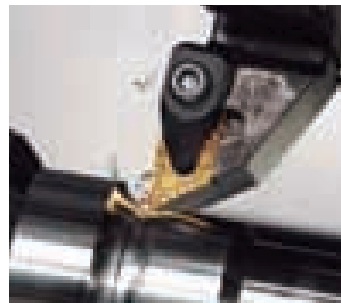
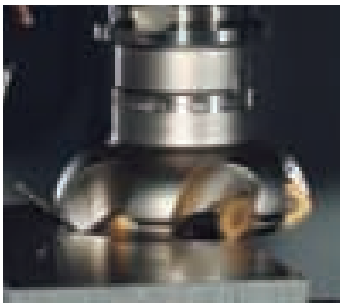


2007

Cutting Tools

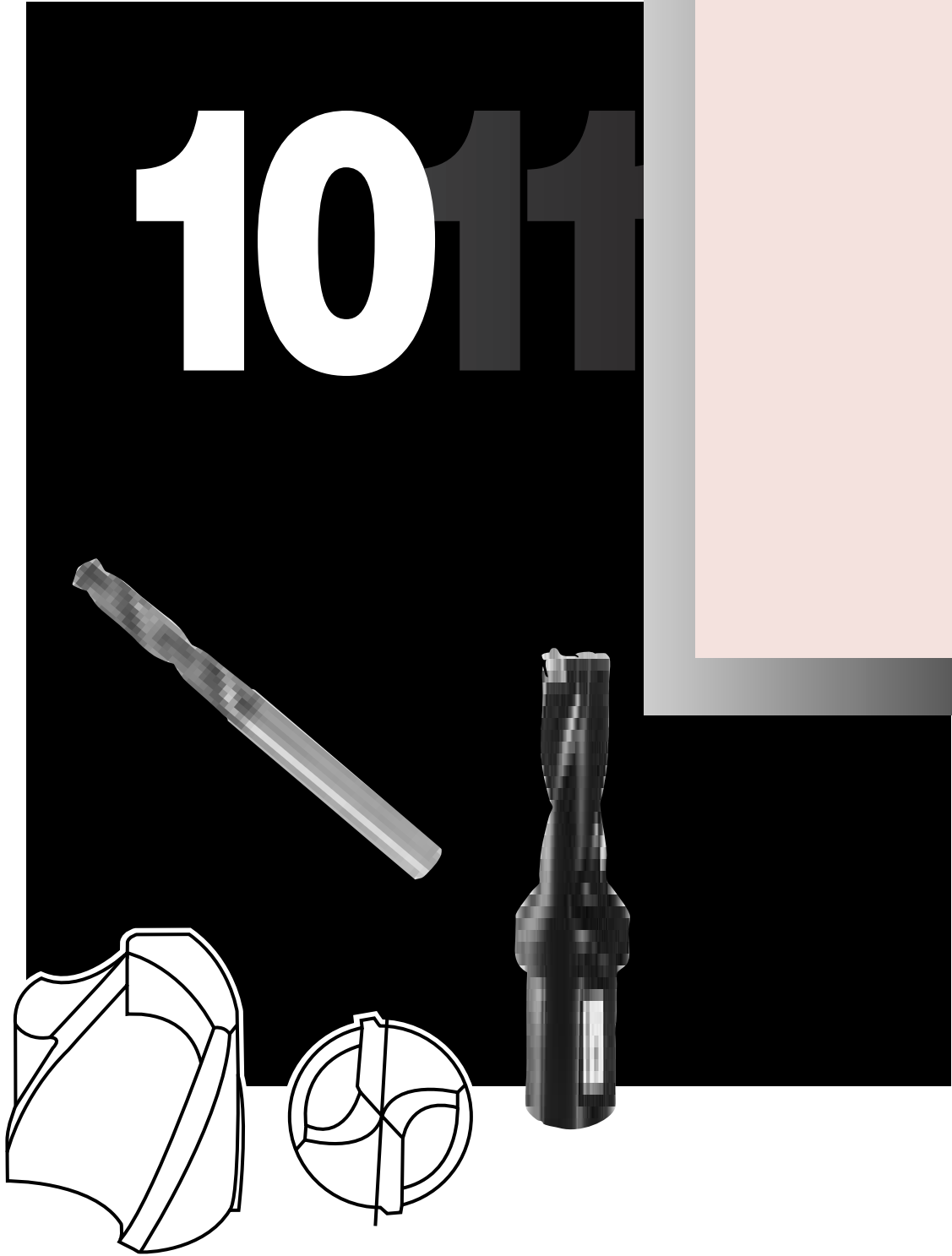


Selection Guides



- List of Drilling Tools 410
- Selection Guides 412

Specifications

- Solid Carbide Drills
 - For High Speed Deep Hole Drilling of Steels 416 (DSX)
- TAC Drilling Tools
 - For Steel, Stainless steel, Cast Irons (TDX) 419



List of Drilling Tools - Part 1 - For steels

Operation	Tool name	Type	Appearance	Work materials				L/D	Drill diameter range (mm)										
				Carbon steels	Alloy steels	Mild steels	Stainless steels		0.4	1.0	2.0	3.0	5.0	10	15	20	30	50	100
General drilling	Spiral jet drills for steels	DSX		●	●	●	○	3,5,8	0.4	1.0	2.0	3.0	5.0	10	15	20	30	50	100
	TAC drills	TDX		●	●	●	●	2,3,4,5	0.4	1.0	2.0	3.0	5.0	10	15	20	30	50	100

● best suitable ○ usable

TDX highest productivity, maximum performance

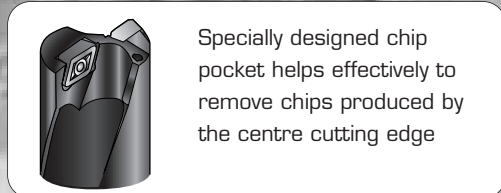
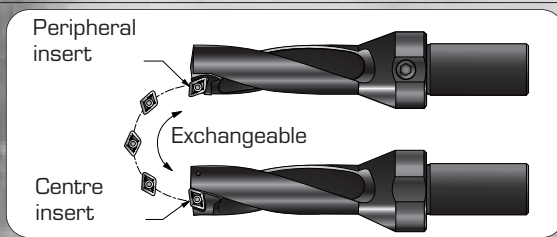
Advantages/Applications

Wide product range

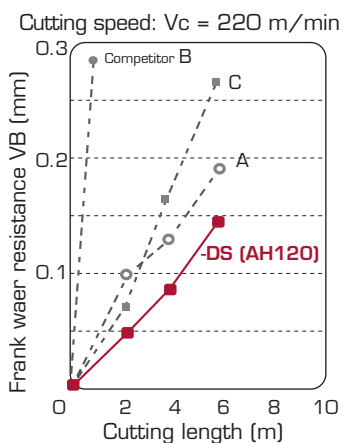
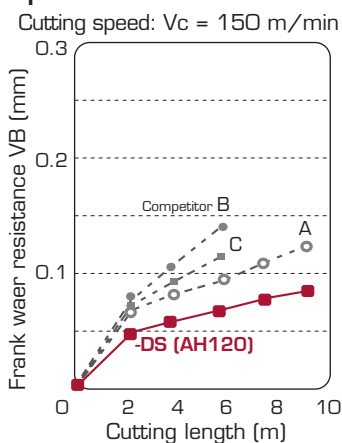
- 2, 3, 4 and 5xd for different bore hole depths
- 4 different high performance cutting grades
- 3 different chipbreaker geometries
- Wiper - technology
- Inserts with 4 cutting edges
- Suited for minimum quantity lubricating
- Eccentric sleeve

Low vibration and low noise drilling of most different cutting materials

High cutting parameter, reduced machining time

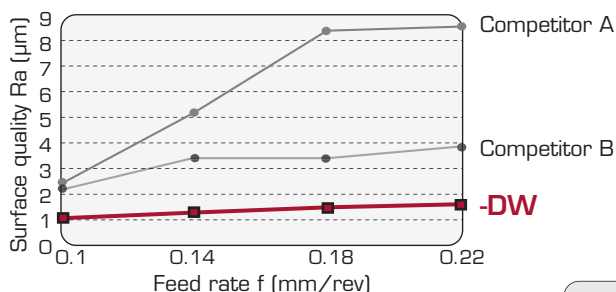


Comparison of tool life

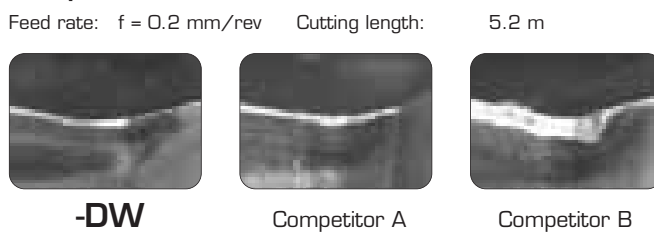


Work material: Stainless steel (X5CrNi189)
 Drill: TDX $\phi 19$, L/D = 3
 Insert: -DS AH120
 Machine: Machining centre
 Feed rate: $f = 0.08$ mm/rev
 Drilling depth: 25 mm (Counter hole)
 Coolant: Emulsion

Surface quality



Comparison of wear

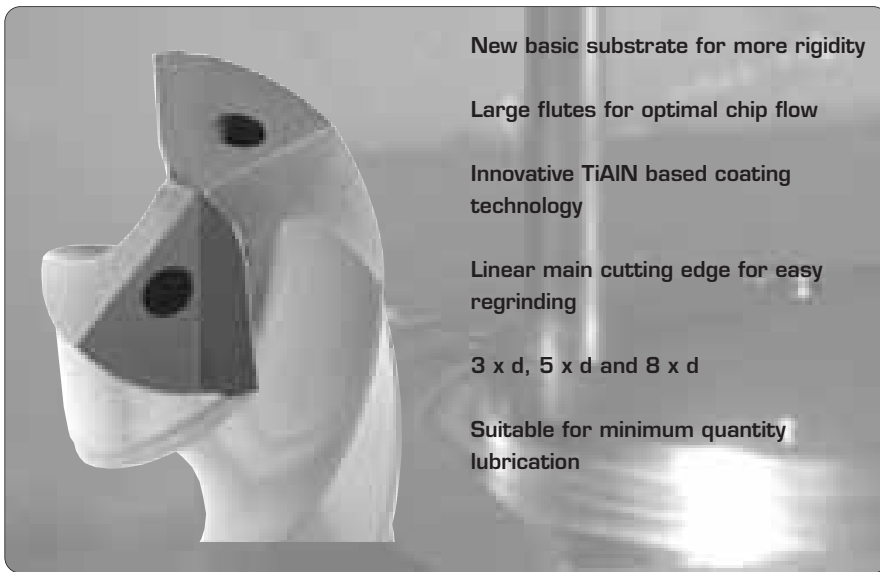


Work material: Ck55 Machine: Machining centre
 Drill: TDX $\phi 22$, L/D = 2 Coolant: Emulsion
 Cutting speed: $V_c = 100$ m/min

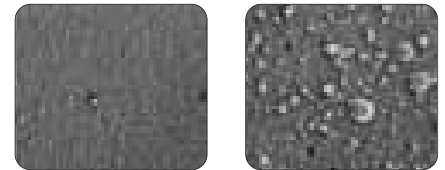
Type	Type of coolant supply	IT class	Attainable surface roughness (Rmax)	Features	Page
DSX	Internal	9 ~ 10	6.3 ~ 25	<ul style="list-style-type: none"> Coated solid drills with spiral oil holes. Excels in high-speed deep-hole drilling. 	416
TDX	Internal	11 ~	12 ~	<ul style="list-style-type: none"> Indexable-insert drills. Four-corner insert design for economical drilling. Excellent chip evacuation. 	419

