


**NEW**

# KBN010 / KBN020



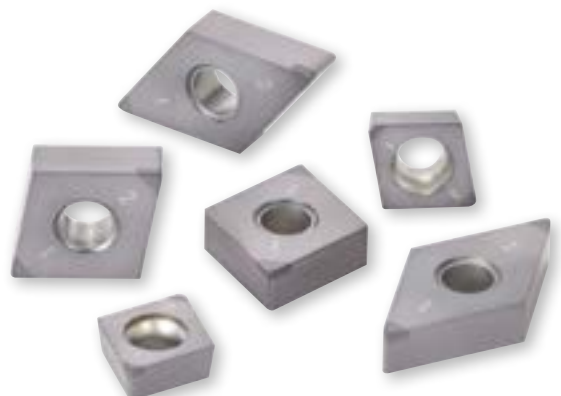
**“Wear resistance + fracture resistance” lowers costs  
when machining hardened material**

Combination of new coating technology and high content CBN provides  
Exceptional wear resistance and fracture resistance.

Supports a wide range of applications from continuous to heavily interrupted machining.

Newly developed "MEGACOAT TOUGH" coating technology.

**NEW** New coating is now available



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

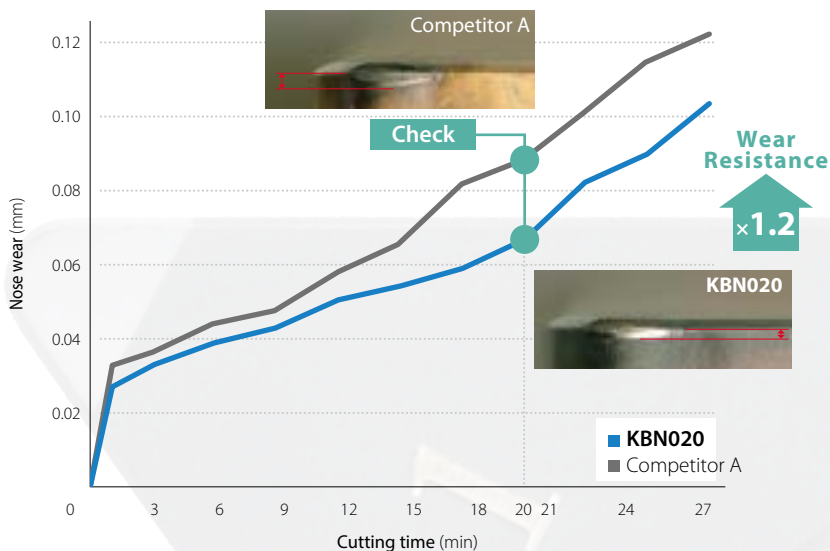
Combination of new coating technology and high content CBN provides exceptional wear resistance and fracture resistance

## Wear resistance

New coating "MEGACOAT TOUGH" suppresses layer peeling.

Excellent wear resistance

Wear resistance comparison (in-house evaluation)



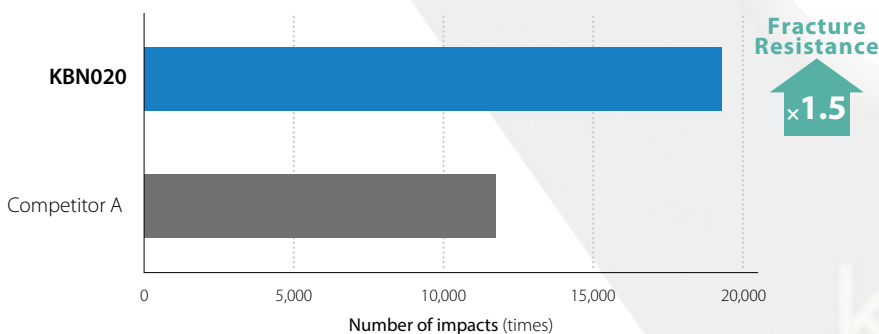
Cutting conditions : Vc = 150 m/min, ap = 0.2 mm, f = 0.1 mm/rev, Wet  
Workpiece : SCM415® 60 HRC

