



HSS NON-STEP EXTRA LONG DRILLS
10 D, 15 D and 20 D !

VOL.3

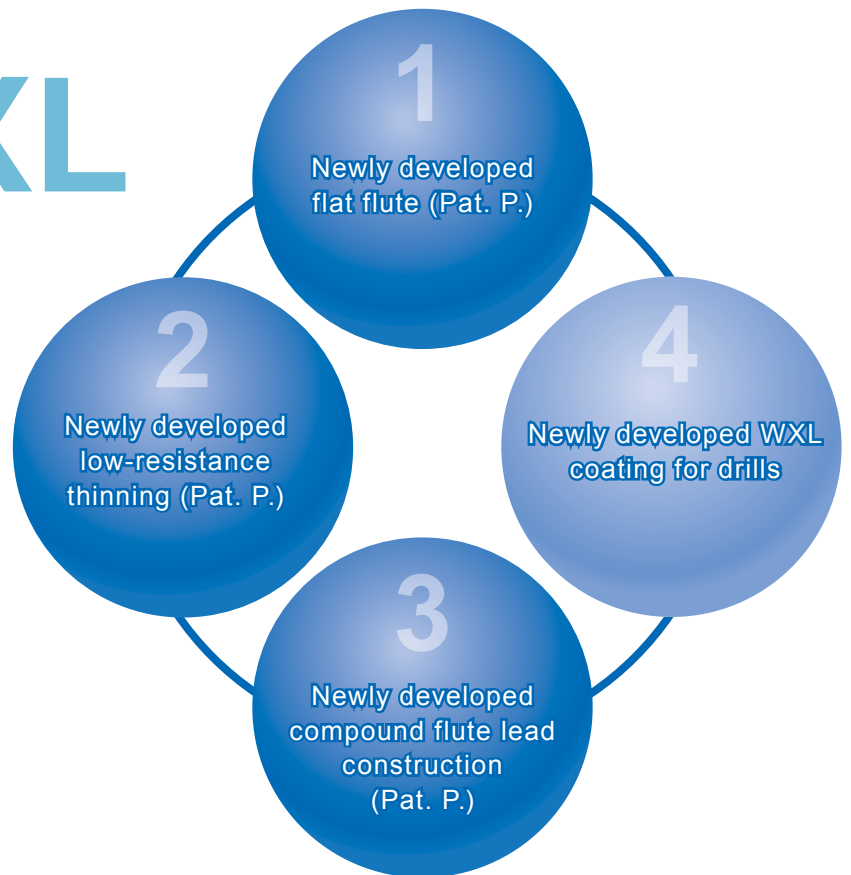


15D
10D
20D

TDXL

HSS drills without coolant-holes can achieve
from 10xD up to 20xD !

TDXL



TDXL features four newly developed technologies including three patents pending!

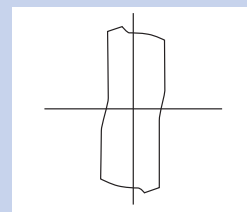
New technologies!

New flute shape (Pat. P.) dramatically improves chip evacuation ! It is capable of non-step drilling from 10 D up to 20xD!

Flute Form



Highly rigid, wide flutes with smooth curves



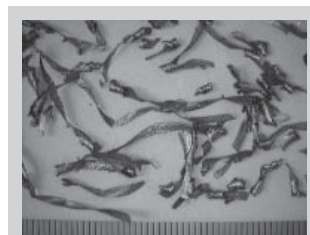
Newly developed flat flute (Pat. P.)

Chip shape when drilling S50C



TDXL

Short, broken pieces



Competitor

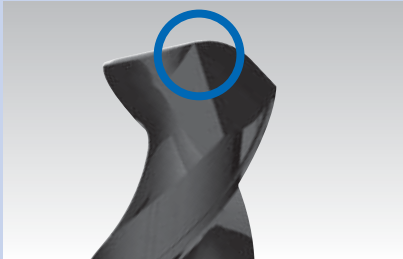
Long, curly chips

HSS EXTRA-LONG DRILL

New technologies !

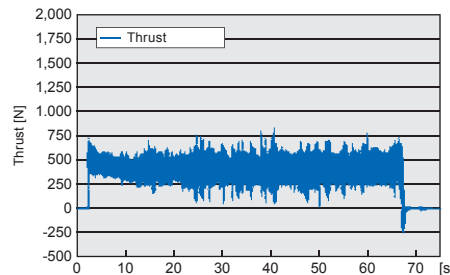
The newly developed thinning (Pat. P.) exhibited half the thrust resistance (in-house comparison)!

