G

DRILL

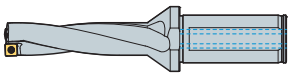
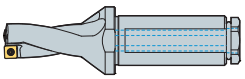
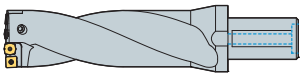
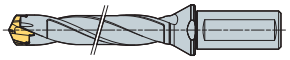
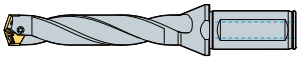
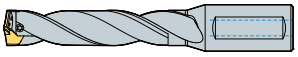
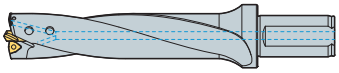
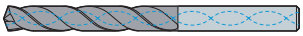
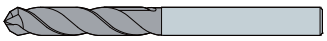
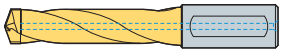
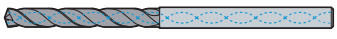
Korloy drills provide a total solution for hole making,
based on tooling know-how as well as extensive research and
development for our tools.

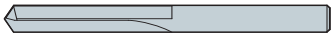
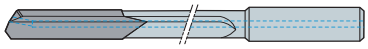
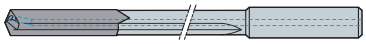
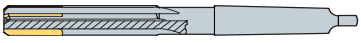
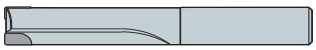
Technical Information for Drills

Indexable Drills

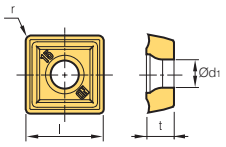
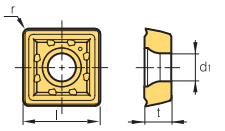
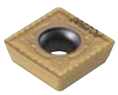
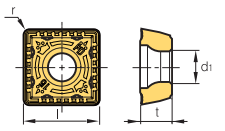
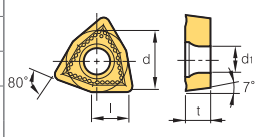
Solid Drills

Reamer

Type	Designation		Shape	Drills dia.	Aspect ratio	Page
Indexable Drills	King Drill	K□D	 Available insert: SP□T, XO□T	Ø12.0~Ø60.5	2D~5D	G12 ~ G20
	King Dril HP	K□D..HP	 Available insert: SP□T, XO□T	Ø12.0~Ø60.5	2D~4D	G22 ~ G24
	King Drill (for large diameter drilling)	K□D	 Available insert: SP□T, XO□T	Ø61.0~Ø100.0	2D~4D	G26
	TPDC new	TPDC	 Available insert: TPD□□□□CP	Ø12.0~Ø30.9	3D~12D	G32 ~ G33
	TPDB Plus new	TPDB-P	 Available insert: TPD□□□B	Ø10.0~Ø32.9	3D~12D	G39 ~ G43
	TPDB-H new	TPDB-H	 Available insert: TPD□□□B-H	Ø14.0~Ø30.4	3D~8D	G48 ~ G50
	Indexable Drills & Drill with center	WPDC	 Available insert: WC□T	Ø25.0~Ø80.0	5D~8D	G55 ~ G56
Solid Drills	Mach Solid Drill Plus new	MSDP		Ø1.0~Ø20.0	3D~7D	G59 ~ G63
		MSDPH		Ø2.5~Ø20.0	3D~7D	G60 ~ G63
	Mach Solid Drill Plus-S new	MSDPH-S		Ø3.0~Ø16.0	3D~5D	G66 ~ G69
	Mach Solid Drill Plus CFRP new	MSDP-C		Ø3.0~Ø12.7	5D	G72
	Mach Solid Flat Drill new	MSFD		Ø2.5~Ø16.0	2D	G76 ~ G78
		MSFDH		Ø2.5~Ø16.0	3D	G79 ~ G81
	Mach Long Drill Plus new	MLD□□□□N		Ø3.0~Ø10.0	10D~25D	G84 ~ G86
	Vulcan Drill	VZD		Ø12.6~Ø40.5	-	G89 ~ G90
	ESD Plus new	ESDP		Ø1.0~Ø20.0	3D~7D	G93 ~ G97

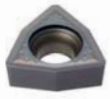
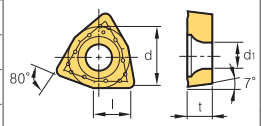
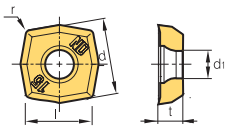
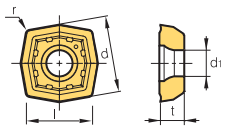
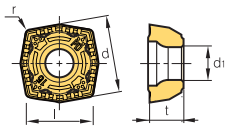
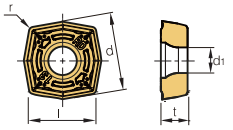
Type	Designation		Shape	Drills dia.	Aspect ratio	Page
Solid Drills	Carbide Drill new	SSDP		Ø1.0~Ø15.0	-	G99 ~ G100
	Burnishing Drill	BDS		Ø4.0~Ø16.0	5D~7D	G101
		BDT		Ø4.2~Ø10.3	2D~4D	G101
	Top solid Drill	TSDM		Ø8.0~Ø25.0	5D~8D	G102
	PCD Drill	PDD		Ø5.0~Ø12.0	5D	G103
	Gun Drill	KGDS		Ø2.0~Ø33.0	50D~100D	G108
		KGDT		Ø6.0~Ø26.5	50D~100D	G109
Reamer	Indexable Reamer	IRT	 Available Insert: RI	Ø10.0~Ø31.0	3D~5D	G114
		IRB	 Available Insert: RI	Ø10.0~Ø31.0	3D~5D	G115
	Chucking/Machine Reamer	SCRS		Ø5.0~Ø20.0	2D~3D	G117
		SCRH		Ø5.0~Ø20.0	2D~3D	G117
		TCRS		Ø7.0~Ø30.0	2D~3D	G118
		TMRS		Ø7.0~Ø30.0	3D~5D	G118
	PCD Reamer	PDR		Ø5.0~Ø20.0	3D~5D	G119
	Cermet Reamer	KCR		Ø6.0~Ø30.0	3D~7D	G120
	Broach Reamer	HBRE		Ø3.0~Ø25.0	3D~7D	G121

Available insert

Picture	Designation	Coated								Uncoated	Dimensions (mm)					Configuration	Page
		NC5330	NCM535	PC3700	PC5335	PC9530	PC6510	PC5300	PC5400	H01	l	d	t	r	d_1		
SPET-ND 	040204-ND									●	4.7	-	2.4	0.4	2.3		G12 ~ G26
	050204-ND									●	5.1	-	2.4	0.4	2.3		
	060205-ND									●	6.2	-	2.5	0.5	2.5		
	07T208-ND									●	7.5	-	2.8	0.7	2.8		
	090308-ND									●	9.2	-	3.3	0.8	3.4		
	11T308-ND									●	11.0	-	4.0	0.8	4.0		
	130410-ND									●	13.0	-	4.5	1.0	4.5		
	15M510-ND									●	15.2	-	5.0	1.0	5.5		
	180510-ND									●	18.2	-	5.5	1.0	6.0		
SPMT-LD 	060205-LD				●						6.2	-	2.5	0.5	2.5		G12 ~ G26
	07T208-LD				●						7.5	-	2.8	0.7	2.8		
	090308-LD				●						9.2	-	3.3	0.8	3.4		
	11T308-LD				●						11.0	-	4.0	0.8	4.0		
	130410-LD				●						13.0	-	4.5	1.0	4.5		
	15M510-LD				●						15.2	-	5.0	1.0	5.5		
	180510-LD				●						18.2	-	5.5	1.0	6.0		
SPMT-PD 	040204-PD	●	●				●	●			4.7	-	2.4	0.4	2.3		G12 ~ G26
	050204-PD	●	●				●	●			5.1	-	2.4	0.4	2.3		
	060205-PD	●	●				●	●			6.2	-	2.5	0.5	2.5		
	07T208-PD	●	●				●	●			7.5	-	2.8	0.7	2.8		
	090308-PD	●	●				●	●			9.2	-	3.3	0.8	3.4		
	11T308-PD	●	●				●	●			11.0	-	4.0	0.8	4.0		
	130410-PD	●	●				●	●			13.0	-	4.5	1.0	4.5		
	15M510-PD	●	●				●	●			15.2	-	5.0	1.0	5.5		
	180510-PD	●	●				●	●			18.2	-	5.5	1.0	6.0		
WCMT-C20N 	030208-C20N				●						3.8	5.56	2.38	0.8	2.8		-
	040208-C20N				●						4.3	6.35	2.38	0.8	3.0		
	050308-C20N				●						5.4	7.94	3.18	0.8	3.4		
	06T308-C20N				●						6.5	9.525	3.97	0.8	3.7		
	080408-C20N				●						8.7	12.7	4.76	0.8	4.3		
	080412-C20N				●						8.7	12.7	4.76	1.2	4.3		

● : Stock Item

Available insert

Picture	Designation	Coated								Uncoated	Dimensions (mm)					Configuration	Page
		NC5330	NCM535	PC3700	PC5335	PC9530	PC6510	PC5300	PC5400	H01	l	d	t	r	d_1		
WCMT-C21N 	030204-C21N				●						3.8	5.56	2.38	0.4	2.55		G55 G56
	040204-C21N				●						4.3	6.35	2.38	0.4	2.8		
	040208-C21N				●						4.3	6.35	2.38	0.8	2.8		
	050308-C21N				●						5.4	7.94	3.18	0.8	3.4		
	06T308-C21N				●						6.5	9.525	3.97	0.8	4.4		
	080408-C21N				●						8.7	12.7	4.76	0.8	5.5		
XOET-ND 	040204-ND									●	4.3	4.9	2.4	0.4	2.3		G12 ~ G26
	050204-ND									●	4.8	5.4	2.4	0.4	2.3		
	060204-ND									●	5.8	6.6	2.5	0.4	2.5		
	07T205-ND									●	6.9	7.8	2.8	0.5	2.8		
	090305-ND									●	8.4	9.6	3.3	0.5	3.4		
	11T306-ND									●	10.0	11.4	4.0	0.6	4.0		
	130406-ND									●	11.9	13.6	4.5	0.6	4.5		
	15M508-ND									●	13.9	15.9	5.0	0.8	5.5		
	180508-ND									●	16.5	18.9	5.5	0.8	6.0		
XOMT-LD 	060204-LD				●						5.8	6.6	2.5	0.4	2.5		G12 ~ G26
	07T205-LD				●						6.9	7.8	2.8	0.5	2.8		
	090305-LD				●						8.4	9.6	3.3	0.5	3.4		
	11T306-LD				●						10.0	11.4	4.0	0.6	4.0		
	130406-LD				●						11.9	13.6	4.5	0.6	4.5		
	15M508-LD				●						13.9	15.9	5.0	0.8	5.5		
	180508-LD				●						16.5	18.9	5.5	0.8	6.0		
XOMT-PD 	040204-PD							●			4.3	4.9	2.4	0.4	2.3		G12 ~ G26
	050204-PD							●			4.8	5.4	2.4	0.4	2.3		
	060204-PD							●			5.8	6.6	2.5	0.4	2.5		
	07T205-PD							●			6.9	7.8	2.8	0.5	2.8		
	090305-PD							●			8.4	9.6	3.3	0.5	3.4		
	11T306-PD							●			10.0	11.4	4.0	0.6	4.0		
	130406-PD							●			11.9	13.6	4.5	0.6	4.5		
	15M508-PD							●			13.9	15.9	5.0	0.8	5.5		
	180508-PD							●			16.5	18.9	5.5	0.8	6.0		
XOMT-RD new 	07T207-RD							●			6.9	7.8	2.8	0.7	2.8		G12 ~ G26
	090308-RD							●			8.4	9.6	3.3	0.8	3.4		
	11T309-RD							●			10.0	11.4	4.0	0.9	4.0		
	130410-RD							●			11.9	13.6	4.5	1.0	4.5		
	15M511-RD							●			13.9	15.9	5.0	1.1	5.5		
	180512-RD							●			16.5	18.9	5.5	1.2	6.0		

● : Stock Item

Optimized insert design for maximum drilling efficiency

King Drill

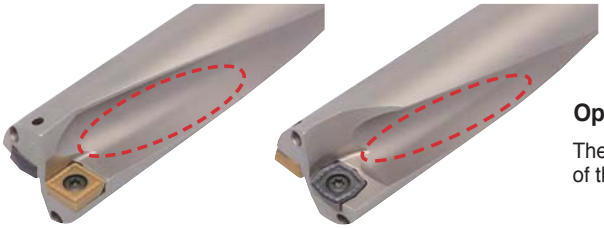
Code system of holder

K 5D 200 25 □ - 07

KING/KORLOY	Aspect ratio (L/D)	Drill Dia.	Shank Dia	Shank shape	Inscribed circle of insert
	2D, 3D, 4D, 5D	Ø20.0 (One decimal place marked)	Ø20, Ø25 Ø32, Ø40	No mark: Flange Shank, Weldone HP: Flange Shank, Weldon, PT Tap F1: Flange Shank, Whistle Notch F2: Flange Shank, Without Side Lock S: Straight Shank, Weldone S1: Straight Shank, Whistle Notch S2: Straight Shank, Without Side Lock M0, M1, M2, M3...: MT0, MT1, MT2, MT3... H63, H100: HSK63, HSK100 B30, B40, B50: BT30, BT40, BT50	04, 05, 06, 07, 09 11 13, 15, 18

Features

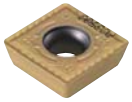
- Optimized design of inserts for maximum drilling efficiency
- Excellent cutting performance and chip control due to the optimized geometry and chip breaker of both inserts, central & peripheral
- Different inserts, optimized for the central and peripheral insert locations in order to maximize cutting tool life



Optimized flute system - 2 coolant holes applied

The optimized shape of the flute increases the rigidity of the drill body and improves chip evacuation

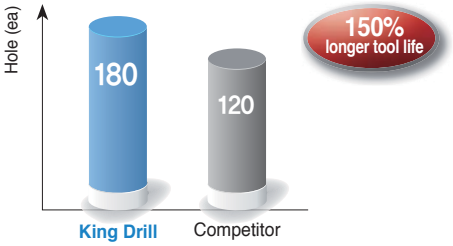
Features of chip breaker

Chip breaker	PD		LD		ND		RD
Features	- Universal - At medium speed and medium feed		- Superior chip control for machining mild steel and stainless steel - Light cutting (at low ~ medium speed and low feed)		- Sharp cutting edge for aluminum machining - Insert surface buffed for high quality result - E Class Tolerance		- Improved chipping resistance - Excellent performance in case of frequent fracture and chipping on the cutting edge
Insert	Peripheral insert	Central insert	Peripheral insert	Central insert	Peripheral insert	Central insert	Central insert
Shape							
Grades for workpiece	NC5330: P, M, K PC3500: P PC5300: P, M, K, S PC6510: K	PC5300: P, M, K, S	PC5335: P, M		H01: N		PC5300: P,M,K,S

Application examples

- **Use** Track link bush
- **Workpiece** SM45C
- **Cutting conditions** vc (m/min) = 120, fn (mm/rev) = 0.1
  Through coolant system
- **Tools** **inserts** SPMT07T208-PD (PC3500)
  XOMT07T205-PD (PC5300)
  Holder K5D20025-07
- **Machine** Drilling machine

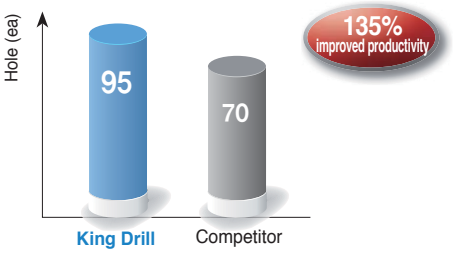
■ **Test result**



• Superior surface finish and chip evacuation

- **Use** Track link bush
- **Workpiece** SCM415H
- **Cutting conditions** King Drill: vc (m/min) = 140, fn (mm/rev) = 0.12
  Competitor: vc (m/min) = 125, fn (mm/rev) = 0.1
- **Tools** **inserts** SPMT090308-PD (PC3500)
  XOMT090305-PD (PC5300)
  Holder K3D27032-09
- **Machine** MCT

■ **Test result**



• Increased productivity due to higher capabilities for cutting conditions compared to the competitor

Recommended cutting condition

Workpiece				Insert			vc (m/min)	Aspect ratio (L/D) = 2D, 3D, 4D				
ISO		Workpiece	Hardness (HB)	Chip breaker	Grade			Feed rate (mm/rev) per drill dia. (mm)				
					Central	Peripheral		Ø12~Ø16	Ø17~Ø23	Ø24~Ø29	Ø30~Ø42	Ø43~Ø60
P	Carbon steel	Low carbon steel	80~180	LD	PC5335	PC5335	120 (60~170)	0.04~0.08	0.04~0.08	0.04~0.08	0.04~0.08	0.04~0.08
				PD/RD	PC5300	PC3500	150 (120~180)					
						NC5330	180 (140~220)					
		High carbon steel	180~280	PD	PC5300	PC3500	120 (90~150)	0.04~0.10	0.04~0.12	0.05~0.16	0.06~0.16	0.06~0.18
						NC5330	150 (110~190)	0.04~0.06	0.04~0.07	0.04~0.08	0.04~0.08	0.04~0.08
	Alloy steel	Low alloy steel	140~260	LD	PC5335	PC5335	120 (60~160)	0.06~0.10	0.06~0.10	0.06~0.12	0.06~0.14	0.06~0.14
				PD	PC5300	PC3500	150 (120~170)	0.06~0.12	0.06~0.12	0.06~0.14	0.06~0.16	0.06~0.16
						NC5330	180 (140~210)	0.06~0.08	0.06~0.08	0.06~0.10	0.06~0.12	0.06~0.12
		Hardened low alloy steel	200~400	PD	PC5300	PC5300	100 (50~150)	0.04~0.10	0.06~0.10	0.06~0.12	0.06~0.14	0.06~0.14
		High alloy steel	260~320	PD	PC5300	PC3500	100 (50~160)	0.05~0.11	0.05~0.11	0.05~0.13	0.05~0.15	0.05~0.15
		Hardened high alloy steel	300~450	PD	PC5300	PC5300	70 (30~120)	0.04~0.08	0.06~0.08	0.06~0.10	0.06~0.12	0.06~0.12
M	Stainless steel	Stainless steel	135-275	LD	PD5335	PC5335	120 (80~140)	0.04~0.07	0.04~0.07	0.04~0.07	0.04~0.08	0.04~0.08
				PD	PC5300	PC5300	130 (100~160)	0.04~0.07	0.04~0.07	0.04~0.07	0.04~0.08	0.04~0.08
K	Cast iron	Gray cast iron	150~230	PD	PC5300	PC6510	190 (150~250)	0.04~0.12	0.05~0.14	0.06~0.18	0.10~0.22	0.10~0.26
		Ductile cast iron	150~230	PD	PC5300	PC6510	130 (100~160)	0.04~0.07	0.04~0.08	0.04~0.10	0.05~0.12	0.05~0.12
S	Heat resisting alloy	Ni-heat resisting alloy	130~400	PD	PC5300	PC5300	50 (30~100)	0.04~0.10	0.04~0.10	0.04~0.10	0.04~0.10	0.04~0.10
		Ti-heat resisting alloy	130~400	LD	PC5335	PC5335	60 (40~80)	0.04~0.08	0.04~0.10	0.06~0.12	0.06~0.14	0.06~0.16
				PD	PC5300	PC5300	60 (40~80)	0.04~0.08	0.04~0.10	0.06~0.12	0.06~0.14	0.06~0.16
		High hardened steel	over 400	PD	PC5300	PC5300	40 (20~80)	0.04~0.05	0.04~0.06	0.04~0.08	0.04~0.08	0.04~0.08
N	Aluminium	Aluminium	30~150	ND	H01	H01	300 (250~400)	0.05~0.14	0.06~0.16	0.10~0.20	0.10~0.22	0.12~0.25
		Alloyed copper	150-160	ND	H01	H01	250 (200~300)	0.05~0.14	0.06~0.16	0.10~0.20	0.10~0.22	0.12~0.25

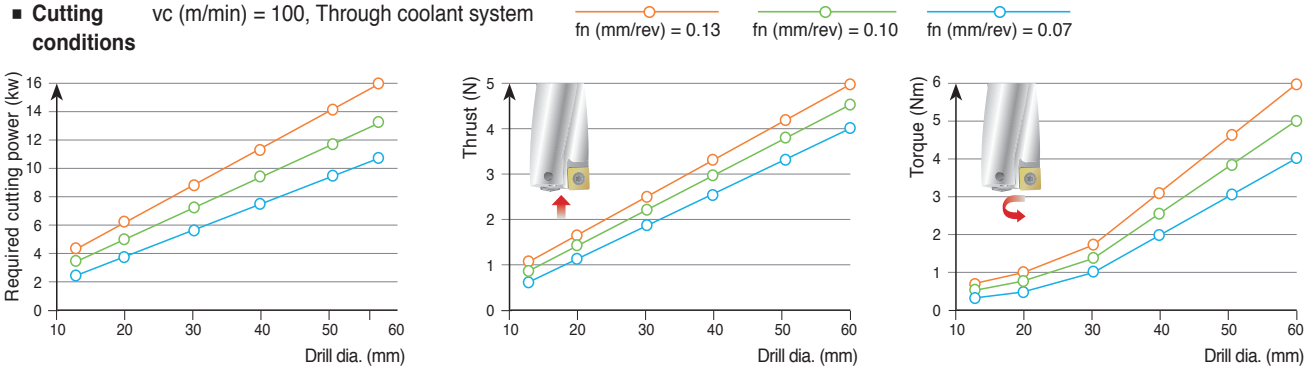
• The Max. feed of 5D holders is 70%~80% of the max. conditions of 2D/3D/4D holders
• In interrupted machining part, reduce 30~50% of feed from the above machining around interrupted part

Required cutting power

- The graphs below show the cutting force required in drilling
- Machining with the King Drill and a machine with high rigidity and power

■ **Workpiece** SCM440 (240HB)