## Fracture resistance

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

Excellent fracture resistance

Continuous to interrupted machining comparison (in-house evaluation)



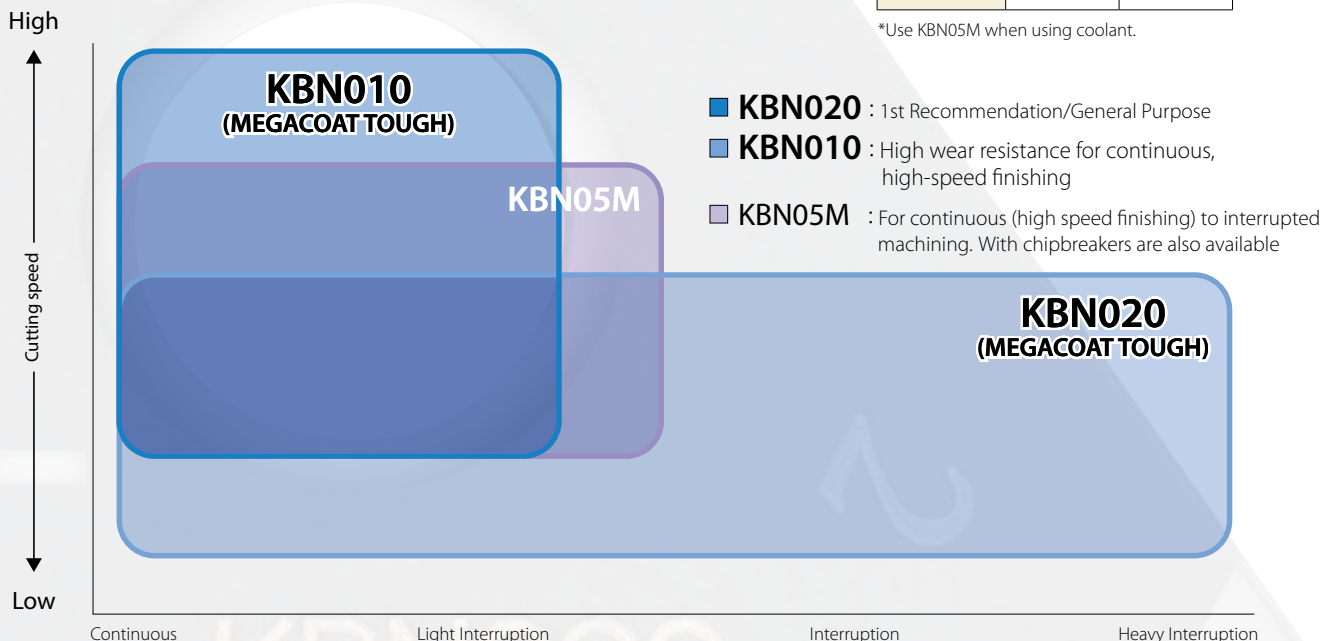
Cutting conditions : Vc = 150 m/min, ap = 0.2 mm, f = 0.2 mm/rev, Dry  
Workpiece : SCM415® 60 HRC

