	GH☆ 50~60~70	-
	Stainless steel (Austenitic related)	0.5~1.2~1.8		-	GM☆ 100~160~200	GM☆ 100~160~200	-	-
	Stainless steel (Martensitic related)	0.5~1.2~1.8		-	-	☆ 150~200~250	-	★ 180~240~300
	Stainless steel (Precipitation hardening)	0.5~1.2~1.8		-	-	★ 90~120~150	-	-
	Gray cast iron	0.5~1.5~2.0		★ 120~180~250	-	-	-	-
	Nodular cast iron	0.5~1.2~1.8		★ 100~150~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~0.8~1.2		-	-	☆ 20~30~50	-	★ 20~30~50
	Titanium alloys	0.2~0.8~1.2		GM☆ 30~50~70	-	GM★ 40~60~80	-	-
LD	Carbon steel	0.5~1.5~2.0(ap≤1.0mm) 0.06~0.2~0.3(ap≤3.5mm)	0.5~1.5~2.0(ap≤2.0mm) 0.06~0.2~0.4(ap≤5.0mm)	-	★ 120~180~250	☆ 120~180~250	-	-
	Alloy steel	0.5~1.5~2.0(ap≤1.0mm) 0.06~0.2~0.3(ap≤3.5mm)	0.5~1.5~2.0(ap≤2.0mm) 0.06~0.2~0.4(ap≤5.0mm)	-	★ 100~160~220	☆ 100~160~220	-	-
	Mold steel (~ 40HRC)	0.5~1.2~1.8(ap≤1.0mm) 0.06~0.15~0.2(ap≤3.5mm)	0.5~1.2~1.8(ap≤2.0mm) 0.06~0.15~0.3(ap≤5.0mm)	-	★ 80~140~180	☆ 80~140~180	-	-
	Mold steel (40 ~ 50HRC)	0.2~0.7~1.0(ap≤1.0mm) 0.03~0.1~0.15(ap≤3.5mm)	0.2~0.7~1.0(ap≤2.0mm) 0.03~0.1~0.2(ap≤5.0mm)	-	★ 60~100~130	☆ 60~100~130	-	-
	Stainless steel (Austenitic related)	0.5~1.2~1.8(ap≤1.0mm) 0.06~0.15~0.2(ap≤3.5mm)	0.5~1.2~1.8(ap≤2.0mm) 0.06~0.15~0.3(ap≤5.0mm)	-	★ 100~160~200	★ 100~160~200	-	-
	Stainless steel (Martensitic related)	0.5~1.2~1.8(ap≤1.0mm) 0.06~0.15~0.2(ap≤3.5mm)	0.5~1.2~1.8(ap≤2.0mm) 0.06~0.15~0.3(ap≤5.0mm)	-	-	☆ 150~200~250	-	★ 180~240~300
	Stainless steel (Precipitation hardening)	0.5~1.2~1.8(ap≤1.0mm) 0.06~0.15~0.2(ap≤3.5mm)	0.5~1.2~1.8(ap≤2.0mm) 0.06~0.15~0.3(ap≤5.0mm)	-	-	★ 90~120~150	-	-
	Gray cast iron	0.5~1.5~2.0(ap≤1.0mm) 0.06~0.2~0.3(ap≤3.5mm)	0.5~1.5~2.0(ap≤2.0mm) 0.06~0.2~0.4(ap≤5.0mm)	★ 120~180~250	-	-	-	-
	Nodular cast iron	0.5~1.2~1.8(ap≤1.0mm) 0.06~0.15~0.2(ap≤3.5mm)	0.5~1.2~1.8(ap≤2.0mm) 0.06~0.15~0.3(ap≤5.0mm)	★ 100~150~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~0.8~1.2(ap≤1.0mm) 0.03~0.1~0.15(ap≤3.5mm)	0.2~0.8~1.2(ap≤2.0mm) 0.03~0.1~0.2(ap≤5.0mm)	-	-	☆ 20~30~50	-	★ 20~30~50
Titanium alloys	0.2~0.8~1.2(ap≤1.0mm) 0.03~0.1~0.15(ap≤3.5mm)	0.2~0.8~1.2(ap≤2.0mm) 0.03~0.1~0.2(ap≤5.0mm)	☆ 30~50~70	-	★ 40~60~80	-	-	
FL	Carbon steel	0.5~1.5~2.0		-	★ 120~180~250	☆ 120~180~250	-	-
	Alloy steel	0.5~1.5~2.0		-	★ 100~160~220	☆ 100~160~220	-	-
	Mold steel (~ 40HRC)	0.5~1.2~1.8		-	★ 80~140~180	☆ 80~140~180	-	-
	Mold steel (40 ~ 50HRC)	0.2~0.7~1.0		-	★ 60~100~130	☆ 60~100~130	-	-
	Stainless steel (Austenitic related)	0.5~1.2~1.8		-	☆ 100~160~200	★ 100~160~200	-	-
	Stainless steel (Martensitic related)	0.5~1.2~1.8		-	-	☆ 150~200~250	-	★ 180~240~300
	Stainless steel (Precipitation hardening)	0.5~1.2~1.8		-	-	★ 90~120~150	-	-
	Gray cast iron	0.5~1.5~2.0		★ 120~180~250	-	-	-	-
	Nodular cast iron	0.5~1.2~1.8		★ 100~150~200	-	-	-	-
	Ni-base heat-resistant alloys	0.2~0.8~1.2		-	-	☆ 20~30~50	-	★ 20~30~50
Titanium alloys	0.2~0.8~1.2		☆ 30~50~70	-	★ 40~60~80	-	-	

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

★: 1st Recommendation ☆: 2nd Recommendation

* The bold-faced number indicates a center value of recommended cutting condition.

Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

* When finishing with LD type and FL type inserts, recommended feed rate for SOMT14 LD type: f=1.5(mm/rev) or less/for SOMT10 LD type: f=0.9(mm/rev) or less for SOMT14 FL type: f=3.0(mm/rev) or less/for SOMT10 FL type: f=1.4(mm/rev) or less

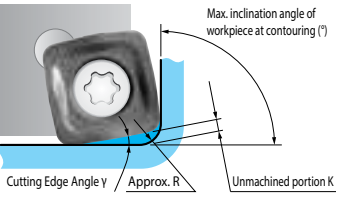
* For machining center equivalent to BT30, reduce feed rate to 25% or less of the recommended condition.

* For slotting, internal coolant is recommended.



Milling

Note for machining program (Approx. R)

Shape	Description	Insert type	Cutting edge angle γ	Approx. R (mm)	Unmachined portion K (mm)	Max. inclination angle of workpiece at contouring
	MFH...-10-...	GM / GH	10°	3.0	0.85	90°
		FL	14°	3.0	0.89	80°
		LD	14°	3.5	0.69	65°
	MFH...-14-...	GM / GH	10°	3.5	1.37	90°
		FL	13°	3.0	1.36	80°
		LD	16°	5.0	1.06	65°

Reference data for ramping

MFH...-10-...

Cutter dia. DCX (mm)	25	28	32	35	40	50	63	80
Max. ramping angle RMPX	5°	4.5°	4°	3.5°	3°	2.5°	2°	1°
tan RMPX	0.087	0.078	0.070	0.061	0.052	0.043	0.035	0.017

MFH...-14-...

Cutter dia. DCX (mm)	50	63	80	100	125	160
Max. ramping angle RMPX	2°	1.8°	1°	0.5°	0.4°	0.2°
tan RMPX	0.035	0.031	0.017	0.009	0.007	0.003

M



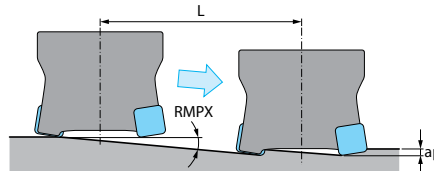
Milling

Guide for ramping (Slant milling)

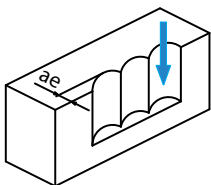
Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length "L" at max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$



Vertical milling (Plunging)



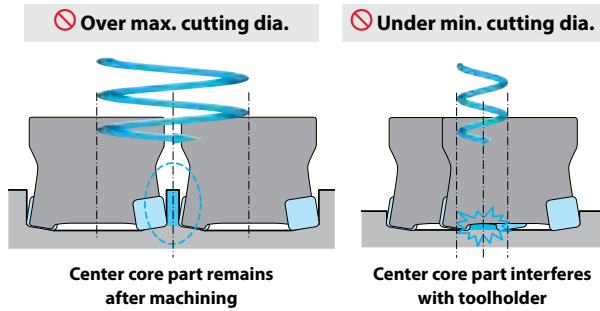
Insert description	Max. width of cut (ae)
SOMT10	8mm
SOMT14	11.5mm

*Vertical milling (Plunging) is available only with GM/GH type insert.
(LD type and FL type are not applicable)
For vertical milling (plunging), reduce feed rate to fz=0.2mm/t or less.

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Guide for helical milling

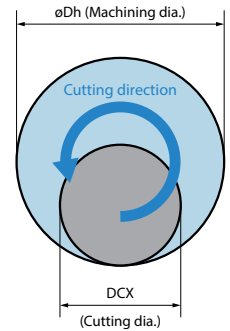
For helical milling, use between min. cutting dia. and max. cutting dia.



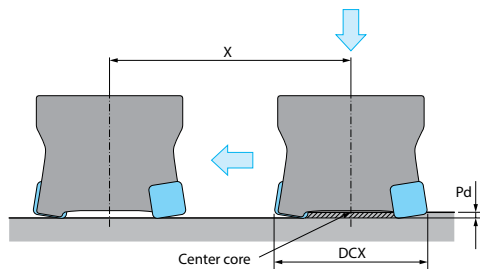
Description	Min. cutting dia.	Max. cutting dia.
MFH...-10-...	2×DCX-18	2×DCX-2
MFH...-14-...	2×DCX-25	2×DCX-2

Unit: mm

- Sinking depth (h) at helical milling should be under max. depth of cut (APMX) in the cutter dimension chart.
- Down-cut milling is recommended. (Ref. to the right figure)
- Feed rate should be under 50% of the recommended cutting conditions.
- Use caution to eliminate incidences caused by producing long chips.



Guide for drilling



3D machining

Insert type	Ramping	Contouring (Rising wall angle)	Vertical	Helical milling	Pocketing
GM / GH	✓	✓ (90°)	✓	✓	✓
LD	✓	△ (65°)	×	×	×
FL	✓	△ (80°)	×	×	×

- Some applications are not available depending on insert type.
- For FL and LD type, there is a limit of rising wall angle at contouring.

Description	GM type / GH type		LD type		FL type	
	Max. cutting depth Pd	Min. cutting length X for flat bottom surface	Max. cutting depth Pd	Min. cutting length X for flat bottom surface	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MFH...-10-...	1.5	DCX-18	1.5	DCX-14	1.5	DCX-15
MFH...-14-...	2	DCX-24	2	DCX-18	2	DCX-19

[Drilling depth] Please refer to Pd (Max. cutting depth) in the chart.
[When traversing after drilling]

1. Reduce feed rate 25% or less of the recommended conditions until the center core part (Unmachined part) is removed.
2. When drilling, reduce feed rate per revolution to $f=0.2\text{mm/rev}$ or under.

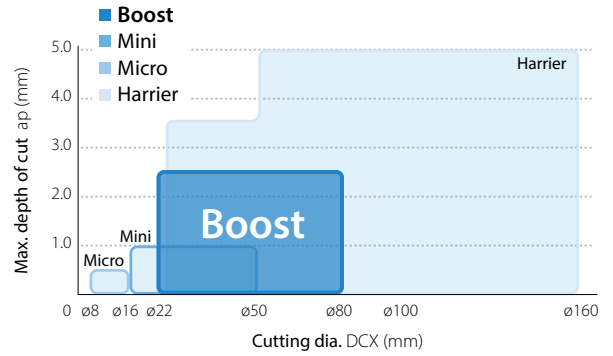
Unit: mm



High feed and large depth of cut milling

MFH Boost

Large D.O.C. for greater milling capabilities
Excellent performance in a wide range of applications, including automotive parts, difficult-to-cut materials, and molds



1 High feed milling with large depth of cut capabilities

A small 04 size insert (4-edge, double-sided insert) supports depths of cut up to 2.5 mm with cutting dia. available from $\phi 22$ mm.

Achieves high efficiency machining in various shouldering, slotting, helical milling, and ramping applications.

4-edge, double-sided insert

Max. depth of cut
2.5 mm

MFH Boost Advantage

fz (mm/t)	90° End mill (mm)	MFH Boost (mm)	Conventional high feed cutter (mm)
0	6.0	2.5	0
0.2	6.0	2.5	0
0.3	6.0	2.5	0
0.4	5.5	2.5	0
0.6	2.5	2.5	0
0.8	1.5	2.0	0
1.0	1.0	1.5	0
1.2	0.5	1.0	0
1.3	0.2	0.5	0
1.4	0.1	0.2	0
1.6	0	0	0.5

BT50

M

Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

2 Available for a variety of machining applications and environments

1 Solutions for 90° end mills (Rough to medium-finish machining)

High feed rates dramatically improve machining efficiency

Machining efficiency simulation example

Pocketing: Vc = 150 m/min, ae = 12.5 mm

MFH Boost
ø 25 (3 Inserts)

100 cc/min

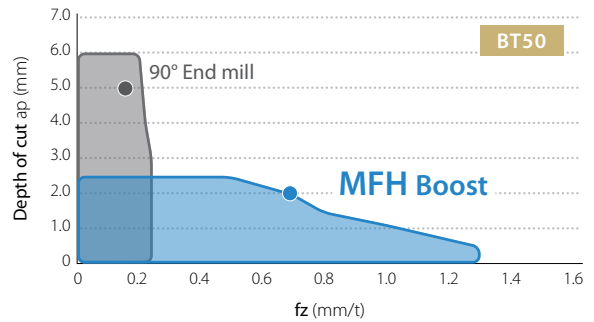
ap = 2.0 mm, fz = 0.7 mm/t

Machining efficiency
x 1.8

Conventional
90° end mill
ø 25 (3 Inserts)

54 cc/min

ap = 5.0 mm, fz = 0.15 mm/t



High efficiency and good tool life

Machining efficiency and cutting edge condition comparison (Internal evaluation)

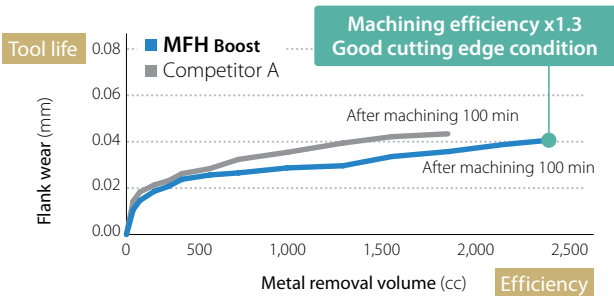
Cutting edge condition after 100 min machining

MFH Boost

ap = 1.6 mm, fz = 0.6 mm/t

Competitor A 90° end mill

ap = 5.0 mm, fz = 0.15 mm/t



Cutting conditions: Vc = 150 m/min, ae = 12.5 mm, dry, 42CrMo4, ø 25 (1 Insert) BT50

High stability in unstable machining environment

Chatter resistance comparison (Internal evaluation)

Slotting

ø 25 (3 Inserts)
External air
C50
BT50



Video



Machining efficiency

MFH Boost

103 cc/min

Vc = 120 m/min, ap = 1.5 mm, fz = 0.6 mm/t

Machining efficiency
x 4.5

Competitor A
90° End Mill

31 cc/min

Chattering (Machining was impossible)

Vc = 80 m/min, ap = 2 mm, fz = 0.2 mm/t

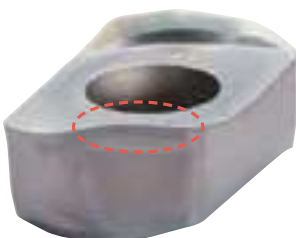
23 cc/min

Vc = 80 m/min, ap = 2 mm, fz = 0.15 mm/t

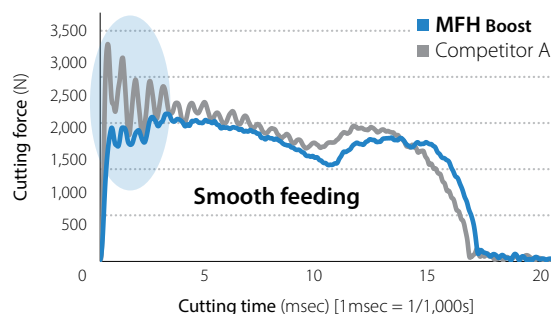
High efficiency and stable machining designs

Kyocera's original technology

Convex cutting edge design reduces impact when entering workpiece



Cutting force when entering workpiece (Internal evaluation)



Cutting conditions:
Vc = 150 m/min, ap = 2.0 mm,
ae = 25 mm, fz = 0.7 mm/t,
dry, C50, ø 50 (1 Insert), BT50

M
Milling

2 Better solution than conventional high feed cutters

Large D.O.C. dramatically improves machining efficiency

Machining efficiency simulation example

Multistage machining (Depth 30 mm): Vc = 150 m/min, ae = 12.5 mm

MFH Boost
ø 25 (3 Inserts)

100 cc/min

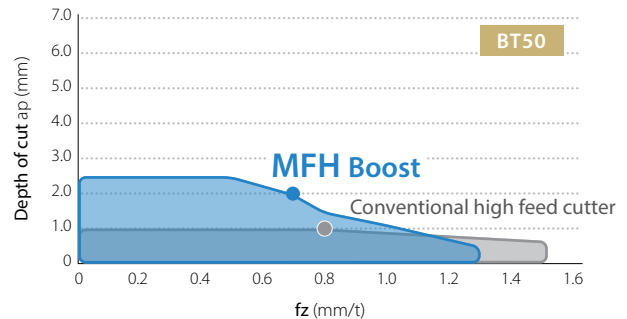
ap = 2.0 mm, fz = 0.7 mm/t

Machining efficiency
x 1.3

Conventional high feed cutter
ø 25 (3 Inserts)

76 cc/min

ap = 1.0 mm, fz = 0.8 mm/t



High efficiency and good tool life

Machining efficiency and cutting edge condition comparison (Internal evaluation)

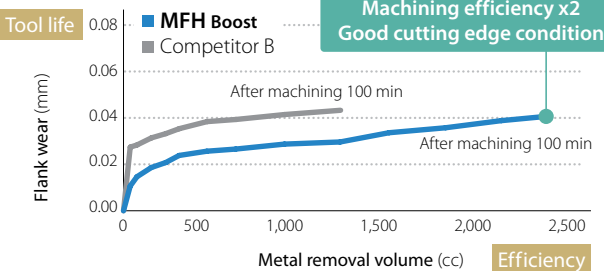
Cutting edge condition after 100 min machining

MFH Boost

ap = 1.6 mm, fz = 0.6 mm/t

Competitor B High feed type

ap = 0.8 mm, fz = 0.6 mm/t



Cutting conditions: Vc = 150 m/min, ae = 12.5 mm, dry, 42CrMo4, ø 25 (1 Insert), BT50

Excellent wall accuracy

Machining efficiency and wall accuracy comparison (Internal evaluation)

Pocketing (Depth 12mm)

MFH Boost
ø 25 (3 Inserts)

ap = 1.5 mm × 8 passes
Q = 115 cc/min



Competitor B High feed type
ø 25 (4 Inserts)

ap = 0.8 mm × 15 passes
Q = 81 cc/min



Cutting conditions: Vc = 200 m/min, ae = 12.5 mm, dry, C50, BT50

Superior wall accuracy



Wiper on outer periphery

Reduction of wall level variation in multi-pass machining

3 Solutions for machining difficult-to-cut materials

Dramatic improvement in machining efficiency with titanium alloy, stainless steel machining, etc.

Machining efficiency comparison (Internal evaluation)

Titanium alloy pocketing (Depth 6 mm)

MFH Boost

Approx. 1' 30"

ap = 1.5 mm × 4 passes (fz = ~0.35 mm/t)

Machining efficiency
x 1.8

Competitor C
High feed type

Approx. 2' 50"

ap = 0.6 mm × 10 passes (fz = ~0.4 mm/t)

Cutting conditions: Vc = 50 m/min, ae = 12.5 mm (ae/DCX = 50%), Ramping angle 3°, Ti-6Al-4V, wet, ø 25 (3 inserts), BT50

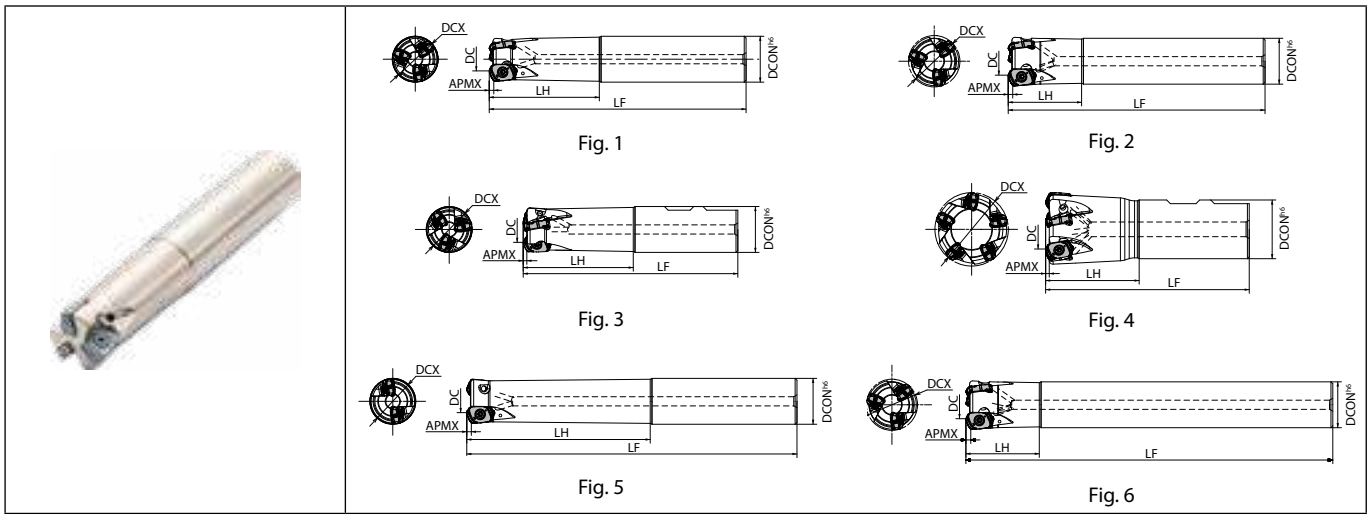


M

Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

MFH Boost



Toolholder dimensions

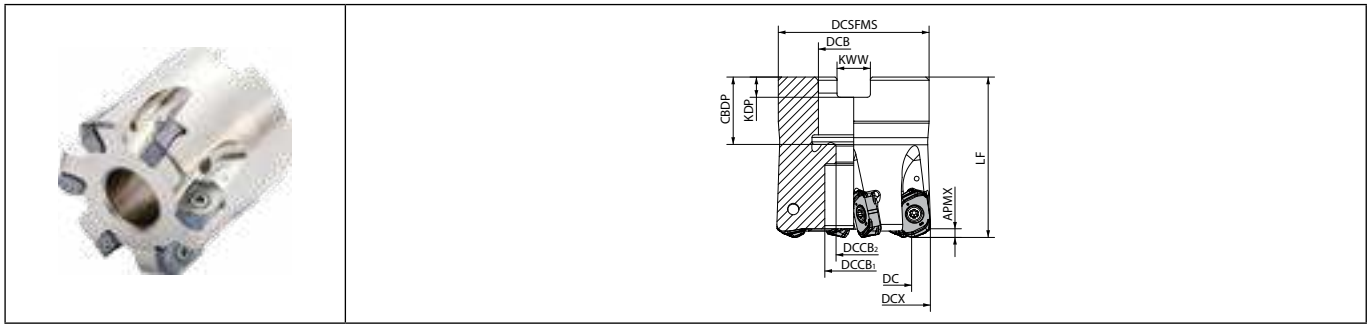
Description	Availability	Inserts	Dimension (mm)						A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts ➔ M214		
			DC	DCX	DCON	LF	LH	APMX						Anti-seize compound	Screw	Wrench			
Cylindrical	Same shank	MFH 25-S25-04-2T	● 2	14	25	25	140	60	2.5	-10	Yes	12700	0.5	1	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM	
		MFH 25-S25-04-3T	● 3																1
		MFH 32-S32-04-4T	● 4	21	32	32	150	70											1
		MFH 32-S32-04-5T	● 5																1
	Standard shank	MFH 22-S20-04-2T	● 2	11	22	20	130	30	2.5	-10	Yes	13600	0.3	2	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM	
		MFH 28-S25-04-3T	● 3	17	28	25	140	40											2
		MFH 28-S25-04-4T	● 4																2
		MFH 35-S32-04-4T	● 4	24	35														2
		MFH 35-S32-04-5T	● 5			32	150	50											2
		MFH 40-S32-04-5T	● 5	29	40														2
	Long Shank	MFH 25-S25-04-2T-180	● 2	14	25	25	180	100	2.5	-10	Yes	12700	0.6	5	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM	
		MFH 25-S25-04-3T-180	● 3	17	28		40												5
MFH 28-S25-04-3T-200		● 3						6											
MFH 32-S32-04-4T-200		● 4	21	32		200	120	5											
MFH 32-S32-04-4T-200		● 4	24	35	32			6											
MFH 35-S32-04-4T-200		● 4	24	35	32			6											
Weldon	MFH 25-W25-04-2T	● 2	14	25	25	117	60	2.5	-10	Yes	12700	0.4	3	P-37	SB-3575TRP	DTPM-10	LOMU040410ER-GM		
	MFH 25-W25-04-3T	● 3																3	
	MFH 32-W32-04-4T	● 4	21	32		131	70											3	
	MFH 32-W32-04-5T	● 4			32													3	
	MFH 40-W32-04-5T	● 5																4	
	MFH 40-W32-04-6T	● 6	29	40		111	50											4	

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



MFH Boost



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)											A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts			Applicable inserts ● M214
			DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX					Anti-seize compound	Screw	Wrench	
Metric MFH 040R-04-5T-M 040R-04-6T-M 050R-04-6T-M 050R-04-7T-M 052R-04-6T-M 052R-04-7T-M 063R-04-7T-M 063R-04-7T-27M 063R-04-9T-M 063R-04-9T-27M 080R-04-8T-M 080R-04-10T-M	●	5	29	40	38	16	15	9	40	19	5.6	8.4						P-37 SB-3575TRP DTPM-10 Recommended tightening torque for insert clamp 2.0N·m	LOMU040410ER-GM		
	●	6	39	50	47	22	18	11					21	6.3	10.4	10000	0.2				
	●	7	41	52									50			9000	0.4				
	●	6														8800	0.5 0.4				
	●	7				22	18	11								8000	0.8				
	●	9	52	63	60	27	20	13		24	7	12.4									
	●	8				22	18	11		21	6.3	10.4				0.7					
	●	8				27	20	13		24	7	12.4				1.8					
	●	10	69	80	76				63							7100	1.7				
	Bores dia. inch spec MFH 080R-04-8T 080R-04-10T	□	8	69	80	76	31.75	26	17	63	32	8	12.7	2.5	-10	Yes	7100			1.6	P-37 SB-3575TRP DTPM-10 Recommended tightening torque for insert clamp 2.0N·m	LOMU040410ER-GM
□		10																			

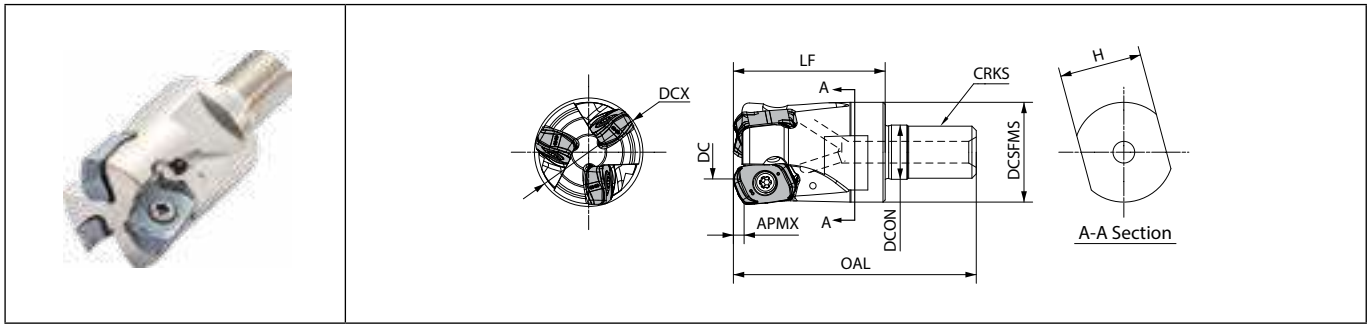
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M212

MFH Boost



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)								A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Spare parts			Applicable inserts M214	
			DC	DCX	DCON	DCSFMS	OAL	LF	APMX	CRKS				H	Anti-seize compound	Screw		Wrench
MFH 22-M10-04-2T	●	2	11	22	10.5	18.7	48	30		M10X1.5	15		13600	P-37 SB-3575TRP DTPM-10 Recommended tightening torque for insert clamp 2.0N·m	LOMU040410ER-GM			
25-M12-04-2T	●	3	14	25	12.5	23	56	35		M12X1.75	19		12700					
25-M12-04-3T	●		17	28									12000					
28-M12-04-3T	●	4	21	32								-10	Yes			11200		
28-M12-04-4T	●												24			35	10700	
32-M16-04-4T	●	5	29	40	17	30	62	40		M16X2.0	24					10000		
32-M16-04-5T	●															31	42	9800
35-M16-04-4T	●	6	31	42												10000		
35-M16-04-5T	●															31	42	9800
40-M16-04-5T	●	5	31	42												10000		
40-M16-04-6T	●															31	42	9800
42-M16-04-5T	●	6	31	42												10000		
42-M16-04-6T	●													31	42	9800		

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.


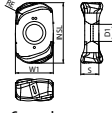
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

See page M82 for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)



Milling

LOMU

Insert		Description		Dimension (mm)					Carbide					Applicable toolholder M211~M213		
				No. of edges	S	D1	RE	W1	INSL	CVD		PVD				
										CA6535	PRI1510	PRI1525	PRI1535		PRI1810	PRI1825	PRI1835
	 General purpose	LOMU	040410ER-GM	4	4.4	4.1	1	9.1	14.5	●	●	●	●	●	●	MFH...-04..

Handed insert shows Right-hand

Recommended cutting conditions M215

Classification of usage

- ★ : Roughing / 1st Choice
 - ☆ : Roughing / 2nd Choice
 - : Finishing / 1st Choice
 - : Finishing / 2nd Choice
- (In case hardness is 45HRC or under)

Carbon steel / Alloy steel			☆		★	☆	P
Mold and die steel			☆		★	☆	
Austenitic stainless steel				☆	☆	★	M
Martensitic stainless steel	★					☆	
Precipitation hardening stainless steel				☆		★	
Gray cast iron			☆		★		K
Nodular cast iron			☆		★		
Non-ferrous metals							N
Heat-resistant alloy	★					☆	S
Titanium alloy				☆		★	
Hard materials							H

M



Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

Multi-
Function

Slot Mill

Ball-nose
Radius

Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M214

Recommended cutting conditions ★ 1st recommendation ☆ 2nd recommendation

Chipbreaker	Workpiece	Toolholder description and feed (fz: mm/t)		Recommended insert grade (Vc: m/min)				
		ap(mm)	MFH...04...	MEGACOAT NANO EX (MEGACOAT NANO)			CVD Coating	
				PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	CA6535	
GM	Carbon steel (~ 280HB)	≤ 0.5	0.20 - 0.80 - 1.30	-	★ 120 - 160 - 220	☆ 120 - 160 - 220	-	
		≤ 1.0	0.20 - 0.70 - 1.10					
		≤ 1.5	0.20 - 0.60 - 0.80					
		≤ 2.0	0.20 - 0.40 - 0.70					
		≤ 2.5	0.20 - 0.30 - 0.50					
	Alloy steel (~ 350HB)	≤ 0.5	0.20 - 0.75 - 1.20	-	★ 100 - 150 - 200 (Dry machining recommended)	☆ 100 - 150 - 200 (Dry machining recommended)	-	
		≤ 1.0	0.20 - 0.65 - 1.00					
		≤ 1.5	0.20 - 0.55 - 0.70					
		≤ 2.0	0.20 - 0.40 - 0.55					
		≤ 2.5	0.20 - 0.25 - 0.35					
	~ 40HRC)	≤ 0.5	0.20 - 0.60 - 1.10	-	★ 80 - 120 - 160 (Dry machining recommended)	☆ 80 - 120 - 160 (Dry machining recommended)	-	
		≤ 1.0	0.20 - 0.50 - 0.90					
		≤ 1.5	0.20 - 0.40 - 0.65					
		≤ 2.0	0.20 - 0.30 - 0.55					
		≤ 2.5	0.20 - 0.25 - 0.35					
	Mold steel (40 ~ 50HRC)	≤ 0.5	0.10 - 0.30 - 0.50	-	★ 60 - 100 - 130 (Dry machining recommended)	-	-	
		≤ 1.0	0.10 - 0.25 - 0.40					
		≤ 1.5	0.10 - 0.20 - 0.30					
		≤ 2.0	-					
		≤ 2.5	-					
	(50 ~ 55HRC)	≤ 0.5	0.10 - 0.20 - 0.40	-	★ 50 - 70 - 100 (Dry machining recommended)	-	-	
		≤ 1.0	0.10 - 0.15 - 0.25					
		≤ 1.5	-					
		≤ 2.0	-					
		≤ 2.5	-					
	Austenitic stainless steel	≤ 0.5	0.20 - 0.60 - 1.00	-	-	☆ 100 - 140 - 180	★ 100 - 140 - 180	-
		≤ 1.0	0.20 - 0.50 - 0.90					
		≤ 1.5	0.20 - 0.45 - 0.60					
		≤ 2.0	0.20 - 0.30 - 0.50					
		≤ 2.5	0.20 - 0.25 - 0.40					
	Martensitic stainless steel	≤ 0.5	0.20 - 0.60 - 1.00	-	-	☆ 100 - 150 - 200	★ 150 - 200 - 300	-
		≤ 1.0	0.20 - 0.50 - 0.90					
		≤ 1.5	0.20 - 0.45 - 0.60					
		≤ 2.0	0.20 - 0.30 - 0.50					
		≤ 2.5	0.20 - 0.25 - 0.40					
	Precipitation hardened stainless steel	≤ 0.5	0.10 - 0.30 - 0.50	-	-	-	★ 90 - 120 - 150	-
≤ 1.0		0.10 - 0.25 - 0.45						
≤ 1.5		0.10 - 0.15 - 0.25						
≤ 2.0		-						
≤ 2.5		-						
Gray cast iron	≤ 0.5	0.20 - 0.80 - 1.30	★ 120 - 160 - 220	-	-	-	-	
	≤ 1.0	0.20 - 0.70 - 1.10						
	≤ 1.5	0.20 - 0.60 - 0.80						
	≤ 2.0	0.20 - 0.40 - 0.70						
	≤ 2.5	0.20 - 0.30 - 0.50						
Nodular cast iron	≤ 0.5	0.20 - 0.60 - 1.00	★ 100 - 150 - 200	-	-	-	-	
	≤ 1.0	0.20 - 0.50 - 0.90						
	≤ 1.5	0.20 - 0.40 - 0.70						
	≤ 2.0	0.20 - 0.30 - 0.60						
	≤ 2.5	0.20 - 0.25 - 0.40						
Ni-base heat-resistant alloy	≤ 0.5	0.10 - 0.30 - 0.45	-	-	☆ 20 - 30 - 50	★ 20 - 30 - 50	-	
	≤ 1.0	0.10 - 0.25 - 0.40						
	≤ 1.5	0.10 - 0.15 - 0.20						
	≤ 2.0	-						
	≤ 2.5	-						
Titanium alloy	≤ 0.5	0.10 - 0.30 - 0.50	-	-	-	★ 40 - 60 - 80	-	
	≤ 1.0	0.10 - 0.25 - 0.45						
	≤ 1.5	0.10 - 0.15 - 0.25						
	≤ 2.0	-						
	≤ 2.5	-						

- The number in bold font is recommended starting conditions. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
- Machining with coolant is recommended for precipitation hardened stainless steel, Ni-base heat-resistant alloy and titanium alloy.
- Wet machining may have a lower tool life than dry machining. Set the cutting speed, feed rate and D.O.C. lower than recommended conditions.
- Machining with BT30 or equivalent, feed rate should be reduced to 80% or less of recommended cutting conditions. Slotting is not recommended.
- Center through air is recommended for slotting.
- Slotting or pocketing are not recommended for face mill type.
- For face mill type cutters, it is recommended that width of cut should be set to 75% or less of the cutting diameter.
- It is recommended to set the long shank to 75% or less of the recommended conditions for both ap and feed.



Approximate programming radius adjustment

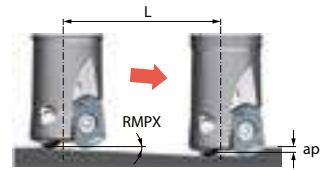
Shape	Programmable R (mm)	Over machined radius portion (mm)	Non-machined portion (mm)
	1.5	0	1.42
	2.0	0	1.24
	3.0 (Recommended)	0	0.87
	3.5	0.06	0.69

Ramping tips

- Ramping angle should be under RMPX
- Reduce recommended feed rate in cutting conditions above by 70%

Formula for max. cutting Length (L) at max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$



- When ramping both forth and back direction alternately, set the maximum ramping angle RMPX to 50%.



Reference data for ramping

Description	Cutter dia. DCX (mm)	22	25	28	32	35	40	42	50	52	63	80
MFH... -04- ...	Max. ramping angle RMPX	3.9°	3.0°	2.4°	2.0°	1.7°	1.4°	1.3°	1.0°	1.0°	0.8°	0.6°
	tan RMPX	0.068	0.052	0.042	0.035	0.029	0.024	0.022	0.018	0.017	0.013	0.010

Guide for helical milling

For helical milling, use between min. cutting dia. and max. cutting dia.

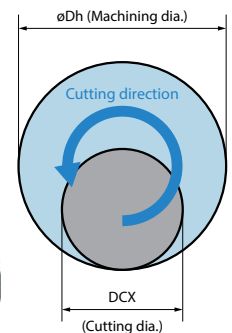
⊘ Exceeding max. cutting dia.

Center core part remains after machining



⊘ Under min. cutting dia.

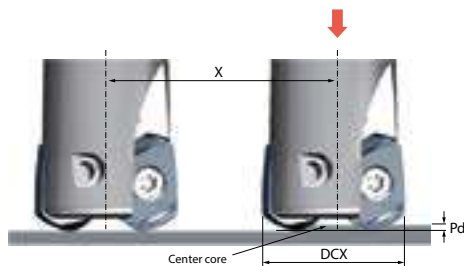
Center core part interferes with toolholder



Description	Min. cutting dia. (mm)	Max. cutting dia. (mm)
MFH... -04- ...	2×DCX-11	2×DCX-2

• Maximum ramping depth per cycle to be under maximum D.O.C. ap (2.5 mm)
 • Use climb milling. (Refer to the above figure)
 • Feed rates should be reduced to 50% of recommended cutting conditions
 • Use caution to eliminate incidences caused by producing long chips

Guide for drilling



Description	GM type	
	Max. drilling depth Pd (mm)	Min. cutting length X for flat bottom surface (mm)
MFH... -04- ...	0.6	DCX-12

- It is recommended to reduce feed by 25% of recommendation until the center core is removed
- Axial feed rate recommendation per revolution is $f \leq 0.2 \text{ mm/rev}$

Vertical milling (Plunging)

Vertical milling (Plunging)

Insert description	Maximum width of cut (ae)
LOMU04 Type	5.0 mm

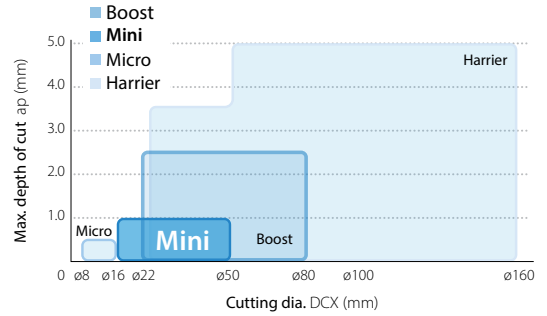
• Reduce feed rate to $fz \leq 0.2 \text{ mm/t}$ when plunging

MFH Mini

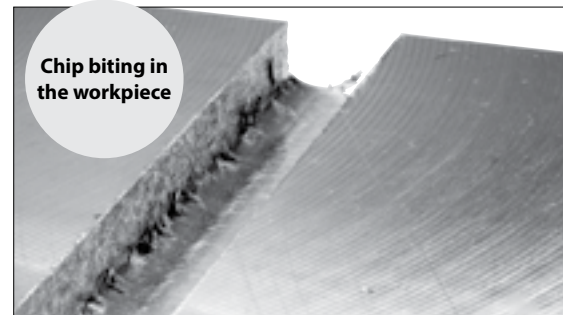
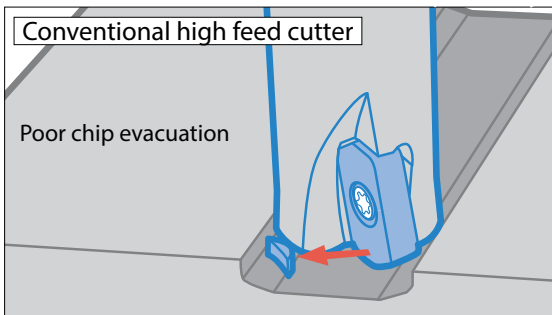
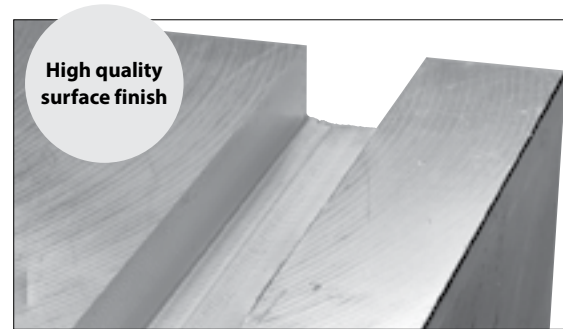
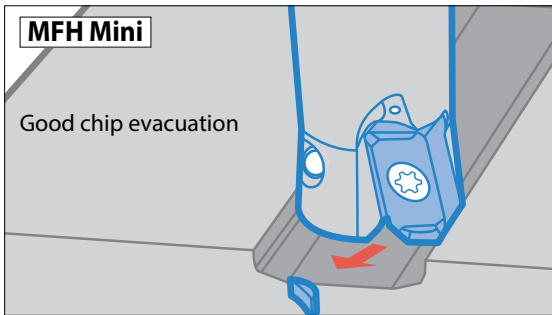
Cutter dia. $\phi 16 \sim \phi 50$

Economical double-sided 4-edge insert

High efficiency and high feed machining at small dia. machining and small machining center



1 Excellent chip evacuation



Chips clings to the insert

(Internal evaluation)



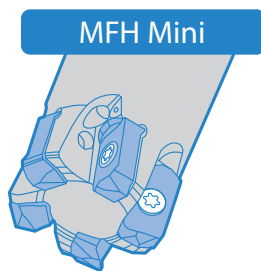
MFH Mini controls chip biting with 3D convex cutting edge

Cutting conditions: Workpiece material ST44-2 Cutter dia. $\phi 16$ $V_c = 150$ m/min $a_p \times a_e = 10$ mm (0.5 mm x 20 passes) x 16 mm $f_z = 0.6$ mm/t Dry



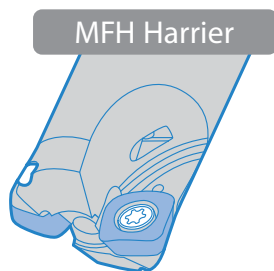
2 Multi edge design enables high efficiency machining

Cutter Dia. $\phi 25$



5 flutes

MFH25-S25-03-5T



2 flutes

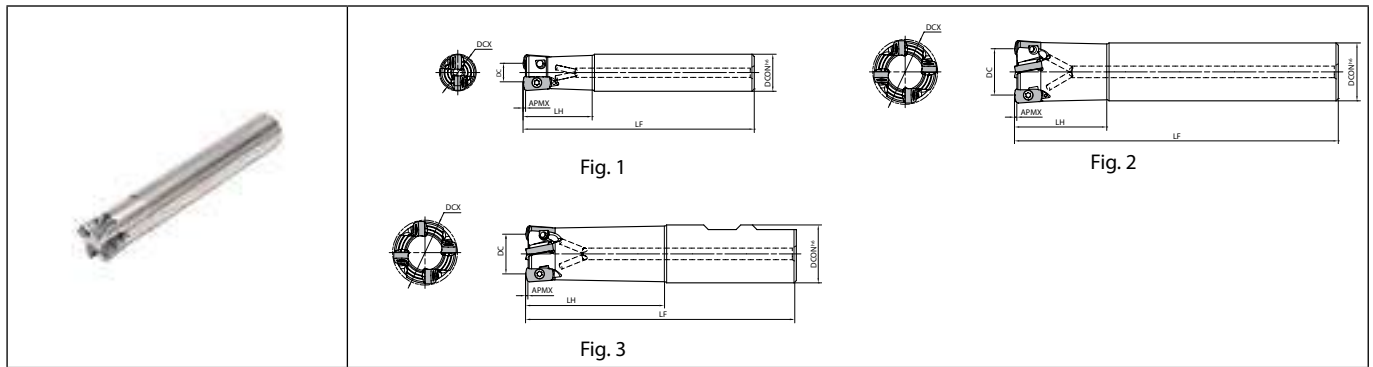
MFH25-S25-10-2T

3 High efficiency and high feed machining at small machining center (BT30/BT40)



Suitable for roughing of mold

MFH Mini



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)					A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts M221			
			DC	DCX	DCON	LF	APMX						Anti-seize compound	Screw	Wrench				
			Recommended tightening torque for insert clamp 1.2N·m			Recommended tightening torque for insert clamp 1.2N·m							Recommended tightening torque for insert clamp 1.2N·m						
Cylindrical	Same shank	● 2	8	16	16	100	30	1	-10	Yes	18800	0.1	1	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH		
		● 3	12	20	20	130	50				15700	0.3						1	
		● 4	17	25	25	140	60				13400	0.5							1
		● 5	24	32	32	150	70				11400	0.8						1	
		● 6																	
		Standard shank	● 2	9	17	16	100				20	1						-10	Yes	17900	0.1	2	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
	● 3		14	22	20	130	30	17000	0.3	2									
	● 4		20	28	25	140	40	14700	0.5		2								
	● 5							12400	0.5	2									
	● 6																		
	Long Shank		● 2	8	16	16	150	50	1	-10	Yes		18800	0.2	1	P-37	SB-3065TRP			DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
		● 3	12	20	20	160	80	15700				0.3	1						
● 4		17	25	25	180	100	13400	0.6				1							
● 5		24	32	32	200	120	11400	1.1					1						
Weldon	MFH	● 2	8	16	16	79	30	1	-10	Yes	18800	0.1	3	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH		
		● 3	12	20	20	101	50				15700	0.2						3	
		● 4	17	25	25	117	60				13400	0.4							3
		● 5	24	32	32	131	70				11400	0.7						3	
		● 6																	
		Standard shank	● 2	9	17	16	100				20	1						-10	Yes	17900	0.1	2	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH
	● 3		14	22	20	130	30	17000	0.3	2									
	● 4		20	28	25	140	40	14700	0.5		2								
	● 5							12400	0.5	2									
	● 6																		

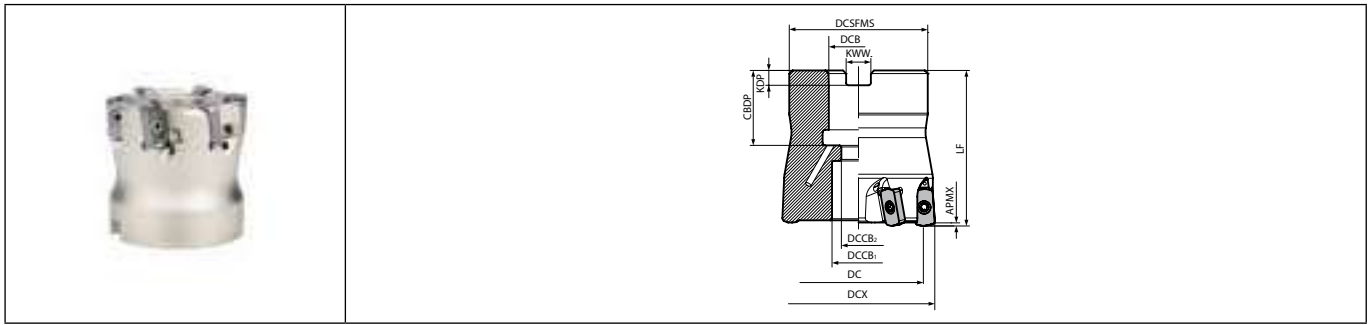
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

MFH Mini



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)											A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts			Applicable inserts ➔ M221	
			R	DC	DCX	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW					APMX	Anti-seize compound	Screw		Wrench
MFH 040R-03-ST-M	●	5			38												9900	0.2	P-37 SB-3065TRP DTPM-8 Recommended tightening torque for insert clamp 1.2N·m	LOGU030310ER-GM LOGU030310ER-GH		
040R-03-6T-M	●	6	32	40													9900	0.24				
040R-03-7T-M-KUA	●	7			34	16	15	9		19	5.6	8.4					9900	0.27				
042R-03-5T-M-KUA	●	5	34	42	38				40								9900	0.26				
042R-03-7T-M-KUA	●	7			34												9900	0.39				
050R-03-5T-M-KUA	●	5											1	-10	Yes		8600	0.41				
050R-03-8T-M-KUA	●	8	42	50													8600	0.5				
050R-03-8T-M	●	8															8600	0.43				
052R-03-ST-M-KUA	●	5			47	22				21	6.3	10.4					8600	0.57				
052R-03-8T-M-KUA	●	8	44	52													8600	0.6				
063R-03-8T-M-KUA	●	8	55	63					40								8600	0.57				
066R-03-8T-M-KUA	●	8	58	66													8600	0.6				

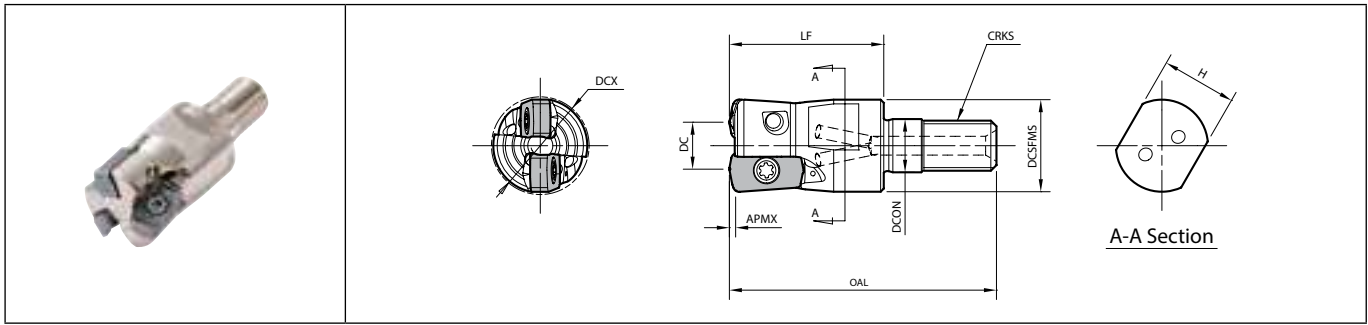
Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.



Milling

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MFH Mini



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)									A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Spare parts			Applicable inserts M221
			DC	DCX	DCON	DCSFMS	OAL	LF	APMX	CRKS	H				Anti-seize compound	Screw	Wrench	
			Recommended tightening torque for insert clamp 1.2N·m			Recommended tightening torque for insert clamp 1.2N·m			Recommended tightening torque for insert clamp 1.2N·m									
MFH 16-M08-03-2T	●	2	8	16									18880	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH	
MFH 17-M08-03-2T	●	2	9	17	8.5	14.7	42	25	1	M8x1.25	12	-10	Yes	17900	Recommended tightening torque for insert clamp 1.2N·m			
MFH 18-M08-03-2T	●	2	10	18									17000	Recommended tightening torque for insert clamp 1.2N·m				
MFH 20-M10-03-3T	●	3	12	20									15700	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH	
MFH 20-M10-03-4T	●	4			10.5	18.7	48	30	1	M10x1.5	15	-10	Yes	14700	Recommended tightening torque for insert clamp 1.2N·m			
MFH 22-M10-03-3T	●	3	14	22									14700	Recommended tightening torque for insert clamp 1.2N·m				
MFH 22-M10-03-4T	●	4											14700	Recommended tightening torque for insert clamp 1.2N·m				
MFH 25-M12-03-4T	●	4	17	25									13400	P-37	SB-3065TRP	DTPM-8	LOGU030310ER-GM LOGU030310ER-GH	
MFH 25-M12-03-5T	●	5			12.5	23	56	35	1	M12x1.75	19	-10	Yes	12400	Recommended tightening torque for insert clamp 1.2N·m			
MFH 28-M12-03-4T	●	4	20	28									12400	Recommended tightening torque for insert clamp 1.2N·m				
MFH 28-M12-03-5T	●	5											12400	Recommended tightening torque for insert clamp 1.2N·m				
MFH 32-M16-03-5T	●	5	24	32						M16x2.0			11400				LOGU030310ER-GM LOGU030310ER-GH	
MFH 32-M16-03-6T	●	6											11400					
MFH 35-M16-03-6T-KUA	●	6	27										11400					
MFH 40-M16-03-5T-KUA	●	5	40		17	30	62	40	1	M16x2.0	24	-10	Yes	9900	P-37	SB-3065TRP		DTPM-8
MFH 42-M16-03-5T-KUA	●	5	24										9900	Recommended tightening torque for insert clamp 1.2N·m				
MFH 42-M16-03-7T-KUA	●	7	42										9900	Recommended tightening torque for insert clamp 1.2N·m				

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

See page M82 for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

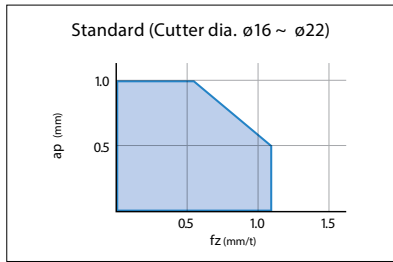
Ball-nose Radius

Others

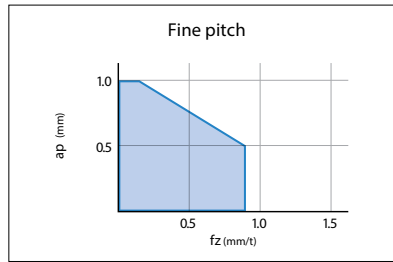
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M220

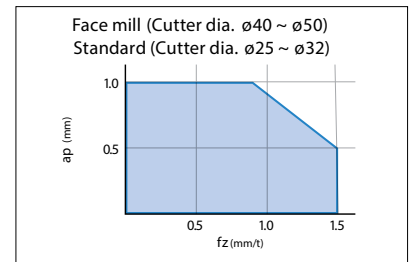
Cutting performance



MFH16-...-2T, MFH17-...-2T, MFH18-...-2T
MFH20-...-3T, MFH22-...-3T



MFH20-...-4T, MFH22-...-4T, MFH25-...-5T
MFH28-...-5T, MFH32-...-6T



MFH25-...-4T, MFH28-...-4T, MFH32-...-5T
MFH040R-..., MFH050R-...

When using fine pitch type, reduce the cutting conditions compared with standard type.

Recommended cutting conditions

Insert type	Workpiece material	Toolholder description and feed rate (fz: mm/t) * Recommended feed rate (Reference value): ap=0.5mm							Recommended insert grades (Vc: m/min)										
		MFH16 -...-2T	MFH20 -...-3T	MFH20 -...-4T	MFH25 -...-4T	MFH25 -...-5T	MFH32 -...-5T	MFH32 -...-6T	MFH -...-R-03	MEGACOAT NANO EX (MEGACOAT NANO)			MEGACOAT HARD	CVD Coated carbide					
										PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	PR0155	CA6535					
GM GH	Carbon steel	0.2~0.7~1.2							0.2~0.5~0.8	0.2~0.8~1.5	0.2~0.5~0.8	0.2~0.8~1.5	0.2~0.5~0.8	0.2~0.8~1.5	-	★ 120~180~250	☆ 120~180~250	-	-
	Alloy steel	0.2~0.5~0.9							0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	-	★ 100~160~220	☆ 100~160~220	-	-
	Mold steel (~40HRC)	0.2~0.3~0.5							0.2~0.25~0.3	0.2~0.3~0.6	0.2~0.25~0.3	0.2~0.3~0.6	0.2~0.25~0.3	0.2~0.25~0.6	-	☆ 80~140~180	☆ 80~140~180	GH ★ 80~140~180	-
	Mold steel (40~50HRC)	0.1~0.3~0.5							0.1~0.2~0.3	0.1~0.3~0.5	0.1~0.2~0.3	0.1~0.3~0.5	0.1~0.2~0.3	0.1~0.3~0.5	-	☆ 60~100~130	-	GH ★ 60~100~130	-
	Mold steel (50~55HRC)	0.1~0.3~0.5							0.1~0.2~0.3	0.1~0.3~0.5	0.1~0.2~0.3	0.1~0.3~0.5	0.1~0.2~0.3	0.1~0.3~0.5	-	☆ 50~70~100	-	GH ★ 50~70~100	-
	Mold steel (55~60HRC)	0.03~0.06~0.1 (* Recommended only for GH chipbreaker)							-	-	-	-	-	-	-	-	GH ☆ 50~60~70	-	-
	Stainless steel (Austenitic related)	0.2~0.5~0.9							0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	-	GM ☆ 100~160~200	GM ★ 100~160~200	-	-
	Stainless steel (Martensitic related)	0.2~0.5~0.9							0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	-	-	☆ 150~200~250	-	★ 180~240~300
	Stainless steel (Precipitation hardening)	0.2~0.5~0.9							0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	-	-	★ 90~120~150	-	-
	Gray cast iron	0.2~0.7~1.2							0.2~0.5~0.8	0.2~0.8~1.5	0.2~0.5~0.8	0.2~0.8~1.5	0.2~0.5~0.8	0.2~0.8~1.5	★ 120~180~250	-	-	-	-
Nodular cast iron	0.2~0.5~0.9							0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	0.2~0.4~0.6	0.2~0.6~1.2	★ 100~150~200	-	-	-	-	
Ni-base heat-resistant alloys	0.2~0.3~0.6							0.2~0.25~0.4	0.2~0.4~0.8	0.2~0.25~0.4	0.2~0.4~0.8	0.2~0.25~0.4	0.2~0.4~0.8	-	-	☆ 20~30~50	-	★ 20~30~50	
Titanium alloys	0.2~0.3~0.6							0.2~0.25~0.4	0.2~0.4~0.8	0.2~0.25~0.4	0.2~0.4~0.8	0.2~0.25~0.4	0.2~0.4~0.8	GM ☆ 30~50~70	-	GM ★ 40~60~80	-	-	

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

The bold-faced number indicates a center value of recommended cutting condition.

Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

For machining center equivalent to BT30, reduce feed rate to 25% or less of the recommended condition.

For slotting, internal coolant or center through coolant is recommended.

Slotting and pocketing are not recommended for face mill type.

Standard Fine pitch ★: 1st Recommendation ☆: 2nd Recommendation

Note for machining program (Approx. R)

Shape	Approx. R (mm)	Max. over machining of radius (mm)	Max. unmachined portion (mm)
	R1.0	0	0.51
	R1.5	0	0.41
	R1.6 (Recommended)	0	0.39
	R2.0	0.09	0.31

Cutting edge angle: 12°



Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

Reference data for ramping

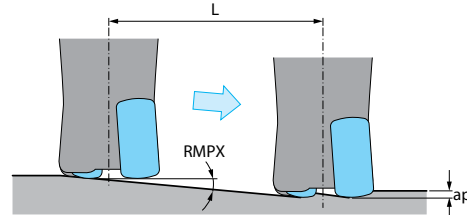
Description	Cutter dia. DCX (mm)	16	17	18	20	22	25	28	32	40	50
MFH ...-03-...	Max. ramping angle RMPX	2.8°	2.5°	2.1°	1.7°	1.4°	1.2°	1°	0.8°	0.5°	0.4°
	tan RMPX	0.049	0.042	0.037	0.03	0.024	0.021	0.017	0.014	0.009	0.007

Guide for ramping (Slant milling)

Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
 Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length "L" at max. ramping angle

$$L = \frac{ap}{\tan RMPX}$$

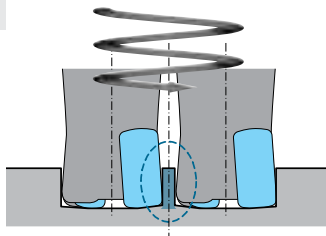


Guide for helical milling

For helical milling, use between min. cutting dia. and max. cutting dia.

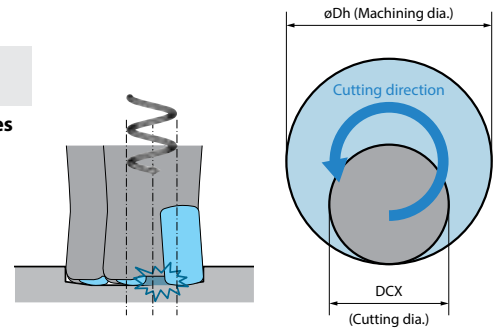
Over max. cutting dia.

Center core part remains after machining



Under min. cutting dia.

Center core part interferes with toolholder

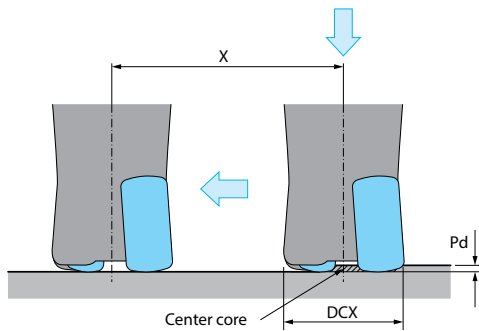


Description	Min. cutting dia.	Max. cutting dia.
MFH...-03-...	2×DCX-8	2×DCX-2

Unit: mm

- Sinking depth at helical milling should be max. ap (1mm) or under.
- Down-cut milling is recommended. (refer to the figure above)
- Feed rate should be under 50% of the recommended cutting conditions.
- Be careful to machine in a safe environment to avoid accident caused by long chips.

Guide for drilling



Description	GM type / GH type	
	Max. cutting depth Pd	Min. cutting length X for flat bottom surface
MFH...-03-...	1.0	DCX-9

Unit: mm

- * When traversing directly after drilling, set the table feed at up to 25% of the recommended cutting conditions.
- * When drilling, reduce feed rate per revolution to f=0.2 mm/rev or under.

Vertical milling (Plunging)

Vertical milling (Plunging)

Available for vertical milling (plunging).

Insert description	Max. width of cut
LOGU03 type	3.5mm

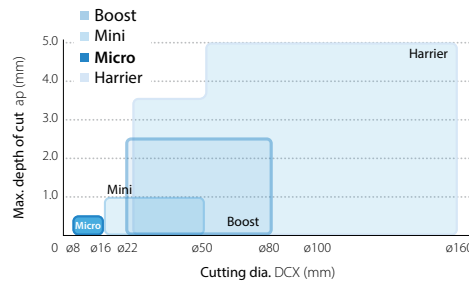
For vertical milling (plunging), reduce feed rate to fz=0.2mm/t or less.

MFH Micro

Cutter dia. $\phi 8 \sim \phi 16$

Low resistance and durable against chatter for highly efficient machining. Max. ap 0.5mm.

Stable high feed machining on a wide range of applications



1 Stable machining with chattering resistance

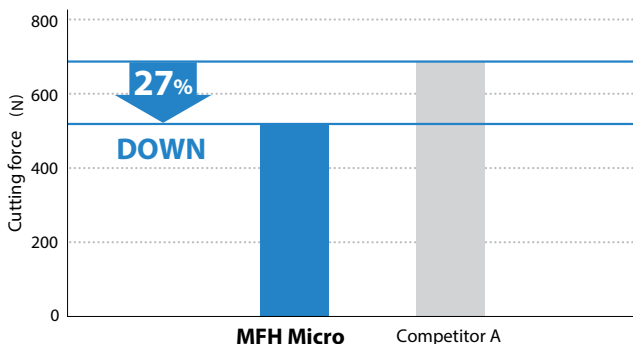
3D convex cutting edge controls initial impact when entering the workpiece

3D convex cutting edge

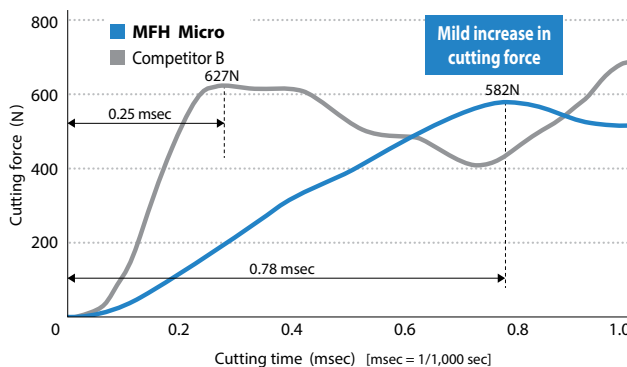


High precision G class insert

Cutting force comparison (Internal evaluation)



Increase in cutting force when entering workpiece (Internal evaluation)



Cutting conditions: $V_c = 120$ m/min, $a_p = 0.4$ mm, $f_z = 0.6$ mm/t
Cutter dia. $\phi 10$ mm, slotting, dry workpiece material: 50C

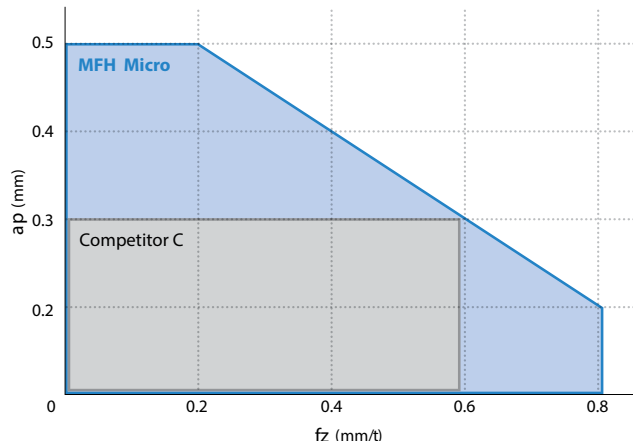
Cutting conditions: $V_c = 120$ m/min, $a_p \times a_e = 0.4 \times 5$ mm, $f_z = 0.6$ mm/t
Cutter dia. $\phi 10$ mm, dry workpiece material: 50C

2 Wide range of machining applications

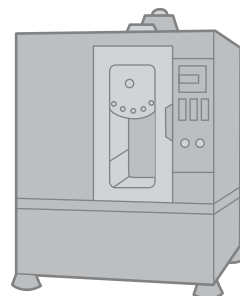
Wide range of machining applications at a maximum depth of cut of 0.5mm

Stable machining even with small machining centers

Cutting performance map (Cutter dia. $\phi 10$ mm)



(Internal evaluation)



Applicable for BT30/ BT40

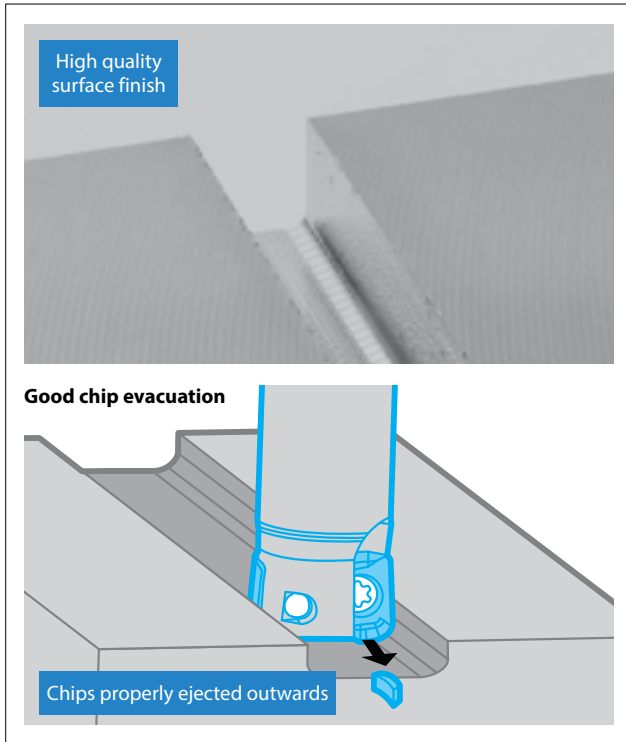
M
Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

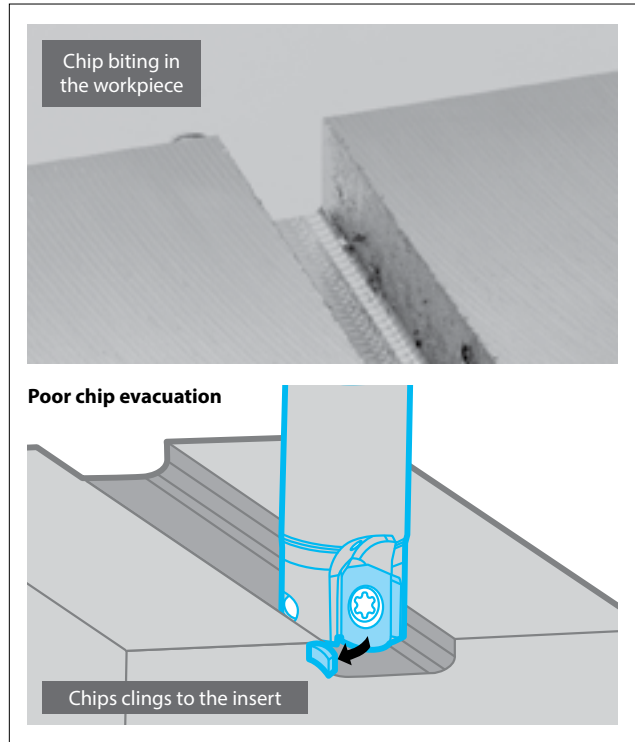
3 Excellent chip evacuation

Controls chip biting with convex cutting edge

MFH Micro



Competitor F



Cutting conditions: Cutter dia. DCX = $\phi 10\text{mm}$, $V_c = 120\text{ m/min}$, $a_p = 0.4\text{mm}$ (25pass), $f_z = 0.6\text{mm/t}$ Total 10mm, Dry workpiece material: ST44-2

(Internal evaluation)



4 Replaces solid end mills to reduce machining costs

Suppresses chattering and increases milling efficiency

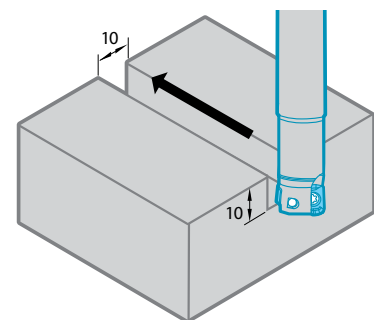
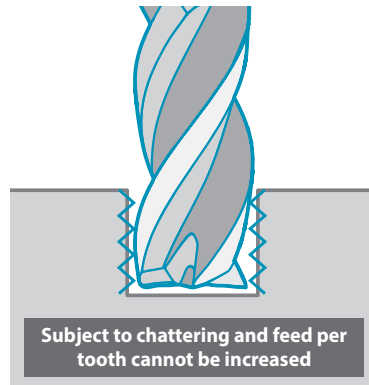
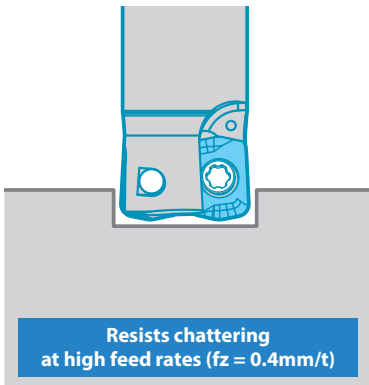
MFH Micro compared to solid end mills

MFH Micro $Q = 15.3\text{ cc/min}$
 $V_c = 150\text{ m/min}$, $f_z = 0.4\text{mm/t}$
 $a_p \times a_e = 0.4 \times 10\text{mm}$, dry
 MFH10-S10-01-2T (2 flutes)
 LPGT010210ER-GM (PR1525)



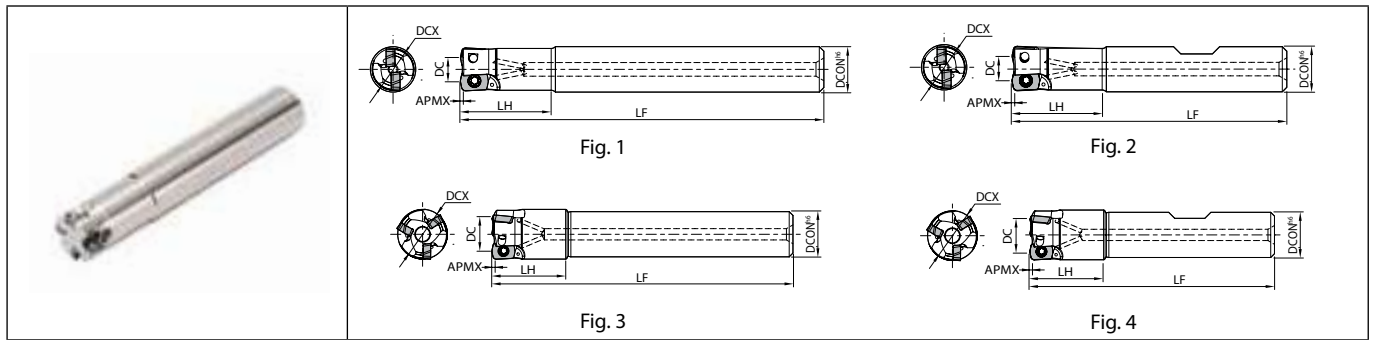
Solid end mill $Q = 12.2\text{ cc/min}$
 $V_c = 80\text{ m/min}$, $f_z = 0.04\text{mm/t}$
 $a_p \times a_e = 3 \times 10\text{mm}$, dry
 $\phi 10$ (4 flutes)

Machine part slotting workpiece material: 50C



(User evaluation)

MFH Micro



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)							A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Spare parts			Applicable inserts M226
			DC	DCX	DCON	LF	LH	APMX	Anti-seize compound						Screw	Wrench		
Cylindrical MFH 08-S10-01-1T 10-S10-01-2T 12-S12-01-3T 16-S16-01-4T	●	1	4.2	8	10	75	16	0.5	+5	Yes	20000	0.04	1	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM	
	●	2	6.2	10	80	20	16200				0.06	1						
	●	3	8.2	12	12	80	20				14000							0.06	1
	●	4	12.2	16	16	90	25				11400	0.12						1
MFH 14-S12-01-3T	●	3	10.2	14	12	80	20	0.5	+5	Yes	12500	0.07	3	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM	
Weldon MFH 08-W10-01-1T 10-W10-01-2T 12-W12-01-3T 16-W16-01-4T MFH 14-W12-01-3T	●	1	4.2	8	10	58	16	0.5	+5	Yes	20000	0.03	2	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM	
	●	2	6.2	10	60	20	16200				0.05	2						
	●	3	8.2	12	12	65	20				14000							0.05	2
	●	4	12.2	16	16	73	25				11400	0.1						2
	MFH 14-W12-01-3T	●	3	10.2	14	12	65				20	0.5							+5	Yes	12500	0.05	4	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.
 Recommended tightening torque for insert clamp : 0.5N·m

LPGT

Insert	Description	Dimension (mm)					Carbide				Applicable toolholder M226 M227
		S	D1	RE	W1	INSL	CVD	PVD			
<p>Classification of usage</p> <p>★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)</p>	Carbon steel / Alloy steel	☆	★	★	☆	☆	☆	☆	☆	☆	P
	Mold and die steel	☆	★	★	☆	☆	☆	☆	☆	☆	P
	Austenitic stainless steel				☆	☆	☆	☆	☆	☆	M
	Martensitic stainless steel	★									M
	Precipitation hardening stainless steel				☆	☆	☆	☆	☆	☆	M
	Gray cast iron										K
	Nodular cast iron										K
	Non-ferrous metals										N
	Heat-resistant alloy	★									S
	Titanium alloy						☆	☆	☆	☆	S
Hard materials										H	
LPGT 010210ER-GM		2.19	2.1	1	4.19	6.26	●	●	●	●	MFH...-01-..

Handed insert shows Right-hand

Recommended cutting conditions M228

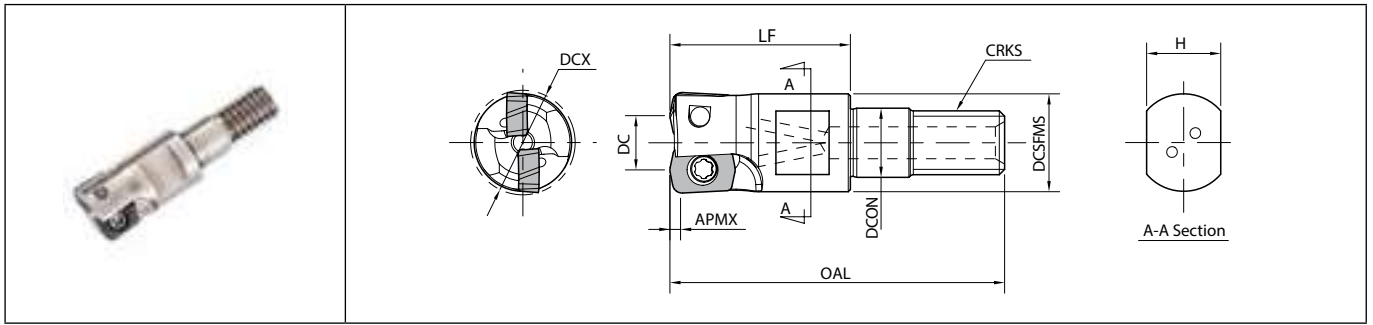
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M226



Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

MFH Micro



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)										A.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Spare parts			Applicable inserts ● M226
			DC	DCX	DCON	DCSFMS	OAL	LF	APMX	CRKS	H	Anti-seize compound				Screw	Wrench		
			MFH 08-M06-01-1T	●	1	4.2	8	6.5	9.2	30.5	17	0.5				M6x1.0	7	+5		Yes	20000	P-37	SB-1840TRP	FTP-6	LPGT010210ER-GM
MFH 10-M06-01-2T	●	2	6.2	10	11.2	14000													
MFH 12-M06-01-3T	●	3	8.2	12			11.2	12500											
MFH 14-M06-01-3T	●	3	10.2	14	11.2														
MFH 16-M08-01-4T	●	4	12.2	16			8.5		14.7	39	22	0.5	M8x1.25	12	+5	Yes	11400	P-37	SB-1840TRP	FTP-6

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Please use commercial shanks for cutting diameter from ø8 to ø14 (Screw size : M6 x 1.0)

Check screw specifications for the shank in use.

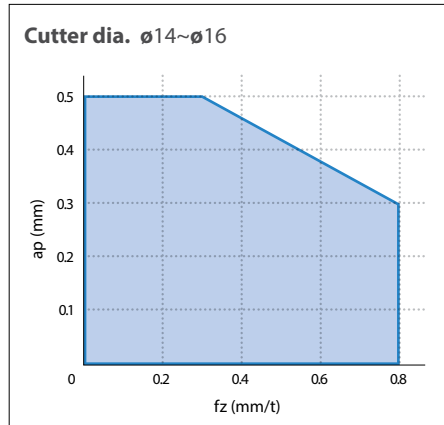
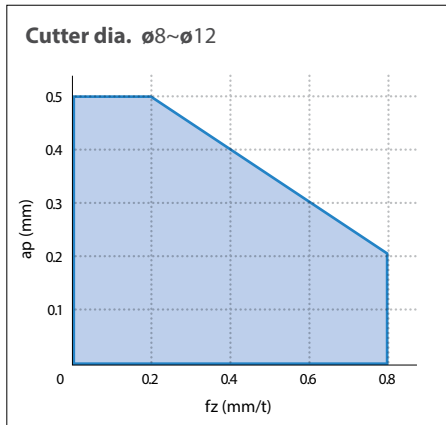
Recommended tightening torque for insert clamp : 0.5N·m

Actual End Mill depth (MFH16-M08-01-4T)

Arbor Description	Applicable End Mill (Head)			Actual End Mill depth (mm)
	Description	Cutting Dia.	Dimension	LUX
		DC	LF	
BT30K-M08-45	MFH16-M08-01-4T	16	22	28.8
BT40K-M08-55	MFH16-M08-01-4T	16	22	28.7

➔ See page M82 for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

Cutting performance



Recommended cutting conditions

Insert type	Workpiece material	Recommended feed rate (fz: mm/t): ap: 0.3mm (Reference value)					Recommended insert grades (Cutting speed Vc: m/min)		
		MFH08-...-1T	MFH10-...-2T	MFH12-...-3T	MFH14-...-3T	MFH16-...-4T	MEGACOAT NANO EX (MEGACOAT NANO)		CVD Coated carbide CA6535
							PR1825 (PR1525)	PR1835 (PR1535)	
GM	Carbon steel	0.2~ 0.4 ~0.6			0.2~ 0.5 ~0.8		★ 120~ 180 ~250	☆ 120~ 180 ~250	-
	Alloy steel	0.2~ 0.4 ~0.6			0.2~ 0.5 ~0.8		★ 100~ 160 ~220	☆ 100~ 160 ~220	-
	Mold steel (~40HRC)	0.2~ 0.3 ~0.5			0.2~ 0.4 ~0.6		★ 80~ 140 ~180	☆ 80~ 140 ~180	-
	Mold steel (40~50HRC)	0.2~ 0.25 ~0.3			0.2~ 0.25 ~0.4		★ 60~ 100 ~130	☆ 60~ 100 ~130	-
	Stainless steel (Austenitic related)	0.2~ 0.3 ~0.5			0.2~ 0.4 ~0.6		☆ 100~ 160 ~200	★ 100~ 160 ~200	-
	Stainless steel (Martensitic related)	0.2~ 0.3 ~0.5			0.2~ 0.4 ~0.6		-	☆ 150~ 200 ~250	★ 180~ 240 ~300
	Stainless steel (Precipitation hardening)	0.2~ 0.3 ~0.5			0.2~ 0.4 ~0.6		-	★ 90~ 120 ~150	-
	Gray cast iron	0.2~ 0.4 ~0.6			0.2~ 0.5 ~0.8		★ 120~ 180 ~250	-	-
	Nodular cast iron	0.2~ 0.3 ~0.5			0.2~ 0.4 ~0.6		★ 100~ 150 ~200	-	-
	Ni-base heat-resistant alloys	0.2~ 0.25 ~0.3			0.2~ 0.25 ~0.4		-	☆ 20~ 30 ~50	★ 20~ 30 ~50
Titanium alloys	0.2~ 0.25 ~0.3			0.2~ 0.25 ~0.4		-	★ 40~ 60 ~80	-	

Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys. The bold-faced number indicates a center value of recommended cutting condition.

★: 1st Recommendation ☆: 2nd Recommendation

Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation. Internal coolant is recommended for slotting.

Note for machining program (Approx. R)

Shape	Approx. R (mm)	Max. over machining of radius (mm)	Max. unmachined portion (mm)
	R1.0	0	0.21
	R1.2 (Recommended)	0	0.17
	R1.5	0.08	0.1
	R2.0	0.28	0.01

Cutting edge angle: 12°



- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Reference data for ramping

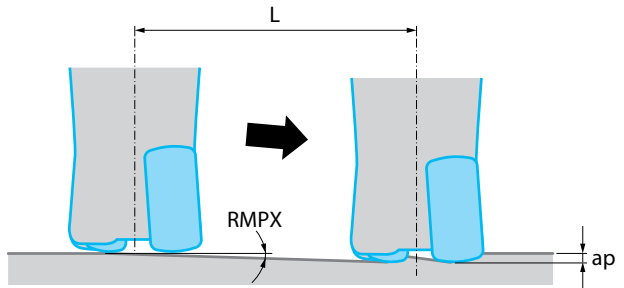
Description	Cutter dia. DCX (mm)	8	10	12	14	16
MFH...-01-...	Max. ramping angle RMPX	4.0°	3.0°	2.0°	1.5°	1.2°
	tan RMPX	0.070	0.052	0.035	0.026	0.021

Decrease ramping angle if chips become excessively long.

Guide for ramping (Slant milling)

Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length "L" at max. ramping angle $L = \frac{ap}{\tan RMPX}$

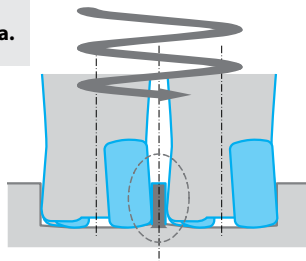


Guide for helical milling

For helical milling, use between min. cutting dia. and max. cutting dia.

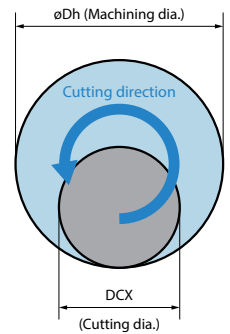
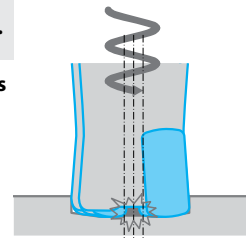
⊘ Exceeding max. cutting dia.

Center core part remains after machining



⊘ Under min. cutting dia.

Center core part interferes with toolholder

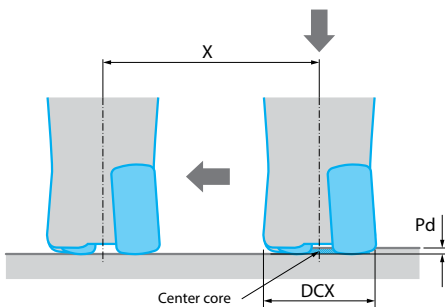


Description	Min. cutting dia.	Max. cutting dia.
MFH...-01-...	2×DCX-3.5	2×DCX-2

Unit: mm

- Sinking depth at helical milling should be max. ap (0.5mm) or under.
- Down-cut milling is recommended (refer to the figure above).
- Feed rate should be under 50% of the recommended cutting conditions.
- Be careful to machine in a safe environment to avoid accident caused by long chips.

Guide for drilling



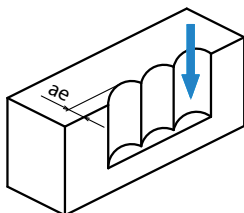
Description	GM type	
	Max. cutting depth	Min. cutting length X for flat bottom surface
MFH...-01-...	0.5	DCX-3.5

Unit: mm

- * When traversing directly after drilling, set the table feed at up to 25% of the recommended cutting conditions.
- * When drilling, reduce feed rate per revolution to under f=0.2mm/rev.

Vertical milling (Plunging)

Vertical milling (Plunging)



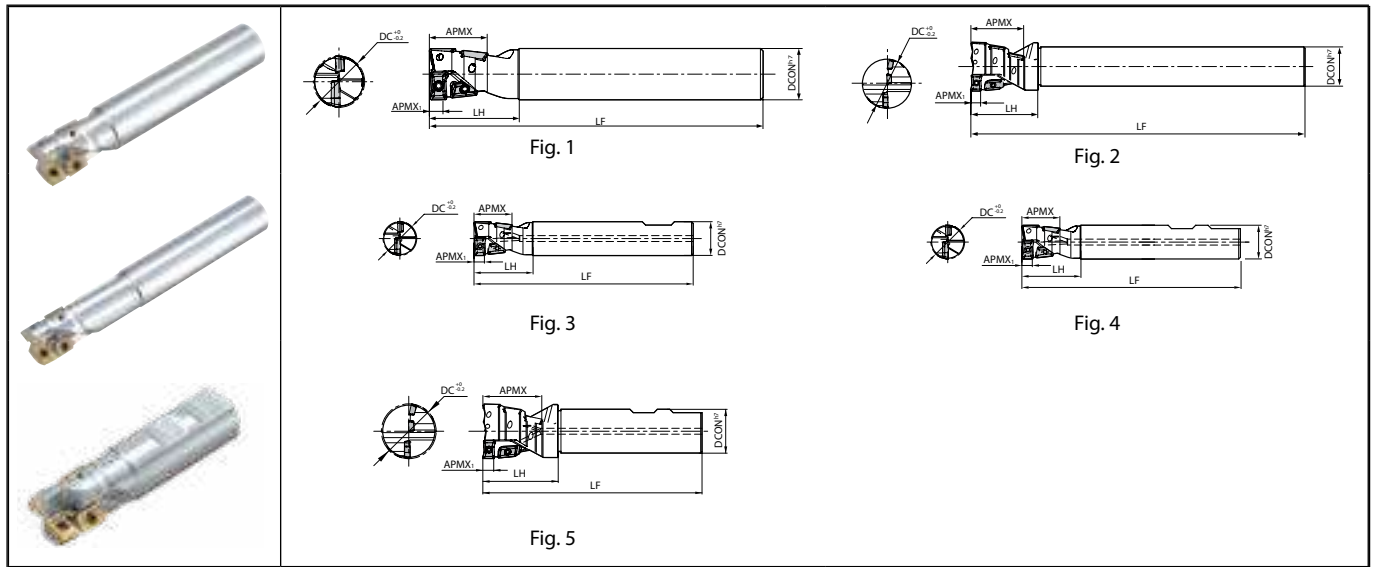
Available for vertical milling (plunging).