■ **Cutting conditions** vc (m/min) = 100, Through coolant system

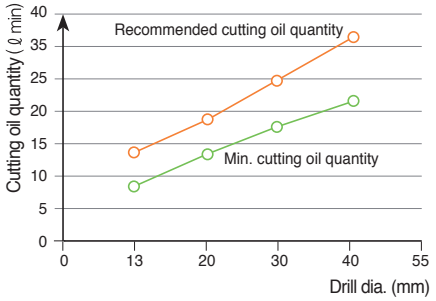


Cutting oil quantity

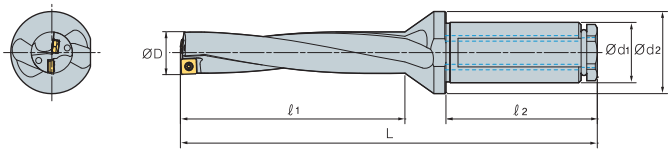
■ **Workpiece** SCM440 (240HB)

■ **Cutting conditions** vc (m/min) = 100, Through coolant system

- The data of the graph above could be changed depending on workpiece and cutting condition



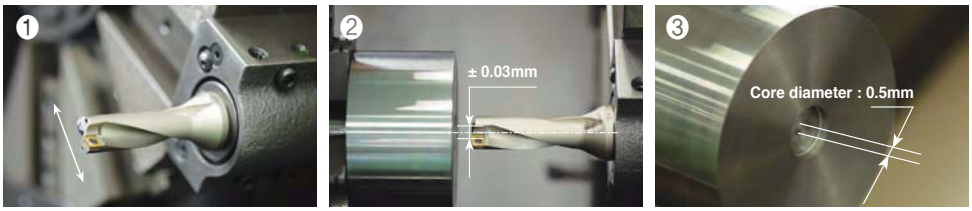
Drill tolerance and hole tolerance



(mm)

Drill dia.		Ø12~Ø29	Ø30~Ø45	Ø46~Ø60.5
2D~3D	Drill tolerance (ØD)	0~ -0.15	0~ -0.15	0~ -0.15
	Hole tolerance	+0.2~ -0.1	+0.25~ -0.1	+0.28~ -0.1
4D~5D	Drill tolerance (ØD)	0~ -0.15	0~ -0.15	0~ -0.15
	Hole tolerance	+0.25~ -0.05	+0.3~ -0.05	+0.33~ -0.05

Notice for setting the drill in the lathe

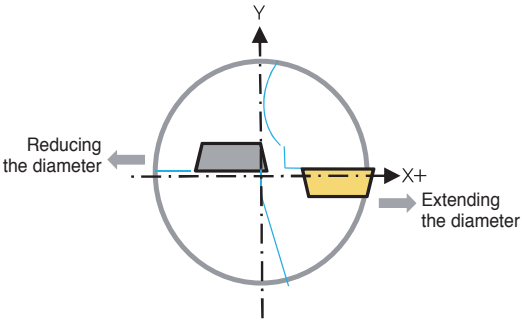


- Set the peripheral insert parallel to the X axis. (based on the side lock)
- If the machined core is 0.5 mm after machining 5 mm, that is the proper setting

※ Please make sure that the location of the side lock could be different depending on manufacturers of machine

Range of adjusting machining diameter in the lathe

- In machining in the lathe, the King Drill can extend and reduce the machining diameter by adjusting the x-axis. Please refer to the table showing the range of adjusting drilling diameter below
- The more the drilling diameter is extended or reduced, the more the drill loses drilling balance. In this case, reduce the feed or cutting speed in machining
- Reducing the machining diameter excessively could damage the holder



(mm)

Drill dia. (Ø)	Range of adjusting drilling diameter (Ø)	Drill dia. (Ø)	Range of adjusting drilling diameter (Ø)	Drill dia. (Ø)	Range of adjusting drilling diameter (Ø)	Drill dia. (Ø)	Range of adjusting drilling diameter (Ø)
12.0	11.7~12.4	24.5	23.9~25.1	37.0	36.3~37.7	49.5	48.7~50.2
12.5	12.2~12.9	25.0	24.4~25.6	37.5	36.8~38.2	50.0	49.2~50.7
13.0	12.7~13.4	25.5	24.9~26.1	38.0	37.3~38.7	50.5	49.7~51.2
13.5	13.2~13.9	26.0	25.4~26.6	38.5	37.8~39.2	51.0	50.2~51.7
14.0	13.6~14.5	26.5	25.9~27.1	39.0	38.3~39.7	51.5	50.7~52.2
14.5	14.1~15.0	27.0	26.4~27.6	39.5	38.8~40.2	52.0	51.2~52.7
15.0	14.6~15.5	27.5	26.9~28.1	40.0	39.3~40.7	52.5	51.7~53.2
15.5	15.1~16.0	27.8	27.4~28.6	40.5	39.8~41.2	53.0	52.2~53.7
16.0	15.6~16.5	28.5	27.9~29.1	41.0	40.3~41.7	53.5	52.7~54.2
16.5	16.0~17.0	29.0	28.4~29.6	41.5	40.8~42.2	54.0	53.2~54.7
17.0	16.5~17.5	29.5	28.9~30.1	42.0	41.3~42.7	54.5	53.7~55.2
17.5	17.0~18.0	30.0	29.3~30.7	42.5	41.8~43.2	55.0	54.2~55.7
18.0	17.5~18.5	30.5	29.8~31.2	43.0	42.2~43.7	55.5	54.7~56.2
18.5	18.0~19.0	31.0	30.3~31.7	43.5	42.7~44.2	56.0	55.2~56.7
19.0	18.5~19.5	31.5	30.8~32.2	44.0	43.2~44.7	56.5	55.7~57.2
19.5	19.0~20.0	32.0	31.3~32.7	44.5	43.7~45.2	57.0	56.2~57.7
20.0	19.4~20.6	32.5	31.8~33.2	45.0	44.2~45.7	57.5	56.7~58.2
20.5	19.9~21.1	33.0	32.3~33.7	45.5	44.7~46.2	58.0	57.2~58.7
21.0	20.4~21.6	33.5	32.8~34.2	46.0	45.2~46.7	58.5	57.7~59.2
21.5	20.9~22.1	34.0	33.3~34.7	46.5	45.7~47.2	59.0	58.2~59.7
22.0	21.4~22.6	34.5	33.8~35.2	47.0	46.2~47.7	59.5	58.7~60.2
22.5	21.9~23.1	35.0	34.3~35.7	47.5	46.7~48.2	60.0	59.2~60.7
23.0	22.4~23.6	35.5	34.8~36.2	48.0	47.2~48.7	60.5	59.7~61.2
23.5	22.9~24.1	36.0	35.3~36.7	48.5	47.7~49.2		
24.0	23.4~24.6	36.5	35.8~37.2	49.0	48.2~49.7		

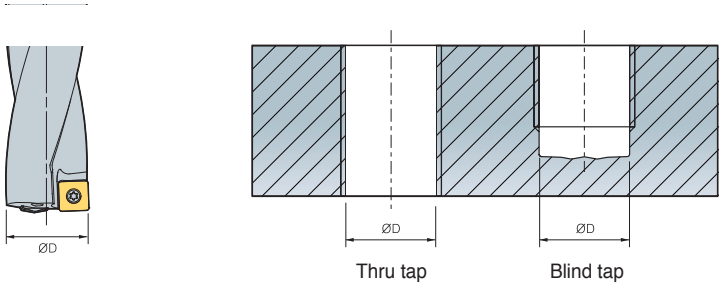
Insert and parts

Drill dia. (mm)	Peripheral insert	Central insert	Screw	Wrench	Torque (N·m)
Ø12.0~Ø13.5	SP□T040204-□□	XO□T040204-□□	FTNA0204	TW06P	0.4
Ø13.6~Ø16.0	SP□T050204-□□	XO□T050204-□□	FTNA0204	TW06P	0.4
Ø16.1~Ø19.5	SP□T060205-□□	XO□T060204-□□	FTKA02206S	TW07P	0.8
Ø19.6~Ø23.5	SP□T07T208-□□	XO□T07T205-□□	FTKA02565	TW07S	0.8
Ø23.6~Ø29.5	SP□T090308-□□	XO□T090305-□□	FTKA0307	TW09S	1.2
Ø29.6~Ø35.5	SP□T11T308-□□	XO□T11T306-□□	FTKA03508	TW15S	3
Ø35.6~Ø42.5	SP□T130410-□□	XO□T130406-□□	FTKA0410	TW15S	3
Ø42.6~Ø50.5	SP□T15M510-□□	XO□T15M508-□□	FTNC04511	TW20S	5
Ø50.6~Ø60.5	SP□T180510-□□	XO□T180508-□□	FTNA0511	TW20-100	5

- In clamping an insert, please clean the tip seat and apply CASMOLY1000 on the screw
- Please make sure to use a Korloy-produced wrench and screw only

King Drill - for machining a tap foundation hole

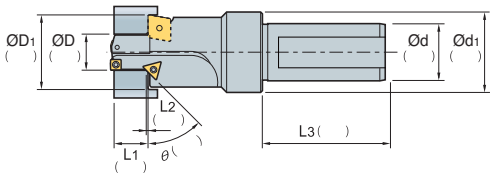
- There are two types of specifications of tap, metric and inch. The King Drill is available for machining both thru tap and blind tap

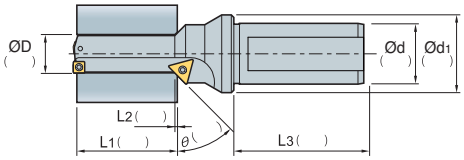


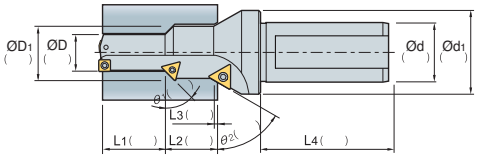
(mm)

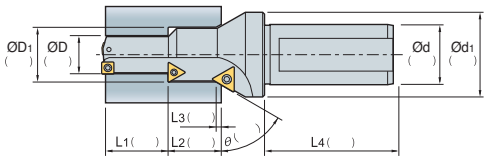
Tap type	Thread	ØD	Designation	Reference
Metric	M14 x 2.0	12.0	K3D12020-04	G14
	M16 x 2.0	14.0	K3D14020-05	G14
	M18 x 2.5	15.5	K3D15520-05	G14
	M20 x 2.5	17.5	K3D17525-06	G14
	M22 x 2.5	19.5	K3D19525-06	G14
	M24 x 3.0	21.0	K3D21025-07	G14
	M27 x 3.0	24.0	K3D24032-09	G14
	M30 x 3.5	26.5	K3D26532-09	G14
	M33 x 4.0	29.0	K3D29032-09	G14
	M36 x 4.0	32.0	K3D32032-11	G15
	M39 x 4.0	35.0	K3D35032-11	G15
	M42 x 4.5	37.5	K3D37540-13	G15
Inch	9/16-12 UNC	12.2	K3D12220-04	G14
	5/8-11 UNC	13.5	K3D13520-04	G14
	3/4-10 UNC	16.5	K3D16525-06	G14
	7/8-9 UNC	19.5	K3D19525-06	G14
	9/16-18 UNF	12.9	K3D12920-04	G14
	5/8-18 UNF	14.5	K3D14520-05	G14
	3/4-16 UNF	17.5	K3D17525-06	G14

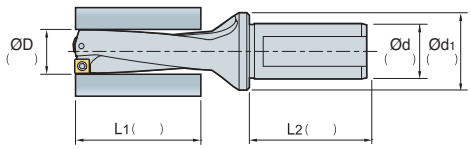
Special drill order form

☐ 

☐ 

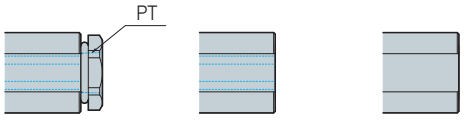
☐ 

☐ 

☐ 

■ Coolant type

☐ Through coolant Plug Type (Standard) ☐ Through coolant Non Plug Type ☐ No coolant

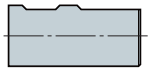


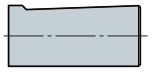
■ Hole type

☐ Blind hole ☐ Thru hole

■ Types of shank

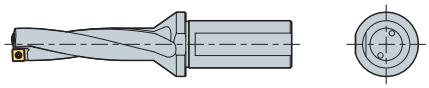
☐  Flat Type

☐  Weldon Type

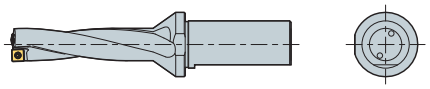
☐  Whistle Notch Type

■ Location of side lock

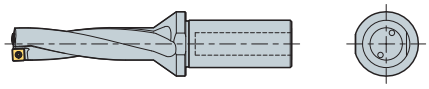
☐ Parallel to peripheral insert (standard)



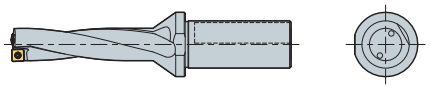
☐ 90°angle to peripheral insert (standard)



☐ 180°angle to peripheral insert (standard)



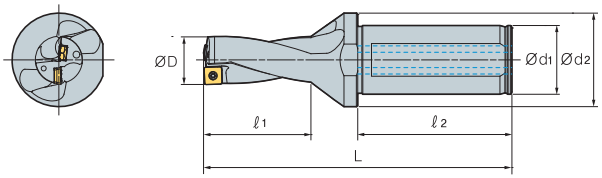
☐ 270° angle to peripheral insert (standard)



■ Note

- Currently using tool:
- Current cutting condition
  - RPM or vc (m/min):
  - vf (mm/min) or fn (mm/rev):
  - Depth of cut (mm):
- Standard of measuring tool life:
- Currently using machine
  - Machining center:
  - General lathe:
  - CNC lathe:

King Drill (2D)

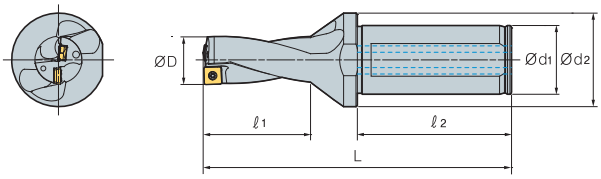


(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K2D	12020-04	12.0	20	25	27	50	91	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	12520-04	12.5	20	25	27	50	91			
	13020-04	13.0	20	25	29	50	93			
	13520-04	13.5	20	25	29	50	93			
	14020-05	14.0	20	25	31	50	96	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	14520-05	14.5	20	25	31	50	96			
	15020-05	15.0	20	25	33	50	99			
	15520-05	15.5	20	25	33	50	99			
	16020-05	16.0	20	25	35	50	101			
	16525-06	16.5	25	34	35	56	107	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	17025-06	17.0	25	34	37	56	109			
	17525-06	17.5	25	34	37	56	109			
	18025-06	18.0	25	34	39	56	112			
	18525-06	18.5	25	34	39	56	112			
	19025-06	19.0	25	34	41	56	114			
	19525-06	19.5	25	34	41	56	114			
	20025-07	20.0	25	34	43	56	118	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	20525-07	20.5	25	34	43	56	118			
	21025-07	21.0	25	34	45	56	120			
	21525-07	21.5	25	34	45	56	120			
	22025-07	22.0	25	34	47	56	122			
	22525-07	22.5	25	34	47	56	122			
	23025-07	23.0	25	34	49	56	126			
	23525-07	23.5	25	34	49	56	126			
	24032-09	24.0	32	44	51	60	133	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	24532-09	24.5	32	44	51	60	133			
	25032-09	25.0	32	44	53	60	135			
	25532-09	25.5	32	44	53	60	135			
	26032-09	26.0	32	44	55	60	137			
	26532-09	26.5	32	44	55	60	137			
	27032-09	27.0	32	44	57	60	140			
	27532-09	27.5	32	44	57	60	140			
	28032-09	28.0	32	44	59	60	143			
	28532-09	28.5	32	44	59	60	143			
	29032-09	29.0	32	44	61	60	145			
	29532-09	29.5	32	44	61	60	145			
	30032-11	30.0	32	44	63	60	150	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	30532-11	30.5	32	44	63	60	150			
	31032-11	31.0	32	44	65	60	152			
	31532-11	31.5	32	44	65	60	152			
	32032-11	32.0	32	44	67	60	154			
	32532-11	32.5	32	44	67	60	154			
	33032-11	33.0	32	44	69	60	157			
	33532-11	33.5	32	44	69	60	157			
	34032-11	34.0	32	44	71	60	159			
	34532-11	34.5	32	44	71	60	159			
	35032-11	35.0	32	44	73	60	161			
	35532-11	35.5	32	44	73	60	161			

Applicable inserts **G04~05**

King Drill (2D)

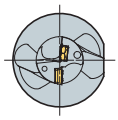


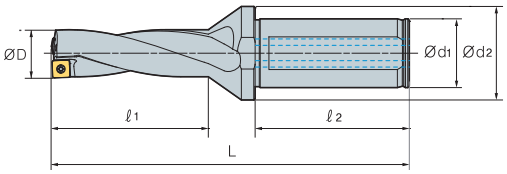
(mm)

	Designation	ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K2D	36040-13	36.0	40	48	76	70	176	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	36540-13	36.5	40	48	76	70	176			
	37040-13	37.0	40	48	78	70	178			
	37540-13	37.5	40	48	78	70	178			
	38040-13	38.0	40	48	80	70	181			
	38540-13	38.5	40	48	80	70	181			
	39040-13	39.0	40	48	82	70	183			
	39540-13	39.5	40	48	82	70	183			
	40040-13	40.0	40	48	84	70	186			
	40540-13	40.5	40	48	84	70	186			
	41040-13	41.0	40	48	86	70	188			
	41540-13	41.5	40	48	86	70	188			
	42040-13	42.0	40	48	88	70	191			
	42540-13	42.5	40	48	88	70	191			
	43040-15	43.0	40	58	91	70	196	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	43540-15	43.5	40	58	91	70	196			
	44040-15	44.0	40	58	93	70	198			
	44540-15	44.5	40	58	93	70	198			
	45040-15	45.0	40	58	95	70	201			
	45540-15	45.5	40	58	95	70	201			
	46040-15	46.0	40	58	97	70	203			
	46540-15	46.5	40	58	97	70	203			
	47040-15	47.0	40	58	99	70	206			
	47540-15	47.5	40	58	99	70	206			
	48040-15	48.0	40	58	101	70	208			
	48540-15	48.5	40	58	101	70	208			
	49040-15	49.0	40	58	103	70	210			
	49540-15	49.5	40	58	103	70	210			
	50040-15	50.0	40	58	105	70	212			
	50540-15	50.5	40	58	105	70	212			
	51040-18	51.0	40	68	108	70	218	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	51540-18	51.5	40	68	108	70	218			
	52040-18	52.0	40	68	110	70	220			
	52540-18	52.5	40	68	110	70	220			
	53040-18	53.0	40	68	112	70	222			
	53540-18	53.5	40	68	112	70	222			
	54040-18	54.0	40	68	114	70	224			
	54540-18	54.5	40	68	114	70	224			
	55040-18	55.0	40	68	116	70	226			
	55540-18	55.5	40	68	116	70	226			
	56040-18	56.0	40	68	118	70	230			
	56540-18	56.5	40	68	118	70	230			
	57040-18	57.0	40	68	121	70	233			
	57540-18	57.5	40	68	121	70	233			
	58040-18	58.0	40	68	124	70	236			
	58540-18	58.5	40	68	124	70	236			
	59040-18	59.0	40	68	127	70	239			
	59540-18	59.5	40	68	127	70	239			
	60040-18	60.0	40	68	130	70	242			
	60540-18	60.5	40	68	130	70	242			

Applicable inserts **G04~05**

King Drill (3D)





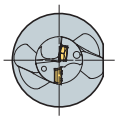
(mm)

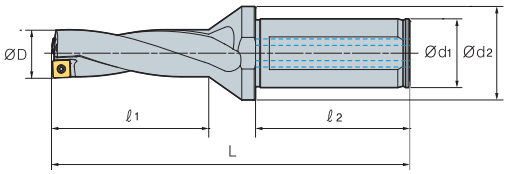
Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K3D	12020-04＊	12.0	20	25	39	50	103	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	12220-04	12.2	20	25	39	50	103			
	12520-04	12.5	20	25	39	50	103			
	12920-04	12.9	20	25	42	50	106			
	13020-04	13.0	20	25	42	50	106			
	13520-04	13.5	20	25	42	50	106			
	14020-05＊	14.0	20	25	45	50	110	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	14520-05	14.5	20	25	45	50	110			
	15020-05	15.0	20	25	48	50	114			
	15520-05＊	15.5	20	25	48	50	114			
	16020-05	16.0	20	25	51	50	117			
	16525-06	16.5	25	34	51	56	123	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	17025-06	17.0	25	34	54	56	126			
	17525-06＊	17.5	25	34	54	56	126			
	18025-06	18.0	25	34	57	56	130			
	18525-06	18.5	25	34	57	56	130			
	19025-06	19.0	25	34	60	56	133			
	19525-06＊	19.5	25	34	60	56	133			
	20025-07	20.0	25	34	63	56	138	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	20525-07	20.5	25	34	63	56	138			
	21025-07＊	21.0	25	34	66	56	141			
	21525-07	21.5	25	34	66	56	141			
	22025-07	22.0	25	34	69	56	144			
	22525-07	22.5	25	34	69	56	144			
	23025-07	23	25	34	72	56	149			
	23525-07	23.5	25	34	72	56	149			
	24032-09＊	24.0	32	44	75	60	157	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	24532-09	24.5	32	44	75	60	157			
	25032-09	25.0	32	44	78	60	160			
	25532-09	25.5	32	44	78	60	160			
	26032-09	26.0	32	44	81	60	163			
	26532-09＊	26.5	32	44	81	60	163			
	27032-09	27.0	32	44	84	60	167			
	27532-09	27.5	32	44	84	60	167			
	28032-09	28.0	32	44	87	60	171			
	28532-09	28.5	32	44	87	60	171			
	29032-09＊	29.0	32	44	90	60	174			
	29532-09	29.5	32	44	90	60	174			

Applicable inserts **G04~05**

The items marked ＊ can machine a tap foundation hole (Reference G09p)

King Drill (3D)





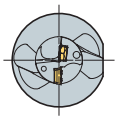
(mm)