■ Thining Form



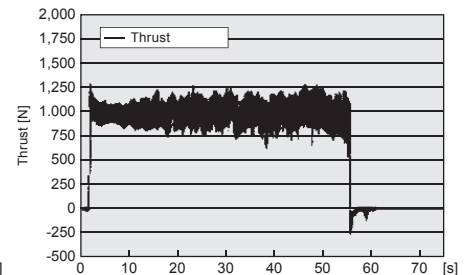
Sharp and low-thrust new thinning form

■ Thrust Resistance



TDXL

TDXL was tested at a depth of 20xD



Competitor

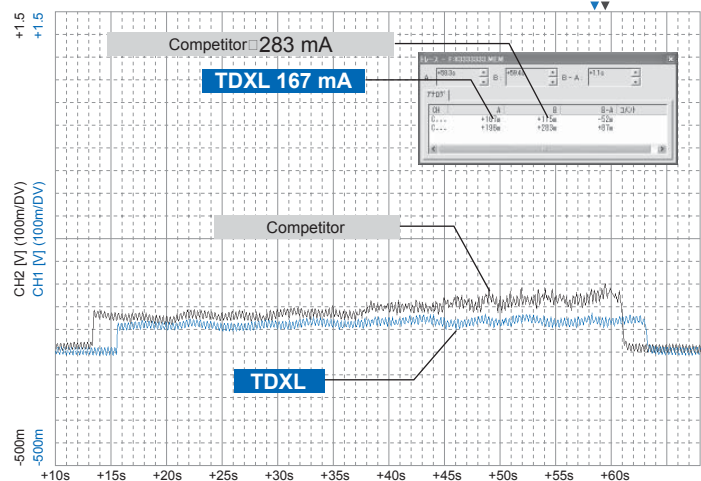
The competitor's product with a shorter flute was tested at a depth of 15xD

New technologies !

Newly developed compound flute lead construction (Pat. P.)

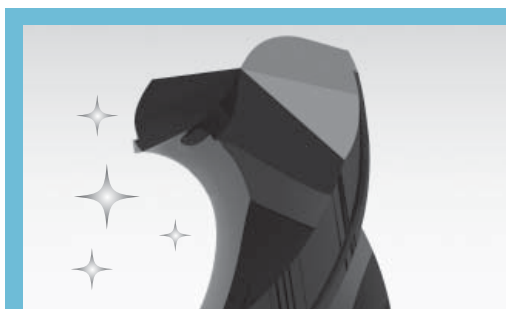
The newly conceived flute design widens in the middle, significantly improving chip evacuation. Thanks to this, it is capable of non-step drilling of up to 20xD.

■ Stable drilling power (spindle amperage)



New technologies !

New coating improves durability !



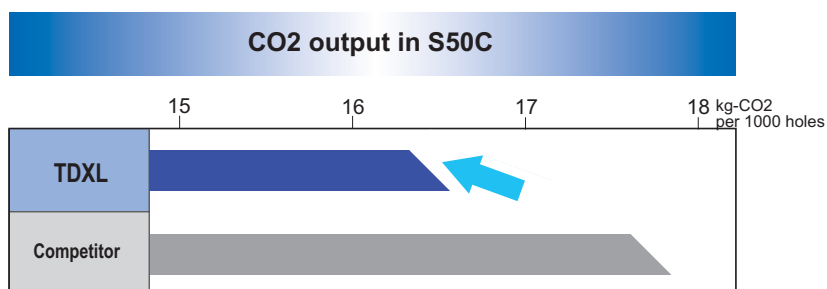
The newly developed WXL Coating makes drills sparkle!

- Lower CO₂ output than competitors !!!!.

Eco-Friendly Commitment !

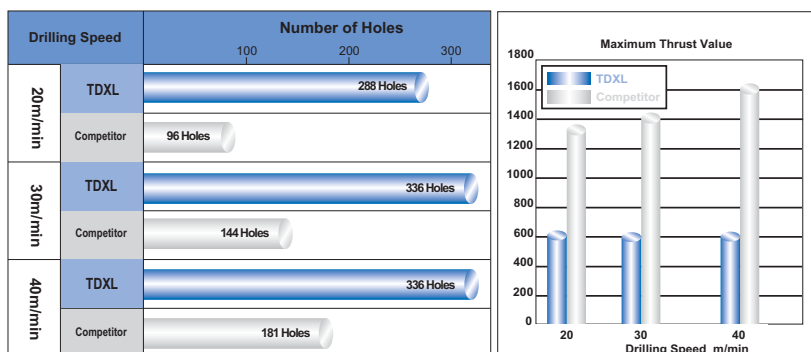
Compared to the competitor's product, cut CO₂ by 0,96 kg or 5,4% per 1000 holes !!

Tool	TDXL 10 × 10 D
Work Material	S50C (DIN CK50 AISI 1050)
Drilling Speed	25 m/min (796 min ⁻¹)
Feed	176 mm/min (0,22mm/rev) NON STEP
Depth of Holes	100 mm (10D) (Blind)
Coolant	Water Soluble
Machine	Vertical Machining Center



- Compared to the competitor's product, the maximum thrust value is stable. Durability is 1,8 to 3 times greater !!