Insert description	Max. width of cut
LOGT01 type	1.7mm

For vertical milling (plunging), reduce feed rate to fz=0.2mm/t or less.



MEY



Toolholder dimensions

Description	Availability	Inserts	Flutes	Dimension (mm)						A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts M232			
				DC	DCON	LF	LH	APMX	APMX _i					Anti-seize compound	Screw	Wrench				
																		Image of anti-seize compound	Image of screw	Image of wrench
Standard	●	4	2	16	16	120	31	19	4.5	+11	-11	No	1	P-37	Image of anti-seize compound	Image of screw	Image of wrench	Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D		
				17	16	120	31	19	4.5	+11	-11								1	
				20	20	130	35	22	6	-9	-9								1	
				21	20	130	35	22	6	-9	-9								1	
				25	25	140	40	28	7.5	-11	-11								1	
				26	25	140	40	28	7.5	-11	-11								1	
				32	32	150	50	36	9.5	+13	-9								-9	1
				33																	1
				40	40	160	55	42	7.5	-11	-11								2	
				50	50	170	70	54	9.5	-9	-9								2	
Long head	●	4	2	16	16	140	51	19	4.5	+11	-11	No	1	P-37	Image of anti-seize compound	Image of screw	Image of wrench	Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D		
				20	20	150	53	22	6	-9	-9								1	
				25	25	170	70	28	7.5	+13	-11								1	
				32	32	180	80	36	9.5	-9	-9								1	
Long shank	●	4	2	16	16	190	61	19	4.5	+11	-11	No	1	P-37	Image of anti-seize compound	Image of screw	Image of wrench	Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D		
				17			31													
				20	20	200	63	22	6	-9	-9								1	
				21	35															
				25	25	220	80	28	7.5	-11	-11								1	
				26	40															
				32	32	230	90	36	9.5	+13	-9								-9	1
				33			50													
				40	40	240	55	42	7.5	-11	-11								2	
				50	50	250	70	54	9.5	-9	-9								2	

APMX_i shows the edge length of the complete 2-insert part.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M230

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

Toolholder dimensions

Description	Availability	Inserts	Flutes	Dimension (mm)						A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts ● M232		
				DC	DCON	LF	LH	APMX	APMX1					Anti-seize compound	Screw	Wrench			
Weldon	MEY	16-S16-80W-H	●	4	2	16	16	80	31	19	4.5	+11	-11	No	P-37	3	SB-2040TRG	DTM-6	Center Edge : GOMT08T208ER-D Side Edge : JOMT08T208ER-D
		17																	
		20-S20-85W-H	●			20	20	85	35	22	6	-9	3			SB-2555TRG	DT-8	Center Edge : GOMT100308ER-D Side Edge : JOMT100308ER-D	
		21																	
		21-S20-85W-H	●			21	25	95	40	28	7.5	-11	4			SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D	
		25-S25-95W-H	●			25													
		32-S32-110W-H	●			32	32	110	50	36	9.5	+13	-9			4	SB-4070TRG	DT-15	Center Edge : GOMT160408ER-D Side Edge : JOMT160408ER-D
		33-S32-110W-H	●			33													
40-S32-130W-H	●	7	40	130	55	42	7.5	-11	5	SB-3070TRG	DT-10	Center Edge : GOMT13T308ER-D Side Edge : JOMT13T308ER-D							

APMX1 shows the edge length of the complete 2-insert part.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Applicable Inserts

Description		Applicable Inserts ● M232			
		Side Edge	No. of Inserts	Center Edge	No. of Inserts
MEY	16-S16(-...)	JOMT08T208ER-D	3	GOMT08T208ER-D	1
	17-S16(-...)				
	20-S20(-...)				
	21-S20(-...)	JOMT100308ER-D		GOMT100308ER-D	
	25-S25(-...)				
	26-S25(-...)				
	32-S32(-...)	JOMT160408ER-D	GOMT160408ER-D		
	33-S32(-...)				
40-S32(-...)	JOMT13T308ER-D	6	GOMT13T308ER-D		
50-S42(-...)				JOMT160408ER-D	GOMT160408ER-D

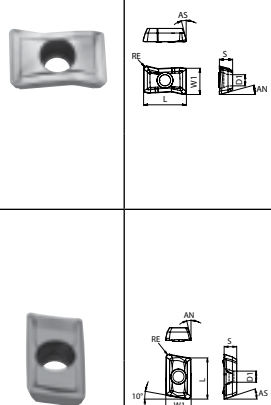
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M



Milling

GOMT/JOMT

Insert		Description	No. of edges	Dimension (mm)					Angle (°)		Carbide	Applicable toolholder ● M230 ● M231
				S	D1	RE	L	W1	AN	AS		
		GOMT 08T208ER-D	2	2.78	2.3	0.8	8.7	5.21	17	13	●●	MEY16-S16(-...) MEY17-S16(-...)
		GOMT 100308ER-D	2	3.3	2.8	0.8	10.7	6.56	17	13	●●	MEY20-S20(-...) MEY21-S20(-...)
		GOMT 13T308ER-D	2	3.85	3.4	0.8	13.2	8.36	17	13	●●	MEY25-S25(-...) MEY26-S25(-...) MEY40-S32(-...)
		GOMT 160408ER-D	2	4.76	4.4	0.8	16.7	10.03	17	13	●●	MEY32-S32(-...) MEY33-S32(-...) MEY50-S42(-...)
		JOMT 08T208ER-D	2	2.78	2.3	0.8	8.5	5.14	13	17	●●	MEY16-S16(-...) MEY17-S16(-...)
		JOMT 100308ER-D	2	3.18	2.8	0.8	10.2	6.41	13	17	●●	MEY20-S20(-...) MEY21-S20(-...)
		JOMT 13T308ER-D	2	3.7	3.4	0.8	13.2	8.07	13	17	●●	MEY25-S25(-...) MEY26-S25(-...) MEY40-S32(-...)
		JOMT 160408ER-D	2	4.5	4.4	0.8	16.7	9.72	13	17	●●	MEY32-S32(-...) MEY33-S32(-...) MEY50-S42(-...)

Handed insert shows Right-hand

Recommended cutting conditions ● M232

Classification of usage

- ★ : Roughing / 1st Choice
- ☆ : Roughing / 2nd Choice
- : Finishing / 1st Choice
- : Finishing / 2nd Choice
- (In case hardness is 45HRC or under)

Carbon steel / Alloy steel	★	P
Mold and die steel	★	
Austenitic stainless steel	☆	M
Martensitic stainless steel		
Precipitation hardening stainless steel		
Gray cast iron	★	
Nodular cast iron	★	K
Non-ferrous metals		N
Heat-resistant alloy		S
Titanium alloy		
Hard materials		

M



Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M232

Recommended cutting conditions

Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)	
			MEGACOAT NANO EX	
	Drilling	Shouldering, slotting	PR1810	PR1825
Carbon steel	0.08~0.15	0.05~0.25	-	★ 120~250
Alloy steel	0.08~0.15	0.05~0.25	-	★ 100~220
Mold steel	0.08~0.12	0.05~0.15	-	★ 80~180
Stainless steel	0.08~0.12	0.05~0.15	-	★ 120~220
Cast iron	0.05~0.20	0.05~0.25	★ 100~220	-

★: 1st Recommendation ☆: 2nd Recommendation

Caution of drilling

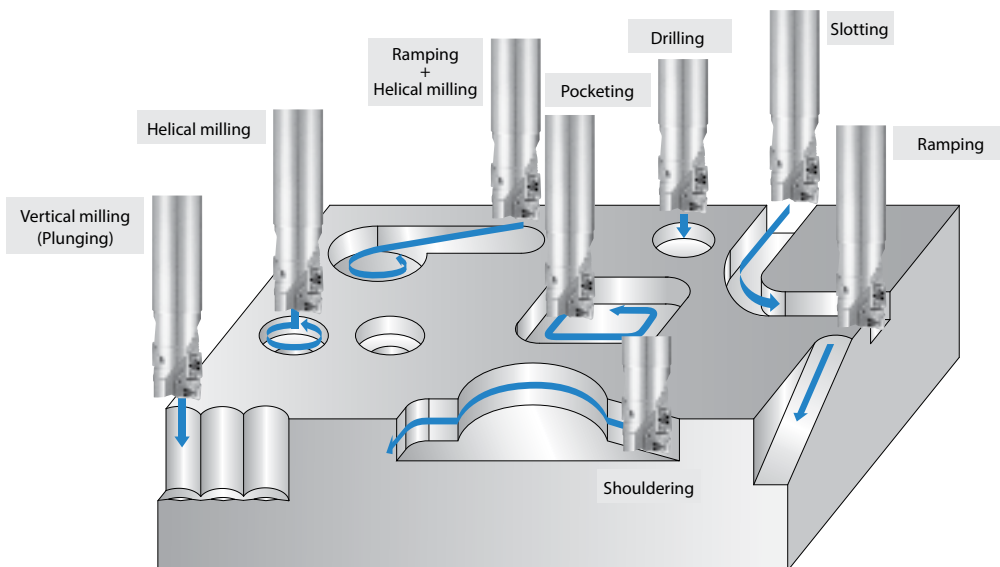
1. Drilling conditions should be calculated as one flute line.
2. Use compressed air during drilling.
3. Carbon steel other than low carbon steel can be drilled to a depth of 0.5D without step feeding.
For soft steel or sticky material such as stainless steel, Step feed drilling (0.5 ~ 1.0mm) is recommended.
4. For stainless steel drilling, coolant is recommended.
5. Please refer to right list for maximum hole depth.

Cutting dia. (DC)	Max. hole depth (mm)
ø16	13
ø17	13
ø20	17
ø21	17
ø25	22
ø26	22
ø32	29
ø33	29
ø40	36
ø50	40

Shape of the bottom of the drilled hole

Cutting dia.	a (mm)	Shape of the bottom
ø16, ø17	0.5	
ø20, ø21	0.64	
ø25, ø26	0.85	
ø32, ø33	1.12	
ø40	1.54	
ø50	1.65	

Examples of MEY multi-function machining



M



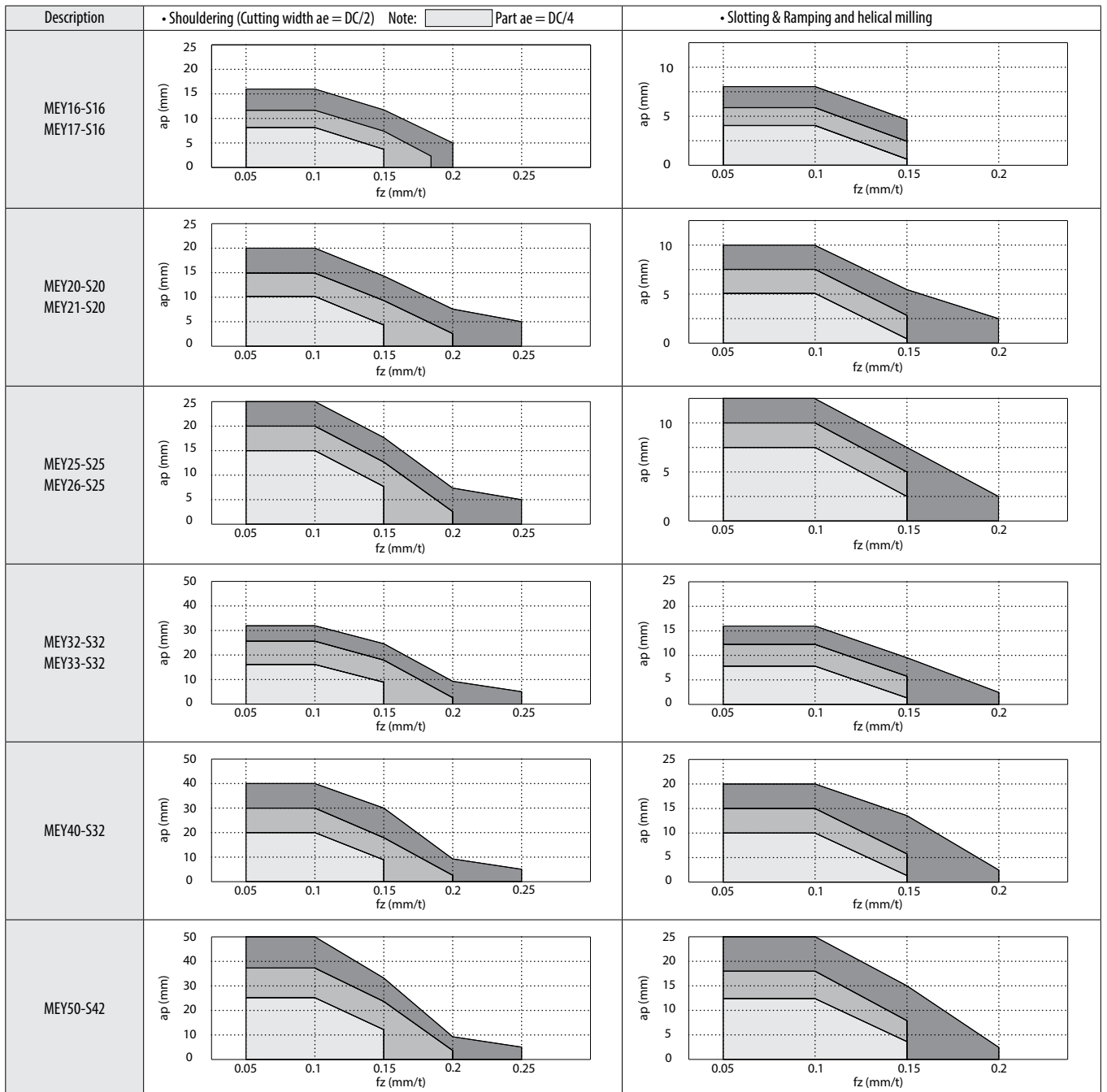
Milling

Cutting performance of MEY

Workpiece material: C50

Cutting dia.	Description	Overhang length LPR (mm)			Cutting dia.	Description	Overhang length LPR (mm)			Shape
ø16	MEY16-S16	31	[~61]	(Not recommended)	ø25	MEY25-S25	40	[~70]	(Not recommended)	
	MEY16-S16-140H	-	~61	[~91]		MEY25-S25-170H	-	70	[~100]	
	MEY16-S16-190	-	61	~91		MEY25-S25-220	-	~80	~100	
ø17	MEY17-S16	31	[~61]	(Not recommended)	ø26	MEY26-S25	40	[~70]	(Not recommended)	
	MEY17-S16-190	31	~61	~91		MEY26-S25-220	40	~70	~100	
ø20	MEY20-S20	35	[~65]	(Not recommended)	ø32	MEY32-S32	50	[~80]	(Not recommended)	
	MEY20-S20-150H	-	~65	[~95]		MEY32-S32-180H	-	~80	[~110]	
	MEY20-S20-200	-	65	~95		MEY32-S32-230	-	90	~110	
ø21	MEY21-S20	35	[~65]	(Not recommended)	ø33	MEY33-S32	50	[~80]	(Not recommended)	
	MEY21-S20-200	35	~65	~95		MEY33-S32-230	50	~80	~110	
ø40	MEY40-S32	55	[~85]	[~115]	ø50	MEY50-S42	70	[~100]	[~130]	
	MEY40-S32-240	55	~85	~115		MEY50-S42-250	70	~100	~130	

When using in [] dimension, be careful that the chucking length to the shank may get too short.



M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

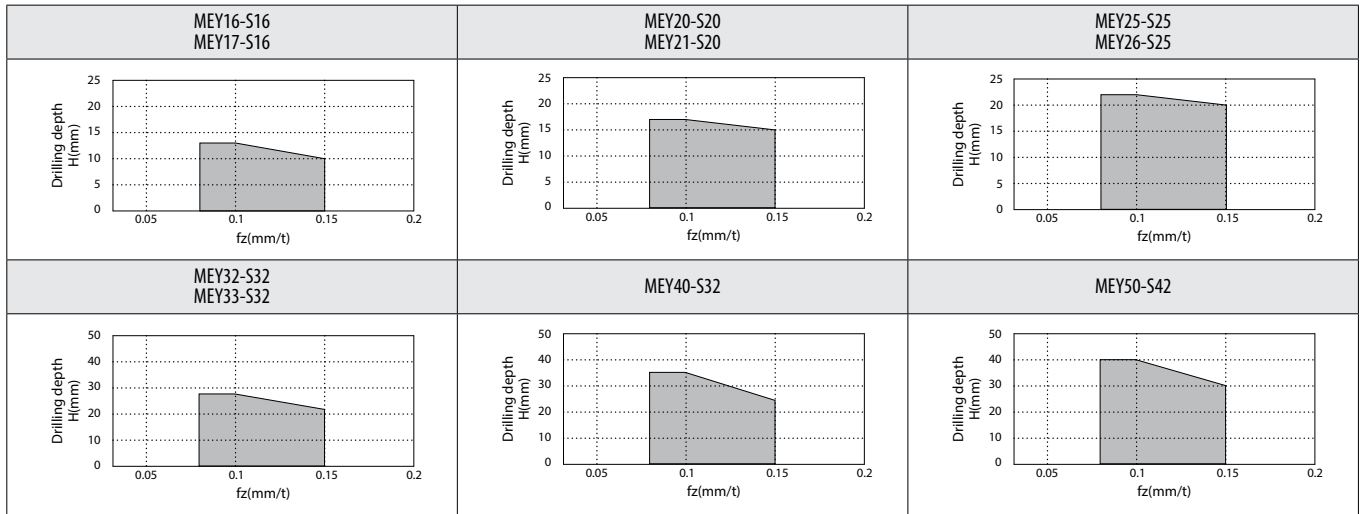
Multi-Function

Slot Mill

Ball-nose Radius

Others

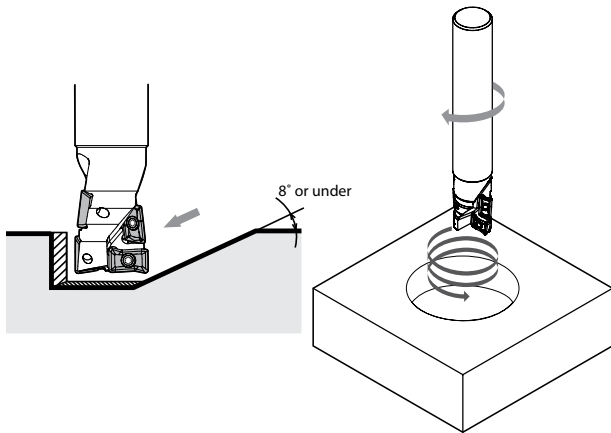
Drilling (Standard/long head/long shank: C50)



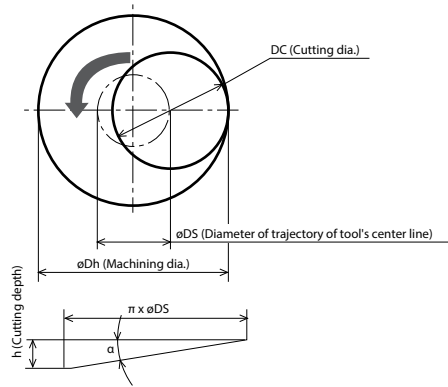
How to use MEY effectively

Ramping/Helical milling

- Ramping angle is recommended to be 8° or under.
- Sinking depth per revolution when helical milling should be 1/2DC or under.
- Use compressed air during machining.



Helical milling factors



øDS (How to find diameter of trajectory of tool's center line)

$$\text{øDS} = \text{øDh} - \text{DC}$$

h How to find "h"

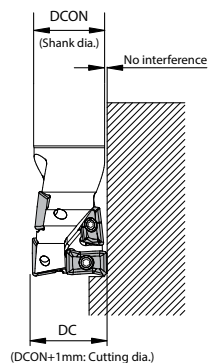
$$h = \pi \times \text{øDS} \times \tan \alpha$$

(α should be 8° or under)

Shouldering

- Tools with 1mm larger cutting diameter than shank diameter are available.
- High wall shouldering is possible.

Lineup	(mm)	
Description	DC	DCON
MEY17-S16	17	16
MEY21-S20	21	20
MEY26-S25	26	25
MEY33-S32	33	32
MEY17-S16-190	17	16
MEY21-S20-200	21	20
MEY26-S25-220	26	25
MEY33-S32-230	33	32





Full range from 1.6 mm to 23.3 mm in 3 types

Lineup of MST series slot mills

Type	Applicable inserts	Features	Slot width (mm)															
			1.6	2.2 (2.25)	3.05	4.05	6	8	10	13	14	16	18	20	22	24		
MSTA	SLT..	1.6 ~ 4.05 mm fixed	●	●	●	●												
MSTB	LNEU12..	6 ~ 13 mm semi-adjustable					▶ * Adjustable in 0.5mm increments between 6mm and 13mm with the combination of inserts											
MSTC	SP..10T3..	14 ~ 18 mm full-adjustable									▶ * Adjustable between 14mm and 18mm							
	SD..1204...	18 ~ 23.3 mm full-adjustable												▶ * Adjustable between 18mm and 23.3mm				



Slot mill MSTA (Slot width 1.6, 2.2(2.25), 3.05, 4.05 mm)

Self-clamping type slot mill

MSTA slot mills have simple self-clamping system to allow for easy attachment by just installing the insert.

High rigidity clamping system

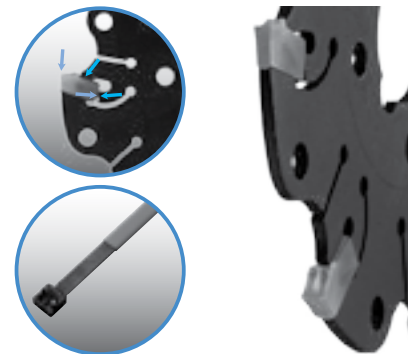
Owing to the high rigidity clamping system – with an end – stopper, the toolholder enable high operability and stable slotting by maintaining an accurate edge position.

Double-prism clamping system

High replacement precision with the double-prism clamping system

Easy replacement

The replacement of inserts is easy and quick by using special wrench.



Wrench is not attached. Please purchase it separately.

Slot mill MSTB (Slot width 6.0 ~ 13.0mm)

Up-right type/semi-adjustable slot width

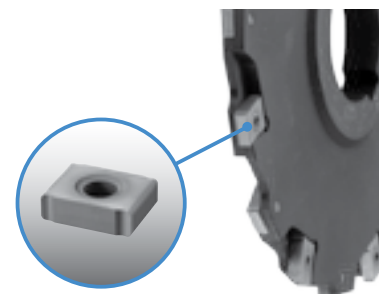
Easy and secure screw holding

Inserts can be attached to the MSTB slot mills very easily by using clamp screws.

Economical inserts with 4 cutting edges

Applicable to a variety of slotting by choosing different inserts

By changing the thickness of inserts, it's applicable to various slotting widths up to max 13mm in 0.5mm increments.



- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Slot mill MSTC (Slot width 14.0 ~ 23.3 mm)

Lay-down type/full-adjustable slot width

Applicable to various slotting needs. Slotting widths: 14.0mm to 23.3mm.

Cutter dia.: from 100mm to 160mm

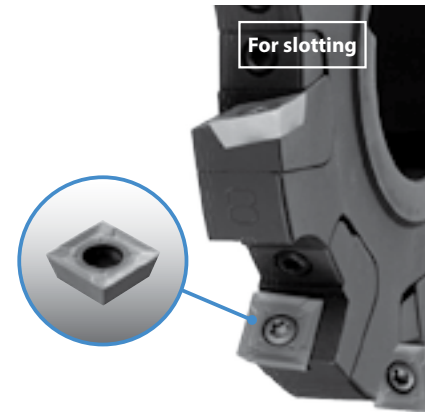
Smooth slotting width adjustment is possible owing to unique cam style adjustment mechanism.

Economical 4-edge Insert

A wide range of corner-R is suitable for various work.

Owing to the wiper edge insert, an excellent surface finish can be expected.

Owing to numerous insert geometries and grades, they are applicable for various types of workpiece machining.



*Change to silver coating in sequence.

Features of insert grades

Insert shape			
Symbol	SB	SD	SE
Rake angle			
Shape			

CA0835

- TiN+TiCN+Al₂O₃ based CVD coated carbide
- For carbon steel, alloy steel, stainless steel and nodular cast iron.
- For middle to high speed machining.

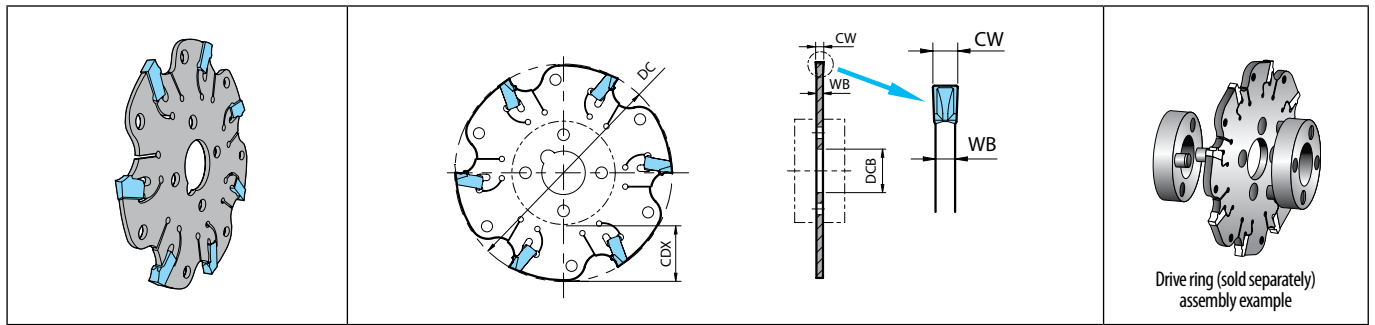
PR0725

- TiN+TiCN+TiN based multi-layer PVD coated carbide
- For carbon steel, alloy steel, stainless steel, heat-resistant alloys and cast iron.
- For middle speed machining.

PR0110

- TiB₂ based PVD coated carbide
- For non-ferrous metals such as aluminum alloys (Si<10%) and titanium alloys.
- For high speed machining.

MSTA



Toolholder dimensions (Metric)

Description	Availability	N	Dimension (mm)					Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Applicable inserts ● M240
			DC	DCB	CDX	WB	CW				
MSTA 63N16-5T	●	5	63	16	15	1.3	1.6	No	5100	0.03	SLT.-.-SKB SLT.-.-SKD
80N16-7T	●	7	80	21	15				4000	0.04	
100N16-9T	●	9	100	22	27				3200	0.07	
125N16-11T	●	11	125	32	35				2600	0.1	
MSTA 63N22-5T	●	5	63	16	15	1.8	2.2 (2.25)	No	5100	0.03	SLT.-.-SKB SLT.-.-SKD
80N22-7T	●	7	80	21	15				4000	0.05	
100N22-9T	●	9	100	22	27				3200	0.08	
125N22-11T	●	11	125	32	35				2600	0.12	
MSTA 160N22-14T	●	14	160	40	40				2000	0.3	
MSTA 63N30-4T	●	4	63	16	15	2.4	3.05	No	5100	0.05	SLT.-.-SKB SLT.-.-SKD
80N30-6T	●	6	80	21	15				4000	0.08	
100N30-9T	●	9	100	22	27				3200	0.13	
125N30-11T	●	11	125	32	35				2600	0.2	
MSTA 160N30-14T	●	14	160	40	40				2000	0.35	
MSTA 63N40-4T	●	4	63	16	15	3.4	4.05	No	5100	0.06	SLT.-.-SKB SLT.-.-SKD
80N40-6T	●	6	80	21	15				4000	0.1	
100N40-9T	●	9	100	22	27				3200	0.15	
125N40-11T	●	11	125	32	35				2600	0.25	
MSTA 160N40-14T	●	14	160	40	40				2000	0.4	

Attach the drive ring (sold separately) to MSTA slot mill to use. Drive ring is sold singularly.

Please purchase two drive rings per one MSTA slot mill.

Do not exceed the max. revolution.

Do not operate cutting on reverse revolution.

Wrench (MS-FRW1) is not attached. Please purchase it separately.

Drive ring (For Metric)

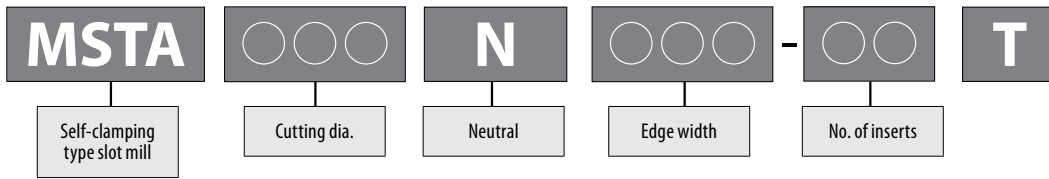
Shape	Description	Availability	Dimension (mm)					Drawing	Applicable toolholders
			DCB	DIOUT	WB	KWW	DCON		
	DR16-32A	●	16	32	8	4.1	3	Fig. 2	MSTA 63N16-5T
	DR16-32B	●		32					MSTA 63N22-5T
	DR16-38	●		38			4	Fig. 1	MSTA 63N30-4T
	DR22-46	●	22	46	10	6.1	5		MSTA 63N40-4T
	DR32-55	●	32	55	10	8.1	6	Fig. 3	MSTA 80N○○-○T
	DR40-80	●	40	80	12	10.1	12		MSTA 100N○○-○T
									MSTA 125N○○-○○T
									MSTA 160N○○-○○T

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Identification system MSTA toolholder



Toolholder dimensions (inch spec)

Description	Availability	Inserts	Dimension (in , (mm))					Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Applicable inserts M240
			DC	DCB	CDX	CW	WB				
MSTA 02N063-5T 03N063-7T 04N063-9T 05N063-11T	●	5	2.5 (63.5)	0.625 (15.875)	0.625 (15.875)	0.063 (1.6)	0.051 (1.3)	No	5100	0.03	SLT...SKB SLT...SKD
	●	7	3 (76.2)						0.875 (22.225)	4000		0.04
	●	9	4 (101.6)	1 (25.4)	3200				0.07		
	●	11	5 (127)	1.25 (31.75)	2600				0.1		
MSTA 03N089-7T 04N089-9T 06N089-14T	●	7	3 (76.2)	0.625 (15.875)	0.875 (22.225)	0.089 (2.2) (2.25)	0.071 (1.8)	No	4000	0.05	SLT...SKB SLT...SKD
	●	9	4 (101.6)	1 (25.4)	1.063 (27)				3200	0.08	
	●	14	6 (152.4)	1.25 (31.75)	1.438 (36.525)				2000	0.3	
MSTA 02N126-4T 03N126-6T 04N126-9T 05N126-11T 06N126-14T	●	4	2.5 (63.5)	0.625 (15.875)	0.625 (15.875)	0.120 (3.05)	0.095 (2.4)	No	5100	0.05	SLT...SKB SLT...SKD
	●	6	3 (76.2)						0.875 (22.225)	4000		0.08
	●	9	4 (101.6)	1 (25.4)	1.063 (27)				3200	0.13	
	●	11	5 (127)	1.25 (31.75)	1.375 (34.925)				2600	0.2	
MSTA 03N164-6T 04N164-9T 05N164-11T	●	6	3 (76.2)	0.625 (15.875)	0.875 (22.225)	0.160 (4.05)	0.134 (3.4)	No	4000	0.1	SLT...SKB SLT...SKD
	●	9	4 (101.6)	1 (25.4)	1.063 (27)				3200	0.15	
	●	11	5 (127)	1.25 (31.75)	1.375 (34.925)				2600	0.25	

Attach the drive ring (sold separately) to MSTA slot mill to use. Drive ring is sold singularly.
 Please purchase two drive rings per one MSTA slot mill.
 Do not exceed the max. revolution.
 Do not operate cutting on reverse revolution.
 Wrench (MS-FRW1) is not attached. Please purchase it separately.



Drive ring (For Inch spec)

Shape	Description	Availability	Dimension (inch)					Drawing	Applicable toolholders
			DCB	DIOUT	WB	KWW	DCON		
	DR0625-1250A	●					.158 (4mm)	Fig. 1	MSTA 02N126-4T
	DR0625-1250B	●	.625 (15.875mm)	1.250 (31.75mm)	.315 (8mm)	.130 (3.3mm)		Fig. 2	MSTA 02N063-5T
	DR0625-1250C	●					.120 (3mm)	Fig. 3	MSTA 03N○○○-○T
	DR1000-1875	●	1.000 (25.4mm)	1.875 (47.625mm)		.256 (6.5mm)	.200 (5mm)		MSTA 04N○○○-○T
	DR1250-2250	●	1.250 (31.75mm)	2.250 (57.15mm)	.394 (10mm)	.319 (8.1mm)	.240 (6mm)		MSTA 05N○○○-○T
	DR1250-3125	●	1.250 (31.75mm)	3.125 (79.375mm)	.472 (12mm)	.319 (8.1mm)	.472 (12mm)		MSTA 06N○○○-○T

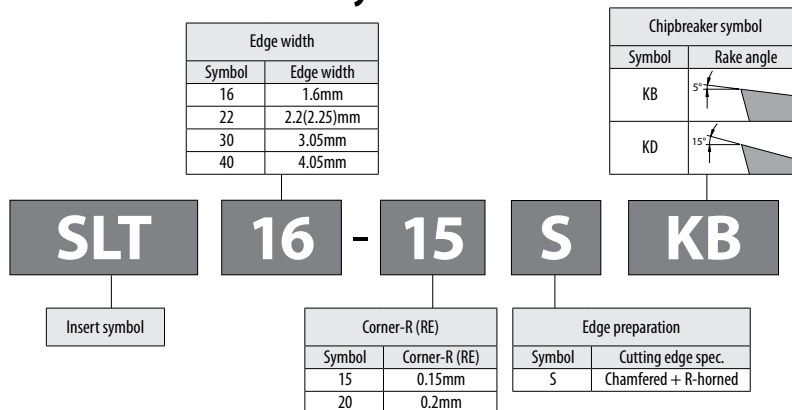
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SLT

Insert		Description	Dimension (mm)		Angle (°)	Tolerance (mm)		Carbide		Applicable toolholder M238 M239
			CW	RE	GAN	CW min.	CW max.	CA0835	PVD	
		SLT 16-15SKB	1.6	0.15	5	-0.1	0	●	○	MSTA...
		SLT 22-20SKB	2.2	0.2	5	-0.05	+0.08	●	●	
		SLT 30-20SKB	3.05	0.2	5	0	+0.15	●	●	
		SLT 40-20SKB	4.05	0.2	5	0	+0.15	●	●	
		SLT 16-15SKD	1.6	0.15	15	-0.1	0	●	●	
		SLT 22-20SKD	2.25	0.2	15	0	+0.15	●	●	
		SLT 30-20SKD	3.05	0.2	15	0	+0.15	●	●	
		SLT 40-20SKD	4.05	0.2	15	0	+0.15	●	●	

Recommended cutting conditions M241

Inserts identification system



Selection of chipbreaker

- KB chipbreaker ... general purpose chipbreaker for steel and cast iron
- KD chipbreaker ... low cutting force chipbreaker for stainless steel

Features of insert grades

CA0835

- TiN+TiCN+Al₂O₃ based CVD Coated carbide
- For carbon steel, alloy steel, stainless steel and cast iron
- For middle to high speed machining

PR0735

- TiN base PVD Coated carbide
- For stainless steel, heat-resistant alloys, etc.
- For low to middle speed machining

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

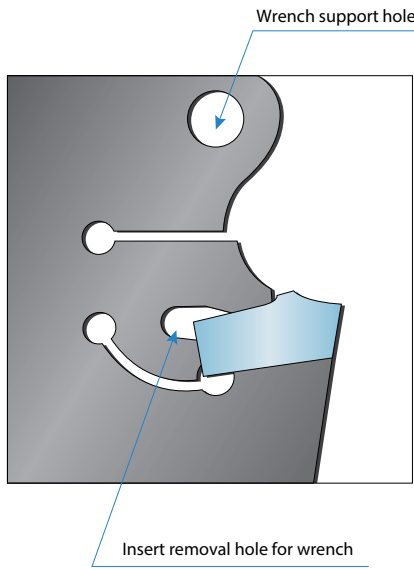
M240



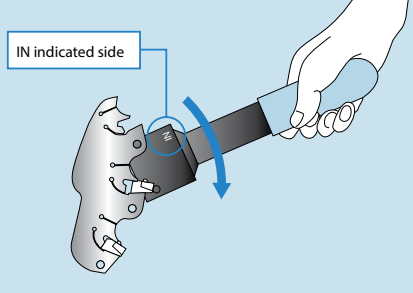
Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi-Function
Slot Mill
Ball-nose Radius
Others

Set up

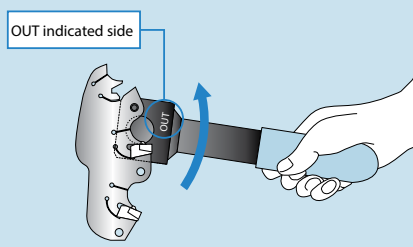


How to attach inserts



1. Put insert inside the slot mill.
2. Insert one of the pins on the wrench (on IN indicated side) into the wrench support hole.
3. Using the other pin, push the front relief surface of the insert.
4. Rotate the wrench until insert's back end makes contact with slot mill.

How to detach inserts



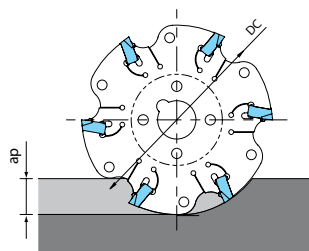
1. Insert one of the pins on the wrench (on OUT indicated side) into the wrench support hole, and insert other pin into the insert releasing hole.
2. Insert can be uninstalled by rotating the wrench counterclockwise. (A magnet is installed on OUT indicated side.)

Note: Use appropriate wrench for set up.

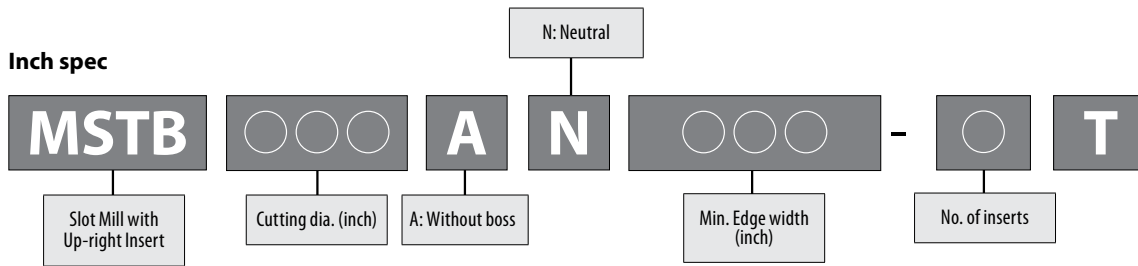
Recommended cutting conditions

Workpiece material		Hardness (HB)	Recommended insert grades (Vc: m/min)		fz (mm/t)				Remarks
			CVD coated carbide	PVD coated carbide	Edge width (mm)				
			CA0835	PR0735	1.6	2.2(2.25)	3.05	4.05	
Low carbon steel	C10 ~ C25	125	250~310	200~250	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	Coolant
Carbon steel	C30 ~ C60 (Annealed)	190	160~190	130~160	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
	C30 ~ C60 (Heat treated)	250	140~180	110~150	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
Alloy steel	CrMo, Cr (Annealed)	180	140~180	110~150	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
	CrMo, Cr (Heat treated)	275	120~160	100~130	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
High carbon alloy	X153CrMoV12, X40CrMoV51, etc.	280	100~140	80~120	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
Stainless steel	Austenitic related X5CrNi18 10, X5CrNiMo17 12 2, CrNi2520, etc.	220	150~190	80~120	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
	Martensitic related X10Cr13, X6Cr17 etc.	300	140~180	60~80	0.03~0.10	0.04~0.12	0.06~0.16	0.08~0.18	
Gray cast iron	GG25 ~ GG35	260	160~200	-	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	Dry
Nodular cast iron	GGG40 ~ GGG50	160	130~160	-	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	
	GGG60 ~ GGG80	250	110~140	-	0.03~0.12	0.04~0.14	0.06~0.18	0.08~0.20	

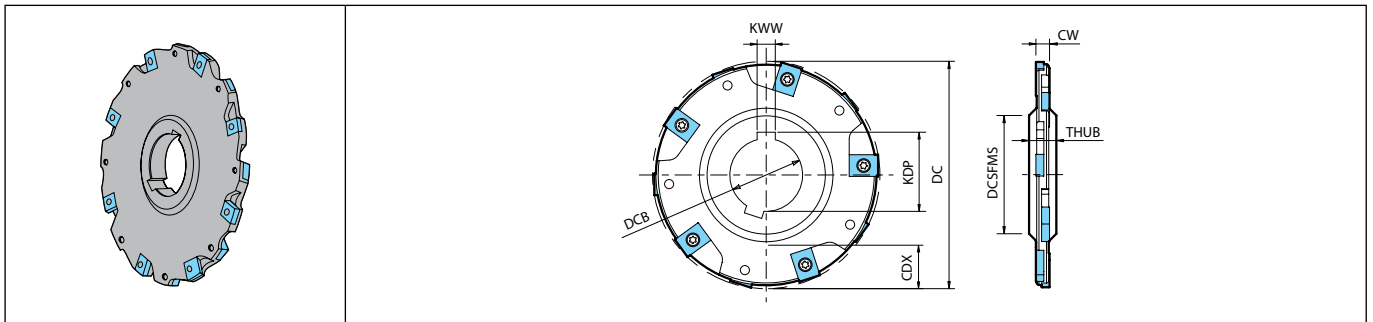
Note: 1. Use down-cut machining.
 2. If ap is 1/10 or under of cutter dia.(DC), it is possible to increase feed per tooth (fz) by 40%.



Identification system toolholder MSTB



MSTB (Without Boss, Inch spec)



In order to be used in combination with two or more mills, this slot mill has 2 key slots.

Toolholder dimensions

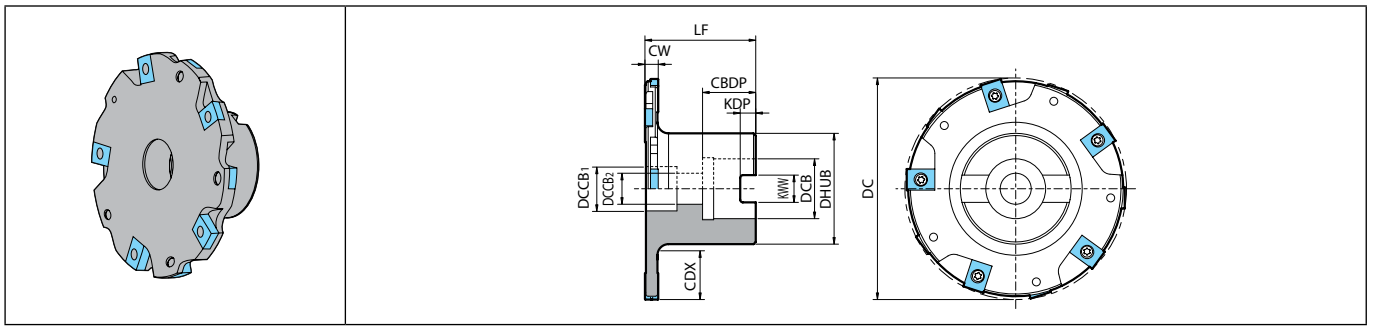
Description	Availability		Dimension (in , (mm))											Coolant hole Max. revolution (min ⁻¹)	Weight (kg)	Spare parts			Applicable inserts ➔ M245
	N	Inserts	Edge line	DC	DCS _{FMS}	DCB	KDP	KWW	CDX	THUB	CW min.	CW max.	Anti-seize compound			Screw	Wrench		
MSTB 3000AN250-4T 4000AN250-5T 5000AN250-6T 6000AN250-8T	●	8	4	3 (76.2)	1.5 (38.1)	1 (25.4)	1.106 (28.1)	0.25 (6.35)	0.625 (15.875)				No	9470 8200 7300 6700	0.3 0.7 1	P-37	SE-40055TR	TT-15	LNEU12...
	●	10	5	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	0.935 (23.8)	0.5 (12.7)	0.25 (6.35)	0.289 (7.34)							
	●	12	6	5 (127)					1.435 (36.4)										
	●	16	8	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.75 (44.45)										
MSTB 4000AN312-5T 5000AN312-6T 6000AN312-8T	●	10	5	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	0.966 (24.5)				No	7400 6600 6000	0.5 0.8 1.1	P-37	SE-40068TR	TT-15	LNEU12...
	●	12	6	5 (127)					1.466 (37.2)	0.5 (12.7)	0.312 (7.92)	0.351 (8.91)							
	●	16	8	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.781 (45.2)										
MSTB 4000AN375-3T 5000AN375-4T 6000AN375-5T	●	9	3	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	1 (25.4)				No	7400 6600 6000	0.5 0.8 1.3	P-37	SE-40068TR	TT-15	LNEU12...
	●	12	4	5 (127)					1.5 (38.1)	0.5 (12.7)	0.375 (9.525)	0.414 (10.52)							
	●	15	5	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.812 (46)										
MSTB 4000AN500-3T 5000AN500-4T 6000AN500-5T	●	9	3	4 (101.6)	1.88 (47.8)	1.25 (31.75)	1.386 (35.2)	0.312 (7.92)	1.06 (26.9)				No	4900 4400 4000	0.6 1.1 1.7	P-37	SE-40090TR	TT-15	LNEU12...
	●	12	4	5 (127)					1.56 (39.6)	0.5 (12.7)	0.5 (12.7)	0.539 (13.69)							
	●	15	5	6 (152.4)	2.25 (57.2)	1.5 (38.1)	1.665 (42.3)	0.375 (9.52)	1.875 (47.6)										

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



MSTB (With Boss, Metric)



Toolholder dimensions

Description	Availability		Edge line	Dimension (mm)														Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Spare parts				Applicable inserts M245
	N	Inserts		DC	DCB	DCCB ₁	DCCB ₂	LF (min.)	CDBP	KDP	KWW	CDX	DHUB	CW min.	CW max.	Anti-seize compound	Mounting bolt				Screw	Wrench			
																							Max. revolution (min ⁻¹)	Weight (kg)		Anti-seize compound	Mounting bolt	Screw	Wrench
MSTB 80SN0607-4T 100SN0607-5T 160SN0607-8T	●	8	4	80	22	18	12		23	6.3	10.4	16	40			No	9240	0.7	P-37	HH10X35	SE-40050TRN	TT-15	LNEU12...		
	●	10	5	100	27	20	14	50	24	7	12.4	21	50	6	7	No	8270	1		HH12X35					
	●	16	8	160	40	33	22		28	9	16.4	41	70			No	6540	1.9		HH20X40					
MSTB 80SN0809-4T 100SN0809-5T 160SN0809-8T	●	8	4	80	22	18	12		23	6.3	10.4	16	40			No	9240	0.8	P-37	HH10X35	SE-40068TR	TT-15	LNEU12...		
	●	10	5	100	27	20	14	50	24	7	12.4	21	50	8	9	No	8270	1.2		HH12X35					
	●	16	8	160	40	33	22		28	9	16.4	41	70			No	6540	2.2		HH20X40					
MSTB 125SN1011-4T 160SN1011-5T	●	12	4	125								26				No	7390	2	P-37	HH20X40	SE-40068TR	TT-15	LNEU12...		
	●	15	5	160	40	33	22	50	28	9	16.4	43	70	10	11	No	6540	2.5							

LF (min.) dimension shows in case of minimum of edge width (CW).

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

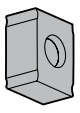
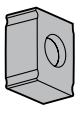


Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M244

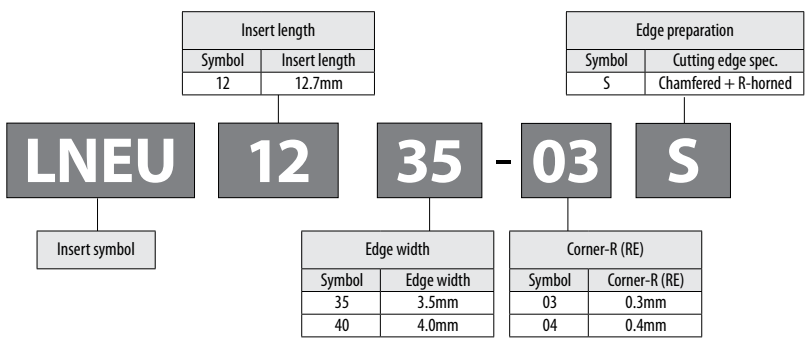
LNEU

Insert		Description	No. of edges	Dimension (mm)			Material	Applicable toolholder ➔ M242~M244	Applicable clamp screw		
				S	D1	RE					
 With honing		LNEU 1235-03-4	4	3.5	4.4	0.3	●	MSTB...	SE-40050TRN		
		LNEU 1240-08-4	4	4	4.4	0.8	●		SE-40055TR		
		LNEU 1245-04 1245-08	4	4.5	4.2	0.4 0.8	● ●		SE-40068TR		
		LNEU 1250-04 1250-08	4	5	4.2	0.4 0.8	● ●		SE-40080TR		
		LNEU 1255-04 1255-08	4	5.5	4.2	0.4 0.8	● ●		SE-40090TR		
		LNEU 1260-04	4	6	4.2	0.4	●		SE-40100TR		
		 Tough edge		LNEU 1235-03S-4	4	3.5	4.4		0.3	●	SE-40050TRN
				LNEU 1240-03S-4	4	4	4.4		0.3	●	SE-40055TR
				LNEU 1245-04S 1245-08S	4	4.5	4.2		0.4 0.8	● ●	SE-40068TR
				LNEU 1250-04S 1250-08S	4	5	4.2		0.4 0.8	● ●	SE-40080TR

Please select the applicable clamp screw depending on each insert description. Recommended cutting conditions ➔ M247
See page M246 for insert description and applicable clamp screw depending on edge width.



Inserts identification system



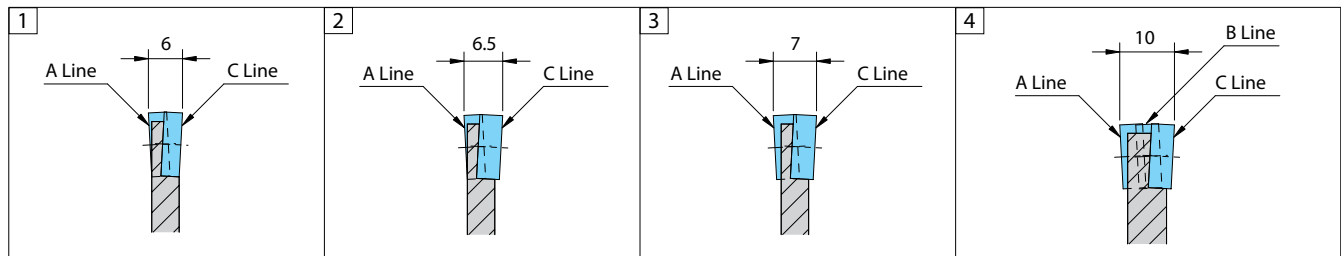
● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Combination of applicable inserts

Description	Clamp screw (Standard attachment parts)	Edge width		A Line		B Line		C Line		Wrench for clamp screw	Tightening torque (N·m)	
		mm	inch (mm)	Applicable inserts	Clamp screw	Applicable inserts	Clamp screw	Applicable inserts	Clamp screw			
Metric	MSTB ○○○AN0607-○T ○○○SN0607-○T	SE-40050TRN	6	-	LNEU1235..	SE-40050TRN	-	-	LNEU1235..	SE-40050TRN	TT-15	3
			6.5		LNEU1240..	SE-40055TR			LNEU1240..	SE-40055TR		
			7		LNEU1245..	SE-40068TR			LNEU1245..	SE-40068TR		
	MSTB ○○○AN0809-○T ○○○SN0809-○T	SE-40068TR	8	-	LNEU1245..	SE-40068TR	-	-	LNEU1245..	SE-40068TR		
			8.5		LNEU1250..	SE-40080TR			LNEU1250..	SE-40080TR		
			9		LNEU1245..	SE-40068TR			LNEU1245..	SE-40068TR		
	MSTB ○○○AN1011-○T ○○○SN1011-○T	SE-40068TR	10	-	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR		
			10.5		LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR		
			11		LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR		
	MSTB ○○○AN1213-○T	SE-40090TR	12	-	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR		
			12.5		LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR		
			13		LNEU1240..	SE-40055TR	LNEU1240..	SE-40055TR	LNEU1245..	SE-40068TR		
Inch spec	MSTB ○○○○AN250-○T	SE-40055TR	.250 (6.35mm)	-	LNEU1240..	SE-40055TR	-	-	LNEU1240..	SE-40055TR		
			.270 (6.86mm)		LNEU1245..	SE-40068TR			LNEU1245..	SE-40068TR		
			.289 (7.34mm)		LNEU1245..	SE-40068TR			LNEU1245..	SE-40068TR		
	MSTB ○○○○AN312-○T	SE-40068TR	.312 (7.92mm)	-	LNEU1245..	SE-40068TR	-	-	LNEU1245..	SE-40068TR		
			.332 (8.43mm)		LNEU1250..	SE-40080TR			LNEU1250..	SE-40080TR		
			.351 (8.91mm)		LNEU1245..	SE-40068TR			LNEU1245..	SE-40068TR		
	MSTB ○○○○AN375-○T	SE-40068TR	.375 (9.525mm)	-	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR	LNEU1245..	SE-40068TR		
			.395 (10.03mm)		LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR	LNEU1250..	SE-40080TR		
			.414 (10.52mm)		LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR		
	MSTB ○○○○AN500-○T	SE-40090TR	.500 (12.7mm)	-	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR	LNEU1255...	SE-40090TR		
			.520 (13.21mm)		LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR	LNEU1260...	SE-40100TR		
			.539 (13.69mm)		LNEU1240..	SE-40055TR	LNEU1240..	SE-40055TR	LNEU1245..	SE-40068TR		

For clamp screw, above listed "Standard attachment parts" are attached. In case of necessity of another size of clamp screw by changing slotting width, please purchase separately.

Slot width (Edge width) adjustment



The slot width (Edge width) of MSTB slot mills is adjustable by a maximum of 1 mm with the combination of inserts.

1. In the case of MSTB○○○AN0607-○T the width (W) is 6mm by installing LNEU1235 on both A line and C line.
2. By replacing C line only with LNEU1240 the width (W) is 6.5 mm.
3. By replacing A line and C line with LNEU1240 the width (W) is 7 mm.
4. If the slotting width (Edge width) is 10 mm, the B line (Middle edge) is necessary.

* Caution

1. There is no description such as "A line", "B line", and "C line" on the actual slot mill. These are only for explanation of the combination of insert.
2. Use proper clamp screws for applicable inserts on the basis of the above chart.
3. Please do not use any slot mills, that have a difference of width of more than 1 mm.

Bottom cutting shape of MSTB slot mill
Slot bottom shape will be (Fig. 1) convex shape.

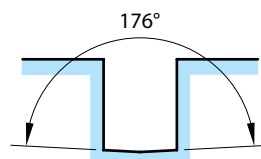
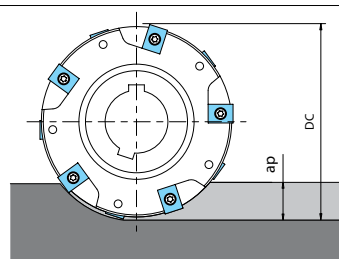


Fig. 1 Convex bottom shape

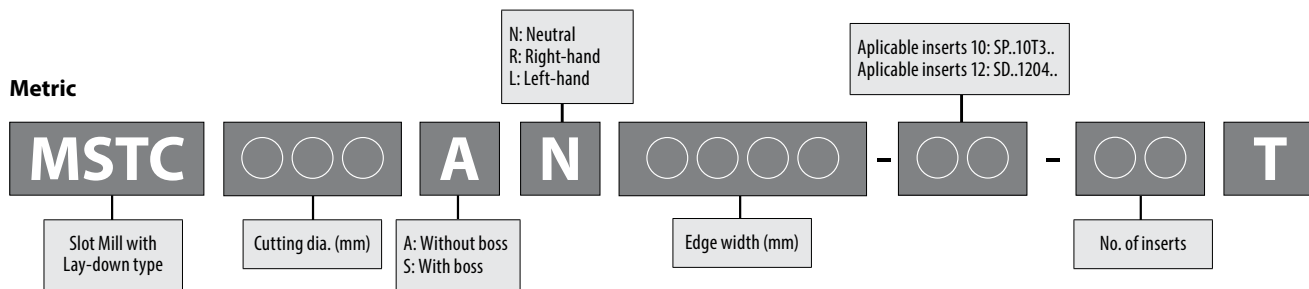
Recommended cutting conditions

Workpiece material		Hardness (HB)	Recommended insert grades (Vc: m/min)		fz (mm/t)		Remarks
			PVD Coated carbide		Insert thickness (mm)		
			PR0725		3.5~4.0	4.5~6.0	
Low carbon steel	C10 ~ C25	125	170~210		0.07~0.20	0.10~0.22	Dry
Carbon steel	C30 ~ C60 (Annealed)	190	100~140		0.07~0.20	0.10~0.22	
	C30 ~ C60 (Heat treated)	250	90~120		0.07~0.20	0.10~0.22	
Alloy steel	CrMo, Cr (Annealed)	180	90~120		0.07~0.20	0.10~0.22	
	CrMo, Cr (Heat treated)	275	80~110		0.05~0.18	0.08~0.20	
High carbon alloy	X153CrMoV12, X40CrMoV51, etc.	280	70~ 90		0.05~0.18	0.08~0.20	
Stainless steel	Austenitic related X5CrNi18 10, X5CrNiMo17 12 2, CrNi2520, etc.	220	110~140		0.05~0.18	0.08~0.20	Coolant
	Martensitic related X10Cr13, X6Cr17 etc.	300	100~120		0.05~0.18	0.08~0.20	
Heat-resistant alloys	Ni-base heat-resistant alloys	350	15~ 30		0.05~0.18	0.08~0.20	
Titanium alloys	Ti-6Al-4V, etc.	270	20~50		0.05~0.18	0.08~0.20	
Gray cast iron	GG25 ~ GG35	260	110~130		0.07~0.22	0.10~0.25	Dry
Nodular cast iron	GGG40 ~ GGG50	160	80~100		0.07~0.22	0.10~0.25	
	GGG60 ~ GGG80	250	70~ 90		0.07~0.22	0.10~0.25	

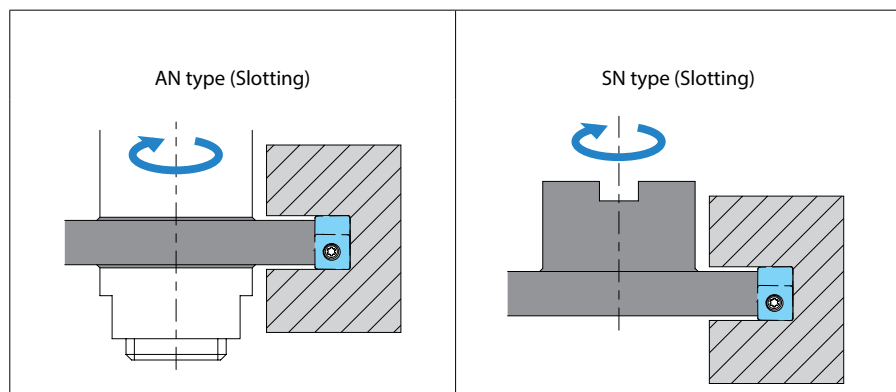
Note: 1. Use down-cut machining.
 2. If a_p is 1/10 or under of cutter dia.(DC), it is possible to increase feed per tooth (fz) by 40%.



Identification system toolholder MSTC



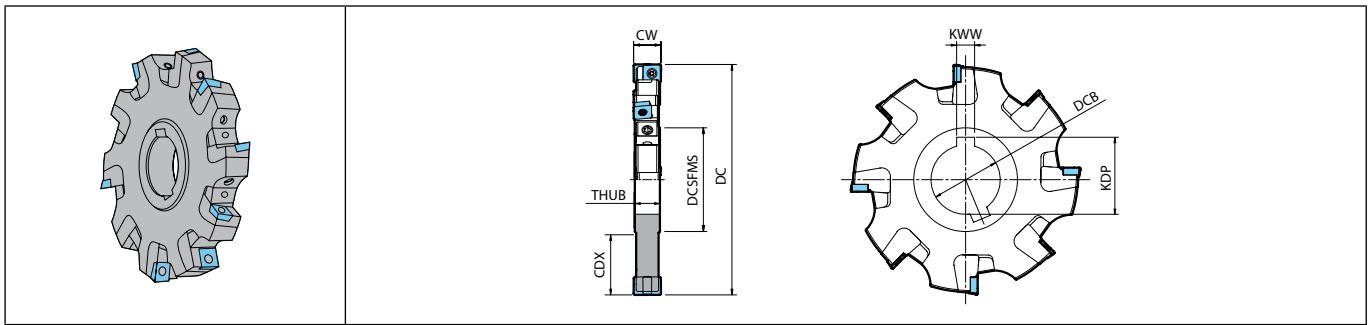
Cutting direction of MSTC slot mill



Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

MSTC (Without Boss)



In order to be used in combination with two or more mills, this slot mill has 2 key slots.

Toolholder dimensions (Without Boss, Metric)

Description	Availability		Edge line	Dimension (mm)										Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Applicable inserts ● M252 ● M253		
	N	Inserts		DC	DCSFMS	DCB	KDP	KWW	CDX	THUB	CW min.	CW max.							
MSTC 100AN1416-10-3T 125AN1416-10-4T 160AN1416-10-5T	●	6	3	100	46.8	32	34.8	8	25.9								17250	0.5	SPCT10T3... SPET10T3...
	●	8	4	125	54.8	40	43.5	10	34.4	13.9	14	16	No			15450	0.8		
	●	10	5	160					51.9							13650	1.5		
MSTC 125AN1618-10-4T 160AN1618-10-5T	●	8	4	125	54.8	40	43.5	10	34.4	15.9	16	18	No			15450	1	SPCT10T3... SPET10T3...	
	●	10	5	160					51.9						13650	1.8			
MSTC 125AN1820-12-4T 160AN1820-12-5T	●	8	4	125	54.8	40	43.5	10	34	18.2	18	20.6	No			10350	1	SDCT1204... SDET1204...	
	●	10	5	160					51.5						9150	1.8			
MSTC 125AN2123-12-4T 160AN2123-12-5T	●	8	4	125	54.8	40	43.5	10	34	20.8	20.6	23.3	No			10350	1.2	SDCT1204... SDET1204...	
	●	10	5	160					51.5						9150	2.1			

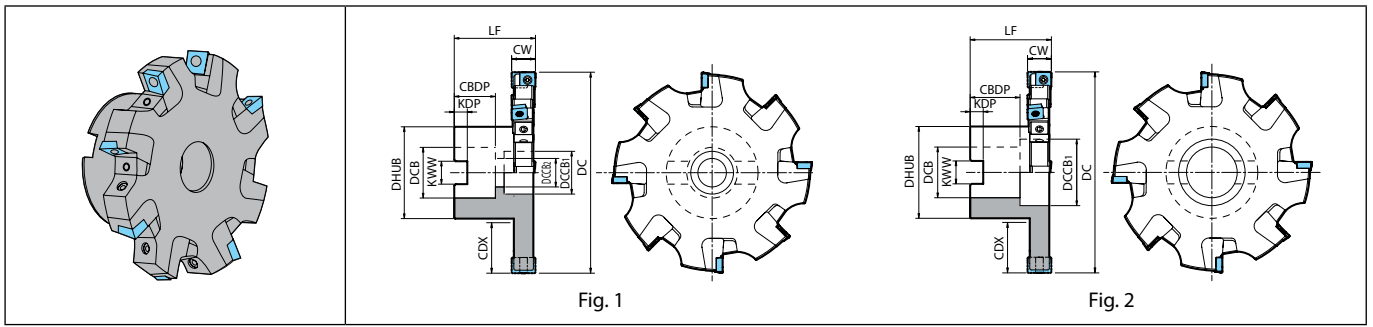
Spare parts ● M251

Slot width (Edge width) adjustment ● M255 - M257

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



MSTC (With Boss)



Toolholder dimensions (With Boss, Metric)

Description	Availability		Edge line	Dimension (mm)													Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M252 M253
	N	Inserts		DC	DCB	DCB ₁	DCB ₂	LF (min.)	CBDP	KDP	KWW	CDX	DHUB	CW min.	CW max.						
MSTC 100SN1416-10-3T	●	6	3	100	27	20	14		24	7	12.4	24.4	48				17250	1	1	SPCT10T3... SPET10T3...	
MSTC 125SN1416-10-4T	●	8	4	125	32	27	18	50.8	26	8	14.4	31.9	58	14	16	No	15450	1.6	1		
MSTC 160SN1416-10-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70			No	13650	2	2		
MSTC 125SN1618-10-4T	●	8	4	125	32	27	18	50.8	26	8	14.4	31.9	58	16	18	No	15450	1.7	1	SPCT10T3... SPET10T3...	
MSTC 160SN1618-10-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70			No	13650	2.3	2		
MSTC 125SN1820-12-4T	●	8	4	125	32	27	18	51	26	8	14.4	31.9	58	18	20.6	No	10350	1.6	1	SDCT1204... SDET1204...	
MSTC 160SN1820-12-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70			No	9150	2.3	2		
MSTC 125SN2123-12-4T	●	8	4	125	32	27	18	51	26	8	14.4	31.9	58	20.6	23.3	No	10350	1.7	1	SDCT1204... SDET1204...	
MSTC 160SN2123-12-5T	●	10	5	160	40	56	-		30	9	16.4	43.4	70			No	9150	2.6	2		

LF (min.) dimension shows in case of minimum of edge width (CW).

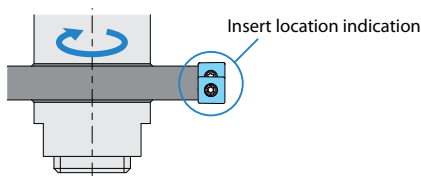
Spare parts M251

Slot width (Edge width) adjustment M255 - M257

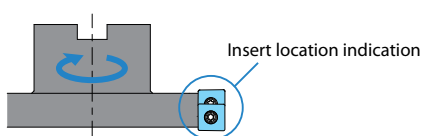
Applicable insert installation method

When installing handed inserts, it is necessary to equip same number of right-hand and left-hand inserts as shown in "No. of edge lines" respectively. Please Install as show in the figure below.

MSTC...AN... (Without boss)



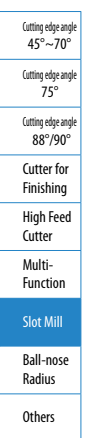
MSTC...SN... (With boss)



Toolholder description	Insert location indication	Applicable inserts M252, M253	
		Handed	Neutral
MSTC...AN...10.. MSTC...SN...10..		SP..10T3...L...	SP..10T3...N...
		SP..10T3...R...	
MSTC...AN...12.. MSTC...SN...12..		SD..1204...L...	SD..1204...N...
		SD..1204...R...	


● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M250





Spare parts (MSTC) (common to Metric / Inch spec)

Description		Spare parts												
		Cartridge		Wedge	Wedge screw	Cam pin	Clamp screw	Wrench			Anti-seize compound	Mounting bolt		
		Right-hand	Left-hand					for wedge screw	for cam pin	for clamp screw				
Without boss	Metric	MSTC 100AN1416-10-3T	C90SP1416-10R	C90SP1416-10L	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-	
		MSTC 125AN1416-10-4T				W6X20								
		MSTC 160AN1416-10-5T			W6X20									
		MSTC 125AN1618-10-4T	C90SP1618-10R	C90SP1618-10L	WC-16	W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15			
		MSTC 160AN1618-10-5T				W6X20								
		MSTC 125AN1820-12-4T	C90SD1820-12R	C90SD1820-12L	WC-18	W6X20								
MSTC 160AN1820-12-5T	W6X20													
MSTC 125AN2123-12-4T	C90SD2023-12R	C90SD2023-12L	WC-20	W6X20										
MSTC 160AN2123-12-5T				W6X20										
With boss	Metric	MSTC 100SN1416-10-3T	C90SP1416-10R	C90SP1416-10L	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	HH12X35	
		MSTC 125SN1416-10-4T				W6X20							HH16X35	
		MSTC 160SN1416-10-5T			W6X20	-								
		MSTC 125SN1618-10-4T	C90SP1618-10R	C90SP1618-10L	WC-16	W6X20	AP-1820	SB-3590TRP		LW-3	DTP-15		P-37	HH16X35
		MSTC 160SN1618-10-5T				W6X20								-
		MSTC 125SN1820-12-4T	C90SD1820-12R	C90SD1820-12L	WC-18	W6X20								AP-1820	SB-3590TRP	LW-3	DTP-15	HH16X35
		MSTC 160SN1820-12-5T				W6X20	-							
		MSTC 125SN2123-12-4T	C90SD2023-12R	C90SD2023-12L	WC-20	W6X20	AP-1820	SB-3590TRP	LW-3	DTP-15	HH16X35			
		MSTC 160SN2123-12-5T				W6X20					-			

 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

Tightening torque

Wrench	TH-3L	DTP-9	DTP-15
			
Tightening torque (N·m)	5~6	1.5	4



Milling

SPCT/SPET

Insert		Description	No. of edges	Dimension (mm)					Carbide			Applicable toolholder M249, M250
				IC	S	D1	RE	BS	CVD	PVD		
											CA0835		PR0110	PR0775
Classification of usage ● : 1st Choice ○ : 2nd Choice												
		SPCT 10T316EN-SD	4	10	3.97	3.4	1.6	-			●	MSTC...-10-..
		SPCT 10T308ER-SD 10T308EL-SD 10T312ER-SD 10T312EL-SD	4	10	3.97	3.4	0.8 0.8 1.2 1.2	2.5 2.5 1.8 1.8			● ● ● ●	MSTC...-10-..
		SPCT 10T316FN-SE	4	10	3.97	3.4	1.6	-			●	MSTC...-10-..
		SPCT 10T308FR-SE 10T308FL-SE 10T312FR-SE 10T312FL-SE	4	10	3.97	3.4	0.8 0.8 1.2 1.2	2.7 2.7 2.2 2.2			● ● ● ●	MSTC...-10-..
		SPET 10T308ER-SB 10T308EL-SB	4	10	3.97	3.4	0.8	2.7			● ●	MSTC...-10-..
		SPET 10T308SR-SB 10T308SL-SB	4	10	3.97	3.4	0.8	2.7			● ●	MSTC...-10-..

Handed insert shows Right-hand

Recommended cutting conditions M254

Inserts identification system

Shape		Tolerance			Edge length	Corner-R (RE)		Hand of tool		
Symbol	Shape	Symbol	Corner height	Thickness	L.C Size	Symbol	Corner-R (RE)	Symbol	Hand of tool	
S	Square	C	±0.013mm	±0.025mm	±0.025mm	S	16 12 08	1.6mm 1.2mm 0.8mm	N L R	Neutral Left-hand Right-hand
E		E	±0.025mm							

S P C T 10 T3 08 E R - SD

Relief angle	
Symbol	Relief angle
D	15°
P	11°

Hole/Chipbreaker	
Symbol	Shape
T	Single-sided chipbreaker, with hole

Thickness	
Symbol	Thickness
T3	3.97mm
04	4.76mm

Edge Preparation	
Symbol	Cutting edge spec.
E	Honed
F	Sharp edge
S	Chamfered + R-honed

Chipbreaker symbol	
Symbol	Rake angle
SB	5°
SD	15°
SE	20°

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M252



Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

SDCT/SDET

Insert		Description	No. of edges	Dimension (mm)					Carbide			Applicable toolholder M249, M250		
				IC	S	D1	RE	BS	CA0835	PVD	PRO110 PRO725			
<p>Classification of usage</p> <p>● : 1st Choice</p> <p>○ : 2nd Choice</p>		Carbon steel / Alloy steel		●									P	
		Mold and die steel												
		Stainless steel		○	●									M
		Gray cast iron		○	●									K
		Nodular cast iron		○	●									K
		Non-ferrous metals			●									N
		Heat-resistant alloy												S
		Titanium alloy			○	●								S
Hard materials												H		
		SDCT 120416EN-SD	4	12.7	4.76	4.4	1.6	-			●		MSTC...-12-..	
		SDCT 120408ER-SD 120408EL-SD 120412ER-SD 120412EL-SD	4	12.7	4.76	4.4	0.8 0.8 1.2 1.2	2.5 2.5 1.8 1.8			● ● ● ●		MSTC...-12-..	
		SDCT 120416FN-SE	4	12.7	4.76	4.4	1.6	-			●		MSTC...-12-..	
		SDCT 120408FR-SE 120408FL-SE 120412FR-SE 120412FL-SE	4	12.7	4.76	4.4	0.8 0.8 1.2 1.2	2.7 2.7 1.9 1.9			● ● ● ●		MSTC...-12-..	
		SDET 120408ER-SB 120408EL-SB 120412ER-SB 120412EL-SB	4	12.7	4.76	4.4	0.8 0.8 1.2 1.2	2.5 2.5 1.8 1.8			● ● ● ●		MSTC...-12-..	
		SDET 120416SN-SB	4	12.7	4.76	4.4	1.6	-			●	●	MSTC...-12-..	
		SDET 120408SR-SB 120408SL-SB	4	12.7	4.76	4.4	0.8	2.5			● ●	● ●	MSTC...-12-..	

Handed insert shows Right-hand

Recommended cutting conditions M254



Milling

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

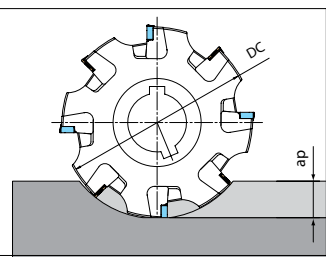
Recommended cutting conditions

Workpiece material		Hardness (HB)	Recommended insert grades (Vc: m/min)			fz (mm/t)				Remarks
			CVD Coated carbide	PVD Coated carbide		Chipbreaker				
			CA0835	PR0725	PR0110	EN-SD ER-SD EL-SD	ER-SB EL-SB	SN-SB SR-SB SL-SB	FN-SE FR-SE FL-SE	
Low carbon steel	C10 ~ C25	125	250~310	170~210	-	0.07~0.20	0.10~0.22	0.15~0.3	-	Dry
Carbon steel	C30 ~ C60 (Annealed)	190	160~190	100~140	-	0.07~0.20	0.10~0.22	0.15~0.3	-	
	C30 ~ C60 (Heat treated)	250	140~180	90~120	-	0.07~0.20	0.10~0.22	0.15~0.3	-	
Alloy steel	CrMo, Cr (Annealed)	180	140~180	90~120	-	0.07~0.20	0.10~0.22	0.15~0.3	-	
	CrMo, Cr (Heat treated)	275	120~160	80~110	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
High carbon alloy	X153CrMoV12, X40CrMoV51, etc.	280	110~130	70~90	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
Stainless steel	Austenitic related X5CrNi18 10, X5CrNiMo17 12 2, CrNi2520, etc.	220	160~200	110~140	-	0.05~0.18	0.08~0.20	0.12~0.25	-	Coolant
	Martensitic related X10Cr13, X6Cr17 etc.	300	150~180	100~120	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
Heat-resistant alloys	Ni-base heat-resistant alloys	350	-	15~30	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
Titanium alloys	Ti-6Al-4V, etc.	270	-	20~50	-	0.05~0.18	0.08~0.20	0.12~0.25	-	
Gray cast iron	GG25 ~ GG35	260	160~200	110~130	-	0.07~0.22	0.10~0.25	0.15~0.35	-	Dry
Nodular cast iron	GGG40 ~ GGG50	160	130~160	80~100	-	0.07~0.22	0.10~0.25	0.15~0.35	-	
	GGG60 ~ GGG80	250	110~140	70~90	-	0.07~0.22	0.10~0.25	0.15~0.35	-	
Non-ferrous metals	AlZnMgCu1.5 etc.	-	-	-	750~950	-	-	-	0.07~0.20	Coolant



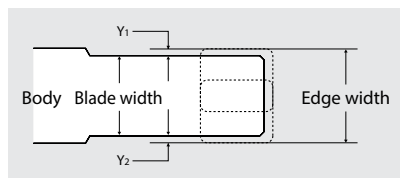
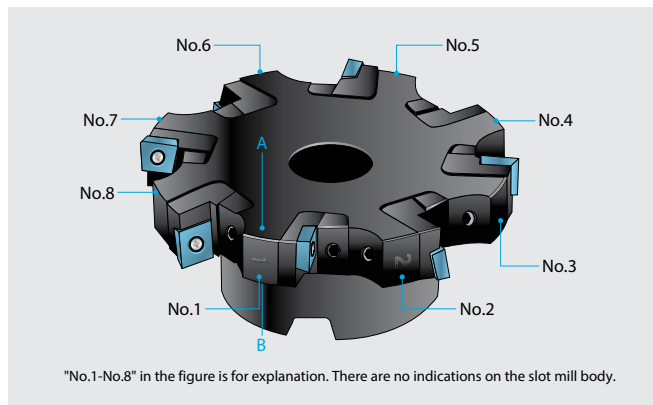
- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

Note: 1. Use down-cut machining.
 2. If ap is 1/10 or under of cutter dia.(DC), it is possible to increase feed per tooth (fz) by 40%.



Slot width (Edge width) adjustment of MSTC slot mill

Slot width (Edge width) measurement and adjustment



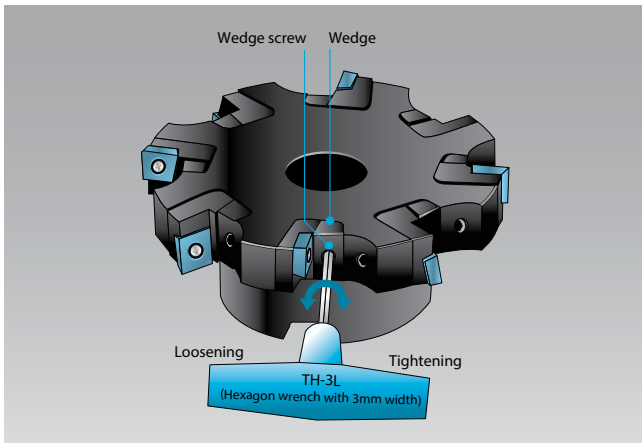
1. Set up the slot mill on length measuring equipment such as tool presetters.
2. Choose any one of the edges as a reference position. (No.1)
3. Measure the blade width of the slot mill body at position No.1. (between point A and B in the figure)
4. Move the length measuring equipment to the insert corner part and measure the step (Y_1) between the point A and the insert No.1.
5. Using the same procedure, measure (Y_2) dimension based on point B.

$$\text{Edge width} = \text{Blade width} + Y_1 + Y_2$$

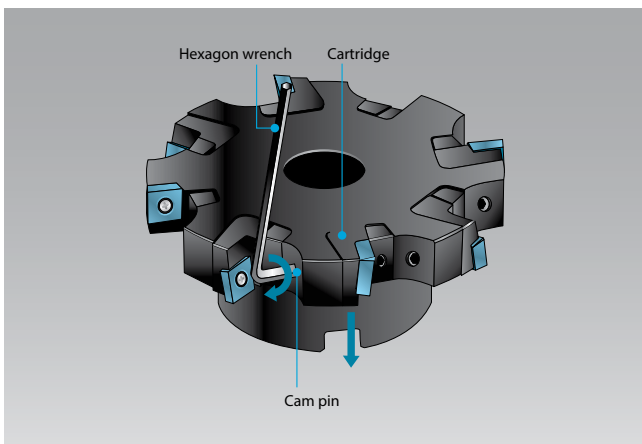
6. Place the point A of the slot mill body near the position No.1 to "0 (zero)" of the length measuring equipment.
7. Adjust the edge position of the inserts in odd numbered positions (No. 3, 5, 7) to "0 (zero)" with the length measuring equipment.
8. Adjust the edge position of the inserts in even numbered positions (No. 2, 4, 6, 8) to the required edge width.

For steps 7. and 8., see "In the case of changing the slot width (Edge width)" on next page.

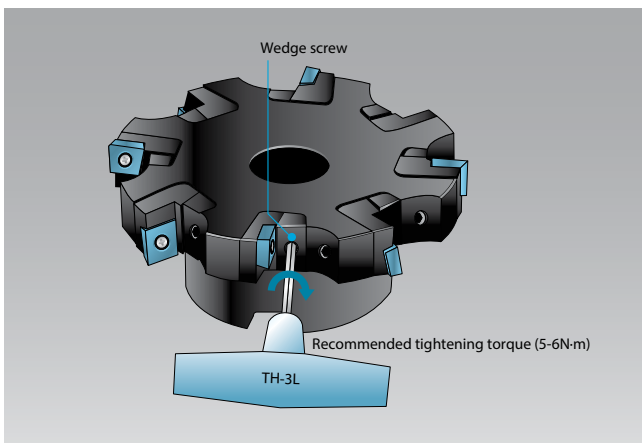
In the case of changing the slot width (Edge width)



1. Set up the slot mill on length measuring equipment such as tool presettlers.
2. Insert a hexagon wrench with 3mm width (TH-3L) into the wedge screw.
3. Turn TH-3L counterclockwise to loosen the wedge.
4. Turn TH-3L clockwise by the torque of 1 N·m to tighten the wedge lightly and make the wedge contact the cartridge and the slot mill body. In doing so, some resistance occurs against the cartridge.

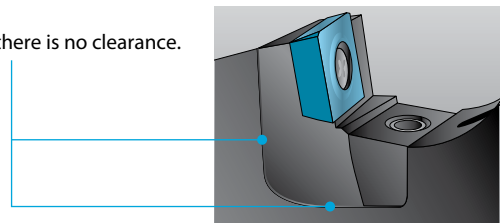


5. Insert a hexagon wrench (LW-2.5 OR LW-3) into the cam pin on the back of the cartridge.
6. Turn the wrench and adjust the position of the cartridge.
7. To secure the adjustment, back-turn the cam pin and make sure that it does not touch the groove surface of the back of the cartridge.
8. Remove the hexagon wrench from the cam pin.



9. Insert TH-3L into the wedge screw.
10. Tighten the wedge screw by the torque of 5-6N·m. (Use a torque wrench to get the correct torque.)
11. Make sure there is no clearance between the cartridge and the slot mill body.

Make sure there is no clearance.



M

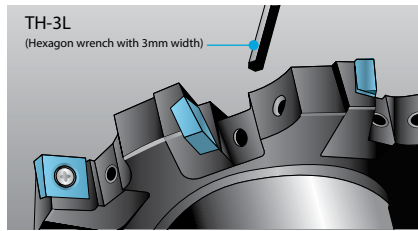


Milling

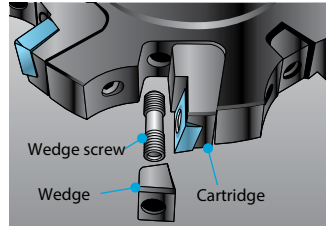
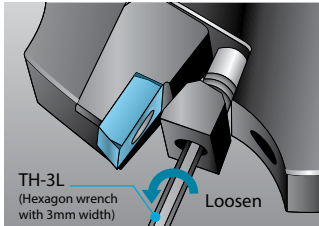
Cutting edge angle	45°~70°
Cutting edge angle	75°
Cutting edge angle	88°/90°
Cutter for Finishing	
High Feed Cutter	
Multi-Function	
Slot Mill	
Ball-nose Radius	
Others	

Replacement of the cartridge

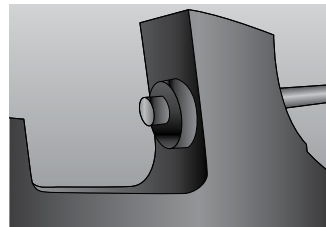
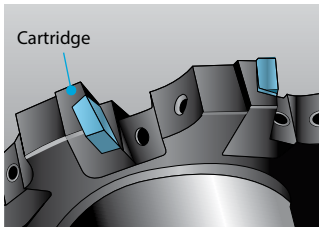
Follow the instruction below to replace the cartridge.



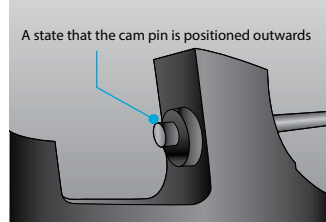
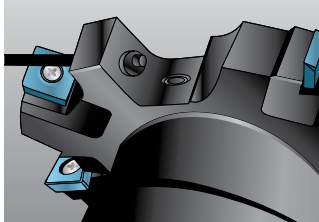
1. Insert hexagon wrench with 3mm width (TH-3L) into the wedge screw.



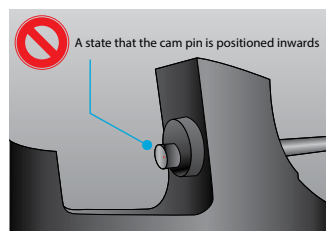
2. Loosen the wedge screw.
3. Remove the wedge screw and wedge.



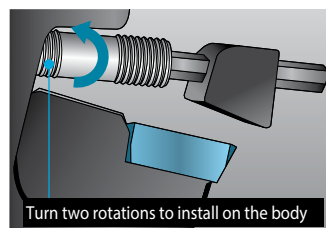
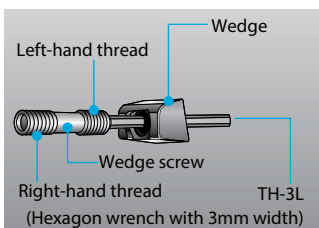
4. Remove the cartridge.



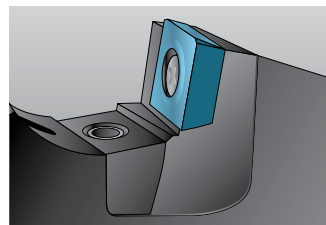
5. Before replacing the cartridge, make sure that the cam pin is positioned radially-outwards.



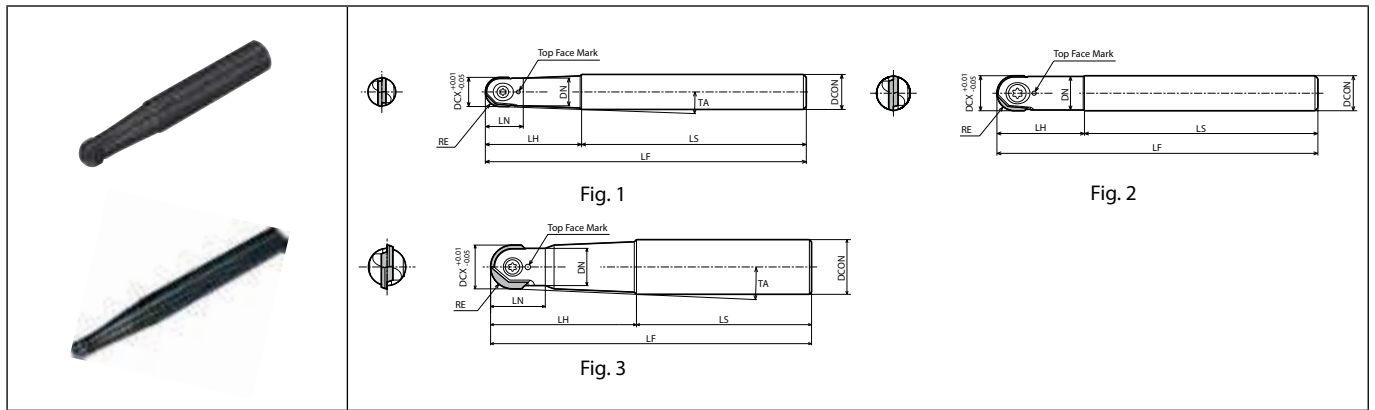
6. If the cam pin is in the position shown in the left diagram, assembling the cartridge is not possible.



7. Place the wedge so that its larger slant surface faces toward the cartridge.
8. Turn the wedge screw two rotations to install the wedge to the body.
9. When installing the wedge screw to the body, keep the wedge from rotating and screw it in.
10. Tighten the wedge screw by the torque of 5-6N·m. Keep the screw head and the wedge even (Prevent either of those from sticking out).