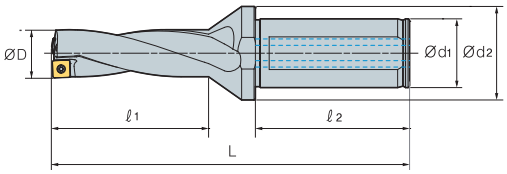
Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K3D	30032-11 *	30.0	32	44	93	60	180	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	30532-11	30.5	32	44	93	60	180			
	31032-11	31.0	32	44	96	60	183			
	31532-11	31.5	32	44	96	60	183			
	32032-11	32.0	32	44	99	60	186			
	32532-11	32.5	32	44	99	60	186			
	33032-11	33.0	32	44	102	60	190			
	33532-11	33.5	32	44	102	60	190			
	34032-11	34.0	32	44	105	60	193			
	34532-11	34.5	32	44	105	60	193			
	35032-11 *	35.0	32	44	108	60	196			
	35532-11	35.5	32	44	108	60	196			
	36040-13	36.0	40	48	112	70	212	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	36540-13	36.5	40	48	112	70	212			
	37040-13	37.0	40	48	115	70	215			
	37540-13	37.5	40	48	115	70	215			
	38040-13	38.0	40	48	118	70	219			
	38540-13	38.5	40	48	118	70	219			
	39040-13	39.0	40	48	121	70	222			
	39540-13	39.5	40	48	121	70	222			
	40040-13	40.0	40	48	124	70	226			
	40540-13	40.5	40	48	124	70	226			
	41040-13	41.0	40	48	127	70	229			
	41540-13	41.5	40	48	127	70	229			
	42040-13	42.0	40	48	130	70	233			
	42540-13	42.5	40	48	130	70	233			
	43040-15	43.0	40	58	134	70	239	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	43540-15	43.5	40	58	134	70	239			
	44040-15	44.0	40	58	137	70	242			
	44540-15	44.5	40	58	137	70	242			
	45040-15	45.0	40	58	140	70	246			
	45540-15	45.5	40	58	140	70	246			
	46040-15	46.0	40	58	143	70	249			
	46540-15	46.5	40	58	143	70	249			
	47040-15	47.0	40	58	146	70	253			
	47540-15	47.5	40	58	146	70	253			
	48040-15	48.0	40	58	149	70	256			
	48540-15	48.5	40	58	149	70	256			
	49040-15	49.0	40	58	152	70	259			
	49540-15	49.5	40	58	152	70	259			
	50040-15	50.0	40	58	155	70	262			
	50540-15	50.5	40	58	155	70	262			

Applicable inserts G04~05

The items marked * can machine a tap foundation hole (Reference G09p)

King Drill (3D)



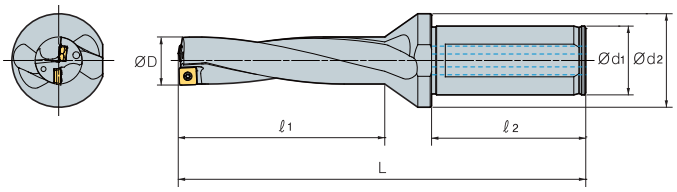


(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K3D	51040-18	51.0	40	68	159	70	269	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	51540-18	51.5	40	68	159	70	269			
	52040-18	52.0	40	68	162	70	272			
	52540-18	52.5	40	68	162	70	272			
	53040-18	53.0	40	68	165	70	275			
	53540-18	53.5	40	68	165	70	275			
	54040-18	54.0	40	68	168	70	278			
	54540-18	54.5	40	68	168	70	278			
	55040-18	55.0	40	68	171	70	281			
	55540-18	55.5	40	68	171	70	281			
	56040-18	56.0	40	68	174	70	286			
	56540-18	56.5	40	68	174	70	286			
	57040-18	57.0	40	68	178	70	290			
	57540-18	57.5	40	68	178	70	290			
	58040-18	58.0	40	68	182	70	294			
	58540-18	58.5	40	68	182	70	294			
	59040-18	59.0	40	68	186	70	298			
	59540-18	59.5	40	68	186	70	298			
	60040-18	60.0	40	68	190	70	302			
	60540-18	60.5	40	68	190	70	302			

Applicable inserts **G04~05**

King Drill (4D)

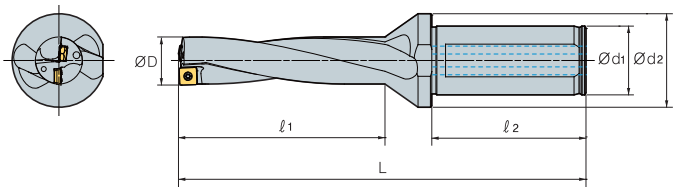


(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K4D	12020-04	12.0	20	25	51	50	115	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	12520-04	12.5	20	25	51	50	115			
	13020-04	13.0	20	25	55	50	119			
	13520-04	13.5	20	25	55	50	119			
	14020-05	14.0	20	25	59	50	124	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	14520-05	14.5	20	25	59	50	124			
	15020-05	15.0	20	25	63	50	129			
	15520-05	15.5	20	25	63	50	129			
	16020-05	16.0	20	25	67	50	133			
	16525-06	16.5	25	34	67	56	139	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	17025-06	17.0	25	34	71	56	143			
	17525-06	17.5	25	34	71	56	143			
	18025-06	18.0	25	34	75	56	148			
	18525-06	18.5	25	34	75	56	148			
	19025-06	19.0	25	34	79	56	152			
	19525-06	19.5	25	34	79	56	152			
	20025-07	20.0	25	34	83	56	158	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	20525-07	20.5	25	34	83	56	158			
	21025-07	21.0	25	34	87	56	162			
	21525-07	21.5	25	34	87	56	162			
	22025-07	22.0	25	34	91	56	166			
	22525-07	22.5	25	34	91	56	166			
	23025-07	23.0	25	34	95	56	172			
	23525-07	23.5	25	34	95	56	172			
	24032-09	24.0	32	44	99	60	181	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	24532-09	24.5	32	44	99	60	181			
	25032-09	25.0	32	44	103	60	185			
	25532-09	25.5	32	44	103	60	185			
	26032-09	26.0	32	44	107	60	189			
	26532-09	26.5	32	44	107	60	189			
	27032-09	27.0	32	44	111	60	194			
	27532-09	27.5	32	44	111	60	194			
	28032-09	28.0	32	44	115	60	199			
	28532-09	28.5	32	44	115	60	199			
	29032-09	29.0	32	44	119	60	203			
	29532-09	29.5	32	44	119	60	203			
	30032-11	30.0	32	44	123	60	210	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	30532-11	30.5	32	44	123	60	210			
	31032-11	31.0	32	44	127	60	214			
	31532-11	31.5	32	44	127	60	214			
	32032-11	32.0	32	44	131	60	218			
	32532-11	32.5	32	44	131	60	218			
	33032-11	33.0	32	44	135	60	223			
	33532-11	33.5	32	44	135	60	223			
	34032-11	34.0	32	44	139	60	227			
	34532-11	34.5	32	44	139	60	227			
	35032-11	35.0	32	44	143	60	231			
	35532-11	35.5	32	44	143	60	231			

Applicable inserts **G04~05**

King Drill (4D)

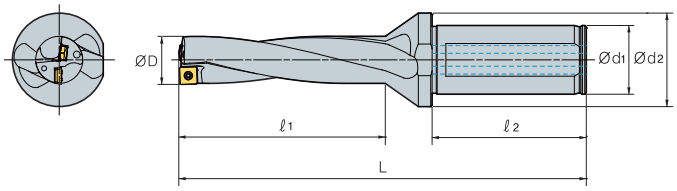


(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K4D	36040-13	36.0	40	48	148	70	248	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	36540-13	36.5	40	48	148	70	248			
	37040-13	37.0	40	48	152	70	252			
	37540-13	37.5	40	48	152	70	252			
	38040-13	38.0	40	48	156	70	257			
	38540-13	38.5	40	48	156	70	257			
	39040-13	39.0	40	48	160	70	261			
	39540-13	39.5	40	48	160	70	261			
	40040-13	40.0	40	48	164	70	266			
	40540-13	40.5	40	48	164	70	266			
	41040-13	41.0	40	48	168	70	270			
	41540-13	41.5	40	48	168	70	270			
	42040-13	42.0	40	48	172	70	275			
	42540-13	42.5	40	48	172	70	275			
	43040-15	43.0	40	58	177	70	282	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	43540-15	43.5	40	58	177	70	282			
	44040-15	44.0	40	58	181	70	286			
	44540-15	44.5	40	58	181	70	286			
	45040-15	45.0	40	58	185	70	291			
	45540-15	45.5	40	58	185	70	291			
	46040-15	46.0	40	58	189	70	295			
	46540-15	46.5	40	58	189	70	295			
	47040-15	47.0	40	58	193	70	300			
	47540-15	47.5	40	58	193	70	300			
	48040-15	48.0	40	58	197	70	304			
	48540-15	48.5	40	58	197	70	304			
	49040-15	49.0	40	58	201	70	308			
	49540-15	49.5	40	58	201	70	308			
	50040-15	50.0	40	58	205	70	312			
	50540-15	50.5	40	58	205	70	312			
	51040-18	51.0	40	68	210	70	320	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	51540-18	51.5	40	68	210	70	320			
	52040-18	52.0	40	68	214	70	324			
	52540-18	52.5	40	68	214	70	324			
	53040-18	53.0	40	68	218	70	328			
	53540-18	53.5	40	68	218	70	328			
	54040-18	54.0	40	68	222	70	332			
	54540-18	54.5	40	68	222	70	332			
	55040-18	55.0	40	68	226	70	336			
	55540-18	55.5	40	68	226	70	336			
	56040-18	56.0	40	68	230	70	342			
	56540-18	56.5	40	68	230	70	342			
	57040-18	57.0	40	68	235	70	347			
	57540-18	57.5	40	68	235	70	347			
	58040-18	58.0	40	68	240	70	352			
	58540-18	58.5	40	68	240	70	352			
	59040-18	59.0	40	68	245	70	357			
	59540-18	59.5	40	68	245	70	357			
	60040-18	60.0	40	68	250	70	362			
	60540-18	60.5	40	68	250	70	362			

Applicable inserts **G04~05**

King Drill (5D)

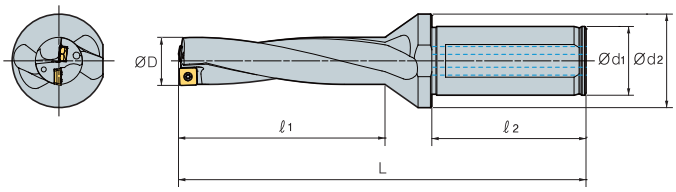


(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K5D	12020-04	12.0	20	25	63	50	127	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	12520-04	12.5	20	25	63	50	127			
	13020-04	13.0	20	25	68	50	132			
	13520-04	13.5	20	25	68	50	132			
	14020-05	14.0	20	25	73	50	138	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	14520-05	14.5	20	25	73	50	138			
	15020-05	15.0	20	25	78	50	144			
	15520-05	15.5	20	25	78	50	144			
	16020-05	16.0	20	25	83	50	149			
	16525-06	16.5	25	34	83	56	155	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	17025-06	17.0	25	34	88	56	160			
	17525-06	17.5	25	34	88	56	160			
	18025-06	18.0	25	34	93	56	166			
	18525-06	18.5	25	34	93	56	166			
	19025-06	19.0	25	34	98	56	171			
	19525-06	19.5	25	34	98	56	171			
	20025-07	20.0	25	34	103	56	178	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	20525-07	20.5	25	34	103	56	178			
	21025-07	21.0	25	34	108	56	183			
	21525-07	21.5	25	34	108	56	183			
	22025-07	22.0	25	34	113	56	188			
	22525-07	22.5	25	34	113	56	188			
	23025-07	23.0	25	34	118	56	195			
	23525-07	23.5	25	34	118	56	195			
	24032-09	24.0	32	44	123	60	205	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	24532-09	24.5	32	44	123	60	205			
	25032-09	25.0	32	44	128	60	210			
	25532-09	25.5	32	44	128	60	210			
	26032-09	26.0	32	44	133	60	215			
	26532-09	26.5	32	44	133	60	215			
	27032-09	27.0	32	44	138	60	221			
	27532-09	27.5	32	44	138	60	221			
	28032-09	28.0	32	44	143	60	227			
	28532-09	28.5	32	44	143	60	227			
	29032-09	29.0	32	44	148	60	232			
	29532-09	29.5	32	44	148	60	232			
	30032-11	30.0	32	44	153	60	240	SP□T11T308-□□ XO□T11T306-□□	FTKA03508	TW15S
	30532-11	30.5	32	44	153	60	240			
	31032-11	31.0	32	44	158	60	245			
	31532-11	31.5	32	44	158	60	245			
	32032-11	32.0	32	44	163	60	250			
	32532-11	32.5	32	44	163	60	250			
	33032-11	33.0	32	44	168	60	256			
	33532-11	33.5	32	44	168	60	256			
	34032-11	34.0	32	44	173	60	261			
	34532-11	34.5	32	44	173	60	261			
	35032-11	35.0	32	44	178	60	266			
	35532-11	35.5	32	44	178	60	266			

Applicable inserts **G04~05**

King Drill (5D)



(mm)

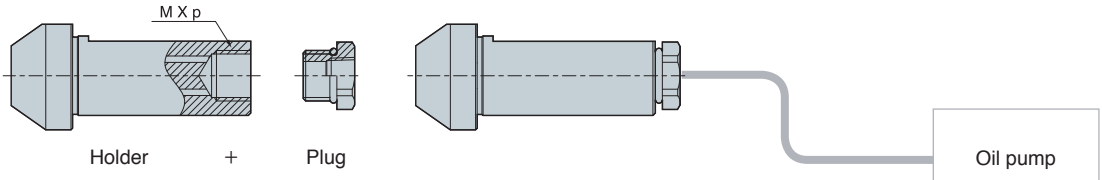
Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K5D	36040-13	36.0	40	48	184	70	284	SP□T130410-□□ XO□T130406-□□	FTKA0410	TW15S
	36540-13	36.5	40	48	184	70	284			
	37040-13	37.0	40	48	189	70	289			
	37540-13	37.5	40	48	189	70	289			
	38040-13	38.0	40	48	194	70	295			
	38540-13	38.5	40	48	194	70	295			
	39040-13	39.0	40	48	199	70	300			
	39540-13	39.5	40	48	199	70	300			
	40040-13	40.0	40	48	204	70	306			
	40540-13	40.5	40	48	204	70	306			
	41040-13	41.0	40	48	209	70	311			
	41540-13	41.5	40	48	209	70	311			
	42040-13	42.0	40	48	214	70	317			
	42540-13	42.5	40	48	214	70	317			
	43040-15	43.0	40	58	220	70	325	SP□T15M510-□□ XO□T15M508-□□	FTNC04511	TW20S
	43540-15	43.5	40	58	221	70	326			
	44040-15	44.0	40	58	225	70	330			
	44540-15	44.5	40	58	225	70	330			
	45040-15	45.0	40	58	230	70	336			
	45540-15	45.5	40	58	230	70	336			
	46040-15	46.0	40	58	235	70	341			
	46540-15	46.5	40	58	235	70	341			
	47040-15	47.0	40	58	240	70	347			
	47540-15	47.5	40	58	240	70	347			
	48040-15	48.0	40	58	245	70	352			
	48540-15	48.5	40	58	245	70	352			
	49040-15	49.0	40	58	250	70	357			
	49540-15	49.5	40	58	250	70	357			
	50040-15	50.0	40	58	255	70	362			
	50540-15	50.5	40	58	255	70	362			
	51040-18	51.0	40	68	261	70	371	SP□T180510-□□ XO□T180508-□□	FTNA0511	TW20-100
	51540-18	51.5	40	68	261	70	371			
	52040-18	52.0	40	68	266	70	376			
	52540-18	52.5	40	68	266	70	376			
	53040-18	53.0	40	68	271	70	381			
	53540-18	53.5	40	68	271	70	381			
	54040-18	54.0	40	68	276	70	386			
	54540-18	54.5	40	68	276	70	386			
	55040-18	55.0	40	68	281	70	391			
	55540-18	55.5	40	68	281	70	391			
	56040-18	56.0	40	68	286	70	398			
	56540-18	56.5	40	68	286	70	398			
	57040-18	57.0	40	68	292	70	404			
	57540-18	57.5	40	68	292	70	404			
	58040-18	58.0	40	68	298	70	410			
	58540-18	58.5	40	68	298	70	410			
	59040-18	59.0	40	68	304	70	416			
	59540-18	59.5	40	68	304	70	416			
	60040-18	60.0	40	68	310	70	422			
	60540-18	60.5	40	68	310	70	422			

Applicable inserts **G04~05**

Drill with through coolant system for general lathe and CNC lathe without through coolant system

King Drill (For through coolant system with a lathe)

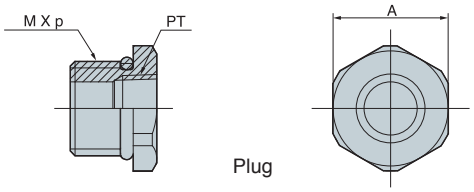
- Through coolant system with drill holder, plug, oil-hole hose and oil-hole pump
- PT TAP in the plug is combined to PT TAP connected to oil hose
- Available to use the drill without a plug in milling machine



• Clamping oil hose to the bottom of plug and connect the oil pump to the holder

(mm)

Tap type	Diameter	Shank dia.	M x p	Plug
K□D120~16020HP-□□	Ø12.0~Ø16.0	Ø20	M12x1.5	PLG12PT18
K□D161~23525HP-□□	Ø16.1~Ø23.5	Ø25	M16x1.5	PLG16PT18
K□D236~35532HP-□□	Ø23.6~Ø35.5	Ø32	M20x2.0	PLG20PT14
K□D356~60940HP-□□	Ø35.6~Ø60.5	Ø40	M27x2.0	PLG27PT38

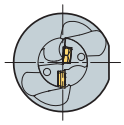


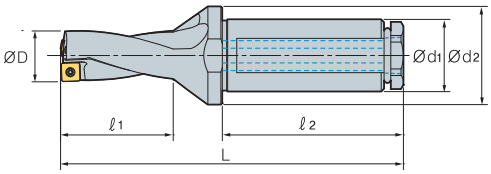
• Plug is assembled

Plug type	M x p	PT tap	A
PLG12PT18	M12x1.5	1/8	16
PLG16PT18	M16x1.5	1/8	19
PLG20PT14	M20x2.0	1/4	26
PLG27PT38	M27x2.0	3/8	35

King Drill (2D)

For through coolant system with a lathe





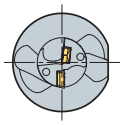
(mm)

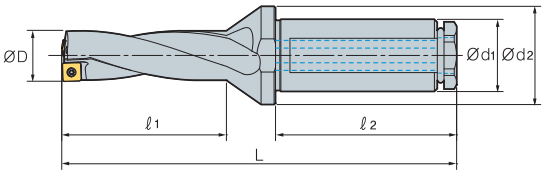
Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K2D	13020HP-04	13.0	20	25	29	50	93	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	13520HP-04	13.5	20	25	29	50	93			
	14020HP-05	14.0	20	25	31	50	96	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	15020HP-05	15.0	20	25	33	50	99			
	16020HP-05	16.0	20	25	35	50	101			
	17025HP-06	17.0	25	34	37	56	109	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	18025HP-06	18.0	25	34	39	56	112			
	19025HP-06	19.0	25	34	41	56	114			
	20025HP-07	20.0	25	34	43	56	118	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	21025HP-07	21.0	25	34	45	56	120			
	22025HP-07	22.0	25	34	47	56	122			
	23025HP-07	23.0	25	34	49	56	126			
	24032HP-09	24.0	32	44	51	60	133	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	25032HP-09	25.0	32	44	53	60	135			
	26032HP-09	26.0	32	44	55	60	137			
	27032HP-09	27.0	32	44	57	60	140			
	28032HP-09	28.0	32	44	59	60	143			
	29032HP-09	29.0	32	44	61	60	145			

Applicable inserts **G04~05**

King Drill (3D)

For through coolant system with a lathe





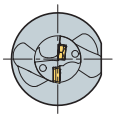
(mm)

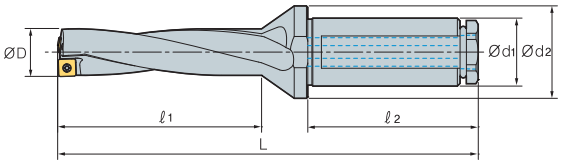
Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K3D	13020HP-04	13.0	20	25	42	50	106	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	13520HP-04	13.5	20	25	42	50	106			
	14020HP-05	14.0	20	25	45	50	110	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	14520HP-05	14.5	20	25	45	50	110			
	15020HP-05	15.0	20	25	48	50	114			
	15520HP-05	15.5	20	25	48	50	114			
	16020HP-05	16.0	20	25	51	50	117			
	16525HP-06	16.5	25	34	51	56	123	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	17025HP-06	17.0	25	34	54	56	126			
	17525HP-06	17.5	25	34	54	56	126			
	18025HP-06	18.0	25	34	57	56	130			
	18525HP-06	18.5	25	34	57	56	130			
	19025HP-06	19.0	25	34	60	56	133			
	19525HP-06	19.5	25	34	60	56	133			
	20025HP-07	20.0	25	34	63	56	138	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	20525HP-07	20.5	25	34	63	56	138			
	21025HP-07	21.0	25	34	66	56	141			
	21525HP-07	21.5	25	34	66	56	141			
	22025HP-07	22.0	25	34	69	56	144			
	22525HP-07	22.5	25	34	69	56	144			
	23025HP-07	23.0	25	34	72	56	149			
	23525HP-07	23.5	25	34	72	56	149			
	24032HP-09	24.0	32	44	75	60	157	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	24532HP-09	24.5	32	44	75	60	157			
	25032HP-09	25.0	32	44	78	60	160			
	25532HP-09	25.5	32	44	78	60	160			
	26032HP-09	26.0	32	44	81	60	163			
	26532HP-09	26.5	32	44	81	60	163			
	27032HP-09	27.0	32	44	84	60	167			
	27532HP-09	27.5	32	44	84	60	167			
	28032HP-09	28.0	32	44	87	60	171			
	28532HP-09	28.5	32	44	87	60	171			
	29032HP-09	29.0	32	44	90	60	174			
	29532HP-09	29.5	32	44	90	60	174			