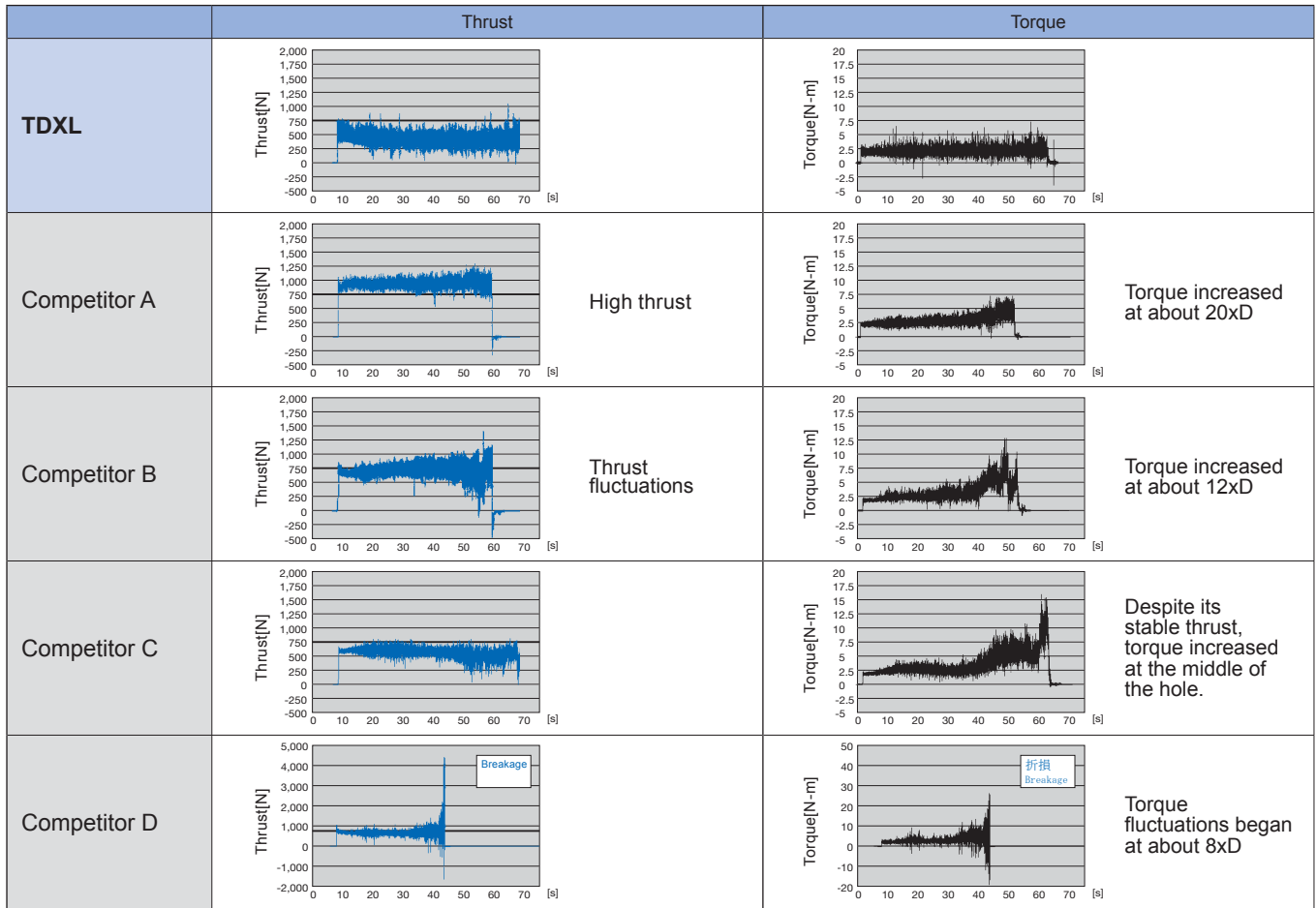
Tool	TDXL 7 × 15 D
Work Material	S50C (DIN CK50 AISI 1050)
Drilling Speed	20 ~ 40 m/min (910 ~ 1.820min ⁻¹)
Feed	127 ~ 255 mm/min (0,14mm/rev) NON STEP
Depth of Holes	99 mm (14 D) (Blind)
Coolant	Water Soluble
Machine	Horizontal Machining Center



Tool runhout under 2µm

Drill for pilot hole

Tool	EX-GDS Ø 7,1 mm
Depth of Holes	14mm



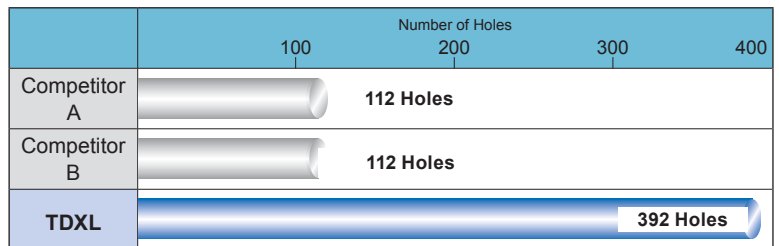
Competitor A & B : Because of its short flute length, it could drill only up to 25xD.

■ Our drill exhibited durability of more than 3 times the competitor's product! Horizontal machining, external coolant, 47 meters drilling length!