DSX Solid carbide drill

Highest precision in detail for process stable applications

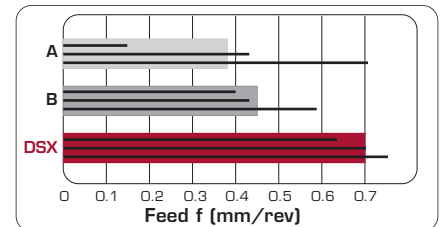


New "Flash coat" technology



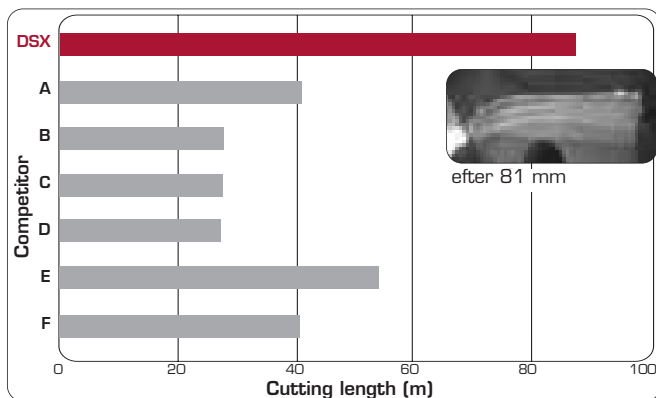
Ra = 0.1 µm

conventional



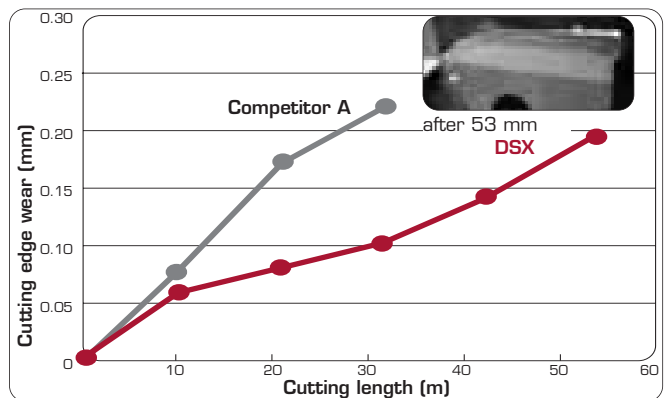
Drill: ø8.0 Vc: 88 m/min
 Work material: Ck45 Drilling depth: 40 mm
 (235HB) Coolant: Emulsion
 Machine: Horizontal machining centre

Tool life



Drill: ø8.0 (L/D = 5) Vc: 140 m/min
 Work material: Ck55 (210HB) f: 0.3 mm/rev
 Machine: Vertical machining centre Drilling depth: 40 mm
 Coolant: Emulsion (20 bar)

Wear

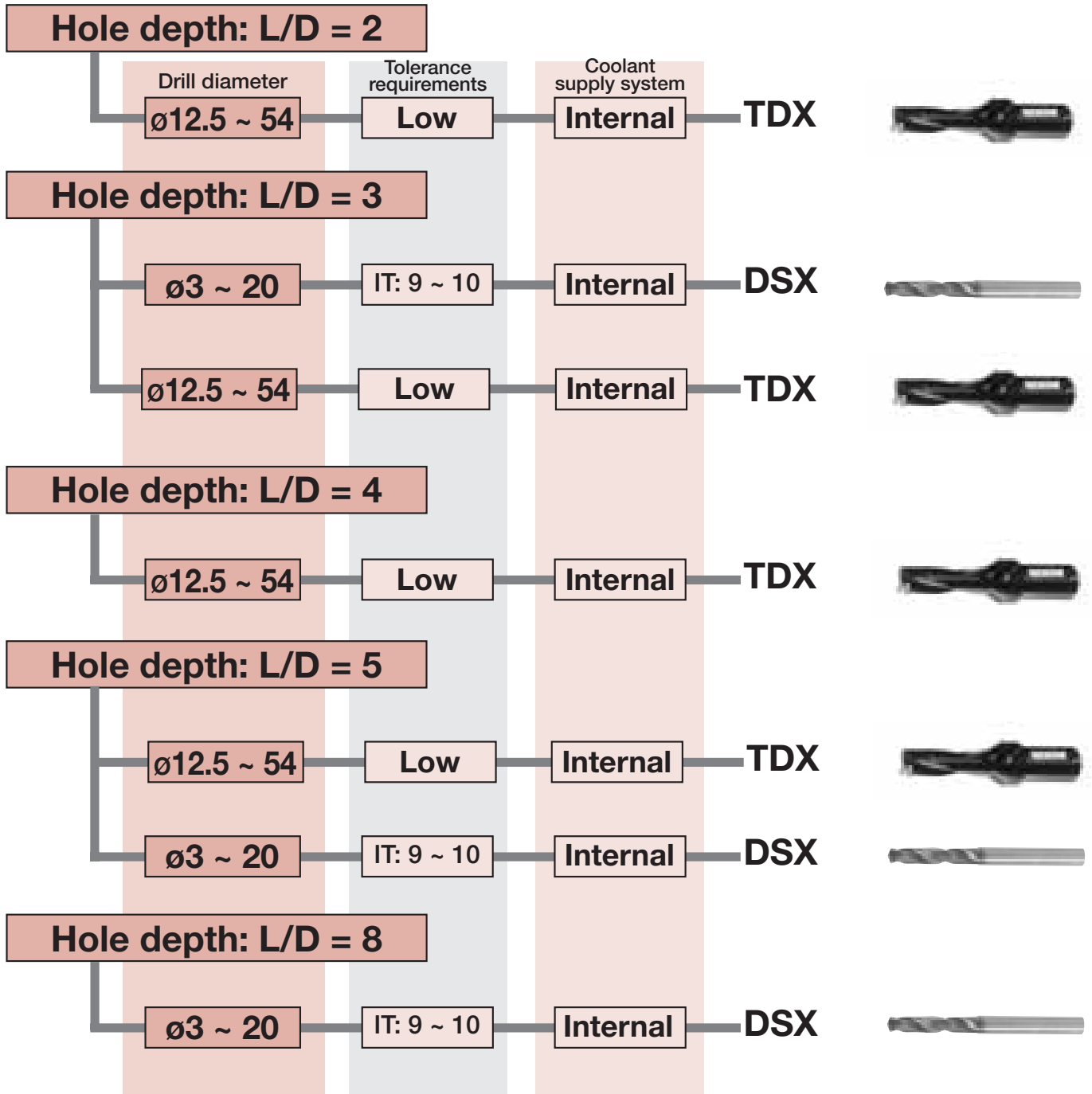


Drill: ø8.0 (L/D = 5) Vc: 80 m/min
 Work material: 42CrMo4 (230HB) f: 0.2 mm/rev
 Machine: Vertical machining centre Drilling depth: 40 mm
 Coolant: Emulsion (20 bar)

Drilling Tool Selection Guide

■ For drilling steels

● Low to medium carbon steels (USt42-2, Ck45 ~ Ck55), alloy steels (15CrMo5 ~ 42CrMo4)

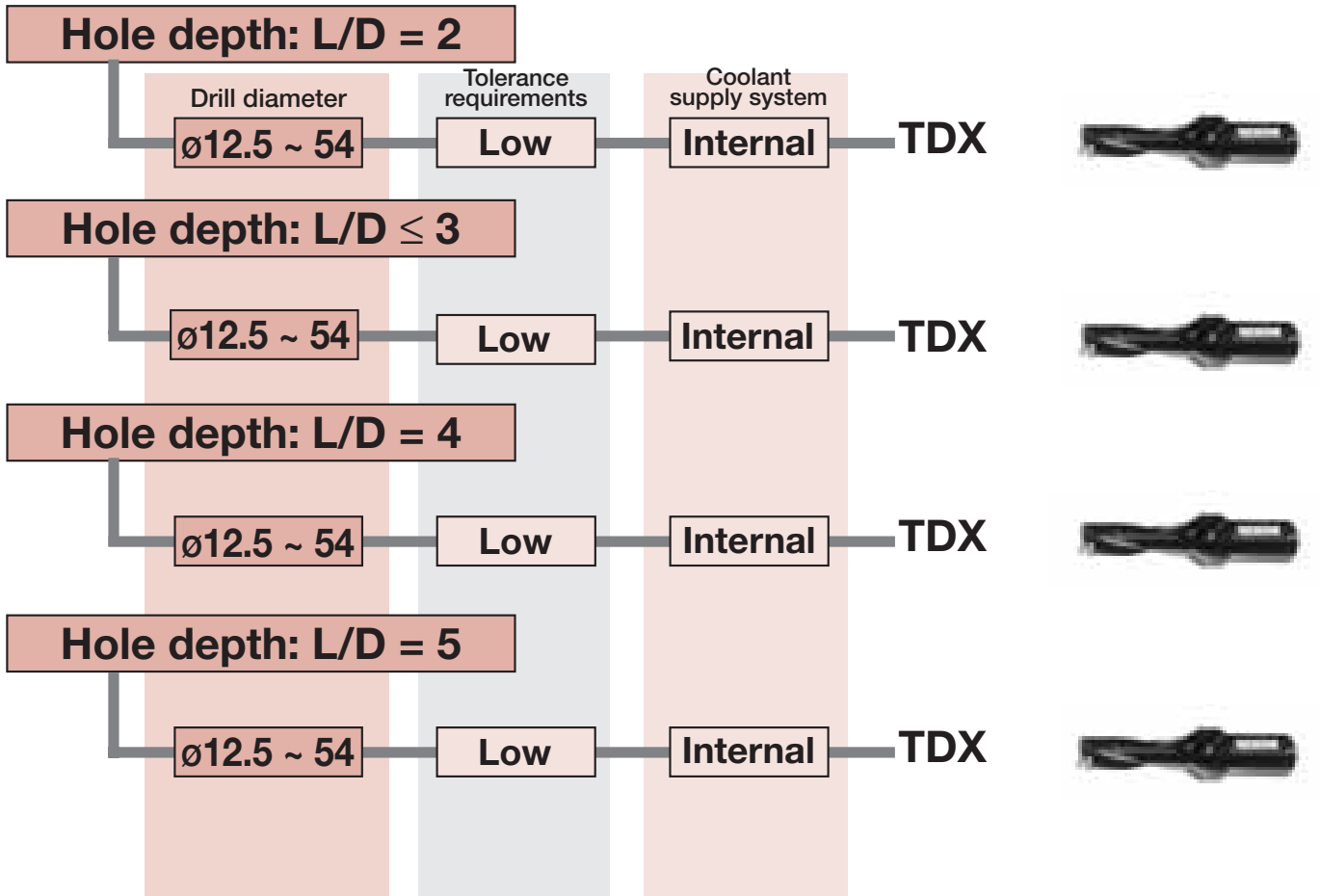


No. of revolutions n (rpm) = Cutting speed V_c (m/min) \times 1000 \div 3.14 \div Drill ϕ (mm)
 Table feed V_f (mm/min) = n (rpm) \times Feed f (mm/rev)

Drilling Tool Selection Guide

■ For drilling cast irons and light alloys

● Grey cast irons (GG20 ~ GG35), ductile cast irons (GGG40 ~ GGG60), aluminium alloys

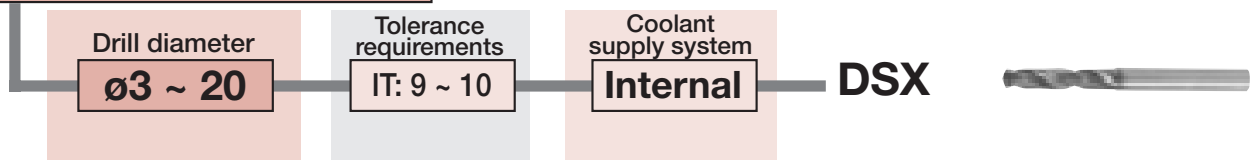


Drilling Tool Selection Guide

■ For drilling difficult-to-cut materials

- Hard materials: Hardened steels (X40CrMoV5-1), high-manganese steels, etc.
- Heat resisting alloys: Inconel 718 etc.
- Titanium alloys: Ti-6Al-4V etc.