Applicable inserts **G04~05**

King Drill (4D)

For through coolant system with a lathe





(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert	Screw	Wrench
K4D	13020HP-04	13.0	20	25	29	50	93	SP□T040204-□□ XO□T040204-□□	FTNA0204	TW06P
	13520HP-04	13.5	20	25	29	50	93			
	14020HP-05	14.0	20	25	59	50	124	SP□T050204-□□ XO□T050204-□□	FTNA0204	TW06P
	15020HP-05	15.0	20	25	63	50	129			
	16020HP-05	16.0	20	25	67	50	133			
	17025HP-06	17.0	25	34	71	56	143	SP□T060205-□□ XO□T060204-□□	FTKA02206S	TW07P
	18025HP-06	18.0	25	34	75	56	148			
	19025HP-06	19.0	25	34	79	56	152			
	20025HP-07	20.0	25	34	83	56	158	SP□T07T208-□□ XO□T07T205-□□	FTKA02565	TW07S
	21025HP-07	21.0	25	34	87	56	162			
	22025HP-07	22.0	25	34	91	56	166			
	23025HP-07	23.0	25	34	95	56	172			
	24032HP-09	24.0	32	44	99	60	181	SP□T090308-□□ XO□T090305-□□	FTKA0307	TW09S
	25032HP-09	25.0	32	44	103	60	185			
	26032HP-09	26.0	32	44	107	60	189			
	27032HP-09	27.0	32	44	111	60	194			
	28032HP-09	28.0	32	44	115	60	199			
	29032HP-09	29.0	32	44	119	60	203			

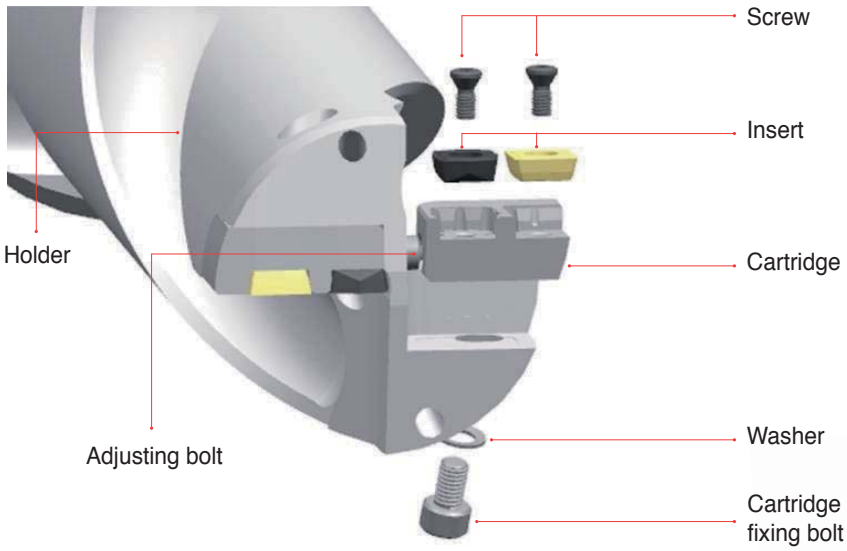
Applicable inserts **G04~05**

High rigidity drill produces cost efficiency due to cartridge replacement

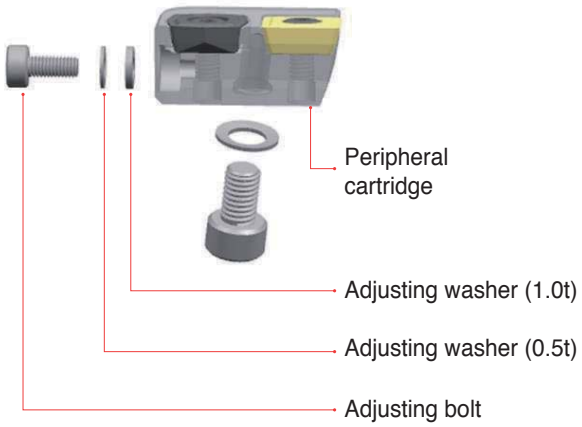
King Drill (For large diameter drilling)

- Cartridge type for Ø61~Ø100 drilling
- Peripheral cartridge can adjust the drilling diameter within 5 mm
- Easy to adjust drilling diameter with adjusting bolt

Structure of King Drill (for large diameter) parts



Adjustment of drill diameter

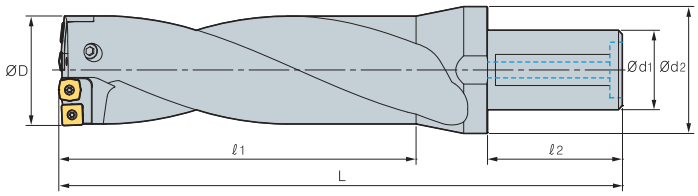


Adjustment Ø (mm)	Adjusting washer	
	Designation	Width (mm)
1	WA0305	0.5
2	WA0310	1.0
3	WA0305+WA0310	1.5
4	WA0310x2	2.0
5	WA0305+WA0310x2	2.5

※ Adjusting washer adjusts the drilling diameter within 5 mm

King Drill

For large diameter drilling



(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Cartridge		Screw	Wrench
								Internal	External		
K2D	616550-11	61~65	50	80	130	80	255	KDC6165C	KDC6165P	FTKA03508	TW15S
	657050-13	65~70	50	88	140	80	265	KDC6570C	KDC6570P	FTKA0410	TW15S
	707550-13	70~75	50	88	150	80	275	KDC7075C	KDC7075P	FTKA0410	TW15S
	758050-13	75~80	50	88	160	80	285	KDC7580C	KDC7580P	FTKA0410	TW15S
	808550-15	80~85	50	88	170	80	295	KDC8085C	KDC8085P	FTNC04511	TW20S
	859050-15	85~90	50	95	180	80	305	KDC8590C	KDC8590P	FTNC04511	TW20S
	909550-15	90~95	50	95	190	80	315	KDC9095C	KDC9095P	FTNC04511	TW20S
	9510050-18	95~100	50	95	200	80	325	KDC95100C	KDC95100P	FTNA0511	TW20-100
K3D	616550-11	61~65	50	80	195	80	320	KDC6165C	KDC6165P	FTKA03508	TW15S
	657050-13	65~70	50	88	210	80	335	KDC6570C	KDC6570P	FTKA0410	TW15S
	707550-13	70~75	50	88	225	80	350	KDC7075C	KDC7075P	FTKA0410	TW15S
	758050-13	75~80	50	88	240	80	365	KDC7580C	KDC7580P	FTKA0410	TW15S
	808550-15	80~85	50	88	255	80	380	KDC8085C	KDC8085P	FTNC04511	TW20S
	859050-15	85~90	50	95	270	80	395	KDC8590C	KDC8590P	FTNC04511	TW20S
	909550-15	90~95	50	95	285	80	410	KDC9095C	KDC9095P	FTNC04511	TW20S
	9510050-18	95~100	50	95	300	80	425	KDC95100C	KDC95100P	FTNA0511	TW20-100
K4D	616550-11	61~65	50	80	260	80	385	KDC6165C	KDC6165P	FTKA03508	TW15S
	657050-13	65~70	50	88	280	80	405	KDC6570C	KDC6570P	FTKA0410	TW15S
	707550-13	70~75	50	88	300	80	425	KDC7075C	KDC7075P	FTKA0410	TW15S
	758050-13	75~80	50	88	320	80	445	KDC7580C	KDC7580P	FTKA0410	TW15S
	808550-15	80~85	50	88	340	80	465	KDC8085C	KDC8085P	FTNC04511	TW20S
	859050-15	85~90	50	95	360	80	485	KDC8590C	KDC8590P	FTNC04511	TW20S
	909550-15	90~95	50	95	380	80	505	KDC9095C	KDC9095P	FTNC04511	TW20S
	9510050-18	95~100	50	95	400	80	525	KDC95100C	KDC95100P	FTNA0511	TW20-100

Applicable inserts **G04~05**

Parts

Cartridge		Range (Ø)	Insert				Screw	Wrench
Internal	External		Designation	Quantity	Designation	Quantity		
KDC6165C	KDC6165P	61 ~ 65	XO□T11T306-□□	2	SP□T11T308-□□	2	FTKA03508	TW15S
KDC6570C	KDC6570P	65 ~ 70	XO□T130406-□□	2	SP□T130410-□□	2	FTKA0410	TW15S
KDC7075C	KDC7075P	70 ~ 75	XO□T130406-□□	2	SP□T130410-□□	2	FTKA0410	TW15S
KDC7580C	KDC7580P	75 ~ 80	XO□T130406-□□	2	SP□T130410-□□	2	FTKA0410	TW15S
KDC8085C	KDC8085P	80 ~ 85	XO□T15M508-□□	2	SP□T15M510-□□	2	FTNC04511	TW20S
KDC8590C	KDC8590P	85 ~ 90	XO□T15M508-□□	2	SP□T15M510-□□	2	FTNC04511	TW20S
KDC9095C	KDC9095P	90 ~ 95	XO□T15M508-□□	2	SP□T15M510-□□	2	FTNC04511	TW20S
KDC95100C	KDC95100P	95 ~ 100	XO□T180508-□□	2	SP□T180510-□□	2	FTNA0511	TW20-100

Cone shaped head indexable drill

TPDC new

- Clamping design
  - One step clamp system → Increased stability
  - Clamping system allowing to change inserts while the holder is attached on the machine → Shortened setting time
- Optimized blade design
  - Excellent chip control → Wide application range in various types of materials.
- Helical shaped coolant hole system
  - Wide chip pocket area secured → Better lubrication + chip flow improved
- Material technology
  - Ultra-fine substrate + Multi-layer coating applied → Excellent anti chipping & wear resistance

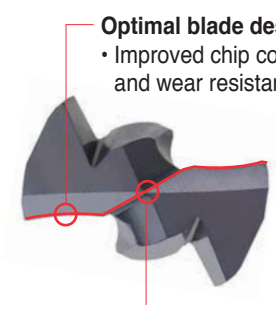
Code system of holder

TPD	C	5D – 150	20 – 75
Top solid piercing drill	Insert type C: Cone type	Aspect ratio (L/D) 3D, 5D, 8D, 10D, 12D	Drill dia. 150: Ø15.0	Shank dia. 20: Ø20	Flute length (mm) 75: 75 mm

Code system of insert

TPD	1500	C	P
Top solid piercing drill	Drill dia. 1500: Ø15.00	Insert type C: Cone type	Machining area P: Steel, Universal M: Stainless steel K: Cast iron N: Aluminium

Features



Optimal blade design
• Improved chip control and wear resistance

Overlap thinning
• Excellent centering and penetration

Surface treatment
• Good durability

Flute polishing
• Better chip flow

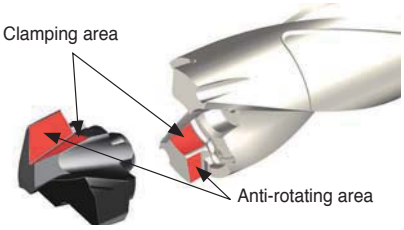
Helical shaped coolant hole system
• Chip flow improved

High helix angle
• Low cutting load and good machinability

Features of clamping system

• One Step Clamp System → Easy and quick tool change with good repeatability

- Clamping area: Easy and fast tool change
- Anti-rotating area: Performs as a stopper
- Clamping and anti-rotating area make an acute angle to prevent insert rotation while machining



Performance evaluation

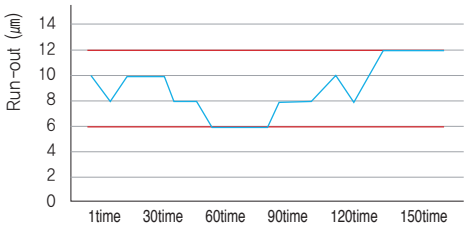
Durability test

■ **Workpiece** SCM440 (HRC22)
Drill dia.(mm) = Ø15.0
vc (m/min) = 90, fn (mm/rev) = 0.25
ap (mm) = 60, wet

■ **Tools** **Inserts** TPD1500CP (PC5335)
Holder TPDC5D-15020-75

After using 40 inserts, the setting run-out remains below 15㎛

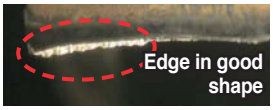
Sustainability test



After clamping 150 times, the drill run-out remains

Application examples

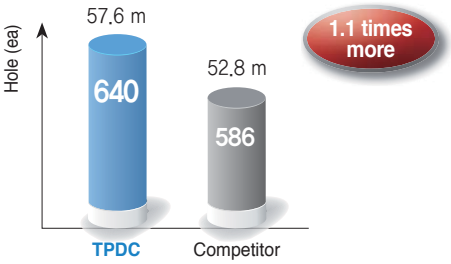
■ **Use** Part of machine
■ **Workpiece** Alloy steel (SCM440, HRC22)
■ **Cutting conditions** Drill dia.(mm) = Ø19.0
vc (m/min) = 100
fn (mm/rev) = 0.3
ap (mm) = 90, wet
■ **Tools** **Inserts** TPD1900CP (PC5335)
Holder TPDC5D-19025-95



TPDC

Competitor

■ **Test result**



Lubricative multi-layer coating prevents chipping on cutting edges

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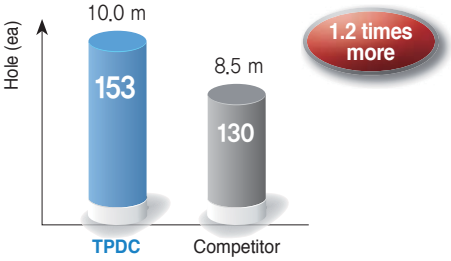
■ **Use** Part of machine
■ **Workpiece** Carbon steel (SM45C, HRC40)
■ **Cutting conditions** Drill dia.(mm) = Ø18.0
vc (m/min) = 60
fn (mm/rev) = 0.15
ap (mm) = 65, wet
■ **Tools** **Inserts** TPD1800CP (PC5335)
Holder TPDC5D-18025-90

■ **Test result**



Lubricative multi-layer coating enhances wear resistance

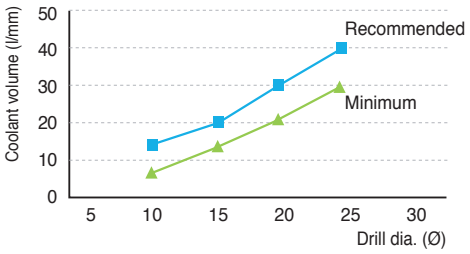
Recommended cutting condition

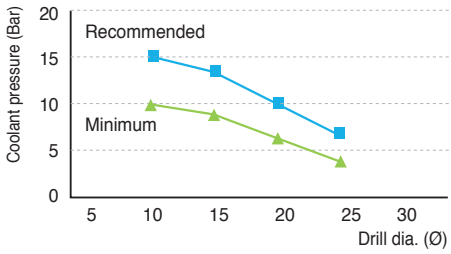
Workpiece				Grade	vc (m/min)	Aspect ratio (L/D) = 3D, 5D		
						Feed rate (mm/rev) per drill dia. (mm)		
ISO		Workpiece	HB			Ø12.00~Ø15.99	Ø16.00~Ø25.99	Ø25.00~Ø30.99
P	Carbon steel	Low carbon steel	80~120	PC5335 PC330P	110(80~140)	0.15~0.30	0.20~0.35	0.25~0.40
		High carbon steel	180~280	PC5335 PC330P	100(70~130)	0.15~0.30	0.20~0.35	0.25~0.40
	Alloy steel	Low alloy steel	140~260	PC5335 PC5300	110(80~140)	0.18~0.35	0.23~0.38	0.28~0.43
		Hardened low alloy steel	200~400	PC5335 PC5300	75(50~100)	0.18~0.35	0.23~0.38	0.28~0.43
		High alloy steel	260~320	PC5335	70(50~90)	0.18~0.30	0.20~0.35	0.25~0.40
		Hardened high alloy steel	300~450	PC5335 PC5300	60(40~80)	0.18~0.30	0.20~0.35	0.25~0.40
M	Stainless steel	Austenite series	135~275	PC330N	60(40~80)	0.05~0.15	0.10~0.20	0.15~0.25
		Ferrite series Martensite series	135~275	PC330N	70(50~90)	0.10~0.20	0.15~0.30	0.20~0.35
N	Non-ferrous metal	Aluminum alloy	30~150	H01	200(90~220)	0.35~0.45	0.40~0.50	0.45~0.55
		Copper alloy	150~160	H01	200(90~220)	0.35~0.45	0.40~0.50	0.45~0.55

- In case of 8D, reduce the cutting condition 40~50% lower than above after machining the beginning of hole(1.5D)
- In case of interrupted machining, reduce the feed to 0.1~0.15 around the interrupted part
- In case of 10D ~12D, follow the recommended cutting conditions below.
- In case of stainless steel machining, machine under low feed first then, set the best cutting condition checking machinability gradually

Coolant tip

- **Workpiece** SCM440 (HRC22)
- **Cutting conditions** vc (m/min) = 100, wet





How to make good insert clamping

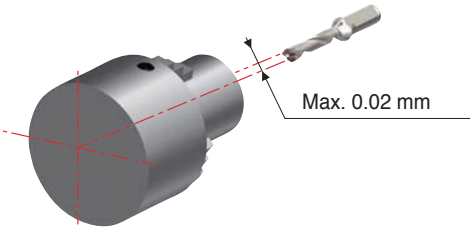
① Clean the mounting seat with air or cloth

② Put an insert on the holder

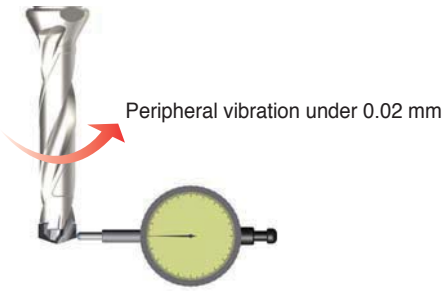
③ A part of wrench and B part of insert must be parallel to each other before clamp the insert
Turn the wrench clockwise to finish clamping

Clamped state

Precautions when setting

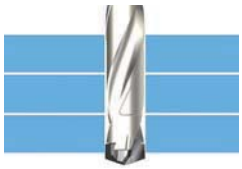
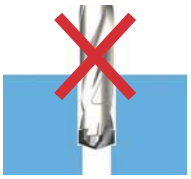


Setting of the horizontal equipment



Setting of the vertical equipment

Precautions when drilling

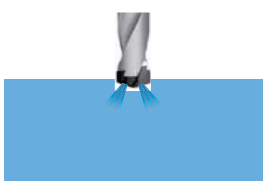
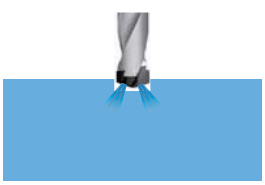
Ramping	Overlapped	Plunging	Boring
			
1. A slope inclined more than 6° is not allowed 2. When entering, reduce the feed to 30~50%	1. Space between panels affects chip evacuation problem 2. Do not make space between panels	Not allowed	Not allowed

Recommended cutting conditions in deep hole (10D, 12D) drilling

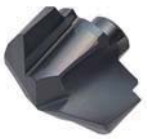
• **Drill with a pilot drill (recommended)**

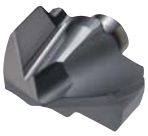
1. Drill a beginning hole (with a pilot drill)	2. Start drilling
	
Drill a beginning hole to the depth of 0.5D and 70% less cutting speed using a 1.5D or a 3D drill.	After replacing the drill to a new one, start drilling under the recommended cutting conditions.