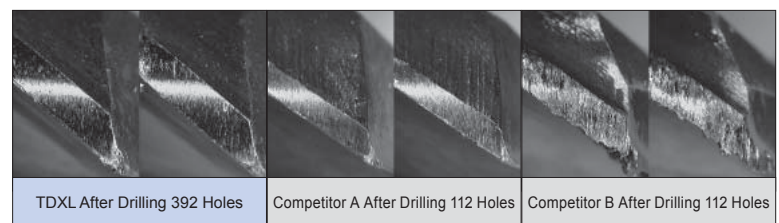
Tool	TDXL 6×20D
Work Material	SCM420H (Similar DIN 15CrMo5)
Drilling Speed	24m/min (1,273min ⁻¹)
Feed	190mm/min (0.15mm/rev) (Up to 112 holes) Non-step
	229mm/min (0.18mm/rev) (Until tool life) Non-Step
Depth of Holes	120mm (20D) (Through)
Coolant	Water Soluble
Machine	Horizontal Machining Center

Drill for pilot hole

Tool	EX-GDS Ø 6,1
Depth of Holes	15mm

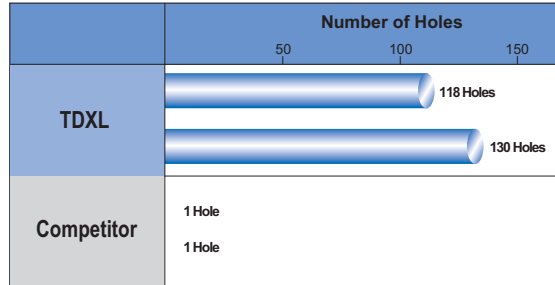


■ Wear Conditions



- Compared to the competitor's product, our drill was capable of drilling an overwhelming number of holes !!

Tool	TDXL 1,6× 20 D
Work Material	S50C (DIN CK50 AISI 1050)
Drilling Speed	20 m/min (3.980 min ⁻¹)
Feed	64 mm/min (0,016mm/rev) Non-step Up to 8 mm from beginning of hole
	92 mm/min (0,023mm/rev) Non-step After 8 mm
Depth of Holes	32 mm (20 D) Blind
Coolant	Water Soluble
Machine	Vertical Machining Center

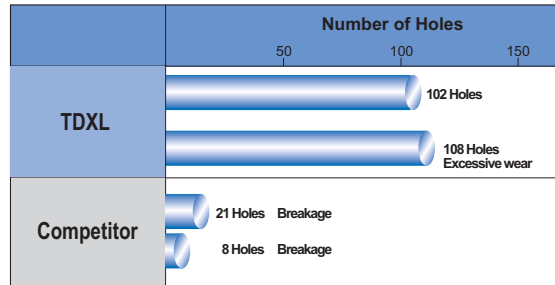


Drill for pilot hole

Tool	EX-GDS dia 1,65
Depth of Holes	4,8 mm

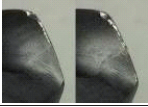

- Stable non-step drilling is possible even for material with 30 HRC !!

Tool	TDXL 10 × 10 D
Work Material	SCM 440 (30 HRC)
Drilling Speed	16 m/min (509 min ⁻¹)
Feed	112 mm/min (0,22mm/rev) Non-step
Depth of Holes	100 mm (10 D) Blind
Coolant	Water Soluble
Machine	Vertical Machining Center



Drill for pilot hole

Tool	EX-GDS dia 10.1
Depth of Holes	20 mm

Competitor	 Competitor after 8 holes
TDXL	TDXL after 93 holes 



HIGH PERFORMANCE

■ HSS extra long drill.
Non step drilling
10 D, 15 D, 20 D

Without internal coolant

HIGH PERFORMANCE

■ HSS ekstra lang
Uden udspåning i
10 D, 15 D, 20 D

Uden kølekanaler

HIGH PERFORMANCE

■ HSS extra lange Bohrer
Ohne Step
10 D, 15 D, 20 D

Ohne innerer Kühlmittelzufuhr

HIGH PERFORMANCE

■ HSS extra långa borrar
Step fri borning
10D, 15D, 20D

utan Kylkanaler

ALTA PRESTAZIONE

■ HSS Punta extra lunga
Foratura continua
10 D, 15 D, 20 D

senza fori di lubrificazione

ALTAS PRESTACIONES

■ Broca HSS extra larga.
Taladrado ininterumpido
10 D, 15 D, 20 D

sin agujeros de refrigeración

HAUTE PERFORMANCE

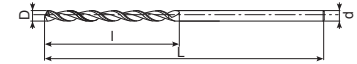
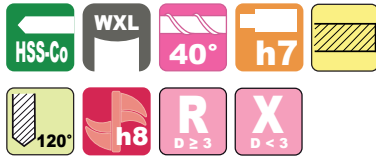
■ Foret HSSE revêtue extra long.
Forage en continu
10 D, 15 D, 20 D

sans arrosage central

Высокая производительность

■ Сверхдлинное сверло из быстрорежущей стали
Непрерывное сверление глубиной
10 D, 15 D, 20 D