MRF



Top Face Shown

Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)								TA	Coolant hole	Fig.	Spare parts				Applicable inserts ➔ M260			
			RE	DCX	DCON	LF	LH	DN	LN	LS				Anti-seize compound	Screw	Wrench	Wrench				
Standard Neck MRF 08-S12 10-S12 12-S12 16-S20 20-S25 25-S32	●	1	4	8	12	100	22	7.5	10	78	6°20'	No	P-37	SC-30067	DT-8		RDFG08FR				
	●		5	10			25	9.5	13	75	3°00'							SC-35085	DT-10	RDFG10FR	
	●		6	12	110	30	11.5	-	-	SC-40100	DT-15							RDFG12FR			
	●		8	16	20	130	50	14	20	2°50'	SC-50130							DT-20	RDFG16FR		
	●		10	20	25	140	60	17	25	3°00'	SC-60160							-	TT-25	RDFG20FR	
	●		12.5	25	32	150	70	22	31	3°30'	SC-60210							-	TT-30	RDFG25FR	
Long Neck MRF 08-S12-130 10-S16-150 12-S16-160 16-S20-160 20-S25-180 25-S32-200	●	1	4	8	12	130	50	7.5	10	80	2°30'	No	P-37	SC-30067	DT-8		RDFG08FR				
	●		5	10	150	60	9.5	15	100	3°50'	SC-35085							DT-10	RDFG10FR		
	●		6	12	160	60	11.5	16	100	2°10'	SC-40100							DT-15	RDFG12FR		
	●		8	16	20	160	65	14	20	95	2°00'							SC-50130	DT-20	RDFG16FR	
	●		10	20	25	180	80	17	25	100	2°10'							SC-60160	-	TT-25	RDFG20FR
	●		12.5	25	32	200	90	22	31	110	2°40'							SC-60210	-	TT-30	RDFG25FR

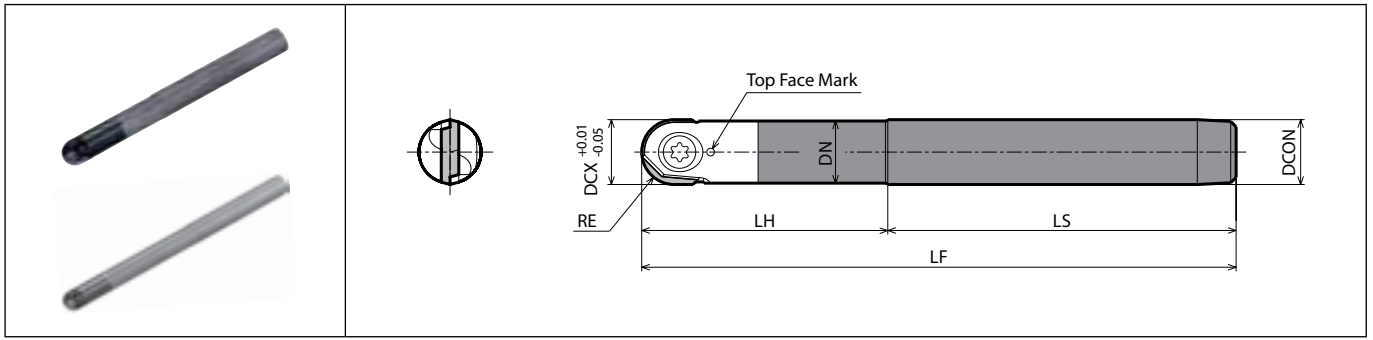
TA (Toolholder's interference angle) is the angle formed by the tangential line from insert dia. to toolholder's shank dia.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M258

MRFW (Carbide Shank)



Top Face Shown

Toolholder dimensions

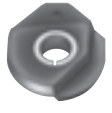
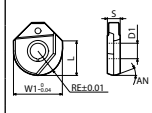
Description	Availability	Inserts	Dimension (mm)							Coolant hole	Spare parts			Applicable inserts ➔ M260		
			RE	DCX	DCON	LF	LH	DN	LS		Anti-seize compound	Screw	Wrench			
Carbide Standard MRFW 08-S08 10-S10 12-S12	●	1	4	8	8	100	30	7.4	70	No	P-37	SC-30067	DT-8	RDFG08FR		
	●		5	10	10		35	9.5				65	SC-35085	DT-10	RDFG10FR	
	●		6	12	12		110	45				11.5	65	SC-40100	DT-15	RDFG12FR
Carbide Long Neck MRFW 08-S08-130 10-S10-140 12-S12-150	●	1	4	8	8	130	65	7.4	65	No	P-37	SC-30067	DT-8	RDFG08FR		
	●		5	10	10		140	75				9.5	65	SC-35085	DT-10	RDFG10FR
	●		6	12	12		150	85				11.5	65	SC-40100	DT-15	RDFG12FR

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



RDFG

Classification of usage		Carbon steel / Alloy steel		●		P			
		Mold and die steel		●		P			
● : 1st Choice ○ : 2nd Choice		Stainless steel		○		M			
		Gray cast iron		○		K			
		Nodular cast iron		○		K			
		Non-ferrous metals				N			
		Heat-resistant alloy				S			
		Titanium alloy				S			
		Hard materials				H			
Insert	Description	Dimension (mm)					Angle (°)	PVD PR915 Carbide	Applicable toolholder ➡ M258 M259
		S	D1	RE	L	W1	AN		
 	RDFG 08FR	2.1	3.1	4	6.6	8	15	●	MRF(W)08...
	10FR	2.7	3.6	5	8	10	15	●	MRF(W)10...
	12FR	3.2	4.1	6	9.4	12	15	●	MRF(W)12...
	16FR	4.2	5.1	8	11.3	16	10	●	MRF16...
	20FR	5.2	6.1	10	14.1	20	10	●	MRF20...
	25FR	6.2	6.1	12.5	15.5	25	10	●	MRF25...

Handed insert shows Right-hand

Recommended cutting conditions ➡ M261

M




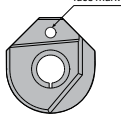
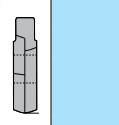

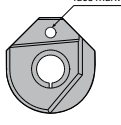
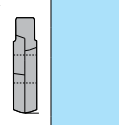
Milling

Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M260

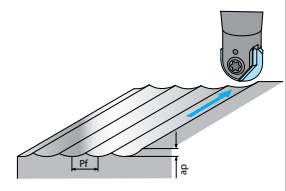
Applicable inserts

Insert	Description
	RDFG 08FR
	10FR
	12FR
	16FR
	20FR
	25FR

Check the top face mark of both insert and toolholder.

Recommended depth of cut

Description	Depth of cut (mm)		Applications
	ap	Pf	
Standard neck	MRF08-S12	0.2 (Max0.3)	0.8
	MRF10-S12	0.2	1
	MRF12-S12	0.5	1.2
	MRF16-S20	0.5	1.6
	MRF20-S25	1	2
	MRF25-S32	1	2.5
Long neck	MRF08-S12-130	0.2 (Max0.3)	0.8
	MRF10-S12-150	0.2	1
	MRF12-S12-160	0.5	1.2
	MRF16-S20-160	0.5	1.6
	MRF20-S25-180	1	2
	MRF25-S32-200	1	2.5
Carbide standard neck	MRFW08-S08	0.2 (Max0.3)	0.8
	MRFW10-S10	0.2	1
	MRFW12-S12	0.5	1.2
Carbide long Neck	MRFW08-S08-130	0.2 (Max0.3)	0.8
	MRFW10-S10-140	0.2	1
	MRFW12-S12-150	0.5	1.2



For ø8, holder may be broken because of over load if ap exceeds 0.3mm.

Recommended cutting conditions (At cutting dia. DCX)

Workpiece material	Insert grades	Vc (m/min)	fz (mm/t)	ø8		ø10		ø12	
				Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)
Carbon steel	PR915	100~200	0.1~0.3	150 (5,970)	0.2 (2,390)	150 (4,770)	0.2 (1,910)	150 (3,980)	0.2 (1,590)
Alloy steel	PR915	80~180	0.1~0.3	130 (5,170)	0.2 (2,070)	130 (4,140)	0.2 (1,660)	130 (3,450)	0.2 (1,380)
Mold steel	PR915	50~150	0.1~0.2	100 (3,980)	0.15 (1,190)	100 (3,180)	0.15 (950)	100 (2,650)	0.15 (800)
Stainless steel	PR915	50~150	0.1~0.2	100 (3,980)	0.15 (1,190)	100 (3,180)	0.15 (950)	100 (2,650)	0.15 (800)
Cast iron	PR915	100~200	0.2~0.4	150 (5,970)	0.3 (3,580)	150 (4,770)	0.3 (2,860)	150 (3,980)	0.3 (2,390)
Workpiece material	Insert grades	Vc (m/min)	fz (mm/t)	ø16		ø20		ø25	
				Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)	Vc(m/min) (n.min ⁻¹)	fz(mm/t) (Vf:mm/min)
Carbon steel	PR915	100~200	0.1~0.3	150 (2,980)	0.2 (1,190)	150 (2,390)	0.2 (950)	150 (1,910)	0.2 (760)
Alloy steel	PR915	80~180	0.1~0.3	130 (2,590)	0.2 (1,030)	130 (2,070)	0.2 (830)	130 (1,660)	0.2 (660)
Mold steel	PR915	50~150	0.1~0.2	100 (1,990)	0.15 (600)	100 (1,590)	0.15 (480)	100 (1,270)	0.15 (380)
Stainless steel	PR915	50~150	0.1~0.2	100 (1,990)	0.15 (600)	100 (1,590)	0.15 (480)	100 (1,270)	0.15 (380)
Cast iron	PR915	100~200	0.2~0.4	150 (2,980)	0.3 (1,790)	150 (2,390)	0.3 (1,430)	150 (1,910)	0.3 (1,150)

Actual cutting speed (Vd) conversion coefficient table

- Vd varies depending on ap and slant face angle.
- Vd can be obtained by dividing the conversion coefficient into the recommended cutting speed.

Model	Tool dia. (DCX)	ø8		ø10		ø12			
	Depth of cut (t:mm)		0.1	0.2	0.1	0.2	0.2	0.5	
	Slant face angle (α)	15°		1.00	1.00	1.00	1.00	1.00	1.00
		30°		1.05	1.02	1.05	1.03	1.04	1.01
		45°		1.18	1.12	1.20	1.14	1.16	1.07
		60°		1.47	1.34	1.51	1.38	1.42	1.24
		75°		2.15	1.82	2.24	1.92	2.02	1.60
		90°(Horizontal plane)		4.48	3.22	5.06	3.57	3.92	2.50
	Tool dia. (DCX)		ø16		ø20		ø25		
	Depth of cut (t:mm)		0.2	0.5	0.5	1	0.5	1	
	Slant face angle (α)	15°		1.00	1.00	1.00	1.02	1.00	1.01
		30°		1.05	1.01	1.02	1.00	1.03	1.00
45°		1.18	1.10	1.12	1.06	1.14	1.08		
60°		1.47	1.30	1.34	1.21	1.38	1.25		
75°		2.14	1.73	1.83	1.53	1.93	1.62		
90°(Horizontal plane)		4.48	2.87	3.20	2.29	3.57	2.55		

e.g.) Suppose tool dia. 8mm, ap=0.1mm, slant face angle 90°: The actual Cutting speed Vd for carbon steel machining, when Vc is 150m/min at the biggest diameter, Vd can be obtained as Vd=150 / 4.48=33.5m/min





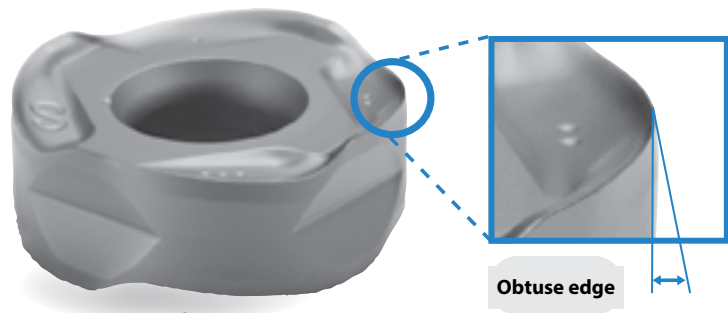
MRW

Economical and high efficiency radius cutter with double-sided insert for various types of workpieces

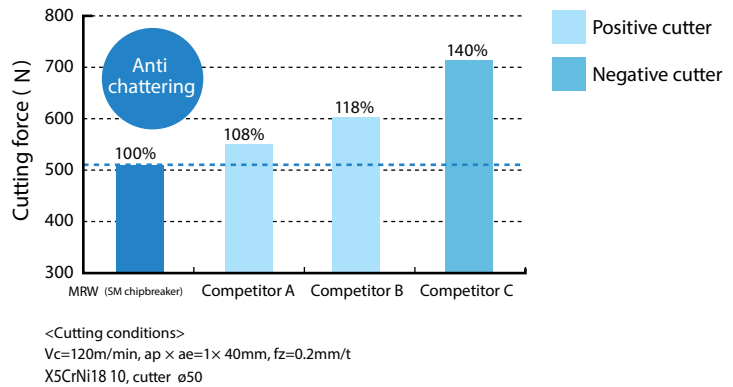
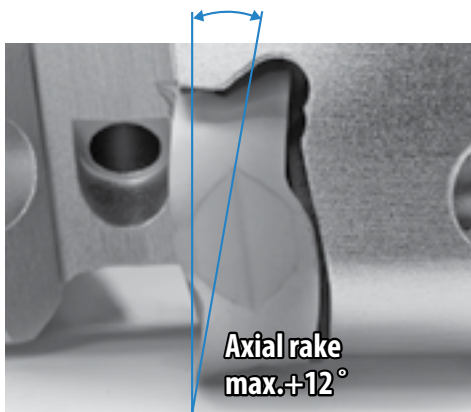
Economical double-sided 8-edge insert
Combine sharpness and cutting edge strength

Obtuse edge increases cutting edge toughness

Helical cutting edge design with maximum axial rake 12° reduces cutting force, equivalent to positive inserts.



Low cutting force chipbreaker



M

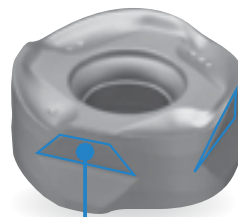


Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

1 Flat lock structure to hold insert firmly

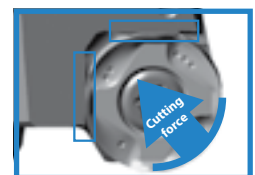
Prevent insert rotation during machining and realizes stable machining



Wide and flat constraint surface

Flat lock structure

- Wide flat constraint surface**
- Receives even cutting forces
 - Controls insert rotation

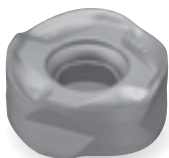


Long tool life by wide lineup with 4 grades and 3 chipbreakers, available for steel, stainless steel and heat-resistant alloys

Workpiece material		Applicable insert grades	Applicable chipbreaker
P Carbon steel/Alloy steel/Mold steel		PR1825	GM/SM/GH chipbreaker
K Cast iron		PR1810	GH/GM chipbreaker
S Ni-base heat-resistant alloys	M Stainless steel (Martensitic related)	CA6535	SM/GM chipbreaker
S Ni-base heat-resistant alloys S Titanium alloys	M Stainless steel (Austenitic related) M Stainless steel (Precipitation hardening)	PR1835	SM/GM chipbreaker

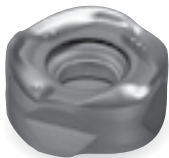
2 Insert grades for difficult-to-cut material

Controls sudden fracture and realizes stable machining
Suitable for high efficiency machining



CA6535

for martensitic stainless steel and Ni-base heat-resistant alloys
High heat resistance and wear resistance with CVD coating
Improved stability with thin layer coating technology

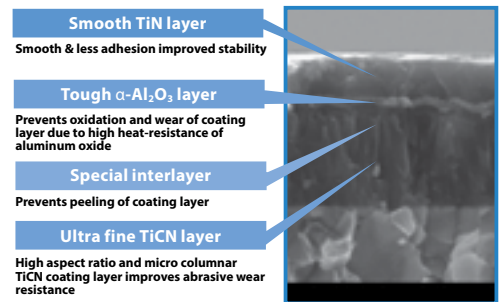


PR1835

For Ni-base heat-resistant alloys, titanium alloys and precipitation hardened stainless steel
Stable and longer tool life by special nano coating layer
MEGACOAT NANO EX



High toughness substrate



Smooth TiN layer
Smooth & less adhesion improved stability

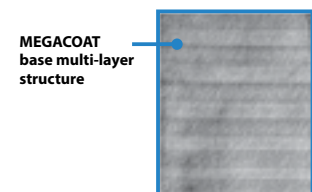
Tough α -Al₂O₃ layer
Prevents oxidation and wear of coating layer due to high heat-resistance of aluminum oxide

Special interlayer
Prevents peeling of coating layer

Ultra fine TiCN layer
High aspect ratio and micro columnar TiCN coating layer improves abrasive wear resistance



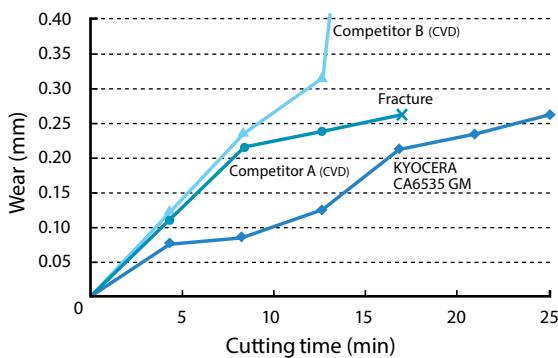
Milling



MEGACOAT base multi-layer structure

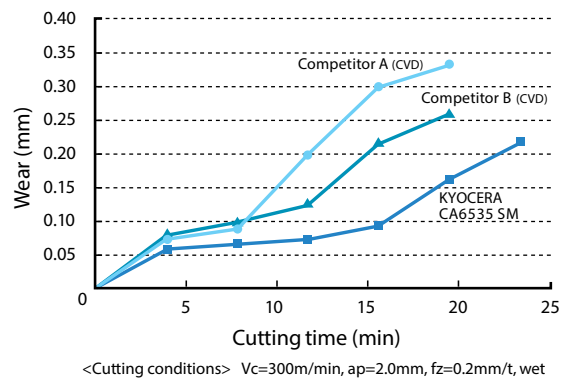
Tool life comparison (Internal evaluation)

Ni-base heat-resistant alloys



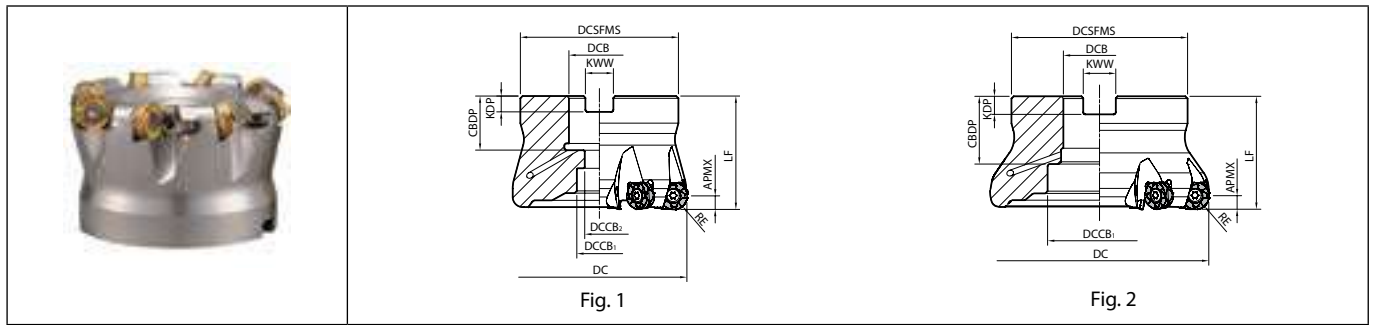
1st choice GM chipbreaker

Stainless steel (Martensitic related)



1st choice SM chipbreaker

MRW



Toolholder dimensions

Description	Availability		Dimension (mm)											A.R. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M267	
	R	Inserts	RE	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX								
Metric MRW 050R-12-5T-M 050R-12-6T-M 063R-12-6T-M 063R-12-7T-M 080R-12-6T-M 080R-12-8T-M 100R-12-7T-M 100R-12-9T-M	●	5	6	50	48	18	11	40	21	6.3	10.4	6	+12	-15.5	Yes	16000	0.3	1	ROMU1204MOER-..		
	●	6		63	60											19	50	30		8	14.4	14000	0.6	1
	●	7				80	70	27	20	13	24											7	12.4	12000	1.1	1
	●	6		100	78											32	46	-		63	33			9	16.4	10600	1.5	2
	●	8				100	78	32	46	-	63											33	9			16.4	10600	1.4	2
	●	7		100	78											32	46	-		63	33
	●	9				100	78	32	46	-	63										
●	5	8	63	60	22							19	11	40	21	6.3	10.4	8	+11	-16.5	Yes			12800	0.5		1	ROMU1605MOER-..
●	6		80	70	27	20	13	50	24	7	12.4	11000	1.1	1							
●	7											100	78	32	46	-	63					33	9	16.4	9600	1.4	2
●	6		100	78	32	46	-	63	33	9	16.4														9600	1.3	2
●	8											125	89	40	55	-	63					33	9	16.4	8500	2.6	2
●	8		125	89	40	55	-	63	33	9	16.4										
●	10											125	89	40	55	-	63					33	9	16.4	8500	2.5	2
Bore dia. inch spec MRW 080R-12-6T 080R-12-8T 100R-12-7T 100R-12-9T MRW 080R-16-6T 080R-16-7T 100R-16-6T 100R-16-8T 125R-16-8T 125R-16-10T	□	6	6	80	70	25.4	20	13	50	27	6							9.5	6	+12	-15.5				Yes	12000	1.2	1	ROMU1204MOER-..
	□	8		100	78	31.75	46	-		63	34	8	12.7	10600	1.5	2					
	□	7							100					78	31.75	46	-	63				34	8	12.7		10600	1.5	2
	□	9		100	78	31.75	46	-		63	34	8	12.7													10600	1.4	2
	MRW 080R-16-6T 080R-16-7T 100R-16-6T 100R-16-8T 125R-16-8T 125R-16-10T	□	6						8					80	70	25.4	20	13	50	27	6	9.5	8	+11	-16.5	Yes	11000	1.1	1	ROMU1605MOER-..
		□	7	100	78	31.75	46	-		63	38	10	15.9	9600	1.4	2					
		□	6											100	78	31.75	46	-	63	38	10	15.9					9600	1.4	2
		□	8	125	89	38.1	55	-		63	38	10	15.9								
		□	8											125	89	38.1	55	-	63	38	10
		□	10	125	89	38.1	55	-		63	38	10	15.9														8560	2.6	2

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

APMX is Maximum ap. For more details, see page M268 below.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M264

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter










Multi-Function

Slot Mill

Ball-nose Radius

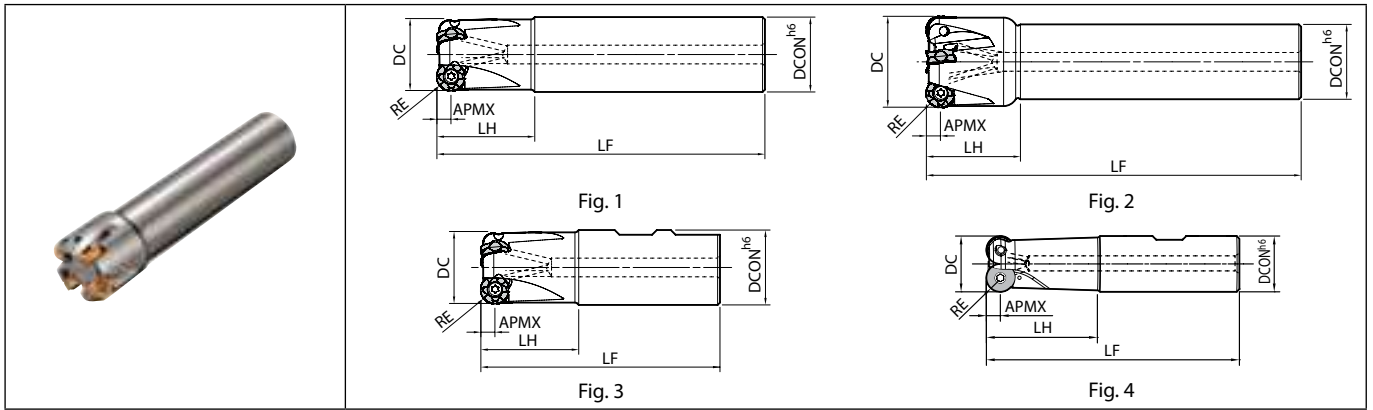
Others

Spare parts and applicable inserts (MRW face mill)

Description	Spare parts					Applicable Inserts  M267		
	Clamp screw	Wrench		Anti-seize compound	Mounting bolt			
		DTPM-15 	TTP-20 			General purpose	Low cutting force	Tough Edge (For Heavy Milling)
MRW 050R-12... 063R-12... 080R-12... 100R-12...	SB-4085TRP	DTPM-15		P-37	HH10X30	ROMU1204M0ER-GM	ROMU1204M0ER-SM	ROMU1204M0ER-GH
Recommended tightening torque for insert clamp 3.5N·m			HH12X35					
			-					
MRW 063R-16... 080R-16... 100R-16... 125R-16...	SB-50140TRP	TTP-20		P-37	HH10X30	ROMU1605M0ER-GM	ROMU1605M0ER-SM	ROMU1605M0ER-GH
Recommended tightening torque for insert clamp 4.5N·m			HH12X35					
			-					



MRW



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)						A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Fig.	Applicable inserts ➔ M267
			RE	DC	DCON	LF	LH	APMX						
Cylindrical	●	3	32	32	140	40	6	+12	-20	Yes	22000	1	ROMU1204MOER-..	
		4	6	40	32	160	40	+12	-16.5	Yes	18800	2		
		5	50	42	170	40	6	+12	-15.5	Yes	16000	2		
Cylindrical	●	3	40	32	160	40	8	+11	-18	Yes	17200	2	ROMU1605MOER-..	
		4	8	50	42	170	40	+11	-16.5	Yes	14800	2		
		5	63	42	170	50	8	+11	-16.5	Yes	12800	2		
Long Shank	●	2	32	32	200	40	6	+12	-20	Yes	22000	1	ROMU1204MOER-..	
		3	6	40	32	200	40	+12	-16.5	Yes	18800	2		
		4	50	42	300	40	6	+12	-15.5	Yes	16000	2		
Long Shank	●	2	40	32	200	40	8	+11	-18	Yes	17200	2	ROMU1605MOER-..	
		3	8	50	42	300	40	+11	-16.5	Yes	14800	2		
		4	63	42	300	50	8	+11	-16.5	Yes	12800	2		
Weldon	●	3	32	32	102	40	6	+12	-20	Yes	22000	3	ROMU1204MOER-..	
		4	6	40	32	100	40	+12	-16.5	Yes	18800	4		
		5	50	40	110	40	6	+12	-15.5	Yes	16000	4		
Weldon	●	3	40	32	100	40	8	+11	-18	Yes	17200	4	ROMU1605MOER-..	
		4	8	50	40	110	40	+11	-16.5	Yes	14800	4		
		5	63	40	120	50	8	+11	-16.5	Yes	12800	4		

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

APMX is Maximum ap. For more details, see page M268 below.

Spare parts and applicable inserts (MRW end mill)

Description	Spare parts			Anti-seize compound	Applicable Inserts ➔ M267		
	Clamp screw	Wrench			General purpose	Low cutting force	Tough Edge (For Heavy Milling)
		DTPM-15 	TTP-20 				
MRW ...-12...	SB-4085TRP	DTPM-15		P-37	ROMU1204MOER-GM	ROMU1204MOER-SM	ROMU1204MOER-GH
Recommended tightening torque for insert clamp 3.5N·m							
MRW ...-16...	SB-50140TRP	TTP-20		P-37	ROMU1605MOER-GM	ROMU1605MOER-SM	ROMU1605MOER-GH
Recommended tightening torque for insert clamp 4.5N·m							

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter


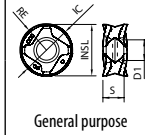

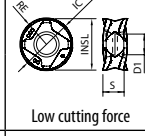

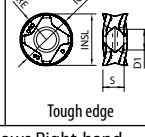
Multi-Function

Slot Mill

Ball-nose Radius

Others

ROMU

Insert		Description	Dimension (mm)					Carbide						Applicable toolholder M264 M266		
			IC	S	D1	RE	INSL	CVD		PVD						
								CA6535	PRI1510	PRI1525	PRI1535	PRI1810	PRI1825		PRI1835	
<p>Classification of usage</p> <p>★ : Roughing / 1st Choice ☆ : Roughing / 2nd Choice ■ : Finishing / 1st Choice □ : Finishing / 2nd Choice (In case hardness is 45HRC or under)</p>		Carbon steel / Alloy steel						☆				★	☆	P		
		Mold and die steel						☆				★	☆		M	
		Austenitic stainless steel							☆			★				
		Martensitic stainless steel	★									☆				
		Precipitation hardening stainless steel							☆			★				
		Gray cast iron						☆				★				K
		Nodular cast iron						☆				★				
		Non-ferrous metals														N
		Heat-resistant alloy	★									☆				S
		Titanium alloy							☆			★				
		Hard materials												H		
  <p>General purpose</p>		ROMU 1204M0ER-GM	12	4.75	4.6	6	11.8	●	●	●	●	●	●	●	MRW...-12..	
		ROMU 1605M0ER-GM	16	5.48	6.2	8	15.8	●	●	●	●	●	●	●	MRW...-16..	
  <p>Low cutting force</p>		ROMU 1204M0ER-SM	12	4.75	4.6	6	11.8	●	●	●	●	●	●	MRW...-12..		
		ROMU 1605M0ER-SM	16	5.48	6.2	8	15.8	●	●	●	●	●	●	MRW...-16..		
  <p>Tough edge</p>		ROMU 1204M0ER-GH	12	4.75	4.6	6	11.8	●	●	●	●	●	●	MRW...-12..		
		ROMU 1605M0ER-GH	16	5.48	6.2	8	15.8	●	●	●	●	●	●	MRW...-16..		

Handed insert shows Right-hand

Recommended cutting conditions M268



Milling

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

Recommended cutting conditions

Workpiece material	Recommended chipbreaker (fz: mm/t) <small>*Recommended feed rate (Reference value) for ROMU12 type: ap=3 mm/for ROMU16 type: ap=4 mm</small>			Recommended insert grades (Vc: m/min)			
	GM	SM	GH	MEGACOAT NANO EX (MEGACOAT NANO)			CVD Coated carbide
				PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	CA6535
Carbon steel	★ 0.1~ 0.2 ~0.3	☆ 0.06~ 0.15 ~0.2	☆ 0.15~ 0.3 ~0.35	-	★ 120~ 180 ~250	☆ 120~ 180 ~250	-
Alloy steel	★ 0.1~ 0.2 ~0.3	☆ 0.06~ 0.15 ~0.2	☆ 0.15~ 0.3 ~0.35	-	★ 100~ 160 ~220	☆ 100~ 160 ~220	-
Mold steel	★ 0.1~ 0.15 ~0.25	☆ 0.06~ 0.12 ~0.2	☆ 0.15~ 0.2 ~0.3	-	★ 80~ 140 ~180	☆ 80~ 140 ~180	-
Stainless steel (Austenitic related)	☆ 0.1~ 0.15 ~0.2	★ 0.06~ 0.12 ~0.2	☆ 0.15~ 0.2 ~0.25	-	☆ 100~ 160 ~200	★ 100~ 160 ~200	-
Stainless steel (Martensitic related)	☆ 0.1~ 0.15 ~0.2	★ 0.06~ 0.12 ~0.2	☆ 0.15~ 0.2 ~0.25	-	-	☆ 150~ 200 ~250	★ 180~ 240 ~300
Stainless steel (Precipitation Hardening)	★ 0.1~ 0.15 ~0.2	☆ 0.06~ 0.12 ~0.2	☆ 0.15~ 0.2 ~0.25	-	-	★ 90~ 120 ~150	-
Gray cast iron	★ 0.1~ 0.2 ~0.3	-	☆ 0.15~ 0.3 ~0.35	★ 120~ 180 ~250	-	-	-
Nodular cast iron	★ 0.1~ 0.15 ~0.25	-	☆ 0.15~ 0.2 ~0.3	★ 100~ 150 ~200	-	-	-
Ni-base heat-resistant alloys	★ 0.1~ 0.12 ~0.15	☆ 0.06~ 0.1 ~0.15	☆ 0.12~ 0.15 ~0.2	-	-	☆ 20~ 30 ~50	★ 20~ 30 ~50
Titanium alloys	☆ 0.1~ 0.12 ~0.15	★ 0.06~ 0.1 ~0.15	-	☆ 30~ 50 ~70	-	★ 40~ 60 ~80	-

★: 1st Recommendation ☆: 2nd Recommendation

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys.

* The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.

* Recommended feed rate is the reference value when ap is RE/2 (3mm for ROMU12, 4mm for ROMU16).

For lower ap than the above conditions, the conversion factor in the following table is recommended.

Insert	ap (Recommended)	Max. ap	Conversion factor for feed per tooth fz				
			ap=0.5mm	ap=1mm	ap=2mm	ap=3mm	ap=4mm
ROMU12 type	3mm or less	6mm	2.1	1.5	1.1	1.0 (Standard)	-
ROMU16 type	4mm or less	8mm	2.4	1.7	1.3	1.1	1.0 (Standard)

* Example (ROMU12 type, carbon steel, GM chipbreaker, ap=1 mm)

$$\boxed{fz=0.2\text{mm/t}} \quad (\text{Reference value for carbon steel and GM chipbreaker}) \quad \times \quad \boxed{1.5} \quad (\text{Conversion factor for ROMU12 type, ap=1mm}) \quad = \quad \boxed{fz = 0.3 \text{ mm/t}} \quad (\text{Recommended feed rate})$$

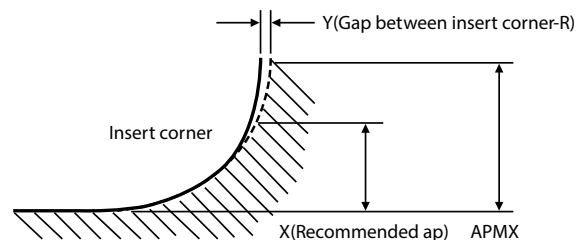
* Recommended ap: 3mm or less for ROMU12, 4mm or less for ROMU16

Except the case that ap temporarily surpass the recommended ap, machining under the recommended ap is recommended.

Corner-R shape during processing

Corner-R shape during processing with MRW (Ref. to the right figure)

Insert	APMX	X	Y
ROMU12 type	6 mm	3 mm	0.1 mm
ROMU16 type	8 mm	4 mm	0.1 mm



* When machining with larger ap than recommended ap (X), there is a gap (Y) between the workpiece corner and insert corner-R(RE).

* The above figure is estimation. There would be ±0.2mm variation depending on the cutting conditions.

M

Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

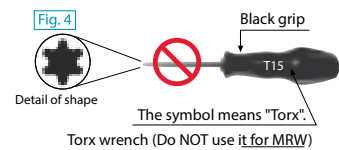
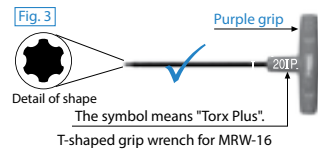
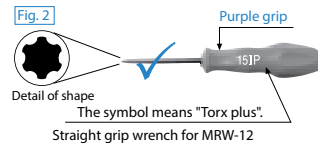
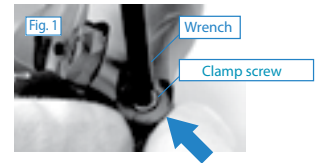
Ball-nose Radius

Others

How to mount an insert

1. Be sure to remove dust and chips from the insert mounting pocket.
2. Clamp screw
 1. Apply anti-seize compound on portion of taper and thread of clamp screw.
 2. Attach the screw to the front end of the wrench. While lightly pressing the insert against the constraint surfaces, put the screw into the hole of the insert and tighten. (Ref. to Fig. 1)
3. Wrenches and clamp screws are "Torx Plus".
 1. Fig. 2 wrench is for MRW-12. (Straight grip)
 2. Fig. 3 wrench is for MRW-16. (T-shaped grip)

Please use a "Torx Plus" Wrench for tightening clamp screw.
 * If a "Torx" wrench (Fig. 4) is used to tighten, the screw head might become damaged and then the screw cannot be removed.
4. When tightening the screw, make sure that the wrench is parallel to the screw.
 Recommended Tightening torque, See spare parts table.
5. After tightening the screw, make sure that there is no clearance between the insert seat surface and the bearing surface of the toolholder or between the insert side surfaces and the constraint surface of the toolholder. If there is any clearance, remove the insert and mount it again according to the above steps.



Case studies

12Cr Steel

Machining efficiency 1.2 times
Economical double-sided insert

- Turbine blade • Vc=270m/min • fz=0.278mm/t
- ap=0.5~1.0mm ae=max.35mm • Dry
- MRW050R-12-6T-M (6 flutes) • ROMU1204M0ER-SM (CA6535)

CA6535	Stable machining
Competitor A (Positive cutter)	Unstable machining with large noise

• MRW improved machining efficiency by 1.2 times with same tool life compared with competitor A.
 • MRW has cost advantage due to double-sided inserts.

(User evaluation)

12Cr Steel

Same or longer tool life
Economical double-sided insert

- Turbine Blade • Vc=250m/min • fz=0.16mm/t
- ap=2.0mm ae=5~30mm • Wet
- MRW050R-12-5T-M (5 flutes) • ROMU1204M0ER-SM (CA6535)

CA6535	Stable, available for further machining
Competitor B (Positive cutter)	Unstable machining with large noise

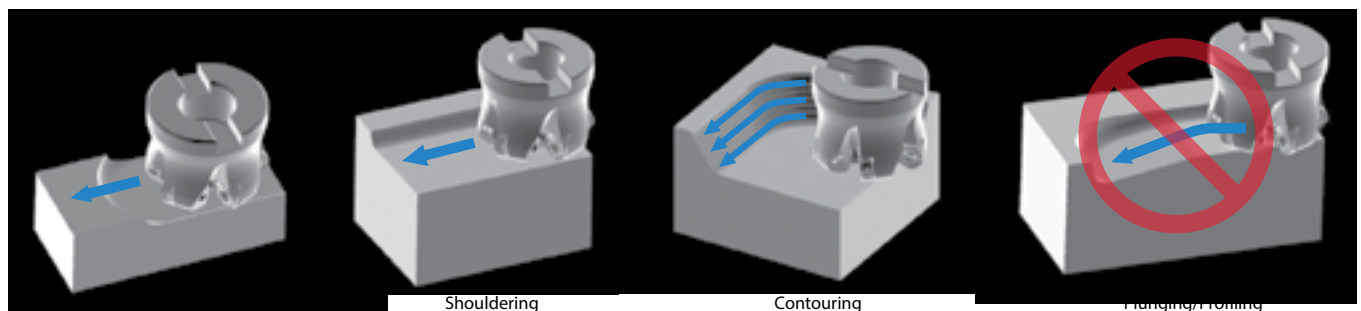
• MRW showed less damage on the cutting edge and reduced machining noise.
 • MRW has equal or longer tool life and cost advantage due to double sided inserts.

(User evaluation)

M

Milling

Applications

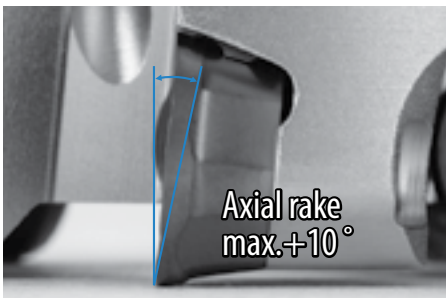


MRX

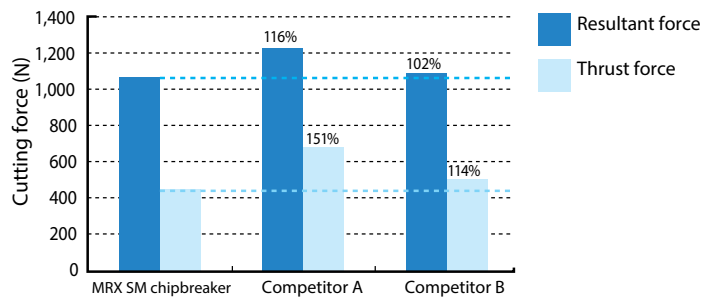
Excellent cutting performance with low cutting force design
High efficiency radius cutter



1 Low cutting force design with helical cutting-edge design



Cutting force comparison (Internal evaluation)



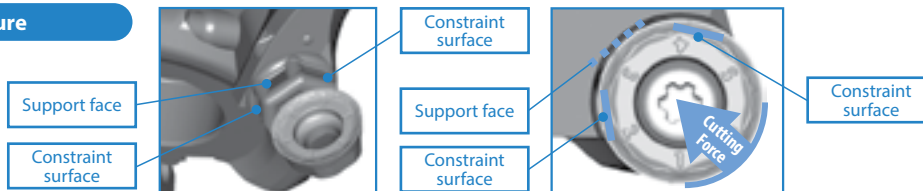
<Cutting conditions>
Vc=120m/min, ap,ae=2x25mm, fz=0.2mm/t, X5CrNi18 10, Cutterø50

2 Flat lock structure to hold insert firmly

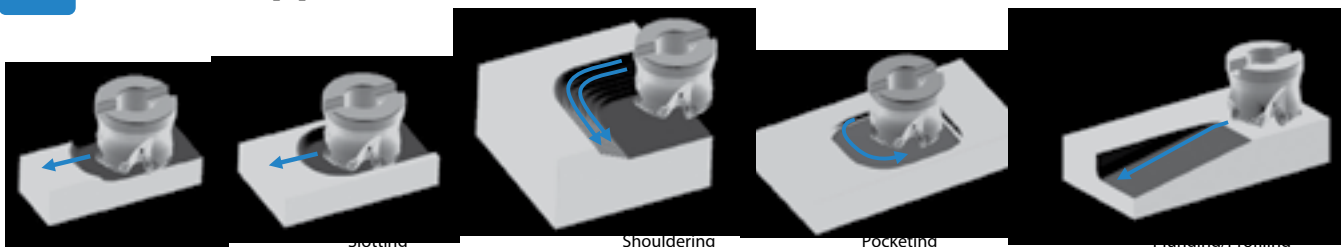
Prevent insert rotation during machining and realizes stable machining

Flat lock structure

Wide flat constraint surface
• Receives even cutting forces
• Controls insert rotation



3 Various applications



4 Machining of various materials possible

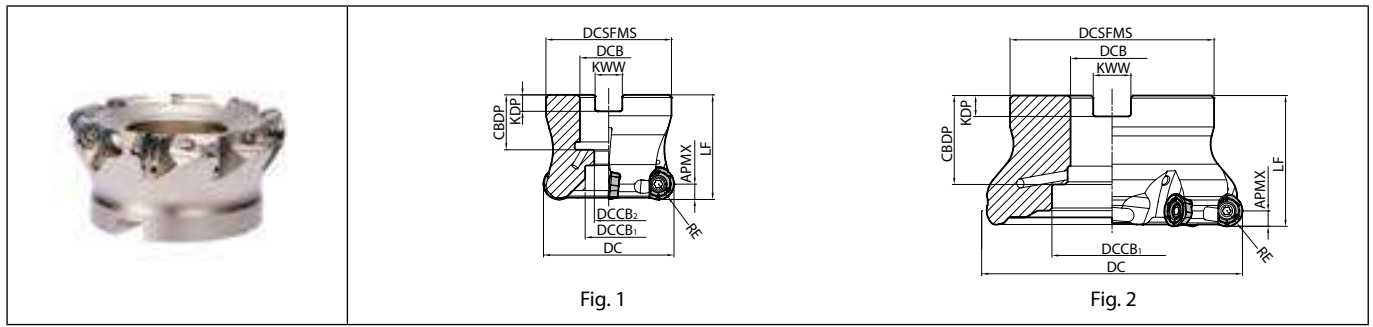
Insert grades **CA6535/PR1835(PR1535)** for difficult-to-cut material are available. Long tool life by wide lineup with 4 grades and 3 chipbreakers, available for steel, stainless steel and heat-resistant alloys.

Cost-effective M class inserts are available

M
Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

MRX



Toolholder dimensions






Description	Availability		Dimension (mm)											A.R. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Weight (kg)	Fig.	Applicable inserts M276		
	R	Inserts	RE	DC	DCSFMS	DCB	DCCB ₁	DCCB ₂	LF	CBDP	KDP	KWW	APMX									
Metric	MRX	●	5	40	38	16	15	9		19	5.6	8.4	5	+10	-5.5	Yes	20000	0.2	1	RPGT10T3... RPMT10T3...		
		●	6	50	48		22	18	11	40	21	6.3					10.4	17500	0.3		1	
		●	7	63	60													15000	0.6		1	
	Metric	MRX	●	4	40	38	16	13.5	9		19	5.6	8.4	6	+10	-5.5	Yes	21000	0.2	1	RPGT1204... RPMT1204...	
			●	5	50														18000			1
			●	5	50	48													0.3	1		
			●	4	52					40	21	6.3	10.4					17500		1		
			●	5			22	18	11													
			●	6	63														15500			1
			●	5	60														0.6	1		
			●	6	66														15000			1
			●	6	80	70	27	20	13		24	7	12.4					13500	1.2	1		
●			8						50	30	8	14.4	1.1					1				
●			7	100	78	32	46	-		30	8	14.4	12000					1.4	2			
●			9										2									
Bore dia. inch spec	MRX	●	4	63									8	+10	-5.5	Yes	13500	0.5	1	RPGT1605... RPMT1605...		
		●	5	60	22	18	11	40	21	6.3	10.4	13000					0.6	1				
		●	4	66													0.5	1				
		●	5	80	70	27	20	13		24	7	12.4					11500	1.1	1			
		●	6						50	30	8	14.4					1					
		●	7	100	78	32	46	-		30	8	14.4					10000	1.4	2			
	MRX	●	6	125	89	40	55		63	33	9	16.4	9000	2.6	2							
		●	8										2									
		□	6	80	70	25.4	20	13		27	6	9.5	13500	1.2	1							
		□	8						50	34	8	12.7	1.1	1								
		□	7	100	78	31.75	46	-		34	8	12.7	12000	1.5	2							
		□	9										2									
MRX	□	5	80	70	25.4	20	13		27	6	9.5	11500	1.1	1								
	□	6						50	34	8	12.7	1										
	□	7	100	78	31.75	46	-		34	8	12.7	10000	1.4	2								
	□	6										2										
	□	7	125	89	38.1	55		63	38	10	15.9	9000	2.7	2								
	□	8										2										

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability




Spare parts and applicable inserts (MRW face mill)

Description	Spare parts					Applicable inserts ➔ M276
	Clamp screw	Wrench		Anti-seize compound	Mounting bolt	
						
MRX 040R-10... 050R-10... 063R-10...	SB-3070TRP	DTPM-10		P-37	HH8X25 HH10X30	RPMT10T3M0ER-GM RPGT10T3M0ER-GM RPGT10T3M0ER-SM RPMT10T3M0EN-GH *1
Recommended tightening torque for insert clamp 2.0N·m						
MRX 040R-12... 050R-12... 063R-12... 080R-12... 100R-12...	SB-4090TRPN	DTPM-15		P-37	HH8X25 HH10X30 HH12X35 -	RPMT1204M0ER-GM RPGT1204M0ER-GM RPGT1204M0ER-SM RPMT1204M0EN-GH *2
Recommended tightening torque for insert clamp 3.5N·m						
MRX 063R-16... 080R-16... 100R-16... 125R-16...	SB-50120TRP	TTP-20		P-37	HH10X30 HH12X35 -	RPMT1605M0ER-GM RPGT1605M0ER-GM RPGT1605M0ER-SM RPMT1605M0EN-GH *3
Recommended tightening torque for insert clamp 4.5N·m						

Max. Revolution

Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

 Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

*1... Not compatible with the conventional RPMT10T3M0.

*2... Not compatible with the conventional RPMT1204M0 and RPMT1204M0-H.

*3... Not compatible with the conventional RPMT1606M0-H.

M



Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

Multi-
Function

Slot Mill

Ball-nose
Radius

Others

MRX

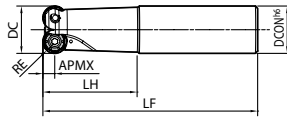


Fig. 1

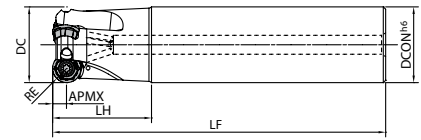


Fig. 2

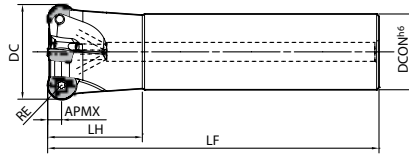


Fig. 3

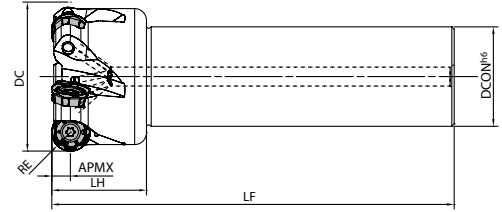


Fig. 4

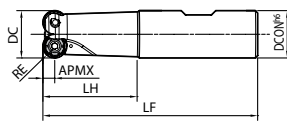


Fig. 5

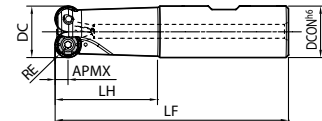


Fig. 6

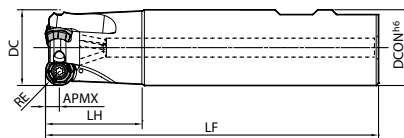


Fig. 7

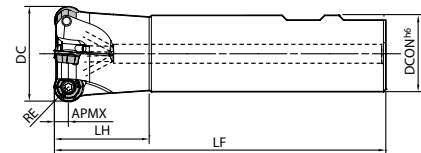


Fig. 8

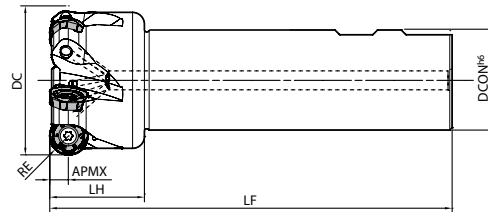


Fig. 9

M



Milling

Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)						A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Fig.	Applicable inserts ● M276				
			RE	DC	DCON	LF	LH	APMX										
Cylindrical	MRX 16-S16-08-2T 20-S20-08-2T 25-S25-08-4T	● 2	4	16	16	110	40	4	+3	No	38000	1	RDGT0803... RDMT0803...					
		● 4		20	20	120			-5.5					Yes	32000	2		
		● 4		25	25	120			+10						28000	2		
	MRX 20-S20-10-2T 25-S25-10-3T 32-S32-10-4T	● 2	5	20	20	120	40	5	+5	-8	No	30000	1	RPGT10T3... RPMT10T3...				
		● 3		25	25				+10						-5.5	Yes	28000	2
		● 4		32	32				140						+10		-5.5	22500	2
	MRX 32-S32-12-3T 40-S32-12-4T 50-S42-12-5T	● 3	6	32	32	140	40	6	+10	-5.5	Yes	24500	2	RPGT1204... RPMT1204...				
		● 4		40	42	170			+10						-5.5	21000	3	
		● 5		50	42	170			+10						-5.5	18000	3	
	MRX 40-S32-16-2T 50-S42-16-4T 63-S42-16-5T	● 2	8	40	32	140	40	8	+10	-5.5	Yes	18000	3	RPGT1605... RPMT1605...				
		● 4		50	42	170			+10						-5.5	15500	3	
		● 5		63	42	170			+10						-5.5	13500	4	
Weldon	MRX 16-W16-08-2T 20-W20-08-2T 25-W25-08-4T	● 2	4	16	16	89	40	4	+3	No	38000	5	RDGT0803... RDMT0803...					
		● 4		20	20	91			-5.5					Yes	32000	6		
		● 4		25	25	97			+10						28000	7		
	MRX 20-W20-10-2T 25-W25-10-3T 32-W32-10-4T	● 2	5	20	20	91	40	5	+5	-8	No	30000	5	RPGT10T3... RPMT10T3...				
		● 3		25	25	97			+10						-5.5	Yes	28000	7
		● 4		32	32	101			+10						-5.5		22500	7
	MRX 32-W32-12-3T 40-W32-12-4T 50-W40-12-5T	● 3	6	32	32	101	40	6	+10	-5.5	Yes	24500	7	RPGT1204... RPMT1204...				
		● 4		40	40	111			+10						-5.5	21000	8	
		● 5		50	40	111			+10						-5.5	18000	8	
	MRX 40-W32-16-2T 50-W40-16-4T 63-W40-16-5T	● 2	8	40	32	101	40	8	+10	-5.5	Yes	18000	8	RPGT1605... RPMT1605...				
		● 4		50	40	111			+10						-5.5	15500	8	
		● 5		63	40	112			+10						-5.5	13500	9	
Long Shank	MRX 16-S16-08-2T-160 20-S20-08-2T-180 25-S25-08-4T-180	● 2	4	16	16	160	70	4	+3	No	38000	1	RDGT0803... RDMT0803...					
		● 4		20	20	180	80		+10					-5.5	Yes	32000	2	
		● 4		25	25	180	80		+10					-5.5		28000	2	
	MRX 20-S20-10-2T-180 25-S25-10-2T-180 32-S32-10-4T-200	● 2	5	20	20	180	80	5	+5	-8	No	30000	1	RPGT10T3... RPMT10T3...				
		● 4		25	25	180			+10						-5.5	Yes	28000	2
		● 4		32	32	200			+10						-5.5		22500	2
	MRX 32-S32-12-2T-200 40-S32-12-4T-200 50-S42-12-4T-300	● 2	6	32	32	200	80	6	+10	-5.5	Yes	24500	2	RPGT1204... RPMT1204...				
		● 4		40	42	300			+10						-5.5	Yes	21000	3
		● 4		50	42	300			+10						-5.5		18000	3
	MRX 40-S32-16-2T-200 50-S42-16-4T-300 63-S42-16-4T-300	● 2	8	40	32	200	40	8	+10	-5.5	Yes	18000	3	RPGT1605... RPMT1605...				
		● 4		50	42	300			+10						-5.5	Yes	15500	3
		● 4		63	42	300			+10						-5.5		13500	4

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.
Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

M

Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

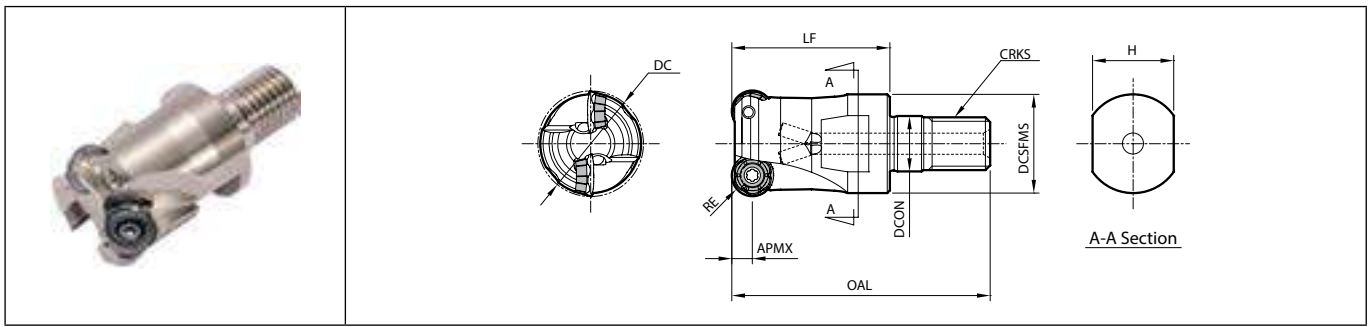
Slot Mill

Ball-nose Radius

Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

MRX



Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)								A.R. max. (°)	R.R. (°)	Coolant hole	Max. revolution (min ⁻¹)	Applicable inserts ● M276	
			RE	DC	DCON	DCSFS	OAL	LF	APMX	CRKS						H
MRX 16-M08-08-2T 20-M10-08-2T 25-M12-08-4T	●	2	16	8.5	14.7	42	25		M8x1.25	12	+3	No	38000	RDGT0803... RDMT0803...		
	●	4	20	10.5	18.7	48	30	4	M10x1.5	15	-5.5	Yes	32000			
	●	4	25	12.5	23	56	35		M12x1.75	19	+10	Yes	28000			
MRX 20-M10-10-2T 25-M12-10-3T 32-M16-10-4T	●	2	20	10.5	18.7	48	30		M10x1.5	15	+5	-8	No	30000	RPGT10T3... RPMT10T3...	
	●	3	25	12.5	23	56	35	5	M12x1.75	19	+10	-5.5	Yes	28000		
	●	4	32	17	30	62	40		M16x2.0	24	+10	-5.5	Yes	22500		
MRX 32-M16-12-3T 40-M16-12-4T	●	3	32		17	30	62	40	6	M16x2.0	24	+10	-5.5	Yes	24500	RPGT1204... RPMT1204...
	●	4	40		17	30	62	40	6	M16x2.0	24	+10	-5.5	Yes	21000	
MRX 40-M16-16-2T	●	2	8	40	17	30	62	40	8	M16x2.0	24	+10	-5.5	Yes	18000	RPGT1605... RPMT1605...

Max. revolution : Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

See page M82 for applicable arbor (BT arbor for exchangeable head / double-face clamping spindle)

Spare parts and applicable inserts

Description	Clamp screw	Wrench		Anti-seize compound	Applicable inserts ● M276
		DTPM	TTP		
MRX ...-08...	SB-2555TRP	DTPM-8		P-37	RDMT0803MOER-GM RDGT0803MOER-GM RDGT0803MOER-SM RDMT0803MOEN-GH * 1
	Recommended tightening torque for insert clamp 1.2N·m				
MRX ...-10...	SB-3070TRP	DTPM-10		P-37	RPMT10T3MOER-GM RPGT10T3MOER-GM RPGT10T3MOER-SM RPMT10T3MOEN-GH * 2
	Recommended tightening torque for insert clamp 2.0N·m				
MRX ...-12...	SB-4090TRPN	DTPM-15		P-37	RPMT1204MOER-GM RPGT1204MOER-GM RPGT1204MOER-SM RPMT1204MOEN-GH * 3
	Recommended tightening torque for insert clamp 3.5N·m				
MRX ...-16...	SB-50120TRP	TTP-20		P-37	RPMT1605MOER-GM RPGT1605MOER-GM RPGT1605MOER-SM RPMT1605MOEN-GH * 4
	Recommended tightening torque for insert clamp 4.5N·m				

Max. Revolution

Do not use the cutter at the maximum revolution or higher since the centrifugal force may cause inserts and parts to scatter even under no load.

Coat anti-seize compound thinly on portion of taper and thread when insert is fixed.

*1... Not compatible with the conventional RDMT08T2M0-H.

*2... Not compatible with the conventional RPMT10T3M0.

*3... Not compatible with the conventional RPMT1204M0 and RPMT1204M0-H.

*4... Not compatible with the conventional RPMT1606M0-H.

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



Recommended cutting conditions

Workpiece material	Recommended chipbreaker (fz: mm/t)				Recommended insert grades (Vc: m/min)			
	* RD**08 type: ap=2mm, RP**10 type: ap=2.5mm RP**12 type: ap=3mm, RP**16 type: ap=4mm				MEGACOAT NANO EX (MEGACOAT NANO)			CVD Coated carbide
	RDMT-GM RPMT-GM	RDGT-GM RPGT-GM	RDGT-SM RPGT-SM	RDMT-GH RPMT-GH	PR1810 (PR1510)	PR1825 (PR1525)	PR1835 (PR1535)	(CA6535)
Carbon steel	★ 0.1~0.2~0.3	☆ 0.1~0.2~0.3	☆ 0.06~0.15~0.2	☆ 0.15~0.3~0.35	-	★ 120~180~250	☆ 120~180~250	-
Alloy steel	★ 0.1~0.2~0.3	☆ 0.1~0.2~0.3	☆ 0.06~0.15~0.2	☆ 0.15~0.3~0.35	-	★ 100~160~220	☆ 100~160~220	-
Mold steel	★ 0.1~0.15~0.25	☆ 0.1~0.15~0.25	☆ 0.06~0.12~0.2	☆ 0.15~0.2~0.3	-	★ 80~140~180	☆ 80~140~180	-
Stainless steel (Austenitic related)	☆ 0.1~0.15~0.2	☆ 0.1~0.15~0.2	★ 0.06~0.12~0.2	☆ 0.15~0.2~0.25	-	☆ 100~160~200	★ 100~160~200	-
Stainless steel (Martensitic related)	☆ 0.1~0.15~0.2	☆ 0.1~0.15~0.2	★ 0.06~0.12~0.2	☆ 0.15~0.2~0.25	-	-	☆ 150~200~250	★ 180~240~300
Stainless steel (Precipitation Hardening)	☆ 0.1~0.15~0.2	★ 0.1~0.15~0.2	☆ 0.06~0.12~0.2	☆ 0.15~0.2~0.25	-	-	★ 90~120~150	-
Gray cast iron	★ 0.1~0.2~0.3	☆ 0.1~0.2~0.3	-	☆ 0.15~0.3~0.35	★ 120~180~250	-	-	-
Nodular cast iron	★ 0.1~0.15~0.25	☆ 0.1~0.15~0.25	-	☆ 0.15~0.2~0.3	★ 100~150~200	-	-	-
Ni-base heat-resistant alloys	☆ 0.1~0.12~0.15	★ 0.1~0.12~0.15	☆ 0.06~0.1~0.15	☆ 0.12~0.15~0.2	-	-	☆ 20~30~50	★ 20~30~50
Titanium alloys	☆ 0.1~0.12~0.15	☆ 0.1~0.12~0.15	★ 0.06~0.1~0.15	-	☆ 30~50~70	-	★ 40~60~80	-

* Machining with coolant is recommended for Ni-base heat-resistant alloys and titanium alloys. ★: 1st Recommendation ☆: 2nd Recommendation
 * RDGT/RPGT are recommended for stainless steel, Ni-base heat-resistant alloys and titanium alloy.
 * The bold-faced number indicates a center value of recommended cutting condition. Adjust the cutting speed and the feed rate within the above conditions according to the actual machining situation.
 * Recommended feed rate in the table is the reference value when ap is RE/2. (2 mm for RD**08/2.5 mm for RP**10/3mm for RP**12/4 mm for RP**16)
 For other ap, calculate the recommended feed rate based on the conversion factor below.
 * For MRX16-S16-08-2T(-160), MRX16-W-08-2T, MRX20-S20-10-2T(-180) and MRX20-W20-10-2T, set the feed rate not higher than 50% of the recommended cutting conditions.

Conversion factor for feed per tooth by depth of cut (ap)

Insert	Max. ap	Conversion factor for feed per tooth fz									
		ap=0.5 mm	ap=1 mm	ap=1.5 mm	ap=2 mm	ap=2.5 mm	ap=3 mm	ap=4 mm	ap=5 mm	ap=6 mm	ap=8 mm
RD**08 type (GM/SM/GH chipbreaker)	4mm	1.7	1.3	1.1	1 (Standard)	0.9	0.8	0.8	-	-	-
RP**10 type (GM/SM/GH chipbreaker)	5mm	1.9	1.4	1.2	1	1 (Standard)	0.9	0.8	0.8	-	-
RP**12 type (GM/SM/GH chipbreaker)	6mm	2.1	1.5	1.3	1.1	1	1 (Standard)	0.9	0.8	0.8	-
RP**16 type (GM/SM/GH chipbreaker)	8mm	2.4	1.7	1.4	1.3	1.1	1.1	1 (Standard)	0.9	0.8	0.8

* Example (ROMU12 type, carbon steel, GM chipbreaker, ap=1mm)

$$\begin{matrix} fz=0.2 \text{ mm/t} \\ \text{(Reference value for carbon steel and GM chipbreaker)} \end{matrix} \times \begin{matrix} 1.5 \\ \text{(Conversion factor for ROMU12 type, ap=1mm)} \end{matrix} = \begin{matrix} fz=0.3 \text{ mm/t} \\ \text{(Recommended feed rate)} \end{matrix}$$

Recommended cutting conditions for drilling/ramping/helical milling

Tool spec.		Max. ap	Drilling		Ramping (Slant milling)			Helical milling		
Insert	Tool dia.	ap	Max. cutting depth Pd	Min. Cutting length X for flat bottom surface	Max. ramping angle RMPX	tan RMPX	Cutting length L at max. ramping angle	Min. cutting dia. øDh1	Min. cutting dia. for flat bottom facing øDh2	Max. cutting dia. øDh3
RD**08 type	16	4	0.7	9	8°	0.141	28	20	24	30
	20			13	9°	0.158	25	26	32	38
	25			18	5°	0.087	45	36	42	48
RP**10 type	20	5	0.6	11	5°	0.087	57	26	30	38
	25			16	10°	0.176	28	33	40	48
	32			23	6°	0.105	47	47	54	62
	40			31	4°	0.070	71	63	70	78
	50			41	3°	0.052	95	83	90	98
	63			54	2°	0.035	143	109	116	124
RP**12 type	32	6	2.4	21	9°	0.158	37	43	52	62
	40			29	5°	0.087	68	59	68	78
	50			39	4°	0.070	85	79	88	98
	63			52	2°	0.035	171	105	114	124
	80			139				148	158	
	100			179				188	198	
RP**16 type	40	8	3.4	25	11°	0.194	41	51	64	78
	50			35	7°	0.123	65	71	84	98
	63			48	4°	0.070	114	97	110	124
	80			65	3°	0.052	152	131	144	158
	100			85	2°	0.035	229	171	184	198
	125			110	1°	0.017	458	221	234	248

* Above is the value considering the clearance 1mm between the tool body and the workpiece.

Unit: mm



Milling

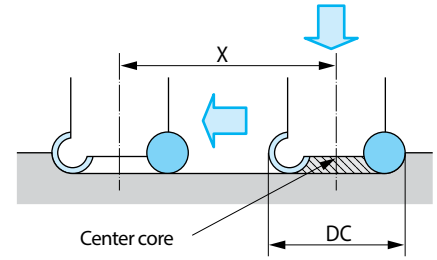
Guide for drilling

Depth of drilling

Refer to max. cutting depth (Pd) shown in the lower table of M277. (Pd Shows the maximum plunge depth.)

When traversing after drilling

1. Reduce the table feed by 50% until the center core part (do not forget to grind) is completely cut off. (The internal cutting edge's radial rake angle is large in the negative direction)
2. The min. cutting length "X" for flat bottom surface is as follows M277.

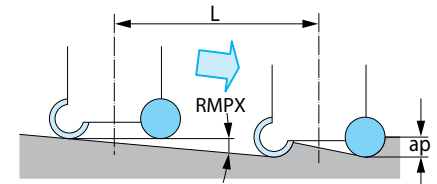


Guide for ramping (Slant milling)

- Ramping angle should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
- Feed rate should be 70% or under of the above cutting conditions.

Formula of the cutting length "L" at max. ramping angle

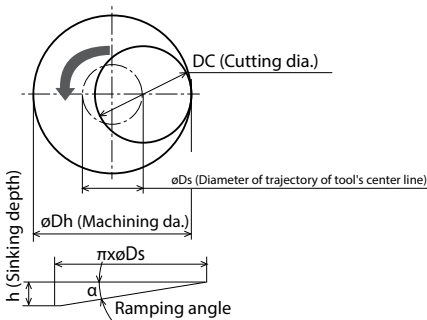
$$L = \frac{ap}{\tan RMPX}$$



Guide for helical milling

- Sinking depth (h) per revolution when helical milling should be max. ap or under in the above cutting conditions. Ramping angle (with trajectory of the center line of tool) should be RMPX (Maximum ramping angle) or under in the above cutting conditions.
- Feed rate should be 70% or under of the above cutting conditions.
- Down-cut machining is recommended.

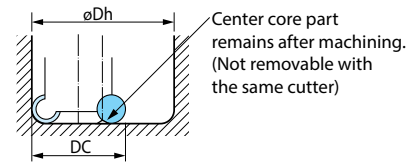
Helical milling factors



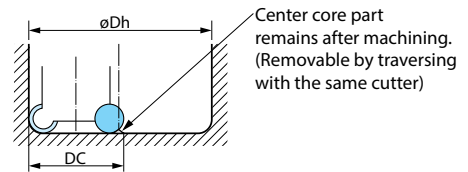
øDs (How to find diameter of trajectory of tool's center line)
 $\text{øDs} = \text{øDh} - \text{DC}$

Formula for sinking depth (h)
 $h = \pi \times \text{øDs} \times \tan \alpha$
 (h should be ap or under)
 (α should be RMPX or under)

[When cutting dia. $\text{øDh1} \leq \text{øDh} < \text{øDh2}$]



[When cutting dia. $\text{øDh2} \leq \text{øDh} \leq \text{øDh3}$]



Please refer to M277 the list for øDh1 ~ Dh3.

M
Milling
Cutting edge angle 45°~70°
Cutting edge angle 75°
Cutting edge angle 88°/90°
Cutter for Finishing
High Feed Cutter
Multi- Function
Slot Mill
Ball-nose Radius
Others

Max. ap and usable edges

(mm)

Usable edges	Insert corner-R			
	R4	R5	R6	R8
3 edges	ap=2.0~4.0	ap=2.5~5.0	ap=3.0~6.0	ap=4.0~8.0
6 edges	ap=2.0 Less than	ap=2.5 Less than	ap=3.0 Less than	ap=4.0 Less than

Case studies

X5CrNi18 10

- Nozzle parts
- Vc = 113m/min
- ap x ae = 1.0 x 65mm
- fz = 0.14mm/t
- Dry
- MRX100R-12-9T-M (9 flutes)
- RPGT1204M0ER-SM (PR1535)

4.5 times longer tool life

PR1535	450 pcs/edge
Conventional	100 pcs/edge

• High cost efficiency with 4.5 times longer tool life and 1.5 times more insert edges.
 • MRX prevented burr formation and improved surface finish.

(User evaluation)

X40CrMoV51 (47~49HRC)

- Mold part
- Vc = 125m/min
- ap x ae = 1.0~2.0x 10mm
- fz = 0.25mm/t
- Dry
- MRX20-S20-08-2T (2 flutes)
- RDGT0803M0ER-GM (PR1525)

More than double tool life

PR1525	2 pcs and more Stable tool life
Conventional	1 pc unstable tool life

• Conventional tool machined only 1 pc of workpiece due to unstable tool life, but MRX doubled the tool life with stable machining.

(User evaluation)

MCSE

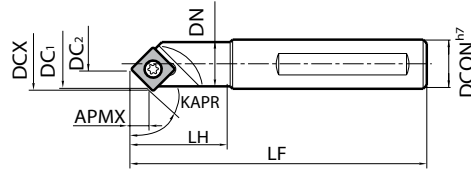


Fig. 1

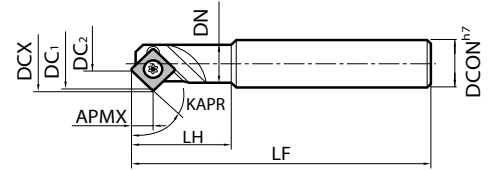


Fig. 2

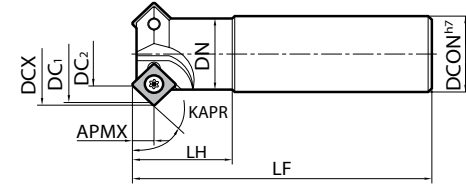


Fig. 3

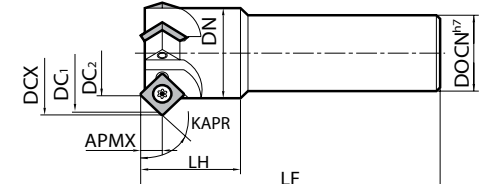


Fig. 4

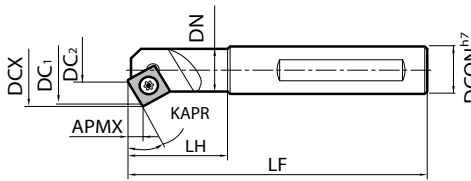


Fig. 5

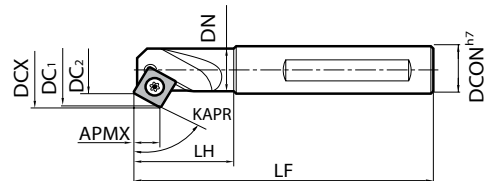


Fig. 6

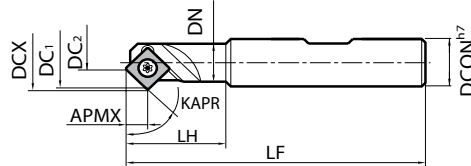


Fig. 7

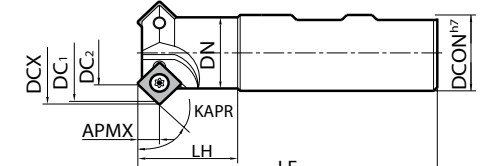


Fig. 8

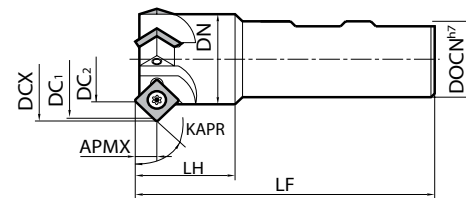


Fig. 9



Milling

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

Multi-
Function

Slot Mill

Ball-nose
Radius

Others

Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)								Standard corner-R(RE)	KAPR (°)	A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts			Applicable inserts M281																												
			DCX	DC1	DC2	DON	LF	LH	APMX	DN							Screw	Wrench	Wrench																													
MCSE 104	●	1	16	15	4	16	85	31	6.5	15	0.4	45	0	-4.5	No	1	SB-3060TR	DT-10	-	SDKW09T2... SDMT09T204C																												
MCSE 106	●	1	22	21	6	20	121	41	8.6	16	0.8						0	-1	2	2	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C																								
MCSE 115	●	1	31	30	15																				20	121	41	8.6	18	0.8	0	+5	2	2	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C										
MCSE 227	●	2	43	42	27	20	121	41	8.6	30																													0.8	0	+8	3	3	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C	
MCSE 336	●	3	52	51	36																				20	121	41	8.6	38																			0.8
MCSE 106-W	□	1	22	21	6	20	92	40	8.6	16		0.8	45	0	-1	No																																
MCSE 115-W	□	1	31	30	15						20						92	40	8.6	18	0.8	45	0	+5	7	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C																			
MCSE 104-30D	●	1	19	18	4	16	85	31	4.7	15																				0.4	30	0	-4	No	5	SB-3060TR	DT-10	-										
MCSE 108-30D	●	1	28	27	8	20	110	41	6.3	19	0.8						0	-2.5	5	5										SB-5090TR						-	LTW-20	SEKW1203... SEMT120304C										
MCSE 110-30D	●	1	30	28	10																																		20	120	40	6.3	18	0.8	0	0	5	5
MCSE 108-60D	●	1	19.5	19	8	20	110	41	10	19		0.8	60	0	-3.5	6															6	SB-5070TR	-	LTW-20	SEKW1203... SEMT120304C													
MCSE 120-60D	●	1	31	30	20						20						120	40	18	18	0.8	60	0	0	6	6	SB-5090TR	-	LTW-20	SEKW1203... SEMT120304C																		

SDKW/SDMT/SEKW/SEMT





Insert		Description	Dimension (mm)					Angle (°)	Carbide			Cermets	Applicable toolholder M281
			IC	S	D1	RE	AN		PVD	-	-		
		SDKW 09T204FN	9.525	2.78	3.4	0.4	15	●	-	-	-	MCSE104-30D MCSE104	
		SDKW 09T204TN	9.525	2.78	3.4	0.4	15	●	●	-	-	MCSE104-30D MCSE104	
		SEKW 120304FN 120308FN	12.7	3.18	5.5	0.4 0.8	20	●	●	-	-	MCSE106(-W), MCSE108...D MCSE110-30D, MCSE115(-W) MCSE120-60D, MCSE227(-W) MCSE336(-W)	
		SEKW 120304TN 120308TN	12.7	3.18	5.5	0.4 0.8	20	●	●	-	-	MCSE106(-W), MCSE108...D MCSE110-30D, MCSE115(-W) MCSE120-60D, MCSE227(-W) MCSE336(-W)	
		SDMT 09T204C	9.525	2.78	3.4	0.4	15	●	●	●	-	MCSE104-30D MCSE104	
		SEMT 120304C	12.7	3.18	5.5	0.4	20	●	●	-	-	MCSE106(-W), MCSE108...D MCSE110-30D, MCSE115(-W) MCSE120-60D, MCSE227(-W) MCSE336(-W)	

Recommended cutting conditions M282

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability





Applicable inserts

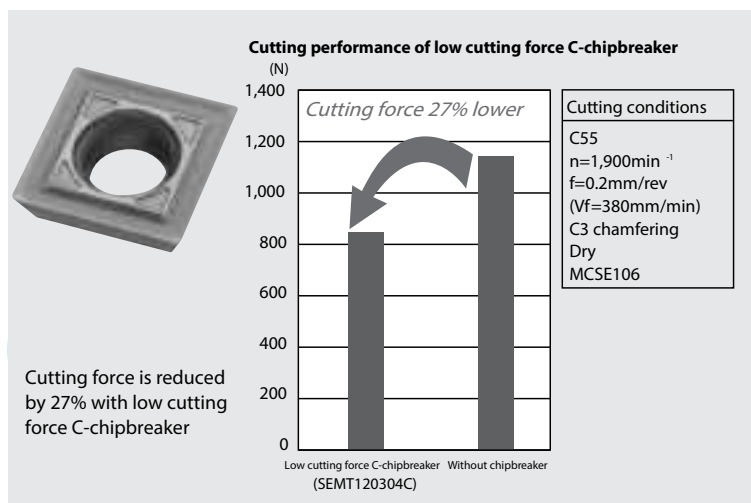
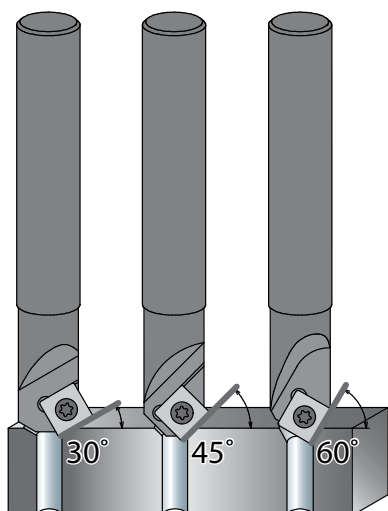
Description		Applicable inserts  M281		
				
MCSE	104 104-30D	SDKW 09T204TN	SDKW 09T204FN	SDMT 09T204C
MCSE	106(-W) 115(-W) 227(-W) 336(-W)	SEKW 120304TN 120308TN	SEKW 120304FN 120308FN	SEMT 120304C
MCSE	108-30D 110-30D			
MCSE	108-60D 120-60D			

Recommended cutting conditions

Workpiece material	fz (mm/t)		Recommended insert grades (Vc: m/min)		
			MEGACOAT	Carbide	Cermet
	DC ₂ (ø4~ø20)	DC ₂ (ø27~ø36)	PR1825	KW10	TN100M
Carbon steel	0.05~0.25	0.2~0.4	★ 120~250	-	★ 100~180
Alloy steel	0.05~0.25	0.2~0.4	★ 100~220	-	★ 100~180
Mold steel	0.05~0.25	0.2~0.4	★ 80~180	-	★ 100~150
Stainless steel	0.05~0.2	0.1~0.3	★ 120~220	-	☆ 100~180
Cast iron	0.1~0.3	0.3~0.5	-	☆ 80~150	-
Non-ferrous metals	0.1~0.3	0.3~0.5	-	★ 100~300	-

★: 1st Recommendation ☆: 2nd Recommendation

-  M
-  Milling
- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others



High efficiency bolt countersink end mill

MEF Expanded Offering

For countersinking and boring of bolts with hexagon holes (M6 to M30)

Economical inserts with 4 cutting edges

1 New GM chipbreaker provides high-efficiency and stable machining
Excellent chip control for a wide range of machining. Provides stable machining with a low cutting force design

NEW



Conventional challenges

- . Poor chip evacuation can lead to entanglement.
- . Feed rate cannot increase due to high cutting force.
- . Chatter occurs when deep hole making.

GM Chipbreaker



Variable chipbreaker width considering speed difference of inner and outer periphery

Bump at corners
⇒ Stable chip control at low D.O.C.

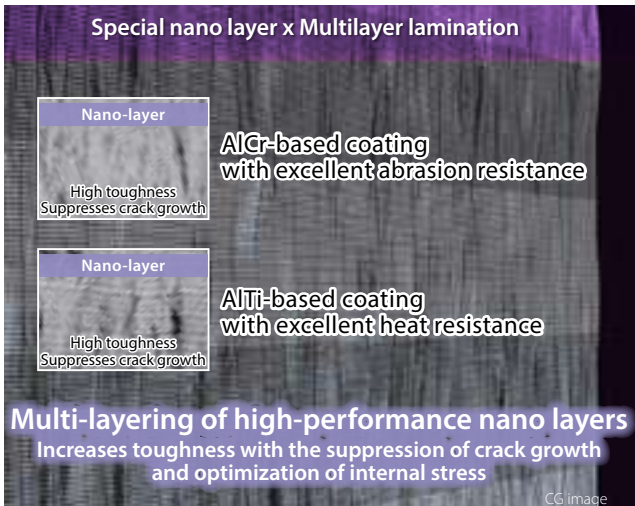
⇒ Stable chip control at high D.O.C.

Chip samples by GM chipbreaker

Case1	Vc = 120 m/min fz = 0.10 mm/t	ap = 4.5 mm ø26 C45	Case2	Vc = 80m/min fz = 0.15 mm/t	ap = 3.5 mm ø30 C45
Case3	Vc = 120 m/min fz = 0.10 mm/t	ap = 1.0 mm ø26 C50	Case4	Vc = 120 m/min fz = 0.15 mm/t	ap = 1.0 mm ø26 C50

Achieves excellent chip control under various machining conditions
(User/internal evaluation)

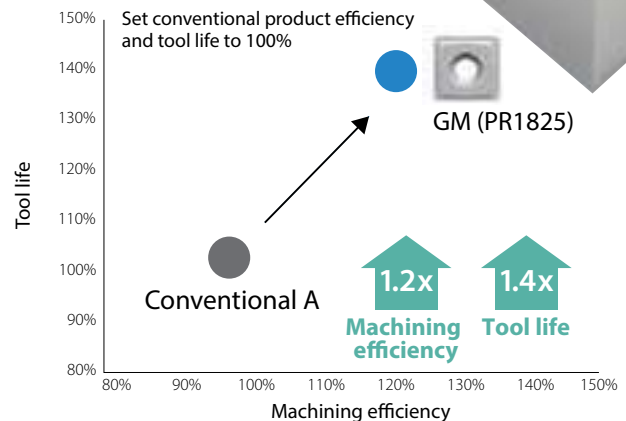
2 New Grade PR18 series
Provides extended tool life **NEW**



Case study

Alloy steel/Copper alloy Block

Vc = 100m/min
ap x H = 0.8x75mm
Vf = 225mm/min
Wet (Internal and external)
SPMT090308EN-GM PR1825
Custom-made toolholder

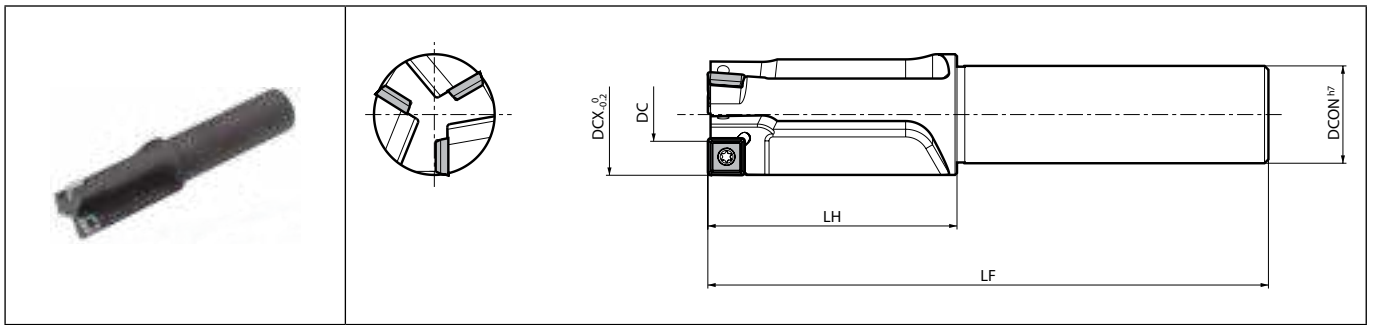


GM chipbreaker (PR1825) provided stable machining with increased cutting speed and feed rate. Reduced chip clogging and extended tool life.

(User evaluation)

M
Milling

MEF

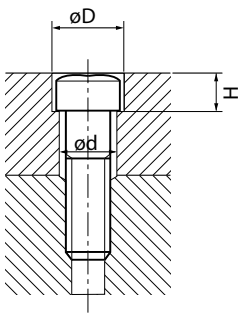


Toolholder dimensions

Description	Availability	Inserts	Dimension (mm)					Standard corner-R(RE)	A.R. (°)	R.R. (°)	Objective bolt size	Spare parts		Applicable inserts ➔ M285	
			DC	DCX	DCON	LF	LH					Coolant hole	Screw		Wrench
			Illustration of screw and wrench												
MEF 11-S10 14-S12 17-S16 18-S16 20-S16 22-S20 23-S20 24-S20 25-S20	●	1	3	11	10	103	23	0.4	+5	-13	M6	No	SB-2250TR	DT-7	SPMT060204EN-GM SPMT060208EN-GM SPMT060204E-Z SPMT060208E-Z
			4.5	14	12	108	28				M8				
			7.3	17.5		115	35				M10				
	●	2	7.7	18	16	117	38			-					
			9.5	20		120	40			M12					
			11.4	22		124	44			-					
	●	3	12.4	23		126	46			-12	M14				
			13.4	24	20	128	48			-					
			14.4	25		130	50			-					
MEF 26-S25 27-S25 28-S25 29-S25 30-S25 32-S25 35-S32 39-S32 43-S32 48-S32	●	3	9.8	26		132	52	0.8	+5	-13	M16	No	SB-3080TR	DT-10	SPMT090304EN-GM SPMT090308EN-GM SPMT090304E-Z SPMT090308E-Z
			10.6	27		134	54				-				
			11.5	28	25	136	56				-				
	●	4	12.6	29		138	58			-	M18				
			13.5	30		140	60			-					
			15.5	32		144	64			-	M20				
	●	32	18.4	35		150	70			-	M22				
			22.5	39		158	78			-	M24				
			26.2	43		166	86			-12	M27				
	●	4	31.3	48		176	96			-	M30				

Although Corner-R(RE) pertains to MEF11-S10, DC = 3.0 mm.

Bolt countersink (Hexagon socket head cap screw)



Nominal screw size	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
øD (mm)	11	14	17.5	20	23	26	29	32	35	39	43	48
H (mm)	6.5	8.6	10.8	13	15.2	17.5	19.5	21.5	23.5	25.5	29	32
ød (mm)	6.6	9	11	14	16	18	20	22	24	26	30	33
Applicable end mill	MEF11	MEF14	MEF17	MEF20	MEF23	MEF26	MEF29	MEF32	MEF35	MEF39	MEF43	MEF48

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M284



- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

SPMT

Insert		Description	Dimension (mm)				Angle (°)	Carbide				Applicable toolholder M284	
			IC	S	D1	RE		PVD		-			
									PR1810	PR1825	PR1835		KW10
<p>Classification of usage</p> <p>★: Roughing / 1st Choice ☆: Roughing / 2nd Choice ■: Finishing / 1st Choice □: Finishing / 2nd Choice (In case hardness is 45HRC or under)</p>		Carbon steel / Alloy steel	★	☆								P	
		Mold and die steel	★	☆									
		Austenitic stainless steel		☆	★								M
		Martensitic stainless steel				☆							
		Precipitation hardening stainless steel			★								
		Gray cast iron	★			☆							K
Nodular cast iron	★												
Non-ferrous metals							★			N			
Heat-resistant alloy								☆		S			
Titanium alloy							★	☆					
Hard materials										H			

		SPMT 060204EN-GM	6.35	2.38	2.5	0.4	11	●	●	●	●	MEF(11~25)-S..
		SPMT 060208EN-GM				0.8			●	●	●	
		SPMT 090304EN-GM	9.525	3.18	3.4	0.4	11	●	●	●	●	MEF(26~48)-S..
		SPMT 090308EN-GM				0.8			●	●	●	
		SPMT 060204E-Z	6.35	2.38	2.5	0.4	11	●	●	●	●	MEF(11~25)-S..
		SPMT 060208E-Z				0.8			●	●	●	
		SPMT 090304E-Z	9.525	3.18	3.4	0.4	11	●	●	●	●	MEF(26~48)-S..
		SPMT 090308E-Z				0.8			●	●	●	

Recommended cutting conditions M285

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)			
		MEGACOAT NANO EX			Carbide
		PR1810	PR1825	PR1835	KW10
Carbon steel	0.1~0.12~0.15	-	★ 120~180~220	☆ 120~180~220	-
Alloy steel	0.1~0.12~0.15	-	★ 120~180~220	☆ 120~180~220	-
Mold steel	0.05~0.08~0.1	-	★ 100~150~180	☆ 100~150~180	-
Stainless steel	0.05~0.08~0.1	-	-	★ 80~120~180	-
Cast iron	0.1~0.15~0.2	★ 100~180~220	-	-	☆ 80~100~120
Non-ferrous metals	0.1~0.15~0.2	-	-	-	★ 100~200~300

★: 1st Recommendation ☆: 2nd Recommendation

●: Standard item R: Right-hand only L: Left-hand only □: Check availability



Points at bolt countersinking

1. Carbon steel

Increase the feed rate to **fz=0.1 ~ 0.15 (mm/t)** for preventing long chips at low feed rates.
Chip control is good when setting (**Vc=80m/min**) for **MEF11~MEF25**, and (**Vc=120m/min**) for **MEF26~MEF48**.

Toolholder description	Vc(m/min)	fz(mm/t)
MEF11~MEF25	80	0.1~0.15
MEF26~MEF48	120	0.1~0.15

2. Sticky materials

Step feed is recommended for good chip control
Increase the feed rate to **fz=0.1 ~ 0.15 (mm/t)** for preventing long chips at low feed rate (**fz=0.05mm/t**).
Use cover to prevent accidents or injury by thick chips at higher feed rates.

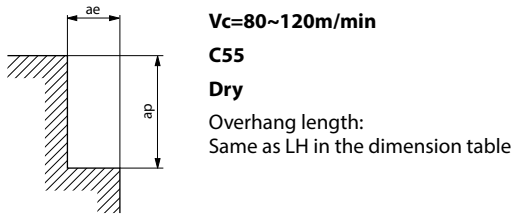
Toolholder description	Vc(m/min)	fz(mm/t)	Step feed (mm)
MEF11~MEF48	80~150	0.1~0.15	0.5~1.5

3. Stainless steel

Use a lower cutting speed. high cutting speeds cause chattering.

Cutting performance when shouldering

MEF bolt countersink end mill is also recommended of shouldering.