Hole depth: L/D = 3, 5, 8



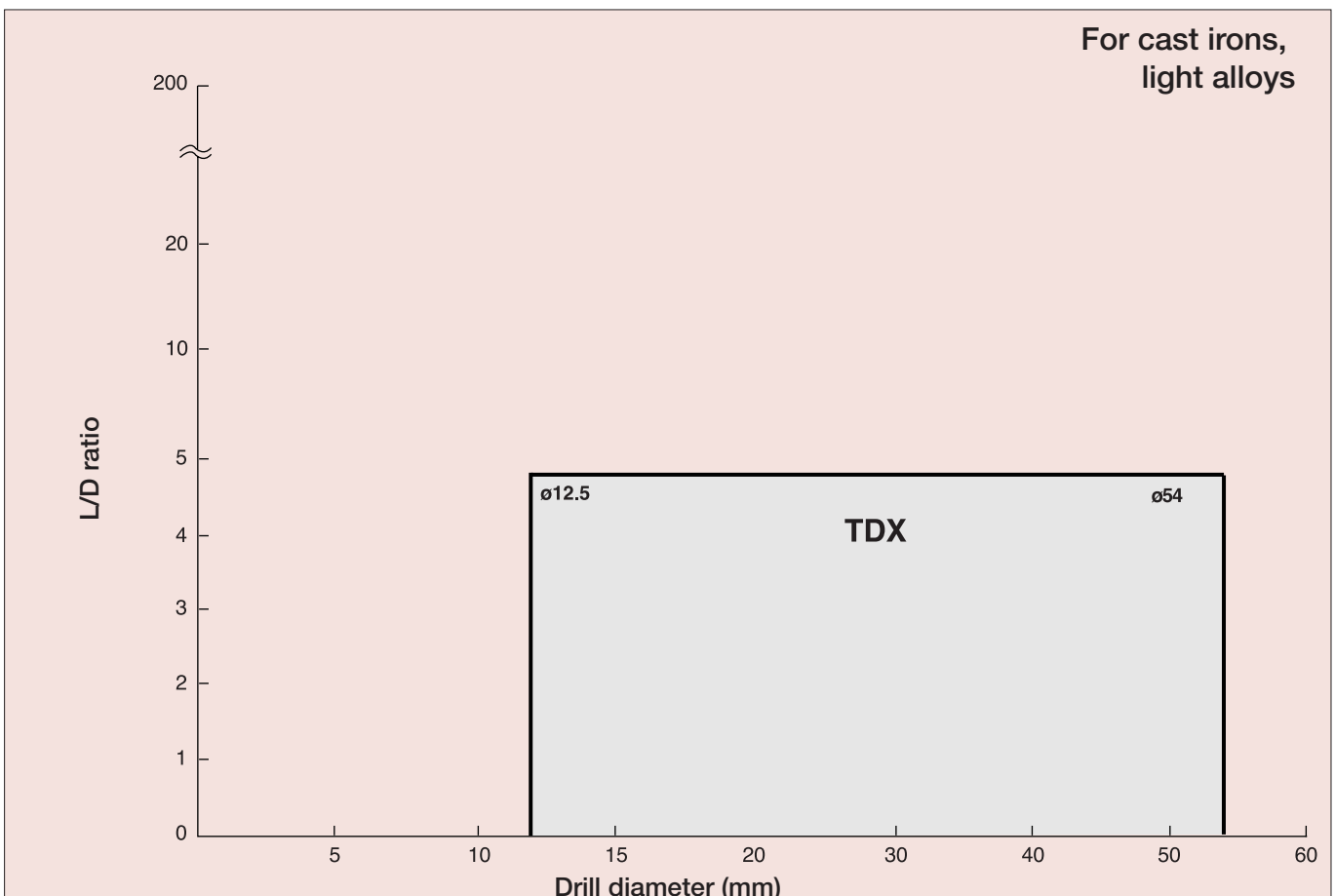
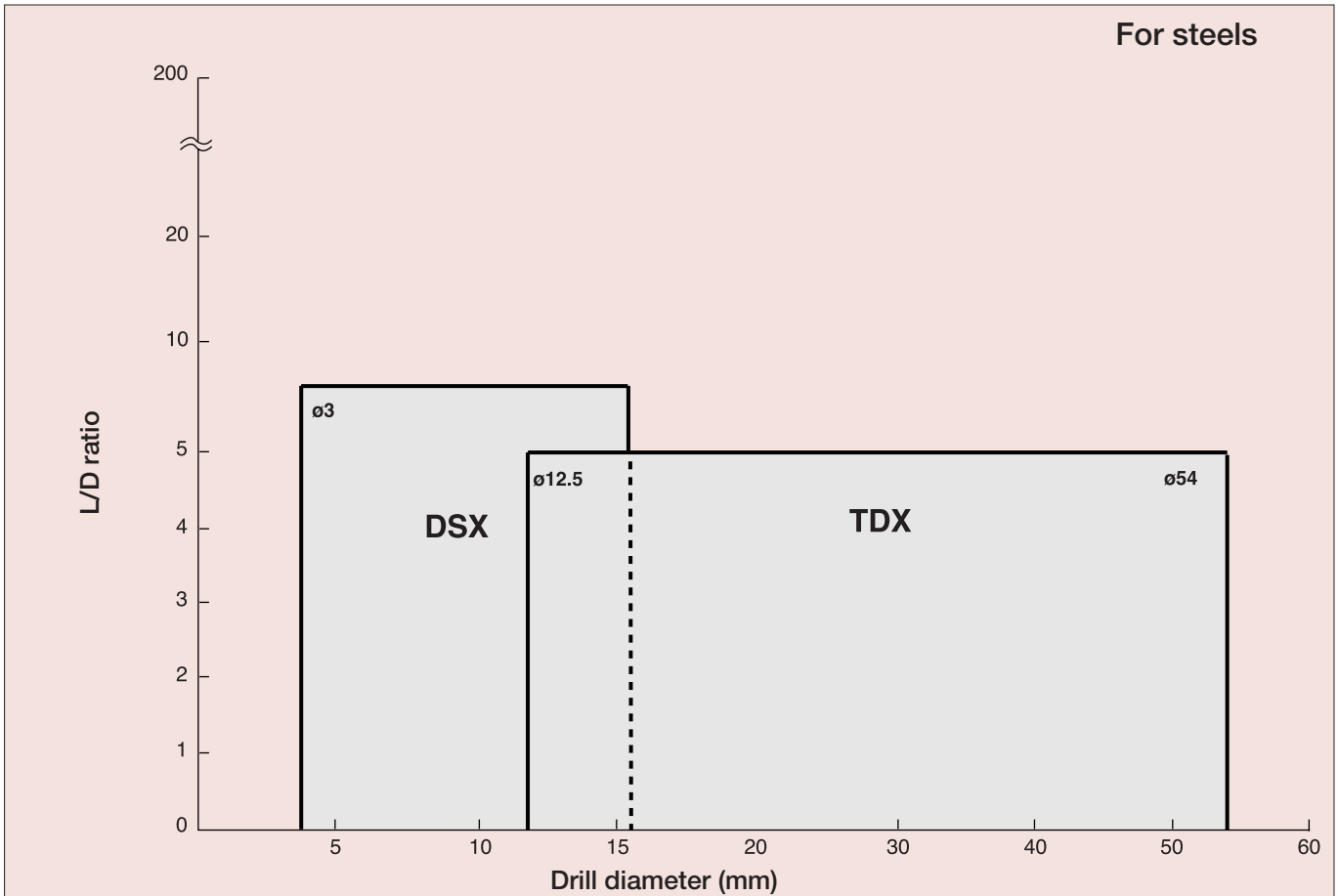
■ Thread sizes and applicable drill diameter for pre-drilling before tapping

When using Spiral-Jet drills for pre-drilling of tapping holes, refer to the following table to select proper drill diameter.

Metric coarse thread				
Nominal thread size	Inner diameter of second class thread (mm)		Applicable drill diameter for DSX types øD (mm)	Applicable drill diameter for HSS drills (mm)
	max.	min.		
M3×0.5	2.599	2.459	—	2.40
M3.5×0.6	3.010	2.850	—	2.80
M4×0.7	3.422	3.242	3.40	3.30
M4.5×0.75	3.878	3.688	3.80	3.70
M5×0.8	4.334	4.134	4.30	4.20
M6×1	5.153	4.917	5.10	5.00
M7×1	6.153	5.917	6.10	6.00
M8×1.25	6.912	6.647	6.80	6.70
M9×1.25	7.912	7.647	7.80	7.70

Metric coarse thread				
Nominal thread size	Inner diameter of second class thread (mm)		Applicable drill diameter for DSX types øD (mm)	Applicable drill diameter for HSS drills (mm)
	max.	min.		
M10×1.5	8.676	8.376	8.60	8.50
M11×1.5	9.676	9.376	9.60	9.50
M12×1.75	10.441	10.106	10.40	10.30
M14×2	12.210	11.835	12.10	12.00
M16×2	14.210	13.835	14.10	14.00
M18×2.5	15.744	15.294	15.50	15.40
M20×2.5	17.744	17.294	17.50	17.40
M22×2.5	19.744	19.294	19.50	19.40
M24×3	21.252	20.752	—	21.00

Application Ranges of Drilling Tools



DSX

Giga Jet Drill

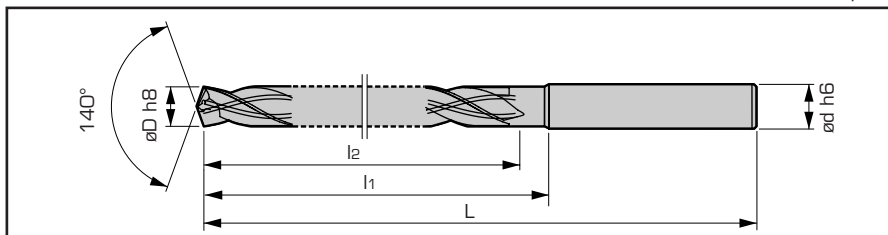
Specifications

Solid carbide, coated drills with spiral oil holes

- Standard stock in Europe
- Standard stock in Japan

Specification

L/D = 3

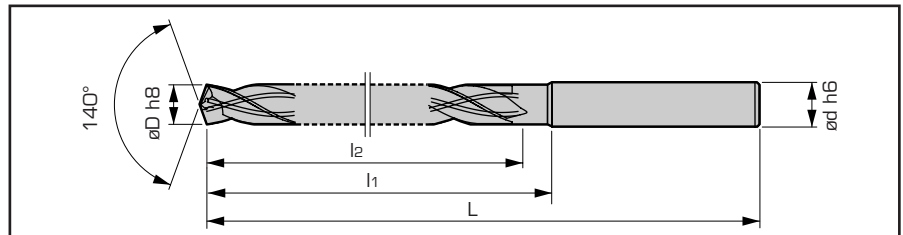


Drill øD	Cat. No.	Stock	Dimensions (mm)			
			ød	L	l ₁	l ₂
3.0	DSX0300F03	●	3.0	68	20	15
3.1	DSX0310F03	●				
3.2	DSX0320F03	●				
3.3	DSX0330F03	●	4.0	71	23	18
3.4	DSX0340F03	●				
3.5	DSX0350F03	●				
3.6	DSX0360F03	●				
3.7	DSX0370F03	●				
3.8	DSX0380F03	●	4.0	73	25	20
3.9	DSX0390F03	●				
4.0	DSX0400F03	●				
4.1	DSX0410F03	●				
4.2	DSX0420F03	●				
4.3	DSX0430F03	●	5.0	78	28	23
4.4	DSX0440F03	●				
4.5	DSX0450F03	●				
4.6	DSX0460F03	●				
4.7	DSX0470F03	●				
4.8	DSX0480F03	●	5.0	80	30	25
4.9	DSX0490F03	●				
5.0	DSX0500F03	●				
5.1	DSX0510F03	●				
5.2	DSX0520F03	●				
5.3	DSX0530F03	●	6.0	82	30	28
5.4	DSX0540F03	●				
5.5	DSX0550F03	●				
5.6	DSX0560F03	●				
5.7	DSX0570F03	●				
5.8	DSX0580F03	●	6.0	82	30	30
5.9	DSX0590F03	●				
6.0	DSX0600F03	●				
6.1	DSX0610F03	●				
6.2	DSX0620F03	●				
6.3	DSX0630F03	●	7.0	86	33	33
6.4	DSX0640F03	●				
6.5	DSX0650F03	●				
6.6	DSX0660F03	●				
6.7	DSX0670F03	●				
6.8	DSX0680F03	●	7.0	88	35	35
6.9	DSX0690F03	●				
7.0	DSX0700F03	●				
7.1	DSX0710F03	●				
7.2	DSX0720F03	●				
7.3	DSX0730F03	●	8.0	92	38	38
7.4	DSX0740F03	●				
7.5	DSX0750F03	●				
7.6	DSX0760F03	●	8.0	94	40	40