Без внутреннего охлаждения



	EDP	D	L	l	d	Stock	Price		EDP	D	L	l	d	Stock	Price
10 XD	8622816	1,6	75	26	1,6	●			8622870	7,0	140	90	7,0	●	
	8622818	1,8	75	26	1,8	●			8622871	7,1	155	100	7,1	●	
	8622820	2,0	75	26	2,0	●			8622872	7,2	155	100	7,2	●	
	8622821	2,1	75	33	2,1	●			8622873	7,3	155	100	7,3	●	
	8622822	2,2	75	33	2,2	●			8622874	7,4	155	100	7,4	●	
	8622823	2,3	75	33	2,3	●			8622875	7,5	155	100	7,5	●	
	8622824	2,4	75	33	2,4	●			8622876	7,6	155	105	7,6	●	
	8622825	2,5	75	33	2,5	●			8622877	7,7	155	105	7,7	●	
	8622826	2,6	90	40	2,6	●			8622878	7,8	155	105	7,8	●	
	8622827	2,7	90	40	2,7	●			8622879	7,9	155	105	7,9	●	
	8622828	2,8	90	40	2,8	●			8622880	8,0	155	105	8,0	●	
	8622829	2,9	90	40	2,9	●			8622881	8,1	165	110	8,1	●	
	8622830	3,0	90	40	3,0	●			8622882	8,2	165	110	8,2	●	
	8622831	3,1	100	45	3,1	●			8622883	8,3	165	110	8,3	●	
	8622832	3,2	100	45	3,2	●			8622884	8,4	165	110	8,4	●	
	8622833	3,3	100	45	3,3	●			8622885	8,5	165	110	8,5	●	
	8622834	3,4	100	50	3,4	●			8622886	8,6	165	115	8,6	●	
	8622835	3,5	100	50	3,5	●			8622887	8,7	165	115	8,7	●	
	8622836	3,6	100	50	3,6	●			8622888	8,8	165	115	8,8	●	
	8622837	3,7	100	50	3,7	●			8622889	8,9	165	115	8,9	●	
	8622838	3,8	100	50	3,8	●			8622890	9,0	165	115	9,0	●	
	8622839	3,9	100	50	3,9	●			8622891	9,1	190	125	9,1	●	
	8622840	4,0	100	50	4,0	●			8622892	9,2	190	125	9,2	●	
	8622841	4,1	115	55	4,1	●			8622893	9,3	190	125	9,3	●	
	8622842	4,2	115	55	4,2	●			8622894	9,4	190	125	9,4	●	
	8622843	4,3	115	60	4,3	●			8622895	9,5	190	125	9,5	●	
	8622844	4,4	115	60	4,4	●			8622896	9,6	190	130	9,6	●	
	8622845	4,5	115	60	4,5	●			8622897	9,7	190	130	9,7	●	
	8622846	4,6	115	60	4,6	●			8622898	9,8	190	130	9,8	●	
	8622847	4,7	115	60	4,7	●			8622899	9,9	190	130	9,9	●	
	8622848	4,8	115	65	4,8	●			8622900	10,0	190	130	10,0	●	
	8622849	4,9	115	65	4,9	●			8622901	10,1	205	140	10,1	●	
8622850	5,0	115	65	5,0	●			8622902	10,2	205	140	10,2	●		
8622851	5,1	128	70	5,1	●			8622903	10,3	205	140	10,3	●		
8622852	5,2	128	70	5,2	●			8622904	10,4	205	140	10,4	●		
8622853	5,3	128	70	5,3	●			8622905	10,5	205	140	10,5	●		
8622854	5,4	128	78	5,4	●			8622906	10,6	205	145	10,6	●		
8622855	5,5	128	78	5,5	●			8622907	10,7	205	145	10,7	●		
8622856	5,6	128	78	5,6	●			8622908	10,8	205	145	10,8	●		
8622857	5,7	128	78	5,7	●			8622909	10,9	205	145	10,9	●		
8622858	5,8	128	78	5,8	●			8622910	11,0	205	145	11,0	●		
8622859	5,9	128	78	5,9	●			8622911	11,1	215	155	11,1	●		
8622860	6,0	128	78	6,0	●			8622912	11,2	215	155	11,2	●		
8622861	6,1	140	78	6,1	●			8622913	11,3	215	155	11,3	●		
8622862	6,2	140	87	6,2	●			8622914	11,4	215	155	11,4	●		
8622863	6,3	140	87	6,3	●			8622915	11,5	215	155	11,5	●		
8622864	6,4	140	87	6,4	●			8622916	11,6	215	155	11,6	●		
8622865	6,5	140	87	6,5	●			8622917	11,7	215	155	11,7	●		
8622866	6,6	140	87	6,6	●			8622918	11,8	215	155	11,8	●		
8622867	6,7	140	87	6,7	●			8622919	11,9	215	155	11,9	●		
8622868	6,8	140	90	6,8	●			8622920	12,0	215	155	12,0	●		
8622869	6,9	140	90	6,9	●										

Applications - Anwendungen - Applicazioni - Applications - Applikation - Applikation - Aplicaciones - Применение								
C≤0.2%	0.25<C≤0.4%	C≥0.45%	SCM	-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	SUS
○	◎	◎	◎					
SKD	GG	GGG	Cu	Al	AC	Ti	TiAl	Inc
	◎	◎			◎			



HIGH PERFORMANCE

■ HSS extra long drill.