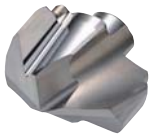
• **Drilling without a pilot drill**

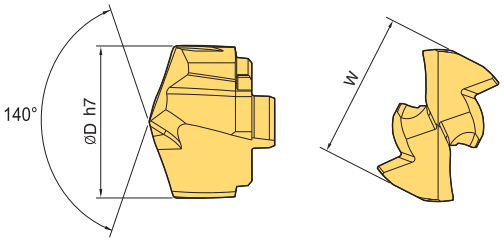
1. Drill a beginning hole (without a pilot drill)	2. Stop drilling	3. Ready for drilling	4. Start drilling
			
After drilling to the depth of 0.5D with 70% less cutting speed, stop drilling for 2~3 seconds without taking out the drill.	After taking out the drill without the injection of the coolant to the hole, stop machining for 2~3 seconds.	Insert the drill to the depth of 2~3 mm higher than the surface of the bottom of the hole and be ready to machine during 2~3 seconds after starting the injection of the coolant.	Start drilling under the recommended cutting conditions

TPDC Insert new


CP


CM


CN



(mm)

	Designation	Drill dia. (ØD)	Coated PC5335	Coated PC330P	Coated PC330N	Uncoated H01	Holder	Wrench
TPD	1200CP,CM,CN	12.0	●				TPDC□D-12016-□	TPDC-W12
	1220CP,CM,CN	12.2	●					
	1250CP,CM,CN	12.5	●				TPDC□D-12516-□	
	1260CP,CM,CN	12.6	●					
	1300CP,CM,CN	13.0	●				TPDC□D-13016-□	TPDC-W13
	1350CP,CM,CN	13.5	●				TPDC□D-13516-□	
	1400CP,CM,CN	14.0	●				TPDC□D-14016-□	TPDC-W14
	1420CP,CM,CN	14.2						
	1430CP,CM,CN	14.3						
	1450CP,CM,CN	14.5					TPDC□D-14516-□	
	1500CP,CM,CN	15.0	●				TPDC□D-15020-□	TPDC-W15
	1550CP,CM,CN	15.5						
	1600CP,CM,CN	16.0	●				TPDC□D-16020-□	TPDC-W16
	1630CP,CM,CN	16.3						
	1650CP,CM,CN	16.5						
	1670CP,CM,CN	16.7						
	1700CP,CM,CN	17.0	●				TPDC□D-17020-□	TPDC-W17
	1750CP,CM,CN	17.5						
	1770CP,CM,CN	17.7						
	1800CP,CM,CN	18.0	●				TPDC□D-18025-□	TPDC-W18
	1810CP,CM,CN	18.1						
	1850CP,CM,CN	18.5						
	1860CP,CM,CN	18.6						
	1870CP,CM,CN	18.7						
	1900CP,CM,CN	19.0	●				TPDC□D-19025-□	TPDC-W19
	1920CP,CM,CN	19.2						
	1950CP,CM,CN	19.5						
	1970CP,CM,CN	19.7						
	2000CP,CM,CN	20.0	●				TPDC□D-20025-□	TPDC-W20
	2050CP,CM,CN	20.5						
	2100CP,CM,CN	21.0	●				TPDC□D-21025-□	TPDC-W21
	2150CP,CM,CN	21.5						
	2200CP,CM,CN	22.0	●				TPDC□D-22025-□	TPDC-W22
	2250CP,CM,CN	22.5						
	2260CP,CM,CN	22.6						
	2270CP,CM,CN	22.7						
	2300CP,CM,CN	23.0	●				TPDC□D-23025-□	TPDC-W23
	2350CP,CM,CN	23.5						
	2400CP,CM,CN	24.0	●				TPDC□D-24032-□	TPDC-W24
	2450CP,CM,CN	24.5						
	2500CP,CM,CN	25.0	●				TPDC□D-25032-□	TPDC-W25
	2530CP,CM,CN	25.3						
	2550CP,CM,CN	25.5						
	2580CP,CM,CN	25.8						
	2590CP,CM,CN	25.9						
	2600CP,CM,CN	26.0	●				TPDC□D-26032-□	TPDC-W26
	2650CP,CM,CN	26.5						
	2700CP,CM,CN	27.0	●				TPDC□D-27032-□	TPDC-W27
	2750CP,CM,CN	27.5	●					
	2800CP,CM,CN	28.0	●				TPDC□D-28032-□	TPDC-W28
	2850CP,CM,CN	28.5						
	2900CP,CM,CN	29.0	●				TPDC□D-29032-□	TPDC-W29
	2950CP,CM,CN	29.5						
	3000CP,CM,CN	30.0	●				TPDC□D-30032-□	TPDC-W30
	3050CP,CM,CN	30.5						

※ We can provide if you order diameter 12.0~30.9 except for the stock items above

● : Stock Item

Parts (Recommended torque per wrench)

(mm)

Designation	Drill dia. (ØD)	Torque (N·m)
TPDC-W12	12	2.5
TPDC-W13	13	2.5
TPDC-W14	14	2.5
TPDC-W15	15	2.5
TPDC-W16	16	2.5
TPDC-W17	17	2.5

Designation	Drill dia. (ØD)	Torque (N·m)
TPDC-W18	18	2.5
TPDC-W19	19	2.5
TPDC-W20	20	3.5
TPDC-W21	21	3.5
TPDC-W22	22	3.5
TPDC-W23	23	3.5

Designation	Drill dia. (ØD)	Torque (N·m)
TPDC-W24	24	3.5
TPDC-W25	25	3.5
TPDC-W26	26	4.5
TPDC-W27	27	4.5
TPDC-W28	28	4.5
TPDC-W29	29	4.5
TPDC-W30	30	4.5

TPDC (3D/5D/8D/10D/12D) new

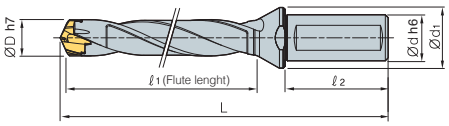


Fig.1

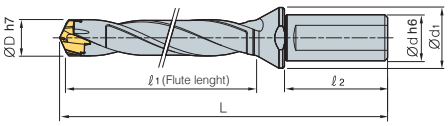


Fig.2

(mm)

Designation		ØD	Ød	Ød1	ℓ1	ℓ2	L	Insert	Fig.
TPDC	3D-12016-36	12.0~12.4	16	20	36	48	99	TPD1200C□-1249C□	1
	3D-12516-38	12.5~12.9	16	20	38	48	101	TPD1250C□-1299C□	1
	3D-13016-39	13.0~13.4	16	20	39	48	103	TPD1300C□-1349C□	1
	3D-13516-41	13.5~13.9	16	20	41	48	105	TPD1350C□-1399C□	1
	3D-14016-42	14.0~14.4	16	20	42	48	106	TPD1400C□-1449C□	1
	3D-14516-44	14.5~14.9	16	20	44	48	107	TPD1450C□-1499C□	1
	3D-15020-45	15.0~15.9	20	25	45	50	113	TPD1500C□-1599C□	2
	3D-16020-48	16.0~16.9	20	25	48	50	117	TPD1600C□-1699C□	2
	3D-17020-51	17.0~17.9	20	25	51	50	120	TPD1700C□-1799C□	2
	3D-18025-54	18.0~18.9	25	33	54	56	132	TPD1800C□-1899C□	2
	3D-19025-57	19.0~19.9	25	33	57	56	135	TPD1900C□-1999C□	2
	3D-20025-60	20.0~20.9	25	33	60	56	138	TPD2000C□-2099C□	2
	3D-21025-63	21.0~21.9	25	33	63	56	141	TPD2100C□-2199C□	2
	3D-22025-66	22.0~22.9	25	33	66	56	145	TPD2200C□-2299C□	2
	3D-23025-69	23.0~23.9	25	33	69	56	149	TPD2300C□-2399C□	2
	3D-24032-72	24.0~24.9	32	43	72	60	159	TPD2400C□-2499C□	2
	3D-25032-75	25.0~25.9	32	43	75	60	162	TPD2500C□-2599C□	2
	3D-26032-78	26.0~26.9	32	43	78	60	173	TPD2600C□-2699C□	2
	3D-27032-81	27.0~27.9	32	43	81	60	176	TPD2700C□-2799C□	2
	3D-28032-84	28.0~28.9	32	43	84	60	180	TPD2800C□-2899C□	2
	3D-29032-87	29.0~29.9	32	43	87	60	185	TPD2900C□-2999C□	2
	3D-30032-90	30.0~30.9	32	43	90	60	188	TPD3000C□-3099C□	2
	5D-12016-60	12.0~12.9	16	20	60	48	123	TPD1200C□-1249C□	1
	5D-12516-63	12.5~12.9	16	20	63	48	126	TPD1250C□-1299C□	1
	5D-13016-65	13.0~13.9	16	20	65	48	129	TPD1300C□-1349C□	1
	5D-13516-68	13.5~13.9	16	20	68	48	132	TPD1350C□-1399C□	1
	5D-14016-70	14.0~14.9	16	20	70	48	134	TPD1400C□-1449C□	1
	5D-14516-73	14.5~14.9	16	20	73	48	136	TPD1450C□-1499C□	1
	5D-15020-75	15.0~15.9	20	25	75	50	143	TPD1500C□-1599C□	2
	5D-16020-80	16.0~16.9	20	25	80	50	149	TPD1600C□-1699C□	2
	5D-17020-85	17.0~17.9	20	25	85	50	154	TPD1700C□-1799C□	2
	5D-18025-90	18.0~18.9	25	33	90	56	168	TPD1800C□-1899C□	2
	5D-19025-95	19.0~19.9	25	33	95	56	173	TPD1900C□-1999C□	2
	5D-20025-100	20.0~20.9	25	33	100	56	178	TPD2000C□-2099C□	2
	5D-21025-105	21.0~21.9	25	33	105	56	183	TPD2100C□-2199C□	2
	5D-22025-110	22.0~22.9	25	33	110	56	189	TPD2200C□-2299C□	2
	5D-23025-115	23.0~23.9	25	33	115	56	195	TPD2300C□-2399C□	2
	5D-24032-120	24.0~24.9	32	43	120	60	207	TPD2400C□-2499C□	2
	5D-25032-125	25.0~25.9	32	43	125	60	212	TPD2500C□-2599C□	2
	5D-26032-130	26.0~26.9	32	43	130	60	225	TPD2600C□-2699C□	2
	5D-27032-135	27.0~27.9	32	43	135	60	230	TPD2700C□-2799C□	2
	5D-28032-140	28.0~28.9	32	43	140	60	236	TPD2800C□-2899C□	2
	5D-29032-145	29.0~29.9	32	43	145	60	243	TPD2900C□-2999C□	2
	5D-30032-150	30.0~30.9	32	43	150	60	248	TPD3000C□-3099C□	2
	8D-12016-96	12.0~12.9	16	20	96	48	159	TPD1200C□-1249C□	1
	8D-12516-100	12.5~12.9	16	20	100	48	163	TPD1250C□-1299C□	1
	8D-13016-104	13.0~13.9	16	20	104	48	168	TPD1300C□-1349C□	1
	8D-13516-108	13.5~13.9	16	20	108	48	173	TPD1350C□-1399C□	1
	8D-14016-112	14.0~14.9	16	20	112	48	176	TPD1400C□-1449C□	1
	8D-14516-116	14.5~14.9	16	20	116	48	180	TPD1450C□-1499C□	1
	8D-15020-120	15.0~15.9	20	25	120	50	188	TPD1500C□-1599C□	2
	8D-16020-128	16.0~16.9	20	25	128	50	197	TPD1600C□-1699C□	2
	8D-17020-136	17.0~17.9	20	25	136	50	205	TPD1700C□-1799C□	2
	8D-18025-144	18.0~18.9	25	33	144	56	222	TPD1800C□-1899C□	2
	8D-19025-152	19.0~19.9	25	33	152	56	230	TPD1900C□-1999C□	2

Applicable inserts **G31**

※ The shank is based on DIN6535 and ISO9677

TPDC (3D/5D/8D/10D/12D) new

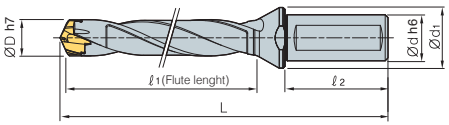


Fig.1

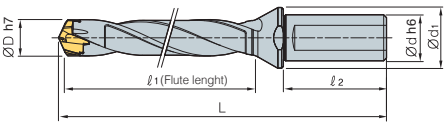


Fig.2

(mm)

Designation		ØD	Ød	Ød1	ℓ1	ℓ2	L	Insert	Fig.
TPDC	8D-20025-160	20.0~20.9	25	33	160	56	238	TPD2000C□-2099C□	2
	8D-21025-168	21.0~21.9	25	33	168	56	246	TPD2100C□-2199C□	2
	8D-22025-176	22.0~22.9	25	33	176	56	255	TPD2200C□-2299C□	2
	8D-23025-184	23.0~23.9	25	33	184	56	264	TPD2300C□-2399C□	2
	8D-24032-192	24.0~24.9	32	43	192	60	279	TPD2400C□-2499C□	2
	8D-25032-200	25.0~25.9	32	43	200	60	287	TPD2500C□-2599C□	2
	8D-26032-208	26.0~26.9	32	43	208	60	303	TPD2600C□-2699C□	2
	8D-27032-216	27.0~27.9	32	43	216	60	311	TPD2700C□-2799C□	2
	8D-28032-224	28.0~28.9	32	43	224	60	320	TPD2800C□-2899C□	2
	8D-29032-232	29.0~29.9	32	43	232	60	330	TPD2900C□-2999C□	2
	8D-30032-240	30.0~30.9	32	43	240	60	338	TPD3000C□-3099C□	2
	10D-12016-120	12.0~12.4	16	20	120	48	183	TPD1200C□-1249C□	1
	10D-12516-125	12.5~12.9	16	20	125	48	188	TPD1250C□-1299C□	1
	10D-13016-130	13.0~13.4	16	20	130	48	194	TPD1300C□-1349C□	1
	10D-13516-135	13.5~13.9	16	20	135	48	199	TPD1350C□-1399C□	1
	10D-14016-140	14.0~14.4	16	20	140	48	204	TPD1400C□-1449C□	1
	10D-14516-145	14.5~14.9	16	20	145	48	208	TPD1450C□-1499C□	1
	10D-15020-150	15.0~15.9	20	25	150	50	218	TPD1500C□-1599C□	1
	10D-16020-160	16.0~16.9	20	25	160	50	229	TPD1600C□-1699C□	1
	10D-17020-170	17.0~17.9	20	25	170	50	239	TPD1700C□-1799C□	1
	10D-18025-180	18.0~18.9	25	33	180	56	258	TPD1800C□-1899C□	1
	10D-19025-190	19.0~19.9	25	33	190	56	268	TPD1900C□-1999C□	1
	10D-20025-200	20.0~20.9	25	33	200	56	278	TPD2000C□-2099C□	1
	10D-21025-210	21.0~21.9	25	33	210	56	288	TPD2100C□-2199C□	1
	10D-22025-220	22.0~22.9	25	33	220	56	299	TPD2200C□-2299C□	1
	10D-23025-230	23.0~23.9	25	33	230	56	310	TPD2300C□-2399C□	1
	10D-24032-240	24.0~24.9	32	43	240	60	327	TPD2400C□-2499C□	2
	10D-25032-250	25.0~25.9	32	43	250	60	337	TPD2500C□-2599C□	2
	10D-26032-260	26.0~26.9	32	43	260	60	355	TPD2600C□-2699C□	2
	10D-27032-270	27.0~27.9	32	43	270	60	365	TPD2700C□-2799C□	2
	10D-28032-280	28.0~28.9	32	43	280	60	376	TPD2800C□-2899C□	2
	10D-29032-290	29.0~29.9	32	43	290	60	388	TPD2900C□-2999C□	2
	10D-30032-300	30.0~30.9	32	43	300	60	398	TPD3000C□-3099C□	2
	12D-12016-144	12.0~12.4	16	20	144	48	207	TPD1200C□-1249C□	1
	12D-12516-150	12.5~12.9	16	20	150	48	213	TPD1250C□-1299C□	1
	12D-13016-156	13.0~13.4	16	20	156	48	220	TPD1300C□-1349C□	1
	12D-13516-162	13.5~13.9	16	20	162	48	226	TPD1350C□-1399C□	1
	12D-14016-168	14.0~14.4	16	20	168	48	232	TPD1400C□-1449C□	1
	12D-14516-174	14.5~14.9	16	20	174	48	237	TPD1450C□-1499C□	1
	12D-15020-180	15.0~15.9	20	25	180	50	248	TPD1500C□-1599C□	1
	12D-16020-192	16.0~16.9	20	25	192	50	261	TPD1600C□-1699C□	1
	12D-17020-204	17.0~17.9	20	25	204	50	273	TPD1700C□-1799C□	1
	12D-18025-216	18.0~18.9	25	33	216	56	294	TPD1800C□-1899C□	1
	12D-19025-228	19.0~19.9	25	33	228	56	306	TPD1900C□-1999C□	1
	12D-20025-240	20.0~20.9	25	33	240	56	318	TPD2000C□-2099C□	1
	12D-21025-252	21.0~21.9	25	33	252	56	330	TPD2100C□-2199C□	1
	12D-22025-264	22.0~22.9	25	33	264	56	343	TPD2200C□-2299C□	1
	12D-23025-276	23.0~23.9	25	33	276	56	356	TPD2300C□-2399C□	1
	12D-24032-288	24.0~24.9	32	43	288	60	375	TPD2400C□-2499C□	2
	12D-25032-300	25.0~25.9	32	43	300	60	387	TPD2500C□-2599C□	2
	12D-26032-312	26.0~26.9	32	43	312	60	407	TPD2600C□-2699C□	2
	12D-27032-324	27.0~27.9	32	43	324	60	419	TPD2700C□-2799C□	2
	12D-28032-336	28.0~28.9	32	43	336	60	432	TPD2800C□-2899C□	2
	12D-29032-348	29.0~29.9	32	43	348	60	446	TPD2900C□-2999C□	2
	12D-30032-360	30.0~30.9	32	43	360	60	458	TPD3000C□-3099C□	2

Applicable inserts **G31**

※ The shank is based on DIN6535 and ISO9677

Highly precise and efficient top solid indexable drill

TPDB Plus new

- Highly precise clamping system - Superior clamping precision with auto-centering system and highly precise grinding clamping parts
- Screw on clamping system - Easy to replace inserts
- Sharp cutting edge - Low cutting load and good chip control
- Holder with excellent durability - Holder with high rigidity and excellent wear resistance due to special surface treatment
- Holder with excellent chip control - Low cutting resistance and outstanding chip evaluation applying high helix angle

Code system of holder

TPD B - 200 - 25 - 5 - P

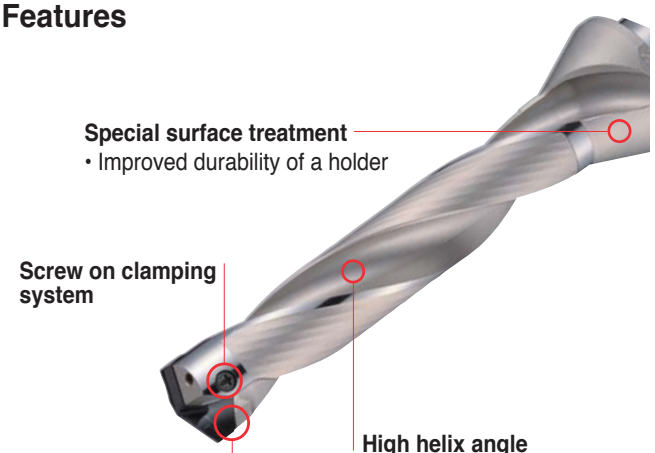
Top solid Piercing Drill	Insert type	Drill dia.	Shank dia.	Aspect ratio	Plus
	B: Blade type	200: Ø20.0	25: Ø25	3D, 5D, 8D, 10D, 12D	

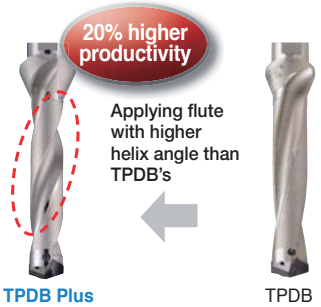
Code system of insert

TPD 200 B

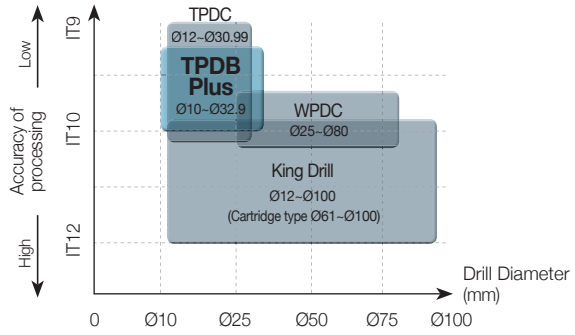
Top solid Piercing Drill	Drill dia.	Insert type
	200: Ø20.0	B: Blade type

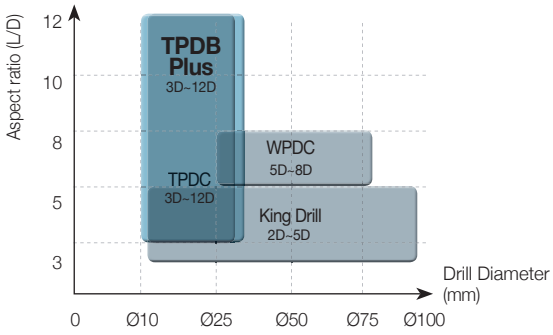
Features





Application range



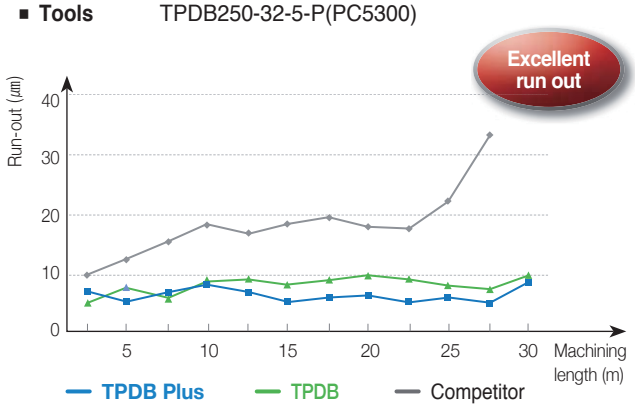


Tools	Application range					
	Drill Diameter (Ø)	Aspect ratio (L/D)	Tolerance of drill dia.	Tolerance	Surface finish of hole (Ra)	Workpiece
TPDB Plus	10 - 32.9 mm	3, 5, 8, 10, 12	h7	IT10	≤ 2.0㎛	P, K

Performance evaluation

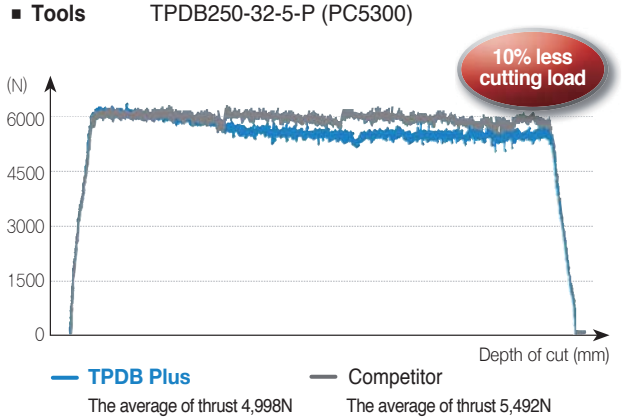
Run-out

- **Workpiece** Alloy steel (SCM440)
- **Cutting conditions** Drill dia.(mm) = Ø25, vc (m/min) = 90 fn (mm/rev) = 0.25, ap (mm) = 120, wet (20 bar)
- **Tools** TPDB250-32-5-P(PC5300)



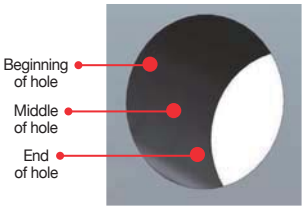
Cutting load

- **Workpiece** Alloy steel (SCM440)
- **Cutting conditions** Drill dia.(mm) = Ø25, vc (m/min) = 120 fn (mm/rev) = 0.25, ap (mm) = 120, wet (20 bar)
- **Tools** TPDB250-32-5-P (PC5300)