## 2 Supports a wide range of applications from continuous to heavily interrupted machining

KBN010 for high-speed finishing

KBN020 [1st recommendation] covers a wide range of applications

Application Map



Coolant

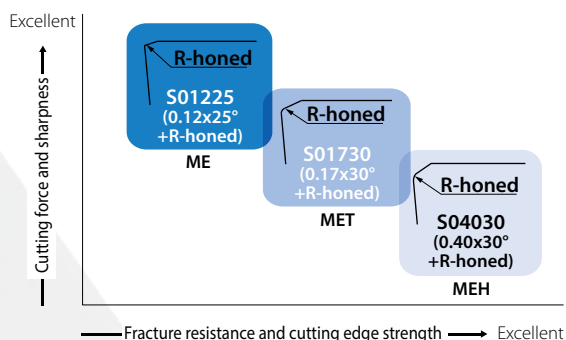
✓ Recommended    ✗ Not Recommended

Application	Wet	Dry
Continuous	✓	✗
Interruption	Partially*	✓

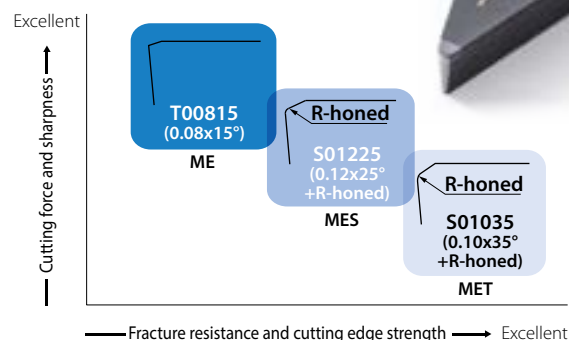
\*Use KBN05M when using coolant.

## 3 Extended lineup of cutting edge preparations for various applications and features

Negative insert



Positive insert



Negative insert standard cutting edge preparation (Hardened material machining)

Symbol	Cutting edge preparation		Applications and features
ME	S01225	0.12mm x 25° + R-honed	General purpose
MET	S01730	0.17mm x 30° + R-honed	Superior fracture resistance
MEH	S04030	0.40mm x 30° + R-honed	For interrupted · High-feed machining prevents flaking

Positive insert standard cutting edge preparation (Hardened material machining)

Symbol	Cutting edge preparation		Applications and features
ME	T00815	0.08mm x 15°	Chamfered sharp edge, minimize burrs
MES	S01225	0.12mm x 25° + R-honed	General purpose
MET	S01035	0.10mm x 35° + R-honed	For interruption stable machining

# 4

## 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 Newly developed adhesion layer

Interlayer for stress relief

High adhesion layer

Two layers dedicated to CBN

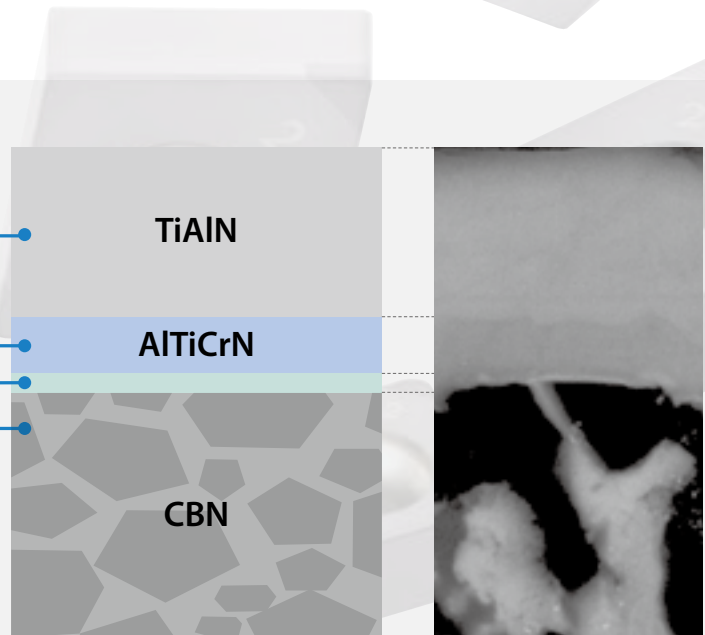
Improved adhesion between CBN and high wear resistant layer. Suppresses layer peeling

#### Check High toughness 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



Layer image

### Case studies

#### Clutch SCr420H

Vc = 100 m/min  
ap = 0.15 mm  
f = 0.1 mm/rev  
Wet  
WNGA080408S01225



Tool Life

**KBN020** 650 pcs/edge ↑ 1.6x

Competitor B 400 pcs/edge

KBN020 provides stable machining with longer tool life.

(User evaluation)

#### Gear SCM415

Vc = 100 m/min  
ap = 0.05 mm  
f = 0.15 mm/rev  
Wet  
CNGA120408S01325MEW



Tool Life

**KBN020** 300 pcs/edge ↑ 1.5x

Competitor C 200 pcs/edge

KBN020 improves dimensional variation with longer tool life.