Non step drilling
10 D, 15 D, 20 D

Without internal coolant

HIGH PERFORMANCE

■ HSS ekstra lang

Uden udspåning i
10 D, 15 D, 20 D

Uden kølekanaler

HIGH PERFORMANCE

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Ohne Step
10 D, 15 D, 20 D

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senza fori di lubrificazione

ALTAS PRESTACIONES

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HAUTE PERFORMANCE

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Forage en continu
10 D, 15 D, 20 D

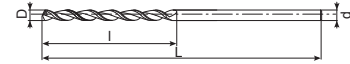
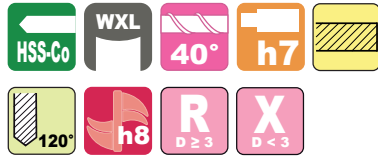
sans arrosage central

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15 XD	8623016	1,6	70	30	1,6	●			8623052	5,2	155	94	5,2	●	
	8623018	1,8	75	34	1,8	●			8623053	5,3	155	96	5,3	●	
	8623020	2,0	80	36	2,0	●			8623054	5,4	155	98	5,4	●	
	8623021	2,1	80	38	2,1	●			8623055	5,5	155	100	5,5	●	
	8623022	2,2	80	40	2,2	●			8623056	5,6	160	102	5,6	●	
	8623023	2,3	85	42	2,3	●			8623057	5,7	165	104	5,7	●	
	8623024	2,4	85	44	2,4	●			8623058	5,8	165	106	5,8	●	
	8623025	2,5	85	46	2,5	●			8623060	6,0	170	108	6,0	●	
	8623026	2,6	100	48	2,6	●			8623062	6,2	170	112	6,2	●	
	8623027	2,7	100	50	2,7	●			8623063	6,3	175	114	6,3	●	
	8623028	2,8	100	50	2,8	●			8623065	6,5	200	118	6,5	●	
	8623029	2,9	105	54	2,9	●			8623066	6,6	200	120	6,6	●	
	8623030	3,0	105	54	3,0	●			8623068	6,8	200	124	6,8	●	
	8623031	3,1	110	56	3,1	●			8623069	6,9	200	126	6,9	●	
	8623032	3,2	110	58	3,2	●			8623070	7,0	200	126	7,0	●	
	8623033	3,3	110	60	3,3	●			8623071	7,1	200	128	7,1	●	
	8623034	3,4	115	62	3,4	●			8623075	7,5	205	136	7,5	●	
	8623035	3,5	115	64	3,5	●			8623080	8,0	215	144	8,0	●	
	8623036	3,6	115	66	3,6	●			8623081	8,1	215	146	8,1	●	
	8623037	3,7	120	68	3,7	●			8623082	8,2	220	148	8,2	●	
8623038	3,8	120	70	3,8	●			8623085	8,5	225	154	8,5	●		
8623039	3,9	120	70	3,9	●			8623086	8,6	225	156	8,6	●		
8623040	4,0	120	72	4,0	●			8623088	8,8	230	160	8,8	●		
8623041	4,1	135	74	4,1	●			8623090	9,0	230	162	9,0	●		
8623042	4,2	135	76	4,2	●			8623093	9,3	240	168	9,3	●		
8623043	4,3	140	78	4,3	●			8623095	9,5	240	172	9,5	●		
8623044	4,4	140	80	4,4	●			8623097	9,7	245	176	9,7	●		
8623045	4,5	140	82	4,5	●			8623098	9,8	245	178	9,8	●		
8623046	4,6	145	84	4,6	●			8623100	10,0	250	180	10,0	●		
8623047	4,7	145	86	4,7	●			8623105	10,5	270	190	10,5	●		
8623048	4,8	145	86	4,8	●			8623110	11,0	280	200	11,0	●		
8623049	4,9	150	88	4,9	●			8623115	11,5	290	208	11,5	●		
8623050	5,0	150	90	5,0	●			8623118	11,8	295	214	11,8	●		
8623051	5,1	150	92	5,1	●			8623120	12,0	300	216	12,0	●		

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	◎	◎			◎			



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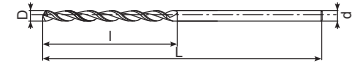
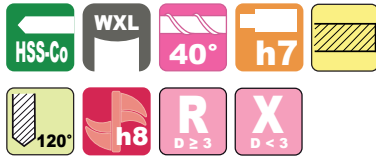
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sans arrosage central