Drill øD	Cat. No.	Stock	Dimensions (mm)			
			ød	L	l ₁	l ₂
7.7	DSX0770F03	●				
7.8	DSX0780F03	●				
7.9	DSX0790F03	●	8.0	94	40	40
8.0	DSX0800F03	●				
8.1	DSX0810F03	●				
8.2	DSX0820F03	●				
8.3	DSX0830F03	●	9.0	100	45	43
8.4	DSX0840F03	●				
8.5	DSX0850F03	●				
8.6	DSX0860F03	●				
8.7	DSX0870F03	●				
8.8	DSX0880F03	●	9.0	100	45	45
8.9	DSX0890F03	●				
9.0	DSX0900F03	●				
9.1	DSX0910F03	●				
9.2	DSX0920F03	●				
9.3	DSX0930F03	●	10.0	106	50	48
9.4	DSX0940F03	●				
9.5	DSX0950F03	●				
9.6	DSX0960F03	●				
9.7	DSX0970F03	●				
9.8	DSX0980F03	●	10.0	106	50	50
9.9	DSX0990F03	●				
10.0	DSX1000F03	●				
10.1	DSX1010F03	●				
10.2	DSX1020F03	●				
10.3	DSX1030F03	●	11.0	116	55	53
10.4	DSX1040F03	●				
10.5	DSX1050F03	●				
10.6	DSX1060F03	●				
10.7	DSX1070F03	●				
10.8	DSX1080F03	●	11.0	116	55	55
10.9	DSX1090F03	●				
11.0	DSX1100F03	●				
11.1	DSX1110F03	●				
11.2	DSX1120F03	●				
11.3	DSX1130F03	●	12.0	122	60	58
11.4	DSX1140F03	●				
11.5	DSX1150F03	●				
11.6	DSX1160F03	●				
11.7	DSX1170F03	●				
11.8	DSX1180F03	●	12.0	122	60	60
11.9	DSX1190F03	●				
12.0	DSX1200F03	●				
12.1	DSX1210F03	●				
12.2	DSX1220F03	●	13.0	128	65	65
12.3	DSX1230F03	●				

Drill øD	Cat. No.	Stock	Dimensions (mm)			
			ød	L	l ₁	l ₂
12.4	DSX1240F03	●				
12.5	DSX1250F03	●				
12.6	DSX1260F03	●				
12.7	DSX1270F03	●	13.0	128	65	65
12.8	DSX1280F03	●				
12.9	DSX1290F03	●				
13.0	DSX1300F03	●				
13.1	DSX1310F03	●				
13.2	DSX1320F03	●				
13.3	DSX1330F03	●				
13.4	DSX1340F03	●				
13.5	DSX1350F03	●	14.0	134	70	70
13.6	DSX1360F03	●				
13.7	DSX1370F03	●				
13.8	DSX1380F03	●				
13.9	DSX1390F03	●				
14.0	DSX1400F03	●				
14.1	DSX1410F03	●				
14.2	DSX1420F03	●				
14.3	DSX1430F03	●				
14.4	DSX1440F03	●				
14.5	DSX1450F03	●	15.0	140	75	75
14.6	DSX1460F03	●				
14.7	DSX1470F03	●				
14.8	DSX1480F03	●				
14.9	DSX1490F03	●				
15.0	DSX1500F03	●				
15.1	DSX1510F03	●				
15.2	DSX1520F03	●				
15.3	DSX1530F03	●				
15.4	DSX1540F03	●				
15.5	DSX1550F03	●	16.0	146	80	80
15.6	DSX1560F03	●				
15.7	DSX1570F03	●				
15.8	DSX1580F03	●				
15.9	DSX1590F03	●				
16.0	DSX1600F03	●				
16.5	DSX1650F03	●	17.0	152	85	85
17.0	DSX1700F03	●				
17.5	DSX1750F03	●	18.0	158	90	90
18.0	DSX1800F03	●				
18.5	DSX1850F03	●	19.0	164	95	95
19.0	DSX1900F03	●				
19.5	DSX1950F03	●	20.0	170	100	100
20.0	DSX2000F03	●				

- Standard stock in Europe
- Standard stock in Japan



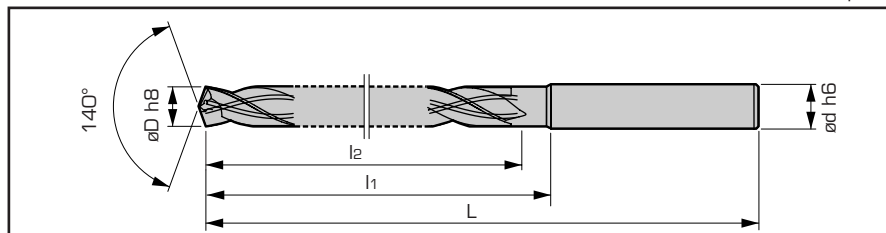
L/D = 5

Drill øD	Cat. No.	Stock	Dimensions (mm)			
			ød	L	l ₁	l ₂
3.0	DSX0300F05	●	3.0	77	29	24
3.1	DSX0310F05	●				
3.2	DSX0320F05	●				
3.3	DSX0330F05	●	4.0	81	33	28
3.4	DSX0340F05	●				
3.5	DSX0350F05	●				
3.6	DSX0360F05	●				
3.7	DSX0370F05	●				
3.8	DSX0380F05	●	4.0	85	37	32
3.9	DSX0390F05	●				
4.0	DSX0400F05	●				
4.1	DSX0410F05	●				
4.2	DSX0420F05	●				
4.3	DSX0430F05	●	5.0	91	41	36
4.4	DSX0440F05	●				
4.5	DSX0450F05	●				
4.6	DSX0460F05	●				
4.7	DSX0470F05	●				
4.8	DSX0480F05	●	5.0	94	44	40
4.9	DSX0490F05	●				
5.0	DSX0500F05	●				
5.1	DSX0510F05	●				
5.2	DSX0520F05	●				
5.3	DSX0530F05	●	6.0	96	44	44
5.4	DSX0540F05	●				
5.5	DSX0550F05	●				
5.6	DSX0560F05	●				
5.7	DSX0570F05	●				
5.8	DSX0580F05	●	6.0	100	48	48
5.9	DSX0590F05	●				
6.0	DSX0600F05	●				
6.1	DSX0610F05	●				
6.2	DSX0620F05	●				
6.3	DSX0630F05	●	7.0	105	52	52
6.4	DSX0640F05	●				
6.5	DSX0650F05	●				
6.6	DSX0660F05	●				
6.7	DSX0670F05	●				
6.8	DSX0680F05	●	7.0	109	56	56
6.9	DSX0690F05	●				
7.0	DSX0700F05	●				
7.1	DSX0710F05	●				
7.2	DSX0720F05	●				
7.3	DSX0730F05	●	8.0	114	60	60
7.4	DSX0740F05	●				
7.5	DSX0750F05	●				
7.6	DSX0760F05	●	8.0	118	64	64

Drill øD	Cat. No.	Stock	Dimensions (mm)			
			ød	L	l ₁	l ₂
7.7	DSX0770F05	●				
7.8	DSX0780F05	●				
7.9	DSX0790F05	●	8.0	118	64	64
8.0	DSX0800F05	●				
8.1	DSX0810F05	●				
8.2	DSX0820F05	●				
8.3	DSX0830F05	●	9.0	127	72	68
8.4	DSX0840F05	●				
8.5	DSX0850F05	●				
8.6	DSX0860F05	●				
8.7	DSX0870F05	●				
8.8	DSX0880F05	●	9.0	127	72	72
8.9	DSX0890F05	●				
9.0	DSX0900F05	●				
9.1	DSX0910F05	●				
9.2	DSX0920F05	●				
9.3	DSX0930F05	●	10.0	136	80	76
9.4	DSX0940F05	●				
9.5	DSX0950F05	●				
9.6	DSX0960F05	●				
9.7	DSX0970F05	●				
9.8	DSX0980F05	●	10.0	136	80	80
9.9	DSX0990F05	●				
10.0	DSX1000F05	●				
10.1	DSX1010F05	●				
10.2	DSX1020F05	●				
10.3	DSX1030F05	●	11.0	149	88	84
10.4	DSX1040F05	●				
10.5	DSX1050F05	●				
10.6	DSX1060F05	●				
10.7	DSX1070F05	●				
10.8	DSX1080F05	●	11.0	149	88	88
10.9	DSX1090F05	●				
11.0	DSX1100F05	●				
11.1	DSX1110F05	●				
11.2	DSX1120F05	●				
11.3	DSX1130F05	●	12.0	158	96	92
11.4	DSX1140F05	●				
11.5	DSX1150F05	●				
11.6	DSX1160F05	●				
11.7	DSX1170F05	●				
11.8	DSX1180F05	●	12.0	158	96	96
11.9	DSX1190F05	●				
12.0	DSX1200F05	●				
12.1	DSX1210F05	●				
12.2	DSX1220F05	●	13.0	167	104	104
12.3	DSX1230F05	●				

Drill øD	Cat. No.	Stock	Dimensions (mm)			
			ød	L	l ₁	l ₂
12.4	DSX1240F05	●				
12.5	DSX1250F05	●				
12.6	DSX1260F05	●				
12.7	DSX1270F05	●	13.0	167	104	104
12.8	DSX1280F05	●				
12.9	DSX1290F05	●				
13.0	DSX1300F05	●				
13.1	DSX1310F05	●				
13.2	DSX1320F05	●				
13.3	DSX1330F05	●				
13.4	DSX1340F05	●				
13.5	DSX1350F05	●	14.0	176	112	112
13.6	DSX1360F05	●				
13.7	DSX1370F05	●				
13.8	DSX1380F05	●				
13.9	DSX1390F05	●				
14.0	DSX1400F05	●				
14.1	DSX1410F05	●				
14.2	DSX1420F05	●				
14.3	DSX1430F05	●				
14.4	DSX1440F05	●				
14.5	DSX1450F05	●	15.0	185	120	120
14.6	DSX1460F05	●				
14.7	DSX1470F05	●				
14.8	DSX1480F05	●				
14.9	DSX1490F05	●				
15.0	DSX1500F05	●				
15.1	DSX1510F05	●				
15.2	DSX1520F05	●				
15.3	DSX1530F05	●				
15.4	DSX1540F05	●				
15.5	DSX1550F05	●	16.0	194	128	128
15.6	DSX1560F05	●				
15.7	DSX1570F05	●				
15.8	DSX1580F05	●				
15.9	DSX1590F05	●				
16.0	DSX1600F05	●				
16.5	DSX1650F05	●				
17.0	DSX1700F05	●	17.0	203	136	136
17.5	DSX1750F05	●				
18.0	DSX1800F05	●	18.0	212	144	144
18.5	DSX1850F05	●				
19.0	DSX1900F05	●	19.0	221	152	152
19.5	DSX1950F05	●				
20.0	DSX2000F05	●	20.0	230	160	160