- When shouldering, both side edge and bottom edges function.
- Both edges wear at the same time depending on ap. The insert uses 2 edges instead of 4. (Fig. 1)
- MEF type's side edge is designed to have a slight clearance for the countersinking. Therefore, worked side wall is approx. 1° inclined against the vertical face. (Fig. 2)

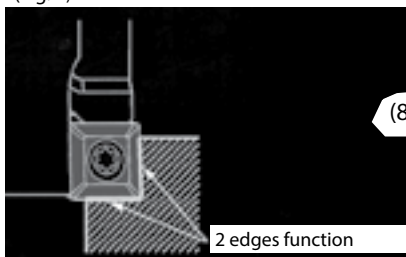


Fig. 1

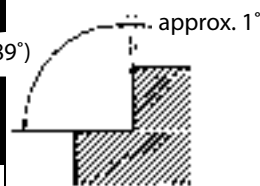


Fig. 2

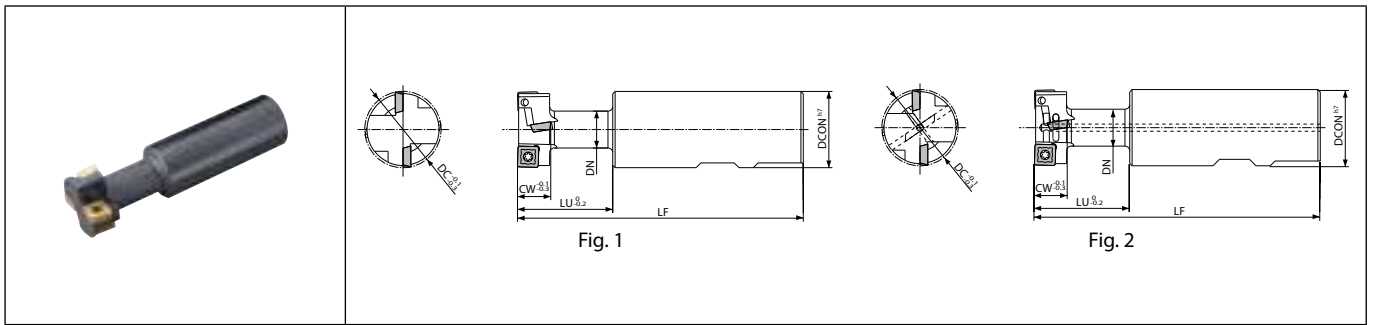
Description	Cutting range
MEF11-S12 MEF14-S12 MEF17-S16 MEF18-S16	
MEF20-S16 MEF22-S20 MEF25-S20	
MEF26-S25 MEF32-S25 MEF35-S32	
MEF39-S32 MEF43-S32 MEF48-S32	

M

Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

METS



Toolholder dimensions

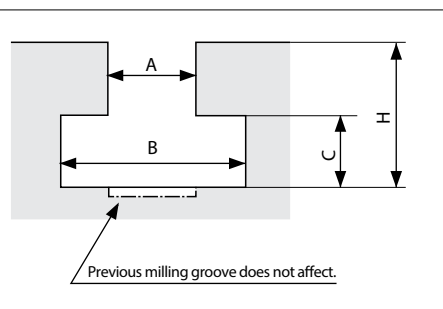
Description	Availability	Inserts	Flutes	Dimension (mm)						A.R. (°)	R.R. (°)	Coolant hole	Fig.	Spare parts		Applicable inserts M288
				DC	DCON	LF	LU	CW	DN					Screw	Wrench	
METS 21-S25 25-S25 32-S32 40-S32 50-S32	●	2	1	21	25	109	29	9	10.5	-10	No	1	SB-2560TR	DT-8	SDMT060304E-K	
	●	4	2	25	25	112	32	11	12.5			1	SB-3060TR	DT-10	SDMT080308E-K	
	●			32	32	120	38	14	15.5	1	SB-4085TR	DT-15	SDMT120408E-K			
	●			40	32	130	50	18	20.5	1	SB-4085TR	DT-15	SDMT120408E-K			
	●	50	50	140	60	22	26.5	-12	1	SB-4085TR	DT-15	SDMT120408E-K				
METS 21-S25-H 25-S25-H 32-S32-H 40-S32-H 50-S32-H	●	2	1	21	25	109	29	9	10.5	-10	Yes	2	SB-2560TR	DT-8	SDMT060304E-K	
	●	4	2	25	25	112	32	11	12.5			2	SB-3060TR	DT-10	SDMT080308E-K	
	●			32	32	120	38	14	15.5	2	SB-4085TR	DT-15	SDMT120408E-K			
	●			40	32	130	50	18	20.5	2	SB-4085TR	DT-15	SDMT120408E-K			
	●	50	50	140	60	22	26.5	-12	2	SB-4085TR	DT-15	SDMT120408E-K				

METS...-H has air holes

JIS standard of T-slot (Extracted from B0952)

(Unit: mm)


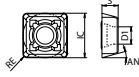
A (Nominal size)	B	C	H	
			Max.	Min.
12	19 ⁺² ₀	8 ⁺¹ ₀	25	20
14	23 ⁺² ₀	9 ⁺² ₀	28	23
18	30 ⁺² ₀	12 ⁺² ₀	36	30
22	37 ⁺³ ₀	16 ⁺² ₀	45	38
28	46 ⁺⁴ ₀	20 ⁺² ₀	56	48



Milling

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

SDMT

Insert		Description	Dimension (mm)					Angle (°)	Carbide			Applicable toolholder ➡ M287
			IC	S	D1	RE	AN		PVD	-		
 	SDMT 060304E-K	6.35	3.18	2.8	0.4	15	●	●	●	METS21-S25(-H) METS25-S25(-H)		
	SDMT 080308E-K	8	3.18	3.4	0.8	15	●	●	●	METS32-S32(-H)		
	SDMT 120408E-K	12.7	4.76	4.4	0.8	15	●	●	●	METS40-S32(-H) METS50-S32(-H)		

Recommended cutting conditions ➡ M289

Classification of usage

- ★ : Roughing / 1st Choice
- ☆ : Roughing / 2nd Choice
- : Finishing / 1st Choice
- : Finishing / 2nd Choice
- (In case hardness is 45HRC or under)

Carbon steel / Alloy steel	★				P
Mold and die steel	★				
Austenitic stainless steel					M
Martensitic stainless steel					
Precipitation hardening stainless steel					
Gray cast iron	★	☆			K
Nodular cast iron	★				
Non-ferrous metals			★		N
Heat-resistant alloy					S
Titanium alloy					
Hard materials					H



Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M288

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)		
		MEGACOAT NANO EX		Carbide
		PR1810	PR1830	KW10
Carbon steel	0.1~0.15	-	★ 100~200	-
Alloy steel	0.08~0.12	-	★ 100~200	-
Mold steel	0.05~0.1	-	★ 80~150	-
Cast iron	0.1~0.15	★ 100~200	-	☆ 80~120
Non-ferrous metals	0.1~0.15	-	-	★ 100~300

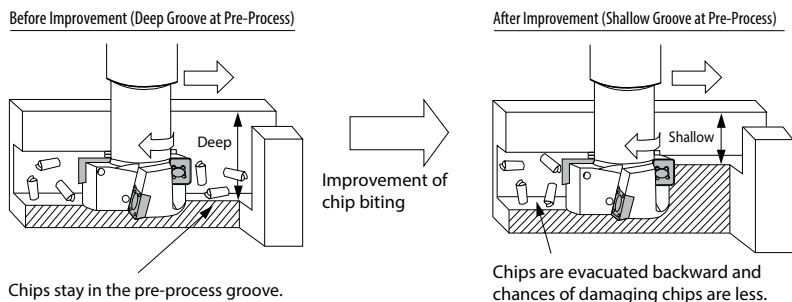
★: 1st Recommendation ☆: 2nd Recommendation

Description (T-Slot nominal size)	Steel			Cast iron		
	Groove shape at pre-process	T-Slotting conditions	Conditions to prevent chattering	Groove shape at pre-process	T-Slotting conditions	Conditions to prevent chattering
METS21-S25(-H) (Nominal size 12)	C=1~3mm 	Vc= 120 fz= 0.1 (n= 1,820) (Vf= 182)	Vc= 60 fz= 0.15 (n= 920) (Vf= 137)	C=1mm and over 	Vc= 120 fz= 0.12 (n= 1,820) (Vf= 218)	Vc= 80 fz= 0.15 (n= 1,210) (Vf= 182)
METS25-S25(-H) (Nominal size 14)	C=1~3mm 	Vc= 120 fz= 0.1 (n= 1,530) (Vf= 306)	Vc= 60 fz= 0.15 (n= 760) (Vf= 228)	C=1mm and over 	Vc= 120 fz= 0.12 (n= 1,530) (Vf= 367)	Vc= 80 fz= 0.15 (n= 1,020) (Vf= 306)
METS32-S32(-H) (Nominal size 18)	C=1~3mm 	Vc= 100 fz= 0.1 (n= 1,000) (Vf= 200)	Vc= 60 fz= 0.15 (n= 600) (Vf= 180)	C=1mm and over 	Vc= 120 fz= 0.12 (n= 1,190) (Vf= 286)	Vc= 80 fz= 0.15 (n= 800) (Vf= 240)
METS40-S32(-H) (Nominal size 22)	C=9mm 	Vc= 80 fz= 0.15 Chattering is likely when set to shallower than C=9mm.	Vz= 60 fz= 0.15 (n= 480) (Vf= 144)	C=9mm and over 	Vc= 120 fz= 0.15 (n= 960) (Vf= 228)	Vc= 80 fz= 0.15 (n= 640) (Vf= 192)
METS50-S32(-H) (Nominal size 28)	Not recommended for steel because of chattering				Vc= 120 fz= 0.15 (n= 760) (Vf= 228)	Vc= 80 fz= 0.15 (n= 510) (Vf= 153)

Cutting speed: Vc(m/min), Revolution: n(min⁻¹), Feed rate fz(mm/t), Table feed Vf(mm/min)

Chattering is likely when fz is less than fz=0.1mm/t. Keep feed rate between fz=0.1 ~ 0.15mm/t.

How to prevent damaging chips when steel machining



Chips stay in the pre-process groove.

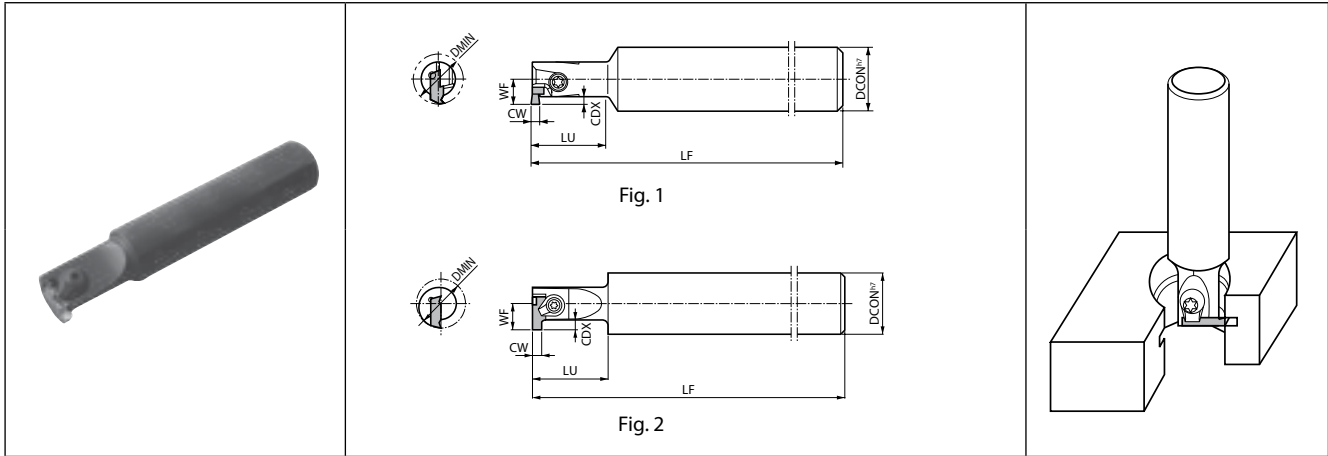
Improvement of chip biting

Chips are evacuated backward and chances of damaging chips are less.

Make pre-process groove shallower to prevent the tool damage from chips.
Use compressed air to aid in chip evacuation.



MGI



Toolholder dimensions

Description	Availability	Dimension (mm)									Coolant hole	Fig.	Spare parts					Applicable inserts ➔ M291
		DMIN	DCON	LF	LU	CDX	WF	CW min.	CW max.	Clamp set			Clamp set	Screw	Wrench	Wrench		
																	Clamp set		Clamp set	Screw	Wrench	Wrench
MGI 1420-1SS	●	14	20	100	20	2.2	6.8	1	3	No	1	-	-	SB-4065TR	-	FT-15	GVR...-020SS	
MGI 1620-1S	●	16	20	110	25	2.2	7.8	1	3.4	No	1	-	-	SB-4085TR	-	FT-15	GVR...-020S	
MGI 2020-1A	●	20	20	110	30	2.2	9.8	1	3.4	No	2	CPS-5F	-	-	-	FT-15	GVR...-020A, GVR...-...AR	
MGI 2220-1B	●	22	20	110	30	2.8	11	1.45	4	No	2	CPS-5F	-	-	-	FT-15	GVR...-020B, GVR...-...BR	
MGI 3225-1C	●	32	25	120	35	5.5 (4.5)	16	2.8	4	No	2	-	CPS-6F	-	LW-3	-	GVR...-020C	

CDX shows available grooving depth.

GVR280-020C, GVR300-020C is available to the groove depth up to 4.5mm.

GVR430 ~ 500-020C can be installed to MGI3225-1C, but not recommended for steel machining because of toolholder's rigidity.

Cutting edge angle
45°~70°

Cutting edge angle
75°

Cutting edge angle
88°/90°

Cutter for
Finishing

High Feed
Cutter

Multi-
Function

Slot Mill

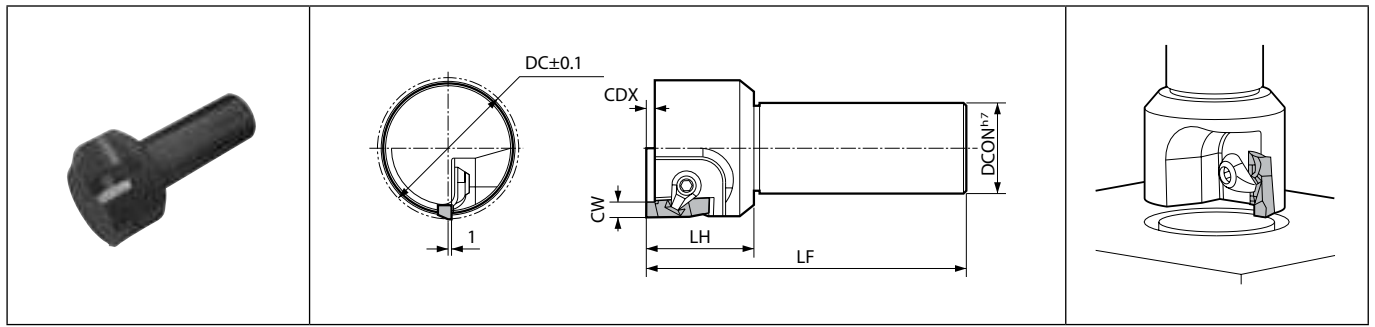
Ball-nose
Radius

Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M290

MVG



Toolholder dimensions

Description	Availability	Dimension (mm)							Coolant hole	Spare parts		Applicable inserts ➔ M292
		DC	DCON	LF	LH	CDX	CW min.	CW max.		Clamp set	Wrench	
MVG 3032	●	30										GVFR400-020B GVFR430-020B GVFR460-020B GVFR490-020B
3532	●	35										
4032	●	40										
4532	●	45	32	120	40	5.2	4	4.9	No	CPS-6V	LW-3	
5032	●	50										
5532	●	55										
6032	●	60										

CDX shows available grooving depth.

M

GVFR

Classification of usage		Carbon steel / Alloy steel							Stainless steel		Gray cast iron		Non-ferrous metals		Titanium alloy		Hard materials (~40HRC)		Hard materials (40HRC ~)		Applicable toolholder ➔ M292	
		●	☉	●	☉	●	☉	●	☉	●	☉	●	☉	●	☉	●	☉	●	☉	●	☉	●
Insert	Description	No. of edges	Dimension (mm)						Tolerance (mm)		Carbide		Cermet		Applicable toolholder ➔ M292							
			CW	CDX	S	RE	INSL	W1	CW min.	CW max.	PVD	-	-	-								
	GVFR 400-020B	4																				
	430-020B	4.3																				
	460-020B	4.6	5.3	5	0.2	20	5.8	-0.03	+0.03	●	●	●	●	●	●	●	●	●	●	●	●	MVG...
	490-020B	4.9																				

CDX shows available grooving depth.
Right-hand shown

Recommended cutting conditions ➔ M292

● : Standard item R : Right-hand only L : Left-hand only ☐ : Check availability

M292



Milling

Cutting edge angle 45°~70°

Cutting edge angle 75°

Cutting edge angle 88°/90°

Cutter for Finishing

High Feed Cutter

Multi-Function

Slot Mill

Ball-nose Radius

Others

MGI

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)				
		MEGACOAT	PVD Coated carbide	Carbide	Cermets	
		PR1225	PR930	KW10	TC40	TC60
Carbon steel	0.05~0.15	★ 80~150	☆ 80~150	-	☆ 120~200	☆ 100~180
Alloy steel	0.05~0.15	★ 80~150	☆ 80~150	-	☆ 120~200	☆ 100~180
Mold steel	0.03~0.12	★ 60~130	☆ 60~130	-	☆ 100~180	☆ 80~150
Stainless steel	0.03~0.12	★ 60~130	☆ 60~130	-	☆ 100~180	★ 80~150
Cast iron	0.05~0.2	-	-	★ 80~150	☆ 100~150	-
Non-ferrous metals	0.05~0.2	-	-	★ 100~300	-	-

Use down-cut machining.

★: 1st Recommendation ☆: 2nd Recommendation

MVG

Recommended cutting conditions

Workpiece material	fz (mm/t)	Recommended insert grades (Vc: m/min)				
		MEGACOAT	PVD coated carbide	Carbide	Cermets	
		PR1225	PR930	KW10	TC40	TC60
Carbon steel	0.05~0.15	★ 80~170	☆ 80~150	-	★ 120~200	☆ 100~180
Alloy steel	0.05~0.15	★ 80~170	☆ 80~150	-	★ 120~200	☆ 100~180
Mold steel	0.03~0.12	★ 60~150	☆ 60~130	-	★ 100~180	☆ 80~150
Stainless steel	0.03~0.12	★ 60~150	☆ 60~130	-	☆ 100~180	☆ 80~150
Cast iron	0.05~0.2	-	-	★ 80~150	-	-
Non-ferrous metals	0.05~0.2	-	-	★ 100~300	-	-

★: 1st Recommendation ☆: 2nd Recommendation

M



Milling

S-type inserts


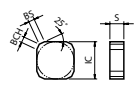

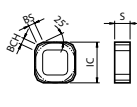

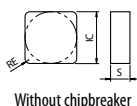
Insert		Description	Dimension (mm)					Angle (°)		Carbide				Cermet	Applicable toolholder				
			IC	S	BCH	RE	BS	AN	AS	CVD				- TIN1000 TIN60					
										CA420M	PR1210	PR1225	PR1810			PR1825	KW10		
		SPCN 1203EDTR	12.7	3.18	-	1	2	11	15										
		SPKN 1203EDER	12.7	3.18	1	-	1.6	11	15	●									
		SPKN 1203EDFR	12.7	3.18	1	-	1.6	11	15										
		SPKN 1203EDTR	12.7	3.18	1	-	2	11	15	●	●								
		SPKN 1203EDTL	12.7	3.18	1	-	1	11	15										
		SPKN 1504EDFR	15.875	4.76	1	-	2.2	11	15										
		SPKN 1504EDTR	15.875	4.76	1	-	2.2	11	15	●	●								
		SPEN 1203EEER	12.7	3.18	1	-	1.4	11	20	●									
		SPEN 1203EESR	12.7	3.18	1	-	1.4	11	20			●							
		SPCN 1203XPTR	12.7	3.18	-	1	2	11	11										
		SPKN 1203XPFR	12.7	3.18	1	-	2	11	11										
		SPKN 1203XPTR	12.7	3.18	-	1	2	11	11										
		SPKN 1504XETR	15.875	4.76	1	-	2	11	20										
		SPCN 1904EETR1	19.05	4.76	0.7	-	1.2	11	20										
		SPKR 1203EDER-S	12.7	3.18	-	2	1	11	15			●							
		SPMR 1203EDER-H	12.7	3.18	-	1	2	11	15					●					
		SPGN 090304 090308	9.525	3.18	-	0.4 0.8	-	11	-							●	●		
		SPGN 120304 120308	12.7	3.18	-	0.4 0.8	-	11	-							●	●		
		SPMN 120308 120312	12.7	3.18	-	0.8 1.2	-	11	-							●	●	●	
		SPMN 120408 120412	12.7	4.76	-	0.8 1.2	-	11	-	●	●								

Handed insert shows Right-hand

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability



S-type inserts

Insert		Description		No. of edges	Dimension (mm)					Angle (°)		Coating		Applicable toolholder
					IC	S	RE	BCH	BS	AN	AS	Carbide	Cermet	
												CVD	TM100M	
 		SNCN	1204XNTN	8	12.7	4.76	-	2	2	-	-	●	-	-
		SNKN	1204XNTN	8	12.7	4.76	-	2	2	-	-	●	-	-
 		SNMF	1204XNTN	8	12.7	4.76	-	2	2	-	-	●	-	-
  <p>Without chipbreaker</p>		SNMN	120412 120424	8	12.7	4.76	1.2 2.4	-	-	-	-	● ●	-	-

Classification of usage

- ★ : Roughing / 1st Choice
- ☆ : Roughing / 2nd Choice
- : Finishing / 1st Choice
- : Finishing / 2nd Choice
- (In case hardness is 45HRC or under)

Carbon steel / Alloy steel	■	P
Mold and die steel	■	P
Austenitic stainless steel	□	M
Martensitic stainless steel	□	M
Precipitation hardening stainless steel	□	M
Gray cast iron	★	K
Nodular cast iron	★	K
Non-ferrous metals	□	N
Heat-resistant alloy	□	S
Titanium alloy	□	S
Hard materials	□	H

M



Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

M296

PCD inserts

Classification of usage		Material													PCD		Applicable toolholder
		Carbon steel / Alloy steel	Mold and die steel	Austenitic stainless steel	Martensitic stainless steel	Precipitation hardening stainless steel	Gray cast iron	Nodular cast iron	Non-ferrous metals	Heat-resistant alloy	Titanium alloy	Hard materials					
Insert	Description	No. of edges	Dimension (mm)											Angle (°)		PCD	
			IC	W1	S	D1	RE	INSL	LE	BCH	BS	AN	AS				
	NDCW 150302FRX 150302FRX-NE	1	-	9.525	3.18	4.4	0.2	15	5.7 5.1	-	-	-	-	15	●	●	DMC...SX(...) DMC...H
	SDKN 1203AUFN-NE	1	12.7	-	3.18	-	-	-	3.1	0.5	1.2	15	23	●		-	
	SEEN 1203AFFN 1203AFFN-NE	1	12.7	-	3.18	-	-	-	3.5 3	0.5	1.4	20	25	●	●	-	
	TEEN 1603PTFR 1603PTFR-NE	1	9.525	-	3.18	-	-	-	4.7 4.1	0.6	1.4	20	22	●	●	-	
	TPGN 110302 110304	1	6.35	-	3.18	-	0.2 0.4	-	3.9 3.7	-	-	11	-	●	●	-	

Handed insert shows Right-hand

Classification of usage

- ★ : Roughing / 1st Choice
- ☆ : Roughing / 2nd Choice
- : Finishing / 1st Choice
- : Finishing / 2nd Choice
- (In case hardness is 45HRC or under)

M



Milling

- Cutting edge angle 45°~70°
- Cutting edge angle 75°
- Cutting edge angle 88°/90°
- Cutter for Finishing
- High Feed Cutter
- Multi-Function
- Slot Mill
- Ball-nose Radius
- Others

● : Standard item R : Right-hand only L : Left-hand only □ : Check availability

CBN & PCD Inserts are sold in 1 piece boxes

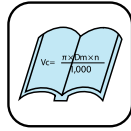
Available geometries

Classification of usage ★: Roughing / 1st Choice ☆: Roughing / 2nd Choice ■: Finishing / 1st Choice □: Finishing / 2nd Choice (In case hardness is 45HRC or under)			Carbon steel / Alloy steel								☆		★		■		P	
			Mold and die steel								☆		★		■		P	
			Austenitic stainless steel								☆		★		■		M	
			Martensitic stainless steel										☆				M	
Precipitation hardening stainless steel												★				M		
Gray cast iron								☆		★		☆		■		K		
Nodular cast iron								☆		★		☆		■		K		
Non-ferrous metals												★				N		
Heat-resistant alloy												☆				S		
Titanium alloy												★				S		
Hard materials																H		
Insert	Description	Dimension (mm)								Angle (°)		Carbide				Cermets	Applicable toolholder	
		IC	S	D1	RE	BCH	BS	L	AN	AS	PVD							
											PR1210	PR125	PR1810	PR1825	PR1835			KW10	TN100M
	RDHX 0702MOT	7	2.39	2.8	-	-	-	-	15	-					●			-
	RDHX 1003MOT	10	3.18	3.8	-	-	-	-	15	-					●			
	RDHX 12T3MOT	12	3.97	3.8	-	-	-	-	15	-					●			
	RDMT 08T2M0-H	8	2.78	3.4	-	-	-	-	15	-			●	●	●			-
	RPMT 10T3M0	10	3.97	3.4	-	-	-	-	11	-			●	●	●			-
	RPMT 1204M0	12	4.76	4.4	-	-	-	-	11	-			●	●	●			
	RPMT 1204M0-H	12	4.76	4.4	-	-	-	-	11	-			●	●	●	●		-
	RPMT 1606M0-H	16	6.35	5.5	-	-	-	-	11	-			●	●	●	●		
	RPMT 2006M0-H	20	6.35	6.5	-	-	-	-	11	-			●	●	●	●		
	SDKW 1204AESN	12.7	4.76	5.5	1	-	1.5	-	15	20	●							-
	SDKW 1204AETN	12.7	4.76	5.5	1	-	1.5	-	15	20	●							
	SEKW 1204AFTN	12.7	4.76	5.5	-	0.5	1.7	-	20	25	●	●						
	SDMT 1204AESR-H	12.7	4.76	5.5	1	-	0.8	-	15	20					●			-
	SEKT 1204AFEN-S	12.7	4.76	5.5	-	0.5	1.7	-	20	25	●							-

Handed insert shows Right-hand

●: Standard item R: Right-hand only L: Left-hand only □: Check availability





R

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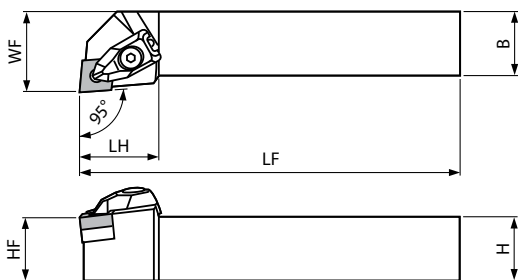
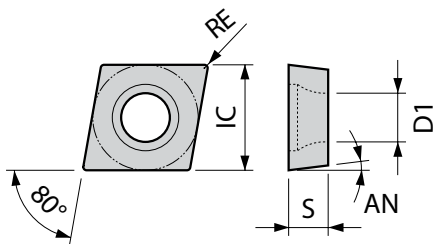
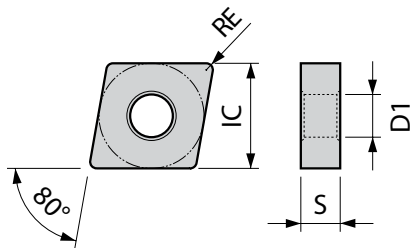
All dimension markings in the catalog are complied with ISO13399. Symbol, detail and previous symbol are shown below.

1. Insert

Symbol	Detail	Previous symbol
AN	Relief angle	α
D1	Hole diameter	$\varnothing d$
IC	I.C. Size	A
RE	Corner-R	$r\epsilon$
S	Insert thickness	T

2. Toolholder for external

Symbol	Detail	Previous symbol
B	Shank width	B
H	Shank height	H1
HF	Edge height	h
LF	Overall length	L1
LH	Head length	L2
WF	Functional width	F1

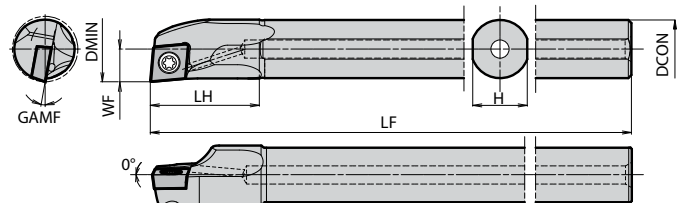
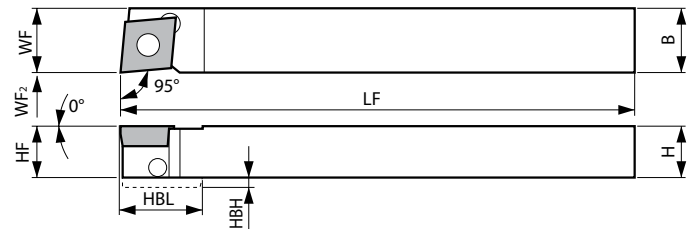


3. Small parts machining

Symbol	Detail	Previous symbol
B	Shank width	B
H	Shank height	H1
HF	Edge height	h
LF	Overall length	L1
LH	Head length	L2
LU	Usable length	L2
WF	Functional width	F1

4. Boring bars

Symbol	Detail	Previous symbol
DMIN	Min. bore dia.	$\varnothing A$
DCON	Shank dia.	$\varnothing D, \varnothing D1$
GAMF	Radial rake angle	θ
H	Shank width	H
LF	Overall length	L1
LH	Head length	L2
LPR	Overall length	L1
LU	Usable length	L2
RE	Corner-R	$r\epsilon$
WF	Functional width	F



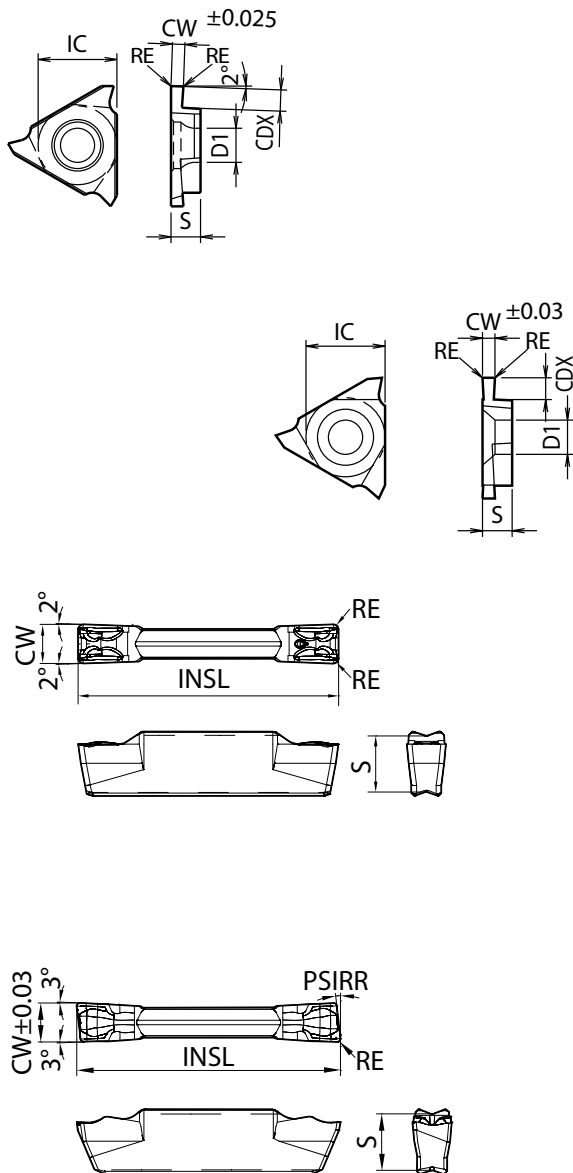
R



Technical information

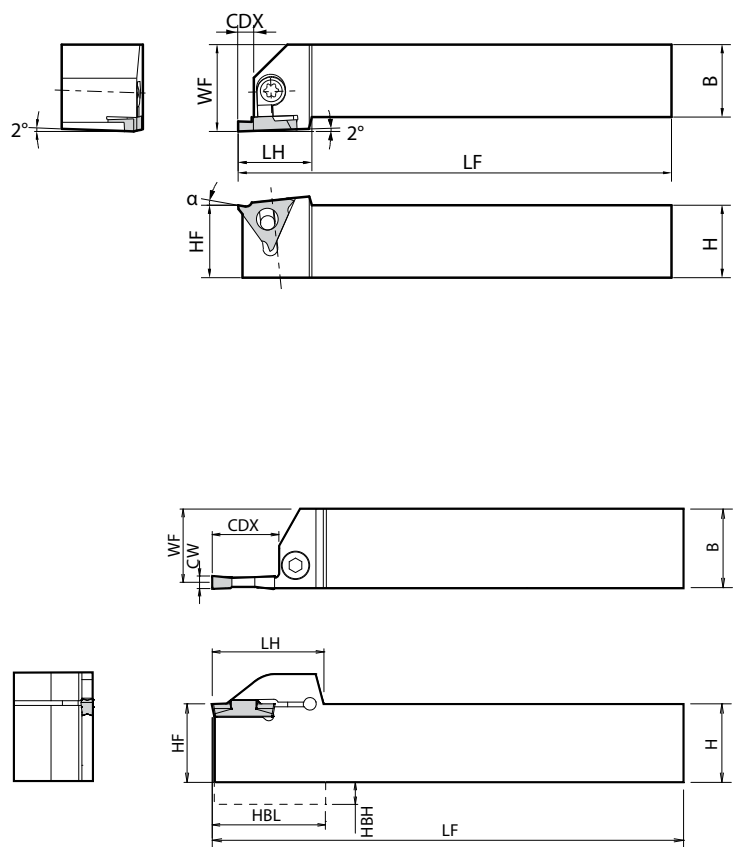
5. Grooving / Cut-off inserts

Symbol	Detail	Previous symbol
IC	I.C. Size	A
BCH	Chamfer width	C
CDX	Max. cutting depth	B
CW	Edge width	W
D1	Hole diameter	$\varnothing d$
DAXN	External dia. of the groove (max.)	$\varnothing D$
DAXX	External dia. of the groove (min.)	$\varnothing D$
INSL	Insert length	L
PSIR θ /L	Lead angle	θ
RE	Corner-R	r_e
S	Insert thickness	H, T
W1	Insert width	A



6. Grooving / Cut-off toolholders

Symbol	Detail	Previous symbol
B	Shank width	B
CDX	Max. cutting depth	T
CUTDIA	Max. cut-off dia.	$\varnothing D_{max}$
DAXN	External dia. of the groove (max.)	$\varnothing D$
DAXX	External dia. of the groove (min.)	$\varnothing D$
DCB	Connection bore dia. (Sleeve)	$\varnothing d_1$
DMIN	Min. Bore dia.	$\varnothing A$
DCON	Shank dia.	$\varnothing D, \varnothing D_1$
H	Shank height	H1
HF	Edge height	h
LF	Overall length	L1
LH	Head length	L2
WF	Functional width	F1



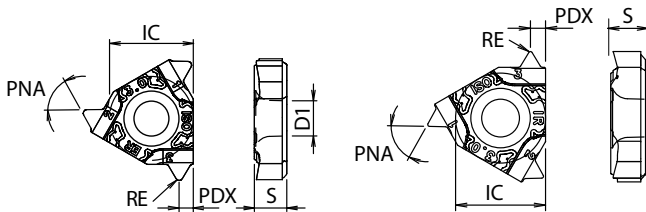
Technical information

7. Threading inserts

Symbol	Detail	Previous symbol
IC	I.C. Size	A
D1	Hole diameter	$\varnothing d$
PNA	Thread angle	θ
PDX	Profile distance	S
S	Insert thickness	T
RE	Corner-R	r_e

8. Threading toolholders

Symbol	Detail	Previous symbol
B	Shank width	B
DMIN	Min. Bore dia.	$\varnothing A$
DCON	Shank dia.	$\varnothing D$
H	Shank height	H1
HF	Edge height	h
LF	Overall length	L1
LH	Head length	L2
LU	Usable length	L2
WF	Functional width	F, F1

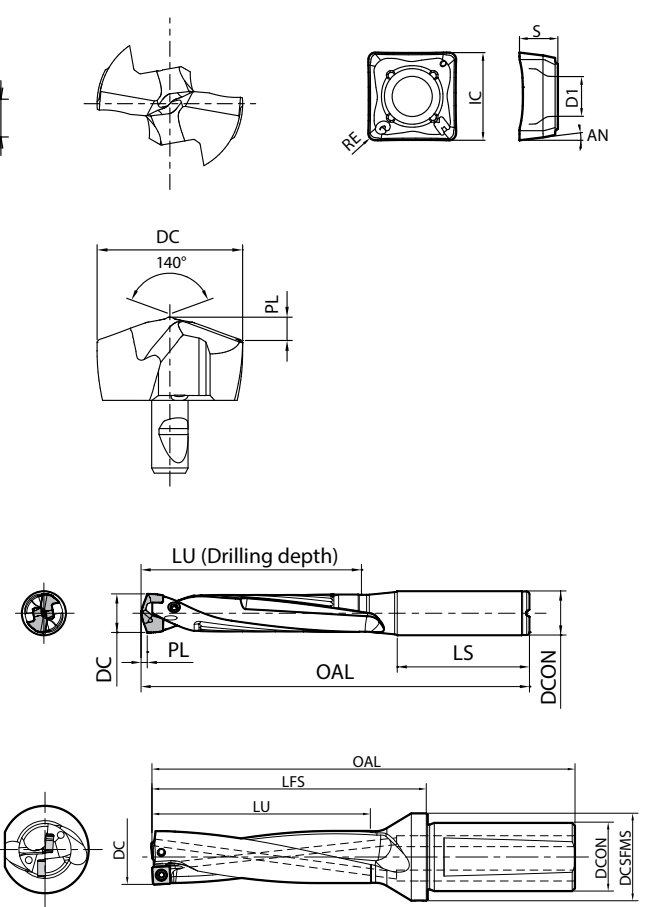


9. Inserts for drill

Symbol	Detail	Previous symbol
IC	I.C. Size	A
D1	Hole diameter	$\varnothing d$
DC	Drill dia.	$\varnothing D_c$
PL	Drill head point length	Lp
RE	Corner-R	r_e
S	Insert thickness	T
INSL	Insert length	A
W1	Insert width	W

10. Drill holder

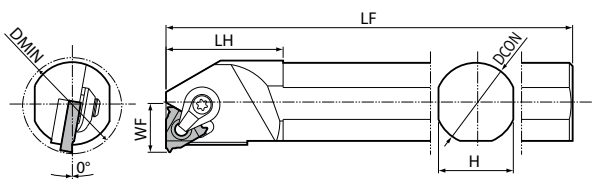
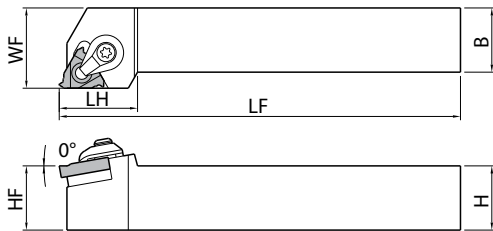
Symbol	Detail	Previous symbol
DC	Drill dia.	$\varnothing D_c$
DCON	Shank dia.	$\varnothing D_s$
OAL	Overall length	L
LU	Usable length (Drilling depth)	L3
PL	Drill head point length	Lp
LS	Shank length	Ls
DCSFMS	Flange dia.	$\varnothing d_1$
LFS	Functional length	L1
LCF	Flute length	L2



R



Technical information

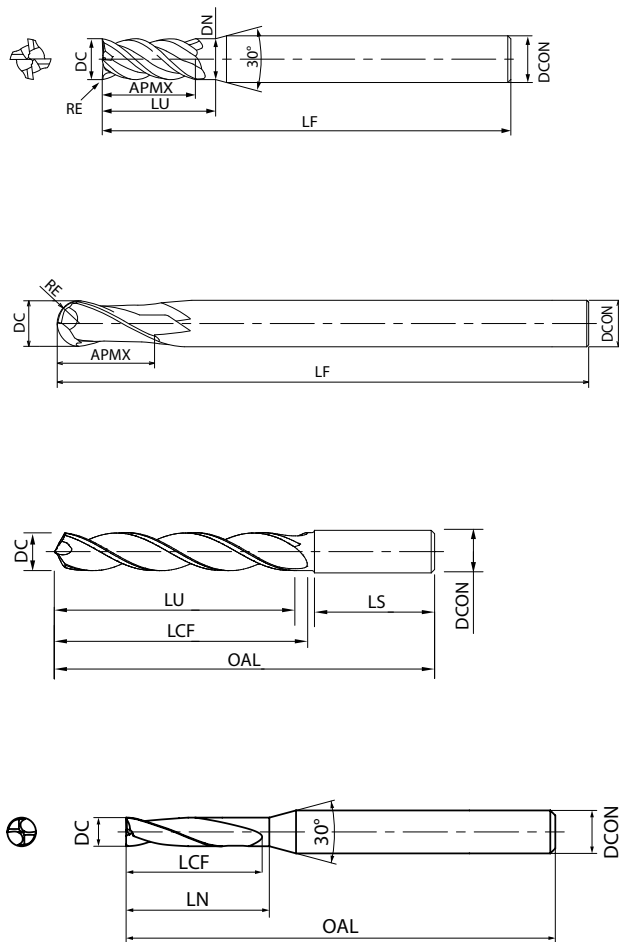


11. Solid end mill

Symbol	Detail	Previous symbol
APMX	Max. depth of cut	ℓ
CHW	Chamfer width	C
DC	Cutting dia.	ϕD_c
DCON	Shank dia.	ϕD_s
DN	Neck dia.	ϕD_1
LF	Overall length	L
LU	Under neck length	ℓ_2
RE	Corner-R	$r\epsilon, r$
ZFP	No. of inserts	Z

12. Solid drill

Symbol	Detail	Previous symbol
OAL	Overall length	L
DC	Cutting dia.	ϕD_c
DCON	Shank dia.	ϕD_s
LCF	Flute length	ℓ
LN	Under neck length	ℓ_2
LS	Shank length	Ls
LU	Usable length	ℓ_e

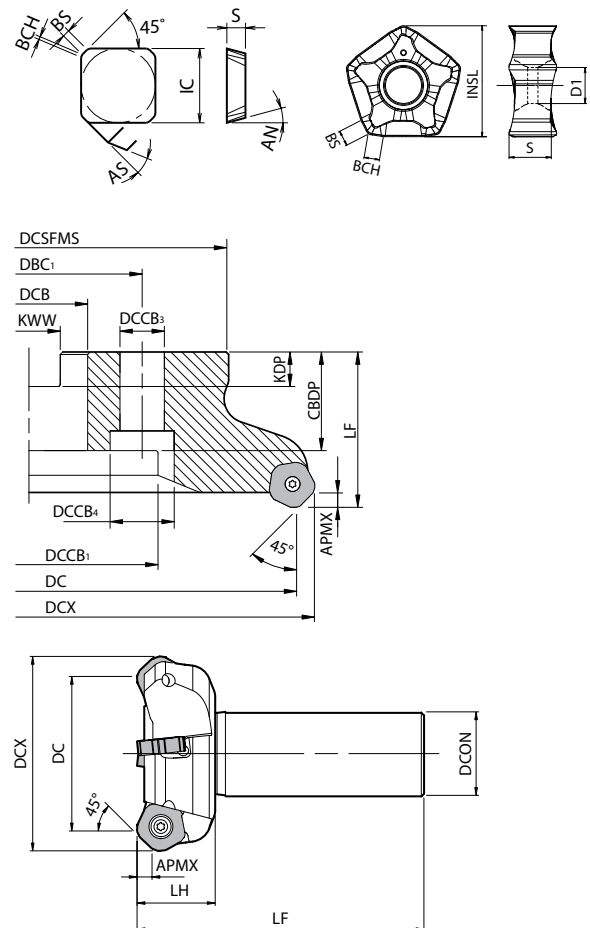


13. Milling inserts

Symbol	Detail	Previous symbol
BCH	Corner chamfer length	X
BS	Wiper edge width	Z
D1	Hole diameter	ϕd
IC	I.C. Size	A
INSL	Insert length	W
L	Cutting edge length	W
RE	Corner-R	$r\epsilon$
S	Insert thickness	T

14. Toolholder for milling

Symbol	Detail	Previous symbol
APMX	Max. depth of cut	S
CBDP	Connection bore depth	E
DC	Cutting dia.	ϕD
DCB	Bore dia.	ϕd
DCON	Shank dia.	ϕD_s
DCSFMS	Contact surface dia.	ϕD_2
DCX	Maximum cutting dia.	ϕD_1
KDP	Keyway depth	a
KWW	Keyway width	b
LF	Toolholder height	H
LH	Head length	ℓ



SI derived units conversion chart

Bold units are the ones by SI derived unit.

Extracted from JIS handbook "Iron & steel"

Force

N	kgf	dyn
1	1.01972×10^{-1}	1×10^5
9.806 65	1	9.80665×10^5
1×10^{-5}	1.01972×10^{-6}	1

Stress

1Pa=1N/m², 1MPa=1N/mm²

Pa or N/m ²	MPa or N/mm ²	kgf/mm ²	kgf/cm ²	kgf/m ²
1	1×10^{-6}	1.01972×10^{-7}	1.01972×10^{-5}	1.01972×10^{-1}
1×10^6	1	1.01972×10^{-1}	1.01972×10	1.01972×10^5
9.80665×10^6	9.806 65	1	1×10^2	1×10^6
9.80665×10^4	9.806 65 x 10⁻²	1×10^{-2}	1	1×10^4
9.806 65	9.806 65 x 10⁻⁶	1×10^{-6}	1×10^{-4}	1

Pressure

1Pa=1N/m²

Pa	kPa	MPa	bar	kgf/cm ²
1	1×10^{-3}	1×10^{-6}	1×10^{-5}	1.01972×10^{-5}
1×10^3	1	1×10^{-3}	1×10^{-2}	1.01972×10^{-2}
1×10^6	1×10^3	1	1×10	1.01972×10
1×10^5	1×10^2	1×10^{-1}	1	1.01972
9.80665×10^4	9.806 65 x 10	9.806 65 x 10⁻²	9.80665×10^{-1}	1

Cutting symbol

Cutting conditions below are indicated by the new symbols listed in 2nd column.

1. Turning

Cutting conditions	Symbol	Previous symbol	Unit
Cutting speed	Vc	V	m/min
Feed rate	f	f	mm/rev
Depth of cut	ap	d	mm
Edge width	CW	W	mm
Workpiece dia.	Dm	D	mm
Required power	Pc	Pkw	kW
Specific cutting force	kc	Ks	MPa
Theoretical surface roughness	h	Rz	μm
Corner radius	RE	R	mm
Revolution	n	N	min ⁻¹

3. Drilling

Cutting conditions	Symbol	Previous symbol	Unit
Cutting speed	Vc	V	m/min
Feed speed	Vf	F	mm/min
Feed rate	f	f	mm/rev
Drill dia.	DC	D (Ds)	mm
Required power	Pc	Pkw	kW
Specific cutting force	kc	Ks	MPa
Drilling depth	H	d	mm
Revolution	n	N	min ⁻¹

2. Milling

Cutting conditions	Symbol	Previous symbol	Unit
Cutting speed	Vc	V	m/min
Feed speed	Vf	F	mm/min
Feed per tooth	fz	f	mm/t
Feed rate	f	f	mm/rev
No. of inserts	Z	Z	teeth
Depth of cut	ap	d	mm
Width of cut	ae	w	mm
Pick feed	Pf	Pf	mm
Required power	Pc	Pkw	kW
Specific cutting force	kc	Ks	MPa
Chip removal volume	Q	Q	cm ³ /min
Revolution	n	N	min ⁻¹

R



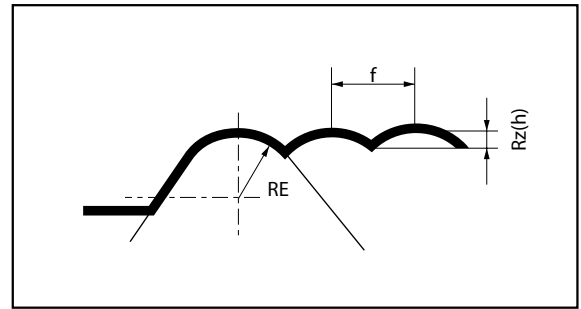
Technical information

Theoretical (Geometrical) surface roughness

Theoretical surface roughness for turning indicates the minimum roughness value from the cutting conditions and it is shown by the formula as follows.

$$Rz(h) = \frac{f^2}{8RE} \times 10^3$$

Rz(h): Theoretical surface roughness [μm]
 f: Feed rate [mm/rev]
 RE: Corner radius of insert [mm]



How to obtain surface roughness values

Type	Symbol	How to obtain	Explanation
Max. height roughness	Rz	Rz is a mean value in micron meter obtained from the distance of the highest peaks and the lowest valleys within the range of sampled reference length (" ℓ ") in the direction of the center line of the roughness curve. Note) When calculating Rz, extraordinarily high or low threads are considered as damages and excluded from the calculation, and only standard lengths are used. $Rz = Rp + Rv$	
Ten points mean roughness	RzJIS	RzJIS is a mean value in micron meter obtained from the distance of 5 highest peaks (Yp) and the 5 lowest valleys (Yv) measured from the center line of the roughness curve within the range of sampled reference length " ℓ ". $RzJIS = \frac{(Yp1+Yp2+Yp3+Yp4+Yp5) + (Yv1+Yv2+Yv3+Yv4+Yv5)}{5}$	 Yp1, Yp2, Yp3, Yp4, Yp5: Distance from the mean line to the highest 5 peaks in the range of sampled reference length " ℓ " Yv1, Yv2, Yv3, Yv4, Yv5: Distance from the mean line to the lowest 5 valleys in the range of sampled reference length " ℓ "
Arithmetical mean roughness	Ra	Ra is obtained from the following formula in micron meter, the roughness curve is expressed by $y=f(x)$, the X-axis is in the direction of the center line and the Y-axis is the vertical magnification of the roughness curve in the range of sampled reference length " ℓ ". $Ra = \frac{1}{\ell} \int_0^{\ell} \{f(x)\} dx$	

Relationship with triangle symbol

Arithmetical mean roughness Ra (μm)	Max. height roughness Rz (μm)	Ten points mean roughness RzJIS (μm)	*(Triangle symbol)
0.025	0.1	0.1	▽▽▽▽
0.05	0.2	0.2	
0.1	0.4	0.4	
0.2	0.8	0.8	
0.4	1.6	1.6	▽▽▽
0.8	3.2	3.2	
1.6	6.3	6.3	
3.2	12.5	12.5	▽▽
6.3	25	25	
12.5	50	50	▽
25	100	100	

* Triangle symbol was removed from JIS standard in the 1994 revision.

How to indicate

- When Ra is $1.6\mu\text{m}$ → $1.6\mu\text{m}Ra$
- When Rz is $6.3\mu\text{m}$ → $6.3\mu\text{m}Rz$
- When RzJIS is $6.3\mu\text{m}$ → $6.3\mu\text{m}RzJIS$

Indication in JIS standard

Example of Ra indication	Example of Rz indication
1. When indicating the upper limit only (when upper limit is $6.3\mu\text{m}Ra$) 	1. When indicating the upper limit only indicate surface roughness following the parameter symbol.
2. When indicating both lower and upper limit (when upper limit is $6.3\mu\text{m}Ra$, lower limit is $1.6\mu\text{m}Ra$) 	2. When indicating both lower and upper limit indicate surface roughness as (upper limit ~ lower limit) following the parameter symbol.

Note: The indications of Ra and Rz are different.

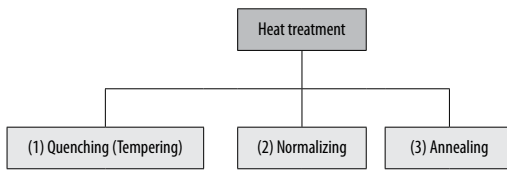
Caution-symbols for surface roughness

The above information is based on JIS B 0601-2001. However, some symbols were revised as shown in the right table in accordance with ISO Standard from JIS B 0601-2001 version. Ten Points Mean Roughness (Rz) was eliminated from 2001 version but it still remains as RzJIS reference, since it was popular in Japan.

Type	Symbol of JIS B 0601-1994	Symbol of JIS B 0601-2001
Max. height roughness	Ry	Rz
Ten points mean roughness	Rz	(RzJIS)
Arithmetical mean roughness	Ra	Ra

Heat treatment

One of the ways to determine the hardness of steel is the heat treatment and it is classified to 3 types.



Heat treatment method	Detail	Effect
	<ul style="list-style-type: none"> · Quenching (Tempering) After heating to 727° C or over, cool rapidly down to 550° C in water or oil. 	Quenching makes steel hard. Because it cools down red-hot steel very rapidly in water or oil, but it may promote internal stress. In order to remove such internal stress, tempering is used. (After cooled down once, reheat it to 200° C ~ 600° C)
	<ul style="list-style-type: none"> · Normalizing After heating to 727° C or over, cool down rapidly to 600° C and then to normal temperature. 	It miniaturizes the crystals. (Steel is also composed of small cells.) It is used to improve the mechanical character or machinability.
	<ul style="list-style-type: none"> · Annealing After heating to 727° C or over, cool down very slowly to 600° C, then to normal temperature. 	It miniaturizes the crystals like the process of normalizing, but the crystal size is bigger than that of normalizing. It targets machinability improvement and distortion correction.

Hardness expression

Hardness	Reference standard	Example	Explanation of example
Brinell hardness	JIS Z 2243: 1992	250HB	Hardness value: 250, Hardness symbol: HB
		200 ~ 250HB	When the hardness has the range
Vickers hardness	JIS Z 2244: 1998	640HV	Hardness value: 640, Hardness symbol: HV
Rockwell hardness	JIS Z 2245: 1992	60HRC	Hardness value: 60, Hardness symbol: HRC
Shore hardness	JIS Z 2246: 1992	50HS	Hardness value: 50, Hardness symbol: HS



Vickers hardness conversion chart

Vickers hardness (HV)	Brinell hardness 10mm dia. ball Load: 3,000kgf (HB)		Rockwell hardness ²⁾			Shore hardness (HS)	Tensile strength MPa ¹⁾
	Standard ball	Tungsten carbide ball	A scale Load: 60kgf Diamond point (HRA)	B scale Load: 100kgf 1.6mm (1/16in) dia. ball (HRB)	C scale Load: 150kgf Diamond point (HRC)		
940	-	-	85.6	-	68.0	97	
920	-	-	85.3	-	67.5	96	
900	-	-	85.0	-	67.0	95	
880	-	(767)	84.7	-	66.4	93	
860	-	(757)	84.4	-	65.9	92	
840	-	(745)	84.1	-	65.3	91	
820	-	(733)	83.8	-	64.7	90	
800	-	(722)	83.4	-	64.0	88	
780	-	(710)	83.0	-	63.3	87	
760	-	(698)	82.6	-	62.5	86	
740	-	(684)	82.2	-	61.8	84	
720	-	(670)	81.8	-	61.0	83	
700	-	(656)	81.3	-	60.1	81	
690	-	(647)	81.1	-	59.7	-	
680	-	(638)	80.8	-	59.2	80	
670	-	630	80.6	-	58.8	-	
660	-	620	80.3	-	58.3	79	
650	-	611	80.0	-	57.8	-	
640	-	601	79.8	-	57.3	77	
630	-	591	79.5	-	56.8	-	
620	-	582	79.2	-	56.3	75	
610	-	573	78.9	-	55.7	-	
600	-	564	78.6	-	55.2	74	
590	-	554	78.4	-	54.7	-	2055
580	-	545	78.0	-	54.1	72	2020
570	-	535	77.8	-	53.6	-	1985
560	-	525	77.4	-	53.0	71	1950
550	505	517	77.0	-	52.3	-	1905
540	496	507	76.7	-	51.7	69	1860
530	488	497	76.4	-	51.1	-	1825
520	480	488	76.1	-	50.5	67	1795
510	473	479	75.7	-	49.8	-	1750
500	465	471	75.3	-	49.1	66	1705
490	456	460	74.9	-	48.4	-	1660
480	448	452	74.5	-	47.7	64	1620
470	441	442	74.1	-	46.9	-	1570
460	433	433	73.6	-	46.1	62	1530
450	425	425	73.3	-	45.3	-	1495
440	415	415	72.8	-	44.5	59	1460
430	405	405	72.3	-	43.6	-	1410
420	397	397	71.8	-	42.7	57	1370
410	388	388	71.4	-	41.8	-	1330
400	379	379	70.8	-	40.8	55	1290
390	369	369	70.3	-	39.8	-	1240
380	360	360	69.8	(110.0)	38.8	52	1205
370	350	350	69.2	-	37.7	-	1170
360	341	341	68.7	(109.0)	36.6	50	1130
350	331	331	68.1	-	35.5	-	1095
340	322	322	67.6	(108.0)	34.4	47	1070
330	313	313	67.0	-	33.3	-	1035

Vickers hardness (HV)	Brinell hardness 10mm dia. ball Load: 3,000kgf (HB)		Rockwell hardness ²⁾			Shore hardness (HS)	Tensile strength MPa ¹⁾
	Standard ball	Tungsten carbide ball	A scale Load: 60kgf Diamond point (HRA)	B scale Load: 100kgf 1.6mm (1/16in) dia. ball (HRB)	C scale Load: 150kgf Diamond point (HRC)		
320	303	303	66.4	(107.0)	32.2	45	1005
310	294	294	65.8	-	31.0	-	980
300	284	284	65.2	(105.5)	29.8	42	950
295	280	280	64.8	-	29.2	-	935
290	275	275	64.5	(104.5)	28.5	41	915
285	270	270	64.2	-	27.8	-	905
280	265	265	63.8	(103.5)	27.1	40	890
275	261	261	63.5	-	26.4	-	875
270	256	256	63.1	(102.0)	25.6	38	855
265	252	252	62.7	-	24.8	-	840
260	247	247	62.4	(101.0)	24.0	37	825
255	243	243	62.0	-	23.1	-	805
250	238	238	61.6	99.5	22.2	36	795
245	233	233	61.2	-	21.3	-	780
240	228	228	60.7	98.1	20.3	34	765
230	219	219	-	96.7	(18.0)	33	730
220	209	209	-	95.0	(15.7)	32	695
210	200	200	-	93.4	(13.4)	30	670
200	190	190	-	91.5	(11.0)	29	635
190	181	181	-	89.5	(8.5)	28	605
180	171	171	-	87.1	(6.0)	26	580
170	162	162	-	85.0	(3.0)	25	545
160	152	152	-	81.7	(0.0)	24	515
150	143	143	-	78.7	-	22	490
140	133	133	-	75.0	-	21	455
130	124	124	-	71.2	-	20	425
120	114	114	-	66.7	-	-	390
110	105	105	-	62.3	-	-	-
100	95	95	-	56.2	-	-	-
95	90	90	-	52.0	-	-	-
90	86	86	-	48.0	-	-	-
85	81	81	-	41.0	-	-	-

Extracted from JIS handbook "Iron & steel" (SAE J 417)

Note:

1. 1 MPa = 1 N/mm²

2. Value in () is not in practical use, but reference only.



Technical information

Ferrous materials

Classification	Name of JIS standard	Symbol	
Structural steel	Rolled steel for welded structure	SM	
	Re-rolled steel	SRB	
	Rolled steel for general structure	SS	
	Light gauge steel for general structure	SSC	
	Hot-rolled steel plate, sheet and strip for automobile structural use	SAPH	
Steel sheet	Cold-rolled steel plate, sheet and strip	SPC	
	Hot-rolled soft steel plate, sheet and strip	SPH	
Steel pipe	Carbon steel pipe for ordinary piping	SGP	
	Carbon steel pipe for boiler / heat exchanger	STB	
	Seamless steel pipe for high pressure gas cylinder	STH	
	Carbon steel pipe for general structural use	STK	
	Carbon steel pipe for machine structural use	STKM	
	Alloy steel pipe for structural use	STKS	
	Stainless steel pipe for machine structural use	SUS-TK	
	Steel square pipe for general structural use	STKR	
	Alloy steel pipe for ordinary piping	STPA	
	Carbon steel pipe for pressure service	STPG	
	Carbon steel pipe for high-temperature service	STPT	
	Carbon steel pipe for high-pressure service	STS	
	Stainless steel pipe for ordinary piping	SUS-TP	
	Machine structural steel	Carbon steel for machine structural use	SxxC, SxxCK
Aluminum chromium molybdenum steel		SACM	
Chromium molybdenum steel		SCM	
Chromium steel		SCr	
Nickel chromium steel		SNC	
Nickel chromium molybdenum steel		SNCM	
Manganese steel and manganese chromium steel for machine structural use		SMn, SMnC	
Special steel	Tool steel	Carbon tool steel	SK
		Hollow drill steel	SKC
		Alloy tool steel	SKS, SKD, SKT
		High speed tool steel	SKH
	Special steel	Free cutting carbon steel	SUM
		High carbon chromium bearing steel	SUJ
		Spring steel	SUP
	Stainless steel	Stainless steel bar	SUS-B
		Hot-rolled stainless steel plate, sheet and strip	SUS-HP, SUS-HS
		Cold-rolled stainless steel plate, sheet and strip	SUS-CP, SUS-CS
	Heat-resisting steel	Heat-resisting steel bar	SUH-B, SUH-CB
		Heat-resisting steel plate and sheet	SUH-HP, SUH-CP
	Superalloy	Corrosion-resisting and heat-resisting superalloy bar	NCF-B
		Corrosion-resisting and heat-resisting superalloy plate and sheet	NCF-P

Classification	Name of JIS standard	Symbol
Forged steel	Carbon steel forging	SF
	Chromium molybdenum steel forging	SFCM
	Nickel chromium molybdenum steel forging	SFNCM
Cast iron	Gray cast iron	FC
	Spheroidal graphite cast iron	FCD
	Blackheart malleable cast iron	FCMB
	Whiteheart malleable cast iron	FCMW
Cast steel	Pearlitic malleable cast iron	FCMP
	Carbon cast steel	SC
	High tensile strength carbon cast steel & low alloy cast steel	SCC
	Stainless cast steel	SCS
	Heat-resisting cast steel	SCH
	High manganese cast steel	SCMnH
	Cast steel for high temperature and high pressure service	SCPH

Non-ferrous metals

Classification	Name of JIS standard	Symbol	
Copper	Copper and copper alloy sheet / strip	CxxxxP CxxxxPP CxxxxR	
	Copper and copper alloy rod and bar	CxxxxBD CxxxxBDS CxxxxBE	
Aluminum alloys and aluminum alloys expanded material	Aluminum and Al. alloy sheet / strip	AxxxxP AxxxxPC	
	Aluminum and Al. alloy rod, bar, and wire	AxxxxBE AxxxxBES AxxxxBD AxxxxBDS AxxxxW AxxxxWS	
		Aluminum and Al. alloy extruded shape	AxxxxS
		Aluminum and Al. alloy forging	AxxxxFD AxxxxFH
		Magnesium alloy expanded material	Magnesium alloy sheet and plate	MP
Magnesium alloy rod and bar	MB		
Nickel alloy	Nickel copper alloy sheet and plate	NCuP	
	Nickel copper alloy rod and bar	NCuB	
Titanium expanded material	Titanium rod and bar	TB	
Casting	Brass casting	CAC20x	
	High strength brass casting	CAC30x	
	Bronze casting	CAC40x	
	Phosphoric bronze casting	CAC50x	
	Aluminum bronze casting	CAC70x	
	Aluminum alloy casting	AC	
	Magnesium alloy casting	MC	
	Zinc alloy die casting	ZDCx	
	Aluminum alloy die casting	ADC	
	Magnesium alloy die casting	MD	
White metal	WJ		

R



Technical information

Material cross reference table

Steel

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/SAE	ГОСТ
Carbon steel for machine structural use	C10E C10R	040A10 045A10 045M10	XC10	S10C	08 10	1010	
		040A12	XC12	S12C		1012	
	C15E C15R	055M15		S15C	15	1015	
			XC18	S17C		1017	
	C22 C22E C22R	070M20 C22 C22E C22R	C22 C22E C22R	S20C	20	1020	
				S22C		1023	
	C25 C25E C25R	C25 C25E C22R	C25 C25E C25R	S25C	25	1025	
				S28C		1029	25Г
	C30 C30E C30R	080A30 080M30 C30 C30E C30R	C30 C30E C30R	S30C	30	1030	30Г
				S33C			30Г
	C35 C35E C35R	C35 C35E C35R	C35 C35E C35R	S35C	35	1035	35Г
				S38C		1038	35Г
	C40 C40E C40R	080M40 C40 C40E C40R	C40 C40E C40R	S40C	40	1039 1040	40Г
		080A42		S43C		1042 1043	40Г
	C45 C45E C45R	C45 C45E C45R	C45 C45E C45R	S45C	45	1045 1046	45Г
		080A47		S48C			45Г
	C50 C50E C50R	080M50 C50 C50E C50R	C50 C50E C50R	S50C	50	1049	50Г
				S53C		1050 1053	50Г
	C55 C55E C55R	070M55 C55 C55E C55R	C55 C55E C55R	S55C	55	1055	
	C60 C60E C60R	C60 C60E C60R	C60 C60E C60R	S58C	60	1059 1060	60Г
	C10E	045A10 045M10	XC10	S09CK			
	C15E		XC12	S15CK	15F		
			XC18	S20CK			

R



Technical information

Material cross reference table

Steel

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/SAE	ГОСТ
Nickel chromium steel	36NiCr6			SNC236			40XH
	14NiCr10			SNC415	12CrNi2		
	36NiCr10			SNC631	30CrNi3		30XH3A
	15NiCr13	655M13		SNC815	12Cr2Ni4		
	31NiCr14			SNC836	37CrNi3		
Nickel chromium molybdenum steel	20NiCrMo2 20NiCrMoS2	805A20 805M20 805A22 805M22	20NCD 2	SNCM220	20CrNiMo	8615 8617 8620 8622	
	40NiCrMo2-2			SNCM240		8637 8640	
				SNCM415			
	17NiCrMo6-4			SNCM420	18CrNiMnMoA	4320	20XH2M (20XHM)
	30CrNiMo8			SNCM431			
	40NiCrMo6			SNCM439	40CrNiMoA	4340	
	34CrNiMo6			SNCM447			
				SNCM616			
				SNCM625			
				SNCM630			
Chromium steel	17Cr3 17CrS3			SCr415	15Cr 15CrA		15X 15XA
				SCr420	20Cr	5120	20X
	34Cr4 34CrS4	34Cr4 34CrS4	34Cr4 34CrS4	SCr430	30Cr	5130 5132	30X
	37Cr4 37CrS4	37Cr4 37CrS4	37Cr4 37CrS4	SCr435	35Cr	5132	35X
	41Cr4 41CrS4	530M40 41Cr4 41CrS4	41Cr4 41CrS4	SCr440	40Cr	5140	40X
				SCr445	45Cr 50Cr		45X
Chromium molybdenum steel	15CrMo4			SCM415	15CrMo		
	18CrMo4 18CrMoS4			SCM418	20CrMo		20XM
	20CrMo5	708M20		SCM420			20XM
				SCM421			
				SCM430	30CrMo 30CrMoA	4130	30XM 30XMA
				SCM432			
	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	SCM435	35CrMo	4137	35XM
	42CrMo4 42CrMoS4	708M40 709M40 42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	SCM440	42CrMo	4140 4142	
				SCM445		4145 4147	
			SCM822				

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Technical information

Material cross reference table

Steel

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/SAE	ГОСТ
Manganese steel Manganese chromium steel	20Mn5	150M19		SMn420	20Mn2	1522	
	34Mn5	150M36		SMn433	30Mn2 35Mn2	1536	30Г2 35Г2
	36Mn5	150M36		SMn438	40Mn2	1541	35Г2 40Г2
				SMn443	45Mn2	1541	40Г2 45Г2
	16MnCr5			SMnC420	15CrMn	5115	
				SMnC443	40CrMn	5140	
				SMn420H		1522H	
				SMn433H			
				SMn438H		1541H	
				SMn443H		1541H	
Structural steel with specified hardenability band				SMnC420H			
				SMnC443H			
	17Cr3 17CrS3			SCr415H	15CrH		15X
	17Cr3			SCr420H	20Cr1H	5120H	20X
	34Cr4 34CrS3	34Cr4 34CrS4	34Cr4 34CrS4	SCr430H		5130H 5132H	30X
	37Cr4 34CrS4	37Cr4 37CrS4	37Cr4 37CrS4	SCr435H		5135H	35X
	41Cr4 41CrS4	41Cr4 41CrS4	41Cr4 41CrS4	SCr440H	40CrH	5140H	40X
	15CrMo5			SCM415H	15CrMoH	4118H	
	18CrMo4 18CrMoS4			SCM418H			
	18CrMo4	708H20		SCM420H	20CrMoH	4118H	
	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	34CrMo4 34CrMoS4	SCM435H		4135H 4137H	
	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	42CrMo4 42CrMoS4	SCM440H	42CrMoH	4140H 4142H	
				SCM445H		4145H 4147H	
				SCM822H			
				SNC415H			
				SNC631H			
	15NiCr13	655H13		SNC815H	12Cr2Ni4H		
	21NiCrMo2	805H17 805H20 805H22	20N CD 2	SNCM220H	20CrNiMoH	8617H 8620H 8622H	
	20NiCrMoS6-4			SNCM420H	20CrNi2MoH	4320H	

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Technical information

Material cross reference table

Steel

Classification	Germany	UK	France	Japan	China	USA		Russia
	DIN	BS	NF	JIS	GB	UNS	AISI	ГОСТ
Stainless steel			Z12CMN17-07Az	SUS 201	1Cr17Mn6Ni5N	S20100	201	
		284S16		SUS 202	1Cr18Mn8Ni5N	S20200	202	12X17F9AH4
	X12CrNi17 7	301S21	Z11CN17-08	SUS 301	1Cr18Mn10Ni5Mo3N 1Cr17Ni7	S30100	301	07X16H6
	X2CrNiN18-7			SUS 301L		S30153		
	X12CrNi17 7			SUS 301J1				
		302S25	Z12CN18-09	SUS 302	1Cr18Ni9	S30200	302	12X18H9
				SUS 302B		S30215	302B	
	X10CrNiS18 9	303S21	Z8CNF18-09	SUS 303	Y1Cr18Ni9	S30300	303	
		303S41		SUS 303Se	Y1Cr18Ni9Se	S30323	303Se	12X18H10E
	X5CrNi18 10	304S31	Z7CN18-09	SUS 304	0Cr18Ni9	S30400	304	08X18H10
	X2CrNi19 11	304S11	Z3CN19-11	SUS 304L	00Cr18Ni10	S30403	304L	03X18H11
			Z6CN19-09Az	SUS 304N1	0Cr18Ni9N	S30451	304N	
				SUS 304N2	0Cr19Ni10NbN	S30452		
	X2CrNi18 10		Z3CN18-10Az	SUS 304LN	00Cr18Ni10N	S30453	304LN	
				SUS 304J1				
				SUS 304J2				
				SUS 304J3		S30431	S30431	
	X5CrNi18 12	305S19	Z8CN18-12	SUS 305	1Cr18Ni12	S30500	305	06X18H11
				SUS 305J1				
			Z10CN24-13	SUS 309S	0Cr23Ni13	S30908	309S	
		310S31	Z8CN25-20	SUS 310S	0Cr25Ni20	S31008	310S	10X23H18
	X5CrNiMo17 12 2	316S31	Z7CND17-12-02	SUS 316	0Cr17Ni12Mo2	S31600	316	
	X5CrNiMo17 13 3		Z6CND18-12-03	SUS 316F				
	X2CrNiMo17 13 2	316S11	Z3CND17-12-02	SUS 316L	00Cr17Ni14Mo2	S31603	316L	
	X2CrNiMo17 14 3		Z3CND17-13-03					03X17H14M3
				SUS 316N	0Cr17Ni12Mo2N	S31651	316N	
	X2CrNiMoN17 12 2		Z3CND17-11Az	SUS 316LN	00Cr17Ni13Mo2N	S31653	316LN	
	X2CrNiMoN17 13 3		Z3CND17-12Az					
	X6CrNiMoTi17 12 2		Z6CNDT17-12	SUS 316Ti		S31635		08X17H13M2T
				SUS 316J1	0Cr18Ni12Mo2Cu2			
				SUS 316J1L	00Cr18Ni14Mo2Cu2			
		317S16		SUS 317	0Cr19Ni13Mo3	S31700	317	
	X2CrNiMo18 16 4	317S12	Z3CND19-15-04	SUS 317L	00Cr19Ni13Mo3	S31703	317L	
		Z3CND19-14Az	SUS 317LN		S31753			
			SUS 317J1	0Cr18Ni16Mo5				
			SUS 317J2					
			SUS 317J3L					
			SUS 836L		N08367			
	904S14	Z2NCUDU25-20	SUS 890L		N08904	N08904		
X6CrNiTi18 10	321S31	Z6CNT18-10	SUS 321	1Cr18Ni9Ti 0Cr18Ni10Ti	S32100	321	08X18H10T	
X6CrNiNb18 10	347S31	Z6CNNb18-10	SUS 347	0Cr18Ni11Nb	S34700	347	08X18H12E	
		Z6CN18-16	SUS 384		S38400	384		
	394S17	Z2CNU18-10	SUS XM7	0Cr18Ni9Cu3	S30430	304Cu		
		Z15CNS20-12	SUS XM15J1	0Cr18Ni13Si4	S38100			
			SUS 329J1	0Cr26Ni5Mo2	S32900	329		
		Z3CNDU22-05Az	SUS 329J3L		S39240	S31803	08X21H6M2T	
		Z3CNDU25-07Az	SUS 329J4L		S39275	S31260		

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Technical information

Steel

Classification	Germany	UK	France	Japan	China	USA		Russia
	DIN	BS	NF	JIS	GB	UNS	AISI	ГОСТ
Stainless steel	X6CrAl13	405S17	Z8CA12	SUS 405	0Cr13Al 0Cr13	S40500	405	
			Z3C14	SUS 410L SUS 429	00Cr12	S42900	429	
	X6Cr17	430S17	Z8C17	SUS 430	1Cr17	S43000	430	12X17
	X7CrMoS18		Z8CF17	SUS 430F	Y1Cr17	S43020	430F	
	X6CrTi17		Z4CT17	SUS 430LX		S43035		
	X6CrNb17		Z4CNb17	SUS 430J1L				
	X6CrMo17 1	434S17	Z8CD17-01	SUS 434 SUS 436L SUS 436J1L	1Cr17Mo	S43400 S43600	434 436	
			Z3CDT18-02	SUS 444		S44400	444	
				SUS 447J1	00Cr30Mo2	S44700		
			Z1CD26-01	SUS XM27 SUS 403	00Cr27Mo 1Cr12	S44627 S40300		403
	X10Cr13	410S21	Z13C13	SUS 410	1Cr13	S41000	410	
	X6Cr13	403S17	Z8C12	SUS 410S SUS 410F2		S41008	410S	08X13
	X12CrS13			SUS 410J1	1Cr13Mo 1Cr12Mo	S41025		
		416S21	Z11CF13	SUS 416	Y1Cr13	S41600	416	
	X20Cr13	420S29	Z20C13	SUS 420J1	2Cr13	S42000	420	20X13
	X30Cr13	420S37	Z33C13	SUS 420J2	3Cr13	S42000	420	30X13
			Z30CF13	SUS 420F SUS 420F2 SUS 429J1	Y3Cr13	S42020	420F	
	X20CrNi17 2	431S29	Z15CN16-02 Z70C15	SUS 431 SUS 440A SUS 440B	1Cr17Ni2 7Cr17 8Cr17	S43100 S44002 S44003	431 440A 440B	20X17H2
			Z100CD17	SUS 440C	9Cr18 11Cr17 9Cr18Mo	S44004	440C	95X18
				SUS 440F	Y11Cr17	S44020	S44020	
	X5CrNiCuNb16-4		Z6CNU17-04	SUS 630	0Cr17Ni4CuNb	S17400	S17400	
	X7CrNiAl17 7		Z9CNA17-07	SUS 631 SUS 632J1	0Cr17Ni7Al	S17700	S17700	09X17H7 Ю

Representative classification of stainless steel

Stainless steel (Austenitic related)

JIS	
SUS201	SUS309S
SUS202	SUS310S
SUS301	SUS316
SUS302	SUS316L
SUS302B	SUS316N
SUS303	SUS317
SUS303Se	SUS317L
SUS304	SUS321
SUS304L	SUS347
SUS304N1	SUS384
SUS304N2	SUSXM7
SUS305	SUSXM15J1
SUS308	

Stainless steel (Ferritic related)

JIS
SUS405
SUS429
SUS430
SUS430F
SUS434
SUSXM27

Stainless steel (Martensitic related)

JIS
SUS403
SUS410
SUS410S
SUS416
SUS420J1
SUS420F
SUS431
SUS440A
SUS440B
SUS440C
SUS440F

Stainless steel (Precipitation hardening)

JIS
SUS630
SUS631



Technical information

Steel

Classification	Germany	UK	France	Japan	China	USA		Russia
	DIN	BS	NF	JIS	GB	UNS	AISI	ГОСТ
Heat-resisting steel		331S42	Z35CNWS14-14	SUH 31				45X14H14B2M
		349S52	Z52CMN21-09Az	SUH 35				
	X53CrMnNi21 9	349S54	Z55CMN21-09Az	SUH 36	5Cr21Mn9Ni4N	S63008		55X20 Г 9AH4
		381S34		SUH 37	2Cr21Ni12N	S63017		
				SUH 38				
		309S24	Z15CN24-13	SUH 309	2Cr23Ni13	S30900	309	
	CrNi2520	310S24	Z15CN25-20	SUH 310	2Cr25Ni20	S31000	310	20X25H20C2
			Z12NCS35-16	SUH 330	1Cr16Ni35	N08330	N08330	
			Z6NCTV25-20	SUH 660	0Cr15Ni25Ti2MoAlVB	S66286		
				SUH 661		R30155		
	CrAl1205			SUH 21				
	X6CrTi12	409S19	Z6CT12	SUH 409		S40900	409	
			Z3CT12	SUH 409L				
			Z12C25	SUH 446	2Cr25N	S44600	446	15X28
	X45CrSi9 3	401S45	Z45CS9	SUH 1	4Cr9Si2	S65007		
			Z40CSD10	SUH 3	4Cr10Si2Mo			40X10C2M
		443S65	Z80CSN20-02	SUH 4	8Cr20Si2Ni			
				SUH 11				40X 9C2
			SUH 600	2Cr12MoVNbN			20X12BHMБOP	
			SUH 616	2Cr12NiMoWV	S42200			

Representative classification of heat-resisting steel

Heat-resisting steel (Austenitic related)

JIS
SUH31
SUH35
SUH36
SUH37
SUH38
SUH309
SUH310
SUH330
SUH660
SUH661

Heat-resisting steel (Ferritic related)

JIS
SUH21
SUH409
SUH446

Heat-resisting steel (Martensitic related)

JIS
SUH1
SUH3
SUH4
SUH11
SUH600
SUH616

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Technical information

Material cross reference table

Steel

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/ASTM	ГОСТ
Carbon tool steel			C140E3U	SK140 (SK1)	T13		Y13
			C120E3U	SK120 (SK2)	T12	W1-11½	Y12
	C105W1		C105E2U	SK105 (SK3)	T11	W1-10	Y11
			C90E2U	SK95 (SK4)	T10	W1-9	Y10
	C80W1		C90E2U C80E2U	SK85 (SK5)	T8Mn T9	W1-8	Y8Г Y9
	C80W1		C80E2U C70E2U	SK75 (SK6)	T8		Y8
	C70W2		C70E2U	SK65 (SK7)	T7		Y7
High speed tool steel		BT1	HS18-0-1	SKH2	W18Cr4V	T1	P18
	S18-1-2-5	BT4	HS18-1-1-5	SKH3	W18Cr4VCo5	T4	P18K5Φ2
		BT5	HS18-0-2-9	SKH4	W18Cr4V2Co8	T5	P18K5Φ
	S12-1-4-5	BT15	HS12-1-5-5	SKH10	W12Cr4V5Co5	T15	
	S6-5-2	BM2	HS6-5-2	SKH51	W6Mo5Cr4V2	M2	P6M5
				SKH52	CW6Mo5Cr4V2 W6Mo5Cr4V3	M3-1	P6M5Φ3
	S6-5-3		HS6-5-3	SKH53	CW6Mo5Cr4V3	M3-2	P6M5Φ3
		BM4	HS6-5-4	SKH54		M4	
	S6-5-2-5	BM35	HS6-5-2-5HC	SKH55	W6Mo5Cr4V2Co5 W7Mo5Cr4V2Co5	M35 M41	P6M5K5
				SKH56		M36	
	S10-4-3-10	BT42	HS10-4-3-10	SKH57			
		HS2-9-2	SKH58	W2Mo9Cr4V2	M7		
S2-10-1-8	BM42	HS2-9-1-8	SKH59	W2Mo9Cr4VCo8	M42		
Alloy tool steel				SKS11		F2	XB4
	105WCr6		105WCr5	SKS2			XBГ
				SKS21	W		
				SKS5			
				SKS51		L6	
				SKS7			
			C140E3UCr4	SKS8	Cr06		13X
				SKS4	5CrW2Si 6CrW2Si	S1	6XB2C 5XB2CΦ
				SKS41	4CrW2Si	S1	4XB2C
		BW2	100V2	SKS43		W2-9½	
				SKS44		W2-8	
				SKS3	9CrWMn		9XBГ
	105WCr6		105WCr5	SKS31	CrWMn		XBГ
				SKS93			
				SKS94			
				SKS95	8MnSi		
	X210Cr12	BD3	X200Cr12	SKD1	Cr12	D3	X12
	X153CrMoV12			SKD10	Cr12Mo1V1	D2	X12MΦ
	X153CrMoV12	BD2	X160CrMoV12	SKD11	Cr12MoV	D2	
		BA2	X100CrMoV5	SKD12	Cr5Mo1V	A2	
		X32WCrV3	SKD4				
X30WCrV9-3	BH21	X30WCrV9	SKD5	3Cr2W8V	H21		
X38CrMoV51	BH11	X38CrMoV5	SKD6	4Cr5MoSiV	H11	4X5MΦC	
X40CrMoV51	BH13	X40CrMoV5	SKD61	4Cr5MoSiV1	H13	4X5MΦ1C	
	BH12	X35CrWMoV5	SKD62		H12	3X3M3Φ	
X32CrMoV33	BH10	32CrMoV12-18	SKD7	4Cr3Mo3SiV	H10		
	BH19		SKD8		H19		
		55CrNiMoV4	SKT3				
55NiCrMoV6	BH224/5	55NiCrMoV7	SKT4	5CrNiMo		5XHM	

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Technical information

Material cross reference table

Steel

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/ASTM	ГОСТ
Spring steel				SUP3		1075 1078	75 80 85
	56SiCr7		60Si7	SUP6	55Si2Mn		60C2
	61SiCr7		60Si7	SUP7	60Si2Mn 60Si2MnA	9260	60C2Г
	55Cr3		55Cr3	SUP9	55CrMnA	5155	
	55Cr3		60Cr3	SUP9A	60CrMnA	5160	
	50CrV4	735A51, 735H51	51CrV4	SUP10	50CrVA	6150	ХФА50ХГФА
	51CrV4			SUP11A	60CrMnBA	51B60	50ХГР
	54SiCr6 60CrMn3-2	685A57, 685H57 705A60, 705H60	54SiCr6 60CrMo4	SUP12 SUP13	 60CrMnMoA	9254 4161	
Free cutting carbon steel				SUM11		1110	
				SUM12	Y12	1108	
				SUM21		1212	
	9SMn28	(230M07)	S250	SUM22	Y15	1213	
	9SMnPb28		S250Pb	SUM22L	Y12Pb	12L13	
				SUM23		1215	
				SUM23L			
	9SMnPb28		S250Pb	SUM24L	Y15Pb	12L14	
	9SMn36		S300	SUM25			
	15S10			SUM31		1117	
				SUM31L			
		210M15, 210A15	(13MF4)	SUM32	Y20		
			(35MF6)	SUM41	Y30 Y35	1137	
		(45MF6.1)	SUM42	Y40Mn	1141		
	(226M44)	(45MF6.3)	SUM43		1144		
High carbon chromium bearing steel				SUJ1	GCr4	51100	
	100Cr6		100Cr6	SUJ2	GCr15	52100	ШХ15
				SUJ3	GCr15SiMn	ASTM A 485 Grade 1	
				SUJ4	GCr15SiMo		
				SUJ5	GCr18Mo		

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Technical information

Material cross reference table

Cast iron

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	AISI/SAE	ГОСТ
Gray cast iron	GG10	100		FC100	HT100	NO.20	CY10
	GG15	150	FGL150	FC150	HT150	NO.30	CY15
	GG20	200	FGL200	FC200	HT200	NO.35	CY20
	GG25	250	FGL250	FC250	HT250	NO.45	CY25
	GG30	300	FGL300	FC300	HT300	NO.50	CY30
	GG35	350	FGL350	FC350	HT350	NO.60	CY35
	GG40		FGL400				CY40
Modular cast iron	GGG40	400/17	FGS370-17	FCD400	QT400-18	60-40-18	BY40
		420/12	FGS400-12	FCD450	QT450-10	65-45-12	BY45
	GGG50	500/7	FGS500-7	FCD500	QT500-7	70-50-05	BY50
	GGG60	600/7	FGS600-2	FCD600	QT600-3	80-60-03	BY60
	GGG70	700/2	FGS700-2	FCD700	QT700-2	100-70-03	BY70
	GGG80	800/2	FGS800-2	FCD800	QT800-2	120-90-02	BY80
		900/2			QT900-2		BY100

Non-ferrous metals

Classification	Germany	UK	France	Japan	China	USA	Russia
	DIN	BS	NF	JIS	GB	ASTM	ГОСТ
Aluminum alloys	A199.99R				1A99	1199	A99
	A199.98R				1A97		A97
					1A95		A95
	A199.90	1080(1A)	1080A	A1080	1A80		A8
	A199.50	1050(1B)	1050A	A1050	1A50	1050	A5
	AlMg2.5	NS4	5052	A5052	5A02	5052	AMg
		NS5			5A03		AMg3
	AlMg5	NB6		A5056	5A05	5056	AMg5V
		NG61	5957	A5556	5A30	5456	
	AlCu2.5Mg0.5		2117	A2117	2A01	2036	D18
	AlCuMg1	HF15	2017S	A2017	2A11		D1
	AlCuMg2		2024	A2024	2A12	2124	D16AVTV
					2B16	2319	
				A2N01	2A80		AK4
				A2018	2A90	2218	AK2
AlCuSiMn		2014	A2014	2A14	2014	AK8	
AlZnMgCu1.5		7075	A7075	7A09	7175	V95P	
Aluminum alloy casting	G-AlSi7Mg	LM25		AC4C	ZAlSi7Mn	356.2	
	G-Al12	LM6	A-S12-Y4	AC3A	ZAlSi12	413.2	AL2
					ZAlSi5Cu1Mg	355.2	AL5
	G-Al12(Cu)			AC8A	ZAlSi2Cu2Mg1	413.0	
					ZAlCu5Mn		AL19
					ZAlCu5MnCdVA	201.0	
	G-ALMg10	LM10	AG11		ZAlMg10	520.2	AL8
G-ALMg5Si				ZAlMg5Si		AL13	



Technical information

Insert grade cross reference table

CVD Coated Carbide (Turning)

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
Symbol												
P (Steel)	P01	CA510	JC110V	HG8010 HG3305	MC6115 MC6015		GC4405 GC4305 GC4315	TP0501	AC8015P AC810P	T9205 T9105	KCP05B KCP05 KCPK05	IC8150 IC5005
	P10	CA115P CA510 CA515	JC110V JC215V	GM8015 HG8010	MC6115 MC6015 MY5015 MC6125	CP7	GC4405 GC4415 GC4305 GC4315 GC4325	TP0501 TP1501	AC8015P AC8020P AC810P	T9205 T9105 T9215 T9115	KCP05B KCP05 KCPK05 KCP10B KCP10	IC8150 IC8250 IC5005
	P20	CA125P CA025P CA525 CR9025	JC110V JC215V	GM8020 HG8025	MC6115 MC6015 MY5015 MC6125 MC6025 UE6020	CP7	GC4415 GC4315 GC4425 GC4325 GC4335	TP1501 TP2501 TP3501 TP25 TP40	AC8020P AC8025P AC820P	T9215 T9115 T9225 T9125	KCP10B KCP10 KCP25B KCP25	IC8150 IC8250 IC8350
	P30	CA125P CA025P CA525 CA530 CR9025	JC215V JC325V JC450V	GM25 GM8035 HG8025	MC6125 MC6025 UE6020 MC6035 UH6400	CP7	GC4425 GC4325 GC4335	TP2501 TP3501 TP25 TP40	AC8035P AC830P AC6030M AC630M	T9225 T9125 T9235 T9135	KCP25B KCP25 KCP30B KCP30	IC8250 IC8350
	P40	CA530	JC325V JC450V	GX30	MC6035 UH6400		GC4335 GC4325	TP3501 TP40	AC8035P AC830P AC6030M AC630M	T9235 T9135 T6215	KCP30B KCP30 KCP40B KCP40	IC8350
M (Stainless steel)	M10	CA6515	JC605X JC110V	HG8025	MC7015 US7020		GC2015 GC1515	TM1501	AC6020M	T6215 T6120	KCM15B KCM15	IC6015 IC8150
	M20	CA6515 CA6525	JC605X JC110V	HG8025 GM8020	MC7015 US7020 MC7025		GC1515 GC2015 GC2025 GC2220	TM1501 TM2501	AC6020M AC6030M AC630M	T6215 T6120 T6130	KCM15B KCM15 KCM25B KCM25	IC6015 IC6025 IC8150 IC8250
	M30	CA6525	JC110V JC525X	HG8025 GM25 GM8035	MC7025 US7020 US735		GC2025 GC2220 GC235	TM1501 TM2501 TM3501	AC6030M AC630M AC8035P AC830P	T6215 T6130	KCM25B KCM25 KCM35B KCM35	IC6025 IC8350
	M40		JC525X	GX30 GM8035	MC7025 US735		GC235	TP40 TM2501 TM3501	AC6030M AC630M		KCM35B KCM35	
K (Cast iron)	K01	CA310 CA4505	JC050W JC105V JC605W	HX3505 HX3515	MC5105 MC5005		GC3210 GC3005 GC4305	TK0501	AC4010K	T5105 T505	KCK05B KCK05	IC5005 IC428
	K10	CA310 CA315 CA4505 CA4515	JC050W JC105V JC110V JC108W	HX3305 HX3515 HG8010 HG8025 GM8020	MC5105 MC5115 MC5005 MC5015 MY5015 MH515	CP1	GC3210 GC3005 GC4305 GC4315	TK0501 TK1501	AC4010K AC4015K	T5105 T5115 T505 T515	KCK05B KCK05 KCK15B KCK15	IC5005 IC5010 IC418 IC428 IC8150
	K20	CA315 CA320 CA4515	JC110V JC108W JC215V	HX3515 HG8010 GM8020 HG8025	MC5115 MC5125 MC5015 MY5015 MH515	CP1	GC3210 GC3225 GC4315 GC4325	TK0501 TK1501	AC4015K AC420K AC425K AC8025P	T5115 T5125 T515	KCK15B KCK15 KCK20B KCK20	IC5005 IC5010 IC418 IC428 IC8150
	K30	CA320	JC108W JC215V	GM8020 HG8025	MC5125		GC3225 GC4325	TK1501		T5125	KCP25B KCK20	