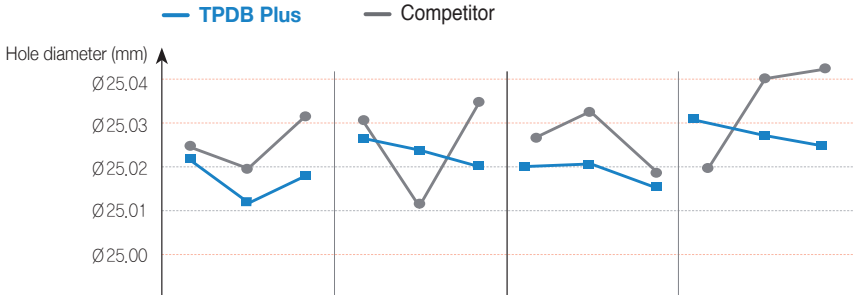


Outstanding roundness of hole

- **Workpiece** Alloy steel (SCM440)
- **Cutting conditions** Drill dia.(mm) = Ø25, vc (m/min) = 90/120, fn (mm/rev) = 0.25/0.35, ap (mm) = 120, wet (20 bar)
- **Tools** TPDB250-32-5-P (PC5300)



Drilling part



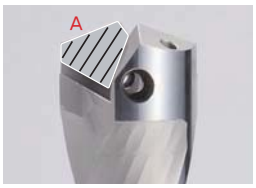
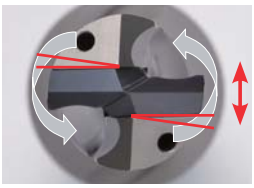
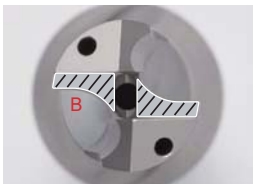
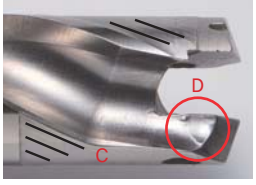
Machining part	Beginning	Middle	End	Beginning	Middle	End	Beginning	Middle	End	Beginning	Middle	End
fn (mm/rev)	0.25 (mm/rev)			0.35(mm/rev)			0.25 (mm/rev)			0.35 (mm/rev)		
vc (m/min)	90 (m/min)						120 (m/min)					

Recommended Cutting Conditions

Workpiece				Grade	vc (m/min)	Aspect ratio (L/D) = 3D, 5D		
						Feed rate (mm/rev) per drill dia. (mm)		
ISO		Workpiece	HB			Ø10~Ø16.9	Ø17~Ø26.9	Ø27~Ø32.9
P	Carbon steel	Low carbon steel	80~120	PC5335 PC330P	110(80~140)	0.15~0.30	0.20~0.35	0.25~0.40
		High carbon steel	180~280	PC5335 PC330P	100(70~130)	0.15~0.30	0.20~0.35	0.25~0.40
	Alloy steel	Low alloy steel	140~260	PC5300	110(80~140)	0.18~0.35	0.23~0.38	0.28~0.43
		Low alloy heat treated steel	200~400	PC5300	75(50~100)	0.18~0.35	0.23~0.38	0.28~0.43
		High alloy steel	50~260	PC5300	70(50~90)	0.18~0.30	0.20~0.35	0.25~0.40
		High alloy heat treated steel	220~450	PC5300	60(40~80)	0.18~0.30	0.20~0.35	0.25~0.40
K	Cast iron	Gray cast iron	150~230	PC5300	110(80~140)	0.18~0.35	0.20~0.40	0.25~0.45
		Ductile cast iron	160~260	PC5300	100(70~130)	0.18~0.35	0.20~0.40	0.25~0.45

※ In case of 8D, machine in 20-30% lower cutting conditions than the mentioned above, or machine the beginning of hole (1.5D) before drilling.
※ In interrupted machining, reduce the feed to 0.1-0.15 machining around the interrupted part.
※ Prefer to the 'Recommended drilling method' on the page 37 for drilling of 10D-12D

Replacement of Holders and Screws

Worn part	How to check	Description
[Pic.1] 	[Pic.2] Check the gap 	• In case of drilling for a long time as shown in the [Pic.1] the 'A' part is torn and twisted due to torque. • As shown in the [Pic.2] check the gap between the insert and the tip seat turning the clamped insert from side to side. If there is a gap between them, replace the used holder to a new one.
[Pic.3] 	[Pic.4] Check the moving 	• The insert could move up or down due to the load on the Z-axis in drilling over an extended period of time which causes wear on the 'B' part as shown the [Pic.3]. • After clamping an insert, if the insert is moving or there is a gap between the insert and the tip seat as shown in the [Pic.4] replace the used holder to a new one.
[Pic.5] 	Check the moving 	• After an extended period of use, the screw can be worn as shown in the 'E' part of [Pic.5] which could decrease the clamping force of the insert. When the screw is worn, replace the old screw to a new one among the enclosed extras. • Spreading the grease on the screw makes it last longer.
[Pic.6] ① Check the 'C' and 'D' parts as shown in the [Pic.6] ② Check whether the chips are getting longer or not.		• Winding or jamming of long and tiny chips in drilling causes wear or scratch on the 'C' part as shown in the [Pic.6] due to chattering from machining in improper cutting conditions. In that case, reset the cutting conditions and check the Run-out before machining. • The excessive wear of the part 'D' as shown in the [Pic.6] relating to chip curling might cause long chips.

How to Clamp a TPDB Plus Insert

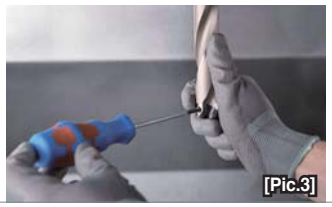
Clamping an insert to a holder


[Pic.1]

❶ Put an insert on the tip seat of the holder.
❷ As the [Pic.1], push the insert to the v-shaped groove of the holder.
❸ Screw and clamp the insert.

Changing the used insert to a new one

[Pic.2]


[Pic.3]

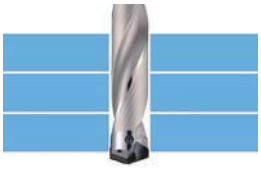
❶ Unscrew and separate the used insert from the holder.
❷ As the [Pic.2], clean the insert seat.
❸ Put a new insert on the tip seat.
❹ As the [Pic.3], clamp the insert pushing it with a hand not to separate from the holder.

Precaution in Drilling

Drilling of angled entrace

1. The approach angle between drill and the workpiece at the beginning should be less than 6.
2. Reduce the feed to 30-50% than general cutting conditions at the beginning and the end of angled surface.

Drilling of stacked plates



1. Gap between the plates could make wrong chip evacuation causing fracture of the drill.
2. Place the workpiece, stacked plates without any gap between each.

Plunging

1. Irregular cutting resistance in plunging could cause fracture and deformation of the drill.

Boring

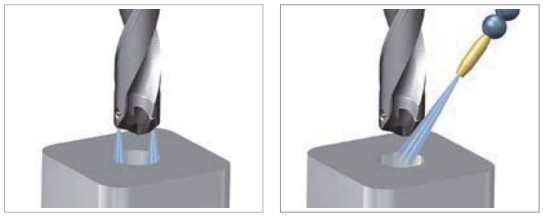
1. Boring is not recommended due to wear and chipping in the corner of the insert.

Check Point in Drilling

- Condition of the clamped workpiece
- Revolution of the main axis of the machine
- Condition of the holder
- Run-out of the clamped drill (Max. 0.03 mm)
- Condition of supplying coolant (pressure, floconcentration)
- Chip evacuation

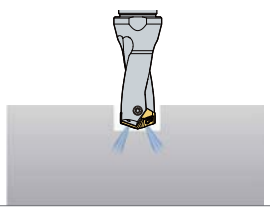
Supply of Coolant

- Supply enough coolant to the beginning of the hole.
- Minimum pressure of oil coolant: 5 bar
- Minimum flow of coolant: 5ℓ/min



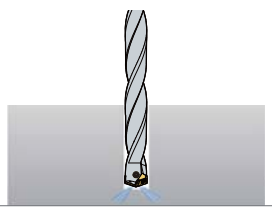
Recommended Drilling Method (10D, 12D)

Machine a beginning hole (with a pilot drill)

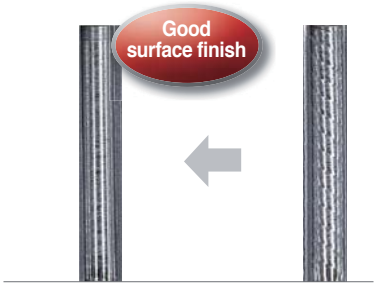


· Machine a beginning hole with the depth of cut as 0.5D and at 30% lower speed using a 1.5D or 3D drill.

Start drilling



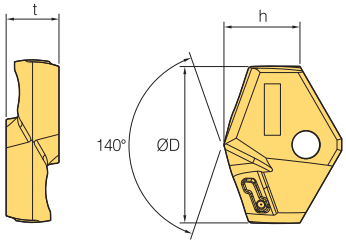
· After machining the beginning hole, replace the pilot drill to a drill for drilling and machine in recommended cutting conditions.



Result of recommended drilling

Result of general drilling

TPDB Plus Insert new



(mm)

Designation		Coated			ØD	h	t
		PC5300	PC5335	PC330P			
TPD	100B~109B	●			10.0 ~ 10.9	5.5	3.5
	110B~119B	●	●		11.0 ~ 11.9	5.8	3.5
	120B~129B	●	●		12.0 ~ 12.9	6.3	3.5
	130B~139B	●			13.0 ~ 13.9	6.5	4.0
	140B~149B	●	●		14.0 ~ 14.9	6.8	4.0
	150B~159B	●	●		15.0 ~ 15.9	7.0	4.0
	160B~169B	●	●		16.0 ~ 16.9	7.7	5.5
	170B~179B	●	●		17.0 ~ 17.9	7.9	5.5
	180B~189B	●	●		18.0 ~ 18.9	8.1	6.0
	190B~199B	●	●		19.0 ~ 19.9	8.3	6.0
	200B~209B	●	●		20.0 ~ 20.9	9.7	6.5
	210B~219B	●	●		21.0 ~ 21.9	9.4	6.5
	220B~229B	●	●		22.0 ~ 22.9	9.6	7.0
	230B~239B	●	●		23.0 ~ 23.9	9.8	7.0
	240B~249B	●	●		24.0 ~ 24.9	10.7	7.5
	250B~259B	●	●		25.0 ~ 25.9	10.9	7.5
	260B~269B	●	●		26.0 ~ 26.9	11.0	8.5
	270B~279B	●			27.0 ~ 27.9	11.8	8.5
	280B~289B	●			28.0 ~ 28.9	12.6	9.5
	290B~299B	●			29.0 ~ 29.9	12.9	9.5
	300B~309B	●			30.0 ~ 30.9	13.0	10.0
	310B~319B	●			31.0 ~ 31.9	13.2	10.0
	320B~329B	●			32.0 ~ 32.9	13.4	10.0

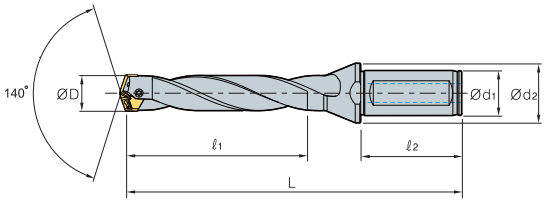
● : Stock Item

Parts

(mm)

Designation		Drill dia. (ØD)	Screw	Wrench	Torque (N·m)
TPD	100B~129B	10.0 ~ 12.9	FTNB0209-P	TW06P	0.4
	130B~149B	13.0 ~ 14.9	FTNB02512-P	TW07S	0.8
	150B~179B	15.0 ~ 17.9	FTNB02514-P	TW07S	0.8
	180B~199B	18.0 ~ 19.9	FTNB0316-P	TW09S	1.2
	200B~239B	20.0 ~ 23.9	FTNB0319	TW09S	1.2
	240B~259B	24.0 ~ 25.9	FTNB03522	TW15S	3.0
	260B~279B	26.0 ~ 27.9	FTNB03524	TW15S	3.0
	280B~299B	28.0 ~ 29.9	FTNB0426	TW15S	3.0
	300B~329B	30.0 ~ 32.9	FTNB0528	TW20-100	4.0

TPDB Plus (3D) new

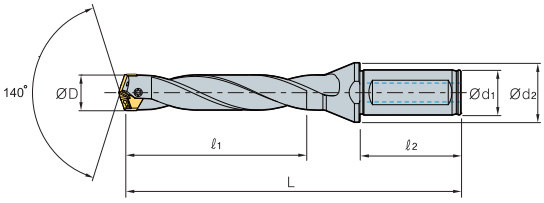


(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDB	100-16-3-P	10.0 ~ 10.4	16	20	30.0	48	95	TPD100B ~ 104B
	105-16-3-P	10.5 ~ 10.9	16	20	31.5	48	96	TPD105B ~ 109B
	110-16-3-P	11.0 ~ 11.4	16	20	33.0	48	98	TPD110B ~ 114B
	115-16-3-P	11.5 ~ 11.9	16	20	34.5	48	99	TPD115B ~ 119B
	120-16-3-P	12.0 ~ 12.4	16	20	36.0	48	102	TPD120B ~ 124B
	125-16-3-P	12.5 ~ 12.9	16	20	37.5	48	104	TPD125B ~ 129B
	130-16-3-P	13.0 ~ 13.4	16	20	39.0	48	107	TPD130B ~ 134B
	135-16-3-P	13.5 ~ 13.9	16	20	40.5	48	109	TPD135B ~ 139B
	140-16-3-P	14.0 ~ 14.4	16	20	42.0	48	111	TPD140B ~ 144B
	145-16-3-P	14.5 ~ 14.9	16	20	43.5	48	114	TPD145B ~ 149B
	150-20-3-P	15.0 ~ 15.4	20	25	45.0	50	118	TPD150B ~ 154B
	155-20-3-P	15.5 ~ 15.9	20	25	46.5	50	120	TPD155B ~ 159B
	160-20-3-P	16.0 ~ 16.4	20	25	48.0	50	122	TPD160B ~ 164B
	165-20-3-P	16.5 ~ 16.9	20	25	49.5	50	124	TPD165B ~ 169B
	170-20-3-P	17.0 ~ 17.4	20	25	51.0	50	127	TPD170B ~ 174B
	175-20-3-P	17.5 ~ 17.9	20	25	52.5	50	129	TPD175B ~ 179B
	180-25-3-P	18.0 ~ 18.4	25	33	54.0	56	137	TPD180B ~ 184B
	185-25-3-P	18.5 ~ 18.9	25	33	55.5	56	139	TPD185B ~ 189B
	190-25-3-P	19.0 ~ 19.4	25	33	57.0	56	142	TPD190B ~ 194B
	195-25-3-P	19.5 ~ 19.9	25	33	58.5	56	144	TPD195B ~ 199B
	200-25-3-P	20.0 ~ 20.4	25	33	60.0	56	146	TPD200B ~ 204B
	205-25-3-P	20.5 ~ 20.9	25	33	61.5	56	148	TPD205B ~ 209B
	210-25-3-P	21.0 ~ 21.4	25	33	63.0	60	151	TPD210B ~ 214B
	215-25-3-P	21.5 ~ 21.9	25	33	64.5	60	153	TPD215B ~ 219B
	220-25-3-P	22.0 ~ 22.4	25	33	66.0	60	155	TPD220B ~ 224B
	225-25-3-P	22.5 ~ 22.9	25	33	67.5	60	157	TPD225B ~ 229B
	230-25-3-P	23.0 ~ 23.4	25	33	69.0	60	160	TPD230B ~ 234B
	235-25-3-P	23.5 ~ 23.9	25	33	70.5	60	162	TPD235B ~ 239B
	240-32-3-P	24.0 ~ 24.4	32	43	72.0	60	168	TPD240B ~ 244B
	245-32-3-P	24.5 ~ 24.9	32	43	73.5	60	170	TPD245B ~ 249B
	250-32-3-P	25.0 ~ 25.4	32	43	75.0	60	173	TPD250B ~ 254B
	255-32-3-P	25.5 ~ 25.9	32	43	76.5	60	175	TPD255B ~ 259B
	260-32-3-P	26.0 ~ 26.9	32	43	78.0	60	177	TPD260B ~ 269B
	270-32-3-P	27.0 ~ 27.9	32	43	81.0	60	182	TPD270B ~ 279B
	280-32-3-P	28.0 ~ 28.9	32	43	84.0	60	186	TPD280B ~ 289B
	290-32-3-P	29.0 ~ 29.9	32	43	87.0	60	191	TPD290B ~ 299B
	300-32-3-P	30.0 ~ 30.9	32	43	90.0	60	195	TPD300B ~ 309B
	310-32-3-P	31.0 ~ 31.9	32	43	93.0	60	200	TPD310B ~ 319B
	320-32-3-P	32.0 ~ 32.9	32	43	96.0	60	204	TPD320B ~ 329B

Applicable inserts G38

TPDB Plus (5D) new

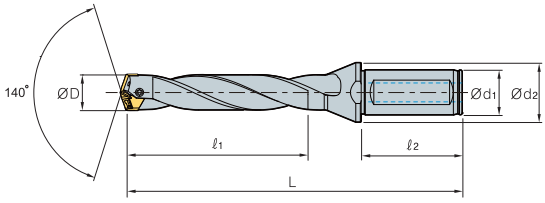


(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDB	100-16-5-P	10.0 ~ 10.4	16	20	50.0	48	115	TPD100B ~ 104B
	105-16-5-P	10.5 ~ 10.9	16	20	52.5	48	117	TPD105B ~ 109B
	110-16-5-P	11.0 ~ 11.4	16	20	55.0	48	120	TPD110B ~ 114B
	115-16-5-P	11.5 ~ 11.9	16	20	57.5	48	123	TPD115B ~ 119B
	120-16-5-P	12.0 ~ 12.4	16	20	60.0	48	126	TPD120B ~ 124B
	125-16-5-P	12.5 ~ 12.9	16	20	62.5	48	129	TPD125B ~ 129B
	130-16-5-P	13.0 ~ 13.4	16	20	65.0	48	133	TPD130B ~ 134B
	135-16-5-P	13.5 ~ 13.9	16	20	67.5	48	136	TPD135B ~ 139B
	140-16-5-P	14.0 ~ 14.4	16	20	70.0	48	139	TPD140B ~ 144B
	145-16-5-P	14.5 ~ 14.9	16	20	72.5	48	143	TPD145B ~ 149B
	150-20-5-P	15.0 ~ 15.4	20	25	75.0	50	148	TPD150B ~ 154B
	155-20-5-P	15.5 ~ 15.9	20	25	77.5	50	151	TPD155B ~ 159B
	160-20-5-P	16.0 ~ 16.4	20	25	80.0	50	154	TPD160B ~ 164B
	165-20-5-P	16.5 ~ 16.9	20	25	82.5	50	157	TPD165B ~ 169B
	170-20-5-P	17.0 ~ 17.4	20	25	85.0	50	161	TPD170B ~ 174B
	175-20-5-P	17.5 ~ 17.9	20	25	87.5	50	164	TPD175B ~ 179B
	180-25-5-P	18.0 ~ 18.4	25	33	90.0	56	173	TPD180B ~ 184B
	185-25-5-P	18.5 ~ 18.9	25	33	92.5	56	176	TPD185B ~ 189B
	190-25-5-P	19.0 ~ 19.4	25	33	95.0	56	180	TPD190B ~ 194B
	195-25-5-P	19.5 ~ 19.9	25	33	97.5	56	183	TPD195B ~ 199B
	200-25-5-P	20.0 ~ 20.4	25	33	100.0	56	186	TPD200B ~ 204B
	205-25-5-P	20.5 ~ 20.9	25	33	102.5	56	189	TPD205B ~ 209B
	210-25-5-P	21.0 ~ 21.4	25	33	105.0	60	193	TPD210B ~ 214B
	215-25-5-P	21.5 ~ 21.9	25	33	107.5	60	196	TPD215B ~ 219B
	220-25-5-P	22.0 ~ 22.4	25	33	110.0	60	199	TPD220B ~ 224B
	225-25-5-P	22.5 ~ 22.9	25	33	112.5	60	202	TPD225B ~ 229B
	230-25-5-P	23.0 ~ 23.4	25	33	115.0	60	206	TPD230B ~ 234B
	235-25-5-P	23.5 ~ 23.9	25	33	117.5	60	209	TPD235B ~ 239B
	240-32-5-P	24.0 ~ 24.4	32	43	120.0	60	216	TPD240B ~ 244B
	245-32-5-P	24.5 ~ 24.9	32	43	122.5	60	219	TPD245B ~ 249B
	250-32-5-P	25.0 ~ 25.4	32	43	125.0	60	223	TPD250B ~ 254B
	255-32-5-P	25.5 ~ 25.9	32	43	127.5	60	226	TPD255B ~ 259B
	260-32-5-P	26.0 ~ 26.9	32	43	130.0	60	229	TPD260B ~ 269B
	270-32-5-P	27.0 ~ 27.9	32	43	135.0	60	236	TPD270B ~ 279B
	280-32-5-P	28.0 ~ 28.9	32	43	140.0	60	242	TPD280B ~ 289B
	290-32-5-P	29.0 ~ 29.9	32	43	145.0	60	249	TPD290B ~ 299B
	300-32-5-P	30.0 ~ 30.9	32	43	150.0	60	255	TPD300B ~ 309B
	310-32-5-P	31.0 ~ 31.9	32	43	155.0	60	262	TPD310B ~ 319B
	320-32-5-P	32.0 ~ 32.9	32	43	160.0	60	268	TPD320B ~ 329B