- Standard stock in Europe
- Standard stock in Japan



$L/D = 8$

Drill øD	Cat. No.	Stock	Dimensions (mm)			
			ød	L	l ₁	l ₂
3.0	DSX0300F08	○	3.0	86	38	33
3.5	DSX0350F08	○	4.0	92	44	39
4.0	DSX0400F08	○	4.0	97	49	44
4.5	DSX0450F08	○	5.0	105	55	50
5.0	DSX0500F08	○	5.0	110	60	55
5.5	DSX0550F08	○	6.0	113	61	61
6.0	DSX0600F08	○	6.0	118	66	66
6.5	DSX0650F08	○	7.0	125	72	72
7.0	DSX0700F08	○	7.0	130	77	77

Drill øD	Cat. No.	Stock	Dimensions (mm)			
			ød	L	l ₁	l ₂
7.5	DSX0750F08	○	8.0	137	83	83
8.0	DSX0800F08	○	8.0	142	88	88
8.5	DSX0850F08	○	9.0	154	99	94
9.0	DSX0900F08	○	9.0	154	99	99
9.5	DSX0950F08	○	10.0	166	110	105
10.0	DSX1000F08	○	10.0	166	110	110
10.5	DSX1050F08	○	11.0	182	121	116
11.0	DSX1100F08	○	11.0	182	121	121
11.5	DSX1150F08	○	12.0	194	132	127

Drill øD	Cat. No.	Stock	Dimensions (mm)			
			ød	L	l ₁	l ₂
12.0	DSX1200F08	○	12.0	194	132	132
12.5	DSX1250F08	○	13.0	206	143	143
13.0	DSX1300F08	○	13.0	206	143	143
13.5	DSX1350F08	○	14.0	218	154	154
14.0	DSX1400F08	○	14.0	218	154	154
14.5	DSX1450F08	○	15.0	230	165	165
15.0	DSX1500F08	○	15.0	230	165	165
15.5	DSX1550F08	○	16.0	242	176	176
16.0	DSX1600F08	○	16.0	242	176	176

Cutting conditions

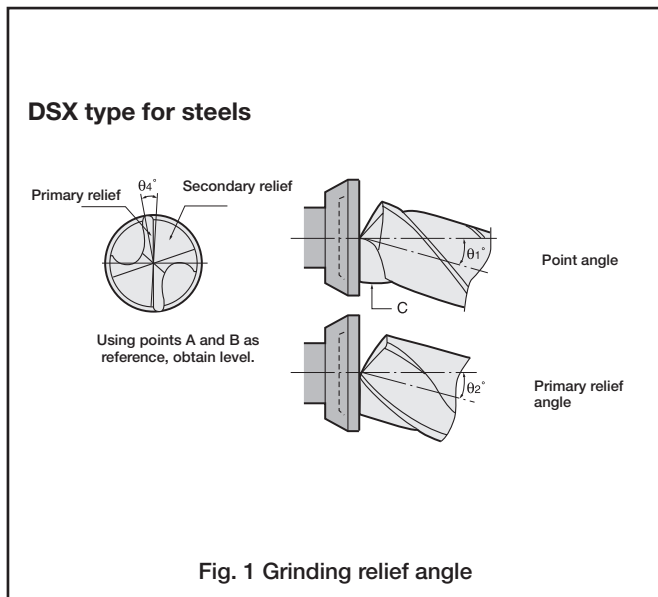
Work material	Cutting speed Vc (m/min)				Feed f (mm/rev)			
	ø3.0 - ø6.0	ø6.0 - ø10.0	ø10.0 - ø16.0	ø16.0 - ø20.0	ø3.0 - ø6.0	ø6.0 - ø10.0	ø10.0 - ø16.0	ø16.0 - ø20.0
Mild steel, Low carbon steel (< 200HB) USt. 42-2, Ck25	70-120-140	80-130-160	90-160-190	90-160-190	0.15-0.20-0.25	0.20-0.30-0.35	0.25-0.30-0.35	0.30-0.40-0.45
Carbon steel, Alloy steel (< 300HB) Ck45, 42CrMo4	50-100-130	70-120-160	80-140-170	80-140-170	0.15-0.20-0.25	0.20-0.30-0.35	0.25-0.30-0.35	0.25-0.35-0.40
Stainless steel (ferritic-martensitic) X5CrNi18-10	30-60-70	50-80-100	50-90-120	50-100-120	0.10-0.15-0.20	0.10-0.20-0.25	0.15-0.25-0.35	0.15-0.25-0.35
Grey cast iron GG25	80-110-140	100-140-160	100-160-180	100-160-180	0.15-0.25-0.35	0.20-0.35-0.40	0.25-0.40-0.45	0.25-0.45-0.50
Ductile cast iron GGG70	70-100-140	80-120-150	80-140-170	80-140-170	0.15-0.25-0.35	0.20-0.30-0.40	0.25-0.35-0.45	0.25-0.35-0.45
Aluminium alloys	80-130-160	100-160-180	100-170-190	100-180-200	0.15-0.25-0.35	0.20-0.30-0.45	0.25-0.40-0.60	0.35-0.60-0.90
Titanium alloys TiAl6V3	25-40-60	30-60-80	30-60-80	30-70-90	0.02-0.05-0.08	0.05-0.10-0.15	0.10-0.15-0.20	0.10-0.15-0.25
Difficult-to-cut materials Inconel	10-20-30	10-30-40	10-30-40	20-35-50	0.02-0.04-0.10	0.05-0.10-0.15	0.10-0.15-0.20	0.10-0.15-0.25
Hardened steel (< 45HRC)	20-30-50	30-40-60	30-40-60	30-40-60	0.08-0.09-0.10	0.10-0.12-0.15	0.12-0.14-0.20	0.12-0.16-0.20

Regrinding Procedures

■ Regrinding method (applied to DSX)

Before regrinding: Check the cutting edge for damage and wear. If any large fracture is found, remove it with a silicon carbide wheel.

(1) Grinding the flank



- Use a 280 to 400 grit diamond cup-type wheel of 100 to 200 mm in diameter.

(1) Grind the relief surface so that primary relief angle of θ_2° can be formed as shown in Fig. 1. After grinding the other side likewise, do sparkout grinding so that the difference of the lip heights will be kept within 0.02 mm.

(2) In the case of DSX type for steels: Turn the drill by θ_4° and secure it there. Then grind secondary relief surface so that secondary relief angle of θ_3° can be formed while taking care to bring the ridge line formed between the primary and secondary relief surfaces to the drill center (values of θ_1° to θ_4° are shown in Table 1).

Table 1

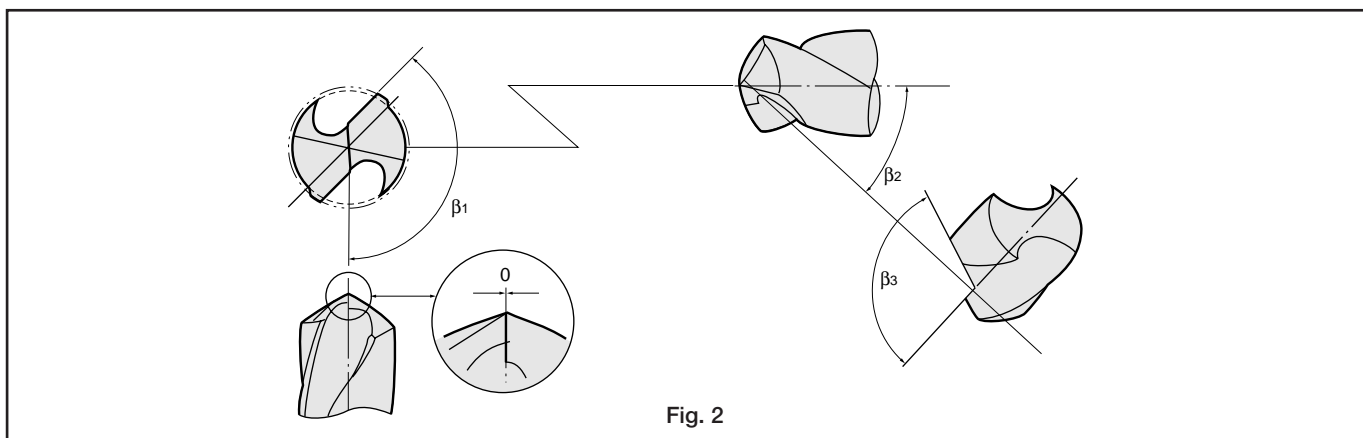
Drill type	θ_1 (Point angle)	θ_2 (Primary relief angle)	θ_3 (Secondary relief angle)	θ_4 (Rotating angle)
DSX	-20°	$-7^\circ \sim -10^\circ$	$-24^\circ \sim -26^\circ$	5°

(2) Thinning

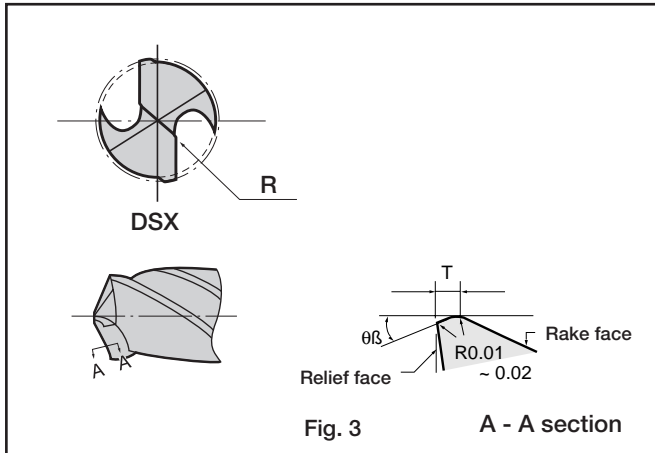
- Use a 280 to 400 grit diamond straight-type wheel of 100 to 200 mm in diameter.
- Conduct thinning in the same manner as cross thinning (X-type).
- For DSX type drills, take care to leave the part of secondary relief by 0.05 to 0.1 mm as shown in Fig. 2.
- Values of β_1 to β_3 written in the Figures are given in the Table 2.

Table 2

Drill type	β_1	β_2	β_3	R
DSX (Fig. 2)	$140^\circ \sim 145^\circ$	$38^\circ \sim 42^\circ$	$108^\circ \sim 112^\circ$	-



(3) Honing



- The honing angle θ and width T should be varied depending on the drill type, diameter and work material. Recommended honing specifications are given in the Table below.
- Honing procedures (refer to Fig. 3)
- Round the R portion shown in Fig. 3 in large.
- Then roughly hone the cutting edge lines by using an electro-deposited diamond file of around 170 grit.
- Carry out finish honing by using a diamond hand stick of 400 to 600 grit.
- For DSX type drills, there is no need to hone the thinned portions.
- The honing width should be changed depending on the drill diameter. For smaller side of diameter, the width should be in smaller side of values given in the Table.