(User evaluation)

**Check**

**Newly developed adhesion layer**

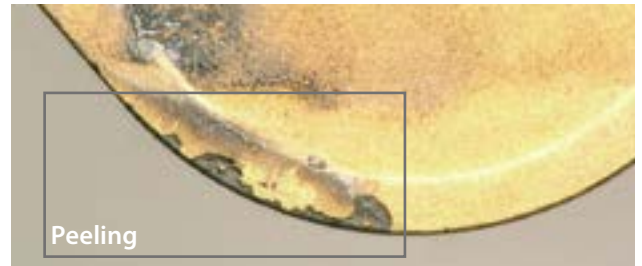
Improved adhesion between CBN and high wear resistance layer

**KBN020**



Cutting conditions : Vc = 150 m/min, ap = 0.2 mm, f = 0.2 mm/rev, Dry  
Workpiece : SCM 415® (In-house evaluation)

**Competitor A**

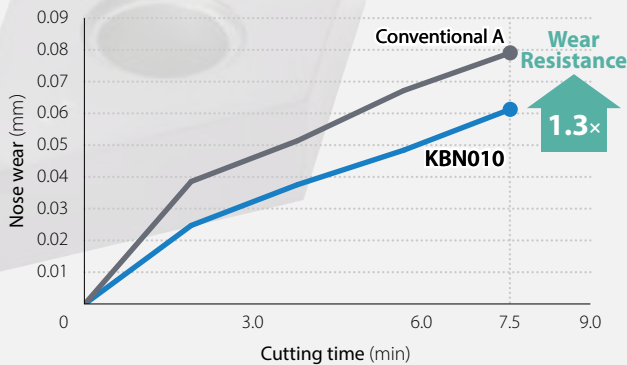


**Check**

**High toughness CBN**

**KBN010**

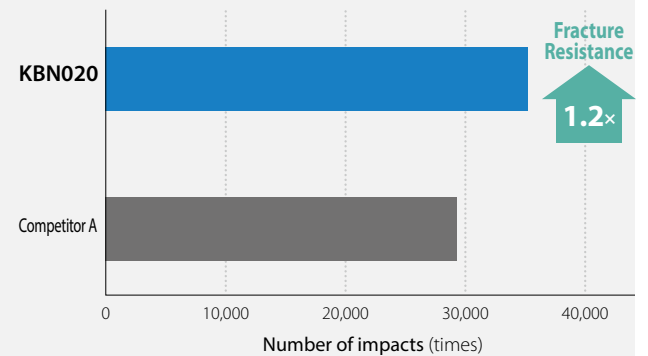
Improved wear resistance by 30% in high-speed machining (Compared to conventional A)



Cutting conditions : Vc = 210 m/min, ap = 0.2 mm, f = 0.1 mm/rev, Wet  
Workpiece : SCM415® 60HRC (In-house evaluation)

**KBN020**

Improved fracture resistance by 20% in heavy interrupted machining (Compared to competitor A)



Cutting conditions : Vc = 100 m/min, ap=0.2 mm, f=0.3 mm/rev, Dry  
Workpiece : SCM415® 4 grooves in workpiece 61HRC (In-house evaluation)

**Gear SNCM220® 58HRC**

Vc = 125 m/min  
ap = 0.25 mm  
f = 0.1 mm/rev  
Dry  
CNGA120408S04030MEH



Tool Life

**KBN010** 600 pcs/edge **3.0x**

Competitor D 200 pcs/edge

KBN010 provides longer tool life than competitor D.

(User evaluation)

**Roll SKD11 62HRC**

Vc = 145 m/min  
ap = 0.25-0.50 mm  
f = 0.1 mm/rev  
Dry  
DNGA150608S01225



Tool Life

**KBN010** 18 pcs/edge **1.3x**

Competitor E 13 pcs/edge

Achieved longer tool life with excellent wear resistance in continuous machining of hardened material.

(User evaluation)



# Solution for Automotive Parts

## Videos



Shaft - External turning  
Continuous to interrupted machining



Gear - Facing  
Heavy interrupted machining

### Solution 1

Available for continuous to interrupted/heavy interrupted machining.  
Can be used on a variety of part shapes such as machining shafts and gears.