Applicable inserts **G38**

TPDB Plus (8D) new

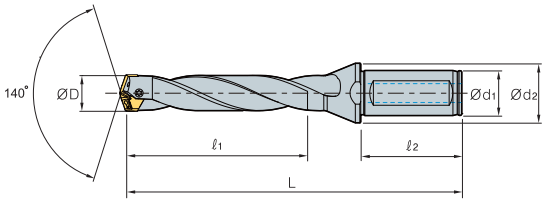


(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDB	100-16-8-P	10.0 ~ 10.4	16	20	80	48	145	TPD100B ~ 104B
	105-16-8-P	10.5 ~ 10.9	16	20	84	48	149	TPD105B ~ 109B
	110-16-8-P	11.0 ~ 11.4	16	20	88	48	153	TPD110B ~ 114B
	115-16-8-P	11.5 ~ 11.9	16	20	92	48	157	TPD115B ~ 119B
	120-16-8-P	12.0 ~ 12.4	16	20	96	48	162	TPD120B ~ 124B
	125-16-8-P	12.5 ~ 12.9	16	20	100	48	166.5	TPD125B ~ 129B
	130-16-8-P	13.0 ~ 13.4	16	20	104	48	172	TPD130B ~ 134B
	135-16-8-P	13.5 ~ 13.9	16	20	108	48	176.5	TPD135B ~ 139B
	140-16-8-P	14.0 ~ 14.4	16	20	112	48	181	TPD140B ~ 144B
	145-16-8-P	14.5 ~ 14.9	16	20	116	48	186.5	TPD145B ~ 149B
	150-20-8-P	15.0 ~ 15.4	20	25	120	50	193	TPD150B ~ 154B
	155-20-8-P	15.5 ~ 15.9	20	25	124	50	197.5	TPD155B ~ 159B
	160-20-8-P	16.0 ~ 16.4	20	25	128	50	202	TPD160B ~ 164B
	165-20-8-P	16.5 ~ 16.9	20	25	132	50	206.5	TPD165B ~ 169B
	170-20-8-P	17.0 ~ 17.4	20	25	136	50	212	TPD170B ~ 174B
	175-20-8-P	17.5 ~ 17.9	20	25	140	50	216.5	TPD175B ~ 179B
	180-25-8-P	18.0 ~ 18.4	25	33	144	56	227	TPD180B ~ 184B
	185-25-8-P	18.5 ~ 18.9	25	33	148	56	231.5	TPD185B ~ 189B
	190-25-8-P	19.0 ~ 19.4	25	33	152	56	237	TPD190B ~ 194B
	195-25-8-P	19.5 ~ 19.9	25	33	156	56	241.5	TPD195B ~ 199B
	200-25-8-P	20.0 ~ 20.4	25	33	160	56	246	TPD200B ~ 204B
	205-25-8-P	20.5 ~ 20.9	25	33	164	56	250.5	TPD205B ~ 209B
	210-25-8-P	21.0 ~ 21.4	25	33	168	60	256	TPD210B ~ 214B
	215-25-8-P	21.5 ~ 21.9	25	33	172	60	260.5	TPD215B ~ 219B
	220-25-8-P	22.0 ~ 22.4	25	33	176	60	265	TPD220B ~ 224B
	225-25-8-P	22.5 ~ 22.9	25	33	180	60	269.5	TPD225B ~ 229B
	230-25-8-P	23.0 ~ 23.4	25	33	184	60	275	TPD230B ~ 234B
	235-25-8-P	23.5 ~ 23.9	25	33	188	60	279.5	TPD235B ~ 239B
	240-32-8-P	24.0 ~ 24.4	32	43	192	60	288	TPD240B ~ 244B
	245-32-8-P	24.5 ~ 24.9	32	43	196	60	292.5	TPD245B ~ 249B
	250-32-8-P	25.0 ~ 25.4	32	43	200	60	298	TPD250B ~ 254B
	255-32-8-P	25.5 ~ 25.9	32	43	204	60	302.5	TPD255B ~ 259B
	260-32-8-P	26.0 ~ 26.9	32	43	208	60	307	TPD260B ~ 269B
	270-32-8-P	27.0 ~ 27.9	32	43	216	60	317	TPD270B ~ 279B
	280-32-8-P	28.0 ~ 28.9	32	43	224	60	326	TPD280B ~ 289B
	290-32-8-P	29.0 ~ 29.9	32	43	232	60	336	TPD290B ~ 299B
	300-32-8-P	30.0 ~ 30.9	32	43	240	60	344	TPD300B ~ 309B
	310-32-8-P	31.0 ~ 31.9	32	43	248	60	354	TPD310B ~ 319B
	320-32-8-P	32.0 ~ 32.9	32	43	256	60	361	TPD320B ~ 329B

Applicable inserts **G38**

TPDB Plus (10D) new

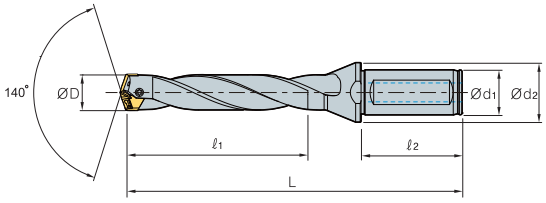


(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDB	100-16-10-P	10.0 ~ 10.4	16	20	100	48	165	TPD100B ~ 104B
	105-16-10-P	10.5 ~ 10.9	16	20	105	48	170	TPD105B ~ 109B
	110-16-10-P	11.0 ~ 11.4	16	20	110	48	175	TPD110B ~ 114B
	115-16-10-P	11.5 ~ 11.9	16	20	115	48	180	TPD115B ~ 119B
	120-16-10-P	12.0 ~ 12.4	16	20	120	48	186	TPD120B ~ 124B
	125-16-10-P	12.5 ~ 12.9	16	20	125	48	191.5	TPD125B ~ 129B
	130-16-10-P	13.0 ~ 13.4	16	20	130	48	198	TPD130B ~ 134B
	135-16-10-P	13.5 ~ 13.9	16	20	135	48	203.5	TPD135B ~ 139B
	140-16-10-P	14.0 ~ 14.4	16	20	140	48	209	TPD140B ~ 144B
	145-16-10-P	14.5 ~ 14.9	16	20	145	48	215.5	TPD145B ~ 149B
	150-20-10-P	15.0 ~ 15.4	20	25	150	50	223	TPD150B ~ 154B
	155-20-10-P	15.5 ~ 15.9	20	25	155	50	228.5	TPD155B ~ 159B
	160-20-10-P	16.0 ~ 16.4	20	25	160	50	234	TPD160B ~ 164B
	165-20-10-P	16.5 ~ 16.9	20	25	165	50	239.5	TPD165B ~ 169B
	170-20-10-P	17.0 ~ 17.4	20	25	170	50	246	TPD170B ~ 174B
	175-20-10-P	17.5 ~ 17.9	20	25	175	50	251.5	TPD175B ~ 179B
	180-25-10-P	18.0 ~ 18.4	25	33	180	56	263	TPD180B ~ 184B
	185-25-10-P	18.5 ~ 18.9	25	33	185	56	268.5	TPD185B ~ 189B
	190-25-10-P	19.0 ~ 19.4	25	33	190	56	275	TPD190B ~ 194B
	195-25-10-P	19.5 ~ 19.9	25	33	195	56	280.5	TPD195B ~ 199B
	200-25-10-P	20.0 ~ 20.4	25	33	200	56	286	TPD200B ~ 204B
	205-25-10-P	20.5 ~ 20.9	25	33	205	56	291.5	TPD205B ~ 209B
	210-25-10-P	21.0 ~ 21.4	25	33	210	60	298	TPD210B ~ 214B
	215-25-10-P	21.5 ~ 21.9	25	33	215	60	303.5	TPD215B ~ 219B
	220-25-10-P	22.0 ~ 22.4	25	33	220	60	309	TPD220B ~ 224B
	225-25-10-P	22.5 ~ 22.9	25	33	225	60	314.5	TPD225B ~ 229B
	230-25-10-P	23.0 ~ 23.4	25	33	230	60	321	TPD230B ~ 234B
	235-25-10-P	23.5 ~ 23.9	25	33	235	60	326.5	TPD235B ~ 239B
	240-32-10-P	24.0 ~ 24.4	32	43	240	60	336	TPD240B ~ 244B
	245-32-10-P	24.5 ~ 24.9	32	43	245	60	341.5	TPD245B ~ 249B
	250-32-10-P	25.0 ~ 25.4	32	43	250	60	348	TPD250B ~ 254B
	255-32-10-P	25.5 ~ 25.9	32	43	255	60	353.5	TPD255B ~ 259B
	260-32-10-P	26.0 ~ 26.9	32	43	260	60	359	TPD260B ~ 269B
	270-32-10-P	27.0 ~ 27.9	32	43	270	60	371	TPD270B ~ 279B
	280-32-10-P	28.0 ~ 28.9	32	43	280	60	382	TPD280B ~ 289B
	290-32-10-P	29.0 ~ 29.9	32	43	290	60	394	TPD290B ~ 299B
	300-32-10-P	30.0 ~ 30.9	32	43	300	60	404	TPD300B ~ 309B
	310-32-10-P	31.0 ~ 31.9	32	43	310	60	416	TPD310B ~ 319B
	320-32-10-P	32.0 ~ 32.9	32	43	320	60	425	TPD320B ~ 329B

Applicable inserts **G38**

TPDB Plus (12D) new



(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDB	100-16-12-P	10.0 ~ 10.4	16	20	120	48	185	TPD100B ~ 104B
	105-16-12-P	10.5 ~ 10.9	16	20	126	48	191	TPD105B ~ 109B
	110-16-12-P	11.0 ~ 11.4	16	20	132	48	197	TPD110B ~ 114B
	115-16-12-P	11.5 ~ 11.9	16	20	138	48	203	TPD115B ~ 119B
	120-16-12-P	12.0 ~ 12.4	16	20	144	48	210	TPD120B ~ 124B
	125-16-12-P	12.5 ~ 12.9	16	20	150	48	216.5	TPD125B ~ 129B
	130-16-12-P	13.0 ~ 13.4	16	20	156	48	224	TPD130B ~ 134B
	135-16-12-P	13.5 ~ 13.9	16	20	162	48	230.5	TPD135B ~ 139B
	140-16-12-P	14.0 ~ 14.4	16	20	168	48	237	TPD140B ~ 144B
	145-16-12-P	14.5 ~ 14.9	16	20	174	48	244.5	TPD145B ~ 149B
	150-20-12-P	15.0 ~ 15.4	20	25	180	50	253	TPD150B ~ 154B
	155-20-12-P	15.5 ~ 15.9	20	25	186	50	259.5	TPD155B ~ 159B
	160-20-12-P	16.0 ~ 16.4	20	25	192	50	266	TPD160B ~ 164B
	165-20-12-P	16.5 ~ 16.9	20	25	198	50	272.5	TPD165B ~ 169B
	170-20-12-P	17.0 ~ 17.4	20	25	204	50	280	TPD170B ~ 174B
	175-20-12-P	17.5 ~ 17.9	20	25	210	50	286.5	TPD175B ~ 179B
	180-25-12-P	18.0 ~ 18.4	25	33	216	56	299	TPD180B ~ 184B
	185-25-12-P	18.5 ~ 18.9	25	33	222	56	305.5	TPD185B ~ 189B
	190-25-12-P	19.0 ~ 19.4	25	33	228	56	313	TPD190B ~ 194B
	195-25-12-P	19.5 ~ 19.9	25	33	234	56	319.5	TPD195B ~ 199B
	200-25-12-P	20.0 ~ 20.4	25	33	240	56	326	TPD200B ~ 204B
	205-25-12-P	20.5 ~ 20.9	25	33	246	56	332.5	TPD205B ~ 209B
	210-25-12-P	21.0 ~ 21.4	25	33	252	60	340	TPD210B ~ 214B
	215-25-12-P	21.5 ~ 21.9	25	33	258	60	346.5	TPD215B ~ 219B
	220-25-12-P	22.0 ~ 22.4	25	33	264	60	353	TPD220B ~ 224B
	225-25-12-P	22.5 ~ 22.9	25	33	270	60	359.5	TPD225B ~ 229B
	230-25-12-P	23.0 ~ 23.4	25	33	276	60	367	TPD230B ~ 234B
	235-25-12-P	23.5 ~ 23.9	25	33	282	60	373.5	TPD235B ~ 239B
	240-32-12-P	24.0 ~ 24.4	32	43	288	60	384	TPD240B ~ 244B
	245-32-12-P	24.5 ~ 24.9	32	43	294	60	390.5	TPD245B ~ 249B
	250-32-12-P	25.0 ~ 25.4	32	43	300	60	398	TPD250B ~ 254B
	255-32-12-P	25.5 ~ 25.9	32	43	306	60	404.5	TPD255B ~ 259B
	260-32-12-P	26.0 ~ 26.9	32	43	312	60	411	TPD260B ~ 269B
	270-32-12-P	27.0 ~ 27.9	32	43	324	60	425	TPD270B ~ 279B
	280-32-12-P	28.0 ~ 28.9	32	43	336	60	438	TPD280B ~ 289B
	290-32-12-P	29.0 ~ 29.9	32	43	348	60	452	TPD290B ~ 299B
	300-32-12-P	30.0 ~ 30.9	32	43	360	60	464	TPD300B ~ 309B
	310-32-12-P	31.0 ~ 31.9	32	43	372	60	478	TPD310B ~ 319B
	320-32-12-P	32.0 ~ 32.9	32	43	384	60	489	TPD320B ~ 329B

Applicable inserts G38

The exclusive top solid indexable drill for steel-frame structure, H-Beam

TPDB-H new

- The highly efficient and exclusive top solid indexable drill for steel-frame structures such as H-Beam, steel sheet, etc
- High precision clamping system: High precision clamping due highly precise grinding and auto-centering
- Screw on clamping system: Easy to replace insert
- Edge design with excellent centering: Low cutting load and good chip control
- High durability holder: Improved wear resistance and durability with special surface treatment implementation
- Holder with good chip evacuation: Good chip evacuation and reduced cutting load with high helix angle
- Optimally designed oil hole: Long tool life

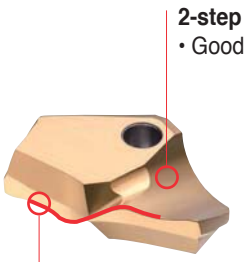
Code system of holder

TPD	B	220	- 25	- 4	- H
Top solid Piercing Drill	Insert type B: Blade type	Drill dia. 220: Ø22.0	Shank dia. 25: Ø25	Aspect ratio (L/D) 3D, 4D, 8D ※ Flange shank (8F) for 8D	H-Beam

Code system of insert

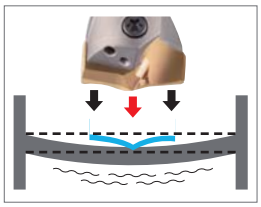
TPD	200	B	-	H
Top solid Piercing Drill	Drill dia. 200: Ø20.0	Insert type B: Blade type		H-Beam

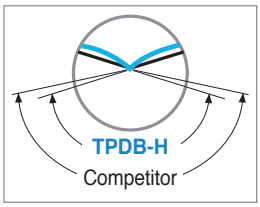
Features of insert



2-step thinning shape
• Good chip control

Double R point cutting edge
• Stable centering and machinability





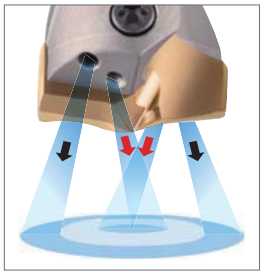
- Applied Double R point edge design is optimized for excellent centering and stable machinability
- Machinability and productivity are improved by minimizing both workpiece's bending and chipping at edge corner section

Features of holder

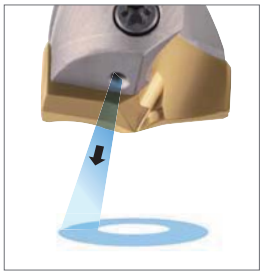
High helix angle
• Good chip evacuation and machinability

4 hole cooling system
• Long tool life

High helix angle
• Good chip evacuation and machinability



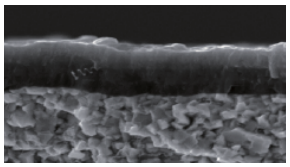
TPDB-H



Competitor

⬇⬇ Concentrated coolant injection on delicate cutting edge increases tool life

Grade selection



• **PC340Q**

- Application of high hardness lubricative PVD coating technology with excellent resistance on wear, welding, and chipping
- The special surface treatment improves chip evacuation and reduces wear on the rake surface and relief face
- High hardness ultra-fine substrate ensures high rigidity of cutting edge and good chipping resistance

Performance evaluation

Chip control

■ **Workpiece** Carbon steel (SS400, SM490A)
■ **Cutting conditions** Drill dia.(mm) = Ø27, vc (m/min) = 80
fn (mm/rev) = 0.2, ap (mm) = 30, wet
■ **Tools** **Inserts** TPD270B-H (PC340Q)
Holder TPDB270-32-4-H

SS400

SM490A

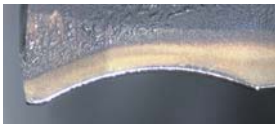
Good chip control

Wear resistance

■ **Workpiece** Carbon steel (SS400)
■ **Cutting conditions** Drill dia.(mm) = Ø22, vc (m/min) = 65
fn (mm/rev) = 0.25, ap (mm) = 30, wet
■ **Tools** **Inserts** TPD220B-H (PC340Q)
Holder TPDB220-25-4-H

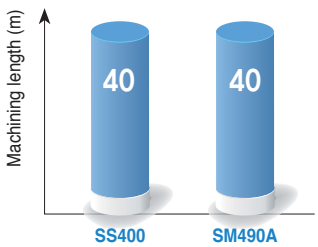
SS400

■ **Workpiece** Carbon steel (SM490A)
■ **Cutting conditions** Drill dia.(mm) = Ø27, vc (m/min) = 70
fn (mm/rev) = 0.25, ap (mm) = 30, wet
■ **Tools** **Inserts** TPD270B-H (PC340Q)
Holder TPDB270-32-4-H



SM490A

■ **Test result**



Normal wear and still usable

Workpiece and recommended cutting conditions

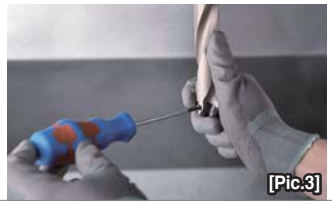
Workpiece				Grade	vc (m/min)	Aspect ratio (L/D) = 3D, 4D Feed rate (mm/rev) per drill dia. (mm)	
ISO	Workpiece		Worpiece materials			Ø14.0~Ø21.0	Ø22.0~Ø30.0
P	H-Beam		SS400 SM490 SHN490	PC340Q	65 (60~75)	0.22 (0.2~0.25)	0.25 (0.2~0.3)
	Angle		SS400 SM490 SHN490	PC340Q	65 (60~75)	0.22 (0.2~0.25)	0.25 (0.2~0.3)
	Plate		SS400 SM490 SHN490	PC340Q	65 (60~75)	0.22 (0.2~0.25)	0.25 (0.2~0.3)
	Plate (Stacked)		SS400 SM490 SHN490	PC340Q	60 (55~65)	0.2 (0.15~0.25)	0.2 (0.15~0.25)

How to clamp a TPDB-H insert

Clamping an insert to a holder

❶ Put an insert on the tip seat of the holder
❷ As the [pic.1], push the insert to the v-shaped groove of the holder
❸ Screw and clamp the insert

Changing the used insert to a new one



❶ Unscrew and separate the used insert from the holder
❷ As the [Pic.2], clean the insert seat
❸ Put a new insert on the tip seat
❹ As the [pic.3], clamp the insert pushing it with a hand not to separate from the holder

Precaution in drilling

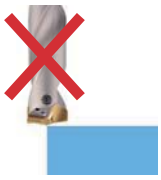
Drilling of angled entrace

1. The approach angle between drill and the workpiece at the beginning should be less than 6°
2. Reduce the feed to 30~50% than general cutting conditions at the beginning and the end of angled surface.

Drilling of stacked plates

1. Gap between the plates could make wrong chip evacuation causing fracture of the drill.
2. Place stacked plates without any gap between each

Plunging

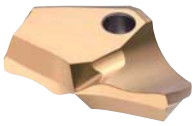


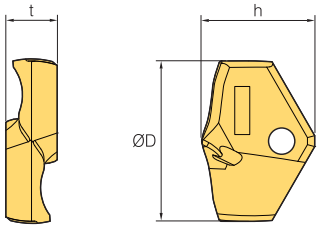
1. Irregular cutting resistance in plunging could cause fracture and deformation of the drill.