Honing specifications for DSX

Round the R portion in large

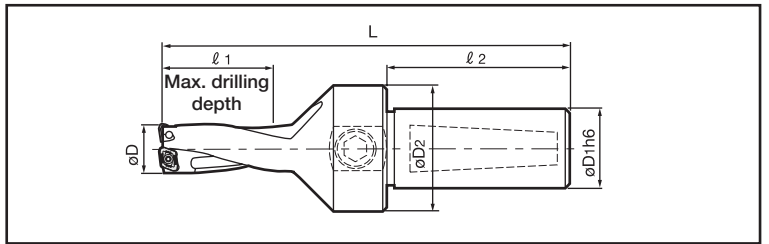
(mm)		~ $\phi 6$	$\phi 6 \sim \phi 12$	$\phi 12 \sim \phi 20$
Mild steels	θ°	-25°	-25°	-25°
	T	0.08 ~ 0.12	0.10 ~ 0.15	0.15 ~ 0.20
Hard steels	θ°	-25°	-25°	-25°
	T	0.05 ~ 0.10	0.08 ~ 0.12	0.10 ~ 0.15

After regrinding, check the following before use:

- The difference of the lip heights is kept within 0.02 mm.
- There is no damaged portion on the cutting edges left.
- Cutting edges are properly honed.
- No grinding burrs left.

For General Drilling of Steels, Cast Irons and Aluminium Alloys

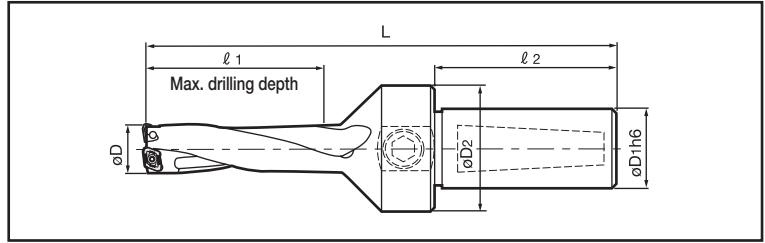
TDX	TAC drills	Specifications
		Indexable insert drills with oil hole



■ For L/D = 2 (Whistle notch type shank)

Drill øD (mm)	Cat. No.	Stock	Dimensions (mm)					Applicable insert	Max. Offset + (mm)	Clamp screw	Torx wrench	Hex. wrench	Plug screw								
			øD1	øD2	l1	l2	L														
12.5	TDX125L025W20-2	●	20	32	25	40	89.5	XPMT040104R-**	0.8	CSTB-2	T-6D										
13.0	TDX130L026W20-2	●			26		91.0		0.7												
13.5	TDX135L027W20-2	●			27		92.5		0.5												
14.0	TDX140L028W20-2	●			28		94.0		0.4												
14.5	TDX145L029W20-2	●			29		95.5		0.3												
15.0	TDX150L030W20-2	●			30		97.0		0.9												
15.5	TDX155L031W20-2	●			31		98.5		0.8												
16.0	TDX160L032W20-2	●			32		100.0		0.6												
16.5	TDX165L033W20-2	●			33		101.5		0.5												
17.0	TDX170L034W20-2	●			34		103.0		0.4												
17.5	TDX175L035W25-2	●	25	37	35	50	117.5	XPMT06X308R-**	1.2	CSTB-2.2R	T-7D	P-5	1/8-28								
18.0	TDX180L036W25-2	●			36		119.0		1.1												
18.5	TDX185L037W25-2	●			37		120.5		0.9												
19.0	TDX190L038W25-2	●			38		122.0		0.8												
19.5	TDX195L039W25-2	●			39		123.5		0.7												
20.0	TDX200L040W25-2	●			40		125.0		0.5												
20.5	TDX205L041W25-2	●			41		126.5		0.4												
21.0	TDX210L042W25-2	●			42		128.0		0.3												
21.5	TDX215L043W25-2	●			43		129.5		0.2												
22.0	TDX220L044W25-2	●			44		131.0		1.2												
22.5	TDX225L045W25-2	●	45	132.5	1.1																
23.0	TDX230L046W25-2	●	46	134.0	0.9																
23.5	TDX235L047W25-2	●	47	135.5	0.8																
24.0	TDX240L048W25-2	●	48	137.0	0.7																
24.5	TDX245L049W25-2	●	49	138.5	0.5																
25.0	TDX250L050W25-2	●	50	140.0	0.4																
25.5	TDX255L051W25-2	●	51	141.5	0.3																
26.0	TDX260L052W25-2	●	52	143.0	0.2																
27.0	TDX270L054W32-2	●	32	40	54	55	151.0	XPMT08T308R-**	1.5	CSTB-3	T-9D										
28.0	TDX280L056W32-2	●			56		154.0		1.2												
29.0	TDX290L058W32-2	●			58		157.0		1.0												
30.0	TDX300L060W32-2	●			60		160.0		0.7												
31.0	TDX310L062W32-2	●			62		163.0		0.4												
32.0	TDX320L064W32-2	●			64		166.0		0.2												
33.0	TDX330L066W40-2	●			40		50		66						182.0	XPMT110412R-**	2.3	CSTB-4	T-15D		
34.0	TDX340L068W40-2	●							68						185.0		2.1				
35.0	TDX350L070W40-2	●							70						188.0		1.8				
36.0	TDX360L072W40-2	●							72						191.0		1.5				
37.0	TDX370L074W40-2	●	74	194.0		1.3															
38.0	TDX380L076W40-2	●	76	197.0		1.0															
39.0	TDX390L078W40-2	●	78	200.0		0.7															
40.0	TDX400L080W40-2	●	80	203.0		0.5															
41.0	TDX410L082W40-2	●	82	206.0		0.2															
42.0	TDX420L084W40-2	●	84	209.0		3.1															
43.0	TDX430L086W40-2	●	86	212.0	2.9																
44.0	TDX440L088W40-2	●	88	215.0	2.6																
45.0	TDX450L090W40-2	●	90	218.0	2.3																
46.0	TDX460L092W40-2	●	92	221.0	2.1																
47.0	TDX470L094W40-2	●	94	224.0	1.8																
48.0	TDX480L096W40-2	●	96	227.0	1.5																
49.0	TDX490L098W40-2	●	98	230.0	1.3																
50.0	TDX500L100W40-2	●	100	233.0	1.0																
51.0	TDX510L102W40-2	●	102	236.0	0.7																
52.0	TDX520L104W40-2	●	104	239.0	0.5																
53.0	TDX530L106W40-2	○	106	242.0	—																
54.0	TDX540L108W40-2	○	108	245.0	—																
			55				XPMT150512R-**			CSTB-5	T-20D										

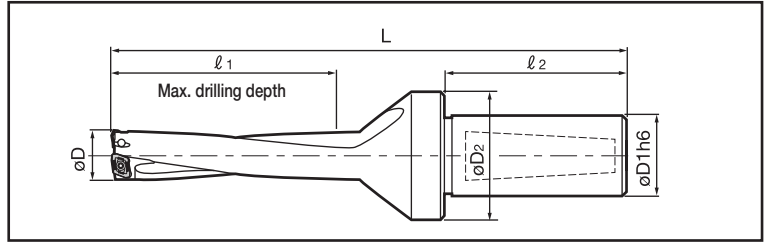
Note: L/D = Hole depth / Drill diameter



■ For L/D = 3 (Whistle notch type shank)

Drill øD (mm)	Cat. No.	Stock	Dimensions (mm)					Applicable insert	Max. Offset + (mm)	Clamp screw	Torx wrench	Hex. wrench	Plug screw									
			øD1	øD2	l ₁	l ₂	L															
12.5	TDX125L038W20	●	20	32	37.5	40	102	XPMT040104R-**	0.8	CSTB-2	T-6D											
13.0	TDX130L039W20	●			39.0		104		0.7													
13.5	TDX135L041W20	●			40.5		106		0.5													
14.0	TDX140L042W20	●			42.0		108		0.4													
14.5	TDX145L044W20	●			43.5		110		0.3													
15.0	TDX150L045W20	●			45.0		112		0.9													
15.5	TDX155L047W20	●			46.5		114		0.8													
16.0	TDX160L048W20	●			48.0		116		0.6													
16.5	TDX165L050W20	●			49.5		118		0.5													
17.0	TDX170L051W20	●			51.0		120		0.4													
17.5	TDX175L053W25	●	25	37	52.5	50	135	XPMT06X308R-**	1.2	CSTB-2L040	T-7D	P-5	1/8-28									
18.0	TDX180L054W25	●			54.0		137		1.1													
18.5	TDX185L056W25	●			55.5		139		0.9													
19.0	TDX190L057W25	●			57.0		141		0.8													
19.5	TDX195L059W25	●			58.5		143		0.7													
20.0	TDX200L060W25	●			60.0		145		0.5													
20.5	TDX205L062W25	●			61.5		147		0.4													
21.0	TDX210L063W25	●			63.0		149		0.3													
21.5	TDX215L065W25	●			64.5		151		0.2													
22.0	TDX220L066W25	●			66.0		153		1.2													
22.5	TDX225L068W25	●	67.5	155	1.1																	
23.0	TDX230L069W25	●	69.0	157	0.9																	
23.5	TDX235L071W25	●	70.5	159	0.8																	
24.0	TDX240L072W25	●	72.0	161	0.7																	
24.5	TDX245L074W25	●	73.5	163	0.5																	
25.0	TDX250L075W25	●	75.0	165	0.4																	
25.5	TDX255L077W25	●	76.5	167	0.3																	
26.0	TDX260L078W25	●	78.0	169	0.2																	
27.0	TDX270L081W32	●	32	40	81.0	55	178	XPMT08T308R-**	1.5	CSTB-3	T-9D											
28.0	TDX280L084W32	●			84.0		182		1.2													
29.0	TDX290L087W32	●			87.0		186		1.0													
30.0	TDX300L090W32	●			90.0		190		0.7													
31.0	TDX310L093W32	●			93.0		194		0.4													
32.0	TDX320L096W32	●			96.0		198		0.2													
33.0	TDX330L099W40	●			50		50		99.0					215	XPMT110412R-**	2.3	CSTB-4	T-15D				
34.0	TDX340L102W40	●							102.0												219	2.1
35.0	TDX350L105W40	●							105.0												223	1.8
36.0	TDX360L108W40	●							108.0												227	1.5
37.0	TDX370L111W40	●	111.0	231		1.3																
38.0	TDX380L114W40	●	114.0	235		1.0																
39.0	TDX390L117W40	●	117.0	239		0.7																
40.0	TDX400L120W40	●	120.0	243		0.5																
41.0	TDX410L123W40	●	123.0	247		0.2																
42.0	TDX420L126W40	●	40	65		126.0		251	XPMT150512R-**	3.1	CSTB-5	T-20D	P-6								PT1/4GN	
43.0	TDX430L129W40	●			129.0	255	2.9															
44.0	TDX440L132W40	●			132.0	259	2.6															
45.0	TDX450L135W40	●			135.0	263	2.3															
46.0	TDX460L138W40	●			138.0	267	2.1															
47.0	TDX470L141W40	●			141.0	271	1.8															
48.0	TDX480L144W40	●			144.0	275	1.5															
49.0	TDX490L147W40	●			147.0	279	1.3															
50.0	TDX500L150W40	●			150.0	283	1.0															
51.0	TDX510L153W40	●			153.0	287	0.7															
52.0	TDX520L156W40	●	156.0	291	0.5																	
53.0	TDX530L159W40	○	159.0	295	—																	
54.0	TDX540L162W40	○	162.0	299	—																	

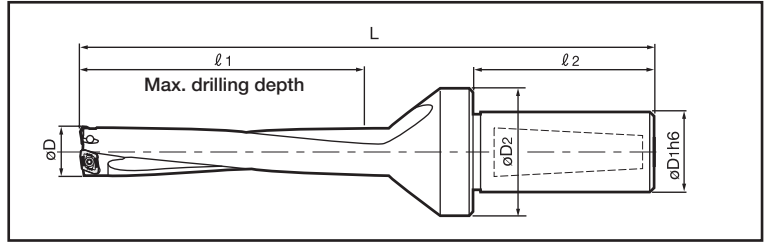
Note: L/D = Hole depth / Drill diameter



■ For L/D = 4 (Whistle notch type shank)