#### Point

Excellent machining performance of auto suspension parts that use a lot of hardened materials.

### Solution 2

Long tool life and stable machining.  
High toughness suppresses sudden fractures during continuous to interrupted machining applications.

#### Point

Stable machining increases productivity.

## Sun gear

#### Workpiece

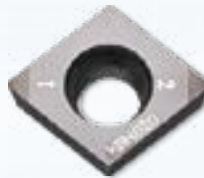
S45C (Carburizing and quenching)

#### Insert

CCMW09T308S01035MET

#### Applications

Boring finishing for spline part (Interruption)



(Image)



## CVT shaft

#### Workpiece

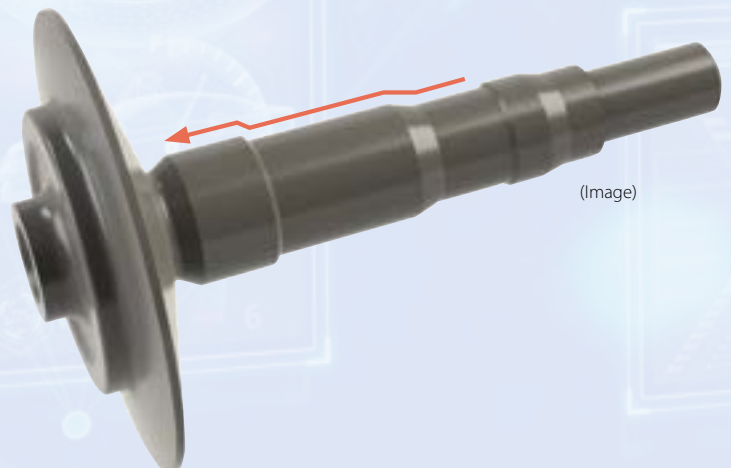
SCr420H

#### Insert

DNGA150404S01225ME

#### Applications

External finishing



(Image)

## Diff ring

Workpiece

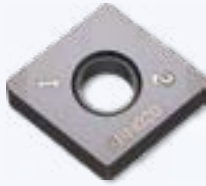
SCr420H

Insert

CNGA120408S01730MET

Applications

Facing (Interruption)



(Image)

## Pinion gear

Workpiece

SCM420H

Insert

DNGA150404S01225ME

Applications

External finishing



(Image)

## Side gear

Workpiece

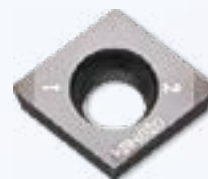
S45C (Carburizing and quenching)

Insert

CCMW09T308S01035MET

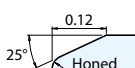
Applications

Boring finishing for spline part (Interruption)


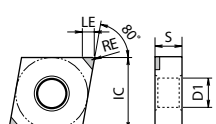

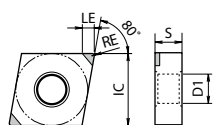

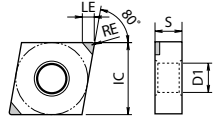

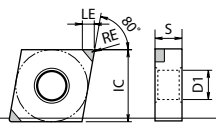

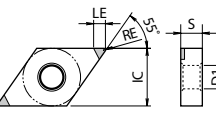

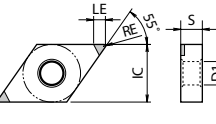


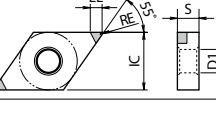


(Image)

## Negative type inserts

Cutting edge preparation				
Symbol	Cutting edge specification	Indication		Shape examples
S	Chamfered and honed	S01225	0.12 mm x 25° chamfered and honed	

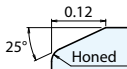
Description	IC	S	D1
CNGA 1204_	12.70	4.76	5.16
DNGA 1504_	12.70	4.76	5.16
DNGA 1506_		6.35	