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Technical information

Insert grade cross reference table

PVD Coated Carbide (Turning)

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Classification	Symbol	Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
P (Steel)	P01	PR1705										
	P10	PR1705 PR1215 PR1725 PR2015		IP2000	MS6015 VP10MF VP10RT	VM1 DT4 DM4		TS2000 CP200	AC1030U ACZ150 AC5005S AC5015S AC5025S AC520U	AH8005	KCS10 KCU10 KCS010	IC807 IC907 IC1007
	P20	PR1215 PR1225 PR1625 PR1725 PR2015 PR2025		IP2000	MS6015 VP10MF VP10RT VP15TF	VM1 QM3 DT4 TM4 DM4	GC1125 GC15	TS2000 TS2500 CP200	AC1030U AC5025S AC520U AC530U	AH8015 AH6225 AH120 AH725 SH725	KCS10 KCU10 KCS010 KCU25 KCS025	IC807 IC808 IC907 IC908 IC1007
	P30	PR1225 PR1535 PR2025		IP2000 IP3000	MS6015 MS7025 VP15TF VP20MF VP20RT	QM3 TM4	GC1125	TS2500 CP500 CP600	AC1030U AC530U	AH8015 AH6225 AH7025 SH730 J740	KCU25 KCS025	IC808 IC908 IC830 IC1008 IC228 IC528
	P40	PR1535 PR2025		IP3000	VP15TF VP20MF VP20RT	QM3 TM4		CP500 CP600	AC1030U	AH6225		IC830 IC228 IC528 IC3028
M (Stainless steel)	M10	PR1215 PR1225 PR2025 PR1205	JC5003 JC8015	IP0505 IP1005	VP10MF VP10RT	VM1 DT4 DM4	GC1115 GC1125 GC15	TS2000 TS2050 TS2500 CP200	AC5005S AC5015S AC510U AC520U ACZ150	AH8005 AH6225	KCS10 KCU10 KCS010	IC806 IC807 IC907 IC1007
	M20	PR1215 PR1725 PR1225 PR1515 PR2025 PR1205	JC5003 JC8015 JC5015 JC5118	IP1005	MS7025 MS9025 VP10MF VP10RT VP15TF	VM1 QM3 DT4 TM4 DM4 ZM3 ST4	GC1115 GC1125 GC15	TS2000 TS2500 CP200 CP500	AC5015S AC5025S AC1030U AC520U	AH8015 AH6225 AH7025 AH120 AH725	KCS10 KCU10 KCS010 KCU25 KCS025	IC808 IC908 IC1008
	M30	PR1125 PR1535 PR2025	JC5015 JC5118	IP1005	MS7025 MS9025 VP15TF VP20MF VP20RT	QM3 DT4 TM4 DM4 ZM3 ST4	GC2035 GC1125	TS2500 CP500 CP600	AC5025S AC6040M AC1030U AC520U AC530U	AH6235 SH725 SH730 J740	KCU25 KCS025	IC908 IC830 IC1008
	M40	PR1535	JC5118		MP7035 VP15TF VP20MF VP20RT	QM3 TM4 ST4	GC2035	CP500 CP600	AC6040M AC1030U AC530U	AH6235		IC830 IC3028
K (Cast iron)	K01	PR2015								AH110	KCS10 KCU10 KCS010	
	K10	PR1215 PR2015			VP10RT		GC15	TS2000 CP200	AC1030U AC510U ACZ150 AC5015S	AH110 GH110	KCS10 KCU10 KCS010	
	K20	PR1215 PR2015			VP10RT VP15TF VP20RT			TS2000 TS2500 CP200	AC1030U AC510U ACZ150 AC5015S AC5025S	AH8015 AH6225 AH7025 AH120	KCS10 KCU10 KCS010 KCU25 KCS025	IC807 IC907 IC908 IC1007 IC1008
	K30	PR2015			VP15TF VP20RT			TS2000 TS2500 CP200 CP500	AC1030U AC530U	AH120 GH130	KCU25 KCS025	IC807 IC907 IC908 IC1007 IC1008
S (Difficult-to-cut material)	S01	PR005S PR115S	JC5003		MV9005 MP9005 VP05RT			TH1000		AH8005		IC804
	S10	PR005S PR015S PR115S PR1205	JC8015 JC5015 JC5118	HS9105 JP9105	MP9005 MP9015 VP10RT		GC1105	TH1000 TS2000 TS2050 CP200	AC5005S AC5015S AC510U ACZ150	AH8005 AH8015 AH6225	KCS10 KCU10 KCS010	IC806 IC807 IC907 IC1007
	S20	PR015S PR115S PR1205 PR1535	JC5015 JC5118	HS9115 JP9115	MP9015 MP9025 MS9025 VP15TF		GC1105 GC1115 GC1125 GC15	TS2000 TS2050 TS2500 CP200	AC5015S AC5025S AC1030U AC520U	AH8015 AH7025 AH6225	KCS10 KCU10 KCU25	IC907 IC908 IC1007 IC1008
	S30	PR1535			MP9025 MS9025 VP20RT		GC1125			AH7025 AH6235	KCU25 KCS025	IC908 IC1008



Technical information

Insert grade cross reference table

Cermet (Turning)

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
P (Steel)	P01	TN610 PV710	LN10		AP25N VP25N	T15 Q15	CT5015 CT525		T1000A T1500Z	NS520	KT315 KTP10	IC20N ICS20N
	P10	TN610 TN620 TN60 PV710 PV720 PV7040 CCX	LN10 NIT		NX2525 AP25N VP25N	T15 Q15 Z15	CT5015 CT525 GC1525	TP1020 TP1030	T1000A T1500A T1500Z	AT9530 GT9530 J9530	KT315 KTP10	IC20N IC30N ICS20N ICS30N
	P20	TN620 TN90 PV720 PV730	NIT CX75 PX90	CZ25	NX2525 NX3035 MP3025 AP25N VP45N	C7X N40 C7Z	CT5015 GC1525	TP1020 TP1030	T1500A T2500A T1500Z T2500Z	NS9530 AT9530 GT9530 J9530		IC20N IC30N ICS20N ICS30N
	P30	PV730	CX75 PX90	CZ25	NX3035 MP3025 VP45N	C7x N40 C7Z	GC1525		T2500A T2500Z	NS9530		IC30N ICS30N
M (Stainless steel)	M10	TN610 TN620 PV710 PV720	LN10 NIT CX75		AP25N VP25N	T15 Z15 Q15	CT525 GC1525		T1000A	NS520	KT315 KTP10	IC20N ICS20N
	M20	TN620 TN90 PV720 PV730	LN10 NIT CX75 PX90		NX2525 AP25N VP25N	Q15	GC1525	TP1030	T1000A T1500A	NS9530 AT9530 GT9530 J9530		IC20N IC30N ICS20N ICS30N
	M30	PV730	PX90	CZ25					T1500A	NS9530		IC30N ICS30N
K (Cast iron)	K01	PV7005 CCX	LN10 NIT		AP25N VP25N	T15 Q15	CT5015			NS520	KT315 KTP10	
	K10	TN60 CCX PV7005 PV7040	LN10 NIT	CZ25	NX2525 AP25N VP25N	T15 Q15 Z15	CT5015		T1000A	NS9530 AT9530 GT9530 J9530	KT315 KTP10	
	K20		NIT	CZ25	NX2525 AP25N VP25N					NS9530		

Boldface grade shows PVD Coated Cermet. (CCX is CVD Coated Cermet grade)

Carbide

Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
K (Cast iron)	K01	KW10	KG03	WH01 WH05	HTi05T				H2 H1	TH03	K313 K68 GH1 K115M	
	K10	KW10 GW15	KG10 KT9 CR1	WH10	HTi05T HTi10		H13A	HX 890	H1 EH510	TH10	K313 K68 K110M	IC20
	K20	GW15 GW25	KT9 CR1 KG20	WH20	HTi10 UTi20T		H13A	HX 890 883	G10E H10E EH520	KS15F KS20	K313 K68 GH2	IC20
	K30		KG30		UTi20T		H13A	HX 883	G10E H10E			
N (Non-ferrous metals)	N01	GW05			HTi10 MT2010		H10	H15		KS05F	GH1 K115M	
	N10	KW10 GW15 GW25	KT9 CR1	WH10	HTi10 MT2010	KM1	H10 H13A	KX HX 890 H15 H25		TH10	K313 K68 K110M	IC4 IC20 IC28
	N20	GW15 GW25	KT9 CR1		HTi10 MT2010 TF15		H10 H13A	KX HX 890 883 H15 H25		KS15F	K313 K68 GH2	IC20 IC28
	N30				TF15			KX HX 883 H25				IC28
S (Difficult-to-Cut Material)	S01	SW05			MT9005 RT9005		H10A					
	S10	KW10 SW10 GW15 GW25	KG10	WH10	MT9005 RT9005 MT9015 RT9010		H10A H10F H13A	HX 890 883	EH510 EH520	KS05F TH10	K313 K68 K110M	IC20
	S20	SW10 SW25 GW25	KG20		MT9015 RT9010 TF15 RT9020	KM1	H10A H10F H13A	HX 890 883 H25	EH510 EH520	KS15F TH10	K313 K68 GH2	IC20 IC28
	S30	SW25			TF15 RT9020		H10F H13A	HX 883				

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Technical information

Insert grade cross reference table

Coated carbide (Milling / Drill)

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
Symbol												
P (Steel)	P10	PR1825 PR1835 PR1525	DH108 DH110 DH111 DH115	PCA12M PN15M PN208 JP4105	MV1020		GC1010	F40M MK2050 MP1501 MP2501	ACP200 ACP2000 ACP100	AH120 AH725	KC505M KC510M KC515M	IC608 IC902 IC5400
	P20	PR1825 PR1835 PR1525 CA520D	DH111 DH115 JC8015 JC8118	CY150 CY9020 JP4120	MP6120 VP15TF MC7020 FH7020 F7030	TM1 DT4 DM4	GC1130 GC4220 GC4330 GC3040	F40M MP3000 MP1501 MP2501 MP3501	ACP3000 ACU2500 ACP200 XCU2500 ACP2000	AH3135 AH9030 AH3225 T3225	KC522M KC525M	IC808 IC810 IC900 IC908 IC910 IC5500
	P30	PR1825 PR1835 PR1525 PR1535	JC8118 JC8050 JC7550 JC7560	HC844 CY25 CY250 JS4045 GF30	MP6130 VP15TF VP20RT UP20M F7030	ZM3	GC1130 GC2030 GC4330 GC3040	F40M F25M MP3000 MP2501 MP3501	ACP3000 ACU2500 ACP300 XCU2500	AH3225 AH6030 AH130 T3130 T3225	KC530M KC725M KC735M KCPM40 KCPK30	IC300 IC830 IC845 IC908 IC910
	P40	PR1835 PR1535	JC5240 JC8050 JC7550 JC7560	PTH30E PTH40H JS4060 GX2140 GX2160	VP30RT		GC2040 GC4340	F40M MP2050 MP2501 MP3501	ACP3000 ACU2500 ACP300	AH140	KC725M KC735M KCPM40 KCPK30	IC328 IC330 IC830 IC928 IC4050
M (Stainless steel)	M10	PR1835 PR1535 CA6535	DH108 DH111 DS108 JC8015	PN15M PN215	MC7020		GC1010 GC1130	F40M F25M	ACM100 ACK300 XCS2000 ACM200	AH725	KC515M	IC608 IC902 IC5400
	M20	PR1835 PR1525 PR1535 CA6535	DH108 DH111 DS108 JC8015 JC8118	JP4120	VP15TF MC7020 F7030	DT4 DM4	GC2030 S30T GC1130	F40M MS2050	ACS2500 ACU2500 ACP300 XCU2500 ACM200	AH3135 AH3225 AH6030 AH725 T3225	KC522M KC525M	IC300 IC808 IC900 IC908 IC5820
	M30	PR1835 PR1525 PR1535 CA6535	JC8118 JC8050 JC7550 JC7560	HC844 CY250 JS4045 PTH30E	MP7130 MP7030 VP20RT UP20M	ZM3	GC1040 S30T GC2040 GC4230 GC4240	F40M MS2050 T25M MM4500	ACM300 ACS2500 ACS3000 XCU2500 ACM200	AH3135 AH130 T3225 T3130	KC530M KC725M KC735M KCPM40 KCSM30	IC330 IC830 IC882 IC928 IC5820
	M40	PR1835 PR1525 PR1535 CA6535	JC8050 JC7550 JC7560	PTH40H JM4160 AX2040 GX2160	MP7140 VP30RT		GC1040 S40T GC2040 GC4240	F40M MP2050 MM4500	ACM300 ACS3000	AH140	KC725M KCPM40 KCSM40	IC328 IC882
K (Cast iron)	K01	PR1810 PR1510 CA415D	DH102 DH103	ATH80D ATH08M TH308	MP8010 MV1020 MC5020		GC1010	MK2050 MH1000 MK1500	ACK3000	AH110		IC902
	K10	PR1810 PR1510 CA415D CA420M	DH108 DH110 DH111 JC8015	ATH10E TH315 CY100H	MP8010 MV1020 MC5020		GC1020 GC3220 K15W	MK2050 MH1000 MK1500	ACK3000 XCK2000 ACK2000 ACK200	AH110 AH120 T1215 T1115	KC514M KCK15 KCK20	IC608 IC903 IC5100
	K20	PR1810 PR1510 CA415D CA420M	DH115 JC8015 JC8118	CY9020 CY150 PTH13S JP4120 GX2120	VP15TF MV1020 MC5020 MC520		GC3330 GC3040 K15W K20W K20D	MK2050 MK1500 MP3501	ACK3000 ACU2500 XCK2000 XCU2500 ACK2000	AH120 AH9030 T1215	KC520M KC524M KCK20	IC808 IC810 IC908 IC910 DT7150
	K30	PR1810 PR1510	JC8118 JCS240	CY250 JS4045 GX2040 GX2160	VP20RT MC5020		GC3330 GC3040 K20W	MK2050 F40M MK1500 MP3501	ACK3000 ACU2500 ACK300	AH120	KC522M KC524M KCPK30	IC808 IC810 IC908 IC910
S (Difficult-to-Cut Material)	S10	PR1535 CA6535	DS108 DS118 JC8015 JC8118	JP4120 JS1025	MP9120 VP15TF		GC1010 GC1130	F40M MS2050 MS2500	ACM100 ACU2500 ACK300 ACP300	AH120 AH725	KC510M	IC380 IC902 IC908 IC928
	S20	PR1535 CA6535	DS150 JC8050 JC8118	PTH30H	MP9120 MP9130 VP15TF		S30T GC2030 GC1130	F40M MS2050 MS2500	ACS2500 ACU2500 ACP300	AH725 AH130 AH6030	KC522M KC525M KCSM30	IC840 IC882 IC900 IC5280
	S30	PR1535	JC7550 JC7560	JM4160	MP9140		GC1040 S40T GC2040	MS2050	ACM300 ACS2500 ACS3000	AH130	KC522M KC725M KCSM40	IC328 IC330 IC830 IC928

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Technical information

Insert grade cross reference table

Cermet (Milling)

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
P (Steel)	P10	TN620M TN100M PV60M	CX75	CH550 MZ1000	NX2525 VP25N		CT530			NS740	KTPK20	IC30N
	P20	TN620M TN100M PV60M	CX75 CX90	CH7000	NX2525 MX3020 VP25N		CT530			NS740	KTPK20	IC30N
	P30	TN620M TN100M	CX90		MX3030 NX4545				T2500A T250A T4500A			IC30N
M (Stainless steel)	M10	TN100M	CX75		NX2525 VP25N		CT530			NS740		IC30N
	M20	TN100M	CX75	CH550	NX2525 MX3020 VP25N		CT530			NS740	KTPK20	IC30N
	M30				MX3030 NX4545							
K (Cast Iron)	K01		CX75									
	K10		CX75		NX2525 VP25N					NS740	KTPK20	
	K20		CX75		NX2525 MX3020 MX3030 VP25N						KTPK20	

Boldface grade shows PVD Coated Cermet.

Ceramic

Classification		Kyocera	Dijet	Nippon Tungsten	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
	Symbol											
K (Cast Iron)	K01	KA30 A65 KS6015 A66N PT600M CS7050		NPC-H2 NPC-A2		HC1 HC2 HC6 HW2 WA1 WA5	CC6190 CC620 CC650		NB90S	TZ120 LX21	KYK10	IN110 IN22 IN23 IS6 IS8 IS80
	K10	A65 KS6015 KS6050 A66N PT600M CS7050		NX NXA Whiskal WIN		HC1 HC2 HC6 HW2 WA1 WA5 SX6 SP9	CC6190			FX105 CX710	KYK10 KY3500 KYK25	IN110 IN22 IN23 IS6 IS8 IS420 IS80
	K20	KS6050				SX6 SX9				FX105 CX710	KY3500	IS8 IS80
S (Difficult-to-cut material)	S01	KS6030				JX1 JX3 JP2 120	CC6060 CC6160 CC6065 CC670	CS100	WX120	WG300 FX510 TS300		IN110 IS25
	S10	KS6030 KS6040	CA200	Whiskal WIN		JX1 JX3 WA1 WA5 SX3 SX7 JP2 120	CC6060 CC6160 CC6065 CC670	CS100 CS300 CW100	WX120		KYS30 KYSP30 KYS25	IS25 IS35 IS9 IW7
	S20	KS6040				JX1 JX3 SX9 JP2 120			WX120		KYSP30	IS9 IW7
H (Hard materials)	H01	A65 A66N PT600M		NPC-A2		HC2 HC7 450 ZC7	CC6050 CC650		NB100C	LX10 LX11		
	H10	A65 A66N PT600M		NPC-A2 Whiskal WIN		450	CC670		NB100C	WG300	KY1615	IN22 IN23 IW7 IN420

Boldface grade shows PVD Coated Ceramic.

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Technical information

Insert grade cross reference table

CBN

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
Symbol												
K (Cast iron)	K01	KBN475 KBN60M KBN900	JBN795 JBN330 JBN500		MB710 BC5110	B23 B30 B52	CB7925 CB50 CB7525	CBN300	BN7125 BN500 NCB100 BNC500	BX910 BX930 BX870	KB1630 KB5630	IB50
	K10	KBN60M KBN900	JBN795 JBN300 JBN330 JBN500 JBN245	BH200	MB730 MB4120	B23 B30 B52	CB7925 CB50 CB7525	CBN200 CBN300 CBN600 CK2065 CH3515 CBN160C CBN300P CBN400C	BN7125 BN500 BNC500	BX470 BX480	KB1630 KB1340 KB5630	IB50 IB55 IB90
	K20	KBN900	JBN245	BH250	MB730 MB4120 MBS140	B16	CB50	CBN200 CBN300 CBN500 CBN600 CK2065 CH3515 CBN160C CBN300P CBN400C	BN7125 BNS8125 BNC8115	BX90S BXC90	KB1630 KB1340 KB1345 KB5630 KBK45	
H (Hard materials)	H01	KBN510 KBN010 KBN05M KBN10M	JBN245 JBN795 JBN500		BC8105	B52 B5K	CB20 CB50 CB7105	CBN010 CH0550	BN1000 BN2000 BNX10 BNC2105 BNC2010 BNC2115	BX310 BXM10	KBH10	IB50 IB10H IB10HC
	01H	KBN510 KBN525 KBN010 KBN020 KBN05M KBN10M KBN25M KBN900	JBN795 JBN500	BH200	MB8110 MB8120 BC8110 BC8120 BC8210 BC8220	B36 B6K	CB50 CB7105 CB7015	CBN010 CBN150 CH0550 CH1050 CBN060K	BN2000 BNC2010 BNC2020 BNC2115 BNC2125 BNC160 BNC200	BX330 BX530 BXA10 BXM10	KBH10 KB5610	IB50 IB55 IB10H IB10HC
	H20	KBN020 KBN25M KBN35M KBN900		BH250	MB8120 BC8120 BC8220	B36 B40	CB7025 CB7125 CB7525	CBN150 CH1050 CBN060K CH2540 CH2581 CH3515	BN2000 BNX20 BNC2020 BNC2125 BNC200	BX360 BX850 BXA20 BXM20	KBH10 KBH20 KB5625	IB55 IB20H IB25HA IB25HC
	H30	KBN020 KBN35M KBN900		BH250	MB8130 BC8220 BC8130	B40 B22	CB7135 CB7525	CH2540 CH2581 CH3515	BN350 BNC300	BX380 BXC50 BR35F	KBH20 KB1630 KB5625 KB5630	IB55 IB20H IB25HA IB25HC
Sintered steel	-	KBN570 KBN70M	JBN795 JBN330		MB4120	B23 B30	CB7135 CB7125	CBN200	BN7115 BN7125	BX470 BX480	KB5630	IB05S IB10S IB90

Boldface grade shows PVD Coated CBN.

PCD

Classification		Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
Symbol												
N (Non-ferrous metals)	N01	KPD001 KPD230 KPD250	JDA30 JDA735			UC1 PD1 PD2	CD05 CD10	PCD05	DA90 DA150 DA1000	DX160 DX180	KD1400 KD1405	ID5
	N10	KPD001 KPD010 KPD230 KPD250	JDA735 JDA10		MD220	PD1 PD2	CD05 CD10	PCD05 PCD20 PCD30	DA150 DA1000	DX140 DX160	KD1400 KD1405 KD1410 KD1415 KD1425	ID5
	N20	KPD001 KPD010 KPD230 KPD250	JDA10 JDA715		MD220 MD2030	PD1 PD2		PCD05 PCD20 PCD30 PCD30M	DA1000 DA2200	DX110 DX120	KD1400 KD1425	



Technical information

Molded chipbreaker cross reference table

Molded chipbreaker cross reference table

Negative inserts

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Cutting range		Kyocera		Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar
		General chip- breaker	Chipbreaker for sticky material /Soft steel										
Carbon steel / Alloy steel	Finishing (with wiper edge)	WF WP	-	-	-	SW	-	WL WF	W-FF2 W-MF2	SEW LUW	AFW FW	FW	WF
	Finishing - Medium (with wiper edge)	WE WQ	-	-	-	MW	-	WM WMX	W-M3 W-M5	GUW	ASW SW	MW	WG
	Finishing	DP GP PP	XF XP	F1 FA FT PF	BE BH FE	F FH FS FY PK FP	UL WM ZF1	XF QF	FF1	FP FB FE SP FA FL LU	TF 01 AS TSF	FF UF FS LF	F3P SF PF
	Finishing - Medium	HQ PQ CQ CJ VC VF	XQ	UA UT	AB B CE CT	SH C SA LP SY	WV WR	LC PF	FF2 MF2	SU EX SJ SX UJ SE	TS NS CB 11 17 27 ZF	K RP FN FM	NF SM
	Medium - Roughing	PMG PG GS PS	XS	UR UB	AE DE AH	MV MP MA MH	Z5 ZW1	XM QM SM SMC PM PMC	M3 MF3	UA UG GE GU	AM DM NM TM ZM	MN	M3P TF PP
	Medium - Roughing High feed rate	PT GT	-	GC PQ	AR AY	GH RP Standard	GS	MR XMR	M5 MR5 MR6	MU UX ME	TH 32Y 32 37	RP RN	R3P NR
	Roughing	Standard PH	-	GG LG GQ	RE	MT Standard	G	Standard Z3 HM	MR7	MC MU MX UZ	31 33 F-K THS	PR MG	GN
	Roughing Single-sided High feed rate	PX	-	GS RM UC UP UD	H HX HE TE UE	HV HR HX HZ HL HM	-	QR PR HR	R4 R5 R6 R7 RR6 R57 RP	HG HP MP HF	TU TRS 57 65 TUS	RP RH RM RW	TNM NM
Stainless steel, Difficult-to-cut material	Finishing	MQ SQ	-	SF	BH MP	FS SH FJ LM LS	ZF1	MF	M1	SU EF	SF SS	FP	F3M VL F3S
	Medium - Roughing	MS MU TK SG SX	-	GP SZ	DE SE PV VI	MS MA GM MJ MM ES MH GH GJ RM RS	ZP WS	MM MMC MR XMR SM SMR SF SGF SMC MRR	MF1 MF3 A3 A5 M5 56 R8 RR9 MF4	EG EX MU UP EM	HMM SM SA S SH HRM HPF	P MP MS UP	TF PP M3M R3M
Cast iron	Medium	KQ KG C Standard	-	-	AH VA V	LK MK Standard	-	KF KM	-	UZ UX UJ	Standard 33 CF	FN	GN
	Roughing	KH GC ZS	-	-	-	GH RK	-	KR KRR	MR9	GZ	CM CH	RP UN	NR
Non-ferrous metals	Medium - Roughing	AH	-	-	-	-	-	AL	95	AG	P	GP MS	PP



Technical information

Molded chipbreaker cross reference table

Positive inserts

Cutting range	Kyocera		Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar	
	General chipbreaker	Chipbreaker for sticky material / Soft steel											
Carbon steel / Alloy steel	Minute ap	CF	-	-	-	-	-	-	-	01	-	-	
	Finishing (with wiper edge)	WP	-	-	-	SW	-	WF WK WM	W-F1 W-F2	LUW SDW	SW	FW	WF
	Finishing	PF DP GP PP VF	XP	ASF	-	FV SQ FP SMG	AZ3 AMX AZ7 FG	PF UF XF	FF1	FB GU FC FK FP LU	PF PSF 23	11 GF UF FP	PF SM
	Finishing - Medium (1)	HQ	XQ	ACB FT	JE	MQ MV LP	AF1	PM UM SMC	F1 M3	LB SF SU SS	PS PSS 24	LF	14
	Finishing - Medium (2)	GK	-	BM	JQ	No Indication	QD CL	PF PMC XM	MF2 M5	US GU	-	-	F3P
	Medium	Standard	-	-	J	MP Standard	AM5 AM3 AZ8	PR UR KM XR	F2	MU SC	PM	GM MP MR	Standard
Stainless steel/ Difficult-to-cut material	Finishing - Medium	MQ	-	-	MP	FM FV SV LM LS MS	-	MF MMC SM MR MM	-	LU	PSS JS PF PSF PS PM	FW FP MW	PF WF F2M
Non-ferrous metals	Finishing - Medium	AP AH	-	ALU	-	AZ	-	AL	AL	AG AW	AL	HP	AF AS

Positive inserts (for automatic lathe)

Cutting range	Kyocera	Dijet	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	NTK Cutting Tools	Sandvik	Seco	Sumitomo	Tungaloy	Kennametal	Iscar	
Carbon steel / Alloy steel	Minute ap	CF	-	-	-	-	-	-	01	-	-	
	Finishing	PF CK GF SKS	ASF	JQ	FP FV SMG LS-P	AZ7 AMX ZR	PF XF	FF1	SI FC	PF	11 UF FP	PF SM
	Finishing - Medium	GQ SK	ACB FT	JE	LP AM MV	AM3 YL	PM XM	F1 MF2	SU	PS	LF	14
	Medium	GK	-	J	MP Standard	QD CL	PR	F2	SC	PM	MF MP	Standard
Stainless steel	Finishing	MQ	-	MP	FM FV SV LM	-	MF	-	LU	JS PF PSF	FW FP MW	WF
Non-ferrous metals	Finishing - Medium	AP AH	ALU AWI	-	AZ	-	AL	AL	AG AW	AL	HP	AF AS

R



Technical information

Milling insert description cross reference table

Milling insert description cross reference table

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Kyocera	Class	Applications	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	Sandvik	Sumitomo	Tungaloy	Iscar
SDMR1203AUER-H SDKR1203AUEN-S	M K	Steel	SDKR42TN	(SDNR1203AEEN-JS)		SDMR1203AEEN SDMR1203AETN	SDMR1203AETN-MJ SDKR1203AESR-MJ SDKR1203AETN-MJ SDKR1203AEPN-MS SDKR42ZSR-MJ SDKR42ZPN-MS	SDKR1203AUR-HS SDKR1203AUN-76
SDKN1203AUTN	K		SDK42TN-C9	SDKN1203AEN SDKN1203AETN (SDNN1203AETN1)		SDKN42MT (SDNN1203AETN)	SDKN1203AETN-12 SDKN42ZTN	SDKN1203AETN
SDKN1203AUFN	K	Cast Iron	SDK42FN-C9			SDKN42M (SDNN1203AEEN)	SDKN1203AEFN-12 SDKN42ZFN	
		Non-ferrous metals				SDKN42M	(SDCN1203AEFN-D) (SDCN42ZFN-DIA)	
SDKN1504AUTN	K	Steel	SDK53TN-C9	SDKN1504AEN SDKN1504AETN		SDKN53MT	SDKN1504AETN SDKN53ZTN	SDKN1504AETN
SEMR1203AFER-H SEKR1203AFEN-S	M K	Steel	SEKR42TN	(SEER1203AFEN-JS)	SEKR1203AZ-WM (SEER1203AZ-WL)	SEMR1203AFEN (SEER1203AFEN)	SEMR1203AFTN-MJ SEKR1203AFSR-MJ SEKR1203AFTN-MJ SEKR1203AFPN-MS	SEKR1203AFTR-HS SEKR1203AFR-HS SEKR1203AFN-76 SEKR1203AF-N-42
SEEN1203AFTN	E		SEE42TN-C9	SEEN1203AFTN1		SEEN42MT	SEEN1203AFTNCR-14	
SEKN1203AFTN	K		SEK42TN-C9	SEKN1203AFTN1 (SENN1203AFTN1)	SEKN1203AZ (SEMN1203AZ)	SEKN42MT (SENN1203AFTN)	SEKN1203AFTN SEKN1203AFTN-16 SEKN42AFTN SEKN42AFTN16	
SEKN1203AFFN	K	Cast Iron	SEK42FN-C9	(SEEN1203AFFN1)	SEKN1203AZ (SEMN1203AZ)	SEKN42M (SENN1203AFEN)	SEKN1203AFFN SEKN42AFFN	
SEEN1203AFFN	E	Non-ferrous metals	SEE42FN-C9	(SECN1203AFFR1)				
SEKN1203EFTR	K	Steel	SEK42TR-G3	SEKN1203EFTR1	(SECN1203EER)		SEKN1203EFTR (SECN1203EFTR) (SEEN1203EFTR) (SECN42EFTRCR) (SEEN42EFTRCR)	
SEKN1504AFTN	K	Steel	SEK53TN-C9		SEKN1504AZ	SEKN53MT		SEKN1504AFTN
SPEN1203EESR	E	Cast iron	(SPK42FR-A3E)	SPEN42EFSR1 SPEN1203EESR1 SPEN1203EEER1 (SPNN1203EEER1)				
SPMR1203EDER-H SPKR1203EDER-S	M K	Steel		(SPER1203EDER-JS)	SPKN1203EDR-WH		SPKR1203EDSR-MJ SPKR42SSR-MJ	SPKR1203EDR-76 SPKR1203EDTR-HS
SPCN1203EDTR	C			(SPEN1203EDR)	(SPAN1203EDR)	SPCH42TR-R	SPCN1203EDTR SPCN42STR	
SPKN1203EDTR	K		SPK42TR-A3	SPKN1203EDR	SPKN1203EDR	(SPCH42TR) (SPCH42TR-R)	SPKN1203EDTR SPKN42STR (SPEN1203EDTR) (SPEN42STR)	SPKN1203EDTR SPKN1203EDTR-42
SPKN1203EDFR	K	Cast iron	SPK42FR-A3		SPKN1203EDR	(SPCH42R)	SPKN1203EDFR SPKN42SFR	SPKN1203EDFR
SPKN1504EDTR	K	Steel	SPK53TR-A3	SPKN1504EDR	SPKN1504EDR	(SPCH53TR-R)	SPKN1504EDTR SPKN53STR (SPCN1504EDTR) (SPCN53STR)	SPKN1504EDTR
SPKN1504EDFR	K	Cast iron	SPK53FR-A3			(SPCH53R-R) (SPCH53TR-R)	SPKN1504EDFR SPKN53SFR	SPKN1504EDFR

Note 1. Tolerance class is different for description in ().

2. Since edge shape of milling insert is slightly different by each maker, please adjust edges (Z-axis direction) during operation.

R



Technical information

Milling insert description cross reference table

Milling insert description cross reference table

This table is Kyocera's own estimation based on publications and is not authorized by companies mentioned in it.

Kyocera	Class	Applications	MOLDINO (Mitsubishi Hitachi Tool)	Mitsubishi	Sandvik	Sumitomo	Tungaloy	Iscar
SPCN1203XPTR	C	Steel	SPC42TR-A5				SPCN1203ZPTR SPCN42ZTR	
SPKN1203XPTR	K		SPK42TR-A5				SPKN1203ZPTR SPKN42ZTR (SPEN1203ZPTR) (SPEN42ZTR)	
SPKN1203XPFR	K	Cast iron	SPK42FR-A5				SPKN1203ZPFR SPKN42ZFR	
SPKN1504XETR	K	Steel		SPK53C2SR				
TPMR1603PDER-H	M			(TPER1603PPER-JS)	(TPKN1603PPR-WH)			(TPKR1603PPTR-HS)
TPKN1603PDTR	K	Steel	TPK32TR-E0 TPK32TR-G0	TPKN1603PPR (TPEN1603PPR)	TPKN1603PPR	TPKN32TR		TPKN1603PPTR
TPKN1603PDFR	K	Cast iron	TPK32FR-E0		TPKN1603PPR	TPKN32R		TPKN1603PPFR
TPMR2204PDER-H TPKR2204PDER-S	M K	Steel		(TPER2204PDER-JS)	TPKN2204PDR-WH		TPMR2204PDSR-MJ TPKR2204PDSR-MJ TPKR43ZSR-MJ	TPKR2204PDTR-HS TPKR2204PD-R-76
TPKN2204PDTR	K		TPK43TR-E0 TPK43TR-G0	TPKN2204PDR (TPEN2204PDR)	TPKN2204PDR	(TPCH43TR)	TPKN2204PPTR TPKN43ZTR (TPCN2204PPTR) (TPCN43ZTR)	TPKN2204PDTR TPKN2204PDTR-42
TPKN2204PDFR	K	Cast iron	TPK43FR-E0			(TPCH43R)	TPKN2204PPFR TPKN43ZFR (TPCN2204PPFR) (TPCN43ZFR) (TPEN2204PPTR-16) (TPEN43ZTR)	TPKN2204PDFR
TEMR1603PTER-H	M			(TEER1603PEER-JS)			(TEKR1603PEPR-MS)	
TEKN1603PTTR	K	Steel	TEK32TR-G0 (TEE32TR-G0)	(TEEN1603PETR1)		TEKN32TR	(TECN1603PETR) (TEEN1603PETR) (TECN32ZTR) (TEEN32ZTR)	
TEKN1603PTFR	K	Cast iron	TEK32FR-G0 (TEE32FR-G0)	(TEEN1603PEFR1)		TEKN32R	(TEEN1603PEFR) (TEEN32ZFR)	
TEEN1603PTFR	E	Non-ferrous metals		(TECN1603PEFR1)		TEEN32R	(TECN1603PEFR-D) (TECN32ZFR-DIA)	
TEMR2204PTER-H TEKR2204PTER-S	M K			(TEER2204PEER-JS)			TEKR2204PEPR-MS	
TEEN2204PTTR	E	Steel	TEE43TR-G0E (TEK43TR-G0E)	TEEN2204PETR1		TEEN43TR	TEEN2204PETR (TECN2204PETR) TEEN43ZTR (TECN43ZTR)	
TEKN2204PTTR	K		TEK43TR-G0E	TEKN2204PETR1		TEKN43TR	(TEEN2204PETR) (TECN2204PETR) (TEEN43ZTR) (TECN43ZTR)	
TEKN2204PTFR	K	Cast iron	TEK43FR-G0E	(TEEN2204PEFR1)		TEKN43R	(TEEN2204PEFR) (TEEN43ZFR)	
		Non-ferrous metals		(TECN2204PEFR1)		(TEEN43R)	(TECN2204PEFR-D) (TECN43ZFR-DIA)	
SNCN1204XNTN	C	Steel	SNC43TN-D5	SNC43B2S		(CSN43MT)	SNCN1204ZNTN SNCN43ZTN	
SNKN1204XNTN	K		SNK43TN-D5	SNK43B2S		(CSN43MT)	SNKN1204ZNTN SNKN43ZTN	
SNMF1204XNTN	M	Steel	(SNKF43TN-D5)	(SNKF43B2S)		(CSNB43MT)	(SNKF1204ZNTN) (SNKF43ZFN)	

Note 1. Tolerance class is different for description in ().

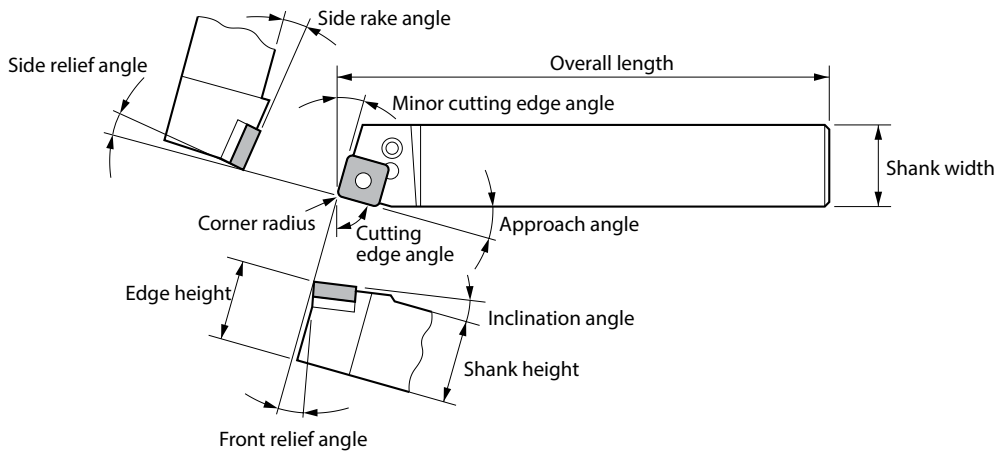
2. Since edge shape of milling insert is slightly different by each maker, please adjust edges (Z-axis direction) during operation.

R



Technical information

Terms and angles of turning toolholder



Function of tool angle

Tool angle	Name	Function	Effect
Rake angle	Side rake angle	· Affects cutting force, cutting heat, chip evacuation and tool life.	· If it is positive (+) angle, sharper cutting performance is obtained. (less cutting force, less edge strength) · Positive (+) angle is recommended for easy to machine workpieces or thin workpieces. · Smaller rake angle or negative (-) angle is recommended when a stronger edge is required like scale machining or interrupted machining.
	Inclination angle		
Relief angle	Front relief angle	· Prevents the tool's contact to the workpiece surface, except the cutting edge.	· When it is small, the cutting edge becomes strong, but the wear at relief faces may shorten the tool life.
	Side relief angle		
Cutting edge angle	Cutting edge angle	· Affects chip control and the direction of cutting force.	· When it is large, chip thickness becomes thick and chip control improves.
	Approach angle	· Affects chip control and the direction of cutting force.	· When it is large, chip thickness becomes thin and chip control worsens, but cutting force is dispersed and edge strength improves. · When it is small, chip control ability improves.
	Minor cutting edge angle	· Prevents friction between cutting edge and workpiece surface.	· When it is large, edge strength deteriorates.

R



Technical information

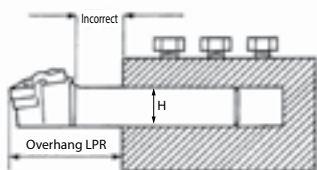
Toolholder rigidity

1. Flexure of toolholder

Symbol	Name	Unit
δ (delta)	Deflection	mm
B	Shank width	mm
H	Shank height	mm
E	Young ratio	N/mm ²
ap	Depth of cut	mm
f	Feed rate	mm/rev
k	Specific cutting force	N/mm ²
LPR	Overhang	mm
F	Cutting force	N

$$(F = k \times a_p \times f)$$

$$\delta = \frac{4 \times F \times (LPR)^3}{E \times B \times H^3} = \frac{4 \times k \times a_p \times f \times (LPR)^3}{E \times B \times H^3}$$



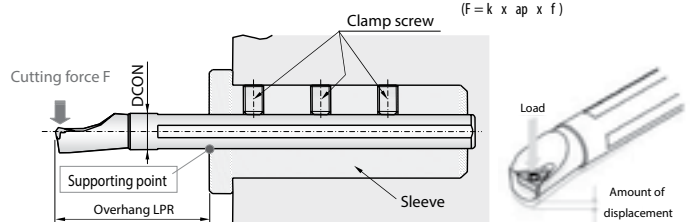
The flexural strength of toolholder will decrease by increasing of shank height by third root and will decrease of reducing overhang by third root. Minimizing toolholder shank overhang as much as possible is important as well as shank's sectional square measure.

2. Flexure of boring bar

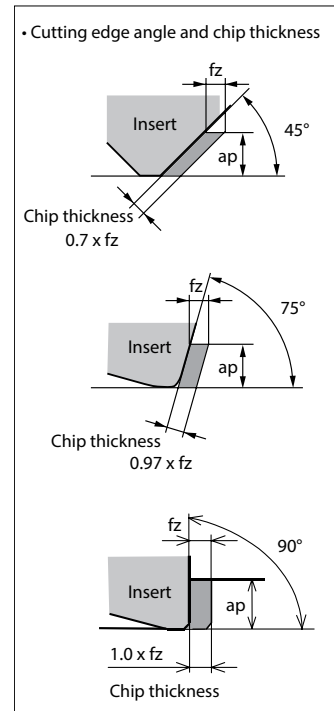
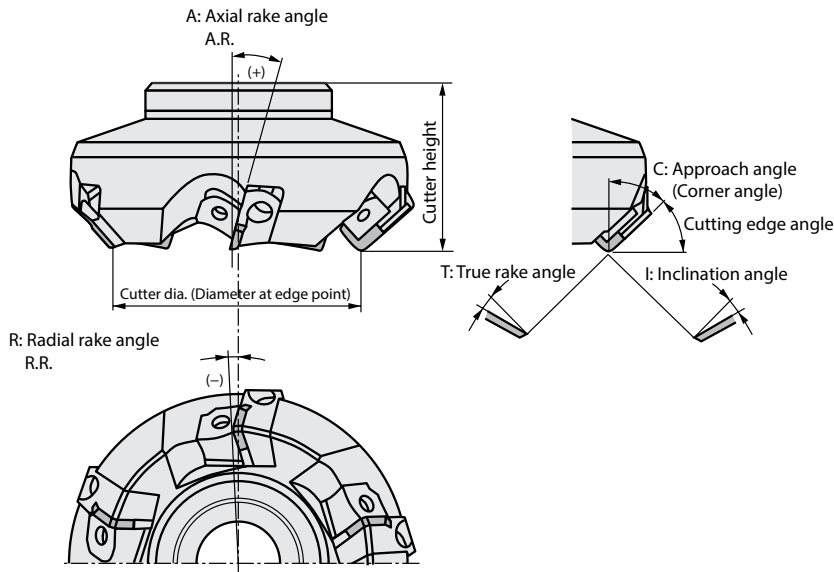
Symbol	Name	Unit
δ (delta)	Deflection	mm
DCON	Shank dia.	mm
E	Young ratio	N/mm ²
ap	Depth of cut	mm
f	Feed rate	mm/rev
k	Specific cutting force	N/mm ²
LPR	Overhang	mm
F	Cutting force	N

$$(F = k \times a_p \times f)$$

$$\delta = \frac{64 \times F \times (LPR)^3}{3 \times E \times \pi \times (DCON)^4} = \frac{64 \times k \times a_p \times f \times (LPR)^3}{3 \times E \times \pi \times (DCON)^4}$$



Terms and angles of milling cutter



Function of tool angle

Symbol	Name	Function	Effect
A	Axial rake angle (A.R.)	Controls chip flow direction and cutting force	When it is positive ... Good cutting performance and less chip welding
R	Radial rake angle (R.R.)	Controls chip flow direction and cutting force	When it is negative ... Good chip evacuation
C	Approach angle	Controls chip thickness and chip flow direction	When it is large ... Thinner chip thickness Lower cutting load
T	True rake angle	Actual rake angle	When it is positive ... Good cutting performance and less chip welding, but lower edge strength When it is negative ... Higher edge strength but easier to weld
I	Inclination angle	Controls chip flow direction	When it is positive ... Good chip evacuation Less cutting force Lower edge stability of the corner part

The formula for true rake angle: $\tan T = \tan R \times \cos C + \tan A \times \sin C$

The formula for inclination angle: $\tan I = \tan A \times \cos C - \tan R \times \sin C$

No. of Inserts (Z)

1) If the number of stages is one

If the number of stages is one, it is not indicated on the catalogue.
Please use "No. of inserts" of the catalogue for "Z" of the formula to calculate cutting conditions.

Toolholder dimensions

Description	Availability	Dimension (mm)			
		DC	LF	LH	ØMM
MECCX 08-510-07-1T	●	1	8	10	16
14-512-07-2T	●	2	14	12	80
17-516-07-3T	●	3	17	...	100

$fz = \frac{V_f}{Z \times n} \Rightarrow V_f = fz \times Z \times n$

2) If the number of stages is more than two

If the number of stages is more than two, it is indicated on the catalogue.
Please use "No. of flutes" of the catalogue for "Z" of the formula to calculate cutting conditions.

Toolholder dimensions

Description	Availability	R	Inserts	Flutes	Stages
MSR 063R-1M	●	4	1	1	1
063R-2M	●	8	2	2	2
080R-1M	●	4	4	1	1
080R-2M	●	8	2	2	2
080R-4M	●	16	4	4	4

$fz = \frac{V_f}{Z \times n} \Rightarrow V_f = fz \times Z \times n$

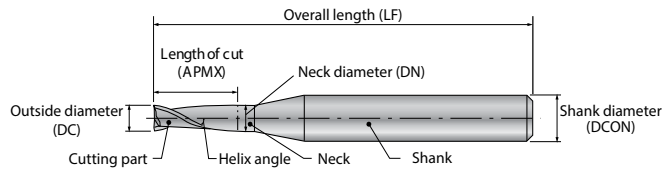
R



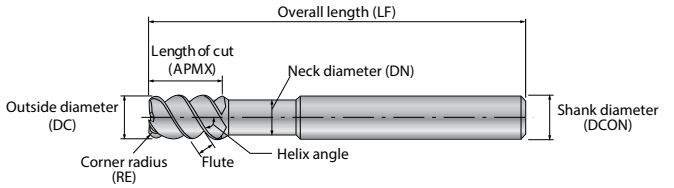
Technical information

Terms of solid end mill

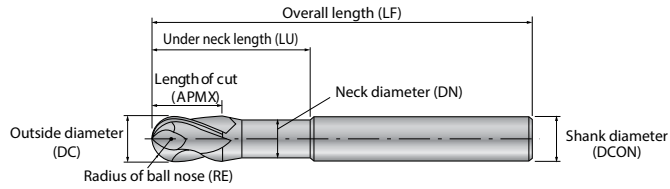
Square



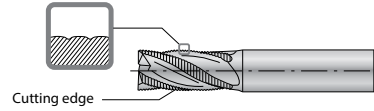
Radius



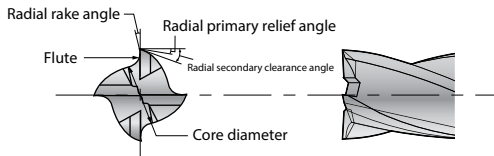
Ball-nose



Cutting edge shape



Cutting edge profile

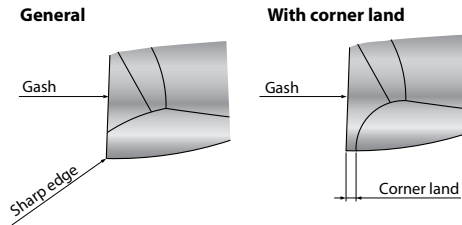


* The illustration shows squared 4 flutes tool

Core diameter rate (%) = Core diameter ÷ Outside dia. x 100

Cutting edge with corner land

Advanced fracture resistance with corner land



Trouble shooting of solid end mill

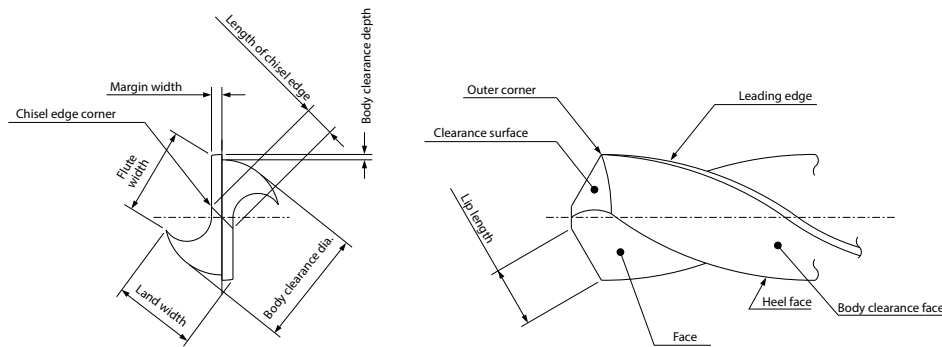
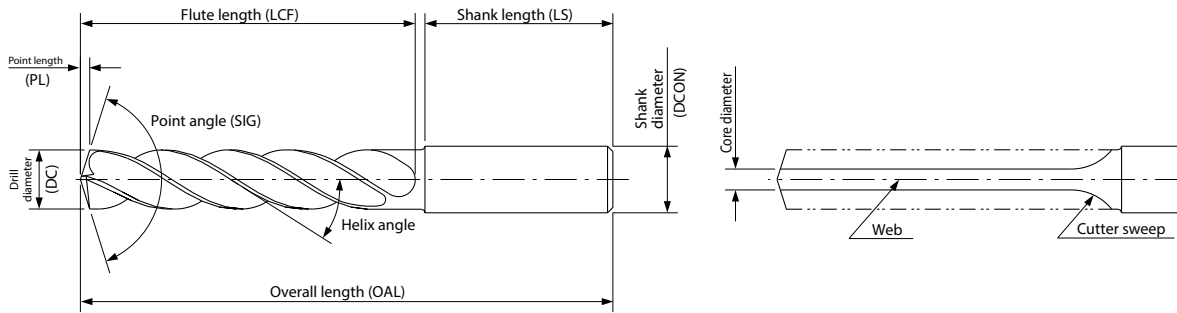
Trouble	Check item	Cutting conditions										Tool geometry				Setting		Machine	
		Countermeasures			Cutting direction	Low pick feed	Compressed air	Coolant			Helix angle	No. of blades	Diameter	Tool rigidity enhancement	Large chip pocket	Workpiece / tool installation	Shorten tool overhang	Power, rigidity	
		Vc	fz	ap				Increase volume	Oil based coolant	Wet working									
Edge damage	Cutting edge wear	Unsuitable cutting conditions	● ↓																
		Less number of blades									● ↑								
		Up cut				Down-cut													
Edge damage	Chipping of cutting edge	Unsuitable cutting conditions		● ↓	● ↓														
		Lack of cutting edge strength										●							
		Insufficient clamping force													●	●	●		
Edge damage	Fracture occurs	Unsuitable cutting conditions			● ↓														
		Lack of tool rigidity										● ↑	●						
		Chip packing						●					●						
Cutting accuracy	Poor finished surface on walls	Unsuitable cutting conditions	● ↓		● ↓					●	●								
		Chip jamming						●	●	●									
		Cutting edge wear	● ↓																
Cutting accuracy	Poor finished surface on faces	Large pick feed					●												
		Unsuitable cutting conditions		● ↓	● ↓														
		Lack of tool rigidity									● ↑	● ↑	● ↑	●					
Cutting accuracy	Out of vertical	Cutting edge wear	● ↓																
		Unsuitable cutting conditions	● ↓	● ↓	● ↓														
		Insufficient clamping force													●	●	●		
Others	Heavy chattering, vibration	Unsuitable cutting conditions	● ↓	● ↓															
		Lack of tool rigidity									● ↑	● ↑	● ↑	●					
		Insufficient clamping force													●	●	●		
Others	Chip jamming	Unsuitable cutting conditions		● ↓	● ↓														
		Improper tool geometry										● ↓		●					

R



Technical information

Terms of solid drill



Trouble shooting of solid drill

Trouble	Check item	Countermeasures	Cutting conditions				Tool geometry				Setting		Machine						
			Vc	fz	Lower feed at initial cutting	Lower feed when breaking through	Step feed	Coolant		Chisel width	Honing width	Core diameter		Shorten flute length	Use internal coolant type tool	Improve tool installation accuracy	Flat workpiece face	Shorten tool overhang	Power, rigidity
								Increase volume	Increase pressure											Larger ↑ more Smaller ↓ less
Edge damage	Fracture occurs	Unsuitable cutting conditions		● ↓															
		Poor rigidity of drill							● ↑		●					●			
		Sloping machine face																	
	Large peripheral cutting edge and margin land wear	Unsuitable cutting conditions	● ↓																
		High cutting heat at the cutting edge point						●					●						
	Chipping on peripheral cutting edge	Poor run-out accuracy													●				
Unsuitable cutting conditions			● ↓			●													
Large deflection of tool holder Chattering occurs (vibration)														●		●	●		
Chipping on chisel	Too wide chisel width								● ↓										
	Poor entry			●															
	Chattering occurs (vibration)															●	●		
Cutting accuracy	Enlarge hole diameter	Unsuitable cutting conditions	● ↑																
		Poor rigidity of drill									● ↑	●							
	Reduce hole diameter	Unsuitable cutting conditions	● ↓																
		High cutting heat at cutting edge point						●					●						
Poor straightness	Poor rigidity of drill										● ↑	●					●		
	Large deflection of tool holder													●					
Poor hole position accuracy, roundness, straightness, surface roughness	Unsuitable cutting conditions			●															
	Poor rigidity of drill										● ↑	●							
	Large deflection of tool holder													●					
	Insufficient clamping force																●		
Burr	Large burrs at hole exit	Unsuitable cutting conditions				●													
		Improper tool geometry														● ↓			
Chip control	Long chips	Unsuitable cutting conditions		● ↑															
		Poor chip disposal						●	●		● ↓	●							
	Chip packing	Unsuitable cutting conditions	● ↓	● ↓															
		Poor chip disposal						●	●				●						



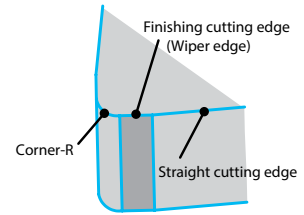
Technical information

About wiper inserts

A wiper insert is designed with a wiper edge that is located between corner radius and straight cutting edge shown as right figure.

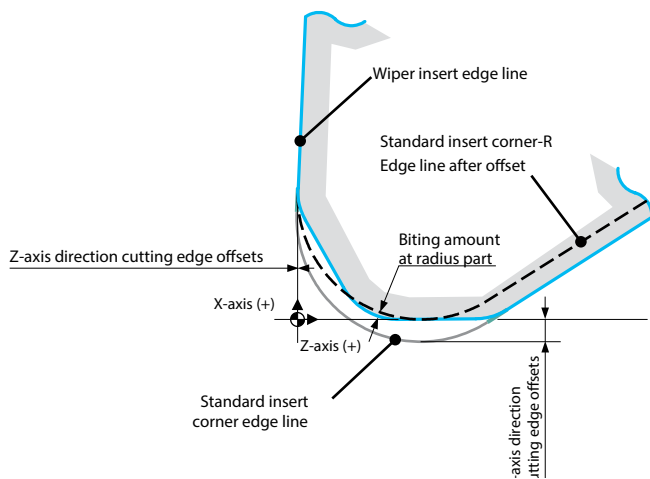
Advantages

- A wiper edge geometry provides improved surface finish quality even at increased feed rate
- Improved machining efficiency : Reduced cutting time with higher feed rate as well as consolidation of roughing and finishing provide high machining efficiency
- Longer tool life : Reduced cutting time with higher feed rate leads to increase part production
- Excellent chip control : Higher feed rate makes chips thicker, which provides easier-to-break chips



Precautions when using WF / WE chipbreaker (negative insert)

Tip of corner-R (DNMX, TNMX)



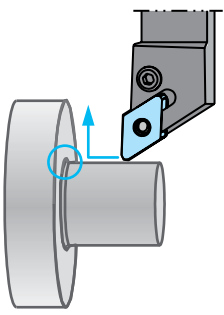
Cautions when machining inside corner-R

Do not use this wiper insert if a precise inside corner-R is required when such a machining in the figure below.

R



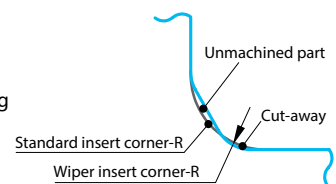
Technical information



* From external turning to up facing without arc complement (A wiper edge does not work during up facing)

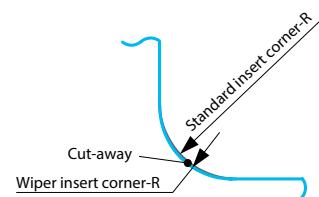
DNMX / TNMX WF chipbreaker

- More incomplete cutting and excessive cutting during machining with this chipbreaker than the machining with a standard insert
- The inside corner-R dimension become smaller than the requirement.



CNMG / WNMG WF / WE chipbreaker

- The inside corner-R dimension would be smaller than the requirement (Cutting excessively).



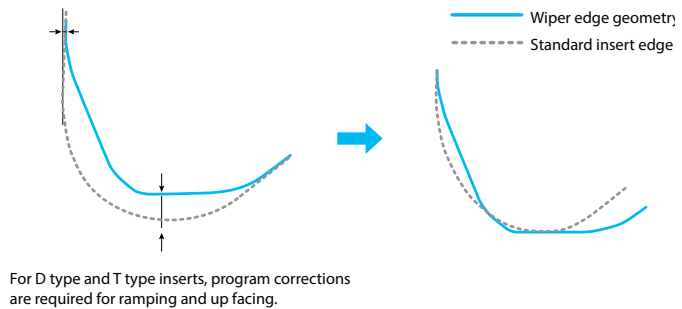
WF / WE chipbreaker edge position offset adjustment

WF / WE chipbreaker (Negative Insert) edge position offset adjustment

For D type and T type, cutting edge offsets are required.

Cutting edge offsets (mm)					
DNMX150404WF DNMX150604WF		DNMX150408WF DNMX150608WF		DNMX150412WF DNMX150612WF	
X-axis direction	Z-axis direction	X-axis direction	Z-axis direction	X-axis direction	Z-axis direction
0.24	0.02	0.14	0.01	0.11	0.01

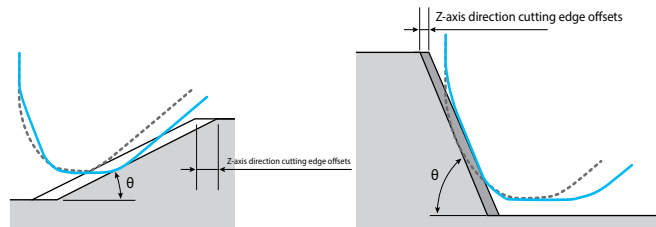
Cutting edge offsets (mm)					
TNMX160404WF		TNMX160408WF		TNMX160412WF	
X-axis direction	Z-axis direction	X-axis direction	Z-axis direction	X-axis direction	Z-axis direction
0.24	0.01	0.16	0.00	0.11	0.00



Program corrections for tapered part of workpiece (Z-axis direction cutting edge offsets)

DNMX1504 / DNMX1506 type

Corner-R(RE) (mm)	Ramping angle θ					
	0°	5°	10°	15°	20°	25°
0.4	0.00	-0.34	-0.35	-0.36	-0.36	-0.36
0.8	0.00	-0.26	-0.26	-0.25	-0.24	-0.22
1.2	0.00	-0.15	-0.17	-0.16	-0.15	-0.15



Corner-R(RE) (mm)	Up facing angle θ																			
	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	
0.4	0.00	-0.02	-0.03	-0.03	-0.04	-0.05	-0.06	-0.07	-0.08	-0.09	-0.10	-0.11	-0.12	-0.10	-0.08	-0.06	-0.04	-0.02	0.00	
0.8	0.00	0.13	0.12	0.11	0.09	0.07	0.05	0.04	0.02	0.00	-0.02	-0.05	-0.07	-0.06	-0.04	-0.02	-0.01	-0.01	0.00	
1.2	0.00	0.36	0.34	0.31	0.27	0.24	0.20	0.16	0.13	0.09	0.05	0.00	-0.04	-0.04	-0.03	-0.02	-0.01	-0.01	0.00	

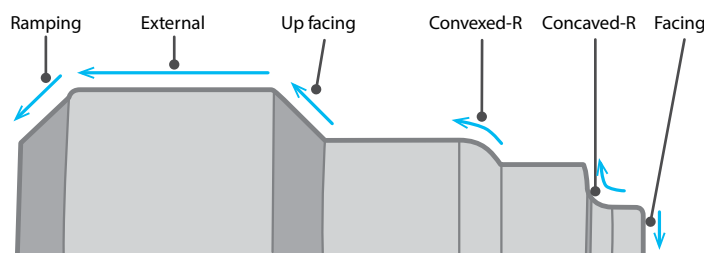
TNMX1604 type

Corner-R(RE) (mm)	Ramping angle θ					
	0°	5°	10°	15°	20°	25°
0.4	0.00					
0.8	0.00					
1.2	0.00					

Do not use TNMX1604 type insert for ramping.

Corner-R(RE) (mm)	Up facing angle θ																			
	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°	
0.4	0.00	-0.06	-0.05	-0.05	-0.06	-0.07	-0.08	-0.08	-0.09	-0.10	-0.11	-0.12	-0.13	-0.12	-0.10	-0.07	-0.05	-0.02	0.00	
0.8	0.00	0.11	0.11	0.10	0.08	0.06	0.04	0.02	0.00	-0.02	-0.04	-0.06	-0.08	-0.08	-0.06	-0.04	-0.02	-0.01	0.00	
1.2	0.00	0.34	0.32	0.29	0.25	0.22	0.19	0.15	0.14	0.08	0.04	0.00	-0.05	-0.05	-0.03	-0.01	0.00	0.00	0.00	

Caution (Finished edge line)

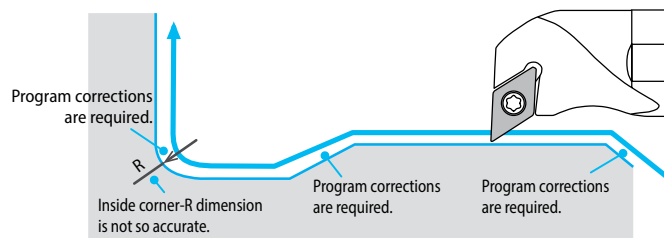
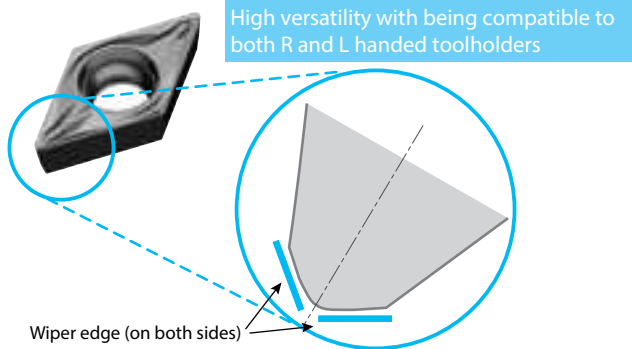


Applications	Notes
External / Facing	Toolholders for D type and T type would not be able to provide sufficient performance depending on a toolholder. Please use an applicable toolholder.
Up facing Ramping	For D type and T type inserts, program corrections on Z-axis direction are required.
Convexed-R / Concaved-R	Do not use wiper insert if a precise R shape is needed.

Precautions when using WP chipbreaker (Positive insert)

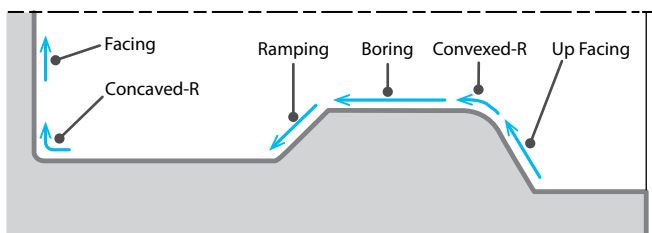
Proper use for a neutral insert and a handed insert

Neutral

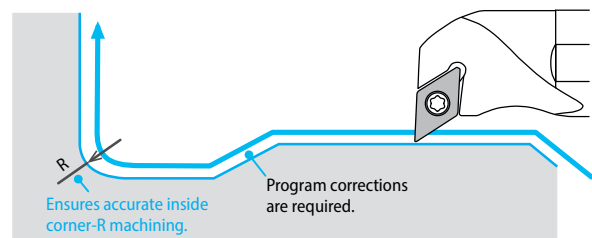
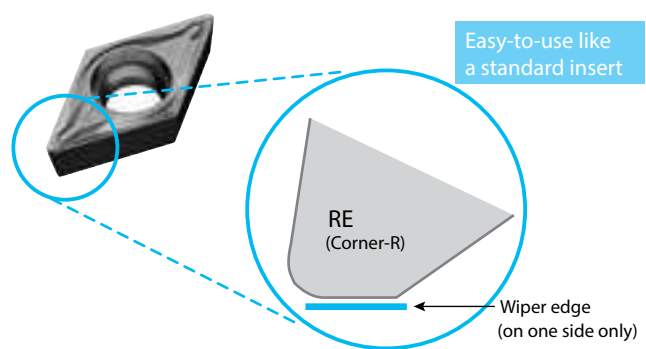


- When use a neutral type insert,
- you need to correct programs for three areas.
 - it should be used for machining which does not require inside corner-R accuracy.

Caution (Finished edge line)



Handed (Left-hand shown)



- When use a handed insert,
- you need to correct program for ramping.
 - it provides accurate inside corner-R machining.

➔ Less program correction is required as well as easy-to-use like a standard insert

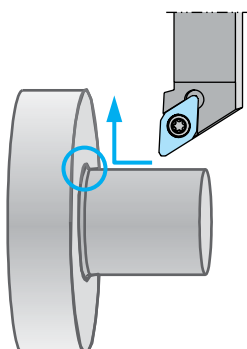
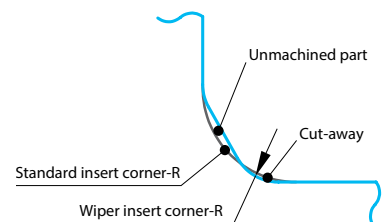
* Position of cutting edge differs from a standard insert. Cutting edge adjustment is required.

Neutral

Applications	Caution
Boring / Facing	Toolholders for D type and T type would not be able to provide sufficient performance depending on a toolholder. Please use an applicable toolholder.
Up Facing / Ramping	For D type and T type inserts, program corrections on Z-axis direction are required.
Convexed-R / Concaved-R	Do not use wiper inserts if a precise R shape is needed.

Handed

Applications	Caution
Boring	Toolholders for D type and TP type would not be able to provide sufficient performance depending on a toolholder. Please use an applicable toolholder.
Ramping	For D type and TP type inserts, program corrections on Z-axis direction are required.
Convexed-R / Concaved-R	Surface finish quality is as standard insert is.
Up Facing	Surface finish quality is as standard insert is.
Facing	Surface finish quality is as standard insert is.

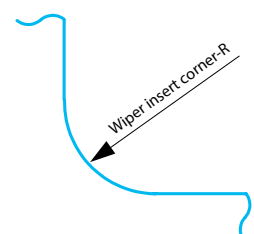


DCMX / TC(P)MX * Neutral WP chipbreaker

- More incomplete cutting and excessive cutting during machining with this chipbreaker than the machining with a standard insert
- The inside corner-R dimension become smaller

CCMT * Neutral DCMX / TPMX * Handed WP chipbreaker

- No problem in the finished line on workpiece (Adjustments are required)



R



Technical information

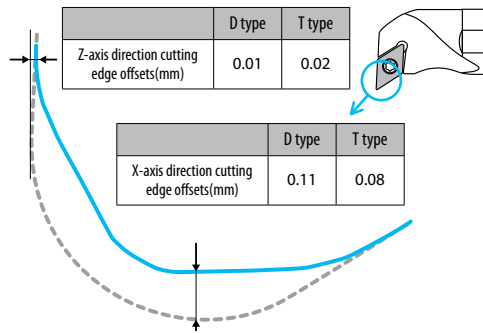
Cautions when machining inside corner-R

Do not use this wiper insert if a precise inside corner-R is required when such a machining in the figure below.

WP chipbreaker (Positive insert) Edge position offset adjustment

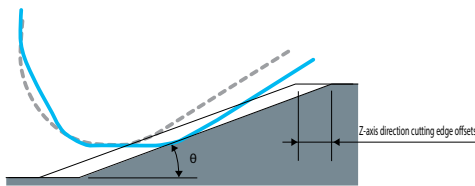
Neutral

For D type and T type, cutting edge offsets are required.

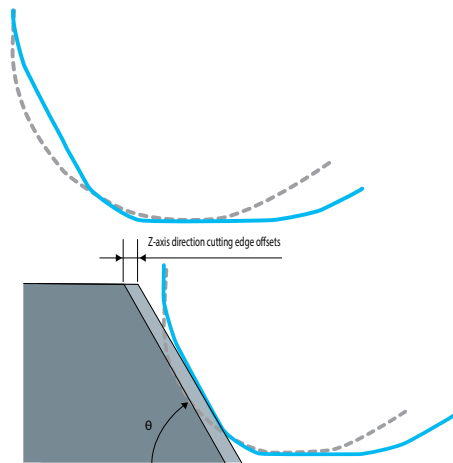


— Wiper edge geometry
 - - - Standard insert edge line

For D type and T type inserts, program corrections are required for ramping and up facing.



Ramping angle θ	0°	5°	10°	15°	20°	25°
Z-axis direction cutting edge offsets (mm) D type	0	-0.14	-0.15	-0.16	-0.16	-0.17
Z-axis direction cutting edge offsets (mm) T type	0	-0.16	-0.17	-0.17	-0.17	-

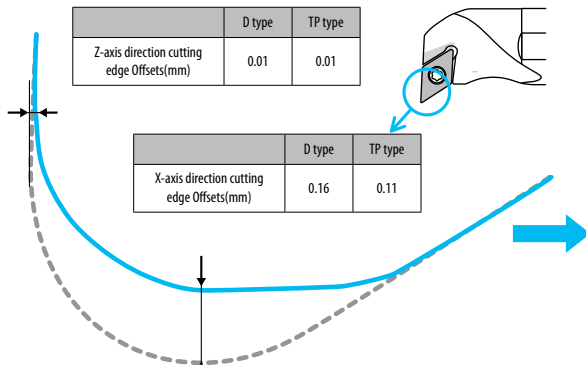


Profiling angle θ	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
Z-axis direction cutting edge offsets (mm) D type	0.00	0.07	0.06	0.04	0.03	0.02	0.01	0.00	-	-	-
Z-axis direction cutting edge offsets (mm) T type	0.00	0.07	0.06	0.05	0.05	0.04	0.03	0.02	0.01	0.01	0.00

Profiling angle θ	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
Z-axis direction cutting edge offsets (mm) D type	-0.01	-0.02	-0.03	-0.04	-0.05	-0.05	-0.04	-0.03	-0.02	-0.01	0.00
Z-axis direction cutting edge offsets (mm) T type	-	-	-	-0.01	-0.02	-0.03	-0.04	-0.03	-0.02	-0.01	0.00

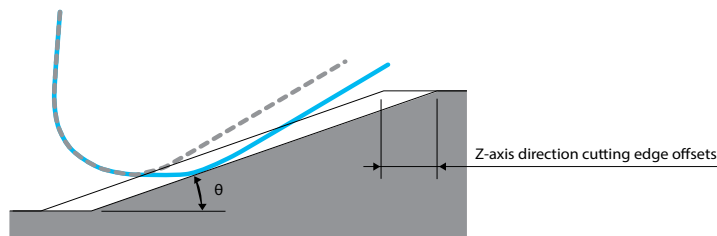
Handed

For D type and TP type, cutting edge offsets are required.



— Wiper edge geometry
 - - - Standard insert edge line











For D type and TP type inserts, program corrections are required for ramping.



Ramping angle θ	0°	5°	10°	15°	20°	25°
Z-axis direction cutting edge offsets (mm) D type	0	-0.22	-0.24	-0.24	-0.25	-0.25
Z-axis direction cutting edge offsets (mm) TP type	0	-0.24	-0.24	-0.25	-0.24	-



Cutting edges figuration and countermeasures

Typical cutting edge figuration	Observation	Causes	Countermeasures
Nose wear	 <ul style="list-style-type: none"> Deterioration of surface roughness and dimensional accuracy 	<ul style="list-style-type: none"> Too high Vc End of tool life 	<ul style="list-style-type: none"> Reduce Vc Change to higher wear resistant grade
Notching	 <ul style="list-style-type: none"> Burr formation Cutting force increase 	<ul style="list-style-type: none"> Too high f and Vc 	<ul style="list-style-type: none"> Sharper cutting performance Reduce Vc Change to higher heat resistant grade
Crater wear	 <ul style="list-style-type: none"> Chip control deterioration Surface finish deterioration (peeled surface) 	<ul style="list-style-type: none"> Too high Vc 	<ul style="list-style-type: none"> Reduce Vc Change to high speed type like Cermet or Al₂O₃ coated insert grade
Plastic deformation	 <ul style="list-style-type: none"> Workpiece dimension changes Crack at nose 	<ul style="list-style-type: none"> Too high cutting load Inappropriate insert grade 	<ul style="list-style-type: none"> Change to harder grade Reduce f and ap
Crack from wear	 <ul style="list-style-type: none"> Surface finish's sudden deterioration Workpiece dimension changes 	<ul style="list-style-type: none"> Too high Vc 	<ul style="list-style-type: none"> Change the tool earlier Change to higher wear resistant grade
Chipping	 <ul style="list-style-type: none"> Cutting force increase Surface roughness deterioration 	<ul style="list-style-type: none"> Too high f Chattering Lack of insert toughness 	<ul style="list-style-type: none"> Reduce f and ap Change to more rigid toolholder Change to tougher grade
Crack from welding or built-up edge	 <ul style="list-style-type: none"> Surface finish deterioration Cutting force increase 	<ul style="list-style-type: none"> Too low Vc 	<ul style="list-style-type: none"> Increase Vc Improve sharp cutting performance (rake angle, chamfer)
Mechanical fracture	 <ul style="list-style-type: none"> Sudden cracking Unstable tool life 	<ul style="list-style-type: none"> Too high f and ap Chattering 	<ul style="list-style-type: none"> Change to tougher grade Enlarge chamfer Enlarge Corner-R(RE) Change to more rigid toolholder
Fracture from thermal crack	 <ul style="list-style-type: none"> Cracking by heat cycle Possible in interrupted machining and milling 	<ul style="list-style-type: none"> Too high Vc and f 	<ul style="list-style-type: none"> Reduce f Reduce Vc Change to dry cutting
Flaking	 <ul style="list-style-type: none"> Possible in hard materials machining Possible in machining with chattering 	<ul style="list-style-type: none"> Lack of insert toughness Poor rigidity of toolholder 	<ul style="list-style-type: none"> Change to tougher grade (TiC-base ceramic to CBN.) Change to more rigid toolholder Change edge preparation

R



Technical information

Milling

Trouble	Countermeasures	Check item		Insert grades		Cutting conditions						Tool geometry						Setting		Machine				
		Change to harder grade	Change to tougher grade	Change to more thermal shock resistant grade	Change to more welding resistant grade	Vc	fz	ap	Cutter dia. cutting width review	Tool path review	Coolant		Relief angle	Corner angle	Edge strength / Honing	No. of inserts	Chip pocket	Wiper edge (Relief angle) review	Insert runout check	Cutter rigidity	Workpiece / Tool installation	Overhang length	Power, rigidity	
											Usage of mist	Dry												Larger ↑ Smaller ↓	More ↑ Less ↓	Larger ↑ Smaller ↓
Edge damage	Flank wear increase	Unsuitable cutting conditions			● ↓						●													
		Unsuitable tool geometry	●										● ↑		● ↓			●						
	Rake face wear increase	Unsuitable cutting conditions				● ↓	● ↓	● ↓			●													
		Unsuitable tool geometry	●										● ↑	● ↑	● ↓									
	Chipping, cracking	Unsuitable cutting conditions					● ↓	● ↓	●	●														
		Unsuitable tool geometry		●									● ↓	● ↑	● ↑			●	●	●	●	●	●	●
Edge breakage by thermal shock	Unsuitable cutting conditions				● ↓	● ↓	● ↓				●													
	Unsuitable tool geometry			●								● ↑		● ↓										
Built-up edge	Unsuitable cutting conditions				● ↑	● ↑					●													
	Unsuitable tool geometry			●								● ↑		● ↓										
Cutting accuracy	Poor surface finish	Unsuitable cutting conditions			● ↑	● ↓	● ↓				●													
		Unsuitable tool geometry	●		●										● ↓	● ↓		●	●		●	●	●	
	Burr formation	Unsuitable cutting conditions				● ↓	● ↓	● ↓	●	●														
		Unsuitable tool geometry											● ↑	● ↓	● ↓			●						
	Workpiece chip off	Unsuitable cutting conditions					● ↓	● ↓		●														
		Unsuitable tool geometry											● ↑	● ↑	● ↓	● ↑		●						
Poor planeness / parallelism	Tool and workpiece evacuation				● ↓	● ↓					● ^{*5}	●	● ↑	● ↓	● ↓	● ↓	●	●	●	●	●	●	●	
Others	Heavy chattering, vibration	Unsuitable cutting conditions, installation			● ↓	● ^{*1} ↓	● ^{*2} ↓	●	● ^{*4}			●	● ↑	● ↓	● ↓	● ↓				●	●	●	●	
		Unsuitable tool geometry				● ↑	● ^{*3} ↓		●		● ^{*6}	●												
	Chip jamming	Unsuitable tool geometry										●	● ↑		● ↓	● ↑								

*1. To prevent chattering, the higher fz may be suitable.

*2. To prevent chattering, the larger ap may be suitable.

*3. Higher fz may be suitable.

*4. Down-cut method is recommended for helical end milling.

*5. If the surface is warped by cutting heat.

*6. Compressed air is recommended.

R



Technical information

Drilling (MagicDrill series)

Trouble	Countermeasures	Check item		Insert grades		Cutting conditions			Tool geometry			Setting				Machine
		Change to harder grade	Change to tougher grade	Vc	fz	Coolant discharge condition	Chipbreaker review	Inner edge's center height check (Core dia. check)	Toolholder rigidity improvement (Short type)	Workpiece / Tool installation	Insert installation	Offset check	Adjustable sleeve usage	Power, rigidity		
															Higher (Larger)↑ Lower (Smaller)↓	Larger ↑ Smaller ↓
Trouble item																
Edge damage	Unusual wear	Unsuitable cutting speed (too high)	●		●↓											
		Unsuitable cutting speed (too low)		●	●↑											
		Unsuitable coolant discharge					●									
		Poor rigidity of machine / workpiece								●					●	
		Small hole dia.										●*1	●			
		Unsuitable insert grade	●													
	Inner edge cracking	No core, too small core							●↑							
		Poor rigidity of machine / workpiece								●	●				●	
		Unstable drilling start				●↓										
		High hardness workpiece	●		●↓	●↓										
		Clogged chips			●↑				●↓							
		Unstable insert installation									●					
	Outer edge cracking	Poor rigidity of machine / workpiece								●					●	
		Unstable drilling start				●↓										
		High hardness workpiece	●		●↓	●↓										
Poor chip control			●	●↑												
Unstable insert installation										●						
Toolholder, others	Scratches on tool body	Poor rigidity of machine / workpiece								●				●		
		Inaccurate tool installment										●*1	●			
		Clogged chips			●↑	●↓										
		Unstable drilling start				●↓										
	Poor hole dia. accuracy / Surface finish	Poor rigidity of machine / workpiece								●					●	
		Poor rigidity of toolholder								●	●					
		Inaccurate tool installment										●*1	●			
		Clogged chips			●↑	●↓			●↓							
		Large core dia.							●↓							
		Unstable drilling start				●↓										
		Unsuitable coolant discharge					●									
	Large vibration / chattering	Unsuitable cutting conditions, installation			●↑	●↓				●	●				●	
	Long chips	Unsuitable cutting conditions			●↑											
		Unsuitable chipbreaker							●							
	Machine failure	Lack of machine power			●↓	●↓			●						●	

*1. For lathe operation



Technical information

Turning

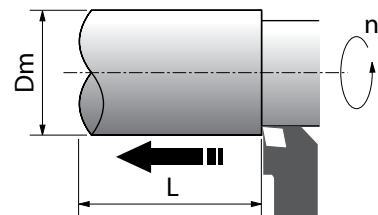
Cutting speed

$$V_c = \frac{\pi \times D_m \times n}{1,000}$$

V_c : Cutting speed [m/min]

D_m : Workpiece dia. [mm]

n : Spindle revolution [min^{-1}]



Power requirement

$$P_c = \frac{K_s \times V_c \times a_p \times f}{6,120 \times \eta}$$

P_c : Power requirement [kW]

P_{HP} : Power requirement (Horse power) [HP]

V_c : Cutting speed [m/min]

a_p : Depth of cut [mm]

f : Feed rate [mm/rev]

K_s : Specific cutting force [kgf/mm^2]

η : Mechanical efficiency (0.7 ~ 0.8)

K_s [kgf/mm^2]	
Low carbon steel	190
Medium carbon steel	210
High carbon steel	240
Low alloy steel	190
High alloy steel	245
Cast iron	93
Malleable cast iron	120
Bronze, brass	70

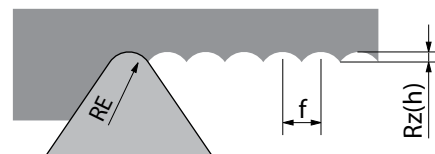
Theoretical surface roughness

$$R_z(h) = \frac{f^2}{8 \times RE} \times 1,000$$

$R_z(h)$: Theoretical surface roughness [μm]

f : Feed rate [mm/rev]

RE : Corner radius of insert [mm]



Chip removal volume

$$Q = V_c \times a_p \times f$$

Q : Chip removal volume [$\text{cm}^3/\text{min}=\text{cc}/\text{min}$]

V_c : Cutting speed [m/min]

a_p : Depth of cut [mm]

f : Feed rate [mm/rev]

R

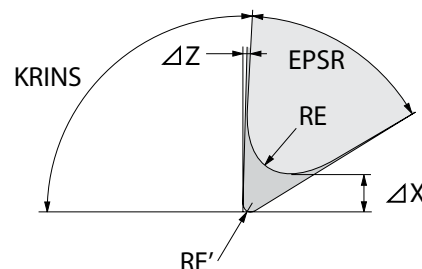


Technical information

Edge position compensation when changing corner-R(RE)

$$\Delta X = (RE - RE') \times \left\{ \frac{\cos \left(\frac{EPSR}{2} + (KRINS - 90^\circ) \right)}{\sin \frac{EPSR}{2}} - 1 \right\}$$

$$\Delta Z = (RE - RE') \times \left\{ \frac{\sin \left(\frac{EPSR}{2} + (KRINS - 90^\circ) \right)}{\sin \frac{EPSR}{2}} - 1 \right\}$$



ΔX : X-axis direction cutting edge offsets [mm]

ΔZ : Z-axis direction cutting edge offsets [mm]

RE : Corner-R before change [mm]

RE' : Corner-R after change [mm]

$EPSR$: Insert corner angle [$^\circ$]

$KRINS$: Toolholder's cutting edge angle [$^\circ$]

Toolholder type	Insert corner angle EPSR	Cutting edge angle KRINS	ΔX	ΔZ
DCLN / PCLN	80°	95°	0.100 x (RE-RE')	0.100 x (RE-RE')
DTGN / PTGN	60°	91°	0.714 x (RE-RE')	0.030 x (RE-RE')
DDJN / PDJN	55°	93°	0.866 x (RE-RE')	0.099 x (RE-RE')
DDHN / PDHN	55°	107.5°	0.531 x (RE-RE')	0.531 x (RE-RE')
DVLN / PVLN	35°	95°	2.072 x (RE-RE')	0.273 x (RE-RE')
DVPN / PVPN	35°	117.5°	1.351 x (RE-RE')	1.351 x (RE-RE')
DSBN / PSBN	90°	75°	0.225 x (RE-RE')	-0.293 x (RE-RE')

Example: Compensation when changing corner-R from 0.8 to 0.4, using PCLN toolholder,

$$\Delta X = 0.100 \times (0.8 - 0.4) = 0.04(\text{mm})$$

$$\Delta Z = 0.100 \times (0.8 - 0.4) = 0.04(\text{mm})$$

Turning (Cutting time)

Cutting time (External turning case 1: 1 pass machining)

At constant revolution

$$T = \frac{60 \times L}{f \times n}$$

At constant cutting speed

$$T = \frac{60 \times \pi \times L \times D_m}{1,000 \times f \times V_c}$$

T : Cutting time [sec]

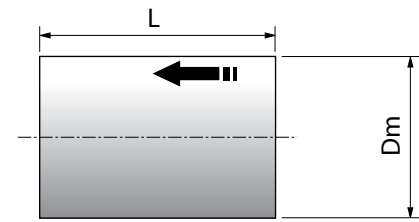
L : Cutting length [mm]

f : Feed rate [mm/rev]

n : Spindle revolution [min⁻¹]

D_m : Workpiece dia. [mm]

V_c : Cutting speed [m/min]



Cutting time (External turning case 2: multi-pass machining)

At constant revolution

$$T = \frac{60 \times L}{f \times n} \times N$$

At constant cutting speed

$$T = \frac{60 \times \pi \times L \times (D_1 + D_2)}{2 \times 1,000 \times f \times V_c} \times N$$

T : Cutting time [sec]

L : Cutting length per pass [mm]

a_p : Depth of cut per pass [mm]

f : Feed rate [mm/rev]

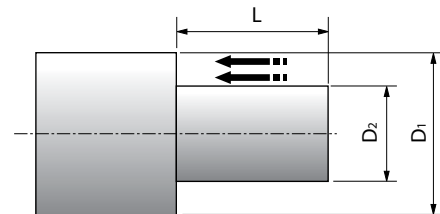
n : Spindle revolution [min⁻¹]

D₁ : Max. dia. of workpiece [mm]

D₂ : Min. dia. of workpiece [mm]

V_c : Cutting speed [m/min]

N : Number of passes = (D₁ - D₂) / a_p / 2 (if it is indivisible, obtain integer by rounding up one place of decimals.)



Cutting time (Facing)

At constant revolution

$$T = \frac{60 \times (D_1 - D_2)}{2 \times f \times n} \times N$$

At constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4,000 \times f \times V_c} \times N$$

T : Cutting time [sec]

T₁ : Cutting time before reaching
Max. spindle revolution [sec]

L : Cutting length [mm]

a_p : Depth of cut per pass [mm]

f : Feed rate [mm/rev]

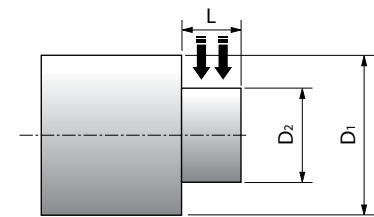
n : Spindle revolution [min⁻¹]

D₁ : Max. dia. of workpiece [mm]

D₂ : Min. dia. of workpiece [mm]

V_c : Cutting speed [m/min]

N : Number of passes = L / a_p (if it is indivisible, obtain integer by rounding up one place of decimals.)