Drill øD (mm)	Cat. No.	Stock	Dimensions (mm)					Applicable insert	Max. Offset + (mm)	Clamp screw	Torx wrench	Hex. wrench	Plug screw						
			øD1	øD2	l ₁	l ₂	L												
12.5	TDX125L050W20-4	●	20	32	50	40	113	XPMT040104R-**	0.8	CSTB-2	T-6D								
13.0	TDX130L052W20-4	●			52		115												
13.5	TDX135L054W20-4	●			54		118												
14.0	TDX140L056W20-4	●			56		120												
14.5	TDX145L058W20-4	●			58		122												
15.0	TDX150L060W20-4	●			60		125												
15.5	TDX155L062W20-4	●			62		127												
16.0	TDX160L064W20-4	●			64		129												
16.5	TDX165L066W20-4	●			66		132												
17.0	TDX170L068W20-4	●			68		134												
17.5	TDX175L070W25-4	●	25	37	70	50	148	XPMT06X308R-**	1.2	CSTB-2.2R	T-7D								
18.0	TDX180L072W25-4	●			72		150												
18.5	TDX185L074W25-4	●			74		152												
19.0	TDX190L076W25-4	●			76		154												
19.5	TDX195L078W25-4	●			78		157												
20.0	TDX200L080W25-4	●			80		160												
20.5	TDX205L082W25-4	●			82		162												
21.0	TDX210L084W25-4	●			84		164												
21.5	TDX215L086W25-4	●			86		166												
22.0	TDX220L088W25-4	●			88		169												
22.5	TDX225L090W25-4	●	90	171															
23.0	TDX230L092W25-4	●	92	173															
23.5	TDX235L094W25-4	●	94	175															
24.0	TDX240L096W25-4	●	96	178															
24.5	TDX245L098W25-4	●	98	181															
25.0	TDX250L100W25-4	●	100	183															
25.5	TDX255L102W25-4	●	102	185															
26.0	TDX260L104W25-4	●	104	187															
27.0	TDX270L108W32-4	●	32	40	108	55	198	XPMT08T308R-**	1.5	CSTB-3	T-9D								
28.0	TDX280L112W32-4	●			112		203												
29.0	TDX290L116W32-4	●			116		208												
30.0	TDX300L120W32-4	●			120		213												
31.0	TDX310L124W32-4	●			124		217												
32.0	TDX320L128W32-4	●			128		222												
33.0	TDX330L132W40-4	●			50		238		132					XPMT110412R-**	2.3	CSTB-4	T-15D		
34.0	TDX340L136W40-4	●							136						243				
35.0	TDX350L140W40-4	●							140						248				
36.0	TDX360L144W40-4	●							144						252				
37.0	TDX370L148W40-4	●	148	258															
38.0	TDX380L152W40-4	●	152	262															
39.0	TDX390L156W40-4	●	156	267															
40.0	TDX400L160W40-4	●	160	272															
41.0	TDX410L164W40-4	●	164	277															
42.0	TDX420L168W40-4	●	168	282															
43.0	TDX430L172W40-4	●	40	65	172	XPMT150512R-**	3.1	CSTB-5	T-20D										
44.0	TDX440L176W40-4	●			176		287												
45.0	TDX450L180W40-4	●			180		292												
46.0	TDX460L184W40-4	●			184		296												
47.0	TDX470L188W40-4	●			188		302												
48.0	TDX480L192W40-4	●			192		306												
49.0	TDX490L196W40-4	●			196		311												
50.0	TDX500L200W40-4	●			200		316												
51.0	TDX510L204W40-4	●			204		320												
52.0	TDX520L208W40-4	●			208		325												
53.0	TDX530L212W40-4	○	212	330															
54.0	TDX540L216W40-4	○	216	335															

Note: L/D = Hole depth / Drill diameter



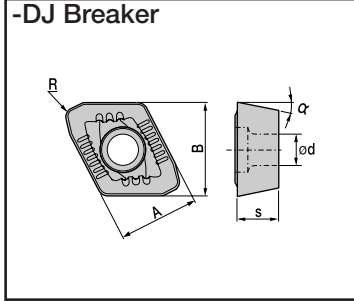
■ For L/D = 5 (Whistle notch type shank)

Drill øD (mm)	Cat. No.	Stock	Dimensions (mm)					Applicable insert	Max. Offset + (mm)	Clamp screw	Torx wrench	Hex. wrench	Plug screw							
			øD ₁	øD ₂	l ₁	l ₂	L													
12.5	TDX125L063W20-5	○	20	32	62.5	40	125	XPMT040104R-**	0.8	CSTB-2	T-6D									
13.0	TDX130L065W20-5	○			65.0		128													
13.5	TDX135L068W20-5	○			67.5		131													
14.0	TDX140L070W20-5	○			70.0		134													
14.5	TDX145L073W20-5	○			72.5		137													
15.0	TDX150L075W20-5	○			75.0		140													
15.5	TDX155L078W20-5	○			77.5		143													
16.0	TDX160L080W20-5	○			80.0		145													
16.5	TDX165L083W20-5	○			82.5		149													
17.0	TDX170L085W20-5	○			85.0		151													
17.5	TDX175L088W25-5	○	25	37	87.5	50	165	XPMT06X308R-**	1.2	CSTB-2.2R	T-7D									
18.0	TDX180L090W25-5	○			90.0		168													
18.5	TDX185L093W25-5	○			92.5		171													
19.0	TDX190L095W25-5	○			95.0		173													
19.5	TDX195L098W25-5	○			97.5		176													
20.0	TDX200L100W25-5	○			100.0		180													
20.5	TDX205L103W25-5	○			102.5		182													
21.0	TDX210L105W25-5	○			105.0		185													
21.5	TDX215L108W25-5	○			107.5		188													
22.0	TDX220L110W25-5	○			110.0		191													
22.5	TDX225L113W25-5	○	112.5	193																
23.0	TDX230L115W25-5	○	115.0	196																
23.5	TDX235L118W25-5	○	117.5	199																
24.0	TDX240L120W25-5	○	120.0	202																
24.5	TDX245L123W25-5	○	122.5	205																
25.0	TDX250L125W25-5	○	125.0	208																
25.5	TDX255L128W25-5	○	127.5	211																
26.0	TDX260L130W25-5	○	130.0	213																
27.0	TDX270L135W32-5	○	32	40	135.0	55	225	XPMT08T308R-**	1.5	CSTB-3	T-9D									
28.0	TDX280L140W32-5	○			140.0		231													
29.0	TDX290L145W32-5	○			145.0		237													
30.0	TDX300L150W32-5	○			150.0		243													
31.0	TDX310L155W32-5	○			155.0		248													
32.0	TDX320L160W32-5	○			160.0		254													
33.0	TDX330L165W40-5	○			50		50		165.0					271	XPMT110412R-**	2.3	CSTB-4	T-15D		
34.0	TDX340L170W40-5	○							170.0							277				
35.0	TDX350L175W40-5	○							175.0							283				
36.0	TDX360L180W40-5	○							180.0							288				
37.0	TDX370L185W40-5	○	185.0	295																
38.0	TDX380L190W40-5	○	190.0	300																
39.0	TDX390L195W40-5	○	195.0	306																
40.0	TDX400L200W40-5	○	200.0	312																
41.0	TDX410L205W40-5	○	205.0	318																
42.0	TDX420L210W40-5	○	210.0	324																
43.0	TDX430L215W40-5	○	40	55	215.0	65	XPMT150512R-**	3.1	CSTB-5	T-20D										
44.0	TDX440L220W40-5	○			220.0			336												
45.0	TDX450L225W40-5	○			225.0			341												
46.0	TDX460L230W40-5	○			230.0			348												
47.0	TDX470L235W40-5	○			235.0			353												
48.0	TDX480L240W40-5	○			240.0			359												
49.0	TDX490L245W40-5	○			245.0			365												
50.0	TDX500L250W40-5	○			250.0			370												
51.0	TDX510L255W40-5	○			255.0			376												
52.0	TDX520L260W40-5	○			260.0			382												
53.0	TDX530L265W40-5	○	265.0	388																
54.0	TDX540L270W40-5	○	270.0	393																

Note: L/D = Hole depth / Drill diameter

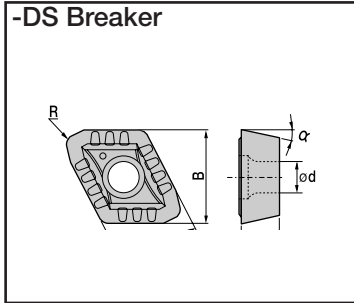
Inserts

-DJ Breaker



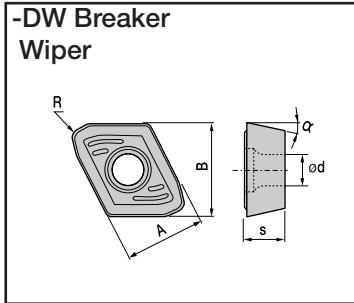
Cat No.	Grades			Dimensions (mm)						Applicable drill diameter
	AH740	T1015	T313W	A	B	s	od	R	α	
XPMT040104R-DJ	●	●	●	4.3	4.5	1.59	2.3	0.4	11°	ø12.5 ~ ø14.5
XPMT050204R-DJ	●	●	●	5.2	5.4	2.38				ø15.0 ~ ø17.0
XPMT06X308R-DJ	●	●	●	6.0	7.0	3.00	2.5	ø17.5 ~ ø21.5		
XPMT07H308R-DJ	●	●	●	7.0	8.2	3.60	2.8	ø22.0 ~ ø26.0		
XPMT08T308R-DJ	●	●	●	8.5	9.9	3.97	3.4	ø26.5 ~ ø32.0		
XPMT110412R-DJ	●	●	●	11.2	12.5	4.76	4.4	ø33.0 ~ ø41.0		
XPMT150512R-DJ	●	●	●	15.0	16.1	5.56	5.5	ø42.0 ~ ø54.0		

-DS Breaker



Cat No.	Grades			Dimensions (mm)						Applicable drill diameter
	AH120	A	B	s	od	R	α			
XPMT040104R-DS	●	4.3	4.5	1.59	2.3	0.4	11°	ø12.5 ~ ø14.5		
XPMT050204R-DS	●	5.2	5.4	2.38				ø15.0 ~ ø17.0		
XPMT06X308R-DS	●	6.0	7.0	3.0	2.5	ø17.5 ~ ø21.5				
XPMT07H308R-DS	●	7.0	8.2	3.6	2.8	ø22.0 ~ ø26.0				
XPMT08T308R-DS	●	8.5	9.9	3.97	3.4	ø26.5 ~ ø32.0				
XPMT110412R-DS	●	11.2	12.5	4.76	4.4	ø33.0 ~ ø41.0				
XPMT150512R-DS	●	15.0	16.1	5.56	5.5	ø42.0 ~ ø54.0				

-DW Breaker Wiper



Cat No.	Grades		Dimensions (mm)						Applicable drill diameter
	AH120	GH730	A	B	s	od	R	α	
XPMT040104R-DW	●	●	4.3	4.5	1.59	2.3	0.4	11°	ø12.5 ~ ø14.5
XPMT050204R-DW	●	●	5.2	5.4	2.38				ø15.0 ~ ø17.0
XPMT06X308R-DW	●	●	6.0	7.0	3.0	2.5	ø17.5 ~ ø21.5		
XPMT07H308R-DW	●	●	7.0	8.2	3.6	2.8	ø22.0 ~ ø26.0		
XPMT08T308R-DW	●	●	8.5	9.9	3.97	3.4	ø26.5 ~ ø32.0		
XPMT110412R-DW	●	●	11.2	12.5	4.76	4.4	ø33.0 ~ ø41.0		
XPMT150512R-DW	●	●	15.0	16.1	5.56	5.5	ø42.0 ~ ø54.0		