Shape	Description	Cutting edge preparation	Dimensions (mm)		No. of edges	MEGACOAT TOUGH								
			RE	LE		KBN010	KBN020							
 Multi edge/ With wiper edge		CNGA	120404S01215MEW	S01215	0.4	2.6	2	●	●					
			120408S01215MEW		0.8	2.5		●	●					
			120412S01215MEW		1.2	2.5		●	●					
 Multi edge		CNGA	120402S01225ME	S01225	0.2	2.6	2	●	●					
			120404S01225ME		0.4	2.6		●	●					
			120408S01225ME		0.8	2.6		●	●					
			120412S01225ME		1.2	2.5		●	●					
			120416S01225ME		1.6	3.4		●	●					
			120420S01225ME		2.0	3.4		●	●					
 Multi edge/ Tough		CNGA	120404S01730MET	S01730	0.4	2.6	2	●	●					
			120408S01730MET		0.8	2.6		●	●					
			120412S01730MET		1.2	2.5		●	●					
			120416S01730MET		1.6	3.4		●	●					
 Multi edge/ Interruption		CNGA	120408S04030MEH	S04030	0.8	2.6	2	●	●					
			120412S04030MEH		1.2	2.5		●	●					
 Multi edge		DNGA	150401S01225ME	S01225	0.1	2.8	2	●	●					
			150402S01225ME		0.2	2.7		●	●					
			150404S01225ME		0.4	2.6		●	●					
			150408S01225ME		0.8	2.2		●	●					
			150412S01225ME		1.2	1.9		●	●					
			150416S01225ME		1.6	3.8		●	●					
		DNGA	150604S01225ME	S01225	0.4	2.6	2	●	●					
			150608S01225ME		0.8	2.2		●	●					
			 Multi edge/ Tough			DNGA		150404S01730MET	S01730	0.4	2.6	2	●	●
								150408S01730MET		0.8	2.2		●	●
150412S01730MET	1.2	1.9		●			●							
150416S01730MET	1.6	3.8		●			●							
DNGA	 Multi edge/ Tough	DNGA	150604S01730MET	S01730	0.4	2.6	2	●	●					
			150608S01730MET		0.8	2.2		●	●					
 Multi edge/ Interruption		DNGA	150404S04030MEH	S04030	0.4	2.6	2	●	●					
			150408S04030MEH		0.8	2.2		●	●					
			150412S04030MEH		1.2	1.9		●	●					










● : Available



## Negative type inserts

Cutting edge preparation			
Symbol	Cutting edge specification	Indication	Shape examples
S	Chamfered and honed	S01225 0.12 mm x 25° chamfered and honed	

Description	IC	S	D1
SNGA 1204_	12.70	4.76	5.16
TNGA 1604_	9.525	4.76	3.81
VNGA 1604_	9.525	4.76	3.81
WNGA 0804_	12.70	4.76	5.16

Shape	Description	Cutting edge preparation	Dimensions (mm)		No. of edges	MEGACOAT TOUGH	
			RE	LE		KBN010	KBN020
 Multi edge	SNGA 120404S01225ME	S01225	0.4	2.6	2	●	●
	120408S01225ME		0.8	2.6		●	●
 Multi edge/ Tough	SNGA 120404S01730MET	S01730	0.4	2.6	2	●	●
	120408S01730MET		0.8	2.6		●	●
	120412S01730MET		1.2	2.6		●	●
 Multi edge	TNGA 160401S01225ME	S01225	0.1	2.9	3	●	●
	160402S01225ME		0.2	2.8		●	●
	160404S01225ME		0.4	2.7		●	●
	160408S01225ME		0.8	2.4		●	●
	160412S01225ME		1.2	2.1		●	●
 Multi edge/ Tough	TNGA 160404S01730MET	S01730	0.4	2.7	3	●	●
	160408S01730MET		0.8	2.4		●	●
	160412S01730MET		1.2	2.1		●	●
 Multi edge/ Interruption	TNGA 160404S04030MEH	S04030	0.4	2.7	3	●	●
	160408S04030MEH		0.8	2.4		●	●
 Multi edge	VNGA 160401S01225ME	S01225	0.1	2.6	2	●	●
	160402S01225ME		0.2	2.3		●	●
	160404S01225ME		0.4	2.0		●	●
	160408S01225ME		0.8	2.7		●	●
 Multi edge/ Tough	VNGA 160404S01730MET	S01730	0.4	2.0	2	●	●
	160408S01730MET		0.8	2.7		●	●
 Multi edge	WNGA 080404S01225ME	S01225	0.4	2.6	3	●	●
	080408S01225ME		0.8	2.6		●	●
 Multi edge/ Tough	WNGA 080404S01730MET	S01730	0.4	2.0	3	●	●
	080408S01730MET		0.8	2.6		●	●