Cutting time (Grooving)

At constant revolution

$$T = \frac{60 \times (D_1 - D_2)}{2 \times f \times n}$$

At constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4,000 \times f \times V_c}$$

T : Cutting time [sec]

T₁ : Cutting time before reaching
Max. spindle revolution [sec]

L : Cutting length [mm]

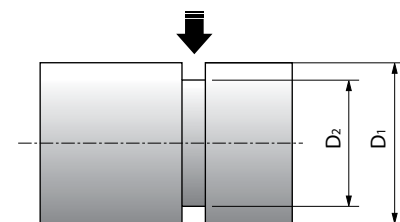
f : Feed rate [mm/rev]

n : Spindle revolution [min⁻¹]

D₁ : Max. dia. of workpiece [mm]

D₂ : Min. dia. of workpiece [mm]

V_c : Cutting speed [m/min]



Cutting time (Cut-off)

At constant revolution

$$T = \frac{60 \times D_1}{2 \times f \times n}$$

At constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_3) \times (D_1 - D_3)}{4,000 \times f \times V_c}$$

$$T_3 = T_1 + \frac{60 \times D_3}{2 \times f \times n_{\max}}$$

T : Cutting time [sec]

T₁ : Cutting time before reaching
Max. spindle revolution [sec]

T₃ : Cutting time when reaching
Max. spindle revolution [sec]

f : Feed rate [mm/rev]

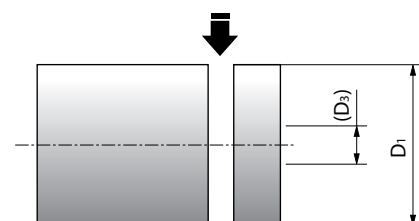
n : Spindle revolution [min⁻¹]

n_{max} : Max. spindle revolution [min⁻¹]

D₁ : Max. dia. of workpiece [mm]

D₃ : Diameter when reaching max. spindle revolution [mm]

V_c : Cutting speed [m/min]



Milling

Cutting speed

$$V_c = \frac{\pi \times DC \times n}{1,000}$$

- V_c : Cutting speed [m/min]
- DC : Cutter dia. [mm]
- n : Spindle revolution [min^{-1}]

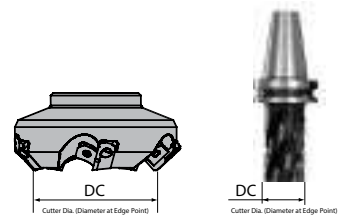
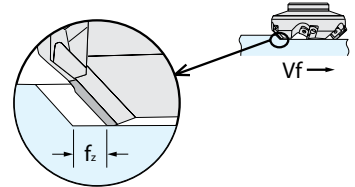


Table feed & feed per tooth

$$f_z = \frac{V_f}{Z \times n}$$

- f_z : Feed per tooth [mm/t]
- V_f : Table feed [mm/min]
- Z : No. of inserts
- n : Spindle revolution [min^{-1}]



Power requirement

$$P_c = \frac{K_s \times Q}{6,120 \times \eta} = \frac{K_s \times a_e \times V_f \times a_p}{6,120,000 \times \eta}$$

$$= \frac{K_s \times a_e \times f_z \times Z \times n \times a_p}{6,120,000 \times \eta}$$

$$P_{HP} = \frac{6,120}{4,500} \times P_c$$

- P_c : Power requirement [kW]
- P_{HP} : Power requirement (Horse power) [HP]
- a_e : Width of cut [mm]
- V_f : Table feed [mm/min]
- f_z : Feed per tooth [mm/t]
- Z : No. of inserts
- n : Spindle revolution [min^{-1}]
- a_p : Depth of cut [mm]
- K_s : Specific cutting force [kgf/mm^2]
- η : Mechanical efficiency (0.7 ~ 0.8)
- Q : Chip removal volume [$\text{cm}^3/\text{min}=\text{cc}/\text{min}$]

K_s [kgf/mm^2]	
Low carbon steel	190
Medium carbon steel	210
High carbon steel	240
Low alloy steel	190
High alloy steel	245
Cast iron	93
Malleable cast iron	120
Bronze, Brass	70

Chip removal volume

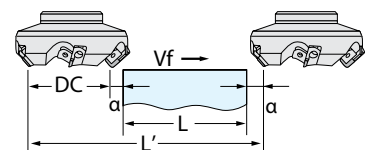
$$Q = \frac{a_e \times V_f \times a_p}{1,000} = \frac{a_e \times f_z \times Z \times n \times a_p}{1,000}$$

- Q : Chip removal volume [$\text{cm}^3/\text{min}=\text{cc}/\text{min}$]
- a_e : Width of cut [mm]
- V_f : Table feed [mm/min]
- f_z : Feed per tooth [mm/t]
- Z : No. of inserts
- n : Spindle revolution [min^{-1}]
- a_p : Depth of cut [mm]

Cutting time

$$T = \frac{60 \times L'}{V_f} = \frac{60 \times L'}{f_z \times Z \times n}$$

- T : Cutting time [sec]
- L' : Total table transfer length [mm]
($= L + DC + 2a$)
- L : Workpiece length [mm]
- DC : Cutter dia. [mm]
- a : Idling distance [mm]
- V_f : Table feed [mm/min]
- f_z : Feed per tooth [mm/t]
- Z : No. of inserts
- n : Spindle revolution [min^{-1}]



R



Technical information

True rake angle

$$\tan T = \tan R \times \cos C + \tan A \times \sin C$$

Inclination angle

$$\tan I = \tan A \times \cos C - \tan R \times \sin C$$

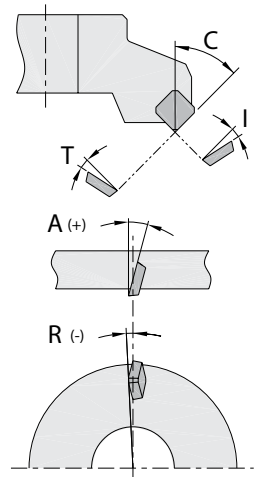
A (GAMP) : Axial rake angle (A.R.) [°] (-90° < A < 90°)

R (GAMF) : Radial rake angle (R.R.) [°] (-90° < R < 90°)

C (KAPR) : Approach angle [°] (0° < C < 90°)

T (GAMN) : True rake angle [°] (-90° < T < 90°)

I (GAMO) : Inclination angle [°] (-90° < I < 90°)



Ball-nose end mill cutting speed & revolution

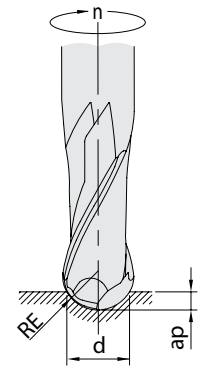
$$n = \frac{1,000 \times V_a}{2 \times \pi \times \sqrt{a_p(2R_E - a_p)}}$$

n : Revolution [min⁻¹]

R_E : Radius of ball-nose end mill (Ball part's radius) [mm]

a_p : Depth of cut [mm]

V_a : Cutting speed at actual dia. d [m/min]



Drilling (MagicDrill series)

Cutting speed

$$V_c = \frac{\pi \times DC \times n}{1,000}$$

V_c : Cutting speed [m/min]

DC : Drill dia. [mm]

n : Spindle revolution [min⁻¹]

Feed rate (Milling)

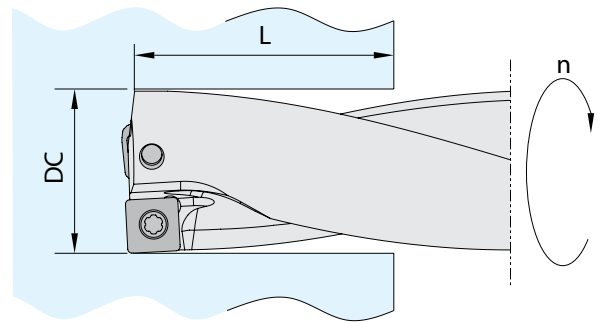
$$V_f = f_z \times Z \times n$$

V_f : Table feed [mm/min]

f_z : Feed per tooth [mm/t]

Z : No. of inserts (No. of insert = 1)

n : Spindle revolution [min⁻¹]



R



Technical information

Cutting time

$$T = \frac{60 \times L}{f \times n} = \frac{60 \times \pi \times DC \times L}{1,000 \times V_c \times f}$$

T : Cutting time [sec]

L : Drilling depth [mm]

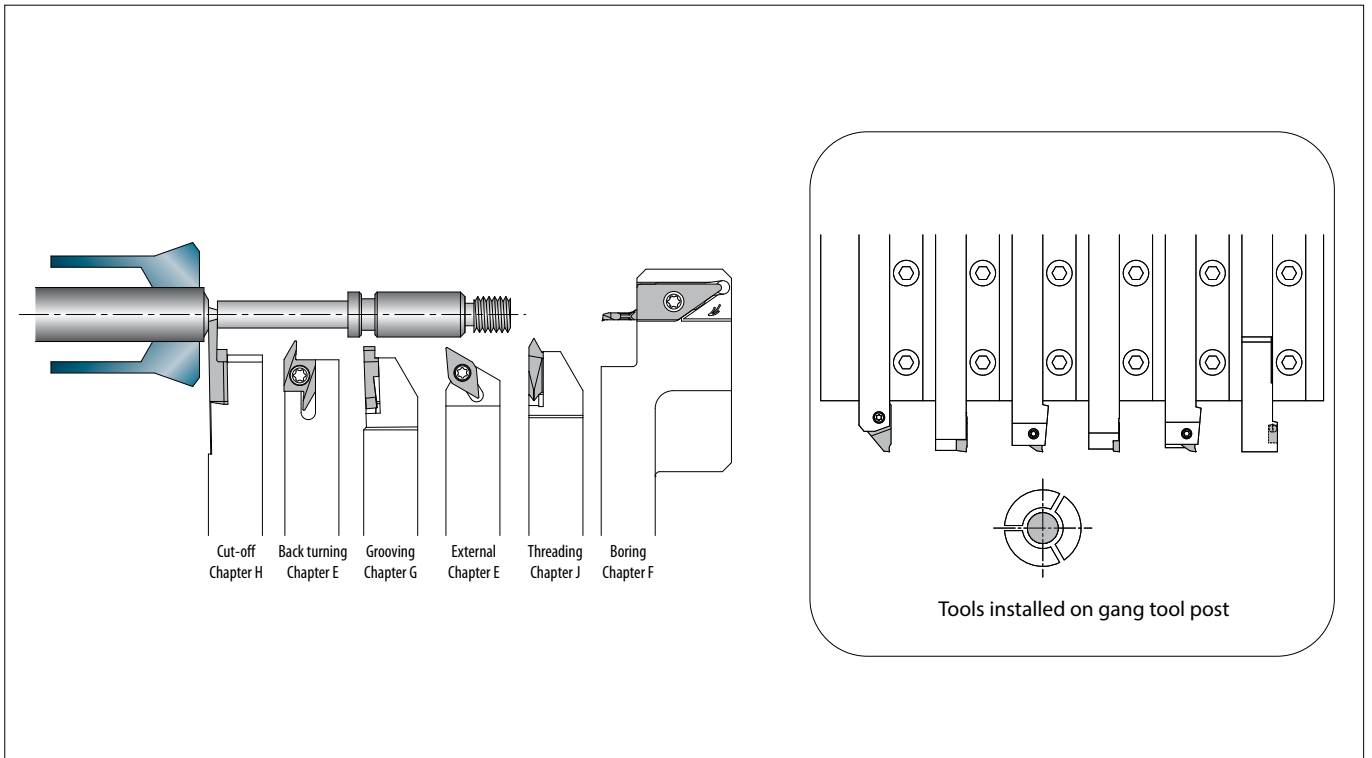
f : Feed rate [mm/rev]

n : Spindle revolution [min⁻¹]

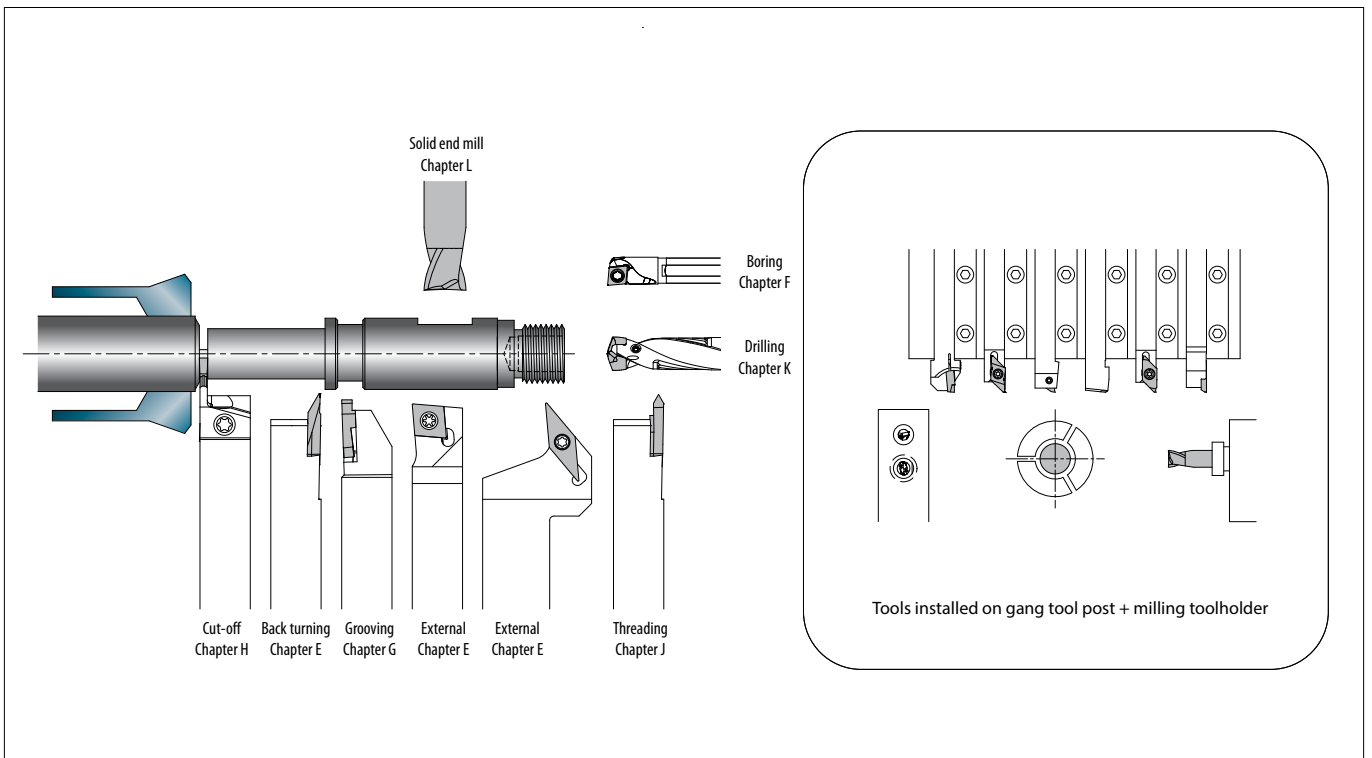
DC : Drill dia. [mm]

V_c : Cutting speed [m/min]

Tooling example 1: CNC automatic lathe (Gang type)



Tooling example 2: CNC automatic lathe (Gang type)

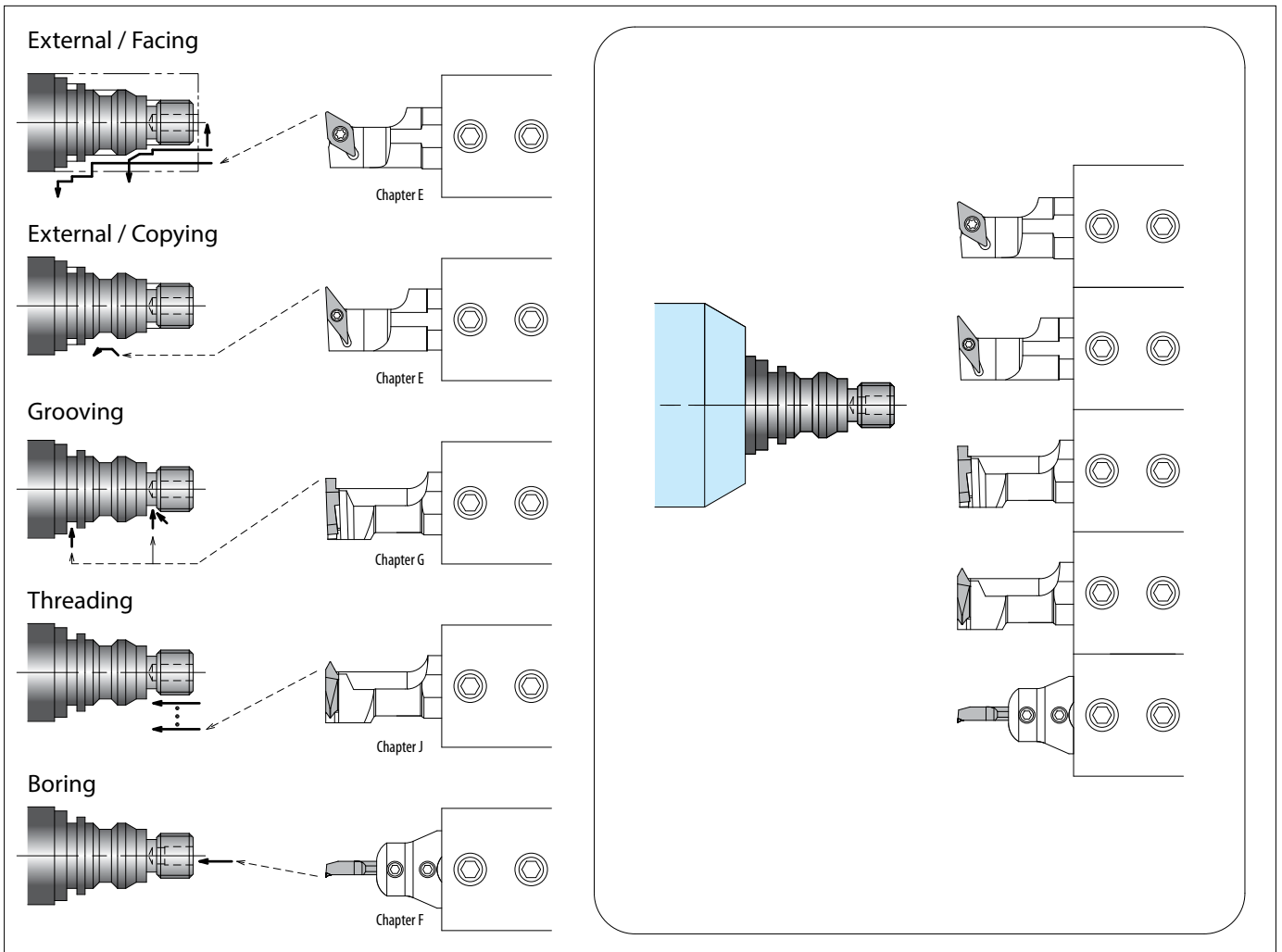


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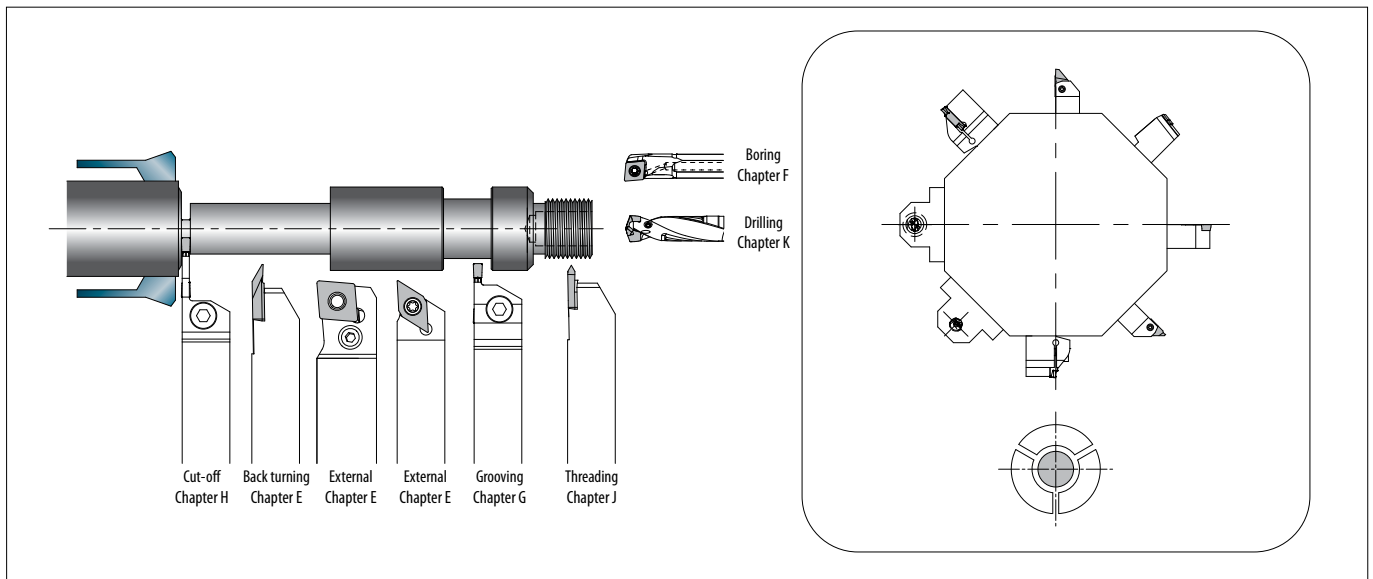


Technical information

Tooling example 3: CNC automatic lathe (Opposed gang type)



Tooling example 4: CNC automatic lathe (Turret type)



For Tooling Layout and Automatic Lathe List by Manufacturer, See Page **R46~R54**

R



Technical information

Citizen machinery (Cincom Products)

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Horizontal/Opposed)	Max. cutting dia.	Remarks
A12/16	10 x 10 x 100	5			ø19.05/ø20	ø12/ø16	
A20	12(13) x 12(13) x 120 * Cut-off toolholder: □16mm	6			ø25.4	ø20	
A20 VII	12(13) x 12(13) x 120 * Cut-off toolholder: □16mm	6			ø25.4	ø20	
A32	16 x 16 x 150	6			ø25.4	ø32	
B12	10 x 10 x 100	5			ø19.05/ø20	ø12	
B12E/B16E	10 x 10 x 120(60)	5			ø19.05(ø20 ^{OP})	ø12/ø16	
B20	12(13) x 12(13) x 120	6			ø19.05/ø20	ø20	
BL12	10 x 10 x 60 ~ 120	5			ø20(ø19.05)	ø12	
BL20/25	12(13) x 12(13) x 120	4 ~ 7			ø20(ø19.05)	ø20/ø25	
C12/16	10 x 10 x 120	6			ø19.05	ø12/ø16	
C32	16 x 16 x 130	5			ø25.4	ø32	
D25	16 x 16 x 150 * Cut-off toolholder: □19mm				ø25.4	ø25	
F10			10 x 10 x 60	10	ø19.05	ø10	
F12			10 x 10 x 60	10	ø19.05	ø12	
F16			10 x 10 x 60	10	ø19.05	ø16	
F20			16(19) x 16(13) x 90	10	ø25.4	ø20	
F25			16(19) x 16(13) x 90	10	ø25.4	ø25	
FL25			16 x 16 x 90	12		ø25	
FL42			16 x 16 x 90	12		ø42	
G32			16(19) x 16(19) x 90	10	-	ø32	
K12/16	12(10) x 12(10) x 100	6(7)			ø19.05/ø20	ø12/ø16	
K12E/K16E	12 x 12 x 120	6			ø19.05/ø20	ø12/ø16	
L10	8 x 8 x 100 ~ 130	5			ø15.875	ø10	
L12	10 x 10 x 100	6			ø19.05	ø12	
L16	12(10) x 12(10) x 130	5			ø19.05	ø16	
L20,L20E	12 x 12 x 130 * Cut-off toolholder: □16mm	5			ø19.05	ø20	
L20X,L220	12(13,16) x 12(13,16) x 120 * Cut-off toolholder: □16mm	5 ~ 7			ø19.05	ø20	
L25	16 x 16 x 130	5			ø25.4	ø25	
L32	16 x 16 x 130	5			ø25.4	ø32	
M12	10 x 10 x 120	5	10 x 10 x 60	10 + a	ø19.05	ø12	
M16	10 x 10 x 120	5	10 x 10 x 60	10 + a	ø19.05	ø16	
M20	16 x 16 x 130	5	16 x 16 x 90	10 + a	ø25.4	ø20	
M32	16 x 16 x 130	5	16 x 16 x 90	10 + a	ø25.4	ø32	
MC20	13 x 13 x 120	2 + 2 + 2			ø19.05/ø20.0	ø20.0	
MSL12	10 x 10 x 120				-	ø12	
R04	8 x 8 x 120	5			ø15.875	ø4	
R07	8 x 8 x 120	5			ø15.875	ø7	
RL01	10(8) x 10(8) x 90				ø16(ø20)	ø10	
RL02	16 x 16 x 90				ø20	ø20	
RL21	10(12) x 10(12) x 90				ø19.05	ø35	

Manufacturers are in no particular order.

R



Technical information

Citizen machinery (Miyano Products)

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Horizontal/Opposed)	Number of tools	Max. cutting dia.	Remarks
ABX-51SY2			20 x 20 x 125(100)	24	ø25	48	ø51	
ABX-51SY2			20 x 20 x 125(100)	24	ø25	48	ø51	
ABX-51TH5			20 x 20 x 125(100)	36	ø25	72	ø51	
ABX-51THY2			20 x 20 x 125(100)	36	ø25	72	ø51	
ABX-64SY2			20 x 20 x 125(100)	24	ø25	48	ø64	
ABX-64SY2			20 x 20 x 125(100)	24	ø25	48	ø64	
ABX-64TH5			20 x 20 x 125(100)	36	ø25	72	ø64	
ABX-64THY2			20 x 20 x 125(100)	36	ø25	72	ø64	
ANX-42SY			20 x 20 x 125(100)	24(48)	ø25	48	ø42	
BNA-34C			20 x 20 x 125(100)	8(16)	ø25	24	ø34	
BNA-34DHY			20 x 20 x 125(100)	14(22)	ø25	27	ø34	
BNA-34S			20 x 20 x 125(100)	8(16)	ø25	24	ø34	
BNA-42C/S			20 x 20 x 125(100)	8(16)	ø25	24	ø42	
BNA-42DHY			20 x 20 x 125(100)	14(22)	ø25	27	ø42	
BNA-42DHY2			20 x 20 x 125(100)	14(22)	ø25	27	ø42	
BNA-42DHY3			20 x 20 x 125(100)	14(22)	ø25	27	ø42	
BNA-42GTY	20 x 20 x 125(100)	3	20 x 20 x 125(100)	8(16)	ø25	24(7)	ø42	
BNA-42MSY2			20 x 20 x 125(100)	8(16)	ø25	24	ø42	
BNA-42S2			20 x 20 x 125(100)	8(16)	ø25	24	ø42	
BNA-42CY5/SY5			20 x 20 x 125(100)	12(24)	ø25	24	ø42	
BNC-42C7			20 x 20 x 125(100)	8(16)	ø25	24	ø42	
BND-51C2			20 x 20 x 125(100)	12	ø25	24	ø51	
BND-51S2			20 x 20 x 125(100)	12	ø25	24	ø51	
BND-51SY2			20 x 20 x 125(100)	12	ø25	24	ø51	
BNE-42S6			20 x 20 x 125(100)	24	ø25	48	ø42	
BNE-42SY6			20 x 20 x 125(100)	24	ø25	48	ø42	
BNE-51S6			20 x 20 x 125(100)	24	ø25	48	ø51	
BNE-51SY6			20 x 20 x 125(100)	24	ø25	48	ø51	
BNE-51MSY			20 x 20 x 125(100)	24	ø25	48	ø51	
BNE-51MY			20 x 20 x 125(100)	24	ø25	48	ø51	
BNE-65MY			20 x 20 x 125(100)	24	ø25	48	ø65	
BNJ-34S3/S5			20 x 20 x 125(100)	18	ø25	30	ø34	
BNJ-34SY3/SY5			20 x 20 x 125(100)	18	ø25	30	ø34	
BNJ-42S3/S5			20 x 20 x 125(100)	18	ø25	30	ø42	
BNJ-42S6			20 x 20 x 125(100)	20	ø25	40	ø42	
BNJ-42SY3/SY5			20 x 20 x 125(100)	18	ø25	30	ø42	
BNJ-42SY5			20 x 20 x 125(100)	18	ø25	30	ø42	
BNJ-42SY6			20 x 20 x 125(100)	20	ø25	40	ø42	
BNJ-51S3/S5			20 x 20 x 125(100)	18	ø25	30	ø51	
BNJ-51SY3/SY5			20 x 20 x 125(100)	18	ø25	30	ø51	
BNJ-51SY6			20 x 20 x 125(100)	20	ø25	40	ø51	
GN-3200	12(16) x 12(16) x 70 ~ 120	4 ~ 5			ø20		ø40	
GN-3200W	12(16) x 12(16) x 70 ~ 120	4 ~ 5			ø20		ø40	"Number of tools" is per turret.
GN-4200	12(16) x 12(16) x 70 ~ 120	6 ~ 7			ø20		ø40	
LX-06E2			20 x 20 x 125(100)	8	ø32	8		6 inch power chuck
LX-06E3			20 x 20 x 125(100)	8	ø32	8		6 inch power chuck
LX-08C			25 x 25 x 150	10	ø40	10		8 inch power chuck
LX-08E2			25 x 25 x 150	8	ø40	8		8 inch power chuck
LX-08E3			25 x 25 x 150	8	ø40	8		8 inch power chuck
LX-08R			20 x 20 x 125(100)	10	ø25	20		8 inch power chuck
LZ-01R2			20 x 20 x 125(100)	12	ø25	24		6 inch power chuck
LZ-01RY2			20 x 20 x 125(100)	12	ø25	24		6 inch power chuck
LZ-02R2			20 x 20 x 125(100)	10	ø25	20		8 inch power chuck
LZ-02RY2			20 x 20 x 125(100)	10	ø25	20		8 inch power chuck
RL01III	10 x 10 x 70 ~ 120	2 ~ 3			ø16		ø10	
RL01V	10 x 10 x 70 ~ 120	2 ~ 3			ø16		ø10	
RL03	12(16) x 12(16) x 70 ~ 120	4 ~ 5			ø20		ø40	
VC03	12(16) x 12(16) x 70 ~ 120	4 ~ 5			ø20		ø40	

* Number of tools shown in parentheses is the maximum number of toolholder mountable including ø25 sleeves.

Manufacturers are in no particular order.



Technical information

Automatic lathe list by manufacturer

Star Micronics

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Front/Rear)	Number of tools	Max. cutting dia.	Remarks
SB-16 (A/C/D/E)	12 x 12 x 95 ~ 130	5			ø22/ø22	4/4	ø16	Only D/E for rear-end sleeves
	12(10) x 12(10) x 95 ~ 130	6			ø22/ø22	4/4	ø16	
SB-12II (C/E)	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø13	Only E for rear-end sleeves
SB-16II (C/E)	12(10) x 12(10) x 95 ~ 130	6			ø22/ø22	4/4	ø16	
SB-20 A/C/E	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø20	
SB-12R typeG	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø13	
	10 x 10 x 95 ~ 130	7			ø22/ø22	4/4		
SB-16III	12 x 12 x 95 ~ 130	5			ø22/ø22	4/4	ø16	
	10 x 10 x 95 ~ 130	6			ø22/ø22	4/4		
SB-16R/20R typeN	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø16/ø23	
	10 x 10 x 95 ~ 130	7			ø22/ø22	4/4		
SB-16R/20R typeG	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø16/ø23	
	10 x 10 x 95 ~ 130	7			ø22/ø22	4/4		
SB-16R/20R typeGB	12 x 12 x 95 ~ 130	6			ø22/ø22	4/4	ø16/ø23	
	10 x 10 x 95 ~ 130	7			ø22/ø22	4/4		
SP-20	12 x 12 x 100 ~ 130	8			ø22 or ø22+ø32/ø22	5 or 4/4	ø25.4	
	12x12x100 ~ 130+16x16x100 ~ 130	7						
SC20	12 x 12 x 95 ~ 130	5			ø22/-	4/-	ø20	
	10 x 10 x 95 ~ 130	6			ø22/-	4/-		
SG-42			16 x 16 x 84 ~ 88(71 ~ 82)		ø22+ø32/-		ø42	
			20 x 20 x 84 ~ 88					
SL-7/10	10 x 10 x 95 ~ 115	6			ø16+ø22/ø16+ø22	4~6/6	ø10	
	8 x 8 x 68 ~ 115	6						
SR-10J	8 x 8 x 67 ~ 110 (Spacer is needed)	6			ø16/ø16+ø22	4/4	ø10	
SR-20RII	12 x 12 x 100 ~ 135	6			ø22/ø22	4/4	ø23	Toolpost for 2 toolholders (deep boring) on the front side
SR-20RIII	12 x 12 x 95 ~ 135	6			ø22/ø22	6/4	ø23	
SR-20J typeC	12 x 12 x 95 ~ 135	6			ø22/ø22	6/4	ø23	
SR-20J typeN	12 x 12 x 95 ~ 135	6			ø22/ø22	6/4	ø23	
SR-20JII typeA	12 x 12 x 100 ~ 135	6			ø22/ø22	7/4	ø23	
SR-20JIII typeB	12 x 12 x 100 ~ 135	6			ø22/ø22	7/8	ø23	
SR-20IV typeA	12 x 12 x 100 ~ 130	7			ø22/ø22	6/8	ø23	
SR-20IV typeB	12 x 12 x 100 ~ 130	7			ø22/ø22	6/8	ø23	
SR-25J/32J	16 x 16 x 95 ~ 155	6			ø22+ø32/ø22	4/4	ø32	
SR-32JII typeA	16 x 16 x 95 ~ 165	6			ø22+ø32/ø22	5/6	ø34	
SR-32JII typeB	16 x 16 x 95 ~ 165	6			ø22+ø32/ø22	5/8	ø34	
SB-32JIII typeA	16 x 16 x 95 ~ 165	6			ø22+ø32/ø22	5/6	ø34	
SB-32JIII typeB	16 x 16 x 95 ~ 165	6			ø22+ø32/ø22	5/8	ø34	
SD-26 typeS	16 x 16 x 95 ~ 135	7			ø22+ø32/ø22	5/8	ø26	Toolpost for 2 toolholders (deep boring) on the front side
SD-26 typeG	16 x 16 x 95 ~ 135	7			ø22+ø32/ø22	5/8	ø26	
SD-26 typeE	16 x 16 x 95 ~ 135	7			ø22+ø32/ø22	5/8	ø26	
SD-26 typeC	16 x 16 x 95 ~ 135	7			ø22+ø32/ø22	5/8	ø26	
SR-38 typeA	16 x 16 x 95 ~ 135	4			ø22+ø32/ø22	5/8	ø38	
	16 x 16 x 100	2						
	20 x 20 x 105 ~ 135 (Cut-off)	1						
SR-38 typeB	16 x 16 x 95 ~ 135	4			ø22+ø32/ø22	5/8	ø38	
	16 x 16 x 100	2						
	20 x 20 x 105 ~ 135 (Cut-off)	1						
SR-38J	16 x 16 x 95 ~ 135	4			ø22+ø32/ø22	5/4	ø38	
	16 x 16 x 95 ~ 135 (Optional)	3						
	20 x 20 x 105 ~ 135 (Cut-off)	1						
ST-20			12 x 12 x 73 ~ 79		ø22+ø32/ø22+ø32		ø20	
			12 x 12 x 65 ~ 73 (Cut-off)					
			16 x 16 x 64 ~ 73					
			16 x 16 x 65 ~ 73 (Cut-off)					
ST-38			16 x 16 x 83 ~ 88		ø22+ø32/ø22+ø32		ø38	
			16 x 16 x 71 ~ 82					
			16 x 16 x 84 ~ 88 (Cut-off)					
			20 x 20 x 84 ~ 88					
			20 x 20 x 84 ~ 88 (Cut-off)					
SV-12/20	12 x 12 x 95 ~ 135	5	12 x 12 x 70 ~ 78		ø22+ø32/-		ø12/ø20	
	16 x 16 x 95 ~ 135	4	16 x 16 x 65 ~ 70					
SV-20R	12 x 12 x 95 ~ 135	7	12 x 12 x 70 ~ 78		ø22+ø32/ø22	- / 8	ø23	
	16 x 16 x 95 ~ 135	6	16 x 16 x 65 ~ 70					
SV-32	16 x 16 x 95 ~ 135	4	16 x 16 x 60 ~ 78(80 ~ 88)		ø22+ø32/-		ø32	
	16 x 16 x 105 ~ 135	4	16 x 16 x 84 ~ 88					
	20 x 20 x 115 ~ 135 (Cut-off)	1	16 x 16 x 71 ~ 82					
SV-38R			20 x 20 x 84 ~ 88		ø22+ø32/ø34	- / 8	ø38	
SW-12RII	10x 10 x 95 ~ 115	7			ø16/ø22	4/8	ø13	
SW-20	12 x 12 x 80 ~ 150	6			ø22/ø22	4/8	ø23	
	16 x 16 x 80 ~ 144							
SX-38 typeA	16 x 16 x 95 ~ 135	4	16 x 16 x 84 ~ 88		ø22+ø32/ø34	- / 8	ø38	
	20 x 20 x 105 ~ 135 (Cut-off)	1	16 x 16 x 71 ~ 82					
			20 x 20 x 84 ~ 88					
SX-38 typeB	16 x 16 x 95 ~ 135	4	16 x 16 x 84 ~ 88		ø22+ø32/ø34	- / 8	ø38	
	20 x 20 x 105 ~ 135 (Cut-off)	1	16 x 16 x 71 ~ 82					
			20 x 20 x 84 ~ 88					

Manufacturers are in no particular order.

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Technical information

Eguro

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Horizontal/Opposed)	Number of tools	Max. cutting dia.	Remarks
NUCBOY-8EX	12 x 12	6			ø20 or ø25 or ø30	5	ø20	
NUCLET-10EX/EL	16 x 16	6			ø20 or ø25 or ø30	5	ø25.5	
NUCPAL-10EX/EL	16 x 16	10			ø20 or ø25 or ø30	8	ø25.5	
NUCLET-10vv	16 x 16	6			ø20 or ø25 or ø30	5	ø25.5	
NUCBOY-8LL	12 x 12	2			ø20 or ø25 or ø30	2	ø20	
NUCLET-10LL	16 x 16	2			ø20 or ø25 or ø30	2	ø25.5	
NUCROBO-8EX	12 x 12	6			ø20 or ø25 or ø30	5	ø20	
NUCROBO-101	16 x 16	6			ø20 or ø25 or ø30	5	ø25.5	
NUCROBO-202	16 x 16	10			ø20 or ø25 or ø30	8	ø25.5	
SANAX-6	12 x 12	10			ø12 or ø16/ø30	3~6/2	ø15	
SANAX-10	16 x 16	10			ø20 or ø30/ø30	5~8/3	ø25.5	
SANATURN-6	12 x 12	5			ø16/ø30	3~5/2	ø15	
SANATURN-10	16 x 16	6			ø20/ø30	7/3	ø25.5	
EBN-10EX	12 x 12	5			ø20 or ø25 or ø30	4	ø25.5	
GL-120	12 x 12	4			-		ø20	
EB-6	8 x 8	2			-		ø15	
EB-8	10 x 10	2			-		ø20	
EB-10	10 x 10	2			-		ø25.5	

Manufacturers are in no particular order.

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Technical information

Automatic lathe list by manufacturer

Tsugami

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Horizontal/Opposed)	Number of tools	Max. cutting dia.	Remarks
B073C	8 x 8 x 85	9	-	-	ø20/-	4/-	ø7	
B073-VR	8 x 8 x 85	9	-	-	ø20/-	4/-	ø7	
B075C	8 x 8 x 85	9	-	-	ø20/ø20	4/4(8)	ø7	
B075-VR	8 x 8 x 85	9	-	-	ø20/ø20	4/4(8)	ø7	
B0123C	12 x 12 x 85	9	-	-	ø20/-	4/-	ø12	
B0123-VR	12 x 12 x 85	9	-	-	ø20/-	4/-	ø12	
B0125C	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø12	
B0126C	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø12	
B0125-VR	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø12	
B0126-VR	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø12	
B0128W	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø12	
B0203-VR	12 x 12 x 85	9	-	-	ø20/-	4/-	ø20	
B0205-VR	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø20	
B0206-VR	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø20	
B0208W	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø20	
BM163-VR	12 x 12 x 85	9	-	-	ø20/-	4/-	ø16	
BM165-VR	12 x 12 x 85	9	-	-	ø20/ø20	4/4(8)	ø16	
BW127J-II	12 x 12 x 85	7	-	-	ø20/ø20	3/4(9)	ø12	
BW128J-II	12 x 12 x 85	7	-	-	ø20/ø20	3/4(9)	ø12	
BW128ZJ-I / II	12 x 12 x 85	7	-	-	ø20/ø20	3/4(9)	ø12	
BW129ZJ-I / II	12 x 12 x 85	7	-	-	ø20/ø20	3/4(9)	ø12	
BW207J-II	12 x 12 x 85/16 x 16 x 85	5/2	-	-	ø20/ø20	3/4(9)	ø20	
BW208J-II	12 x 12 x 85/16 x 16 x 85	5/2	-	-	ø20/ø20	3/4(9)	ø20	
BW208ZJ-I / II	12 x 12 x 85/16 x 16 x 85	5/2	-	-	ø20/ø20	3/4(9)	ø20	
BW209ZJ-I / II	12 x 12 x 85/16 x 16 x 85	5/2	-	-	ø20/ø20	3/4(9)	ø20	
B0265-III	16 x 16 x 100	12	-	-	ø25/ø25	7/4(9)	ø26	
B0266-III	16 x 16 x 100	12	-	-	ø25/ø25	7/8(13)	ø26	
B0265V-III	16 x 16 x 100	6	-	-	ø25/ø25	7/4(9)	ø26	
B0266V-III	16 x 16 x 100	6	-	-	ø25/ø25	7/8(13)	ø26	
B0325-III	16 x 16 x 100	12	-	-	ø25/ø25	7/4(9)	ø32	
B0326-III	16 x 16 x 100	12	-	-	ø25/ø25	7/8(13)	ø32	
B0325V-III	16 x 16 x 100	6	-	-	ø25/ø25	7/4(9)	ø32	
B0326V-III	16 x 16 x 100	6	-	-	ø25/ø25	7/8(13)	ø32	
B0385(L)-III	16 x 16 x 100/20 x 20 x 125	11/1	-	-	ø32,ø25/ø32	3,2/5(10)	ø38	
B0386(L)-III	16 x 16 x 100/20 x 20 x 125	11/1	-	-	ø32,ø25/ø32	3,2/5(13)	ø38	
B0385(L)V-III	16 x 16 x 100/20 x 20 x 125	5/1	-	-	ø32,ø25/ø32	3,2/5(10)	ø38	
B0386(L)V-III	16 x 16 x 100/20 x 20 x 125	5/1	-	-	ø32,ø25/ø32	3,2/5(13)	ø38	
B038T	16 x 16 x 125/20 x 20 x 125	2 ~ 5/1	20 x 20 x 125	St.8	ø32/ø25		ø38	
C150	12 x 12 x 60 ~ 100	4 ~ 6	-	-	-	-	ø80	
C180	12 x 12 x 60 ~ 100	4 ~ 6	-	-	-	-	ø120	
C220/220T	12 x 12 x 60 ~ 100	6 ~ 8	-	-	-	-	ø120	
C200	12 x 12 x 60 ~ 100	4 ~ 6	-	-	-	-	ø120	
P013	8 x 8 x 100 ~ 120	6	-	-	ø16/-	3/-	ø1	
P014	8 x 8 x 100 ~ 120	6	-	-	ø16/ø16	3/3(3)	ø1	
P033	8 x 8 x 100 ~ 120	6	-	-	ø16/-	3/-	ø3	
P034	8 x 8 x 100 ~ 120	6	-	-	ø16/ø16	3/3(3)	ø3	
P036W	8 x 8 x 100 ~ 120	6	-	-	ø16/ø16	4/4(4)	ø3	
P053	8 x 8 x 100 ~ 120	6	-	-	ø16/-	3/-	ø5	
P054	8 x 8 x 100 ~ 120	6	-	-	ø16/ø16	3/3(3)	ø5	
S205-II	12 x 12 x 100	9	-	-	ø25/ø25	7/4(9)	ø20	
S206-II	12 x 12 x 100	9	-	-	ø25/ø25	7/8(13)	ø20	
S205A-II	12 x 12 x 100	9	-	-	ø25/ø25	5/4(9)	ø20	
S206A-II	12 x 12 x 100	9	-	-	ø25/ø25	5/8(13)	ø20	
SS207-II (-5AX)	12 x 12 x 100	8	-	-	ø22/ø20	6/8(12)	ø20	
SS267-III (-5AX)	16 x 16 x 100	8	-	-	ø25/ø25	6/8(12)	ø26	
SS327-III (-5AX)	16 x 16 x 100	8	-	-	ø25/ø25	6/8(12)	ø32	
BW269ZJ	16 x 16 x 100	7	-	-	ø25/ø25	7/8(13)	ø26	
BW329ZJ	16 x 16 x 100	7	-	-	ø25/ø25	7/8(13)	ø32	
MB25	-	-	20 x 20 x 90	2 x St.8	ø20/ø32	5/4	ø25	
M06JC-II	-	-	20 x 20 x 125	St.8	ø25		ø220/ø42	
M06J-II	-	-	25 x 25 x 150	St.8	ø32/ø40		ø260/ø51	
M08J-II	-	-	25 x 25 x 150	St.8	ø32/ø40		ø280/ø65	
M08JL5-II	-	-	25 x 25 x 150	St.8	ø32/ø40		ø280/ø65	
M08JL8-II	-	-	25 x 25 x 150	St.8	ø32/ø40		ø280/ø65	
M06D-II	-	-	25 x 25 x 150	St.12	ø40		ø260/ø51	
M08D-II	-	-	25 x 25 x 150	St.12	ø40		ø280/ø65	
M06DY-II	-	-	25 x 25 x 150	St.12	ø40		ø260/ø51	
M08DY-II	-	-	25 x 25 x 150	St.12	ø40		ø280/ø65	
M06SJ-II	-	-	25 x 25 x 150	St.12	ø40		ø260/ø51	
M08SJ-II	-	-	25 x 25 x 150	St.12	ø40		ø280/ø65	
M06SD-II	-	-	25 x 25 x 150	St.12	ø40		ø260/ø51	
M08SD-II	-	-	25 x 25 x 150	St.12	ø40		ø280/ø65	
M06SY-II	-	-	25 x 25 x 150	St.12	ø40		ø260/ø51	
M08SY-II	-	-	25 x 25 x 150	St.12	ø40		ø280/ø65	
M10J	-	-	25 x 25 x 150	St.12	ø40		ø400/ø80	
M10JL10	-	-	25 x 25 x 150	St.12	ø40		ø400/ø80	
M10D	-	-	25 x 25 x 150	St.12	ø40		ø400/ø80	
B020M-III	12 x 12 x 100	1	-	-	ø25/ø25	1/6	ø20	
SS20MH-III-5AX	12 x 12 x 100	1	-	-	ø25/ø25	1/6	ø20	
B026M-III	20 x 20 x 100 ~ 125	1	-	-	ø32/ø25	1/10	ø26	
SS26MH-III-5AX	20 x 20 x 100 ~ 125	1	-	-	ø32/ø25	1/10	ø26	
B038M	20 x 20 x 100 ~ 125	1	-	-	ø32/ø25	1/10	ø38	
SS38MH-5AX	20 x 20 x 100 ~ 125	1	-	-	ø32/ø25	1/10	ø38	
TMA8F	20 x 20 x 100 ~ 125	1	-	-	ø32/ø32		ø220/ø65	
TMA8J	20 x 20 x 100 ~ 125	1	-	-	ø32/ø32		ø220/ø65	
TMA8H	20 x 20 x 100 ~ 125	1	-	-	ø32/ø32		ø220/ø65	

Manufacturers are in no particular order.

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Technical information

Automatic lathe list by manufacturer

Nomura DS

Model	Toolholder dimensions (Gang tool post)	Number of tools	Toolholder dimensions (Turret tool post)	Number of tools	Sleeve dia. (Horizontal/Opposed)	Number of tools	Max. cutting dia.	Remarks
NN-10C	10 x 10 x 130	6			ø17		ø10	
NN-10CS	10 x 10 x 130	5			ø17	4	ø10	
NN-10SII	10 x 10 x 130	5			ø23		ø10	
NN-10T	10 x 10 x 130	7			ø23		ø10	
NN-10SB5	10 x 10 x 130	5			ø23		ø13	
NN-10EX2	10 x 10 x 120	6			ø16	4	ø10	
NN-10EX2	10 x 10 x 80	7			ø16	4	ø10	
NN-10EX3	10 x 10 x 80	7			ø16	4	ø10	
NN-16SB5	10 x 10 x 130	5			ø23		ø16	
NN-16SB6 Type1	12 x 12 x 130*	7			ø17(ø22)	4	ø16	
NN-16SB6 Type2	12 x 12 x 130*	5			ø17(ø22)	4	ø16	
NN-16SB6 Type2.5	12 x 12 x 130*	6			ø17(ø22)	5	ø16	
NN-16SB6 Type3	12 x 12 x 130*	5			ø17(ø22)	4	ø16	
NN-16SB7	12 x 12 x 130*	5			ø16	4	ø16	
NN-16SB7-M8	12 x 12 x 130*	5			ø16	4	ø16	
NN-20SB	12 x 12 x 130*	5			ø16	3	ø20	
					ø22	2	ø20	
NN-16HIII	12 x 12 x 130	6			ø23		ø16	
NN-20HIII	12 x 12 x 130	6			ø23		ø20	
NN-16UIII	12 x 12 x 130	5			ø23		ø16	
NN-20UIII	12 x 12 x 130	5			ø23		ø20	
NN-20CS	12 x 12 x 130*	5(6)			ø22	4	ø20(ø25)	
NN-20U5	12 x 12 x 150*	5(6)			ø22	4	ø20(ø25)	
NN-32U5	12 x 12 x 150*	3(4)			ø32	1	ø32	
	16 x 16 x 130	2			ø22	3		
NN-16UB5	12 x 12 x 130	5			ø23		ø16	
NN-20UB5	12 x 12 x 130	5			ø23		ø20	
NN-20UB7	12 x 12 x 130	6			ø23		ø20	
NN-20UB8	12 x 12 x 150*	5(6)			ø22	4	ø20(ø25)	
NN-20UB10	12 x 12 x 150*	5(6)			ø22	4	ø20(ø25)	
NN-32UB8	12 x 12 x 150*	3(4)			ø32	1	ø32	
	16 x 16 x 130	2			ø22	3		
NN-32UB10W	12 x 12 x 150*	3(4)			ø32	1	ø32	
	16 x 16 x 130	2			ø22	3		
NN-20YB	12 x 12 x 130	6			ø23		ø20	
NN-25YB/32YB	16 x 16 x 130	5			ø23/ø32		ø25/ø32	
NN-32YB5	16 x 16 x 130	5			ø22/ø32	4	ø32	
NN-32YB5 XB	16 x 16 x 130	6			ø22/ø32	5/1	ø32	
NN-16J	12 x 12 x 130*	6			ø23		ø16	
NN-20J	12 x 12 x 130*	6			ø23		ø20	
NN-20J2	12 x 12 x 130*	6			ø22	4	ø20	
NN-20J5	12 x 12 x 130*	6			ø22	4	ø20	
NN-20J5 XB	12 x 12 x 130*	5			ø22	4	ø20	
NN-32J	16 x 16 x 130	6			ø25	2	ø32	
					ø32	3		
					ø22	4		
NN-32DB	16 x 16 x 130	8			ø32	1	ø32	
					ø22	4		
NN-38DB	20 x 20 x 130	7			ø22	4	ø38	
					ø32	1		
NN-38KM	16 x 16 x 130	5			ø25	3	ø38	
					ø32	2		

* 12.7 x 12.7 toolholder mountable

Manufacturers are in no particular order.

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Technical information

List of instruments and applicable small parts machining and toolholders

Models of major machine tool manufacturers				Applicable toolholders
Manufacturer	Model (Automatic lathe)	Toolholder size	Total length of attached toolholder (Max.)	
Citizen Machinery	A12, A16, B12, L12, RL01, RL21	10 x 10	100	...1010F--
	K12, K16	12 x 12		...1212F--
	RL02	16 x 16		...1616H--
	B12E, B16E, BL12, C12, C16, M12, M16 MSL12	10 x 10	120	...1010JX--
	A20, A20VII, B20, BL20, BL25, K12E, K16E L20X, L220, MC20	12 x 12		...1212JX--
	L16, L20, L20E	12 x 12	130	...1212JX--
	C32, L25, L32, M20, M32	16 x 16		...1616JX--
	A32, D25		150	
Star Micronics	SW-12RII	10 x 10	120	...1010JX--
	SB-16A, SB-16C, SB-16D, SB-12II, SB-16II SB-12R/16R/20R, SR-20IV, SB-20A/C/E, SC20	12 x 12	130	...1212JX--
	SR-20RII, SR-20III, SV-12, SV-20, SR-20J	12 x 12	135	...1212JX--
	SV-20R, SV-32, SV-38R, SR-38J, SX-38	16 x 16		...1616JX--
	SR-25J, SR-32J, SW-20	16 x 16	150	...1616JX--
Tsumami	B0, BH20, BM, BW2	12 x 12	85	...1212F--
	C150, C180, C220, S205, S206, SS207	12 x 12	100	...1212F--
	BH38, B0265, B0266, B0325, B0326 SS26, SS32/32L, SS267, SS327	16 x 16		...1616H--
Nomura DS	NN-10C, NN-10CS, NN-10EX2, NN-10SII NN-10SB5, NN-10T, NN-16SB5	10 x 10	130	...1010JX--
	NN-16HIII, NN-16J, NN-16SB6/7, NN-16UB5, NN-16UIII, NN-20CS, NN-20HIII, NN-20J/J2/J5, NN-20SB, NN-20UIII, NN-20U5, NN-20UB5/7, NN-20YB	12 x 12		...1212JX--
	NN-25YB, NN-32DB, NN-32YB/YB5, NN-32J, NN-38KM	16 x 16		...1616JX--

Manufacturers are in no particular order.

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Technical information

Parts compatibility of lever lock toolholders

- 1) For better usability of lever lock toolholders, some levers, lock screws and shims are modified.
- 2) It is highly recommended to use only new parts. However, they are compatible with conventional parts and can be used together with them.
- 3) It is possible to use new parts only with a toolholder which has been in use.
- 4) When purchasing replacements, order them stating the new numbers.
- 5) Some of the shims remain unmodified.

Classification	Toolholder description		Spare parts						
			Lever		Lock screw		Shim		
			New No.	Conventional	New No.	Conventional	New No.	Conventional	
External turning toolholders	PCLN [®] /L	....-09	LL-1N	LL-1	LS-1N	LS-1	LC-32N	LC-32
		....-12	LL-2N	LL-2	LS-2N	LS-2	LC-42N	LC-42
		....-16	LL-5N	LL-5	LS-4N	LS-4	LC-53N	LC-53
	PDJN [®] /L	....-11	LL-1DN	LL-1D	LS-1N	LS-1	LD-32N	LD-32
		....-15	LL-3N	LL-3	LS-2N	LS-2	LD-42	
	PSBN [®] /L	....-09	LL-1N	LL-1	LS-1N	LS-1	LS-32	
		....-12	LL-2N	LL-2	LS-2N	LS-2	LS-42	
	PSKN [®] /L	....-09	LL-1N	LL-1	LS-1N	LS-1	LS-32	
		....-12	LL-2N	LL-2	LS-2N	LS-2	LS-42	
	PSSN [®] /L	....-09	LL-1N	LL-1	LS-1N	LS-1	LS-32	
		....-12	LL-2N	LL-2	LS-2N	LS-2	LS-42	
	PSDNN	....-09	LL-1N	LL-1	LS-1N	LS-1	LS-32	
		....-12	LL-2N	LL-2	LS-2N	LS-2	LS-42	
	PTGN [®] /L	1212F-11	LL-03N	LL-03	LS-03N	LS-03	-		
		....-11	LL-03TN	LL-03T	LS-03SN	LS-03S	-	
		....-16	LL-1N	LL-1	LS-1N	LS-1	LT-32N	LT-32
		....-22	LL-2N	LL-2	LS-2N	LS-2	LT-42N	LT-42
	PTFN [®] /L	1212F-11	LL-03N	LL-03	LS-03N	LS-03	-		
		....-11	LL-03TN	LL-03T	LS-03SN	LS-03S	-	
		....-16	LL-1N	LL-1	LS-1N	LS-1	LT-32N	LT-32
		....-22	LL-2N	LL-2	LS-2N	LS-2	LT-42N	LT-42
	PRGC [®] /L	....-12	LL-1CN	LL-1C	LS-1N	LS-1	LR-12C	
		PRXC [®] /L				-12		
	PRGN [®] /L	....-09	LL-1N	LL-1	LS-1N	LS-1	LR-80	
....-12		LL-2N	LL-2	LS-2N	LS-2	LR-81			
PWLN [®] /L	....-06	LL-1N	LL-1	LS-1N	LS-1	LW-32N	LW-32	
	....-08	LL-2N	LL-2	LS-2N	LS-2	LW-42N	LW-42	
	09-20	LL-03SN	LL-03S	LS-03SN	LS-03S	-			
Boring bars	<input type="checkbox"/> 16M-	PCLN [®] /L	09-27	LL-1N	LL-1	LS-1SN	LS-1S	LC-32N	LC-32
	<input type="checkbox"/> 20Q-		09-32						
	<input type="checkbox"/> 25R-		12-..						
-	PDUN [®] /L	11-..	LL-1DN	LL-1D	LS-1SN	LS-1S	LD-32N	LD-32
-	PTUN [®] /L	11-..	LL-03TN	LL-03T	LS-03SN	LS-03S	-	
	S25R-	PTUN [®] /L	16-30	LL-03SN	LL-03S	LS-03SN	LS-03S	-	
	S32S-	PWLN [®] /L	16-40	LL-1N	LL-1	LS-1N	LS-1	LT-32N	LT-32
	S40T-		16-50						
	<input type="checkbox"/> 16M-		06-20						
	<input type="checkbox"/> 20Q-	06-27	LL-1N	LL-1	LS-1SN	LS-1S	LW-32N	LW-32	
	<input type="checkbox"/> 25R-	06-32	LL-2N	LL-2	LS-2N	LS-2	LW-42N [®] /L	LW-42 [®] /L	
	....-	08-..	LL-2N	LL-2	LS-2N	LS-2	LW-42N [®] /L	LW-42 [®] /L
Turning mill	T63H-	PCLN [®] /L	-DX12	LL-2N	LL-2	LS-2N	LS-2	LC-42N	LC-42
	T63H-	PCMNN	<input type="checkbox"/> 12	LL-3N	LL-3	LS-2N	LS-2	LD-42	
	T63H-	PDJN [®] /L	-DX15						
	T63H-	PDNNN	<input type="checkbox"/> 15						
	T63H-	PTGN [®] /L	-DX16	LL-1N	LL-1	LS-1N	LS-1	LT-32N	LT-32
	T63H-	PWLN [®] /L	-DX08	LL-2N	LL-2	LS-2N	LS-2	LW-42N	LW-42



Technical information

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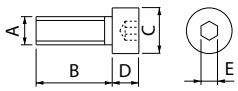
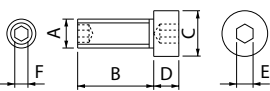
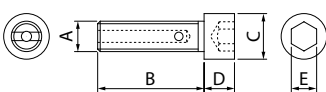
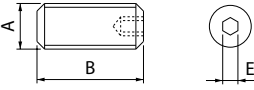
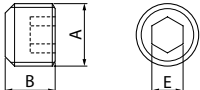
Shape	Description	Availability	Dimension (mm)							Angle		Torque (N-m)	Remarks
			A	B	C	D	E	F	α	θ			
	AJ -6X38	●	M6X1.0	38.0	6.0	10.0	3.0	3.0	-	-	-		
	-8X44-9.5	●	M8X1.25	44.0	9.5	6.0	4.0	4.0	-	-			
	-10X46	●	M10X1.5	46.0	11.5	8.0	5.0	5.0	-	-			
	AJ -519TR	●	M5X0.8	19.0	10.0	-	T15	-	-	40°	-		
	BH 3X6	●	M3X0.5	6.0	-	2.0	2.0	-	-	-	-		
	3X12	●	M3X0.5	12.0	-	2.0	2.0	-	-	-			
	6X25	●	M6X1.0	25.0	-	4.0	4.0	-	-	-			
	BH 6X10TR	●	M6X1.0	10.0	12.0	5.0	T25	-	-	-	6.5		
	CP 8X15TL	●	M8X1.25	15.0	15.0	-	T25	-	-	-	6.0	L... shows Left-hand thread	
	8X23TL	●		23.0									
	CS -2D	●	M4X0.7	21.5	6.4	3.5	2.5	2.0	-	-	1.7		
	-3D	●	M5X0.8	22.0	8.0	4.0	3.0	2.5	-	-	3.9		
	-5D	●	M5X0.8	28.0	8.0	4.0	3.0	2.5	-	-	3.0		
	CS -3D-TR	●	M5X0.8	22.0	8.0	4.0	T15	T15	-	-	3.9		
	GS -50	●	M5X0.8	13.0	7.5	-	3.0	-	-	82°	-		
	HF 20X53H	●	M20X2.5	35.0	43.0	18.0	14.0	14.0				With Coolant Hole	
	20X53HA	●		33.0	50.0	20.0							
	24X60H	●	M24X3.0	40.5	65.0	19.5	17.0						
	24X60HA	●		36.0		24.0							
	HH 3X6	●	M3X0.5	6.0	5.5	3.0	2.5	-	-	-	-		
	3X10S	●		10.0	5.0								
	3X12	●		12.0	5.5								
	HH 3.5X10S	●	M3.5X0.6	10.0	5.5	3.0	2.5	-	-	-			
	HH 4X12S	●	M4X0.7	12.0	7.0	4.0	3.0	-	-	-			
	4X16	●		16.0									
	HH 5X12	●	M5X0.8	12.0	8.5	5.0	4.0	-	-	-			
	5X15	●		15.0									
	5X15L	●		16.0									
	5X16	●		20.0									
	5X20	●		25.0									
5X25	●	30.0											
5X30	●												

● : Available

P



Spare parts

Shape	Description	Availability	Dimension (mm)					Angle		Torque (N-m)	Remarks	
			A	B	C	D	E	F	α			θ
	HH 6X12	⊙	M6X1.0	12.0	10.0	6.0	5.0	-	-	-	-	
	6X16	⊙		16.0								
	6X16A	⊙										
	6X18	⊙		18.0								
	6X18A	⊙		20.0								
	6X20	⊙		25.0								
	6X25	⊙		30.0								
	HH 8X20	⊙	M8X1.25	20.0	13.0	8.0	6.0	-	-	-		
	8X25	⊙		25.0								
	HH 10X25	⊙	M10X1.5	25.0	16.0	10.0	8.0	-	-	-		
	10X30	⊙		30.0								
	10X35	⊙		35.0								
	10X40	⊙		40.0								
	HH 12X35	⊙	M12X1.75	35.0	18.0	12.0	10.0	-	-	-		
	12X40	⊙		40.0								
HH 16X35	⊙	M16X2.0	35.0	24.0	16.0	14.0	-	-	-			
16X40	⊙		40.0									
16X45	⊙		45.0									
HH 20X40	⊙	M20X2.5	40.0	30.0	20.0	17.0	-	-	-			
20X55	⊙		55.0									
	HH 4X12	⊙	M4X0.7	10.0	7.0	4.0	3.0	2.0	-	-	-	
		HH 8X25H	⊙	M8X1.25	25.0	13.0	8.0	5.0	-	-	-	-
10X30H		⊙	M10X1.5	30.0	16.0	10.0	6.0					
10X35HK		⊙		35.0								
12X35H		⊙	M12X1.75	35.0	18.0	12.0	8.0					
12X35HK		⊙		35.0								
16X52H		⊙	M16X2.0	36.0	24.0	16.0	12.0					
	HS 3X3P	⊙	M3X0.5	2.9	-	-	1.5	-	-	-	1.0	
	3X4P	⊙		3.9								
	3X4	⊙		4.0								
	HS 4X4P	⊙	M4X0.7	3.9	-	-	2.0	-	-	-	2.0	
	4X4	⊙		4.0								
	HS 5X5	⊙	M5X0.8	5.0	-	-	2.5	-	-	-	3.0	
	HS 6X4P	⊙	M6X1.0	3.9	-	-	3.0	-	-	-	4.0	
		6X6		⊙								6.0
		6X8T		⊙								8.0
		6X14		⊙								14.0
		6X22		⊙								22.0
	HS 8X10	⊙	M8X1.25	10.0	-	-	4.0	-	-	-	-	
	8X12	⊙		12.0								
	HS 10X10	⊙	M10X1.5	10.0	-	-	5.0	-	-	-	-	
		10X16		⊙								16.0
	HS 12X12	⊙	M12X1.75	12.0	-	-	6.0	-	-	-	-	
		12X16		⊙								16.0
		12X18		⊙								18.0
12X20		⊙		20.0								
12X25		⊙		25.0								
12X30		⊙		30.0								
12X35		⊙		35.0								
HS 16X12	⊙	M16X2.0	12.0	-	-	8.0	-	-	-	-		
	16X18		⊙								18.0	
	16X20		⊙								20.0	
	HS 5X4LP	⊙	M5X0.8	4.0	-	-	2.5	-	-	-	-	

⊙: Available



Spare parts

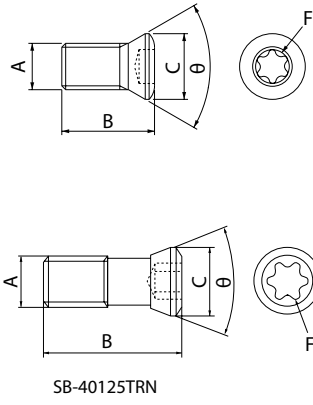
HS4X4P and HS6X4P have a flat edge
Clamp screw equivalent to JIS B-1177

Shape	Description	Availability	Dimension (mm)						Angle		Torque (N·m)	Remarks						
			A	B	C	D	E	F	α	θ								
	HS -2524TRP	⊙	M2.5X0.35	2.4	-	-	5IP	-	-	-	0.5	IP shows Torx Plus						
	-2534TRP	⊙		3.4														
	-3048TRP	⊙	M3X0.5	4.8									6IP	0.8				
	-4067TRP	⊙	M4X0.7	6.7									7IP	1.2				
	HS -50100TRP	⊙	M5X0.8	10	6.0	1.6	15IP	-	-	-	3.5	IP shows Torx Plus						
	HSB 4X8%	⊙	M4X0.7	8.0	R2.0	-	2.0	-	-	-	2.0	R... shows Right-hand thread L... shows Left-hand thread						
	LS -03N	⊙	M5X0.8	9.7	M5X0.8	-	2.0	-	-	-	2.0	N: Silver coated						
	-03SN	⊙		12.0			2.5				3.0							
	LS -05	⊙	M5X0.8	15.5	M5X0.8	-	2.0	2.0	-	-	2.0							
		LS -1N	⊙	M6X1.0	17.0	6.0	-	2.5	2.5	-	-	3.0	N: Silver coated					
-1SN		⊙	14.2															
-1T		⊙	21.0															
LS -2N		⊙	M8X1.0	20.0	8.0	-	3.0	3.0	-	-	4.0							
-3		⊙		22.0														
-4N		⊙		24.0														
LS -5	⊙	M10X1.0	29.0	10.0	-	4.0	4.0	-	-	-								
	LS -1P	⊙	M6X1.0	16.5	6.0	-	10IP	10IP	-	-	2.0	IP shows Torx Plus						
	-2P	⊙	M8X1.0	18.2	8.0	-	15IP	15IP	-	-	3.5							
	-3P	⊙		21.8														
	LS -11	⊙	M6X1.0	9.5	-	-	3.0	-	-	-	-							
	-15	⊙		12.5														
	M 3X8	⊙	M3X0.5	8.0	5.5	2.0	-	-	-	-	-	Flat filister head screw equivalent to JIS B-1101						
	3X12	⊙		12.0														
	4X10	⊙	M4X0.7	10.0	7.0	2.6												
	SB -1TR	⊙	M2X0.4	5.3	3.8	-	-	T6	82°	-	0.5	R... shows right-hand thread						
	-2TR	⊙	M2.5X0.45	6.2	4.5			T8			1.2							
	-3TR	⊙	M3X0.5	7.2	4.8			T10			2.0							
	-35TR	⊙		6.4	5.2			T15			3.5							
	-3.5TR	⊙	M3.5X0.6	9.3	5.6			T20			90°		4.5					
	-4TR	⊙	M4X0.7	7.7	5.8								60°	0.5				
	-5TR	⊙	M5X0.8	20.0	8.7									0.8				
	-2290TR	⊙	M2.2X0.45	9.2	2.8			T6			3.5							
	-25100TR	⊙	M2.5X0.45	10.0	3.5			T7			0.5							
	-40115TR	⊙	M4X0.7	11.5	5.5			T15			0.8							
	-5070TR	⊙	M5X0.8	7.0	6.8			T20			4.5							
	-5090TR	⊙		9.0														
	-50120TR	⊙		12.0														
		SB -1STR	⊙	M2X0.4	5.0			3.1			-		-	T6	60°	-	0.5	R... shows right-hand thread L... shows left-hand thread
		-1635TR	⊙	M1.6X0.35	3.3			2.6						6IP			55°		0.4
-1840TRP		⊙	M1.8X0.35	4.0	2.5													
SB -2035TR		⊙	M2X0.4	3.7	3.0	T6	60°	0.5										
-2035TRG		⊙		3.5	2.7													
-2037TRP		⊙		3.7	3.0	6IP	55°											
-2040TR		⊙		3.8	3.0													
-2040TRG		⊙		4.0	3.0	T6	60°											
-2041TRP		⊙		4.1	2.7													
-2042TRG		⊙		4.3	2.8	T6	37°											
-2045TR		⊙																
-2045TRN		⊙		4.8	3.0	T8	60°											
-2050TR		⊙		5.8	3.5													
-2060TR		⊙	8.3	2.8	T6	0.5												

⊙ : Available



Spare parts

Shape	Description	Availability	Dimension (mm)						Angle		Torque (N-m)	Remarks	
			A	B	C	D	E	F	α	θ			
	SB -2250TR	⊙	M2.2X0.45	5.1	3.1	-	-	T7	-	60°	0.8		
	-2255TR	⊙		5.5	3.5								
	-2260TR	⊙		5.8	3.1								
	-2270T ⁹⁰ /L	⊙		6.8	3.2								
	SB -2545TR	⊙	M2.5X0.45	4.6	3.5	-	-	T8	-	60°	1.2		
	-2555TRG	⊙		5.4									
	-2555TRP	⊙		5.5				8IP					
	-2560TR	⊙		5.7				T8					
	-2570TR	⊙		6.8									
	SB -3060TR	⊙	M3X0.5	5.3	4.2	-	-	T10	-	60°	2.0		
	-3060TRP	⊙		6.0	10IP			1.2					
	-3065TRP	⊙		6.5	4.0			8IP			2.0		
	-3070TRG	⊙		4.2	T10			1.2					
	-3070T ⁹⁰ /L	⊙		7.0	4.0			T8		2.0			
	-3070TRP	⊙		4.2	10IP			2.0					
	-3076TRP	⊙		7.6	3.9			T10		55°	2.0		
	-3080TR	⊙		8.0	4.2					60°	2.0		
	SB -3573TRP	⊙	M3.5X0.6	7.3	5.0	-	-	10IP	-	60°	2.0		
	-3575TRP	⊙		7.5	4.9			T15			3.5		
	-3580TR	⊙		8.0	5.3			15IP			4.0		
	-3590TRP	⊙		9.0	5.1			T10			2.0		
	-3592TR	⊙		9.2	5.1			15IP			4.0		
	-35120TRP	⊙		12.0	5.2								
	SB -4050TRN	⊙	M4X0.5	4.6	5.1	-	-	T10	-	57°	2.0		
	-4060TR	⊙	5.9	5.5	T15			3.5					
	-4065TR	⊙	6.7										
	-4070TRG	⊙	7.0										
	-4070TRN	⊙	7.7							5.4	T10		2.0
	-4070TRS	⊙	6.7	5.5	T15			3.5					
	-4075TRP	⊙	7.5										
	-4082TPR	⊙	8.2										
	-4085TR	⊙	8.5										
	-4085TRP	⊙	8.6										
	-4086TRP	⊙	9.0							5.7			
	-4090TRP	⊙	5.5										
	-4090TRPN	⊙	10.4							5.7			
	-40104TRP	⊙	12.0							5.1			
	-40120TR	⊙	12.5							5.2			
	-40125TRN	⊙	14.0	5.5									
	-40140TR	⊙	6.7	T15	50°			60°		75°			
-40140TRN	⊙	8.0	60°										
SB -44865UTRP	⊙	UNF No.4-48	6.5		3.8						-	-	8IP	-	60°	1.2
-44880UTRP	⊙	8.0	M4.5X0.5	6.8	6.0			-		-	T10	57°	2.0
SB -4570TRN	⊙	13.0		6.6	-	-	20IP		55°		4.5		
SB -5085TR	⊙	M5X0.8	8.5	6.8	-	-	T20	-	50°	4.5			
-50110TRP	⊙		11.0	7.0			20IP		60°				
-50120TRP	⊙		12.0	6.8									
-50120TRPH	⊙		7.2	15IP			3.5						
-50120TRS	⊙		13.7	9.7			T20		70°	4.5			
-50137K	⊙		14.0	7.3			T15		50°	4.2			
-50140TR	⊙			20IP			60°		4.5				
-50140TRP	⊙			T25			6.0						
SB -60120TR	⊙		M6X1.0	12.0			8.5		-	-	20IP	-	60°	4.5
-60130TRP	⊙	13.0		6.0									
-60200TRP	⊙	20.0		6.0									
SB -4070TRW	⊙	M4X0.7	6.7	5.5	-	-	T8	-	60°	1.2			
-4590TRWN	⊙	M4.5X0.75	9.3	5.6			T10		57°	2.0			

R... shows right-hand thread
L... shows left-hand thread
IP shows Torx Plus

⊙ : Available

Reference

Torx and Torx Plus have different cross-sections.



Torx



Torx Plus



Spare parts

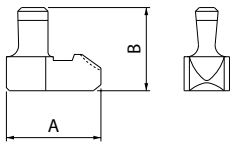
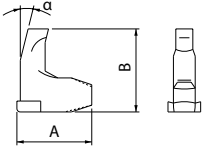
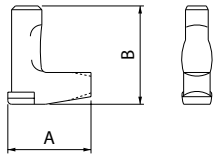
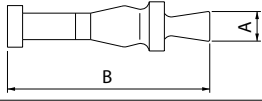
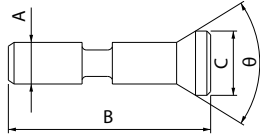
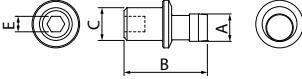
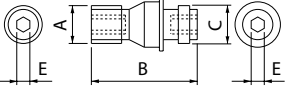
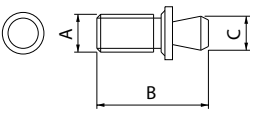
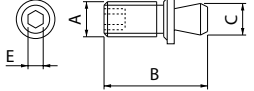
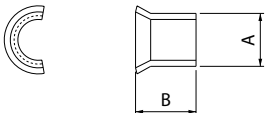
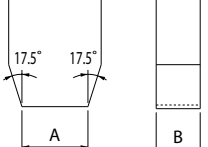
Shape	Description	Availability	Dimension (mm)						Angle		Torque (N-m)	Remarks		
			A	B	C	D	E	F	α	θ				
	-30067	☉	M3X0.35	6.7	4.4	-	-	-	-	T8	60°	1.2		
	-35085	☉	M3.5X0.35	8.5	5.7					T10		2.0		
	-40100	☉	M4X0.5	10.0	6.0					T15		3.5		
	-50130	☉	M5X0.5	13.0	6.6					T20	40°	4.5		
	-60160	☉	M6X0.75	16.0	8.0					T25		6.0		
	-60210	☉	M6X0.75	21.0	9.6					T30		8.0		
	-3070TRP	☉	M3X0.5	7.0	4.3	-	-	-	-	9/P	43°	1.7	IP shows Torx Plus	
	-40050TRN	☉	M4X0.7	5.0	5.0					-				-
	-40055STR	☉	M4X0.7	5.5										
	-40068TR	☉	M4X0.7	6.8										
	-40080TR	☉	M4X0.7	8.0										
	-40090TR	☉	M4X0.7	9.0										
	-40100TR	☉	M4X0.7	10.0										
		-40120TR	☉	M4X0.7	12.0					5.6	-	-		-
-50125TR		☉	M5X0.8	12.5	6.8	T20	4.5							
	-50150TR	☉	M5X0.8	15.1	7.3	3.1	-	-	-	T20	-	4.5		
	3X4	☉	M3X0.5	4.0	4.0	-	-	-	-	-	90°	-	With additional machining below the flat head screw Cross recessed flat head screw equivalent to JIS...B-1111	
	3X6	☉		6.0	6.0									
	3X8	☉		8.0	6.0									
	3X10	☉		10.0	6.0									
	4X9	☉	M4X0.7	9.0	5.6	-	2.0	-	-	-	90°	-		
	8X35	☉	M8X1.25	35.0	11.0	4.4	5.0	-	-	-	90°	-		
	-5035	☉	M5X0.5	7.0	6.3	M3.5X0.6	3.5	-	-	-	-	-	A shows External, D shows Internal. External and Internal threads are both Right-hand threads.	
	-6045	☉	M6X0.75	9.0	7.5	M4.5X0.75	4.5							
	-7050	☉	M7X0.75	9.0	8.8	M5X0.8	5.0							
	SS	☉	M5.5X0.5	8.5	6.6	M4X0.7	4.0							
	-60136R	☉	M6X1.0	13.6	6.3	-	-	-	-	T25	6°	-	Torx	
	-60136TR	☉								T20		4.5		
	8X15	☉	M8X1.25	20.0	8.5	-	4.0	-	-	-	-	-		
	6X17	☉	M6X1.0	17.0	-	-	-	-	-	T20	-	4.5		
	6X18N	☉		18.0						T15		3.5		
	8X16	☉		M8X1.0						16.0		T25		6.0
	6X18	☉	M6X1.0	17.5	-	-	3.0	-	-	-	-	-		
	6X20	☉	M6X1.0	20.5										
	8X18	☉	M8X1.25	18.0										
	*8X21	☉	M8X1.0	21.0										
	10X31	☉	M10X1.0	31.0	M10X1.5	-	5.0	-	-	-	-	-		

* No socket on right-hand thread side

☉ : Available



Spare parts

Shape	Description	Availability	Dimension (mm)						Angle		Remarks
			A	B	C	D	E	F	α	θ	
	LL -03N	☉	7.8	6.3							
	-03SN	☉	11.1	8.9	-	-	-	-	-	-	
	-03TN	☉	8.3	8.9							
	LL -05C	☉	10.7	11.7						12°	
	-1CN	☉	13.0	13.3	-	-	-	-	-	14°	
	-2C	☉	18.8	17.6						14°	
	LL -1K	☉	10.0	12.0							
	-1N	☉	10.3	12.0							
	-1DN	☉	12.3	12.0							
	-2K	☉	13.3	13.2							
	-2N	☉	13.5	13.0							
	-3K	☉	16.0	14.8							
	-3N	☉	16.4	13.0							
	-4N	☉	16.4	14.7							
	-5N	☉	17.1	16.7							
-6	☉	20.7	21.0								
	LP -2S	☉	3.65	20.0	-	-	-	-	-	-	
	-6S	☉	3.65	25.0	-	-	-	-	-	-	
	LPA -11	☉		11.0							
	-13	☉	2.8	13.0	4.2	-	-	-	-	60°	
	-17	☉		17.0							
	LPF -11	☉		11.0							
	-1113	☉	2.5	13.0	3.5	-	-	-	-	60°	
	-1117	☉		17.0							
	-13	☉	3.8	13.0	5.5	-	-	-	-		
-17	☉		17.0								
	PP -4	☉	4.6	14.0	5.5	-	3.0	-	-	-	
	TS -3S	☉	M5X0.8	15.0	3.60	-	2.0	-	-	-	
	WP -1S	☉	M5X0.8	18.0	3.65	-	-	-	-	-	
	5X15	☉		15.0	5.0						
	WP 5X11	☉	M5X0.8	10.5	5.0	-	2.0	-	-	-	
	LSP -1	☉	5.0	5.3							
	-2	☉	6.5	5.6							
	-3	☉	8.25	7.9							
	-4	☉	9.5	10.0							
	LSP -2K	☉	5.1	5.2							
-3K	☉	6.7	5.7								
	P -03	☉	2.8	1.95	-	-	-	-	-	-	
	-03S	☉	3.5	1.95	-	-	-	-	-	-	

☉: Available

P



Spare parts

Shape Handed spare parts show right-hand	Description	Availability	Dimension (mm)						Angle		Remarks
			A	B	C	D	E	F	α	θ	
	DC -42	☉	12.0	3.2	1.2	6.0	4.4	R1.2	-	-	Shim screw: SB-4085TR
	-44	☉	12.55	5.0	1.5			R0.8	-	-	
	DC -44-C	☉	12.55	5.0	1.5	6.0	4.4	-	-	-	Shim screw: SB-4085TR
	DD -42	☉	12.55	3.2	1.2	6.0	4.4	R1.2	-	-	Shim screw: SB-4085TR
	-42-16	☉						R1.6			
	-43	☉		3.4	1.3			R0.8			
	-44	☉		5.0	1.5						
	DS -42	☉	12.0	3.2	1.2	6.0	4.4	R1.2	-	-	Shim screw: SB-4085TR
	-44	☉	12.55	5.0	1.5			R0.8			
	DT -32	☉	8.63	3.2	0.95	5.0	3.4	R1.6	3°	-	Shim screw: SB-3080TR
	-42	☉	12.46		1.2	6.0	4.4	R1.2	-	-	Shim screw: SB-4085TR
	DV -33	☉	9.40	3.5	1.2	6.0	4.4	R1.0	-	-	Shim screw: SB-4085TR
	DW -42	☉	11.5	3.2	1.2	6.0	4.4	R1.2	4°	-	Shim screw: SB-4085TR
	-44	☉	12.65	5.0	1.5			R0.8	-	-	
	556 C%	☉	34.0	10.0	12.7	5.6	5.0	R1.6	0°	55°	R...shows Right-hand L...shows Left-hand Shim screw: HH5X16
	KPS -42	☉	11.5	3.2	2.0	7.2	3.2	C1.0	7°	-	Shim screw: SP3X8
	KPT -32	☉	8.0	3.2	1.9	7.0	3.2	R0.4	11°	-	Shim screw: SP3X8 SP3X10
	-42	☉	10.5	3.2	1.9	7.0	3.2	R0.8	11°	-	
	KVN -32	☉	9.52	3.2	2.1	7.6	5.5	R0.8	-	-	Lock pin: LP-2S LP-6S
	LC -32N	☉	9.47	2.4	1.3	6.18	4.68	R0.8	-	-	Shim pin: LSP-1
	-4K	☉	11.7	3.2	1.4	8.1	6.73	R0.8	-	-	Shim pin: LSP-3K
	-42N	☉	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim pin: LSP-2
	-42N-20	☉						R2.0			
	-53N	☉	15.9	4.8	1.7	10.0	8.0	R1.2	-	-	Shim pin: LSP-3
	-63	☉	19.0	4.8	2.0	11.61	9.3	R1.6	-	-	Shim pin: LSP-4

☉: Available



Spare parts

Shape Handed spare parts show right-hand	Description	Availability	Dimension (mm)						Angle		Remarks
			A	B	C	D	E	F	α	θ	
	LC -42N-C	☉	12.65	3.2	1.5	8.01	6.28	-	-	-	Shim pin: LSP-2
	-53N-C	☉	15.9	4.8	1.7	10.0	8.0	-	-	-	Shim pin: LSP-3
	-63-C	☉	19.0	4.8	2.0	11.61	9.3	-	-	-	Shim pin: LSP-4
	LC -42N ^{90°}	☉	12.65	3.2	1.5	8.01	6.28	R0.8	10°	-	R... shows right-hand L... shows left-hand Shim pin: LSP-2
	LD -32N	☉	9.47	2.4	1.3	6.18	4.68	R0.8	-	-	Shim pin: LSP-1
	-4K	☉	11.7	3.2	1.4	8.1	6.73	R0.8	-	-	Shim pin: LSP-3K
	-4K43	☉		4.8	3.0	8.3	6.60	R1.2			
	-42	☉	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim pin: LSP-2
	-42-20	☉	12.65	4.8	3.1	8.5	6.28	R2.0			
	-43	☉						R0.8			
-43-20	☉					R2.0	-	-			
	LR -80	☉	9.47	3.2	1.3	6.25	4.75	-	-	-	Shim pin: LSP-1
	-81	☉	12.65	3.2	1.5	8.01	6.28	-	-	-	Shim pin: LSP-2
	LR -10C	☉	8.5	3.2	6.3	6.3	4.7	-	-	-	Shim pin: LSP-1
	-12C	☉	10.0	3.2	6.3	6.3	4.7	-	-	-	Shim pin: LSP-2
	-16C	☉	13.6	3.2	7.9	8.01	6.28	-	-	-	
	LS -32	☉	9.47	3.2	1.3	6.18	4.68	R0.8	-	-	Shim pin: LSP-1
	-42	☉	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim pin: LSP-2
	LT -3K	☉	8.53	2.7	1.0	6.1	5.13	R0.8	-	-	Shim pin: LSP-2K
	-32N	☉	9.47	2.7	1.3	6.18	4.68	R0.8	-	-	Shim pin: LSP-1
	-32N-20	☉						R2.0			
	-42N	☉	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim pin: LSP-2
	-42N-20	☉					R2.0				
	LW -32N	☉	9.47	2.4	1.3	6.18	4.68	R0.8	-	-	Shim pin: LSP-1
	-42N	☉	12.65	3.2	1.5	8.01	6.28	R0.8	-	-	Shim pin: LSP-2
	LW -42N ^{90°}	☉	12.65	3.2	1.5	8.01	6.28	R0.8	10°	-	R... shows right-hand L... shows left-hand shim pin: LSP-2
	MFPN -45	☉	17.07	3.5	1.95	9.8	7.18	R3.5	-	-	Shim screw: SPW-7050
	MFSE -105	☉	10.5	3.0	1.4	7.0	5.3	-	7°	45°	Shim screw: SPW-5035
	MFWN -90	☉	15.25	4.0	2.5	9.44	7.25	R3.0	-	-	Shim screw: SPW-7050
								R4.0			
	MSD -42	☉	10.7	3.2	1.85	7.0	3.3	-	20°	45°	Shim screw: SP3X8
	MSE -4245S	☉	10.3	3.2	2.0	6.0	5.0	-	20°	45°	Shim screw: SP4X9
	MSE -4215	☉	10.53	3.2	1.5	6.4	3.4	-	25°	15°	Shim screw: SP3X8
	-4245	☉	10.53	3.2	1.5	6.4	3.4	-	25°	45°	Shim screw: SP3X8

P



Spare parts

☉: Available

Shape	Description	Availability	Dimension (mm)							Angle		Remarks
			A	B	C	D	E	F	α	θ		
	MS0 -4T245	●	10.0	2.0	4.7	6.4	4.8	-	27°	45°	Shim screw: SP3X6	
	MS0 -5200	●	12.6	3.18	1.8	8.27	6.66	R0.8	15°	-	Shim screw: SPW-6045	
	MSP -42	●	11.3	3.2	1.85	7.0	3.3	-	15°	15°	Shim screw: SP3X8	
	MTE -42	●	9.8	3.2	-	6.4	3.4	-	25°	-	Shim screw: SP3X8	
	MVN -32	●	9.52	3.2	2.1	7.4	6.5	R0.8	-	-	Lock pin: TS-35	
	PD -42	●	12.7	3.2	1.7	6.0	8.4	0.8	12°	-	Shim screw: SB-2050TR	
	SP -129	●	9.52	9.52	R0.8	R1.6	R1.2	R1.6	-	-	Shim screw: HH3X12	
	SP -141	●	12.7	4.0	2.4	6.2	3.3	R1.2	-	-	Shim screw: M3X8	
	-143	●	12.7	7.2	2.4	6.2	3.3	R1.2	-	-	Shim screw: M3X12	
	-162	●	15.8	6.0	3.4	8.0	4.4	R1.5	-	-	Shim screw: M4X10	
	SP -148	●	12.7	8.8	2.4	6.2	3.3	R1.2	-	-	Shim screw: BH3X12	
	SP -219	●	6.35	9.52	R0.8	R1.2	R1.6	-	-	-	Shim screw: HH3X12	
	SP -221	●	9.52	4.0	2.5	6.5	3.5	R1.2	-	-	Shim screw: M3X8	
	-223	●	9.52	7.2	2.5	6.5	3.5	R1.2	-	-	Shim screw: M3X12	
	SP -342	●	12.7	6.0	2.5	6.5	3.5	R1.2	-	75°	Shim screw: M3X8	
	-441	●	12.7	4.0	2.5	6.2	3.3	R0.8	-	80°	Shim screw: M3X8	
	-443	●	12.7	7.2	2.5	6.2	3.3	R0.8	-	80°	Shim screw: M3X12	
	-454	●	15.7	8.0	3.4	8.0	4.5	R1.6	-	80°	Shim screw: M4X10	