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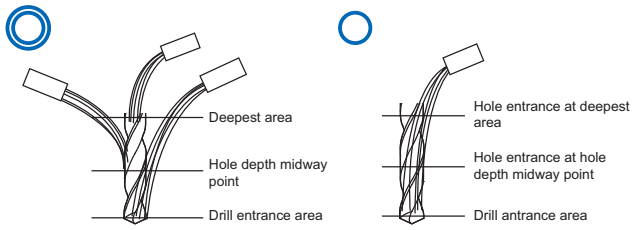
Без внутреннего охлаждения



	EDP	D	L	l	d	Stock	Price		EDP	D	L	l	d	Stock	Price
20 XD	8623216	1,6	85	38	1,6	●		20 XD	8623245	4,5	165	104	4,5	●	
	8623218	1,8	85	42	1,8	●			8623246	4,6	165	106	4,6	●	
	8623220	2,0	85	46	2,0	●			8623248	4,8	170	112	4,8	●	
	8623221	2,1	90	50	2,1	●			8623250	5,0	175	116	5,0	●	
	8623222	2,2	90	52	2,2	●			8623251	5,1	180	118	5,1	●	
	8623223	2,3	95	54	2,3	●			8623252	5,2	180	120	5,2	●	
	8623224	2,4	95	56	2,4	●			8623255	5,5	185	128	5,5	●	
	8623225	2,5	100	58	2,5	●			8623257	5,7	190	132	5,7	●	
	8623226	2,6	110	60	2,6	●			8623258	5,8	200	134	5,8	●	
	8623227	2,7	115	64	2,7	●			8623260	6,0	200	138	6,0	●	
	8623228	2,8	115	66	2,8	●			8623263	6,3	200	146	6,3	●	
	8623229	2,9	120	68	2,9	●			8623265	6,5	225	150	6,5	●	
	8623230	3,0	120	70	3,0	●			8623268	6,8	225	158	6,8	●	
	8623231	3,1	125	72	3,1	●			8623269	6,9	230	160	6,9	●	
	8623232	3,2	125	74	3,2	●			8623270	7,0	230	162	7,0	●	
	8623233	3,3	125	76	3,3	●			8623275	7,5	245	174	7,5	●	
8623234	3,4	130	80	3,4	●		8623280	8,0	255	184	8,0	●			
8623235	3,5	130	82	3,5	●		8623281	8,1	255	188	8,1	●			
8623237	3,7	135	86	3,7	●		8623282	8,2	260	190	8,2	●			
8623238	3,8	140	88	3,8	●		8623285	8,5	265	196	8,5	●			
8623240	4,0	140	92	4,0	●		8623290	9,0	275	208	9,0	●			
8623241	4,1	155	96	4,1	●		8623300	10,0	300	230	10,0	●			
8623242	4,2	155	98	4,2	●		8623310	11,0	350	254	11,0	●			
8623243	4,3	160	100	4,3	●		8623320	12,0	350	276	12,0	●			

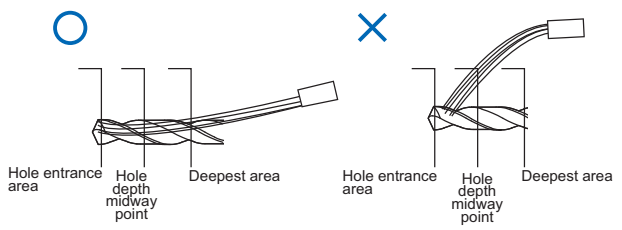
Applications - Anwendungen - Applicazioni - Applications - Applikation - Applikation - Aplicaciones - Применение								
C≤0.2%	0.25<C≤0.4%	C≥0.45%	SCM	-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	SUS
○	◎	◎	◎					
SKD	GG	GGG	Cu	Al	AC	Ti	TiAl	Inc
	◎	◎			◎			

Vertical machining center



Allow the coolant to move along the drill if the discharge flow rate is low or the number of nozzles is too few.

Horizontal machining center



If there are too few coolant nozzles is small, increase the amount of coolant and its discharge pressure and allow the coolant to move along the drill so that it is applied constantly to the entrance.

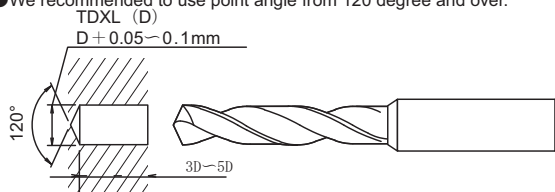
If there are too few coolant nozzles is small, the coolant that is applied to the hole entrance will stray from the hole along the way.

Recommended Operation For Using TDXL

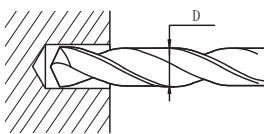
① Make a pilot hole.

Recommended drill : EX-SUS-GDS

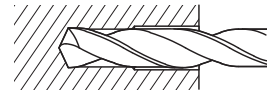
- For a pilot hole, select 0.05mm to 0.1mm larger size drill than TDXL. For deep hole, we recommend to drill deeper pilot hole.
- For a vertical machining center. When drilling many holes in a small area with vertical machining center. We recommend only centering by 130 degree point angle LDS to avoid chips building up in pilot holes, which can cause drill chipping or breakage. When drilling the pilot hole it is recommended to make the hole 3xD in depth, at a feed rate equal to (Drill $\phi \times 0.01$) per revolution. Straightness will be less accurate than a comparable operation in a horizontal machining center.
- We recommended to use point angle from 120 degree and over.