● : Available

# Positive type inserts

Cutting edge preparation				
Symbol	Cutting edge specification	Indication		Shape examples
T	Chamfered	T00815	0.08 mm x 15° chamfered	
S	Chamfered and honed	S01225	0.12 mm x 25° chamfered and honed	

Description	IC	S	D1
CCMW 0602_	6.35	2.38	2.8
CCMW 09T3_	9.525	3.97	4.4
CPGB 0802_	7.94	2.38	3.5
CPGB 0903_	9.525	3.18	4.5
DCMW 0702_	6.35	2.38	2.8
DCMW 11T3_	9.525	3.97	4.4

Shape	Description	Cutting edge preparation	Dimensions (mm)		No. of edges	MEGACOAT TOUGH			
			RE	LE		KBN010	KBN020		
 Multi edge		T00815	CCMW	060202T00815ME	0.2	2.0	2	●	●
			CCMW	060204T00815ME	0.4	1.9		●	●
			CCMW	060208T00815ME	0.8	1.8		●	●
		T00815	CCMW	09T302T00815ME	0.2	2.0		●	●
			CCMW	09T304T00815ME	0.4	1.9		●	●
			CCMW	09T308T00815ME	0.8	1.8		●	●
 Multi edge/ General purpose		S01225	CCMW	060204S01225MES	0.4	1.9	2	●	●
			CCMW	060208S01225MES	0.8	1.8		●	●
		S01225	CCMW	09T304S01225MES	0.4	1.9		●	●
			CCMW	09T308S01225MES	0.8	1.8		●	●
 Multi edge/ Tough		S01035	CCMW	09T304S01035MET	0.4	1.9	2	●	●
			CCMW	09T308S01035MET	0.8	1.8		●	●
 Multi edge		T00815	CPGB	080204T00815ME	0.4	1.9	2	●	●
			CPGB	090302T00815ME	0.2	2.6		●	●
		CPGB	090304T00815ME	0.4	2.6	●		●	
 Multi edge/ General purpose		S01225	CPGB	090304S01225MES	0.4	2.5	2	●	●
			CPGB	090308S01225MES	0.8	2.5		●	●
 Multi edge/ Tough		S01035	CPGB	080204S01035MET	0.4	1.9	2	●	●
			CPGB	080208S01035MET	0.8	2.2		●	●
		S01035	CPGB	090304S01035MET	0.4	2.5		●	●
			CPGB	090308S01035MET	0.8	2.5		●	●
 Multi edge		T00815	DCMW	070202T00815ME	0.2	2.4	2	●	●
			DCMW	070204T00815ME	0.4	2.2		●	●
			DCMW	070208T00815ME	0.8	1.9		●	●
		T00815	DCMW	11T302T00815ME	0.2	2.4		●	●
			DCMW	11T304T00815ME	0.4	2.2		●	●
			DCMW	11T308T00815ME	0.8	1.9		●	●
			DCMW	11T312T00815ME	1.2	1.9		●	●
 Multi edge/ General purpose		S01225	DCMW	11T302S01225MES	0.2	2.4	2	●	●
			DCMW	11T304S01225MES	0.4	2.2		●	●
			DCMW	11T308S01225MES	0.8	1.9		●	●
 Multi edge/ Tough		S01035	DCMW	070202S01035MET	0.2	1.9	2	●	●
			DCMW	070204S01035MET	0.4	1.7		●	●
			DCMW	070208S01035MET	0.8	1.9		●	●
		S01035	DCMW	11T302S01035MET	0.2	2.4		●	●
			DCMW	11T304S01035MET	0.4	2.2		●	●
			DCMW	11T308S01035MET	0.8	1.9		●	●
			DCMW	11T312S01035MET	1.2	1.9		●	●
			DCMW	11T312S01035MET	1.2	1.9		●	●