● : Available



Spare parts

Shape	Description	Availability	Dimension (mm)						Angle		Remarks
			A	B	C	D	E	F	α	θ	
	SP -429	●	9.52	9.52	-	-	-	R1.2	-	-	Shim Screw : HH3X12
	SP -541	●	12.7	4.0	2.5	6.2	3.3	R1.2	-	-	Shim Screw : M3X8
	-543	●		7.2							Shim Screw : M3X12
	SP -826	●	9.52	7.9	-	-	-	-	-	-	Shim Screw : HH3X12
	-829	●	9.52	9.52	-	-	-	-	-	-	
	SP -841	●	12.7	4.0	2.4	6.2	3.3	-	-	-	Shim Screw : M3X8
	-843	●	12.7	7.2	2.4	6.2	3.3	-	-	-	Shim Screw : M3X12
	-849	●	12.7	8.8	2.4	6.2	3.3	-	-	-	Shim Screw : BH3X12
	-861	●	15.8	6.0	3.4	8.0	4.4	-	-	-	Shim Screw : M4X10
	SP -130A	●	9.52	3.2	-	R0.4	R0.8	R1.2	8°	-	Shim Screw : BH3X12
	SP -210A	●	6.35	3.2	R0.4	R0.8	R1.2	-	8°	-	Shim Screw : BH3X6
	SP -420A	●	9.52	3.2	-	-	R0.8	R1.2	8°	-	Shim Screw : BH3X6
	SP -141P	●	12.7	4.0	2.4	6.2	3.3	R1.2	7°	-	Shim Screw : M3X8
	-143P	●	12.7	7.2	2.4	6.2	3.3	R1.2	7°	-	Shim Screw : M3X12
	SP -230P	●	8.3	3.2	2.0	7.2	3.2	R0.5	7°	-	Shim Screw : SP3X10
	SP -341P	●	12.6	4.0	2.5	6.5	3.5	R1.2	7°	-	Shim Screw : M3X8
	SP -441P	●	12.7	4.0	2.5	6.2	3.3	R1.2	11°	-	Shim Screw : M3X8
	-443P	●		7.2							Shim Screw : M3X12

● : Available



Spare parts

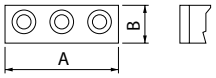

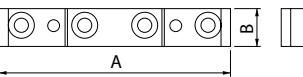
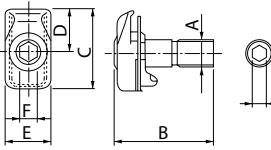
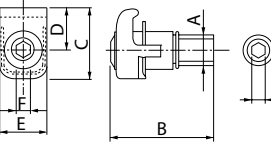
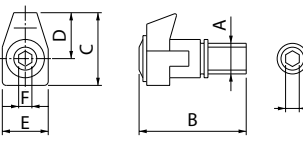
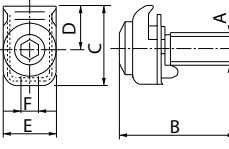
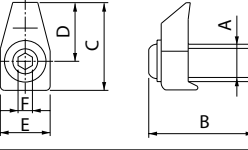
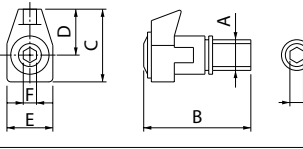
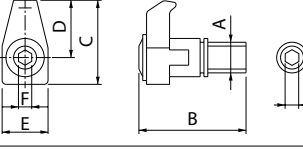
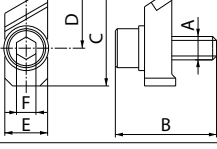
Shape Handed spare parts show right-hand	Description	Availability	Dimension (mm)						Angle		Remarks
			A	B	C	D	E	F	α	θ	
	SP -RC	☉	12.6	3.0	-	7.35	3.35	-	-	-	Shim screw: SP3X8
	SVN -32	☉	8.0	3.2	1.5	3.1	2.3	R0.4	-	-	Shim screw: SB-2050TR
	SVN -32N	☉	8.2	3.2	1.5	7.0	5.9	R0.6	-	-	Shim screw: SS-4N
	SVN -32S	☉	8.2	3.2	1.5	7.0	5.9	R0.2	-	-	Shim screw: SS-4N 1-edge
	TN -32	☉	9.52	3.2	6.5	7.0	4.2	R0.4	-	-	Shim screw: SP3X8
	-43	☉	12.70	3.2	8.1	7.0	4.2	R0.5	-	-	
	TNW -32	☉	9.52	3.2	4.8	7.0	4.2	-	-	-	Shim screw: SP3X8
	WTN -33	☉	9.52	4.76	2.5	7.0	5.3	R0.8	-	-	Shim pin: WP-1S
	-33-20	☉						R2.0			
	WWN -42	☉	12.7	3.0	1.4	7.0	5.3	R1.2	-	-	Shim pin: WPSX15
	WWP -42	☉	12.7	3.0	1.5	8.3	5.3	R1.2	11°	-	Shim pin: WPSX11
	-42-16	☉						R1.6			
	MAP -2216	☉	-	9.0	11.0	19.8	-	-	20°	-	Clamp screw SB-40140TR
	MAP -2506	☉	-	9.5	14.9	20	-	-	5°	-	Clamp screw SB-40140TR
	LSE -445R	☉	12.7	13.0	19.5	26.0	-	-	20°	45°	Dimension A shows insert I.C.
	LSO -445R	☉	13.494	12.0	21.3	23.5	-	-	27°	45°	

☉: Available

P

Spare parts

Clamp sets

Shape Handed spare parts show right-hand	Description	Availability	Dimension (mm)							Remarks
			A	B	C	D	E	F	G	
	BCS -1	☉	64.0	13.0	-	-	-	-	-	
	-5	☉	48.0	16.5	-	-	-	-	-	
	BCS -2	☉	74.0	15.0	-	-	-	-	-	
	-3	☉	88.0	16.0	-	-	-	-	-	
	BCS -4	☉	98.0	16.0	-	-	-	-	-	
	CE -010	☉	M8X1.25	28.0	24.0	12.8	13.0	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts
	-220	☉			27.0	15.8	15.0			
	CE -020	☉	M8X1.25	30.0	17.0	10.5	12.7	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts
	CE -030	☉	M8X1.25	30.0	19.0	12.5	12.7	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts
	-040	☉			22.5	16.0				
	CE -320	☉	M6X1.0	24.5	18.2	9.7	12.7	4.0	-	
	CE -360S	☉	M6X1.0	16.0	18.0	10.55	12.4	4.0	-	
	CE -030A	☉	M8X1.25	30.0	20.0	13.7	12.7	4.0	-	G: Indicates hexagon hole two side widths of back side of bolts
	CE -410	☉	M8X1.25	30.0	26.0	19.5	12.7	4.0	4.0	G: Indicates hexagon hole two side widths of back side of bolts
	-430	☉			29.0	22.5				
	CP -RC%L	☉	M6X1.0	20.0	24.5	14.8	11.0	5.0	-	R...shows right-hand L...shows left-hand

☉: Available



Spare parts

Shape Handed Spare Parts show Right-hand	Description	Availability	Dimension (mm)							Remarks
			A	B	C	D	E	F	G	
	CPS -1	☉	M3X0.5	9.0	10.0	5.2	5.5	2.0	-	
	CPS -2	☉	M5X0.8	14.5	14.0	8.5	6.8	2.5	2.5	G: Indicates hexagon hole two side widths of back side of bolts
	-2P	☉		18.0						
	-3	☉	M6X1.0	19.0	16.5	10.0	8.8	3.0	3.0	
	CPS -2S	☉	M5X0.8	13.5	14.0	8.5	6.8	T15	2.0	G: Indicates hexagon hole two side widths of back side of bolts
	-2TR	☉		15.0						
	CPS -4V	☉	M4X0.7	8.9	11.3	7.3	8.0	T10	-	G: Indicates hexagon hole two side widths of back side of bolts
	-5F	☉	M5X0.8	11.3	12.7	7.5	10.3	T15	2.5	
	-5S	☉		18.0	15.0	9.5	11.0		2.0	
	-5V	☉		13.5	12.7	7.5	10.3		2.5	
	CPS -6F	☉	M6X1.0	16.5	15.6	9.5	12.2	3.0	-	G: Indicates hexagon hole two side widths of back side of bolts
	-6M	☉		18.5	17.5	11.0	13.0		3.0	
	-6S	☉			18.0	12.0	12.0			
	-6V	☉			15.6	9.5	12.2			
	-8V	☉	M8X1.25	24.0	20.8	13.0	15.5	4.0	4.0	
	CPS -5E	☉	M5X0.8	13.5	17.5	12.0	9.0	T15	2.5	G: Indicates hexagon hole two side widths of back side of bolts
	CPS -5%L	☉	M5X0.8	18.0	17.5	12.0	9.0	2.5	2.5	G: Indicates hexagon hole two side widths of back side of bolts R...shows Right-hand Thread L...shows Left-hand Thread
	LGBA -16%S	☉	M5X0.8	15.0	16.1	11.2	9.85	T15	2.0	G: Indicates hexagon hole two side widths of back side of bolts R...shows right-hand L...shows left-hand
	-22%S	☉			17.6	12.7				
	WCS -1N	☉	M6X1.0	21.0	15.7	-	15.0	3.0	-	
	WCS -8	☉	M6X1.0	21.0	19.4	-	15.0	3.0	-	

☉: Available



Spare parts

Shape Handed spare parts show right-hand	Description	Availability	Dimension (mm)						Angle		Remarks
			A	B	C	D	E	F	α	θ	
	C 08R	●	7.6	8.7	8.9	3.6	M5X0.8 (Left-hand Thread)	-	10°	-	
	C 09N	●	6.0	9.0	9.8	5.3	M6X1.0 (Left-hand Thread)	-	10°	-	Clamp screw: W6X18N
	CH -20R	●	13.1	15.5	14.8	7.5	5.3	-	10°	-	Clamp screw: TH8X15
	CGA -3%/	●	24.0	17.66	12.0	6.2	1.9	11.0	-	-	R...shows right-hand L...shows left-hand
	-4%/	●	24.0	17.66	12.0	6.2	2.9	11.0	-	-	
	-5%/	●	27.5	18.66	12.0	6.2	3.9	14.5	-	-	
	CGB 5%/	●	19.0	14.0	8.2	6.35	9.5	-	-	-	R...shows right-hand L...shows left-hand
	CGH -1%/	●	25.0	22.0	8.0	6.05	3.0	5.5	-	-	R...shows right-hand L...shows left-hand
	-2%/	●					5.0				
	-3%/	●	30.0	23.0	8.5		6.0	7.0			
	CGIA -3R	●	10.7	17.0	10.5	5.2	1.8	2.0	-	-	
	-4R	●			11.5		2.5				
	-5R	●	15.7	10.5	3.5		7.0				

● - Available



Spare parts

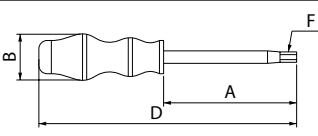
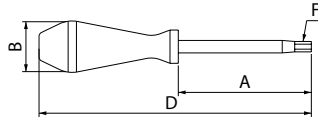
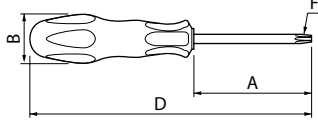
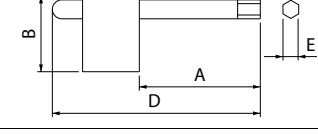
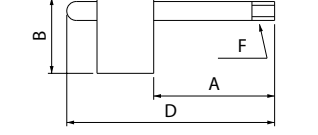
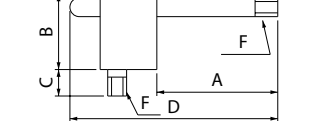
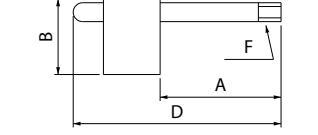
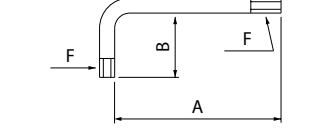
Shape Handed spare parts show right-hand	Description	Availability	Dimension (mm)						Angle		Remarks
			A	B	C	D	E	F	α	θ	
	CP -2D	☉		10.0	21.6			10.4			
	-3D	☉	-	12.0	27.6	-		14.0	-	-	-
	-5D	☉		13.0	32.0						
	CP -2D-90°-JCT	☉	-	13.5	25.3	-		21.5	-	-	-
	CP -3D-90°-JCT	☉			26.4			17.9			
	-4D-90°-JCT	☉	-	13.1	28.4	-		18.2	-	-	-
	-5D-JCT	☉			31.9			21.5			
	CP -8TE	☉	17.9	12.0	12.0	M8X1.25 (Left-hand Thread)		10.0	-	15°	-
	CP -8W	☉	20.9	12.0	8.0	M8X1.25 (Left-hand Thread)		13.0	-	3°	-
	CB -11	☉	11.5	12.7	3.5	-	-	-	-	-	-
	-51	☉	16.0	15.6	3.5	-	-	-	-	-	-
	CB -12	☉	14.0	12.7	3.5	-	-	-	-	-	Right-hand
	-13	☉	14.0	12.7	3.5	-	-	-	-	-	Left-hand
	CB -14	☉	18.51	12.7	3.5	-	-	-	-	-	Right-hand
	-15	☉	18.51	12.7	3.5	-	-	-	-	-	Left-hand
	CB -16	☉	18.0	12.7	3.5	-	-	-	-	-	
	-17	☉	21.0	15.6	3.5	-	-	-	-	-	
	CB -S3220	☉	7.94	7.94	1.0	2.0	-	-	-	-	
	-S4220	☉	11.12	11.12	2.0	2.0	-	-	-	-	
	CB -T2212	☉	7.48	-	1.5	1.2	-	-	-	-	
	-T3220	☉	10.87	-	2.0	2.0	-	-	-	-	

☉: Available



Spare parts

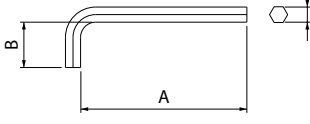
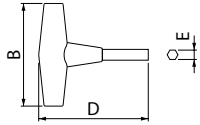
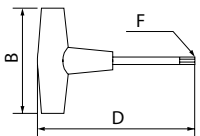
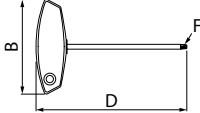
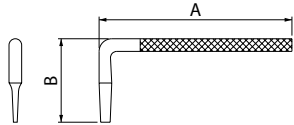
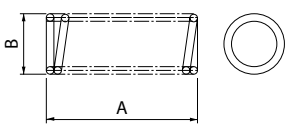
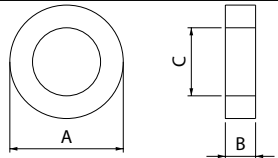
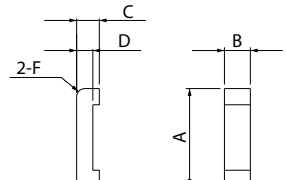
Wrenches

Shape	Description	Availability	Dimension (mm)						Angle		Remarks			
			A	B	C	D	E	F	α	θ				
	DT -7	☉	44	16	-	114	-	T7	-	-	Torx			
	-8	☉	70	26	-	150	-	T8	-	-				
	DT -10	☉	70	29	-	160	-	T10	-	-	Torx			
	-15	☉	70	32	-	170	-	T15	-	-				
	-20	☉	90	32	-	190	-	T20	-	-				
	-25	☉	82	36	-	190	-	T25	-	-				
	DTM -6	☉	40	17	-	115	-	T6	-	-	Torx Top of wrench is magnetized			
	-7	☉	44	17	-	119	-	T7	-	-				
	-8	☉	70	24	-	150	-	T8	-	-				
	-10	☉	70	28	-	167	-	T10	-	-				
	-15	☉	70	31	-	174	-	T15	-	-				
	DTP	-6	☉	73	23	-	150	-	6IP	-	-	IP shows Torx Plus		
		-7	☉						7IP					
		-9	☉	61	30				174				-	9IP
		-15	☉	81	33				186				-	15IP
		-20	☉	100					206				-	20IP
DTPM	-8	☉	70	24	-	150	-	8IP	-	-	IP shows Torx Plus Top of wrench is magnetized			
	-10	☉	70	28	-	165	-	10IP	-	-				
	-15	☉	70	31	-	174	-	15IP	-	-				
	FH -2	☉	40	20	-	71	2.0	-	-	-	Hexagon			
	-2.5	☉	45	20	-	76	2.5	-	-	-				
	FT -6	☉	35	15	-	65	-	T6	-	-	Torx			
	-7	☉	34	15	-	62	-	T7	-	-				
	-8	☉	40	20	-	74	-	T8	-	-				
	-10	☉	40	20	-	74	-	T10	-	-				
	FT -15	☉	45	25	10	80	-	T15	-	-	Torx			
	FTP -5	☉	35	15	-	65	-	5IP	-	-	IP shows Torx Plus			
	-6	☉	34			62	-	6IP						
	LTW -8SS	☉	43	6	-	-	-	T8	-	-	Torx			
	-10S	☉	62	10				T10						
	-10SS	☉	47	7				T10						
	-15S	☉	62	10				T15						
	-20	☉	58	19				T20						
	-25	☉	65	20				T25						

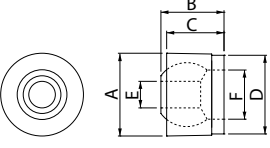
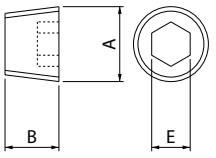
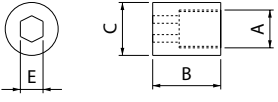
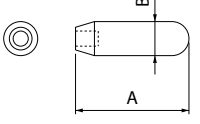
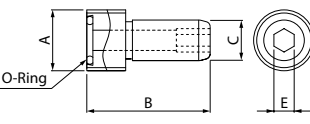
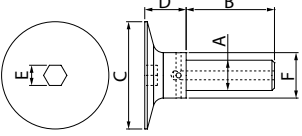
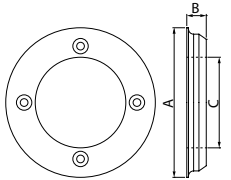
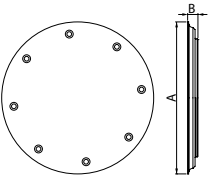
☉: Available



Spare parts

Shape	Description	Availability	Dimension (mm)						Angle		Remarks
			A	B	C	D	E	F	α	θ	
	LW	-1.5	⊙	45	14			1.5			Hexagon
		-2	⊙	50	16			2.0			
		-2.5	⊙	56	18			2.5			
		-3	⊙	63	20			3.0			
		-4	⊙	70	25			4.0			
		-4.5	⊙	78	26			4.5			
		-5	⊙	80	28	-	-	5.0	-	-	
		-6	⊙	90	32			6.0			
		-8	⊙	109	36			8.0			
		-10	⊙	112	40			10.0			
		-14	⊙	140	56			14.0			
		-17	⊙	160	63			17.0			
		-19	⊙	180	70			19.0			
	TH	-4	⊙	-	80	-	83	4.0	-	-	Hexagon
	TT	-15	⊙		70		118		T15		Torx
		-25	⊙		70		69		T25		
		-25L	⊙		80		145		T25		
		-30	⊙		80		110		T30		
	TTC	-20	⊙		98		130		T20		
		-25	⊙		98		130		T25		
	TTW	-15	⊙	-	80	-	125	-	T15	-	Torx
	LTK	-5	⊙	70	30	-	-	-	-	-	
	SP	-20	⊙	8.5	5.6						Spring
		-30	⊙	12.0	7.2						
		-5	⊙	12.0	6.7						
		-50	⊙	12.0	7.2						
		-6	⊙	12.0	7.7						
	W	-6	⊙	11.5	1.6	6.4					Washer
		6-14	⊙	11.5	1.4	6.4					
	WB	-5	⊙	10.0	1.0	5.3					Washer (Brass)
		-6	⊙	11.5	1.6	6.4					
	-8	⊙	15.5	1.6	8.4						
	WSP	-1	⊙	15.1	4.0	3.5	2.5	-	R1.25	-	Spacer

⊙ : Available

Shape	Description	Availability	Dimension (mm)						Angle		Remarks
			A	B	C	D	E	F	α	θ	
	DN 10	☉	6.2	5.1	4.5	5.7	2.6	4.0	-	-	Nozzle
	20	☉	10.1	7.7	7.0	9.6	M4X0.7	6.0	-	-	
	GP -1	☉	PT1/8	7.0	-	-	5.0	-	-	-	Plug
	-2	☉	PT1/4	9.0	-	-	6.0	-	-	-	
	WN -1	☉	M5X8	10.0	7.0	-	3.0	-	-	-	Nut
	PC -1	☉	60.0	8.5	-	-	-	-	-	-	Punch
	-2	☉	62.2	10.0	-	-	-	-	-	-	
	CL 63-1	☉	M18X1.0	36.5	12	-	6.0	-	-	-	Coolant pipe
	100-1	☉	M24X1.5	44.0	16.0	-	8.0	-	-	-	
	HH 12X35HC	☉	M12X1.75	35.0	42.5	16.4	8.0	18.0	-	-	Arbor bolt
	HF 16X48HC	☉	M16X2.0	30.0	62.5	18.4	12.0	40.0	-	-	
	CC -125-MFAH	☉	87.5	11.4	53.0	-	-	-	-	-	Coolant cover
	-160-MFAH	☉	122.5	12.4	70.0	-	-	-	-	-	
	CC -200-MFAH	☉	162.5	14.4	-	-	-	-	-	-	Coolant cover
	-250-MFAH	☉	212.5								
	-315-MFAH	☉	277.5								

☉ : Available



Spare parts

External toolholders

Description			Spare Parts					
			Lever	Lock screw	Shim	Shim Pin	Punch	Wrench
PSBN%	1616H	-09	LL-1N	LS-1N	LS-32	LSP-1	PC-1	FH-2.5
PSKN%	1616H	-09	LL-1N	LS-1N	LS-32	LSP-1	PC-1	FH-2.5

External toolholders

Description			Spare Parts			
			Lever	Lock screw	Shim Pin	Wrench
PTGN%	1212F	-11	LL-03N	LS-03N	P-03	FH-2
	.....	-11	LL-03TN	LS-03SN	P-03S	FH-2.5
PTFN%	1212F	-11	LL-03N	LS-03N	P-03	FH-2
	.....	-11	LL-03TN	LS-03SN	P-03S	FH-2.5

Toolholders for ceramic tools

Description			Spare parts				
			Chipbreaker	Clamp set	Wrench	Shim	Shim screw
CCLNR	2525M	-16	CB-17	CE-220	LW-4	SP-454	M4X10
CS-N%	.....	-12	CB-11	CE-020	LW-4	SP-141 *(SP-143)	M3X8 *(M3X12)
CSKN%	.....	-12	CB-11	CE-020	LW-4	SP-141 *(SP-143)	M3X8 *(M3X12)
CSYN%	.....	-12	CB-11	CE-020	LW-4	SP-141 *(SP-143)	M3X8 *(M3X12)
CSSN%	.....	-12	CB-11	CE-020	LW-4	SP-141 *(SP-143)	M3X8 *(M3X12)

* Shim & shim screw: When using SN□□1204 Insert, purchase spare parts in () separately.

Toolholders for ceramic tools

Description			Spare parts			
			Clamp set	Wrench	Shim	Shim screw
CCLN%	.....	-12GX	CE-410	LW-4	SP-441	M3X8
CDHN%	.....	-12GX	CE-410	LW-4	SP-521	M3X8
	.....	-15GX	CE-430		SP-541	
CDJN%	.....	-12GX	CE-410	LW-4	SP-521	M3X8
	.....	-15GX	CE-430		SP-541	
CSRN%	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10
CSDNN	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10
CSSN%	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10
CS-N%	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10
CSKN%	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10
CSYN%	.....	-12GX	CE-410	LW-4	SP-141	M3X8
	.....	-15GX			SP-162	M4X10

P

Spare parts

Toolholders for solid CBN tools

Description	Spare parts			
	Clamp set	Wrench	Shim	Shim screw
CCLN% -09A	CE-030A	LW-4	SP-429	HH3X12
CSRN% 2525M -09A 2525M -12A	CE-030A	LW-4	SP-129	HH3X12
			SP-148 *(SP-143)	BH3X12
CSKN% 2525M -09A 2525M -12A	CE-030A	LW-4	SP-129	HH3X12
			SP-148 *(SP-143)	BH3X12
CSYN% 2525M -09A 2525M -12A	CE-030A	LW-4	SP-129	HH3X12
			SP-148 *(SP-143)	BH3X12
CSDNN -09A 2525M -12A	CE-040	LW-4	SP-129	HH3X12
			SP-148 *(SP-143)	BH3X12
CTUN% -11A	CE-030A	LW-4	SP-219	HH3X12

* Shim for-12A type toolholder : When using SN□□1204 insert, purchase spare parts in () separately.

Toolholders for bearing machining

Description	Spare parts					
	Lever	Lock screw	Shim	Shim pin	Punch	Wrench
PRGC% -12BE -16BE	LL-1CN	LS-1N	LR-12C	LSP-1	PC-1	FH-2.5
	LL-2C	LS-1T	LR-16C	LSP-2	PC-2	FH-2.5
PRGC% -12BF -16BF	LL-1CN	LS-1N	LR-12C	LSP-1	PC-1	FH-2.5
	LL-2C	LS-1T	LR-16C	LSP-2	PC-2	FH-2.5

Toolholders for back turning

Description	Spare parts			
	Anchor pin	Lock screw	Clamp screw	Wrench
AABSR 0810K -40F 1010.. -40F 1212.. -40F 1616.. -40F	LPA-11	HSB4X8R	-	FH-2
	LPA-13			
	LPA-17			
	-			
SABSR -40F	-	-	SB-3080TR	FT-10
AABWR 0810K -40F 1010.. -40F 1212.. -40F 1616.. -40F	LPA-11	HSB4X8R	-	FH-2
	LPA-13			
	LPA-17			
	-			
SABWR -40F	-	-	SB-3080TR	FT-10
AABWR 0810K -50F 1010.. -50F 1212.. -50F 1616.. -50F	LPA-11	HSB4X8R	-	FH-2
	LPA-13			
	LPA-17			
	-			
SABWR -50F	-	-	SB-3080TR	FT-10

KTKF

Description	Spare parts	
	Clamp screw	Wrench
KTKF% -12 -16	SB-4590TRWN	LTW-10S



Spare parts

External toolholders (back clamp)

Description	Spare Parts		
	Anchor Pin	Lock Screw	Wrench
ACLC%	0810K -06F	LPF-11	HSB4X8%
	1010K -06F		
	1010K -09F		
	1212M -09F		
	1616M -09F		
ADJC%	0810K -07F	LPF-11	HSB4X8%
	1010K -07F		
	1010K -11F		
	1212M -11F		
	1616M -11F		
ADNCR	0810K -07F	LPF-11	HSB4X8R
	1010K -07F		
	1010K -11F		
	1212M -11F		
	1616M -11F		
AVJB%	1010K -11F	LPF-11	HSB4X8%
	1212M -11F		
	1616M -11F		
AVVBR	1010K -11F	LPF-1113	HSB4X8R
	1212M -11F		
	1616M -11F		

* Lock screw: HSB4X8R for R-hand toolholder, HSB4X8L for L-hand toolholder.

External toolholders (screw clamp)

Description	Spare parts		
	Clamp screw	Wrench	
SCLC%	..... -06	SB-2570TR	FT-8
	..... -09	SB-4085TR	FT-15
	..... -12	SB-5090TR	LTW-20
SCAC%	..... -06	SB-2570TR	FT-8
	..... -09	SB-4085TR	FT-15
	1212F -09FF		
SDJC%	..... -07F	SB-2570TR	FT-8
	..... -11F	SB-4085TR	FT-15
SDLC%	..... -07FF	SB-2570TR	FT-8
	..... -11FF	SB-4085TR	FT-15
SDXC%	..... -07	SB-2570TR	FT-8
	..... -11	SB-4085TR	FT-15
SDNC%	..... -07F	SB-2570TR	FT-8
	..... -11F	SB-4085TR	FT-15
SDNCN	..... -07	SB-2570TR	FT-8
	..... -11	SB-4085TR	FT-15
SDLP%	..... -07F	SB-2570TR	FT-8
	..... -11F	SB-4085TR	FT-15
STGC%	..... -08	SB-2050TR	FT-6
STGP%	..... -08	SB-2050TR	FT-6
	..... -11	SB-3080TR	FT-10
	..... -11	SB-2570TR	FT-8
SVJB%	..... -11F	SB-2570TR	FT-8
SVLP%	..... -08FF	SB-2050TR	FT-6
	..... -11FF	SB-2570TR	FT-8
	..... -11F		
SVPP%	..... -08FF	SB-2050TR	FT-6
	..... -11FF	SB-2570TR	FT-8
	..... -11		
SYXP%	..... -06F	SB-2050TR	FT-6

P

Spare parts

External toolholders (screw clamp)

Description	Spare parts		
	Clamp screw	Wrench	Plug
SCLCR -09FFJCT	SB-4085TR	FT-15	GP-1
SDJCR -11..JCT	SB-4085TR	FT-15	GP-1
SVJBR -11FFJCT	SB-2570TR	FT-8	GP-1
SVJPR -11FFJCT	SB-2570TR	FT-8	GP-1

External toolholders (screw clamp)

Description	Spare parts				
	Clamp screw	Wrench	Shim	Shim screw	Wrench
SVBP% -11	SB-2570TR	FT-8	-	-	-
..... -16N	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4
SVVBN -11	SB-2570TR	FT-8	-	-	-
..... -16N	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4

External toolholders (top clamp)

Description	Spare Parts				
	Clamp Set	Wrench	Shim	Shim Screw	Chipbreaker
CSBP% -09N	CPS-2P	LW-2.5	-	-	CB-S3220
CSKP% -09N	CPS-2P	LW-2.5	-	-	CB-S3220
..... -12N	CPS-3	LW-3	KPS-42	SP3X8	CB-S4220
CSSP% -09N	CPS-2P	LW-2.5	-	-	CB-S3220
..... -12N	CPS-3	LW-3	KPS-42	SP3X8	CB-S4220
CSDPN -12N	CPS-3	LW-3	KPS-42	SP3X8	CB-S4220
CTGP% -11N	CPS-2P	LW-2.5	-	-	CB-T2212
..... -16N	CPS-3	LW-3	KPT-32	SP3X8	CB-T3220
CTFP% -11N	CPS-2P	LW-2.5	-	-	CB-T2212
..... -16N	CPS-3	LW-3	KPT-32	SP3X8	CB-T3220
CTTP% -11N	CPS-2P	LW-2.5	-	-	CB-T2212
..... -16N	CPS-3	LW-3	KPT-32	SP3X8	CB-T3220



Spare parts

EZ Bar PLUS

Description	Spare parts	
	Clamp screw	Wrench
S045X-SCLCR03-050EZ	SB-1635TR	FT-6
S060X-SCLCR04-070EZ	SB-2035TR	
C045X-SCLCR03-050EZ	SB-1635TR	FT-6
C060X-SCLCR04-070EZ	SB-2035TR	

Twin-bars

Description	Spare parts	
	Clamp screw	Wrench
STW%L -15	SB-3080TR	LTW-10S
STWSR -15T	SB-3080TR	LTW-10S

System tip-bars

Description	Spare parts			
	Clamp screw	Wrench	Screw (Side stopper)	Wrench
SVNR 1010H -12 1212K -12 1616K -12 2020K -12 2525M -12	SB-3080TR	FT-10	HS3X4	LW-1.5
			HS3X8	
			HS3X12	
			HS3X16	
			SVNSR -12-..		SB-3080TR	LTW-10S	HS3X4	LW-1.5
S12F- SVNR 12	SB-3080TR	FT-10	HS3X4	LW-1.5
S14G- SVNR 12				
S16H- SVNR 12				
S19H- SVNR 12				
S19N- SVNR 12				
S20H- SVNR 12				
S25H- SVNR 12				
S25Q- SVNR 12				
S... SVNR 12S	SB-3080TR	FT-10	HS3X4	LW-1.5



System tip-bars (S-SVN-XN)

Description	Spare Parts		
	Clamp screw	Wrench	Clamp screw
S...- SVNR 12XN	SB-3080TR	FT-10	SP3X4

PSH Sleeve

Description	Spare parts	
	Clamp screw	Wrench
PSH 02.. -.. 03.. -..	HS3X4P	LW-1.5
	PSH 04.. -.. 05.. -.. 06.. -.. 07.. -..	HS4X4P	LW-2



Spare parts

Boring bars (screw clamp)

Description	Spare parts	
	Clamp screw	Wrench
S10H- SCLC%03-.E	SB-1635TR	FT-6
S10J- SCLC%04-.E	SB-2035TR	
S08X- SCLC%06-10E	SB-2545TR	FT-8
S08X- SCLC%06-10	SB-2545TR	FT-8
C...- SCLC%03-..	SB-1635TR	FT-6
C...- SCLC%04-..	SB-2035TR	
C08L- SCLC%06-10	SB-2545TR	FT-8
A08H- SCLC%06-10E	SB-2545TR	FT-8
E...- SCLC%06-..	SB-2545TR	FT-8
S..M- SCLP%08...E	SB-35TR	FT-10
S...- SCLP%09...E	SB-4TR	FT-15
S..M- SCLP%08...E	SB-35TR	FT-10
S...- SCLP%09...E	SB-4TR	FT-15
C10N- SCLP%08...E	SB-35TR	FT-10
C...- SCLP%09...E	SB-4TR	FT-15
A..X- SCLP%08...E	SB-35TR	FT-10
A...- SCLP%09...E	SB-4TR	FT-15
E10N- SCLP%08-12	SB-35TR	FT-10
E10N- SCLP%08-12A-..	SB-3060TR	
E...- SCLP%09...E	SB-4TR	FT-15
S...- SDUC%07...E	SB-2560TR	FT-8
S...- SDUC%11...E	SB-4085TR	FT-15
S...- SDUC%07...E	SB-2560TR	FT-8
S...- SDUC%11...E	SB-4085TR	FT-15
C...- SDUC%07...E	SB-2560TR	FT-8
C...- SDUC%11...E	SB-4085TR	FT-15
S...- SDZC%07...E	SB-2560TR	FT-8
S...- SDZC%11...E	SB-4085TR	FT-15
S...- SDZC%07...E	SB-2560TR	FT-8
S...- SDZC%11...E	SB-4085TR	FT-15
C06J- STLB%06-08A	SB-2035TR	FT-6
E08L- STLP%08-10A	SB-1TR	
E08L- STLP%09-10A	SB-2545TR	FT-8
E10N- STLP%09...E		
E10N- STLP%11...E	SB-3060TR	FT-10
S06H- STUB%06-08E	SB-15TR	FT-6
S08K- STUP%08-10E	SB-1TR	
S..M- STUP%09...E	SB-2TR	FT-8
S...- STUP%11...E	SB-3TR	FT-10
S..X- STUP%16...E	SB-4TR	FT-15
S06H- STUB%06-08	SB-15TR	FT-6
S08K- STUP%08-10	SB-1TR	
S..M- STUP%09...E	SB-2TR	FT-8
S...- STUP%11...E	SB-3TR	FT-10
S25X- STUP%16-32	SB-4TR	FT-15
C10L- STUB%06-08	SB-15TR	FT-6
C08L- STUP%08-10	SB-1TR	
C...- STUP%09...E	SB-2TR	FT-8
C...- STUP%11...E	SB-3TR	FT-10
C20S- STUP%16...E	SB-4TR	FT-15
A08H- STUP%08-10E	SB-1TR	FT-6
A..X- STUP%09...E	SB-2TR	FT-8
A...- STUP%11...E	SB-3TR	FT-10
A...- STUP%16...E	SB-4TR	FT-15
E08L- STUP%08-10	SB-1TR	FT-6
E...- STUP%09...E	SB-2TR	FT-8
E...- STUP%11...E	SB-3TR	FT-10
E20S- STUP%16-25	SB-4TR	FT-15



Boring bars (screw clamp)

Description	Spare parts	
	Clamp screw	Wrench
S...- SWUB%08-.E	SB-2050TR	FT-6
S12M- SWUP%11-14E	SB-2545TR	FT-8
S...- SWUP%11-.E	SB-2560TR	
S...- SWUP%16-.E	SB-4065TR	FT-15
S...- SWUB%06-..	SB-2040TR	FT-6
S10J- SWUB%08-..	SB-2035TR	
C...- SWUB%06-..	SB-2035TR	FT-6
C07K- SWUB%08-..		
C08L- SWUB%08-..		
C10N- SWUB%08-..	SB-2050TR	
C12Q- SWUP%11-14(-./)	SB-2545TR	
C12Q- SWUP%11-16(-./)	SB-2560TR	FT-8
C16X- SWUP%11-18(-./)		
C...- SWUP%16-..	SB-4065TR	FT-15
E...- SWUB%08-..	SB-2050TR	FT-6
S16Q- SSKPR09-20	SB-4TR	FT-15
S20R- SSKPR09-25		
S25X- SSKPR12-32	GS-50S	LW-3
S32S- SSKPR12-40	GS-50	
S12M- SYXP%06-12E	SB-2040TR	FT-6
S16Q- SYXP%06-16E	SB-2045TR	

Boring bars (screw clamp)

Description	Spare parts				
	Clamp screw	Wrench	Shim	Shim screw	Wrench (For shim screw)
S12M- SVJP%08-16E	SB-2050TR	FT-6	-	-	-
S...- SVJC%08-.E					
S...- SVJB%11-.E	SB-2570TR	FT-8			
S...- SVJB%16-.EN	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4
S32S- SVJB%16-40E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
S40T- SVJB%16-50E					
S10M- SVPC%08-16E	SB-2050TR	FT-6	-	-	-
S...- SVPB%11-.E	SB-2570TR	FT-8			
S...- SVPB%16-.EN	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4
S25X- SVPB%16-34E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
S32S- SVPB%16-40E					
S12M- SVUC%08-16E	SB-2050TR	FT-6	-	-	-
S...- SVUC%11-.E	SB-2570TR	FT-8			
S...- SVUB%16-.EN	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4
S25X- SVUB%16-34E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
S32S- SVUB%16-40E					
S12M- SVZC%08-16E	SB-2050TR	FT-6	-	-	-
S...- SVZB%11-.E	SB-2570TR	FT-8			
S...- SVZB%16-.EN	SB-40125TRN	FT-15	SVN-32N	SS-4N	LW-4
S25X- SVZB%16-34E	SB-40115TR	FT-15	SVN-32	SB-2050TR	FT-6
S32S- SVZB%16-40E					

Boring bars (top clamp)

Description	Spare Parts				
	Chipbreaker	Clamp Set	Wrench	Shim	Shim Screw
S12L- CTUP%09-16	-	CPS-1	FH-2	-	-
S...- CTUP%11-..	-	CPS-2	FH-2.5	-	-
S25X- CTUP%16-34	-	CPS-3	LW-3	-	-
S32S- CTUP%16-43				KPT-32	SP3X10
S40X- CTUP%16-50					
S32S- CTUC%16-40	*CB-13/12	CE-320	LW-4	SP-230P	SP3X10
S...- CCLN%09...A	-	CE-360S	LW-4	SP-420A	BH3X6
S...- CSKN%09...A	-	CE-360S	LW-4	SP-130A	BH3X12
S32S- CSKPR12-43	CPS-3	-	LW-3	KPS-42	SP3X10

* CB-13 for Right-hand Toolholder, CB-12 for Left-hand Toolholder.



Spare parts

AD bars, interchangeable head (lever lock)

Description			Spare parts					
			Lever	Lock screw	Punch	Shim Pin	Shim	Wrench
HA32	PCLN [®] %	12-40	LL-2K	LS-2P	PC-2K	LSP-3K	LC-4K	DTPM-15
HA40	PCLN [®] %	12-50						
HA50	PCLN [®] %	12-63						
HA32	PDUN [®] %	15-43	LL-3K	LS-3P	PC-2K	LSP-3K	LD-4K43 (LD-4K*)	DTPM-15
HA40	PDUN [®] %	15-50						
HA50	PDUN [®] %	15-63						
HA32	PTFN [®] %	16-40	LL-1K	LS-1P	PC-2K	LSP-2K	LT-3K	DTPM-10
HA40	PTFN [®] %	16-50						
HA50	PTFN [®] %	16-63						

Shim : LD-4K43 is attached to Toolholder. When using DN □□1506 Insert, purchase LD-4K separately.

AD bars, interchangeable head (screw clamp)

Description			Spare parts	
			Screw	Wrench
HA32	SCLC [®] %	09-40	SB-3580TR	FT-15
HA32	SDUC [®] %	11-40	SB-3580TR	FT-15

Boring adapter (AD bars)

Description			Spare parts		
			Clamp bolt		Wrench
AD	32U		HH5X20 (3 pcs)	HH5X30 (1 pcs)	LW-4
AD	40V		HH5X20 (3 pcs)	HH5X30 (1 pcs)	LW-4
AD	50W		HH6X20 (3 pcs)	HH6X30 (1 pcs)	LW-5

Combination of boring adapter and interchangeable head

Interchangeable head description			Boring adapter			
			Base description	Clamp bolt		Wrench
HA32	PCLN [®] %	12-40	AD32U	HH5X20	HH5X30	LW-4
HA32	PDUN [®] %	15-43				
HA32	PTFN [®] %	16-40		HH5X20		
HA32	SCLC [®] %	09-40				
HA32	SDUC [®] %	11-40				
HA40	PCLN [®] %	12-50	AD40V	HH5X20	HH5X30	LW-4
HA40	PDUN [®] %	15-50				
HA40	PTFN [®] %	16-50				
HA50	PCLN [®] %	12-63	AD50W	HH6X20	HH6X30	LW-5
HA50	PDUN [®] %	15-63				
HA50	PTFN [®] %	16-63				



Spare parts

Boring bars for ceramic tools (top clamp)

Description	Spare parts				
	Chipbreaker	Clamp set	Wrench	Shim	Shim screw
S32S- CCLN%L -12-40GX	-	CE-410	LW-4	-	-
S40T- CCLN%L -12-50GX				SP-441P	M3X8
S32S- CDUN%L -12-40GX	-	CE-410	LW-4	-	-
S40T- CDUN%L -12-50GX				SP-521P	M3X8
S32S- CSKN%L -12-40GX	-	CE-410	LW-4	-	-
S40T- CSKN%L -12-50GX				SP-141P	M3X8
S40T- CSKN%L -12-50	*1 CB-13/12	CE-320	LW-4	SP-141P *2 (SP-143P)	M3X8 *2 (M3X12)

*1 CB-13 for right-hand toolholder, CB-12 for left-hand toolholder.

*2 When using SN□□1204 Insert, please purchase spare parts in () separately.

Boring toolholders for bearing machining (Square shank) (Boring)

Description	Spare parts		
	Clamp screw	Wrench	
SRCP%L 2020B-12 -A20	SB-4TR	FT-15	
2525B-16 -A32	SB-5090TR	LTW-20	

Boring toolholders for bearing machining (Square shank) (Internal round chamfering)

Description	Spare parts	
	Clamp set	Wrench
CBSN%L ...B-12 -A20	CP-RC%L	LW-5

Sleeves for tip-bars

Description	Spare parts		
	Screw	Wrench	
PH 02 ...	HS3X4	LW-1.5	
			03 ...
			04 ...
05 ...	HS4X4	LW-2	
06 ...			
07 ...			

KTGF

Description	Spare parts	
	Clamp screw	Wrench
KTGF%L -16F	SB-4070TRW	FT-8
KTGF%L -16	SB-4070TRS	FT-10

S-KTGF

Description	Spare parts	
	Clamp screw	Wrench
S.... -KTGFL16	SB-4070TRS	FT-10

KTG

Description	Spare parts	
	Clamp screw	Wrench
KTG%L -16	SB-4TR	FT-15
.... 22-..	GS-50	LW-3

KN91

Description	Spare parts					
	Clamp	Clamp bolt	Washer	Spring	Wrench	
KN91%L 44 -4	*CE-111/121	BH8X30	W-8	SP-8	LW-5	
						44 -5
						44 -7
	*CE-131/141					

* KN91%L44-4/5 ... CE-111 for right-hand toolholder, and CE-121 for left-hand toolholder.

KN91%L44-7 ... CE-131 for right-hand toolholder, and CE-141 for left-hand toolholder.

KGHS

Description	Spare parts					
	Clamp	Clamp bolt	Washer	Spring	Wrench	
KGHS%L -4	CGH-1 ¹ / _R	HH6X25	W-6	SP-6	LW-5	
					 -5
					 -7
	CGH-2 ¹ / _R					

Clamp: KGHS%L ... CGH-○L for right-hand toolholder, and CGH-○R for left-hand toolholder.



KGA

Description	Spare parts			
	Clamp	Clamp bolt	Spring	Wrench
KGA%L -3	CGA-3%L	HH6X20	SP-6	LW-5
..... -4	CGA-4%L			
..... -5	CGA-5%L			

Clamp: CGA-○R for right-hand toolholder and CGA-○L for left-hand toolholder.

KGD^{R/L}.....-S

Description	Spare parts		
	Clamp bolt (for insert clamp)	Clamp screw (for blade)	Wrench
KGD%L .....-S	BH6X10TR	SB-60120TR	LTW-25

KGD-JCT (for automatic lathe)

Description	Spare parts		
	Clamp screw	Wrench	Plug
KGD%L -... JCT	SB-40120TR	LTW-15S	GP-1

KGDF^{R/L}.....-S

Description	Spare Parts		
	Clamp bolt (for insert clamp)	Clamp screw (for blade)	Wrench
KGDF%L .....-S	BH6X10TR	SB-60120TR	LTW-25

KGM

Description	Spare parts	
	Screw	Wrench
KGM%L 1212H -3	SB-5TR	LTW-20
1616H -3	HH5X16	LW-4
2020K -3		
2525M -3		
KGM%L 2020K -4	HH5X16	LW-4
2525M -4	HH5X25	
KGM%L 2020K -5	HH5X16	LW-4
2525M -5	HH5X25	
3232P -5		
KGM%L 2525M -8	HH6X25	LW-5
3232P -8		

KGM-T

Description	Spare parts	
	Screw	Wrench
KGM%L 2012K-2T17	SB-5TR	LTW-20
2020K-2T17	HH5X16	LW-4
2525M-2T17	HH5X25	
KGM%L 1616H-3T20	HH5X16	LW-4
2012K-3T20	SB-5TR	LTW-20
2020K-3T20	HH5X16	LW-4
2525M-3T20	HH5X25	
KGM%L 2020K-4T20	HH5X16	LW-4
2525M-4T20	HH5X25	
2525M-4T25		
KGM%L 2525M-5T25	HH5X25	LW-4
3232P-5T25	HH5X25	
KGM%L 2525M-6T30	HH5X25	LW-4

KGM (for automatic lathe)

Description	Spare parts	
	Clamp screw	Wrench
KGM%L 0810K - ...	SE-40120TR	LTW-15S
1010.. - ...		
1212.. - 1.5-...		
1212.. - 2-...		
1212.. - 2.5-...		
1616.. - 2-...		
KGM%L 1616.. - 2.5-...	SE-50125TR	LTW-20
1616.. - 3-...		

KGMM / KGMS

Description	Spare parts	
	Screw	Wrench
KGMM%L 1212H-3	SB-5TR	LTW-20
1616H-3	HH5X16	LW-4
2020K-3		
2525M-3		
KGMS%L 1212H-3	SB-5TR	LTW-20
1616H-3	GS-50	LW-3
2020K-3	HH5X16	LW-4
2525M-3	HH5X25	



KGMU

Description	Spare parts	
	Clamp bolt	Wrench
KGMU%L 2020K	HH5X16	LW-4
2525M	HH5X25	

KIGH

Description	Spare parts				
	Clamp	Clamp bolt	Washer	Spring	Wrench
KIGHR ....-4	CGH-1L	HH6X25	W-6	SP-6	LW-5
....-5					
....-7					
	CGH-2L				

KIGM-V

Description	Spare parts	
	Clamp screw	Wrench
KIGM%L 2016B-3V	GS-50	LW-3
2520B-3V		
3225B-3V	SB-5TR	LTW-20
3225B-4V	SB-5TR	LTW-20
4032B-4V		

GFVS-AA / GFVT-AA

Description	Spare parts	
	Clamp set	Wrench
GFVS%L -08AA	CPS-5V	FT-15
GFVT%L -08AA	CPS-5V	FT-15

GIFV

Description	Spare parts	
	Clamp set	Wrench
GIFV%L 5032B-502B	CPS-6V	LW-3

KTKF-JCT

Description	Spare parts		
	Clamp screw	Wrench	Plug
KTKF%L - ...JCT	SB-4590TRWN	FT-10	GP-1

KTKFS (for sub spindle tooling)

Description	Spare parts	
	Clamp screw	Wrench
KTKFS%L - ...	SB-4050TRN	LTW-10S

KTKH-S

Description	Spare parts
	Releasing wrench
KTKH%L - ...S	LTK-5

KTKH-B

Description	Spare parts	
	Clamp screw	Wrench
KTKH%L 0808K - ...B	SE-40120TR	FT-15
1010K - ...B		
1212M - ...B		
1414M - ...B		
1616M - ...B	SE-50125TR	LTW-20

KTTX

Description	Spare parts	
	Clamp screw	Wrench
KTTXR -16F	SB-4070TRW	FT-8



DRS

Description		Spare parts	
		Clamp screw	Wrench
S20	-DRS 10...	SB-2080TR	FT-6
	-DRS 11...	SB-2290TR	FT-6
	-DRS 12...	SB-25100TR	DT-7

DRX


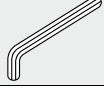


Description			Spare parts	
			Clamp screw	Wrench
S..	-DRX	- . -03	SB-2042TRG	DTM-6
	-DRX	- . -04	SB-2042TRG	DTM-6
	-DRX	- . -05	SB-2045TR	DTM-6
	-DRX	- . -06	SB-2250TR	DTM-7
	-DRX	- . -07	SB-2570TR	DTM-8
	-DRX	- . -09	SB-3080TR	DTM-10
	-DRX	- . -11	SB-4085TR	DTM-15
	-DRX	- . -14	SB-5090TR	DT-20
	-DRX	- . -17	SB-60120TR	DT-25




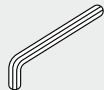


MFPN45 (Face mill)

Description	Spare parts		
	Clamp screw	Wrench	Anti-seize compound
MFPN 45100R-10T-M 2 45200R-20T-M	SB-40140TRN	DTM-15	P-37

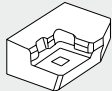

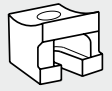
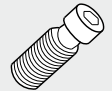
MSE45 (End mill)

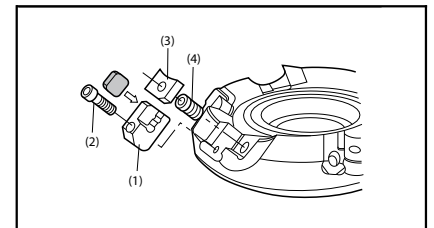
Description	Spare parts			
	Clamp set	Wrench	Shim	Shim screw
MSE 4550 4563 4580-32	 CPS-6M	 LW-3	 MSE-4245	 SP3X8

MSD45 (End mill)

Description	Spare parts			
	Clamp set	Wrench	Shim	Shim screw
MSD 4550 4563 4580-32	 CPS-6M	 LW-3	 MSD-42	 SP3X8

MSO45 (Face mill)

Description	(1) Cartridge	(2) Cartridge clamp screw	(3) Clamp	(4) Clamp screw	Wrench
	MSO 45...R	 LSO-445R	 HH4X16	 CH-20R	 TH8X15	TH-4



MSO45-S (End mill)

Description	Spare parts				
	Shim	Shim screw	Clamp	Clamp screw	Wrench
MSO 45...S	MSO-4T245	SP3X6	CH-20R	TH8X15	TH-4




MSO45-09 (Face mill)

Description	Spare parts	
	Clamp screw	Wrench
MSO 45...R-09	SB-3060TR	DT-10

MSO45-S-09 (End mill)

Description	Spare parts	
	Clamp screw	Wrench
MSO 45...S32-09	SB-3060TR	DT-10

MSP15 / MSE15 (End mill)

Description	Clamp set	Wrench	Shim	Shim screw
	MSP 15..	 CPS-6M	 LW-3	 MSP-42	SP3X8
MSE 15..	CPS-6M	LW-3	MSE-4215	SP3X8



Spare parts

MEC (Face mill)

Description	Spare parts	
	Clamp screw	Wrench
MEC ...R-11-..T(-M)	SB-2555TRG	DTM-8
...R-17-..T(-M)	SB-4070TRN	DTM-15

MEC (End mill)

Description	Spare parts	
	Clamp screw	Wrench
MEC ...W.-1103(-H)	SB-2545TR	DTM-8
...W.-11T3(-H)	SB-2555TRG	DTM-8
...W.-1704-H	SB-4070TRN	DTM-15


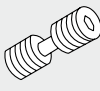
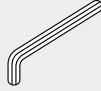


MECX (Face Mill)

Description	Spare parts	
	Clamp screw	Wrench
MECX 050R-07-12T-M	SB-2042TRG	DTM-6
063R-07-14T-M		

MECX (End mill)

Description	Spare parts	
	Clamp screw	Wrench
MECX 32-S32-07-6T	SB-2042TRG	DTM-6
33-S32-200-07-6T		

MTE90 (End mill)

Description	Spare parts				
	Clamp	Clamp screw	Wrench	Shim	Shim screw
MTE 9050	 CP-8TE	 W8X18	 LW-4	 MTE-42	 SP3X8
9063					
9080-32					

MFWN (Face Mill)

Description	Spare parts		
	Clamp screw	Wrench	Anti-seize compound
MFWN 90100R-9T-M	SB-40140TRN	DTM-15	P-37
90250R-18T-M			

MSO90-S (End mill)

Description	Spare parts	
	Clamp screw	Wrench
MSO 90...S32-09	SB-3080TR	DT-10
90...S32-15	SB-5085TR	DT-20

MSO90-09 (Face mill)

Description	Spare parts	
	Clamp screw	Wrench
MSO 90...R-09	SB-3080TR	DT-10

MEA / MEB

Description	Spare parts	
	Clamp screw	Wrench
MEA .. -S..(-...)	SB-2560TR	DT-8
MEB .. -S..	SB-4085TR	DT-15

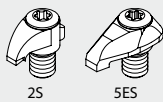
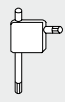
DMC

Description	Spare parts	
	Clamp screw	Wrench
DMC 8.. (-S..)	SB-2545TR	FT-8
DMC 0..	SB-3060TR	FT-10

MTP

Description	Spare parts				
	Clamp	Clamp screw	Wrench	Shim	Shim screw
MTP 90..	CP-8W	W8X18	LW-4	KPT-42	SP3X8

MTPS / MTES

Description	Clamp Set	Wrench
	 2S 5ES	 FT-15
MTPS ...	CPS-2S	
MTES ...	CPS-5ES	












MEAL

Description	Spare parts	
	Clamp screw	Wrench
MEAL .. -S..	SB-5085TR	DT-20



Spare parts

MSTC (Slot mill)

Description		Spare parts												
		Cartridge		Wedge	Wedge screw	Cam pin	Clamp screw	Wrench			Anti-seize compound	Mounting bolt		
		Right-hand	Left-hand					for wedge screw	for cam pin	for clamp screw				
														
Without Boss	Inch spec	MSTC 400AN551-630-10	C90SP1416-10R	C90SP1416-10L	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-	
		MSTC 500AN551-630-10				W6X20								
		MSTC 600AN551-630-10				W6X20								
		MSTC 500AN630-709-10	C90SP1618-10R	C90SP1618-10L	WC-16	W6X20								
		MSTC 600AN630-709-10				W6X20								
		MSTC 500AN709-813-12	C90SD1820-12R	C90SD1820-12L	WC-18	W6X20								AP-1820	SB-3590TRP	LW-3	DTP-15
	MSTC 600AN709-813-12	W6X20												
	MSTC 500AN813-917-12	C90SD2023-12R	C90SD2023-12L	WC-20	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-		
	MSTC 600AN813-917-12				W6X20									
	Metric	Without Boss	MSTC 100AR1416-10-6T	C90SP1416-10R	-	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
			MSTC 125AR1416-10-8T				W6X20							
			MSTC 160AR1416-10-10T				W6X20							
MSTC 125AR1618-10-8T			C90SP1618-10R	-	WC-16	W6X20								
MSTC 160AR1618-10-10T						W6X20								
MSTC 125AR1820-12-8T			C90SD1820-12R	-	WC-18	W6X20	AP-1820								SB-3590TRP	LW-3	DTP-15
MSTC 160AR1820-12-10T		W6X20												
MSTC 125AR2123-12-8T		C90SD2023-12R	-	WC-20	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-		
MSTC 160AR2123-12-10T					W6X20									
Inch spec		Without Boss	MSTC 100AL1416-10-6T	-	C90SP1416-10L	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
			MSTC 125AL1416-10-8T				W6X20							
			MSTC 160AL1416-10-10T				W6X20							
	MSTC 125AL1618-10-8T		C90SP1618-10L	-	WC-16	W6X20								
	MSTC 160AL1618-10-10T					W6X20								
	MSTC 125AL1820-12-8T		C90SD1820-12L	-	WC-18	W6X20	AP-1820								SB-3590TRP	LW-3	DTP-15
MSTC 160AL1820-12-10T	W6X20													
MSTC 125AL2123-12-8T	C90SD2023-12L	-	WC-20	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-			
MSTC 160AL2123-12-10T				W6X20										
Inch spec	Without Boss	MSTC 400AR551-630-10	C90SP1416-10R	-	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-	
		MSTC 500AR551-630-10				W6X20								
		MSTC 600AR551-630-10				W6X20								
		MSTC 500AR630-709-10	C90SP1618-10R	-	WC-16	W6X20								
		MSTC 600AR630-709-10				W6X20								
		MSTC 500AR709-813-12	C90SD1820-12R	-	WC-18	W6X20								AP-1820	SB-3590TRP	LW-3	DTP-15
	MSTC 600AR709-813-12	W6X20												
	MSTC 500AR813-917-12	C90SD2023-12R	-	WC-20	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-		
	MSTC 600AR813-917-12				W6X20									
	Inch spec	Without Boss	MSTC 400AL551-630-10	-	C90SP1416-10L	WC-14	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-
			MSTC 500AL551-630-10				W6X20							
			MSTC 600AL551-630-10				W6X20							
MSTC 500AL630-709-10			C90SP1618-10L	-	WC-16	W6X20								
MSTC 600AL630-709-10						W6X20								
MSTC 500AL709-813-12			C90SD1820-12L	-	WC-18	W6X20	AP-1820								SB-3590TRP	LW-3	DTP-15
MSTC 600AL709-813-12	W6X20													
MSTC 500AL813-917-12	C90SD2023-12L	-	WC-20	W6X18	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	-			
MSTC 600AL813-917-12				W6X20										



Spare parts

MSTC (Slot mill)

Description		Spare Parts											
		Cartridge		Wedge	Wedge Screw	Cam Pin	Clamp Screw	Wrench			Anti-seize Compound	Mounting bolt	
		Right-hand	Left-hand					for Wedge Screw	for Cam Pin	for Clamp Screw			
With Boss	Metric	MSTC 100SR1416-10-6T	C90SP1416-10R	-	WC-14	W6X20	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	HH12X35
		MSTC 125SR1416-10-8T											HH16X35
		MSTC 160SR1416-10-10T											-
		MSTC 125SR1618-10-8T	C90SP1618-10R	-	WC-16	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	HH16X35
		MSTC 160SR1618-10-10T											-
		MSTC 125SR1820-12-8T	C90SD1820-12R	-	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	HH16X35
		MSTC 160SR1820-12-10T											-
		MSTC 125SR2123-12-8T	C90SD2023-12R	-	WC-20	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	HH16X35
	MSTC 160SR2123-12-10T	-											
	MSTC 100SL1416-10-6T	-	C90SP1416-10L	WC-14	W6X20	AP-1416	SE-3070TRP	TH-3L	LW-2.5	DTP-9	P-37	HH12X35	
	MSTC 125SL1416-10-8T											HH16X35	
	MSTC 160SL1416-10-10T		-										
	MSTC 125SL1618-10-8T		C90SP1618-10L	WC-16	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-2.5	DTP-9	P-37	HH16X35	
	MSTC 160SL1618-10-10T											-	
	MSTC 125SL1820-12-8T		C90SD1820-12L	WC-18	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	HH16X35	
	MSTC 160SL1820-12-10T											-	
MSTC 125SL2123-12-8T	C90SD2023-12L		WC-20	W6X20	AP-1820	SB-3590TRP	TH-3L	LW-3	DTP-15	P-37	HH16X35		
MSTC 160SL2123-12-10T		-											

MRP-S (End mill)

Description	Spare parts	
	Clamp screw	Wrench
MRP ...S.. -08(-...)	SB-3060TR	DT-10
MRP ...S.. -10(-T(-...))	SB-3080TR	DT-10
MRP ...S.. -12(-T)(-...)	SB-4085TR	DT-15
MRP 050-S42 -12(-300)	SB-40115TR	
MRP ...S.. -16(-...)	SB-50120TR	DT-20

MRP (Face mill)

Description	Spare parts	
	Clamp screw	Wrench
MRP ...R -10(-.T)	SB-3080TR	DT-10
MRP 050R -12	SB-40115TR	DT-15
MRP 063R -12		
MRP 080R -12		
MRP 080R -12-7T		
MRP ...R -16(-.T)	SB-50120TR	DT-20
MRP ...R -20	SB-60120TR	DT-25



Spare parts

MHD (Helical end mill)

Description	Spare parts								
	Clamp screw	Wrench	Clamp bolt		Wrench				
			1 Front piece	2 Front pieces					
MHD 32-S32 -SA 40-S32 -SA 40-S42 -SA 50-S42 -SA	SB-2560TR	DT-8	-	HH8X50	LW-6				
				HH8X65					
	SB-3080TR	DT-10		HH12X65	LW-10				
MHD 40-S42 -SB 50-S42 -SB	SB-3080TR	DT-10	HH8X40	-	LW-6				
			HH12X40		LW-10				
MHD 20S-520 -C 25-S25 -C 32-S32 -C 40-S42 -C 50-S42 -C	SB-2560TR	DT-8	-	-	-				
						SB-3080TR	DT-10		
	MHD 32-S32 -A 40-S32 -A 40-S42 -A 50-S42 -A	SB-2560TR				DT-8	HH8X35	HH8X50	LW-6
							SB-3080TR	DT-10		HH8X40	HH8X65
			HH12X40	HH12X65	LW-10				
MHD 32-S32 -A-130 40-S32 -A-150 50-S42 -A-150		SB-2560TR	DT-8	HH8X35	HH8X50	LW-6			
	SB-3080TR			DT-10	HH8X40		HH8X65		
					HH12X40	HH12X65	LW-10		
MHD 40-S42 -B 50-S42 -B	SB-3080TR	DT-10	HH8X40	-	LW-6				
			HH12X40		LW-10				
MHD 32 -F 40 -F 50 -F	SB-2560TR	DT-8	-	-	-				
	SB-3080TR	DT-10							

MHD (face mill and integral arbor type)

Description	Spare parts					
	Clamp screw	Wrench	Clamp bolt	Wrench		
MHD 63-FMA -SA 80-FMA -SA 100-FMA -SA	SB-3080TR	DT-10	HH16X90	LW-14		
			HH20X110	LW-17		
			HH24X110	LW-19		
MHD 63-FMA -A 80-FMA -A 100-FMA -A			HH16X90	LW-14		
			HH20X110	LW-17		
			HH24X110	LW-19		
MHD 63-BT50 -SA 80-BT50 -SA 100-BT50 -SA			HH16X65	LW-14		
			HH20X90	LW-17		
			HH24X90	LW-19		
MHD 63-BT50 -A 80-BT50 -A 100-BT50 -A			HH16X65	LW-14		
			HH20X90	LW-17		
			HH24X90	LW-19		
MHD 63 -F 80 -F 100 -F					-	-

P

Spare parts

MHD (Radius)

Description	Spare parts						
	Clamp screw		Wrench		Clamp bolt		Wrench
	For bottom insert	For middle insert	For bottom insert	For middle insert	1 Front piece	2 Front pieces	
MHD 32-S32 -4RSA	SB-2560TR	SB-2560TR	DT-8	DT-8	-	HH8X50	LW-6
40-S32 -5RSA	SB-3080TR	SB-3080TR	DT-10	DT-10		HH8X55	
40-S42 -5RSA			DT-15			HH12X55	LW-10
50-S42 -6RSA	SB-4085TR						
MHD 32-S32 -A	SB-2560TR		DT-8		-	HH8X50	LW-6
40-S32 -A	SB-3080TR		DT-10			HH8X65	
40-S42 -A						HH12X65	LW-10
50-S42 -A							
MHD 32 -F	SB-2560TR		DT-8		-	-	-
40 -F	SB-3080TR		DT-10				
50 -F							
MHD 32 -4RF	SB-2560TR	SB-2560TR	DT-8	DT-8	-	-	-
40 -5RF	SB-3080TR	SB-3080TR	DT-10	DT-10			
50 -6RF	SB-4085TR		DT-15				

MEZ

Description	Spare parts	
	Clamp screw	Wrench
MEZ 16-S16....	SB-2040TRG	DTM-6
20-S20....	SB-2555TRG	DT-8
25-S25....	SB-3070TRG	DT-10
32-S32....	SB-4070TRG	DT-15
40-S32....	SB-3070TRG	DT-10
50-S42....	SB-4070TRG	DT-15

MGI

Description	Spare parts	
	Clamp set	Wrench
MGI ....-1C	CPS-6F	LW-3

MVG

Description	Spare parts	
	Clamp set	Wrench
MVG	CPS-6V	LW-3

Blank tool

Description	Spare parts	
	Coolant pipe	
T63H -BL...-....	CL63-1	

Flange holder

Description	Spare parts					
	Screw	Wrench	Mounting bolt	Wrench	Adjustment screw	Wrench
SF22F -SCLCL09 -40P	SB-4085TR	FT-15	HH5X30	LW-4	HS3X4	LW-1.5
-SDUCL11 -40P	SB-4085TR	FT-15	HH5X30	LW-4	HS3X4	LW-1.5
-SVUBL11 -40P	SB-2570TR	FT-8	HH5X30	LW-4	HS3X4	LW-1.5
-KTGFL16 -40P	SB-4070TRS	FT-10	HH5X30	LW-4	HS3X4	LW-1.5
-KTTXL16 -40P	SB-4070TRW	FT-8	HH5X30	LW-4	HS3X4	LW-1.5

Flange holder (Sleeve type)

Description	Spare parts					
	Mounting bolt	Wrench	Adjustment screw	Wrench	Screw (for fixing toolholder)	Wrench
SF22F -SH.. -40P	HH5X30	LW-4	HS3X4	LW-1.5	HS6X4P	LW-3





T

Description	Page	Category
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Numeric (Threading Insert)

06IR	○○○(○)	J17, J19	Insert (Threading)
08IR	○○○(○)	J17, J19	Insert (Threading)
11IR	○○BSPT	J13	Insert (Threading)
11IR	○○BSPT-TF	J13	Insert (Threading)
11IR	○○BSPT-TQ	J13	Insert (Threading)
11I%	○○ISO	J7	Insert (Threading)
11IR	○○ISO-TF	J7	Insert (Threading)
11IR	○○ISO-TQ	J7	Insert (Threading)
11IR	○○○○	J17, J19	Insert (Threading)
11IR	A○○	J17, J19	Insert (Threading)
16ER	○○BSPT	J12	Insert (Threading)
16ER	○○BSPT-TF	J12	Insert (Threading)
16ER	○○BSPT-TQ	J12	Insert (Threading)
16ER	○○(○)NPT	J14	Insert (Threading)
16ER	○○UN	J8	Insert (Threading)
16ER	○○UN-TF	J8	Insert (Threading)
16ER	○○UN-TQ	J8	Insert (Threading)
16ER	○○W	J10	Insert (Threading)
16ER	○○W-TF	J10	Insert (Threading)
16ER	○○W-TQ	J10	Insert (Threading)
16E%	○○ISO	J6	Insert (Threading)
16ER	○○ISO-TF	J6	Insert (Threading)
16ER	○○ISO-TQ	J6	Insert (Threading)
16ER	○○TR	J20	Insert (Threading)
16ER	○○○○	J16, J18	Insert (Threading)
16ER	A○○	J16, J18	Insert (Threading)
16ER	AG○○	J16, J18	Insert (Threading)
16ER	G○○	J16, J18	Insert (Threading)
16ER	A○○-TF	J16, J18	Insert (Threading)
16ER	A○○-TQ	J16, J18	Insert (Threading)
16ER	AG○○-TF	J16, J18	Insert (Threading)
16ER	AG○○-TQ	J16, J18	Insert (Threading)
16ER	G○○-TF	J16, J18	Insert (Threading)
16ER	G○○-TQ	J16, J18	Insert (Threading)
16IR	○○BSPT	J13	Insert (Threading)
16IR	○○BSPT-TF	J13	Insert (Threading)
16IR	○○BSPT-TQ	J13	Insert (Threading)
16IR	○○(○)NPT	J15	Insert (Threading)
16IR	○○UN	J9	Insert (Threading)
16IR	○○UN-TF	J9	Insert (Threading)
16IR	○○UN-TQ	J9	Insert (Threading)
16IR	○○W	J11	Insert (Threading)
16IR	○○W-TF	J11	Insert (Threading)
16IR	○○W-TQ	J11	Insert (Threading)
16I%	○○ISO	J7	Insert (Threading)
16IR	○○ISO-TF	J7	Insert (Threading)
16IR	○○ISO-TQ	J7	Insert (Threading)
16IR	○○TR	J21	Insert (Threading)
16IR	○○○(○)	J17, J19	Insert (Threading)
16IR	A○○	J17, J19	Insert (Threading)
16IR	AG○○	J17, J19	Insert (Threading)
16IR	G○○	J17, J19	Insert (Threading)
22ER	○○UN	J8	Insert (Threading)
22ER	○○ISO	J6	Insert (Threading)
22ER	○○TR	J20	Insert (Threading)
22ER	N○○	J16, J18	Insert (Threading)
22IR	○○UN	J9	Insert (Threading)
22IR	○○ISO	J7	Insert (Threading)
22IR	○○TR	J21	Insert (Threading)
22IR	N○○	J17, J19	Insert (Threading)

Numeric

556C%	P8	Spare parts (Shim)
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Description	Page	Category
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A

A○○□	DCLN%○○○○	F131	Boring bars
A○○□	DDUN%○○○○	F136	Boring bars
A○○□	DSKN%○○○○	F142	Boring bars
A○○□	DTFN%○○○○	F143	Boring bars
A○○□	DWLN%○○○○	F148	Boring bars
A○○□	PCLNR○○○○	F132	Boring bars
A○○□	PDUNR○○○○	F134	Boring bars
A○○□	PTUNR○○○○	F144	Boring bars
A○○□	PWLN%○○○○	F146	Boring bars
A○○□	SCLC%○○○○AE	F60	Boring bars
A○○□	SCLC%○○○○E	P25	Boring bars (Discontinued description)
A○○□	SCLP%○○○○AE	F64	Boring bars
A○○□	SCLP%○○○○E	P25	Boring bars (Discontinued description)
A○○□	SDQC%○○○○AE	F70	Boring bars
A○○□	SDUC%○○○○AE	F66	Boring bars
A○○□	SDZC%○○○○AE	F74	Boring bars
A○○□	STLC%○○○○AE	F88	Boring bars
A○○□	STLP%○○○○AE	F80	Boring bars
A○○□	STUP%○○○○E	P25	Boring bars (Discontinued description)
A○○□	SVJB%○○○○AE	F90	Boring bars
A○○□	SVJC%○○○○AE	F90	Boring bars
A○○□	SVJP%○○○○AE	F90	Boring bars
A○○□	SVPB%○○○○AE	F94	Boring bars
A○○□	SVPC%○○○○AE	F94	Boring bars
A○○□	SVUB%○○○○AE	F96	Boring bars
A○○□	SVUC%○○○○AE	F96	Boring bars
A○○□	SVZB%○○○○AE	F98	Boring bars
A○○□	SVZC%○○○○AE	F98	Boring bars
A○○□	SWUB%○○○○AE	F100	Boring bars
A○○□	SWUP%○○○○AE	F100	Boring bars
A○○□	SZJB%○○○○AE	F106	Boring bars
A○○□	SZLB%○○○○AE	F109	Boring bars
A○○□	SZQB%○○○○AE	F108	Boring bars
A○○□	SZXB%○○○○AE	F107	Boring bars
A○○□	SZZB%○○○○AE	F110	Boring bars
AABSR	○○○○□(□)-○○F	E20, P21	Toolholder (Back turning)
AABWR	○○○○□(□)-○○F	E21, E22, P21	Toolholder (Back turning)
ABS	○○R○○○○	B112	Insert (Back turning)
ABS	○○R○○○○M	B112	Insert (Back turning)
ABW	○○R○○○○	B112	Insert (Back turning)
ABW	○○R○○○○M	B112	Insert (Back turning)
ACL%C%	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
ACL%C%	○○○○JX-○○FF	E26	Toolholder (Turning)
AJ-	○(○)X○○(-○○)	P2	Spare parts (Screw)
AJ-	519TR	P2	Spare parts (Screw)
AD	○○U	P27	Boring adapter (Discontinued description)
AD	○○V	P27	Boring adapter (Discontinued description)
AD	○○W	P27	Boring adapter (Discontinued description)
ADJC%	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
ADJC%	○○○○JX-○○FF	E29	Toolholder (Turning)
ADNCR	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
APMT	○○○○○○E%L-NB○	M167	Insert (Milling)
APMT	○○○○○○ER-NB○P	M167	Insert (Milling)
AVJB%	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)
AVJB%	○○○○JX-○○FF	E40	Toolholder (Turning)
AVB%	○○○○□-○○F	P22	Toolholder (Turning / Discontinued description)

B

BB-	G1/8	D12, G37, H66	Spare parts (Banjo bolt)
BB-	M10X1.5	D12, G37, H66	Spare parts (Banjo bolt)
BCS-	○	P13	Spare parts (Clamp set)

Description	Page	Category
BDGT ○○T○○FR	C64, M91	Insert (Milling)
BDGT ○○T○○FR-JA	M91	Insert (Milling)
BDGT ○○T○○FR-LE	C64, M91	Insert (Milling)
BDGT ○○○○○FR-JA	M91	Insert (Milling)
BDMT ○○T○○ER-JS	M91, M128	Insert (Milling)
BDMT ○○T○○ER-JT	M91	Insert (Milling)
BDMT ○○T○○ER-N○	M121	Insert (Milling)
BDMT ○○T○○FR	C64, M91	Insert (Milling)
BDMT ○○○○○ER-JS	M91, M100, M128	Insert (Milling)
BDMT ○○○○○ER-JT	M91, M100	Insert (Milling)
BDMT ○○○○○ER-N○	M121	Insert (Milling)
BDMT ○○○○○FR	C64, M91	Insert (Milling)
BGIAR ○○-○	G97	Blade (Grooving)
BH○X○(○)	P2	Spare parts (Screw)
BH○X○TR	P2	Spare parts (Screw)
BT○K- M○○○	M82	BT arbor (for modular end mill)

C

○○□- SCLC%○○○(A)	P25	Boring bars (Discontinued description)
○○□- SCLC%○○○AN	F62	Boring bars
○○○○□- SCLCR○○○○EZ	P24	Boring bars (Discontinued description)
○○○○□- SCLCR○○○○EZP	F32	Boring bars
○○□- SCLP%○○○(-○/○)	P25	Boring bars (Discontinued description)
○○□- SDUC%○○○	P25	Boring bars (Discontinued description)
○○□- SJLC%○○○	F78	Boring bars
○○□- SJZC%○○○	F79	Boring bars
○○□- STLB%○○○A	P25	Boring bars (Discontinued description)
○○□- STLB%○○○AN	F82	Boring bars
○○○○□- STLBR○○○○EZP	F34	Boring bars
○○○○□- STLPR○○○○EZP	F34	Boring bars
○○□- STUB%○○○	P25	Boring bars (Discontinued description)
○○□- STUP%○○○(-○/○)	P25	Boring bars (Discontinued description)
○○□- STXB%○○○	F86	Boring bars
○○□- STXP%○○○	F86	Boring bars
○○□- STZB%○○○	F87	Boring bars
○○□- SWUB%○○○(A)	P26	Boring bars (Discontinued description)
○○□- SWUB%○○○AN	F102	Boring bars
○○□- SWUB%○○○(-○/○)	P26	Boring bars (Discontinued description)
○○○○□- SWUBR○○○○EZP	F36	Boring bars
○○○○□- SWUP%○○○(-○/○)	P26	Boring bars (Discontinued description)
○○N	P15	Spare parts (Clamp)
○○R	P15	Spare parts (Clamp)
CB-○○	P16	Spare parts (Chipbreaker)
CB- S○○○○	P16	Spare parts (Chipbreaker)
CB- T○○○○	P16	Spare parts (Chipbreaker)
CBSN%L ○○○□-○○	D68	Toolholder (Turning)
CBSNR ○○○B-○○A○○	F115, P28	Boring bars
CC- -○○-MFAH	P19	Spare parts (Coolant cover)
CCET ○○T○○○(○)F%-USF	B63	Insert (Turning)
CCET ○○T○○○(○)MF%-J	B65	Insert (Turning)
CCET ○○T○○○(○)MF%-U	B63	Insert (Turning)
CCET ○○T○○○(○)MF%-U	B63	Insert (Turning)
CCET ○○T○○○(○)MF%-USF	B63	Insert (Turning)
CCET ○○T○○○M%-P	B63	Insert (Turning)
CCET ○○○○○○(○)F%-USF	B63	Insert (Turning)
CCET ○○○○○○(○)MF%-J	B65	Insert (Turning)
CCET ○○○○○○(○)MF%-U	B63	Insert (Turning)
CCET ○○○○○○(○)MF%-USF	B63	Insert (Turning)
CCET ○○○○○○(○)M%-F	B62	Insert (Turning)
CCET ○○○○○○(○)M%-FSF	B61	Insert (Turning)
CCET ○○○○○○(○)%-FSF	B61	Insert (Turning)
CCGT ○○T○○○	B60	Insert (Turning)
CCGT ○○T○○○AH	B66	Insert (Turning)

Description	Page	Category
CCGT ○○T○○○AP	B66	Insert (Turning)
CCGT ○○T○○○E%-U	B65	Insert (Turning)
CCGT ○○T○○○(○)F%-U	B64	Insert (Turning)
CCGT ○○T○○○LA○	B66	Insert (Turning)
CCGT ○○T○○○ME%-U	B65	Insert (Turning)
CCGT ○○T○○○(○)MF	B61	Insert (Turning)
CCGT ○○T○○○(○)MF%-U	B64	Insert (Turning)
CCGT ○○T○○○MFP-GF	B58	Insert (Turning)
CCGT ○○T○○○MFP-GQ	B59	Insert (Turning)
CCGT ○○T○○○MFP-SK	B59	Insert (Turning)
CCGT ○○T○○○(○)MFP-SKS	B59	Insert (Turning)
CCGT ○○T○○○MP-CK	B59	Insert (Turning)
CCGT ○○T○○○R-A○	B66	Insert (Turning)
CCGT ○○○○○○	B60	Insert (Turning)
CCGT ○○○○○○AP	B66	Insert (Turning)
CCGT ○○○○○○E%-U	B65	Insert (Turning)
CCGT ○○○○○○(○)F%-U	B64	Insert (Turning)
CCGT ○○○○○○ME%-U	B65	Insert (Turning)
CCGT ○○○○○○(○)MF	B61	Insert (Turning)
CCGT ○○○○○○MFP-GF	B58	Insert (Turning)
CCGT ○○○○○○MFP-GQ	B59	Insert (Turning)
CCGT ○○○○○○MFP-PF	B58	Insert (Turning)
CCGT ○○○○○○MFP-SK	B59	Insert (Turning)
CCGT ○○○○○○(○)MFP-SKS	B59	Insert (Turning)
CCGT ○○○○○○(○)MF%-U	B64	Insert (Turning)
CCGT ○○○○○○MP-CF	B58	Insert (Turning)
CCGT ○○○○○○MP-CK	B59	Insert (Turning)
CCGT ○○○○○○(○)M%-F	B62	Insert (Turning)
CCGT ○○○○○○%-A○	B66	Insert (Turning)
CCGT ○○○○○○(○)%-F	B62	Insert (Turning)
CCGW ○○T○○○	B66, C39	Insert (Turning)
CCGW ○○T○○○NE	C39	Insert (Turning)
CCGW ○○T○○○SE	C39	Insert (Turning)
CCGW ○○○○○○	B66, C39	Insert (Turning)
CCGW ○○○○○○NE	C39	Insert (Turning)
CCGW ○○○○○○SE	C39	Insert (Turning)
CCLN%L ○○○□-○○	D49, P20	Toolholder (Turning)
CCLN%L ○○○□-○○A	D60, P21	Toolholder (Turning)
CCLN%L ○○○□-○○GX	P20	Toolholder (Turning / Discontinued description)
CCMT ○○T○○○	B60, C39	Insert (Turning)
CCMT ○○T○○○APD	C40	Insert (Turning)
CCMT ○○T○○○GK	B60	Insert (Turning)
CCMT ○○T○○○HQ	B60	Insert (Turning)
CCMT ○○T○○○MQ	B61	Insert (Turning)
CCMT ○○T○○○NE	C39	Insert (Turning)
CCMT ○○T○○○PP	B60	Insert (Turning)
CCMT ○○T○○○SE	C39	Insert (Turning)
CCMT ○○T○○○WP	B60	Insert (Turning)
CCMT ○○○○○○	C39	Insert (Turning)
CCMT ○○○○○○GK	B60	Insert (Turning)
CCMT ○○○○○○HQ	B60	Insert (Turning)
CCMT ○○○○○○NE	C39	Insert (Turning)
CCMT ○○○○○○PP	B60	Insert (Turning)
CCMT ○○○○○○SE	C39	Insert (Turning)
CCMT ○○○○○○WP	B60	Insert (Turning)
CCMW ○○T○○○MEF	C20	Insert (Turning)
CCMW ○○T○○○S○○○○MES	C20	Insert (Turning)
CCMW ○○T○○○S○○○○MET	C20	Insert (Turning)
CCMW ○○T○○○S○○○○SET	C20	Insert (Turning)
CCMW ○○T○○○T○○○○ME	C20	Insert (Turning)
CCMW ○○T○○○T○○○○SE	C20	Insert (Turning)
CCMW ○○○○○○S○○○○MES	C20	Insert (Turning)
CCMW ○○○○○○S○○○○SET	C20	Insert (Turning)
CCMW ○○○○○○T○○○○ME	C20	Insert (Turning)



Description	Page	Category
CSKN% ○○○○□○○	D53, P20	Toolholder (Turning)
CSKNR ○○○○□○○A	D63, P21	Toolholder (Turning)
CSKP% ○○○○□○○N	P23	Toolholder (Turning / Discontinued description)
CSRN% ○○○○□○○	D52	Toolholder (Turning)
CSRN% ○○○○□○○A	D63, P21	Toolholder (Turning)
CSRN% ○○○○□○○GX	P20	Toolholder (Turning / Discontinued description)
CSSN% ○○○○□○○GX	P20	Toolholder (Turning / Discontinued description)
CSSN% ○○○○□○○	D54, P20	Toolholder (Turning)
CSSN% ○○○○□○○A	D64	Toolholder (Turning)
CSSP% ○○○○□○○N	P23	Toolholder (Turning / Discontinued description)
CSYN% ○○○○□○○A	P21	Toolholder (Turning / Discontinued description)
CSYN% ○○○○□○○GX	P20	Toolholder (Turning / Discontinued description)
CSYN% ○○○○□○○	D53, P20	Toolholder (Turning)
CT ○○○-45A	K39	Insert (Drilling, Chamfering)
CT ○○○-45DA	K20	Insert (Drilling, Chamfering)
CTFP% ○○○○□○○N	P23	Toolholder (Turning / Discontinued description)
CTGP% ○○○○□○○N	P23	Toolholder (Turning / Discontinued description)
CTJN% ○○○○□○○	D56	Toolholder (Turning)
CTJN% ○○○○□○○A	D66	Toolholder (Turning)
CTTP% ○○○○□○○N	P23	Toolholder (Turning / Discontinued description)
CTUN% ○○○○□○○A	P21	Toolholder (Turning / Discontinued description)

D

DA ○○○○M-FTP / FTP-H	K9, K10	Drill heads
DA ○○○○M-GM	K6, K7, K8, K9	Drill heads
DA ○○○○M-HQP	K12, K13, K14	Drill heads
DA ○○○○M-HQS	K15	Drill heads
DC -○○(□)	P8	Spare parts (Shim)
DC ○○○○M-SC	K32, K33, K34	Drill heads
DCET ○○○○○(○)FL-USF	B74	Insert (Turning)
DCET ○○○○○(○)FR-JSF	B76	Insert (Turning)
DCET ○○○○○(○)FR-USF	B74	Insert (Turning)
DCET ○○○○○L-FSF	B72	Insert (Turning)
DCET ○○○○○MFL-J	B77	Insert (Turning)
DCET ○○○○○MFL-JSF	B76	Insert (Turning)
DCET ○○○○○MFL-U	B74	Insert (Turning)
DCET ○○○○○MFL-USF	B74	Insert (Turning)
DCET ○○○○○(○)MFR-J	B77	Insert (Turning)
DCET ○○○○○(○)MFR-JSF	B76	Insert (Turning)
DCET ○○○○○(○)MFR-U	B74	Insert (Turning)
DCET ○○○○○(○)MFR-USF	B74	Insert (Turning)
DCET ○○○○○ML-F	B72	Insert (Turning)
DCET ○○○○○ML-FSF	B72	Insert (Turning)
DCET ○○○○○(○)MR-F	B72	Insert (Turning)
DCET ○○○○○(○)MR-FSF	B72	Insert (Turning)
DCET ○○○○○(○)R-FSF	B72	Insert (Turning)
DCET ○○○○○(○)F%-USF	B74	Insert (Turning)
DCET ○○○○○(○)L-FSF	B72	Insert (Turning)
DCET ○○○○○MFL-J	B77	Insert (Turning)
DCET ○○○○○MFL-U	B74	Insert (Turning)
DCET ○○○○○MFL-USF	B74	Insert (Turning)
DCET ○○○○○(○)MFR-J	B77	Insert (Turning)
DCET ○○○○○(○)MFR-U	B74	Insert (Turning)
DCET ○○○○○(○)MFR-USF	B74	Insert (Turning)
DCET ○○○○○(○)ML-F	B72	Insert (Turning)
DCET ○○○○○(○)ML-FSF	B72	Insert (Turning)
DCET ○○○○○(○)MR-F	B72	Insert (Turning)
DCET ○○○○○(○)MR-FSF	B72	Insert (Turning)
DCET ○○○○○(○)R-FSF	B72	Insert (Turning)
DCET ○○○○○FR-U	B74	Insert (Turning)
DCGT ○○○○○	B70	Insert (Turning)
DCGT ○○○○○AH	B78	Insert (Turning)

Description	Page	Category
DCGT ○○○○○AP	B78	Insert (Turning)
DCGT ○○○○○CF	B68	Insert (Turning)
DCGT ○○○○○CK	B68	Insert (Turning)
DCGT ○○○○○EL-J	B77	Insert (Turning)
DCGT ○○○○○EL-U	B76	Insert (Turning)
DCGT ○○○○○(○)ER-J	B77	Insert (Turning)
DCGT ○○○○○ER-U	B76	Insert (Turning)
DCGT ○○○○○FL-J	B77	Insert (Turning)
DCGT ○○○○○(○)FL-U	B75	Insert (Turning)
DCGT ○○○○○FR-J	B77	Insert (Turning)
DCGT ○○○○○(○)FR-U	B75	Insert (Turning)
DCGT ○○○○○L-AO	B78	Insert (Turning)
DCGT ○○○○○(○)L-F	B73	Insert (Turning)
DCGT ○○○○○(○)M	B70	Insert (Turning)
DCGT ○○○○○MEL-J	B77	Insert (Turning)
DCGT ○○○○○MEL-U	B76	Insert (Turning)
DCGT ○○○○○(○)MER-J	B77	Insert (Turning)
DCGT ○○○○○MER-U	B76	Insert (Turning)
DCGT ○○○○○(○)MF	B70	Insert (Turning)
DCGT ○○○○○MFL-J	B77	Insert (Turning)
DCGT ○○○○○MFL-U	B75	Insert (Turning)
DCGT ○○○○○MFP-GF	B68	Insert (Turning)
DCGT ○○○○○MFP-GQ	B69	Insert (Turning)
DCGT ○○○○○MFP-SK	B68	Insert (Turning)
DCGT ○○○○○(○)MFP-SKS	B68	Insert (Turning)
DCGT ○○○○○(○)MFR-J	B77	Insert (Turning)
DCGT ○○○○○(○)MFR-U	B75	Insert (Turning)
DCGT ○○○○○ML-F	B73	Insert (Turning)
DCGT ○○○○○MP-CF	B68	Insert (Turning)
DCGT ○○○○○MP-CK	B68	Insert (Turning)
DCGT ○○○○○(○)MR-F	B73	Insert (Turning)
DCGT ○○○○○R-AO	B78	Insert (Turning)
DCGT ○○○○○(○)R-F	B73	Insert (Turning)
DCGT ○○○○○	B70	Insert (Turning)
DCGT ○○○○○AP	B78	Insert (Turning)
DCGT ○○○○○CF	B68	Insert (Turning)
DCGT ○○○○○CK	B68	Insert (Turning)
DCGT ○○○○○E%-U	B76	Insert (Turning)
DCGT ○○○○○(○)F%-U	B75	Insert (Turning)
DCGT ○○○○○(○)L-F	B73	Insert (Turning)
DCGT ○○○○○(○)M	B70	Insert (Turning)
DCGT ○○○○○ME%-U	B76	Insert (Turning)
DCGT ○○○○○(○)MF	B70	Insert (Turning)
DCGT ○○○○○(○)MFL-U	B75	Insert (Turning)
DCGT ○○○○○MFP-GF	B68	Insert (Turning)
DCGT ○○○○○MFP-GQ	B69	Insert (Turning)
DCGT ○○○○○MFP-SK	B68	Insert (Turning)
DCGT ○○○○○(○)MFP-SKS	B68	Insert (Turning)
DCGT ○○○○○(○)MFR-U	B75	Insert (Turning)
DCGT ○○○○○(○)ML-F	B73	Insert (Turning)
DCGT ○○○○○MP-CF	B68	Insert (Turning)
DCGT ○○○○○MP-CK	B68	Insert (Turning)
DCGT ○○○○○(○)MR-F	B73	Insert (Turning)
DCGT ○○○○○(○)R-F	B73	Insert (Turning)
DCGW ○○○○○	B78	Insert (Turning)
DCGW ○○○○○	B78	Insert (Turning)
DCLN% ○○○○□○○	D8	Toolholder (Turning)
DCLN% ○○○○□○○JCT	D9	Toolholder (Turning)
DCMT ○○○○○	B70, C42	Insert (Turning)
DCMT ○○○○○APD	C42	Insert (Turning)
DCMT ○○○○○GK	B70	Insert (Turning)
DCMT ○○○○○GP	B69	Insert (Turning)
DCMT ○○○○○HQ	B70	Insert (Turning)
DCMT ○○○○○L-NE	C42	Insert (Turning)