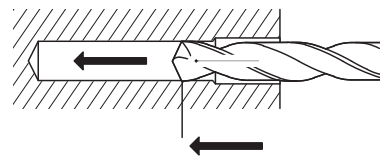
② Insert the TDXL into a pilot hole with low revolution. (~500 min⁻¹)



③ Start supplying the coolant.

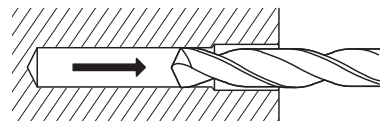


④ Increase the revolution to the designated speed and start drilling. At the start of drilling, set the feed rate to 1% of the drill dia. and increase the feed rate when the depth reaches between 3xD and 5xD.



Increase feed rate to between 1 and 2% Set it to 1%D between 3xD and 5xD

⑤ After drilling, move the drill away from the bottom of the hole; then reduce its speed while pulling it out of the hole.



WORK MATERIAL	CARBON STEELS S50C S35C 500 ~ 710N/mm ²		ALLOY STEELS SCM SCr SNCM 710 ~ 900N/mm ²		TOOL STEELS DIE STEELS (unquenched) SKD SK DH31 DAC 710 ~ 900N/mm ²		DUCTILE CAST IRON FCD400 FCD500 ~ 500N/mm ²		CAST IRON FC250 ~ 350N/mm ²	
DRILLING SPEED	20 ~ 24 m/min		18 ~ 22 m/min		12 ~ 16 m/min		16 ~ 20 m/min		18 ~ 24 m/min	
DRILL DIA. (mm)	SPEED (min ⁻¹)	FEED RATE (mm/rev)	SPEED (min ⁻¹)	FEED RATE (mm/rev)	SPEED (min ⁻¹)	FEED RATE (mm/rev)	SPEED (min ⁻¹)	FEED RATE (mm/rev)	SPEED (min ⁻¹)	FEED RATE (mm/rev)
1,6	4.000	0,016 ~ 0,03	4.000	0,016 ~ 0,03	2.700	0,016 ~ 0,03	3.600	0,01 ~ 0,03	4.150	0,03 ~ 0,05
2	3.200	0,02 ~ 0,05	3.200	0,02 ~ 0,04	2.200	0,02 ~ 0,04	2.850	0,01 ~ 0,04	3.350	0,04 ~ 0,06
3	2.200	0,03 ~ 0,08	2.200	0,03 ~ 0,08	1.500	0,03 ~ 0,07	1.900	0,02 ~ 0,08	2.250	0,06 ~ 0,1
4	1.600	0,04 ~ 0,10	1.600	0,04 ~ 0,10	1.150	0,04 ~ 0,09	1.460	0,02 ~ 0,10	1.650	0,08 ~ 0,13
5	1.300	0,05 ~ 0,13	1.300	0,05 ~ 0,13	900	0,05 ~ 0,12	1.150	0,03 ~ 0,13	1.350	0,10 ~ 0,16
6	1.100	0,06 ~ 0,15	1.100	0,06 ~ 0,15	750	0,06 ~ 0,14	955	0,04 ~ 0,15	1.100	0,12 ~ 0,19
8	800	0,08 ~ 0,20	800	0,08 ~ 0,20	550	0,08 ~ 0,18	715	0,05 ~ 0,2	835	0,16 ~ 0,26
10	650	0,10 ~ 0,25	650	0,10 ~ 0,25	450	0,10 ~ 0,23	575	0,06 ~ 0,25	670	0,20 ~ 0,32
12	550	0,13 ~ 0,30	550	0,12 ~ 0,30	380	0,12 ~ 0,28	475	0,07 ~ 0,30	555	0,24 ~ 0,38

1. The indicated speeds and feeds are for drilling with water-soluble oil.
When using non-water soluble oil, set the drilling speed, reduce the drilling speed by 20-30%.
2. The most suitable cutting fluid is water-soluble oil (10-30 times dilution).
3. Refer to the "Coolant Application Key Points" for instructions on how to apply the coolant.
4. If chip evacuation becomes difficult during non-step drilling due to the type of work material or its annealed condition, perform step-feed drilling. In this case, we recommend the peck feed method in which the drill is retracted at a rate of approximately 100 times the feed rate (mm/rev).

5. If the number of nozzles on a horizontal machine center is too few or the discharge flow rate is insufficient, perform step-feed drilling. In this case, we recommend a step-feed method in which the drill is retracted to the entrance of the hole.
6. Be sure to center the hole before using this drill. To center the hole, use an OSG leading drill (NC-LDS, VP-LDS, etc.) or a stub drill of the same diameter to make a pilot hole.
The point angle of a leading drill may be 90°, 120° or 130°.
7. Use the step-feed method for drilling in quenched and tempered steels.

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