Standard cutting conditions

Work materials	Grade / Breaker				Cutting speed Vc (m/min)	L/D	Feed f (mm/rev)				
	AH120	AH740	T1015	GH730			ø12.5 ~ ø14.5	ø15.0 ~ ø17.0	ø17.5 ~ ø26.0	ø27.0 ~ ø32.0	ø33.0 ~ ø54.0
Carbon steels (C > 0.3) St37, C25E	-DS -DW				160 - 320	2D - 5D	0.02 - 0.06	0.02 - 0.06	0.04 - 0.10	0.04 - 0.10	0.04 - 0.10
Alloy steels (C > 0.3) C45, C55		-DJ		-DW	80 - 250	2D, 3D 4D, 5D	0.04 - 0.10 0.04 - 0.08	0.04 - 0.12 0.04 - 0.08	0.06 - 0.13 0.06 - 0.10	0.06 - 0.15 0.06 - 0.12	0.08 - 0.18 0.08 - 0.14
Mild steels 15CrMo5	-DS -DW				160 - 250	2D - 5D	0.04 - 0.08	0.04 - 0.08	0.06 - 0.12	0.06 - 0.12	0.06 - 0.14
Alloy Steels 42CrMo4		-DJ		-DW	80 - 200	2D, 3D 4D, 5D	0.04 - 0.10 0.04 - 0.08	0.04 - 0.12 0.04 - 0.08	0.06 - 0.13 0.06 - 0.10	0.06 - 0.15 0.06 - 0.12	0.08 - 0.18 0.08 - 0.14
Stainless steels (Austenitic type) X5CrNi18-10	-DS -DW				100 - 220	2D - 5D	0.02 - 0.08	0.02 - 0.08	0.04 - 0.10	0.04 - 0.12	0.04 - 0.12
Stainless steels (Ferric and Martensitic type) X3CrMnNiN18 8 7	-DS -DW				100 - 200	2D - 5D	0.02 - 0.08	0.02 - 0.08	0.04 - 0.10	0.04 - 0.12	0.04 - 0.12
Stainless steels Precipitation hardening type) X2CrNiMoN22 5 3	-DS -DW				80 - 120	2D - 5D	0.04 - 0.08	0.04 - 0.08	0.04 - 0.08	0.04 - 0.10	0.06 - 0.10
Grey cast iron GG25			-DJ	-DW	80 - 250	2D, 3D 4D, 5D	0.06 - 0.12 0.06 - 0.10	0.06 - 0.12 0.06 - 0.10	0.06 - 0.15 0.06 - 0.12	0.06 - 0.18 0.06 - 0.14	0.08 - 0.20 0.08 - 0.16
Ductile cast iron GGG70			-DJ	-DW	80 - 200	2D, 3D 4D, 5D	0.04 - 0.12 0.04 - 0.10	0.04 - 0.12 0.04 - 0.10	0.06 - 0.15 0.06 - 0.12	0.06 - 0.18 0.06 - 0.14	0.08 - 0.20 0.08 - 0.16
Aluminium alloys				-DW	200 - 400	2D, 3D 4D, 5D	0.10 - 0.12 0.08 - 0.12	0.10 - 0.15 0.08 - 0.12	0.15 - 0.20 0.12 - 0.16	0.15 - 0.20 0.12 - 0.16	0.15 - 0.25 0.12 - 0.20

Notes:

- When using the -DW chipbreaker to achieve better surface qualities, cutting parameter as in above table should be used.

- When using the -DW chipbreaker to achieve higher productivity, feed rate should be multiplied by 1.5.
- For work materials of < 40 HRC, feed rate should be set to 50 %.

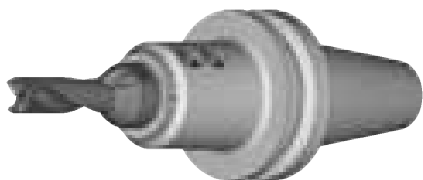
- For smaller drill dia, choose the lower recommended parameter.
- Water soluble coolant is recommended, cutting fluid should be supplied through the tool.
- A minimum fluid quantity of 7 l/min for 2 and 3xd rev. 10 l/min for 4 and 5xd is recommended.

No. of revolutions n (rpm) = Cutting speed Vc (m/min) x 1000 ÷ 3.14 ÷ Drill ø (mm)
Table feed Vf (mm/min) = n (rpm) x Feed f (mm/rev)

EZ Eccentric Sleeve

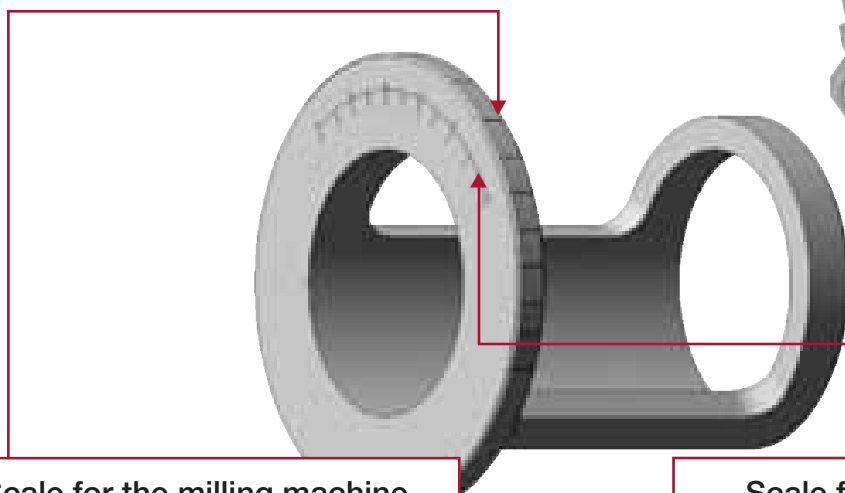
Hole diameter adjustment
at the milling machine

With the EZ sleeve,
the hole size can be adjusted from
+0.6 mm larger to -0.2 mm smaller



Centre-height adjustment
at the turning lathe

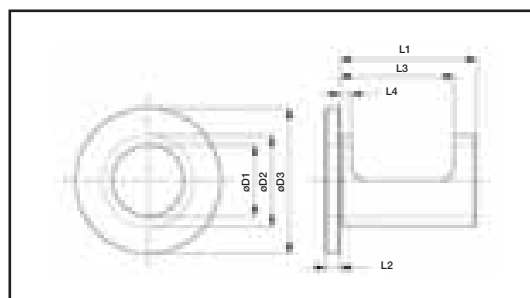
With the EZ sleeve, the centre-height
can be adjusted from
+0.3 mm to -0.2 mm



Scale for the milling machine

Scale for the turning lathe

■ Specifications



Cat. No.	Stock	Dimensions (mm)							Milling machine drill ø	Turning lathe Centre-height	Hex. wrench
		ø D1	ø D2	ø D3	L1	L2	L3	L4			
EZ2025L43	●	20	25	46	43	5	30	4	+0.4 ~ -0.2	+0.2 ~ -0.15	P-2.5
EZ2532L48	●	25	32	51	48	5	40	4	+0.4 ~ -0.2	+0.2 ~ -0.15	
EZ3240L53	●	32	40	54	53	5	45	4	+0.4 ~ -0.2	+0.2 ~ -0.15	
EZ4050L63	●	40	50	69	63	5	55	4	+0.6 ~ -0.2	+0.3 ~ -0.20	

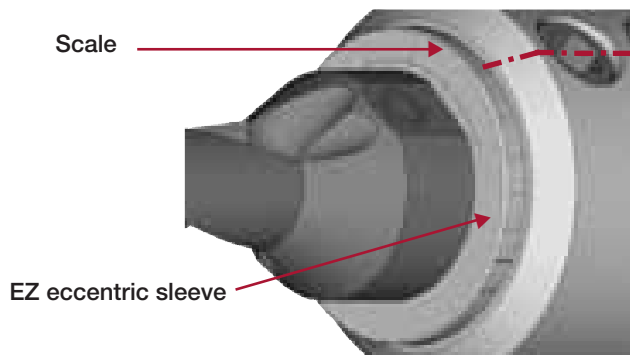
*TDX ø D1 equal to EZ sleeve ø D1

■ Applications

Hole diameter adjustment at the milling machine

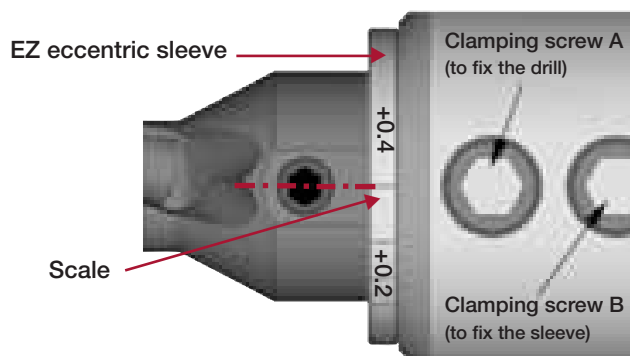


1. Adjust the scale at the flange periphery of the EZ sleeve to the centre of the clamping screws



2. For a larger hole diameter, rotate the sleeve to the + direction; for a smaller hole diameter, rotate the sleeve to the - direction

The illustration shows the example of adjusting the hole diameter + 0.4 mm.



3. When rotating the EZ sleeve, insert the wrench into the hole at the flange periphery and rotate the EZ sleeve. Screws A + B have to be loosened.

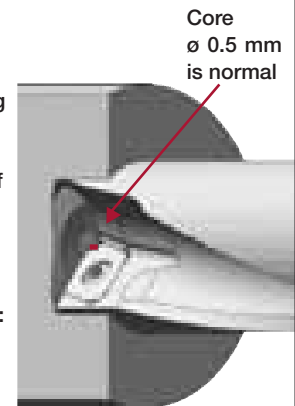
4. Secure the drill by screw A. Secure the EZ sleeve by lightly tightening screw B. Tighten screw B only lightly, otherwise EZ sleeve can be damaged!

Centre-height adjustment at the turning lathe

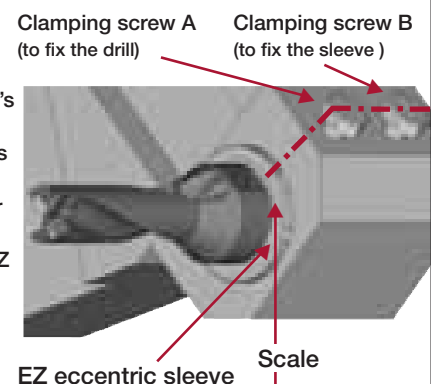
Most of the troubles at the turning lathe are based on the centre-height deviation. The centre-height is appropriate if the core of approximately 0.5 mm diameter remains at the centre of the end face.

Centre-height adjustment is necessary for the following cases:

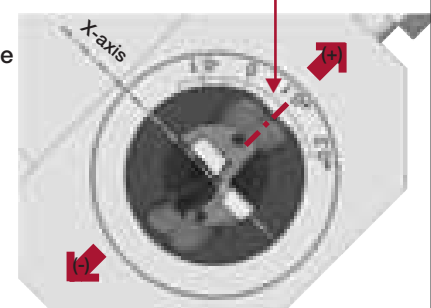
- No core remaining
- Core diameter is more than 1 mm.



1. Set the drills so that the outer insert's face becomes parallel to the X-axis of the tool turret. Adjust the scale (for the lathe) at the flange face of the EZ sleeve to the centre of the clamping screws.



2. When no core remains, rotate the EZ sleeve to + direction; when core diameter is more than 1 mm, rotate to - direction.



Note:

Cannot be used for collect chuck holder.

Over L/D 4 or bigger adjustment, please reduce feed rate.

For smaller adjustment, the drill itself will interfere with the hole diameter. It is recommended that hole diameter should be adjusted to a larger diameter than the drill diameter.