Description	Page	Category
DCMT ○○T○○MQ	B71	Insert (Turning)
DCMT ○○T○○NE	C42	Insert (Turning)
DCMT ○○T○○PP	B69	Insert (Turning)
DCMT ○○T○○R-NE	C42	Insert (Turning)
DCMT ○○T○○SE	C42	Insert (Turning)
DCMT ○○T○○XP	B71	Insert (Turning)
DCMT ○○T○○XQ	B71	Insert (Turning)
DCMT ○○○○○○	C42	Insert (Turning)
DCMT ○○○○○GK	B70	Insert (Turning)
DCMT ○○○○○GP	B69	Insert (Turning)
DCMT ○○○○○HQ	B70	Insert (Turning)
DCMT ○○○○○L-NE	C42	Insert (Turning)
DCMT ○○○○○MQ	B71	Insert (Turning)
DCMT ○○○○○NE	C42	Insert (Turning)
DCMT ○○○○○PP	B69	Insert (Turning)
DCMT ○○○○○R-NE	C42	Insert (Turning)
DCMT ○○○○○SE	C42	Insert (Turning)
DCMT ○○○○○XP	B71	Insert (Turning)
DCMW ○○T○○MEF	C22	Insert (Turning)
DCMW ○○T○○S○○○○MES	C22	Insert (Turning)
DCMW ○○T○○S○○○○MET	C22	Insert (Turning)
DCMW ○○T○○S○○○○SET	C22	Insert (Turning)
DCMW ○○T○○T○○○○ME	C22	Insert (Turning)
DCMW ○○T○○T○○○○SE	C22	Insert (Turning)
DCMW ○○○○○S○○○○MET	C22	Insert (Turning)
DCMW ○○○○○S○○○○SET	C22	Insert (Turning)
DCMW ○○○○○T○○○○ME	C22	Insert (Turning)
DCMW ○○○○○T○○○○SE	C22	Insert (Turning)
DCMX ○○T○○%-WP	B69	Insert (Turning)
DCMX ○○T○○WP	B69	Insert (Turning)
DCMX ○○○○○%-WP	B69	Insert (Turning)
DCMX ○○○○○WP	B69	Insert (Turning)
DD -○(-○)	P8	Spare parts (Shim)
DDHN%L ○○○○□○○○	D15	Toolholder (Turning)
DDJN%L ○○○○□○○JCT	D14	Toolholder (Turning)
DDJN%L ○○○○□○○○	D13	Toolholder (Turning)
DMC ○○	P33	End mill (Milling / Discontinued description)
DMC ○○○H	M171	End mill (Milling)
DMC ○○○S○○	P33	End mill (Milling / Discontinued description)
DMC ○○○SX	M170	End mill (Milling)
DMC ○○○SX○○	M170	End mill (Milling)
DMC ○○○SXT	M170	End mill (Milling)
DN ○○	P19	Spare parts (Nozzle)
DNGA ○○○○○MEF	C10	Insert (Turning)
DNGA ○○○○○ME○	C10	Insert (Turning)
DNGA ○○○○○S○○○○	B114	Insert (Turning)
DNGA ○○○○○S○○○○ME	C10	Insert (Turning)
DNGA ○○○○○S○○○○MEH	C10	Insert (Turning)
DNGA ○○○○○S○○○○MEP	C10	Insert (Turning)
DNGA ○○○○○S○○○○MET	C10	Insert (Turning)
DNGA ○○○○○T○○○○	B114	Insert (Turning)
DNGA ○○○○○T○○○○ME	C10	Insert (Turning)
DNGG ○○○○○AH	B31	Insert (Turning)
DNGG ○○○○○FP-TK	B28	Insert (Turning)
DNGG ○○○○○%L	B31	Insert (Turning)
DNGG ○○○○○%-A○	B31	Insert (Turning)
DNGG ○○○○○%-S	B31	Insert (Turning)
DNGG ○○○○○MFP-SK	B28	Insert (Turning)
DNGG ○○○○○TK	B28	Insert (Turning)
DNGM ○○○○○ME-HD	C11	Insert (Turning)
DNGM ○○○○○ME-HH	C11	Insert (Turning)
DNGM ○○○○○ME-HL	C11	Insert (Turning)
DNGN ○○○○○S○○○○	B114	Insert (Turning)
DNGN ○○○○○T○○○○	B114	Insert (Turning)

Description	Page	Category
DNGU ○○○○○MER-U	B55	Insert (Turning)
DNGU ○○○○○MFP-SK	B55	Insert (Turning)
DNGU ○○○○○MFR-F	B55	Insert (Turning)
DNGU ○○○○○MFR-U	B55	Insert (Turning)
DNMA ○○○○○	B31	Insert (Turning)
DNMG ○○○○○	B27	Insert (Turning)
DNMG ○○○○○AH	B31	Insert (Turning)
DNMG ○○○○○C	B30	Insert (Turning)
DNMG ○○○○○CI	B25	Insert (Turning)
DNMG ○○○○○CQ	B25	Insert (Turning)
DNMG ○○○○○GC	B30	Insert (Turning)
DNMG ○○○○○GP	B24	Insert (Turning)
DNMG ○○○○○GS	B25	Insert (Turning)
DNMG ○○○○○GT	B26	Insert (Turning)
DNMG ○○○○○HQ	B25	Insert (Turning)
DNMG ○○○○○KG	B30	Insert (Turning)
DNMG ○○○○○KH	B30	Insert (Turning)
DNMG ○○○○○KQ	B30	Insert (Turning)
DNMG ○○○○○MQ	B28	Insert (Turning)
DNMG ○○○○○MS	B29	Insert (Turning)
DNMG ○○○○○MU	B29	Insert (Turning)
DNMG ○○○○○PG	B26	Insert (Turning)
DNMG ○○○○○PH	B27	Insert (Turning)
DNMG ○○○○○PMG	B25	Insert (Turning)
DNMG ○○○○○PP	B24	Insert (Turning)
DNMG ○○○○○PQ	B24	Insert (Turning)
DNMG ○○○○○PS	B26	Insert (Turning)
DNMG ○○○○○PT	B26	Insert (Turning)
DNMG ○○○○○R-LD	B28	Insert (Turning)
DNMG ○○○○○SG	B29	Insert (Turning)
DNMG ○○○○○SQ	B29	Insert (Turning)
DNMG ○○○○○TK	B28	Insert (Turning)
DNMG ○○○○○TN-V	B25	Insert (Turning)
DNMG ○○○○○XF	B27	Insert (Turning)
DNMG ○○○○○XP	B27	Insert (Turning)
DNMG ○○○○○XQ	B27	Insert (Turning)
DNMG ○○○○○XS	B27	Insert (Turning)
DNMG ○○○○○ZS	B30	Insert (Turning)
DNMM ○○○○○M	C35	Insert (Turning)
DNMM ○○○○○M-NE	C35	Insert (Turning)
DNMM ○○○○○M-SE	C35	Insert (Turning)
DNMM ○○○○○PX	B27	Insert (Turning)
DNMU ○○○○○E-GK	B55	Insert (Turning)
DNMX ○○○○○WF	B24	Insert (Turning)
DPET ○○T○○○)F%-USF	B79	Insert (Turning)
DPET ○○T○○○L-FSF	B79	Insert (Turning)
DPET ○○T○○○)MFR-USF	B79	Insert (Turning)
DPET ○○T○○○)MR-FSF	B79	Insert (Turning)
DPET ○○T○○○)R-FSF	B79	Insert (Turning)
DPET ○○○○○(○)F%-USF	B79	Insert (Turning)
DPET ○○○○○L-FSF	B79	Insert (Turning)
DPET ○○○○○(○)MFR-USF	B79	Insert (Turning)
DPET ○○○○○M%-FSF	B79	Insert (Turning)
DPET ○○○○○(○)R-FSF	B79	Insert (Turning)
DR ○○-○○(□)	M238	Spare parts (Drive ring)
DR ○○○○-○○○○(□)	M239	Spare parts (Drive ring)
DRV -CH○○	K66	Toolholder (Chamfering Attachment / DRV)
DS -○○	P8	Spare parts (Shim)
DSBN%L ○○○○□○○	D19	Toolholder (Turning)
DT -○	P17	Spare parts (Wrench)
DT -○○	P8, P17	Spare parts (Shim / Wrench)
DTGN%L ○○○○□○○	D22	Toolholder (Turning)
DTGN%L ○○○○□○○JCT	D23	Toolholder (Turning)
DTM -○(○)	P17	Spare parts (Wrench)

Description	Page	Category
DTP -○(○)	P17	Spare parts (Wrench)
DTPM -○(○)	P17	Spare parts (Wrench)
DV -33	P8	Spare parts (Shim)
DVLN%L ○○○○□○○	D30	Toolholder (Turning)
DVLN%L ○○○○□○○JCT	D31	Toolholder (Turning)
DVPN%L ○○○○□○○	D32	Toolholder (Turning)
DVPN%L ○○○○□○○JCT	D33	Toolholder (Turning)
DVWN ○○○○□○○	D34	Toolholder (Turning)
DVWN ○○○○□○○JCT	D35	Toolholder (Turning)
DW -○○	P8	Spare parts (Shim)
DWLN%L ○○○○□○○	D43	Toolholder (Turning)
DWLN%L ○○○○□○○JCT	D44	Toolholder (Turning)

E

EO□□- SCLC%L○○○○	P25	Boring bars (Discontinued description)
EO□□- SCLC%L○○○○A	F62	Boring bars
EO□□- SCLCR○○○○A-○/○	F62	Boring bars
EO□□- SCLC%L-○○AN	F62	Boring bars
EO□□- SCLCR○○○○AN○/○	F62	Boring bars
EO□□- SCLP%L○○○○	P25	Boring bars (Discontinued description)
EO□□- SCLP%L○○○○A	F65	Boring bars
EO□□- SCLPR○○○○A-○/○	F65, P25	Boring bars
EO□□- SCLP%L○○○○AN	F65	Boring bars
EO□□- SCLPR○○○○AN○/○	F65	Boring bars
EO□□- SDQC%L○○○○A	F72	Boring bars
EO□□- SDQCR○○○○A-○/○	F72	Boring bars
EO□□- SDUC%L○○○○A	F68	Boring bars
EO□□- SDUCR○○○○A-○/○	F68	Boring bars
EO□□- SDZCR○○○○A	F76	Boring bars
EO□□- STLP%L○○○○	P25	Boring bars (Discontinued description)
EO□□- STLP%L○○○○A	F82, P25	Boring bars
EO□□- STLPR○○○○A-○/○	F82	Boring bars
EO□□- STLP%L○○○○AN	F82	Boring bars
EO□□- STLPR○○○○AN○/○	F82	Boring bars
EO□□- STUP%L○○○○	P25	Boring bars (Discontinued description)
EO□□- SVPBR○○○○A	F95	Boring bars
EO□□- SVPCR○○○○A	F95	Boring bars
EO□□- SVUBR○○○○A	F97	Boring bars
EO□□- SVUCR○○○○A	F97	Boring bars
EO□□- SWUB%L○○○○A(-○/○)	P26	Boring bars (Discontinued description)
EO□□- SWUB%L○○○○AN	F102	Boring bars
EO□□- SWUBR○○○○AN○/○	F102	Boring bars
EO□□- SWUP%L○○○○A	F102	Boring bars
EO□□- SWUPR○○○○A-○/○	F102	Boring bars
ENET ○○○○PAER-C	M179	Insert (Milling)
ENET ○○○○PAER-G	M179	Insert (Milling)
ENET ○○○○PAER-R	M179	Insert (Milling)
ENGN ○○○○○S○○○○	B115	Insert (Turning)
ENGN ○○○○○T○○○○	B115	Insert (Turning)
EZB%L ○○○○○HP-○○○H	F16	EZ Bars (Boring)
EZBCR ○○○○○-○○○-○○	F27	EZ Bars (Boring)
EZBFR ○○○○○-○○○	F24	EZ Bars (Boring)
EZBPR ○○○○○-○○○	F26	EZ Bars (Boring)
EZBPR ○○○○○-○○○-○○	F26	EZ Bars (Boring)
EZBR ○○○○○-○○○NB	C32, C60, F22	EZ Bars (Boring)
EZBR ○○○○○HP-○○○F	F19	EZ Bars (Boring)
EZBR ○○○○○HP-○○○G	F18	EZ Bars (Boring)
EZBR ○○○○○HP-○○○H-LT	F17	EZ Bars (Boring)
EZBR ○○○○○ST-○○○F	F21	EZ Bars (Boring)
EZBR ○○○○○ST-○○○H	F20	EZ Bars (Boring)
EZBTR ○○○○○-○○○	F30	EZ Bars (Boring)
EZFG%L ○○○○○-○○○	G102	EZ Bars (Grooving)
EZGR ○○○○○-○○○	G70	EZ Bars (Grooving)

Description	Page	Category
EZGR ○○○○○-○○○S	G70	EZ Bars (Grooving)
EZH ○○○○○(○)CT-○○○	F38, F39	Sleeve
EZH ○○○○○(○)HP-○○○	F40, F41	Sleeve
EZH ○○○○○(○)ST-○○(○)	F42, F43	Sleeve
EZTR ○○○○○-○○○-○○○	J40	EZ Bars (Threading)
EZVBR ○○○○○-○○○	F28	EZ Bars (Boring)

F

FGG%L ○○○○-○○	G50	Insert (Grooving)
FH-2	P17	Spare parts (Hexagon wrench / Flag type)
FH-2.5	P17	Spare parts (Hexagon wrench / Flag type)
FMM ○○-○○	G134	Insert (Grooving)
FMN ○	G134	Insert (Grooving)
FT -○(○)	P17	Spare parts (Torx wrench / Flag type)
FTK ○	G139	Insert (Grooving)
FTP -○	P17	Spare parts (Torx plus wrench / Flag type)

G

GA ○○	G61	Insert (Grooving)
GBA32%L ○○○-○○○	C54, G6, G7	Insert (Grooving)
GBA32%L ○○○-○○○F	G7	Insert (Grooving)
GBA32R ○○○-○○○R	G7	Insert (Grooving)
GBA43%L ○○○-○○○	C29, C54, G8, G9, G12	Insert (Grooving)
GBA43%L ○○○-○○○F	G10	Insert (Grooving)
GBA43%L ○○○-○○○GM	G11	Insert (Grooving)
GBA43%L ○○○-○○○R	G12	Insert (Grooving)
GBA43%L ○○○-○○○RF	G12	Insert (Grooving)
GBF32%L ○○○-○○○	G21, G22	Insert (Grooving)
GBF32%L ○○○-○○○F	G20	Insert (Grooving)
GBF32R ○○○-○○○GL	G20	Insert (Grooving)
GC08%L ○○○-○○○	G75	Insert (Grooving)
GC08R ○○○-○○○R	G75	Insert (Grooving)
GC10%L ○○○-○○○	G75	Insert (Grooving)
GC10R ○○○-○○○R	G75	Insert (Grooving)
GC12%L ○○○-○○○	G75	Insert (Grooving)
GC12R ○○○-○○○R	G75	Insert (Grooving)
GDFG ○○○○N-○○○GS	G111	Insert (Grooving)
GDFM ○○○○N-○○○DM	G111	Insert (Grooving)
GDFM ○○○○N-○○○GH	G111	Insert (Grooving)
GDFM ○○○○N-○○○GM	G111	Insert (Grooving)
GDFM ○○○○N-○○○R-CM	G111	Insert (Grooving)
GDFMS ○○○○N-○○○DM	G111	Insert (Grooving)
GDG ○○○○N-○○○AM	G31	Insert (Grooving)
GDG ○○○○N-○○○GS	G31, G90	Insert (Grooving)
GDG ○○○○N-○○○PG	H32	Insert (Cut-off)
GDG ○○○○R-○○○PG-○○D	H32	Insert (Cut-off)
GDGs ○○○○N-○○○NB	C30, C56, G33	Insert (Grooving)
GDM ○○○○L-○○○PF-○○D	H32	Insert (Cut-off)
GDM ○○○○N-○○○GL	G31	Insert (Grooving)
GDM ○○○○N-○○○GM	G30	Insert (Grooving)
GDM ○○○○N-○○○GMI	G90	Insert (Grooving)
GDM ○○○○N-○○○PF	H32	Insert (Cut-off)
GDM ○○○○N-○○○PH	G32, H33	Insert (Grooving / Cut-off)
GDM ○○○○N-○○○PM	H33	Insert (Cut-off)
GDM ○○○○N-○○○PQ	H32	Insert (Cut-off)
GDM ○○○○N-○○○R-CM	G32, G90	Insert (Grooving)
GDM ○○○○R-○○○PF-○○D	H32	Insert (Cut-off)
GDM ○○○○R-○○○PM-○○D	H33	Insert (Cut-off)
GDM ○○○○R-○○○PQ-○○D	H32	Insert (Cut-off)
GDMS ○○○○N-○○○GM	G30	Insert (Grooving)
GDMS ○○○○N-○○○PH	G32, H33	Insert (Grooving / Cut-off)
GDMS ○○○○N-○○○PM	H33	Insert (Cut-off)



Description	Page	Category
GDM5 ○○○○R-○○○PM-○D	H33	Insert (Cut-off)
GE%L ○○○-○○○A	G78	Insert (Grooving)
GER ○○○-○○○AR	G78	Insert (Grooving)
GE%L ○○○-○○○B	G78	Insert (Grooving)
GER ○○○-○○○BR	G78	Insert (Grooving)
GE%L ○○○-○○○C	G79	Insert (Grooving)
GER ○○○-○○○CM	G78	Insert (Grooving)
GER ○○○-○○○CR	G79	Insert (Grooving)
GE%L ○○○-○○○D	G79	Insert (Grooving)
GER ○○○-○○○DM	G78	Insert (Grooving)
GER ○○○-○○○DR	G79	Insert (Grooving)
GE%L ○○○-○○○E	G80	Insert (Grooving)
GER ○○○-○○○EM	G80	Insert (Grooving)
GFV%L ○○○○□-○○○A	G127	Toolholder (Grooving)
GFV%L ○○○○□-○○○B	G127	Toolholder (Grooving)
GFV%L ○○○○M-○○○(○)C	G127	Toolholder (Grooving)
GFVS%L ○○○○□-○○○AA	G125, P30	Toolholder (Grooving)
GFVS%L ○○○○□-○○○B	G129	Toolholder (Grooving)
GFVS%L ○○○○M-○○○(○)C	G129	Toolholder (Grooving)
GFVS%L ○○○○□-H□	G131	Toolholder (Grooving)
GFVT%L ○○○○□-○○○AA	G125, P30	Toolholder (Grooving)
GFVT%L ○○○○□-○○○B	G130	Toolholder (Grooving)
GFVT%L ○○○○M-○○○(○)C	G130	Toolholder (Grooving)
GFVT%L ○○○○□-H□	G131	Toolholder (Grooving)
GH ○○○○(○)-○○	B124, G61,	Insert (Grooving)
GHU ○○-○○	G61, G92	Insert (Grooving)
GIA ○○	G96	Insert (Grooving)
GIFV%L ○○○○B-○○○A	G133	Toolholder (Grooving)
GIFV%L ○○○○B-○○○B	G133, P30	Toolholder (Grooving)
GIFV%L ○○○○B-○○○C	G133	Toolholder (Grooving)
GIV%L ○○○○-○A	G86	Toolholder (Grooving)
GIV%L ○○○○-○AE	G87	Toolholder (Grooving)
GIV%L ○○○○-○AW	G88	Toolholder (Grooving)
GIV%L ○○○○-○B	G86	Toolholder (Grooving)
GIV%L ○○○○-○BE	G87	Toolholder (Grooving)
GIV%L ○○○○-○BW	G88	Toolholder (Grooving)
GIV%L ○○○○-○C	G86	Toolholder (Grooving)
GIV%L ○○○○-○CE	G87	Toolholder (Grooving)
GIV%L ○○○○-○CW	G88	Toolholder (Grooving)
GIV%L ○○○○-○S	G86	Toolholder (Grooving)
GIV%L ○○○○-○SE	G87	Toolholder (Grooving)
GIV%L ○○○○-○SS	G86	Toolholder (Grooving)
GMG ○○○○-○○○MG	G49, G94, G137	Insert (Grooving)
GMG ○○○○-○○○MS	G48	Insert (Grooving)
GMG ○○○○-○○○R	G49	Insert (Grooving)
GMG ○○○○-○○○RU	G49	Insert (Grooving)
GMGA ○○○○-○○○R	G50, G94, G137	Insert (Grooving)
GMGW ○○○○-○○R	C58, G66	Insert (Grooving)
GMGW ○○○○-○○R-HR	C58, G66	Insert (Grooving)
GML ○(,○)-○D	G52, H47	Insert (Grooving / Cut-off)
GMM ○○○○-MT	G51, H46	Insert (Grooving / Cut-off)
GMM ○○○○-NB	G51, H46	Insert (Grooving / Cut-off)
GMM ○○○○-TK	G51, H46	Insert (Grooving / Cut-off)
GMM ○○○○-TMR	H46	Insert (Cut-off)
GMM ○○○○-○○	G50	Insert (Grooving)
GMM ○○○○-○○R	G50	Insert (Grooving)
GMM ○○○○-○○MS	G48	Insert (Grooving)
GMM ○○○○-○○MW	G48, G94, G137	Insert (Grooving)
GMM ○○○○-○○○R	G49	Insert (Grooving)
GMM ○○○○-○○○V	G98	Insert (Grooving)
GMM ○○○%L-MT-○○D	G52, H47	Insert (Grooving / Cut-off)

Description	Page	Category
GMM ○○○○R-TK-○D	G52, H47	Insert (Grooving / Cut-off)
GMM ○○○○R-TMR-○D	H47	Insert (Cut-off)
GMN ○	G31, G57, G51, G53, H46	Insert (Grooving / Cut-off)
GMN ○-TK	G51, H46	Insert (Grooving / Cut-off)
GMN ○,○	G51, H46	Insert (Grooving / Cut-off)
GMR ○-TK-○D	G52, H47	Insert (Grooving / Cut-off)
GMR ○(,○)-○(○)D	G52, H47	Insert (Grooving / Cut-off)
GOMT ○○T○○○ER-D	M232	Insert (Milling)
GOMT ○○○○○ER-D	M232	Insert (Milling)
GP -○	P19	Spare parts (Plug)
GS-50	P2	Spare parts (Screw)
GVF%L ○○○-○○○A	G126	Insert (Grooving)
GVF%L ○○○-○○○AA	G124	Insert (Grooving)
GVF%L ○○○-○○○AR	G126	Insert (Grooving)
GVF%L ○○○-○○○B	C55, G126	Insert (Grooving)
GVF%L ○○○-○○○BR	G126	Insert (Grooving)
GVF%L ○○○-○○○C	C55, G126	Insert (Grooving)
GV%L ○○○-○○○A	C55, G84, G85	Insert (Grooving)
GV%L ○○○-○○○AR	G85	Insert (Grooving)
GV%L ○○○-○○○B	C55, G85	Insert (Grooving)
GVR ○○○-○○○BR	G85	Insert (Grooving)
GV%L ○○○-○○○C	G85	Insert (Grooving)
GV%L ○○○-○○○S	G84	Insert (Grooving)
GV%L ○○○-○○○SS	G84	Insert (Grooving)
GZG ○○○○N-○○○PG	H25	Insert (Cut-off)
GZG ○○○○R-○○○PG-○○D	H25	Insert (Cut-off)
GZM ○○○○L-○○○PF-○○D	H24	Insert (Cut-off)
GZM ○○○○N-○○○PF	H24	Insert (Cut-off)
GZM ○○○○N-○○○PH	H25	Insert (Cut-off)
GZM ○○○○N-○○○PM	H24	Insert (Cut-off)
GZM ○○○○R-○○○PF-○○D	H24	Insert (Cut-off)
GZM ○○○○R-○○○PM-○D	H24	Insert (Cut-off)
GZMS ○○○○N-○○○PH	H25	Insert (Cut-off)

H

HA○○ PCLN%L○○-○○	P27	Boring bars (Discontinued description)
HA○○ PDUN%L○○-○○	P27	Boring bars (Discontinued description)
HA○○ PTFN%L○○-○○	P27	Boring bars (Discontinued description)
HA32 SCLC%L○○-○○	P27	Boring bars (Discontinued description)
HA32 SDUC%L○○-○○	P27	Boring bars (Discontinued description)
HF16X48HC	P19	Spare parts (Screw with coolant hole)
HF20X53H	P2	Spare parts (Screw with coolant hole)
HF20X53HA	P2	Spare parts (Screw with coolant hole)
HF24X60H	P2	Spare parts (Screw with coolant hole)
HF24X60HA	P2	Spare parts (Screw with coolant hole)
HH3X6	P2	Spare parts (Screw)
HH3X10S	P2	Spare parts (Screw)
HH3X12	P2	Spare parts (Screw)
HH3.5X10S	P2	Spare parts (Screw)
HH4X12	P3	Spare parts (Screw)
HH4X12S	P2	Spare parts (Screw)
HH4X16	P2	Spare parts (Screw)
HH5 X○○	P2	Spare parts (Screw)
HH5X15L	P2	Spare parts (Screw)
HH6 X○○	P3	Spare parts (Screw)
HH6 X○○A	P3	Spare parts (Screw)
HH8 X○○	P3	Spare parts (Screw)
HH8X25H	P3	Spare parts (Screw with coolant hole)
HH10 X○○	P3	Spare parts (Screw)
HH10X30H	P3	Spare parts (Screw with coolant hole)
HH10X35HK	P3	Spare parts (Screw with coolant hole)
HH12 X○○	P3	Spare parts (Screw)

Description	Page	Category
HH12X35H	P3	Spare parts (Screw with coolant hole)
HH12X35HC	P19	Spare parts (Screw with coolant hole)
HH12X35HK	P3	Spare parts (Screw with coolant hole)
HH16 X○○	P3	Spare parts (Screw)
HH16X52H	P3	Spare parts (Screw with coolant hole)
HH20 X○○	P3	Spare parts (Screw)
HS -○○○○○(○)TRP	P4	Spare parts (Screw)
HS ○X○○	P3	Spare parts (Screw)
HS ○X○○□(□)	P3	Spare parts (Screw)
HS ○X○○	P3	Spare parts (Screw)
HS ○○○○○	P3	Spare parts (Screw)
HS -AN-AN-○○○	D12,G37,H66	Spare parts (Hose)
HSB4X8%L	P4	Spare parts (Lock screw)
HS -G1/8-G1/8-○○○	H17	Spare parts (Hose)
HS -ST-AN-○○○	D12,G37,H66	Spare parts (Hose)
HS -ST-ST-○○○	D12,G37,H66	Spare parts (Hose)

J

J -AN-R1/8-G1/8	H17	Spare parts (Joint)
JCET ○○○○○○ML-F	B80	Insert (Turning)
JCET ○○○○○○ML-FSF	B80	Insert (Turning)
JCET ○○○○○○MR-F	B80	Insert (Turning)
JCET ○○○○○○MR-FSF	B80	Insert (Turning)
J -G1/8-UNF3/8	D12,G37,H66	Spare parts (Joint)
J -M10X1.5-UNF3/8	D12,G37,H66	Spare parts (Joint)
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J -ST-G1/4-G1/8	F129	Spare parts (Joint)
J -ST-G3/8-G1/4	F129	Spare parts (Joint)
J -ST-NPT1/8-G1/8	H17	Spare parts (Joint)
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KGD%L ○○○○□(□)-○○(○)T○○	G34, H40	Toolholder (Grooving / Cut-off)
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KGZ%L ○○○○□(□)-○○(○)JCTM	H26	Toolholder (Cut-off)
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MFF ○○○R(-M)-SF	M193	Face mill
MFH ○○○M-○○○-○○○T	M202, M213, M220, M227	Modular type head
MFH ○○○M-○○○-○○○T-KUA	M220	Modular type head
MFH ○○○S-○○○-○○○T	M200, M201, M211, M218, M226	End mill
MFH ○○○S-○○○-○○○T○○○	M200, M211, M218	End mill
MFH ○○○W-○○○-○○○T	M200, M211, M218, M226	End mill
MFH ○○○R-○○○-○○○(○)T	M212	Face mill
MFH ○○○R-○○○-○○○(○)T-M	M212	Face mill
MFH ○○○R-○○○-○○○T-○○M	M212	Face mill
MFH ○○○R-○○○-○○○T	M198, M199	Face mill
MFH ○○○R-○○○-○○○T-M	M198, M199, M219	Face mill
MFH ○○○R-○○○-○○○T-M-KUA	M219	Face mill
MFH ○○○R-○○○-○○○T-○○M	M198, M199	Face mill
MFK ○○○R-○○○-○○○(○)T	M50	Face mill

Description	Page	Category
MFK ○○○R-○○○-○○○(○)T-M	M50	Face mill
MFK ○○○R-○○○-○○○(○)T-M-SF	M52	Face mill
MFK ○○○R-○○○-○○○(○)T-SF	M52	Face mill
MFLN ○○○○○R-○○○(○)T	M44, M45, M152	Face mill
MFLN ○○○○○R-○○○(○)T-M	M44, M45, M152	Face mill
MFPN-45	P9	Spare parts (Shim)
MFPN ○○○○○%L-○○○(○)T	M23	Face mill
MFPN ○○○○○R-○○○(○)T-G	M31	Face mill
MFPN ○○○○○R-○○○(○)T-M	M22, P32	Face mill
MFPN ○○○○○R-○○○(○)T-M-G	M31	Face mill
MFPN ○○○○○R-S-○○○T	M25	End mill
MFPN ○○○○○R-S-○○○T-G	M33	End mill
MFSE-10S	P9	Spare parts (Shim)
MFSE ○○○○○%L-○○○(○)T	M38	Face mill
MFSE ○○○○○R-○○○(○)T-M	M38	Face mill
MFSE ○○○○○R-○○○(○)T-W	M38	Face mill
MFSE ○○○○○R-○○○(○)T-W-M	M38	Face mill
MFSN ○○○○○R-S-○○○T-G	M147	End mill
MFSN ○○○○○R-○○○(○)T-G	M145	Face mill
MFSN ○○○○○R-○○○(○)T-M-G	M145	Face mill
MFWN-90	P9	Spare parts (Shim)
MFWN ○○○○○R-S-○○○T	M134	End mill
MFWN ○○○○○R-S-○○○-○○○T	M140	End mill
MFWN ○○○○○R-○○○(○)T	M132	Face mill
MFWN ○○○○○R-○○○(○)T-M (-KUA)	M131, P33	Face mill
MFWN ○○○○○R-○○○-○○○(○)T	M139	Face mill
MFWN ○○○○○R-○○○-○○○(○)T-M	M139	Face mill
MGI ○○○○○A	M290	End mill
MGI ○○○○○B	M290	End mill
MGI ○○○○○C	M290, P37	End mill
MGI ○○○○○S	M290	End mill
MGI ○○○○○SS	M290	End mill
MHD ○○○RF	P37	Helical radius end mill (Discontinued description)
MHD ○○○(○)-BT50-A	P36	Helical end mill (Discontinued description)
MHD ○○○(○)-BT50-SA	P36	Helical end mill (Discontinued description)
MHD ○○○(○)-F	P36, P37	Helical end mill (Discontinued description)
MHD ○○○(○)-FMA-A	P36	Helical end mill (Discontinued description)
MHD ○○○(○)-FMA-SA	P36	Helical end mill (Discontinued description)
MHD ○○○S-○○○RSA	P37	Helical radius end mill (Discontinued description)
MHD ○○○S-○○○A(-○○○)	P36, P37	Helical end mill (Discontinued description)
MHD ○○○S-○○○B	P36	Helical end mill (Discontinued description)
MHD ○○○(S)-○○○C	P36	Helical end mill (Discontinued description)
MHD ○○○S-○○○SA	P36	Helical end mill (Discontinued description)
MHD ○○○S-○○○SB	P36	Helical end mill (Discontinued description)
MRF ○○○S-○○○	M258	End Mill (Ball-nose)
MRF ○○○S-○○○-○○○	M258	End Mill (Ball-nose)
MRFW ○○○S-○○○	M259	End Mill (Ball-nose)
MRFW ○○○S-○○○-○○○	M259	End Mill (Ball-nose)
MRP ○○○R-○○○	P35	Face mill (Discontinued description)
MRP ○○○R-○○○T	P35	Face mill (Discontinued description)
MRP ○○○S-○○○-○○○	P35	End mill (Discontinued description)
MRP ○○○S-○○○-○○○T	P35	End mill (Discontinued description)
MRP ○○○S-○○○-○○○-○○○	P35	End mill (Discontinued description)
MRP ○○○S-○○○-○○○-○○○	P35	End mill (Discontinued description)
MRW ○○○S-○○○-○○○T	M266	End mill
MRW ○○○S-○○○-○○○T-○○○	M266	End mill
MRW ○○○W-○○○-○○○T	M266	End mill
MRW ○○○R-○○○-○○○(○)T	M264	Face mill
MRW ○○○R-○○○-○○○(○)T-M	M264	Face mill
MRX ○○○M-○○○-○○○T	M275	Modular type head
MRX ○○○S-○○○-○○○T	M274	End mill



Description	Page	Category
MRX ○○S○○○OT○○○	M274	End mill
MRX ○○W○○○OT	M274	End mill
MRX ○○○R○○OT	M271	Face mill
MRX ○○○R○○OT-M	M271	Face mill
MSD-42	P9	Spare parts (Shim)
MSD 45○○	P32	Face mill (with Shank / Discontinued description)
MSD 45○○-32	P32	Face mill (with Shank / Discontinued description)
MSE 15○○(-32)	P32	Face mill (with Shank / Discontinued description)
MSE -○○○○(□)	P9	Spare parts (Shim)
MSE 45○○	P32	Face mill (with Shank / Discontinued description)
MSE 45○○-32	P32	Face mill (with Shank / Discontinued description)
MS-FRW1	M238,M239	Spare parts (Wrench / for MSTA)
MSO 45○○-5	P32	Face mill (with Shank / Discontinued description)
MSO 45○○-532-09	P32	Face mill (with Shank / Discontinued description)
MSO 45○○○R	P32	Face mill (Discontinued description)
MSO 45○○○R-09	P32	Face mill (Discontinued description)
MSO 90○○-532-○○	P33	Face mill (with Shank / Discontinued description)
MSO 90○○○R-○○	P33	Face mill (Discontinued description)
MSO-4T245	P10	Spare parts (Shim)
MSO-5200	P10	Spare parts (Shim)
MSP 15○○	P32	Face mill (with Shank / Discontinued description)
MSP-42	P10	Spare parts (Shim)
MSR ○○○R-BT○○○	M166	Face mill
MSR ○○○R-○	M165	Face mill
MSR ○○○R-○○○○○	M165	Face mill
MSR ○○○R-○M	M165	Face mill
MSRS ○○○○R-○○(○)T	M159	Face mill
MSRS ○○○○R-○○(○)T-M	M159	Face mill
MSRS ○○○○R-○○(○)T	M59	Face mill
MSRS ○○○○R-○○(○)T-M	M59	Face mill
MSTA ○○○(○)N○○○○(○)T	M238	Slot mill
MSTA ○○○N○○○○(○)T	M239	Slot mill
MSTB ○○○AN○○○○(○)T	M242	Slot mill
MSTB ○○○SN○○○○(○)T	M244	Slot mill
MSTB ○○○AN○○○○(○)T	M243	Slot mill
MSTC ○○○AL○○○○○○○○	P34	Slot mill (Discontinued description)
MSTC ○○○AL○○○○○○○○(○)T	P34	Slot mill (Discontinued description)
MSTC ○○○AN○○○○○○○○	P34	Slot mill (Discontinued description)
MSTC ○○○AN○○○○○○○○(○)T	M249	Slot mill
MSTC ○○○AR○○○○○○○○	P34	Slot mill (Discontinued description)
MSTC ○○○AR○○○○○○○○(○)T	P34	Slot mill (Discontinued description)
MSTC ○○○SL○○○○○○○○(○)T	P35	Slot mill (Discontinued description)
MSTC ○○○SN○○○○○○○○(○)T	M250	Slot mill
MSTC ○○○SR○○○○○○○○(○)T	P35	Slot mill (Discontinued description)
MTE-42	P10	Spare parts (Shim)
MTE 90○○	P33	Face mill (with Shank / Discontinued description)
MTE 90○○-32	P33	Face mill (with Shank / Discontinued description)
MTE5 ○○○	P33	End mill (Discontinued description)
MTP 90○○	P33	Face mill (with Shank / Discontinued description)
MTP5 ○○○	P33	End mill (Discontinued description)
MVG ○○○○	M292, P37	End mill
MVLN%L ○○○○□○○	D36	Toolholder (Turning)
MVN-32	P10	Spare parts (Shim)
MVWVN ○○○○□○○	D37	Toolholder (Turning)

N

NDCT ○○○○○FR	M172	Insert (Milling)
NDCT ○○○○○TR	M172	Insert (Milling)
NDCT ○○○○○TRX	M172	Insert (Milling)
NDCW ○○○○○FRX	G64, M172, M298	Insert (Milling)
NDCW ○○○○○FRX-NE	G64, M172, M298	Insert (Milling)
NDCW ○○○○○TR	M172	Insert (Milling)

Description	Page	Category
NDCW ○○○○○TRX	M172	Insert (Milling)

P

P-03	P7	Spare parts (Shim pin)
P-03S	P7	Spare parts (Shim pin)
PC -○	P19	Spare parts (Punch)
PCLN%L ○○○○□○○	D10	Toolholder (Turning)
PCLNR ○○○○JX-○○FF	E63	Toolholder (Turning)
PD-42	P10	Spare parts (Shim)
PDHN%L ○○○○□○○	D17	Toolholder (Turning)
PDJN%L ○○○○□○○	D16	Toolholder (Turning)
PDJN%L ○○○○□○○U	D16	Toolholder (Turning)
PH ○○○○○○	P28	Sleeve (for Tip-bars / Discontinued description)
PKM ○○%L-○○○PM-○D	H58	Insert (Cut-off)
PKM ○○N-○○○PH	H58	Insert (Cut-off)
PKM ○○N-○○○PM	H58	Insert (Cut-off)
PNEA ○○○XNTR-T○○○○○	M54	Insert (Milling)
PNEG ○○○XNER-GL	M54	Insert (Milling)
PNEG ○○○XNER-W	M54	Insert (Milling)
PNEG ○○○XNTR-T○○○○○	M54	Insert (Milling)
PNEG ○○○XNTR-T○○○○○W	M54	Insert (Milling)
PNEU ○○○ANER-GL	M26	Insert (Milling)
PNEU ○○○ANER-GL	M26	Insert (Milling)
PNEU ○○○ANER-W	M26	Insert (Milling)
PNMG ○○○XNER-GH	M54	Insert (Milling)
PNMG ○○○XNER-GM	M54	Insert (Milling)
PNMU ○○○ANER-GM	M26	Insert (Milling)
PNMU ○○○ANER-GH	M26	Insert (Milling)
PNMU ○○○ANER-GM	M26	Insert (Milling)
PNMU ○○○ANER-SM	M26	Insert (Milling)
PNMU ○○○XNER-GH	M34	Insert (Milling)
PNMU ○○○XNER-GM	M34	Insert (Milling)
PNMU ○○○XNER-SM	M34	Insert (Milling)
PP-4	P7	Spare parts (Lock pin)
PR07 -ST-UNF3/8	F129	Spare parts (Joint)
PRGC%L ○○○○□○○	D40	Toolholder (Turning)
PRGC%L ○○○○□○○BE	D67, P21	Toolholder (Turning)
PRGC%L ○○○○□○○BF	P21	Toolholder (Turning / Discontinued description)
PRGN%L ○○○○□○○	D42	Toolholder (Turning)
PRXC%L ○○○○□○○	D40	Toolholder (Turning)
PSBN%L ○○○○□○○	D19, P20	Toolholder (Turning)
PSDNN ○○○○□○○	D21	Toolholder (Turning)
PSH ○○○○(○)○○(○)	P24	Sleeve (for 2-Edge tip-bars / Discontinued description)
PSKN%L ○○○○□○○	D20, P20	Toolholder (Turning)
PSSN%L ○○○○□○○	D20	Toolholder (Turning)
P-ST-RC1/8	H17	Spare parts (Coupling)
PTFN%L ○○○○□○○	D25, P20	Toolholder (Turning)
PTGN%L ○○○○□○○	D24, P20	Toolholder (Turning)
PTLNR ○○○○JX-○○FF	E64	Toolholder (Turning)
PVLN%L ○○○○□○○Q	D38	Toolholder (Turning)
PVPN%L ○○○○□○○Q	D38	Toolholder (Turning)
PVVVN ○○○○□○○Q	D39	Toolholder (Turning)
PWLN%L ○○○○□○○	D45	Toolholder (Turning)

R

RBG ○○K○○○○○	B123	Insert (Turning)
RCGX ○○○○M○-AQ	B81	Insert (Turning)
RCGX ○○○○○E○○○	B123	Insert (Turning)
RCGX ○○○○○P○○○○○	B123	Insert (Turning)
RCGX ○○○○○T○○○○○	B123	Insert (Turning)
RCMT ○○○○M○-BB	B109	Insert (Turning)
RCMX ○○○○M○	B81	Insert (Turning)
RDFG ○○FR	M260	Insert (Milling)

Description	Page	Category
RDGT ○○○○MOER-GM	M276	Insert (Milling)
RDGT ○○○○MOER-SM	M276	Insert (Milling)
RDHX ○○T○M○T	M299	Insert (Milling)
RDHX ○○○○M○T	M299	Insert (Milling)
RDMT ○○T○M○H	M299	Insert (Milling)
RDMT ○○○○MOEN-GH	M276	Insert (Milling)
RDMT ○○○○MOER-GM	M276	Insert (Milling)
RNGN ○○○○○○E○○○	B116	Insert (Turning)
RNGN ○○○○○○K○○○○○	B116	Insert (Turning)
RNGN ○○○○○○S○○○○○	B116	Insert (Turning)
RNGN ○○○○○○T○○○○○	B116	Insert (Turning)
RNMG ○○○○○○	B32	Insert (Turning)
RNMN ○○○○○○S○○○○○	C17	Insert (Turning)
ROMU ○○○○M○ER-GH	M267	Insert (Milling)
ROMU ○○○○M○ER-GM	M267	Insert (Milling)
ROMU ○○○○M○ER-SM	M267	Insert (Milling)
RPGN ○○○○○○E○○○	B120	Insert (Turning)
RPGN ○○○○○○T○○○○○	B120	Insert (Turning)
RPGT ○○T○MOER-GM	M276	Insert (Milling)
RPGT ○○T○MOER-SM	M276	Insert (Milling)
RPGT ○○○○MOER-GM	M276	Insert (Milling)
RPGT ○○○○MOER-SM	M276	Insert (Milling)
RPGX ○○○○○○E○○○	B123	Insert (Turning)
RPGX ○○○○○○T○○○○○	B123	Insert (Turning)
RPMT ○○T○M○	M299	Insert (Milling)
RPMT ○○T○MOEN-GH	M276	Insert (Milling)
RPMT ○○T○MOER-GM	M276	Insert (Milling)
RPMT ○○○○M○	M299	Insert (Milling)
RPMT ○○○○M○-BB	B109	Insert (Turning)
RPMT ○○○○M○-H	M299	Insert (Milling)
RPMT ○○○○MOEN-GH	M276	Insert (Milling)
RPMT ○○○○MOER-GM	M276	Insert (Milling)

S

S○○-CH○○	K38	Toolholder (Chamfering attachment / DRC)
S○○-CH○○-DRA	K20	Toolholder (Chamfering attachment / DRA)
S○○- DRS○○○○○	P31	Toolholder („MagicDrill“ / Discontinued description)
S○○- DRV○○○M-○○○	K54, K55, K56, K57, K58, K59, K60, K61, K62	Toolholder („MagicDrill“)
S○○- DRW○○○○○M-○○-06	K90, K91, K92, K93	Toolholder („MagicDrill“)
S○○- DRZ○○○○(○○)-○○	K76, K77, K78, K79, K80, K81, K82	Toolholder (“MagicDrill“)
S○○- DRZ○○○○○-○○CR	K83	Toolholder (“MagicDrill“)
S○○□- CCLN%○○-○○A	P26	Boring bars (Discontinued description)
S○○□- CCLN%○○-○○GX	P28	Boring bars (Discontinued description)
S○○□- CDUN%○○-○○GX	P28	Boring bars (Discontinued description)
S○○□- CELNR○○-○○	F151	Boring bars
S○○□- CSKN%○○-○○	P28	Boring bars (Discontinued description)
S○○□- CSKN%○○-○○A	P26	Boring bars (Discontinued description)
S○○□- CSKN%○○-○○GX	P28	Boring bars (Discontinued description)
S○○□- CSKPR○○-○○	F112, P26	Boring bars
S○○□- CTUC%○○-○○	P26	Boring bars (Discontinued description)
S○○□- CTUNR○○-○○A	F152	Boring bars
S○○□- CTUP%○○-○○	F113, P26	Boring bars
S○○(○)□- KGBFL16	G26	Toolholder (Grooving)
S○○□- KITGFL16	P28	Toolholder (Grooving / Discontinued description)
S○○(○)□- KTNL16	J25	Toolholder (Threading)

Description	Page	Category
S○○(○)□- KTXL16	J35	Toolholder (Threading)
S○○□- PCLN%○○-○○	F132	Boring bars
S○○□- PDQN%○○-○○	F139	Boring bars
S○○□- PDUN%○○-○○	F134, F138	Boring bars
S○○□- PDZN%○○-○○	F140	Boring bars
S○○□- PTUN%○○-○○	F144	Boring bars
S○○□- PWLN%○○-○○	F146	Boring bars
S○○(○)□- SCLCL○○	E54	Toolholder (Turning)
S○○□- SCLC%○○-○○	P25	Boring bars (Discontinued description)
S○○□- SCLC%○○-○○A	F61	Boring bars
S○○□- SCLC%○○-○○E	P25	Boring bars (Discontinued description)
S○○□- SCLC%○○-○○AE	F60	Boring bars
S○○□- SCLCR○○-○○EZ	P24	Boring bars (EZ Bar PLUS / Discontinued description)
S○○□- SCLCR○○-○○EZP	F31	Boring bars
S○○□- SCLP%○○-○○	P25	Boring bars (Discontinued description)
S○○□- SCLP%○○-○○A	F64	Boring bars
S○○□- SCLP%○○-○○E	P25	Boring bars (Discontinued description)
S○○(○)□- SDCL○○	E56	Toolholder (Turning)
S○○□- SDQC%○○-○○A	F71	Boring bars
S○○(○)□- SDUCL○○	E55	Toolholder (Turning)
S○○□- SDUC%○○-○○	P25	Boring bars (Discontinued description)
S○○□- SDUC%○○-○○A	F67	Boring bars
S○○□- SDUC%○○-○○E	P25	Boring bars (Discontinued description)
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S○○□- SDZC%○○-○○A	F75	Boring bars
S○○□- SDZC%○○-○○E	P25	Boring bars (Discontinued description)
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S○○□- STLB%○○-○○AE	F80	Boring bars
S○○□- STLBR○○-○○EZP	F33	Boring bars
S○○□- STLC%○○-○○A	F89	Boring bars
S○○□- STLP%○○-○○A	F81	Boring bars
S○○□- STLPR○○-○○EZP	F33	Boring bars
S○○□- STUB%○○-○○	P25	Boring bars (Discontinued description)
S○○□- STUB%○○-○○E	P25	Boring bars (Discontinued description)
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S○○□- STWPR○○-○○E	F84, J47	Toolholder (Boring / Threading)
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S○○□- SVJB%○○-○○A	F91	Boring bars
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S○○□- SVJB%○○-○○EN	P26	Boring bars (Discontinued description)
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SEEN- □□□□□□□□□□AFTN	M294	Insert (Milling)
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SNMM ○○○○○○PX	B34	Insert (Turning)
SNMN ○○○○○○	B37, M296	Insert (Turning / Milling)
SNMN ○○○○○○S○○○○○	C18	Insert (Turning)

Description	Page	Category
SNMN ○○○○○○T○○○○○	B117	Insert (Turning)
SNMU ○○○○ANER-GH	M20	Insert (Milling)
SNMU ○○○○ANER-GM	M20	Insert (Milling)
SNMU ○○○○○○EN-GH	M148	Insert (Milling)
SNMU ○○○○○○EN-GM	M148	Insert (Milling)
SNMU ○○○○○○EN-SM	M148	Insert (Milling)
SOMT ○○○○○○ER-FL	M203	Insert (Milling)
SOMT ○○○○○○ER-GH	M203	Insert (Milling)
SOMT ○○○○○○ER-GM	M203	Insert (Milling)
SOMT ○○○○○○ER-LD	M203	Insert (Milling)
SP- -○(D)	P18	Spare parts (Spring)
SP ○X○(○)	P6	Spare parts (Screw)
SP -○○○(□)	P10, P11	Spare parts (Shim)
SP -RC	P12	Spare parts (Shim)
SPCN ○○○○EDTR	M295	Insert (Milling)
SPCN ○○○○EETR○	M295	Insert (Milling)
SPCN ○○○○XPTR	M295	Insert (Milling)
SPCT ○○T○○○EN-SD	M252	Insert (Milling)
SPCT ○○T○○○FN-SE	M252	Insert (Milling)
SPCT ○○T○○○□%L-□□	M252	Insert (Milling)
SPEN ○○○○EER	M295	Insert (Milling)
SPEN ○○○○EESR	M295	Insert (Milling)
SPET ○○T○○○□%L-SB	M252	Insert (Milling)
SPGH ○○○○○○L	B82	Insert (Turning)
SPGN ○○○○○○	B83, C43, M295	Insert (Turning / Milling)
SPGN ○○○○○○NE	C43	Insert (Turning)
SPGN ○○○○○○S○○○○○	B121	Insert (Turning)
SPGN ○○○○○○T○○○○○	B121	Insert (Turning)
SPGR ○○○○○○%L	B83	Insert (Turning)
SPKN ○○○○EDER	M295	Insert (Milling)
SPKN ○○○○EDFR	M295	Insert (Milling)
SPKN ○○○○EDT%L	M295	Insert (Milling)
SPKN ○○○○XETR	M295	Insert (Milling)
SPKN ○○○○XPFR	M295	Insert (Milling)
SPKN ○○○○XPTR	M295	Insert (Milling)
SPKR ○○○○EDER-S	M295	Insert (Milling)
SPMN ○○○○○○	B83, M295	Insert (Turning / Milling)
SPMR ○○○○EDER-H	M295	Insert (Milling)
SPMR ○○○○○○	B83	Insert (Turning)
SPMR ○○○○○○G	B83	Insert (Turning)
SPMT ○○○○EDER-NB○	M60	Insert (Milling)
SPMT ○○○○EDER-NB○P	M60	Insert (Milling)
SPMT ○○○○EDER-V	M60	Insert (Milling)
SPMT ○○○○EDSR-NB○T	M60	Insert (Milling)
SPMT ○○○○○○E-Z	M285	Insert (Milling)
SPMT ○○○○○○EN-GM	M285	Insert (Milling)
SPMT ○○○○○○EN-NB○	M160	Insert (Milling)
SPMT ○○○○○○EN-NB○P	M160	Insert (Milling)
SPMT ○○○○○○EN-V	M160	Insert (Milling)
SPW -○○○○	P6	Spare parts (Screw)
SRCP%L ○○○○B-○○-A○○	F114, P28	Boring bars
SS -4N	P6	Spare parts (Screw)
SS○○- DRA○○○M-○(○)	K16, K17, K18, K19	Toolholder ("MagicDrill")
SS○○- DRC○○○M-○	K35, K36, K37	Toolholder ("MagicDrill")
STGC%L ○○○○□-○○	E38, P22	Toolholder (Turning)
STGP%L ○○○○□-○○	E39, P22	Toolholder (Turning)
STLNR ○○○○□-○○FF	E62	Toolholder (Turning)
STWL ○○○○□-○○	G106, P24	Toolholder (for Twin bars)
STWR ○○○○□-○○	F56, P24	Toolholder (for Twin bars)
STWSR ○○○○□(□)-○○T	F59, G109, P24	Toolholder (for Twin bars)
SV -60136(T)R	P6	Spare parts (Screw)

Description	Page	Category
SVJB%L ○○○○□○○F	P22	Toolholder (Turning / Discontinued description)
SVJB%L ○○○○JX○○FF	E40	Toolholder (Turning)
SVJB%L ○○○○□○○	E41	Toolholder (Turning)
SVJB%L ○○○○□○○N	E41	Toolholder (Turning)
SVJBR ○○○○H○○FFICT	P23	Toolholder (Turning / Discontinued description)
SVJBR ○○○○JX○○FFICTM	E41	Toolholder (Turning)
SVJC%L ○○○○□(□)○○FF	E44	Toolholder (Turning)
SVJP%L ○○○○□(□)○○FF	E47	Toolholder (Turning)
SVJPR ○○○○H○○FFICT	P23	Toolholder (Turning / Discontinued description)
SVJPR ○○○○JX○○FFICTM	E47	Toolholder (Turning)
SVLC%L ○○○○□(□)○○FF	E44	Toolholder (Turning)
SVLP%L ○○○○□○○F	P22	Toolholder (Turning / Discontinued description)
SVLP%L ○○○○□(□)○○FF	E48, P22	Toolholder (Turning)
SVLPR ○○○○JX○○F○○	E24	Toolholder (Turning)
SVNR ○○○○□-12	P24	Toolholder (for System Tip-bars / Discontinued description)
SVNR ○○○○□○○N	F48	Toolholder (for System Tip-Bars)
SVN □○○(□)	P12	Spare parts (Shim)
SVNSR ○○○○□-12○○	P24	Toolholder (for System Tip-bars / Discontinued description)
SVNSR ○○○○□○○○○N	F49	Toolholder (for System Tip-Bars)
SVNSR ○○○○□○○○○XN	F53	Toolholder (for System Tip-Bars)
SVPB%L ○○○○□(□)○○	E42, P23	Toolholder (Turning)
SVPB%L ○○○○□○○N	E42, P23	Toolholder (Turning)
SVPCR ○○○○□(□)○○FF	E45	Toolholder (Turning)
SVPP%L ○○○○□○○	P22	Toolholder (Turning / Discontinued description)
SVPP%L ○○○○□(□)○○FF	E49, P22	Toolholder (Turning)
SVVBN ○○○○□(□)○○	E43, P23	Toolholder (Turning)
SVVBN ○○○○□○○N	E43, P23	Toolholder (Turning)
SVVCN ○○○○JX○○	E46	Toolholder (Turning)
SZLB%L ○○○○□○○C	E52	Toolholder (Turning)
SZPB%L ○○○○□○○C	E52	Toolholder (Turning)
SZVBN ○○○○□○○C	E53	Toolholder (Turning)
SYXP%L ○○○○□○○F	P22	Toolholder (Turning / Discontinued description)

T

T63H- BL○○○○○○○	P37	Toolholder (HSK tooling / Discontinued description)
T63H- C○○○○(○)	N33	Toolholder (HSK tooling)
T63H- KGBA%L-○○(○○)	N32	Toolholder (HSK tooling)
T63H- KTRN-○○	N32	Toolholder (HSK tooling)
T63H- N○○○○(○)	N33	Toolholder (HSK tooling)
T63H- PCLN%L-DX○○	N22	Toolholder (HSK tooling)
T63H- PCMNN-H○○	N22	Toolholder (HSK tooling)
T63H- PCMNN-L○○	N22	Toolholder (HSK tooling)
T63H- PDJN%L-DX○○	N24	Toolholder (HSK tooling)
T63H- PDNNN-H○○	N24	Toolholder (HSK tooling)
T63H- PDNNN-L○○	N24	Toolholder (HSK tooling)
T63H- PTGN%L-DX○○	N26	Toolholder (HSK tooling)
T63H- PVLN%L-DX○○	N28	Toolholder (HSK tooling)
T63H- SVLB%L-DX○○N	N30	Toolholder (HSK tooling)
T63H- SVVBN-H○○N	N30	Toolholder (HSK tooling)
T63H- SVVBN-L○○N	N30	Toolholder (HSK tooling)
T63H- S○○○○%L-○○○	N20	Toolholder (HSK tooling)
T63H- S○○○○○○(○)F	N21	Toolholder (HSK tooling)
T63H- S○○○○R-○○○T	N20	Toolholder (HSK tooling)
T63H- WTENN-H○○	N26	Toolholder (HSK tooling)
T63H- WTENN-L○○	N26	Toolholder (HSK tooling)
T63H- WWMNN-H○○	N28	Toolholder (HSK tooling)
T63H- WWMNN-L○○	N28	Toolholder (HSK tooling)
T100H- C○○○○(○)	N33	Toolholder (HSK tooling)
T100H- N○○○○(○)	N33	Toolholder (HSK tooling)
T100H- S○○○○%L-○○○	N20	Toolholder (HSK tooling)
T100H- S○○○○○○F	N21	Toolholder (HSK tooling)
T100H- S○○○○R-○○○T	N20	Toolholder (HSK tooling)

Description	Page	Category
TBET ○○○○○(○)M%L	B84	Insert (Turning)
TBGN ○○○○○S○○○○○	B122	Insert (Turning)
TBGN ○○○○○T○○○○○	C25	Insert (Turning)
TBGT ○○○○○CF	B84	Insert (Turning)
TBGT ○○○○○(○)L	B84	Insert (Turning)
TBGT ○○○○○MFP-PF	B84	Insert (Turning)
TBGT ○○○○○MP-CF	B84	Insert (Turning)
TBGT ○○○○○R	B84	Insert (Turning)
TBGW ○○○○○	B84, C44	Insert (Turning)
TBGW ○○○○○NE	C44	Insert (Turning)
TBMT ○○○○○	C44	Insert (Turning)
TBMT ○○○○○DP	B84	Insert (Turning)
TBMT ○○○○○NE	C44	Insert (Turning)
TCET ○○○○○(○)F%L-USF	B85	Insert (Turning)
TCET ○○○○○(○)MFR-USF	B85	Insert (Turning)
TCGT ○○○○○E%L-U	B86	Insert (Turning)
TCGT ○○○○○(○)F%L-U	B86	Insert (Turning)
TCGT ○○○○○L-A○	B87	Insert (Turning)
TCGT ○○○○○ME%L-U	B86	Insert (Turning)
TCGT ○○○○○(○)MF%L-U	B86	Insert (Turning)
TCGT ○○○○○R-A○	B87	Insert (Turning)
TCGW ○○○○○	B87	Insert (Turning)
TCGW ○○○○○NE	C45	Insert (Turning)
TCGW ○○○○○SE	C45	Insert (Turning)
TCMT ○○T○○○○HQ	B85	Insert (Turning)
TCMT ○○○○○	C45	Insert (Turning)
TCMT ○○○○○HQ	B85	Insert (Turning)
TCMT ○○○○○NE	C45	Insert (Turning)
TCMT ○○○○○SE	C45	Insert (Turning)
TCMX ○○○○○WP	B85	Insert (Turning)
TEEN ○○○○PTFR(-NE)	C64, M298	Insert (Milling)
TEEN ○○○○PTTR	M297	Insert (Milling)
TEKN ○○○○PTFR	M297	Insert (Milling)
TEKN ○○○○PTFR(-NE)	C64, M298	Insert (Milling)
TEKN ○○○○PTTR	M297	Insert (Milling)
TEKR ○○○○PTFR-S	M297	Insert (Milling)
TEMR ○○○○PTFR-H	M297	Insert (Milling)
TH -4	P18	Spare parts (Hexagon wrench / T-shaped type)
TH 8X15	P6	Spare parts (Screw)
TKF ○○R○○○○GTP	B111, E12	Insert (Grooving / Turning)
TKF12R ○○○-AGT	C59, E14	Insert (Grooving / Turning)
TKF12%L ○○○-AS	C59, E14	Insert (Grooving / Turning)
TKF12%L ○○○-NB	C59, E14, H6	Insert (Grooving / Turning)
TKF12%L ○○○-NB-○○DR	H7	Insert (Cut-off)
TKF12%L ○○○-S	H6	Insert (Cut-off)
TKF12%L ○○○-S-○○DR	H6	Insert (Cut-off)
TKF12%L ○○○-T	H6	Insert (Cut-off)
TKF12%L ○○○-T-○○DR	H6	Insert (Cut-off)
TKF16%L ○○○-AS	C59, E14	Insert (Grooving / Turning)
TKF16%L ○○○-NB	H8	Insert (Cut-off)
TKF16%L ○○○-NB-○○DR	H8	Insert (Cut-off)
TKF16%L ○○○-S	H8	Insert (Cut-off)
TKF16%L ○○○-S-○○DR	H8	Insert (Cut-off)
TKF16%L ○○○-T	H8	Insert (Cut-off)
TKF16%L ○○○-T-○○DR	H8	Insert (Cut-off)
TKFB ○○L○○○○MR	B110, E12	Insert (Back turning)
TKFB ○○R○○○○GQ	B110, E12	Insert (Back turning)
TKFB ○○R○○○○M	B110, E12	Insert (Back turning)
TKFB ○○R○○○○P-GQ	B110, E12	Insert (Back turning)
TKFT12 LA○○○○(○)	J28	Insert (Threading)
TKFT12 LB○○○○(○)	J28	Insert (Threading)
TKFT12 LN○○○○	J28	Insert (Threading)
TKFT12 RA○○○○(○)	J28	Insert (Threading)
TKFT12 RB○○○○(○)	J28	Insert (Threading)

Description	Page	Category
TKFT12 RN○○○○	J28	Insert (Threading)
TK%L ○(○)	H70	Insert (Cut-off)
TK%L ○(○)-P	H70	Insert (Cut-off)
TKN ○(○)	H70	Insert (Cut-off)
TKN ○(○)-P	H70	Insert (Cut-off)
TN -○○	P12	Spare parts (Shim)
TKN ○(○)	H70	Insert (Cut-off)
TKN ○(○)-P	H70	Insert (Cut-off)
TNEG ○○○○○%L-SSF	B44	Insert (Turning)
TNGA ○○○○○	B43	Insert (Turning)
TNGA ○○○○○MEF	C13	Insert (Turning)
TNGA ○○○○○ME○	C13	Insert (Turning)
TNGA ○○○○○S○○○○○	B118	Insert (Turning)
TNGA ○○○○○S○○○○○ME	C13	Insert (Turning)
TNGA ○○○○○S○○○○○MEH	C13	Insert (Turning)
TNGA ○○○○○S○○○○○MEP	C13	Insert (Turning)
TNGA ○○○○○S○○○○○MET	C13	Insert (Turning)
TNGA ○○○○○T○○○○○	B118	Insert (Turning)
TNGA ○○○○○T○○○○○ME	C13	Insert (Turning)
TNGG ○○○○○AH	B43	Insert (Turning)
TNGG ○○○○○FP-TK	B41	Insert (Turning)
TNGG ○○○○○L	B45	Insert (Turning)
TNGG ○○○○○L-A○	B43	Insert (Turning)
TNGG ○○○○○L-B	B44	Insert (Turning)
TNGG ○○○○○L-C	B45	Insert (Turning)
TNGG ○○○○○L-S	B44	Insert (Turning)
TNGG ○○○○○L-○R	B45	Insert (Turning)
TNGG ○○○○○M-SK	B41	Insert (Turning)
TNGG ○○○○○MFP-SK	B41	Insert (Turning)
TNGG ○○○○○R	B45	Insert (Turning)
TNGG ○○○○○R-A○	B43	Insert (Turning)
TNGG ○○○○○R-B	B44	Insert (Turning)
TNGG ○○○○○R-C	B45	Insert (Turning)
TNGG ○○○○○R-S	B44	Insert (Turning)
TNGG ○○○○○R-○R	B45	Insert (Turning)
TNGG ○○○○○TK	B41	Insert (Turning)
TNGN ○○○○○S○○○○○	B118	Insert (Turning)
TNGN ○○○○○T○○○○○	B118	Insert (Turning)
TNGU ○○○○○MER-U	B56	Insert (Turning)
TNGU ○○○○○(○)MFR-F	B56	Insert (Turning)
TNGU ○○○○○MFR-U	B56	Insert (Turning)
TNMA ○○○○○	B43	Insert (Turning)
TNMG ○○○○○	B40	Insert (Turning)
TNMG ○○○○○AH	B43	Insert (Turning)
TNMG ○○○○○C	B43	Insert (Turning)
TNMG ○○○○○CQ	B38	Insert (Turning)
TNMG ○○○○○GC	B43	Insert (Turning)
TNMG ○○○○○GP	B38	Insert (Turning)
TNMG ○○○○○GS	B39	Insert (Turning)
TNMG ○○○○○GT	B39	Insert (Turning)
TNMG ○○○○○HQ	B38	Insert (Turning)
TNMG ○○○○○KG	B42	Insert (Turning)
TNMG ○○○○○KH	B42	Insert (Turning)
TNMG ○○○○○KQ	B42	Insert (Turning)
TNMG ○○○○○L-C	B45	Insert (Turning)
TNMG ○○○○○L-ST	B42	Insert (Turning)
TNMG ○○○○○MQ	B42	Insert (Turning)
TNMG ○○○○○MS	B42	Insert (Turning)
TNMG ○○○○○MU	B42	Insert (Turning)
TNMG ○○○○○PG	B39	Insert (Turning)
TNMG ○○○○○PH	B40	Insert (Turning)
TNMG ○○○○○PMG	B39	Insert (Turning)
TNMG ○○○○○PP	B38	Insert (Turning)
TNMG ○○○○○PQ	B38	Insert (Turning)

Description	Page	Category
TNMG ○○○○○PS	B39	Insert (Turning)
TNMG ○○○○○PT	B39	Insert (Turning)
TNMG ○○○○○R-C	B45	Insert (Turning)
TNMG ○○○○○R-LD	B41	Insert (Turning)
TNMG ○○○○○R-ST	B42	Insert (Turning)
TNMG ○○○○○SG	B42	Insert (Turning)
TNMG ○○○○○TK	B41	Insert (Turning)
TNMG ○○○○○XF	B40	Insert (Turning)
TNMG ○○○○○XP	B41	Insert (Turning)
TNMG ○○○○○XQ	B41	Insert (Turning)
TNMG ○○○○○XS	B41	Insert (Turning)
TNMG ○○○○○ZS	B43	Insert (Turning)
TNMM ○○○○○M	C36	Insert (Turning)
TNMM ○○○○○M-NE	C36	Insert (Turning)
TNMM ○○○○○M-SE	C36	Insert (Turning)
TNMM ○○○○○PX	B40	Insert (Turning)
TNMN ○○○○○S○○○○○	C19	Insert (Turning)
TNMX ○○○○○WF	B38	Insert (Turning)
TNW -32	P12	Spare parts (Shim)
TOMT ○○○○○ER-GM	M109	Insert (Milling)
TOMT ○○○○○ER-SM	M109	Insert (Milling)
TPEH ○○○○○M%L-P	B92	Insert (Turning)
TPET ○○○○○F%L-USF	B94	Insert (Turning)
TPET ○○○○○(○)L-FSF	B92	Insert (Turning)
TPET ○○○○○M%L-USF	B94	Insert (Turning)
TPET ○○○○○(○)ML-FSF	B92	Insert (Turning)
TPET ○○○○○MR-FSF	B92	Insert (Turning)
TPET ○○○○○(○)R-FSF	B92	Insert (Turning)
TPGB ○○○○○(○)	B94, C46, J46	Insert (Turning / Threading)
TPGB ○○○○○MEF	C23	Insert (Turning)
TPGB ○○○○○NE	C46	Insert (Turning)
TPGB ○○○○○SE	C46	Insert (Turning)
TPGB ○○○○○S○○○○○MES	C23	Insert (Turning)
TPGB ○○○○○S○○○○○MET	C23	Insert (Turning)
TPGB ○○○○○S○○○○○SET	C23	Insert (Turning)
TPGB ○○○○○T○○○○○ME	C23	Insert (Turning)
TPGB ○○○○○T○○○○○SE	C23	Insert (Turning)
TPGH ○○○○○L	B90	Insert (Turning)
TPGH ○○○○○L-H	B93	Insert (Turning)
TPGH ○○○○○ML	B91	Insert (Turning)
TPGH ○○○○○ML-H	B93	Insert (Turning)
TPGH ○○○○○MR	B91	Insert (Turning)
TPGH ○○○○○R	B90	Insert (Turning)
TPGH ○○○○○R-H	B93	Insert (Turning)
TPGN ○○○○○	B96, C48, M297, M298	Insert (Turning / Milling)
TPGN ○○○○○NE	C48	Insert (Turning)
TPGN ○○○○○SE	C48	Insert (Turning)
TPGN ○○○○○S○○○○○	B122	Insert (Turning)
TPGN ○○○○○S○○○○○SET	C25	Insert (Turning)
TPGN ○○○○○T○○○○○	B122	Insert (Turning)
TPGN ○○○○○T○○○○○ME	C25	Insert (Turning)
TPGN ○○○○○T○○○○○SE	C25	Insert (Turning)
TPGR ○○○○○L-A	B96	Insert (Turning)
TPGR ○○○○○L-B	B96	Insert (Turning)
TPGR ○○○○○L-C	B96	Insert (Turning)
TPGR ○○○○○L-F	B96	Insert (Turning)
TPGR ○○○○○R-A	B96	Insert (Turning)
TPGR ○○○○○R-B	B96	Insert (Turning)
TPGR ○○○○○R-C	B96	Insert (Turning)
TPGR ○○○○○R-F	B96	Insert (Turning)
TPGT ○○○○○AP	B94	Insert (Turning)
TPGT ○○○○○CF	B88	Insert (Turning)
TPGT ○○○○○L-H	B93	Insert (Turning)

Description	Page	Category
TPGT ○○○○○MFP-PF	B88	Insert (Turning)
TPGT ○○○○○MP-CF	B88	Insert (Turning)
TPGW ○○○○○S○○○○MET	C24	Insert (Turning)
TPGW ○○○○○T○○○○ME	C24	Insert (Turning)
TPGW ○○○○○T○○○○SE	C24	Insert (Turning)
TPKN ○○○○PDER	M297	Insert (Milling)
TPKN ○○○○PDTR	M297	Insert (Milling)
TPKR ○○○○PDER-S	M297	Insert (Milling)
TPMH ○○○○○	C47	Insert (Turning)
TPMH ○○○○○L-NE	C47	Insert (Turning)
TPMH ○○○○○NE	C47	Insert (Turning)
TPMH ○○○○○SE	C47	Insert (Turning)
TPMN ○○○○○	B96, M297	Insert (Turning / Milling)
TPMR ○○○○PDER-H	M297	Insert (Milling)
TPMR ○○○○○	B95	Insert (Turning)
TPMR ○○○○○DP	B95	Insert (Turning)
TPMR ○○○○○G	B95	Insert (Turning)
TPMR ○○○○○GP	B95	Insert (Turning)
TPMR ○○○○○HQ	B95	Insert (Turning)
TPMT ○○○○○APD	C47	Insert (Turning)
TPMT ○○○○○GP	B89	Insert (Turning)
TPMT ○○○○○HQ	B89	Insert (Turning)
TPMT ○○○○○PP	B88	Insert (Turning)
TPMT ○○○○○XP	B89	Insert (Turning)
TPMT ○○○○○XQ	B89	Insert (Turning)
TPMX ○○○○○%-WP	B88	Insert (Turning)
TPMX ○○○○○WP	B88	Insert (Turning)
TS -3S	P7	Spare parts (Lock pin)
TT -○○(□)	P18	Spare parts (Torx wrench / T-shaped type)
TT32%L ○○○○	J36, J38	Insert (Threading)
TT43ER ○○○M	J36	Insert (Threading)
TT43%L ○○○○	J36, J38	Insert (Threading)
TTC -○○	P18	Spare parts (Torx wrench / T-shaped type)
TTP -20	P18	Spare parts (Torx plus wrench / T-shaped type)
TTW -15	P18	Spare parts (Torx wrench / T-shaped type)
TTX32R ○○○○(○)	J34	Insert (Threading)
TTX32R ○○○○(○)S	J34	Insert (Threading)
TWBR ○○○○○-○○	F56	Toolholder (for Twin bars)
TWBTR ○○○○○-○○	F58	Toolholder (for Twin bars)
TWFLG ○○○	G106	Toolholder (for Twin bars)
TWFGTR ○○○	G108	Toolholder (for Twin bars)

V

VBET ○○○○○(○)L-FSF	B98	Insert (Turning)
VBET ○○○○○(○)ML-F	B98	Insert (Turning)
VBET ○○○○○(○)ML-FSF	B98	Insert (Turning)
VBET ○○○○○(○)ML-Y	B99	Insert (Turning)
VBET ○○○○○(○)MR-F	B98	Insert (Turning)
VBET ○○○○○(○)MR-FSF	B98	Insert (Turning)
VBET ○○○○○(○)MR-Y	B99	Insert (Turning)
VBET ○○○○○(○)R-FSF	B98	Insert (Turning)
VBGT ○○○○○(○)L-F	B98	Insert (Turning)
VBGT ○○○○○(○)L-Y	B99	Insert (Turning)
VBGT ○○○○○(○)ML-F	B98	Insert (Turning)
VBGT ○○○○○(○)ML-Y	B99	Insert (Turning)
VBGT ○○○○○(○)MR-F	B98	Insert (Turning)
VBGT ○○○○○(○)MR-Y	B99	Insert (Turning)
VBGT ○○○○○(○)R-F	B98	Insert (Turning)
VBGT ○○○○○(○)R-Y	B99	Insert (Turning)
VBGW ○○○○○MEF	C26	Insert (Turning)
VBGW ○○○○○S○○○○MES	C26	Insert (Turning)
VBGW ○○○○○S○○○○MET	C26	Insert (Turning)
VBGW ○○○○○S○○○○SET	C26	Insert (Turning)

Description	Page	Category
VBGW ○○○○○T○○○○ME	C26	Insert (Turning)
VBGW ○○○○○T○○○○SE	C26	Insert (Turning)
VBMT ○○○○○	C49	Insert (Turning)
VBMT ○○○○○GP	B97	Insert (Turning)
VBMT ○○○○○HQ	B97	Insert (Turning)
VBMT ○○○○○NE	C49	Insert (Turning)
VBMT ○○○○○PP	B97	Insert (Turning)
VBMT ○○○○○SE	C49	Insert (Turning)
VBMT ○○○○○VF	B97	Insert (Turning)
VCET ○○○○○ML-F	B101	Insert (Turning)
VCET ○○○○○(○)ML-Y	B101	Insert (Turning)
VCET ○○○○○MR-F	B101	Insert (Turning)
VCET ○○○○○(○)MR-Y	B101	Insert (Turning)
VCGT ○○○○○AH	B101	Insert (Turning)
VCGT ○○○○○AP	B101	Insert (Turning)
VCGT ○○○○○L-A○	B101	Insert (Turning)
VCGT ○○○○○MFP-GF	B100	Insert (Turning)
VCGT ○○○○○MFP-SK	B100	Insert (Turning)
VCGT ○○○○○MFP-SKS	B100	Insert (Turning)
VCGT ○○○○○MP-CF	B100	Insert (Turning)
VCGT ○○○○○R-A○	B101	Insert (Turning)
VCGW ○○○○○S○○○○MET	C27	Insert (Turning)
VCGW ○○○○○S○○○○SET	C27	Insert (Turning)
VCGW ○○○○○T○○○○ME	C27	Insert (Turning)
VCGW ○○○○○T○○○○SE	C27	Insert (Turning)
VCMT ○○○○○	C50	Insert (Turning)
VCMT ○○○○○HQ	B100	Insert (Turning)
VCMT ○○○○○NE	C50	Insert (Turning)
VCMT ○○○○○PP	B100	Insert (Turning)
VCMT ○○○○○SE	C50	Insert (Turning)
VCMT ○○○○○VF	B100	Insert (Turning)
VNBR ○○○○○(○)	F45	Toolholder (for System Tip-Bars)
VNBR ○○○○○(○)NB	G61, F46	Toolholder (for System Tip-Bars)
VNBR ○○○○○(○)S	F44	Toolholder (for System Tip-Bars)
VNBR ○○○○○-○○(○)S	F44	Toolholder (for System Tip-Bars)
VNBR ○○○○○-○○(○)S	F44	Toolholder (for System Tip-Bars)
VNBTR ○○○○○(○)	F47	Toolholder (for System Tip-Bars)
VNBXR ○○○○○(○)S	F52	Toolholder (for System Tip-Bars)
VNBXR ○○○○○-○○(○)S	F52	Toolholder (for System Tip-Bars)
VNFRG ○○○○○(NB)	G63, G104	Toolholder (for System Tip-Bars)
VNGA ○○○○○	B48	Insert (Turning)
VNGA ○○○○○MEF	C14	Insert (Turning)
VNGA ○○○○○ME○	C14	Insert (Turning)
VNGA ○○○○○S○○○○	B119	Insert (Turning)
VNGA ○○○○○S○○○○ME	C14	Insert (Turning)
VNGA ○○○○○S○○○○MEH	C14	Insert (Turning)
VNGA ○○○○○S○○○○MEP	C14	Insert (Turning)
VNGA ○○○○○S○○○○MET	C14	Insert (Turning)
VNGA ○○○○○T○○○○	B119	Insert (Turning)
VNGA ○○○○○T○○○○ME	C14	Insert (Turning)
VNGG ○○○○○L	B48	Insert (Turning)
VNGG ○○○○○L-S	B48	Insert (Turning)
VNGG ○○○○○M-SK	B47	Insert (Turning)
VNGG ○○○○○MFP-SK	B47	Insert (Turning)
VNGG ○○○○○R	B48	Insert (Turning)
VNGG ○○○○○R-S	B48	Insert (Turning)
VNGR ○○○○○(NB)	G62, G72, G73	Toolholder (for System Tip-Bars)
VNMG ○○○○○	B46	Insert (Turning)
VNMG ○○○○○GP	B46	Insert (Turning)
VNMG ○○○○○HQ	B46	Insert (Turning)
VNMG ○○○○○KG	B47	Insert (Turning)
VNMG ○○○○○KH	B47	Insert (Turning)
VNMG ○○○○○L-VC	B46	Insert (Turning)

Description	Page	Category
VNMG ○○○○○MQ	B47	Insert (Turning)
VNMG ○○○○○MS	B47	Insert (Turning)
VNMG ○○○○○MU	B47	Insert (Turning)
VNMG ○○○○○PP	B46	Insert (Turning)
VNMG ○○○○○PQ	B46	Insert (Turning)
VNMG ○○○○○R-VC	B46	Insert (Turning)
VNMG ○○○○○SG	B47	Insert (Turning)
VNMG ○○○○○TN-V	B46	Insert (Turning)
VNMG ○○○○○VF	B46	Insert (Turning)
VNMM ○○○○○M	C37	Insert (Turning)
VNMM ○○○○○M-NE	C37	Insert (Turning)
VNMM ○○○○○M-SE	C37	Insert (Turning)
VNTR ○○○○	J44	Toolholder (for System Tip-Bars)
VPET ○○○○○(○)F%-USF	B104	Insert (Turning)
VPET ○○○○○L-FSF	B103	Insert (Turning)
VPET ○○○○○MFL-J	B104	Insert (Turning)
VPET ○○○○○(○)MFL-U	B104	Insert (Turning)
VPET ○○○○○MFL-USF	B104	Insert (Turning)
VPET ○○○○○(○)MFR-J	B104	Insert (Turning)
VPET ○○○○○(○)MFR-U	B104	Insert (Turning)
VPET ○○○○○(○)MFR-USF	B104	Insert (Turning)
VPET ○○○○○ML-F	B103	Insert (Turning)
VPET ○○○○○ML-FSF	B103	Insert (Turning)
VPET ○○○○○(○)MR-F	B103	Insert (Turning)
VPET ○○○○○(○)MR-FSF	B103	Insert (Turning)
VPET ○○○○○(○)R-FSF	B103	Insert (Turning)
VPGT ○○○○○CF	B102	Insert (Turning)
VPGT ○○○○○CK	B102	Insert (Turning)
VPGT ○○○○○MFP-GF	B102	Insert (Turning)
VPGT ○○○○○MFP-SKS	B102	Insert (Turning)
VPGT ○○○○○MP-CF	B102	Insert (Turning)
VPGT ○○○○○MP-CK	B102	Insert (Turning)

W

W -6	P18	Spare parts (Washer)
W 6-14	P18	Spare parts (Washer)
W ○(○)X○○□	P6	Spare parts (Screw)
WB -○	P18	Spare parts (Washer)
WBET ○○○○○(○)ML-F	B105	Insert (Turning)
WBET ○○○○○ML-P	B106	Insert (Turning)
WBET ○○○○○MR-F	B105	Insert (Turning)
WBET ○○○○○MR-P	B106	Insert (Turning)
WBGH ○○○○○L-F	B106	Insert (Turning)
WBGH ○○○○○MFP%-PF	B105	Insert (Turning)
WBGH ○○○○○MP%-CF	B105	Insert (Turning)
WBGH ○○○○○(○)%-F	B106	Insert (Turning)
WBGW ○○○○○L	B106	Insert (Turning)
WBGW ○○○○○S○○○○LSET	C28	Insert (Turning)
WBGW ○○○○○T○○○○L-SE	C28	Insert (Turning)
WBMT ○○○○○L	C51	Insert (Turning)
WBMT ○○○○○L-DP	B105	Insert (Turning)
WBMT ○○○○○L-NE	C51	Insert (Turning)
WBMT ○○○○○L-SE	C51	Insert (Turning)
WBMT ○○○○○R-DP	B105	Insert (Turning)
WCMT ○○○○○T○○○	K89	Insert (Drilling)
WCMT ○○○○○	K89	Insert (Drilling)
WCS -○(N)	P14	Spare parts (Clamp set)
WDRC ○(○)	K43	Spare parts (Wrench)
WN -1	P19	Spare parts (Shim nut)
WNEU ○○○○○EN-GL	M135	Insert (Milling)
WNGA ○○○○○MEF	C15	Insert (Turning)
WNGA ○○○○○S○○○○ME	C15	Insert (Turning)
WNGA ○○○○○S○○○○MET	C15	Insert (Turning)
WNGA ○○○○○T○○○○ME	C15	Insert (Turning)

Description	Page	Category
WNGG ○○○○○AH	B53	Insert (Turning)
WNGG ○○○○○%L	B53	Insert (Turning)
WNGG ○○○○○%L-5	B53	Insert (Turning)
WNGG ○○○○○TK	B51	Insert (Turning)
WNGT ○○○○○FN-AM	M135	Insert (Milling)
WNMA ○○○○○	B53	Insert (Turning)
WNMG ○○T○○○HQ	B50	Insert (Turning)
WNMG ○○○○○	B51	Insert (Turning)
WNMG ○○○○○C	B53	Insert (Turning)
WNMG ○○○○○CJ	B50	Insert (Turning)
WNMG ○○○○○CQ	B50	Insert (Turning)
WNMG ○○○○○GC	B53	Insert (Turning)
WNMG ○○○○○GP	B49	Insert (Turning)
WNMG ○○○○○GS	B50	Insert (Turning)
WNMG ○○○○○GT	B51	Insert (Turning)
WNMG ○○○○○HQ	B50	Insert (Turning)
WNMG ○○○○○KG	B52	Insert (Turning)
WNMG ○○○○○KH	B52	Insert (Turning)
WNMG ○○○○○KQ	B52	Insert (Turning)
WNMG ○○○○○MQ	B52	Insert (Turning)
WNMG ○○○○○MS	B52	Insert (Turning)
WNMG ○○○○○MU	B52	Insert (Turning)
WNMG ○○○○○PG	B50	Insert (Turning)
WNMG ○○○○○PH	B51	Insert (Turning)
WNMG ○○○○○PMG	B50	Insert (Turning)
WNMG ○○○○○PP	B49	Insert (Turning)
WNMG ○○○○○PQ	B49	Insert (Turning)
WNMG ○○○○○PS	B50	Insert (Turning)
WNMG ○○○○○PT	B51	Insert (Turning)
WNMG ○○○○○SG	B52	Insert (Turning)
WNMG ○○○○○TK	B51	Insert (Turning)
WNMG ○○○○○WE	B49	Insert (Turning)
WNMG ○○○○○WF	B49	Insert (Turning)
WNMG ○○○○○WP	B49	Insert (Turning)
WNMG ○○○○○WQ	B49	Insert (Turning)
WNMG ○○○○○XP	B51	Insert (Turning)
WNMG ○○○○○XQ	B51	Insert (Turning)
WNMG ○○○○○XS	B51	Insert (Turning)
WNMG ○○○○○ZS	B53	Insert (Turning)
WNMM ○○○○○M-NE	C38	Insert (Turning)
WNMM ○○○○○M-SE	C38	Insert (Turning)
WNMU ○○○○○EN-GH	M135, M141	Insert (Milling)
WNMU ○○○○○EN-GM	M135, M141	Insert (Milling)
WNMU ○○○○○EN-SM	M135, M141	Insert (Milling)
WPGT ○○○○○L-Y	B107	Insert (Turning)
WPGT ○○○○○ML-Y	B107	Insert (Turning)
WP -15	P7	Spare parts (Shim pin)
WP ○X○○	P7	Spare parts (Shim pin)
WPGT ○○○○○MR-Y	B107	Insert (Turning)
WPGT ○○○○○R-Y	B107	Insert (Turning)
WPGW ○○○○○	B107	Insert (Turning)
WPMT ○○○○○	C52	Insert (Turning)
WPMT ○○○○○GP	B107	Insert (Turning)
WPMT ○○○○○HQ	B107	Insert (Turning)
WPMT ○○○○○NE	C52	Insert (Turning)
WPMT ○○○○○SE	C52	Insert (Turning)
WS -10	D12, G37, H66	Spare parts (Washer)
WSP -1	P18	Spare parts (Spacer)
WTENN ○○○□○○N	D28	Toolholder (Turning)
WTJN%L ○○○□○○N	D27	Toolholder (Turning)
WTKN%L ○○○□○○N	D27	Toolholder (Turning)
WTN -33(-○○)	P12	Spare parts (Shim)
WWLN%L ○○○□○○	D46	Toolholder (Turning)
WWN -42	P12	Spare parts (Shim)



Description	Page	Category
WWP -42(-○○)	P12	Spare parts (Shim)

Z

ZBMT ○○T○○GF	B108	Insert (Turning)
ZBMT ○○T○○NE	C53	Insert (Turning)
ZBMT ○○T○○R-GF-○○D	B108	Insert (Turning)
ZCMT ○○T○○○	K74	Insert (Drilling)
ZCMT ○○T○○○SP	K74	Insert (Drilling)
ZCMT ○○T○○○SU	K74	Insert (Drilling)
ZCMT ○○○○○○	K74	Insert (Drilling)
ZCMT ○○○○○○SP	K74	Insert (Drilling)
ZCMT ○○○○○○SU	K74	Insert (Drilling)





INTRODUCING OUR NEW ALL-TASK

HYDRO CHUCKS



UNIVERSAL HYDRAULIC CHUCK

Get the best price/performance ratio for direct clamping from Ø6-32 mm.

Suitable for most of your machining tasks whether it is drilling, countersinking, reaming or light milling.

Available in almost all diameters with extreme accurate run-out accuracy of ≤ 0.003 mm at 2.5xD.

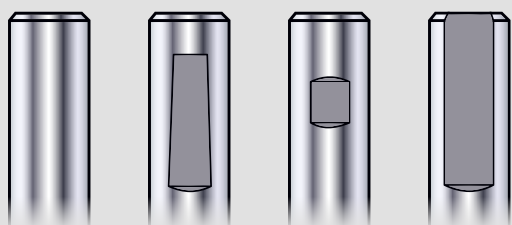


APPLICATIONS

Milling				Drilling	Reaming
HPC	Roughing	Medium	Finishing		
○	○	◐	●	●	●

● Excellent ◐ Suitable ○ Not suitable

Applies to both hydro chuck toolholders



Can be used with all types of shanks without the need of any special sleeves or adaptors.



WATCH THE VIDEO

HD

HEAVY DUTY HYDRAULIC CHUCK

A high-performance toolholder used in precision machining. Offering up to 3 times longer tool life compared to a standard solution.

The right choice for extreme tasks like milling (roughing/finishing), drilling, tapping, reaming and high-performance cutting (HPC).

Available in the most common diameters with extreme accurate run-out accuracy of ≤ 0.003 mm at $2.5 \times D$.



APPLICATIONS

Milling				Drilling	Reaming
HPC	Roughing	Medium	Finishing		
●	●	●	●	●	●

● Excellent ● Suitable ○ Not suitable

CHANGE TOOLS IN SECONDS

No need for special equipment or a torque wrench to change tools. Just one screw needs to be tightened using an Allen key.



INTELLIGENT TOOL MANAGEMENT

SIMPLE, SECURE AND AUTOMATIC

With our flexible and secured industrial vending solutions you can avoid allocating unnecessary resources to your local stocks and at the same time get an overview of tool usage on employee level at any time, anywhere.

It's easy and enables you to save time and money!

When the inventory reaches a minimum level the vending solution automatically reorders the required tools while giving you a real-time overview of your stock levels.



Reduction of administrative costs
Automatically reordering to reduce costs.



Easy integration with ERP system
Orders directly at your supplier.



Eliminate stock-outs
24/7 stock overview and re-ordering.



Reduce inventory spending
Control your tool stock and inventory spending.



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