● Available

# Positive type inserts

Cutting edge preparation			
Symbol	Cutting edge specification	Indication	Shape examples
T	Chamfered	T00815 0.08 mm x 15° chamfered	
S	Chamfered and honed	S01225 0.12 mm x 25° chamfered and honed	

Description	IC	S	D1
TPGB 1103_	6.35	3.18	3.5
TPGB 1603_	9.525		4.5
TPGW 1604_	9.525	4.76	4.4
VBGW 1103_	6.35	3.18	2.8
VBGW 1604_	9.525	4.76	4.4
VCGW 0802_	4.76	2.38	2.3

Shape	Description	Cutting edge preparation	Dimensions (mm)		No. of edges	MEGACOAT TOUGH	
			RE	LE		KBN010	KBN020
 Multi edge	TPGB 110302T00815ME	T00815	0.2	2.3	3	●	●
	110304T00815ME		0.4	2.1		●	●
	110308T00815ME		0.8	1.8		●	●
 Multi edge/ General purpose	TPGB 110304S01225MES	S01225	0.4	2.1	3	●	●
	110308S01225MES		0.8	1.8		●	●
 Multi edge/ Tough	TPGB 110302S01035MET	S01035	0.2	2.3	3	●	●
	110304S01035MET		0.4	2.1		●	●
	110308S01035MET		0.8	1.8		●	●
	TPGB 160304S01035MET	S01035	0.4	1.8	3	●	●
	160308S01035MET		0.8	1.5		●	●
 Multi edge/ Tough	TPGW 160404S01035MET	S01035	0.4	1.8	3	●	●
	160408S01035MET		0.8	1.5		●	●
 Multi edge	VBGW 110302T00815ME	T00815	0.2	2.4	2	●	●
	110304T00815ME		0.4	2.0		●	●
	110308T00815ME		0.8	1.7		●	●
	VBGW 160402T00815ME	T00815	0.2	2.4	2	●	●
	160404T00815ME		0.4	2.0		●	●
	160408T00815ME		0.8	1.7		●	●
 Multi edge/ General purpose	VBGW 110304S01225MES	S01225	0.4	2.0	2	●	●
	160404S01225MES	S01225	0.4	2.0	2	●	●
 Multi edge/ Tough	VBGW 110302S01035MET	S01035	0.2	2.4	2	●	●
	110304S01035MET		0.4	2.0		●	●
	110308S01035MET		0.8	1.7		●	●
	VBGW 160402S01035MET	S01035	0.2	2.4	2	●	●
	160404S01035MET		0.4	2.0		●	●
	160408S01035MET		0.8	1.7		●	●
 Multi edge	VCGW 080202T00815ME	T00815	0.2	2.4	2	●	●
	080204T00815ME		0.4	2.0		●	●
 Multi edge/ Tough	VCGW 080202S01035MET	S01035	0.2	2.4	2	●	●
	080204S01035MET		0.4	2.0		●	●
	080208S01035MET		0.8	1.7		●	●

● : Available

## Recommended cutting conditions

Workpiece material	Hardness	Application		Recommended insert grade	Cutting conditions		
					Vc (m/min)	ap (mm)	f (mm/rev)
Hard materials	55HRC or more	High-speed Finishing	Continuous	KBN010	80 - <b>180</b> - 230	0.05 - <b>0.2</b> - 0.35	0.05 - <b>0.15</b> - 0.3
		General finishing	Continuous~Interruption	KBN020	80 - <b>150</b> - 200	0.05 - <b>0.2</b> - 0.5	0.05 - <b>0.2</b> - 0.45
		High-efficiency stable machining	Light interruption to interruption	KBN020	80 - <b>150</b> - 200	0.05 - <b>0.2</b> - 0.5	0.05 - <b>0.2</b> - 0.45
		Interruption	Interruption to Heavy Interruption	KBN020	80 - <b>130</b> - 180	0.05 - <b>0.2</b> - 0.5	0.05 - <b>0.2</b> - 0.4