Boring

1. Boring is not recommended due to wear and chipping in the corner of the insert.

TPDB-H Insert new





(mm)

Designation		Coated PC340Q	ØD	h	t
TPD	140B-H~149B-H		14.0-14.9	10.0	4.0
	150B-H~159B-H		15.0-15.9	10.5	4.0
	160B-H~169B-H		16.0-16.9	11.5	5.5
	170B-H~179B-H		17.0-17.9	12.0	5.5
	180B-H~189B-H		18.0-18.9	13.0	6.0
	190B-H~199B-H		19.0-19.9	13.5	6.0
	200B-H~209B-H		20.0-20.9	14.5	6.5
	210B-H~219B-H		21.0-21.9	15.0	6.5
	220B-H~229B-H		22.0-22.9	15.5	7.0
	230B-H~239B-H		23.0-23.9	16.0	7.0
	240B-H~249B-H		24.0-24.9	16.5	7.5
	250B-H~259B-H		25.0-25.9	17.0	7.5
	260B-H~269B-H		26.0-26.9	17.5	8.5
	270B-H~279B-H		27.0-27.9	18.5	8.5
	280B-H~289B-H		28.0-28.9	19.5	9.5
	290B-H~299B-H		29.0-29.9	20.0	9.5
	300B-H~309B-H		30.0-30.9	20.5	10.0

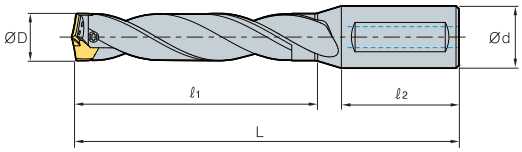
● : Stock Item

Parts

(mm)

Designation		Drill dia. (ØD)	Screw	Wrench	Torque (N·m)
TPD	140B-H~149B-H	14.0-14.9	FTNB02512-P	TW07S	0.8
	150B-H~179B-H	15.0-17.9	FTNB02514-P	TW07S	0.8
	180B-H~199B-H	18.0-19.9	FTNB0316-P	TW09S	1.2
	200B-H~239B-H	20.0-23.9	FTNB0319	TW09S	1.2
	240B-H~259B-H	24.0-25.9	FTNB03522	TW15S	3.0
	260B-H~279B-H	26.0-27.9	FTNB03524	TW15S	3.0
	280B-H~299B-H	28.0-29.9	FTNB0426	TW15S	3.0
	300B-H~309B-H	30.0-30.9	FTNB0528	TW20-100	4.0

TPDB-H (3D) new

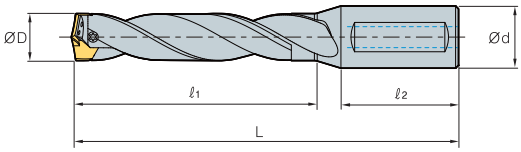


(mm)

Designation		ØD	Ød	ℓ1	ℓ2	L	Insert
TPDB	140-16-3-H	14.0-14.4	16	42	48	97.5	TPD140B-144B-H
	145-16-3-H	14.5-14.9	16	43.5	48	99.5	TPD145B-149B-H
	150-20-3-H	15.0-15.4	20	45	50	103.0	TPD150B-154B-H
	155-20-3-H	15.5-15.9	20	46.5	50	105.0	TPD155B-159B-H
	160-20-3-H	16.0-16.4	20	48	50	106.5	TPD160B-164B-H
	165-20-3-H	16.5-16.9	20	49.5	50	108.5	TPD165B-169B-H
	170-20-3-H	17.0-17.4	20	51	50	110.0	TPD170B-174B-H
	175-20-3-H	17.5-17.9	20	52.5	50	112.0	TPD175B-179B-H
	180-20-3-H	18.0-18.4	20	54	50	113.5	TPD180B-184B-H
	185-20-3-H	18.5-18.9	20	55.5	50	115.5	TPD185B-189B-H
	190-20-3-H	19.0-19.4	20	57	50	117.0	TPD190B-194B-H
	195-20-3-H	19.5-19.9	20	58.5	50	119.0	TPD195B-199B-H
	200-25-3-H	20.0-20.4	25	60	56	126.5	TPD200B-204B-H
	205-25-3-H	20.5-20.9	25	61.5	56	128.5	TPD205B-209B-H
	210-25-3-H	21.0-21.4	25	63	56	130.0	TPD210B-214B-H
	215-25-3-H	21.5-21.9	25	64.5	56	132.0	TPD215B-219B-H
	220-25-3-H	22.0-22.4	25	66	56	133.5	TPD220B-224B-H
	225-25-3-H	22.5-22.9	25	67.5	56	135.5	TPD225B-229B-H
	230-25-3-H	23.0-23.4	25	69	56	137.0	TPD230B-234B-H
	235-25-3-H	23.5-23.9	25	70.5	56	139.0	TPD235B-239B-H
	240-32-3-H	24.0-24.4	32	72	60	144.5	TPD240B-244B-H
	245-32-3-H	24.5-24.9	32	73.5	60	146.5	TPD245B-249B-H
	250-32-3-H	25.0-25.4	32	75	60	148.0	TPD250B-254B-H
	255-32-3-H	25.5-25.9	32	76.5	60	150.0	TPD255B-259B-H
	260-32-3-H	26.0-26.4	32	78	60	151.5	TPD260B-264B-H
	265-32-3-H	26.5-26.9	32	79.5	60	153.5	TPD265B-269B-H
	270-32-3-H	27.0-27.4	32	81	60	155.0	TPD270B-274B-H
	275-32-3-H	27.5-27.9	32	82.5	60	157.0	TPD275B-279B-H
	280-32-3-H	28.0-28.4	32	84	60	158.5	TPD280B-284B-H
	285-32-3-H	28.5-28.9	32	85.5	60	160.5	TPD285B-289B-H
	290-32-3-H	29.0-29.4	32	87	60	162.0	TPD290B-294B-H
	295-32-3-H	29.5-29.9	32	88.5	60	164.0	TPD295B-299B-H
	300-32-3-H	30.0-30.4	32	90	60	165.5	TPD300B-304B-H

Applicable inserts **G47**

TPDB-H (4D) new

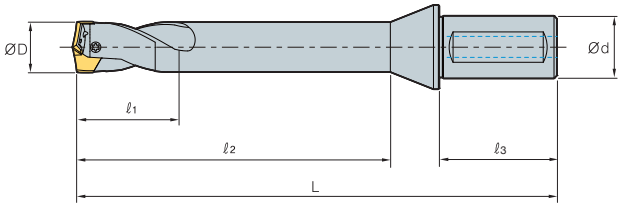


(mm)

Designation		ØD	Ød	ℓ1	ℓ2	L	Insert
TPDB	140-16-4-H	14.0-14.4	16	56	48	111.5	TPD140B-144B-H
	145-16-4-H	14.5-14.9	16	58	48	114.0	TPD145B-149B-H
	150-20-4-H	15.0-15.4	20	60	50	118.0	TPD150B-154B-H
	155-20-4-H	15.5-15.9	20	62	50	120.5	TPD155B-159B-H
	160-20-4-H	16.0-16.4	20	64	50	122.5	TPD160B-164B-H
	165-20-4-H	16.5-16.9	20	66	50	125.0	TPD165B-169B-H
	170-20-4-H	17.0-17.4	20	68	50	127.0	TPD170B-174B-H
	175-20-4-H	17.5-17.9	20	70	50	129.5	TPD175B-179B-H
	180-20-4-H	18.0-18.4	20	72	50	131.5	TPD180B-184B-H
	185-20-4-H	18.5-18.9	20	74	50	134.0	TPD185B-189B-H
	190-20-4-H	19.0-19.4	20	76	50	136.0	TPD190B-194B-H
	195-20-4-H	19.5-19.9	20	78	50	138.5	TPD195B-199B-H
	200-25-4-H	20.0-20.4	25	80	56	146.5	TPD200B-204B-H
	205-25-4-H	20.5-20.9	25	82	56	149.0	TPD205B-209B-H
	210-25-4-H	21.0-21.4	25	84	56	151.0	TPD210B-214B-H
	215-25-4-H	21.5-21.9	25	86	56	153.5	TPD215B-219B-H
	220-25-4-H	22.0-22.4	25	88	56	155.5	TPD220B-224B-H
	225-25-4-H	22.5-22.9	25	90	56	158.0	TPD225B-229B-H
	230-25-4-H	23.0-23.4	25	92	56	160.0	TPD230B-234B-H
	235-25-4-H	23.5-23.9	25	94	56	162.5	TPD235B-239B-H
	240-32-4-H	24.0-24.4	32	96	60	168.5	TPD240B-244B-H
	245-32-4-H	24.5-24.9	32	98	60	171.0	TPD245B-249B-H
	250-32-4-H	25.0-25.4	32	100	60	173.0	TPD250B-254B-H
	255-32-4-H	25.5-25.9	32	102	60	175.5	TPD255B-259B-H
	260-32-4-H	26.0-26.4	32	104	60	177.5	TPD260B-264B-H
	265-32-4-H	26.5-26.9	32	106	60	180.0	TPD265B-269B-H
	270-32-4-H	27.0-27.4	32	108	60	182.0	TPD270B-274B-H
	275-32-4-H	27.5-27.9	32	110	60	184.5	TPD275B-279B-H
	280-32-4-H	28.0-28.4	32	112	60	186.5	TPD280B-284B-H
	285-32-4-H	28.5-28.9	32	114	60	189.0	TPD285B-289B-H
	290-32-4-H	29.0-29.4	32	116	60	191.0	TPD290B-294B-H
	295-32-4-H	29.5-29.9	32	118	60	193.5	TPD295B-299B-H
	300-32-4-H	30.0-30.4	32	120	60	195.5	TPD300B-304B-H

Applicable inserts G47

TPDB-H (8D) new



(mm)

Designation		ØD	Ød	ℓ1	ℓ2	ℓ3	L	Insert
TPDB	140-16-8F-H	14.0-14.4	16	50	112	48	175.0	TPD140B-144B-H
	145-16-8F-H	14.5-14.9	16	50	116	48	179.0	TPD145B-149B-H
	150-20-8F-H	15.0-15.4	20	50	120	50	186.0	TPD150B-154B-H
	155-20-8F-H	15.5-15.9	20	50	124	50	190.0	TPD155B-159B-H
	160-20-8F-H	16.0-16.4	20	50	128	50	195.0	TPD160B-164B-H
	165-20-8F-H	16.5-16.9	20	50	132	50	199.0	TPD165B-169B-H
	170-20-8F-H	17.0-17.4	20	50	136	50	204.0	TPD170B-174B-H
	175-20-8F-H	17.5-17.9	20	50	140	50	208.0	TPD175B-179B-H
	180-20-8F-H	18.0-18.4	20	50	144	50	214.0	TPD180B-184B-H
	185-20-8F-H	18.5-18.9	20	50	148	50	218.0	TPD185B-189B-H
	190-20-8F-H	19.0-19.4	20	50	152	50	222.0	TPD190B-194B-H
	195-20-8F-H	19.5-19.9	20	50	156	50	226.0	TPD195B-199B-H
	200-25-8F-H	20.0-20.4	25	50	160	56	236.0	TPD200B-204B-H
	205-25-8F-H	20.5-20.9	25	50	164	56	240.0	TPD205B-209B-H
	210-25-8F-H	21.0-21.4	25	50	168	56	244.0	TPD210B-214B-H
	215-25-8F-H	21.5-21.9	25	50	172	56	248.0	TPD215B-219B-H
	220-25-8F-H	22.0-22.4	25	50	176	56	252.0	TPD220B-224B-H
	225-25-8F-H	22.5-22.9	25	50	180	56	261.0	TPD225B-229B-H
	230-25-8F-H	23.0-23.4	25	50	184	56	265.0	TPD230B-234B-H
	235-25-8F-H	23.5-23.9	25	50	188	56	269.0	TPD235B-239B-H
	240-32-8F-H	24.0-24.4	32	50	192	60	277.0	TPD240B-244B-H
	245-32-8F-H	24.5-24.9	32	50	196	60	281.0	TPD245B-249B-H
	250-32-8F-H	25.0-25.4	32	50	200	60	285.0	TPD250B-254B-H
	255-32-8F-H	25.5-25.9	32	50	204	60	289.0	TPD255B-259B-H
	260-32-8F-H	26.0-26.4	32	50	208	60	293.0	TPD260B-264B-H
	265-32-8F-H	26.5-26.9	32	50	212	60	297.0	TPD265B-269B-H
	270-32-8F-H	27.0-27.4	32	50	216	60	301.0	TPD270B-274B-H
	275-32-8F-H	27.5-27.9	32	50	220	60	305.0	TPD275B-279B-H
	280-32-8F-H	28.0-28.4	32	50	224	60	311.0	TPD280B-284B-H
	285-32-8F-H	28.5-28.9	32	50	228	60	315.0	TPD285B-289B-H
	290-32-8F-H	29.0-29.4	32	50	232	60	320.0	TPD290B-294B-H
	295-32-8F-H	29.5-29.9	32	50	236	60	324.0	TPD295B-299B-H
	300-32-8F-H	30.0-30.4	32	50	240	60	328.0	TPD300B-304B-H

Applicable inserts **G47**

• The max. length of flute could be ℓ2

Convenient and quickly adjustable drill height

WPDC

Indexable Drill Clamped with Center Drill

Code system for drill

WPDC	410	40	8
Type	**Drill dia.**	**Shank dia.**	**Aspect ratio**
WPDC: Using W-type I/S center drill NPDC: Using N-type I/S center drill	410: Ø41.0 6570: Ø65~70	32: Ø32 40: Ø40	5: 5D 6.5: 6.5D 8: 8D

Code system for cartridge

CWP	4145	C
Type	**Drill dia.**	**Classification**
CWP: Cartridge-WPDC	4145: Ø41~45 450: Ø45.0	C: Central P: Peripheral

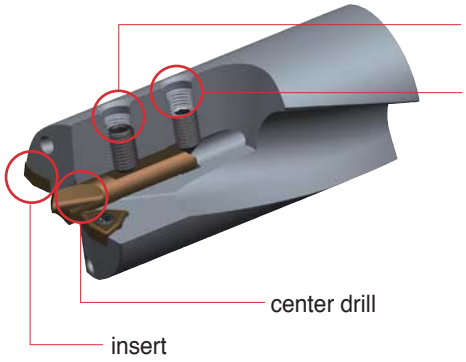
Code system for center drill

CD	H	1035
Type	**Coolant**	**Diameter × length of tool**
Center Dril	H: Coolant Unmarked: None	0630: Ø6X30 0835: Ø8X35 1035: Ø10X35 1238: Ø12X38 1645: Ø16X45

Grade of center drill

PC	40H
Product name	**Coating layer**
PVD coating	40H: TiN coating

How to clamp the drills



Feature of corn-point system

- Convenient and quick adjustable heights when inserting the center drill
- In case the center drill brakes while in usage, it can be replaced with the bolt for adjusting cone point
- The bolt for adjusting cone point prevents chattering on the center drill

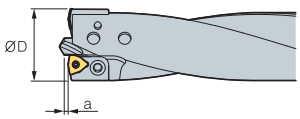
Clamping

❶	❷	❸	❹	❺
				
Place a center drill	Clamp insert and cartridge	Adjust the center drill with the bolt for adjusting cone point	Clamp the center drill firmly with fixing bolt	Reassure the clamp with bolt for adjusting cone point

※ Use safety covers for your safety when clamping the center drill and insert
※ When machining, be careful of the drill disk

Length of the 'a' part of center drill

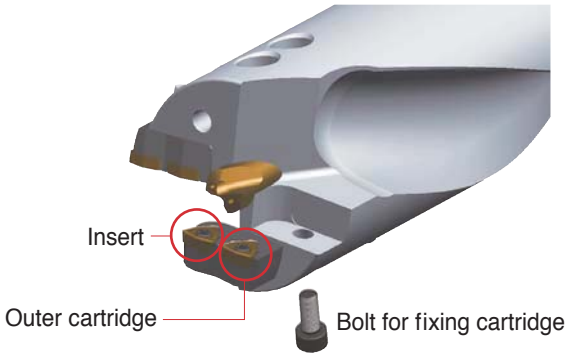
The length of 'a' being too short can cause bad surface finish or high cutting load
On the other hand, the length of 'a' being too long can make tool failure and chattering while drilling



Diameter (ØD)	Length of the 'a' part of center drill		
	Steel	Alloy steel	Non-ferrous metal
25~30	1.2	1.0	1.5
31~40	1.5	1.3	1.8
41~50	1.8	1.5	2.2
51~59	2.2	1.8	2.5
60~75	2.5	2.0	2.8
76~80	3.0	2.5	3.5

Adjusting diameter of cartridge type drill

- Disassemble a cartridge from the holder by loosening the bolt fixed for outer cartridge
- Machine after calculating the hole size on the side of the outer cartridge
- Trim the sharp part after machining
- Clamp the bolt for fixing cartridge without any gap in between the holder and the machined outer cartridge



- **Range of adjustable drill diameter**
  1. Single cartridge type (Drill diameter Ø41~Ø59) ⋯› -1.0 mm
  2. Dual cartridge type (Drill diameter Ø60~Ø80) ⋯› -5.0 mm

- **Diameter of the standard drills is provided with maximum size of standards**
  Ex) WPDC6570-40-6.5 ⋯› Drill diameter 70.0 mm

Ex) How to adjust drill diameter to Ø66.0 machining with WPDC6570-40-8
⋯› To make the drill diameter of outer cartridge to Ø66.0, machine 2.0 mm. (Ø70.0-Ø66.0 = 4 ⋯› 4÷2 = 2 (radius))

Recommended cutting condition

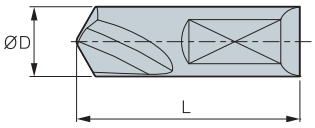
Workpiece				Chip breaker	Grade	vc (m/min)	Aspect ratio (L/D) = 5D, 6.5D, 8D					
							Feed rate (mm/rev) per drill dia. (mm)					
ISO		Workpiece	HB				~Ø30	Ø31~Ø40	Ø41~Ø50	Ø51~Ø59	Ø60~Ø75	Ø76~Ø80
P	Carbon steel	Low carbon steel (~0.25%)	80~180	C21N	PC5335	190 (160~220)	0.07~0.11	0.08~0.12	0.10~0.14	0.12~0.16	0.12~0.16	0.12~0.16
		High carbon steel (0.25%~)	180~280	C21N	PC5335	140 (110~170)	0.07~0.11	0.08~0.12	0.10~0.14	0.12~0.16	0.12~0.16	0.12~0.16
	Alloy steel	Low alloy steel	140~260	C21N	PC5335	130 (100~160)	0.08~0.12	0.08~0.12	0.10~0.14	0.12~0.18	0.12~0.18	0.12~0.18
		High alloy steel	50~260	C21N	PC5335	100 (70~130)	0.06~0.10	0.08~0.12	0.08~0.12	0.10~0.16	0.10~0.16	0.10~0.16
M	Stainless steel	Stainless steel	135~275	C21N	PC5335	100 (70~130)	0.06~0.10	0.08~0.12	0.10~0.12	0.12~0.14	0.12~0.14	0.12~0.14
K	Cast iron	Gray cast iron	150~220	C21N	PC5335	160 (130~190)	0.09~0.15	0.10~0.16	0.12~0.2	0.14~0.22	0.14~0.22	0.14~0.22
		Ductile cast iron	200~300	C21N	PC5335	140 (170~110)	0.09~0.15	0.10~0.16	0.12~0.2	0.14~0.22	0.14~0.22	0.14~0.22
		Malleable cast iron	130~230	C21N	PC5335	150 (180~120)	0.09~0.15	0.10~0.16	0.12~0.2	0.14~0.22	0.14~0.22	0.14~0.22
N	Aluminum	Aluminum	30~150	C21N	PC5335	300 (250~350)	0.08~0.12	0.10~0.14	0.12~0.16	0.14~0.18	0.14~0.18	0.14~0.18
	Alloyed copper	Alloyed copper	150~160	C21N	PC5335	250 (200~300)	0.08~0.12	0.10~0.14	0.12~0.16	0.14~0.18	0.14~0.18	0.14~0.18
S	Heat resistant alloy	Heat resistant alloy	130~400	C21N	PC5335	50 (70~30)	0.05~0.08	0.05~0.08	0.06~0.10	0.06~0.10	0.06~0.10	0.06~0.10

Parts of WPDC type indexable drills

Designation	ØD	Insert			Center drill			Cartridge		
		Insert	Screw	Wrench	Center drill	fixed bolt	cone point bolt	Inner	Outer	Fixed bolt
WPDC250-32-□	25	WC□T030204-C21N	FTKA02206	TW06S	CD0630	KHA0508	KHC0510			
WPDC260~280-32-□	26~28	WC□T040204-C21N	FTNA02555	TW07S						
WPDC290~300-32-□	29~30					KHA0510				
WPDC310~350-32-□	31~35	WC□T050308-C21N	FTKA0307	TW09S	CD0835	KHA0610	KHC0610			
WPDC360~400-32-□	36~40					KHA0612				
WPDC410-40-□	41	WC□T06T308-C21N	FTKA03508	TW15S	CDH1035	KHA0812	KHC0812	CWP4145C	CWP410P	BHA0510
WPDC420-40-□	42								CWP420P	
WPDC430-40-□	43								CWP430P	
WPDC440-40-□	44								CWP440P	
WPDC450-40-□	45								CWP450P	
WPDC460-40-□	46					KHA0815		CWP4650C	CWP460P	BHA0512
WPDC470-40-□	47								CWP470P	
WPDC480-40-□	48								CWP480P	
WPDC490-40-□	49								CWP490P	
WPDC500-40-□	50								CWP500P	
WPDC510-40-□	51	WC□T080408-C21N	FTKA0411K	TW15S	CDH1238	KHA1015	KHC1016	CWP5155C	CWP510P	BHA0612
WPDC520-40-□	52								CWP520P	
WPDC530-40-□	53								CWP530P	
WPDC540-40-□	54								CWP540P	
WPDC550-40-□	55								CWP550P	
WPDC560-40-□	56							CWP5659C	CWP560P	BHA0614
WPDC570-40-□	57								CWP570P	
WPDC580-40-□	58								CWP580P	
WPDC590-40-□	59								CWP590P	
WPDC6065-40-□	60~65	WC□T050308-C21N	FTKA0307	TW09S		KHA1020	KHA1020	CWP6065C	CWP6065P	BHA0510
WPDC6570-40-□	65~70							CWP6570C	CWP6570P	
WPDC7075-40-□	70~75							CWP7075C	CWP7075P	
WPDC7580-40-□	75~80	WC□T06T308-C21N	FTKA03508	TW15S	CDH1645			CWP7580C	CWP7580T	BHA0612

Applicable inserts **G04~05**

Center Drill



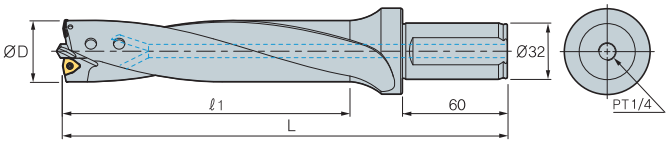
(mm)

Designation	Grade	ØD	L	Oil-hole
CD0630	PC40H	6	30	×
CD0835	PC40H	8	35	×
CDH1035	PC40H	10	35	○
CDH1238	PC40H	12	38	○
CDH1645	PC40H	16	45	○

• This is HSS with Tin coating

WPDC (5D/6.5D/8D)

Standard type



(mm)

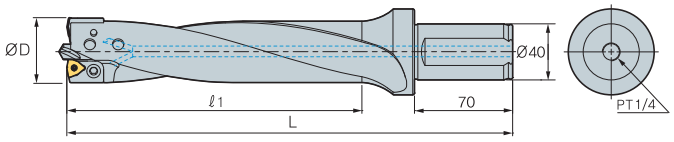
Designation		ØD	5D		6.5D		8D		Insert	Center drill
			ℓ1	L	ℓ1	L	ℓ1	L		
WPDC	250-32-□	25	150	240	185	275	220	310	WC□T030204-C21N	CD0630
	260-32-□	26	150	240	185	275	220	310	WC□T040204-C21N	
	270-32-□	27	150	240	185	275	220	310		
	280-32-□	28	150	240	185	275	220	310		
	290-32-□	29	150	240	185	275	220	310		
	300-32-□	30	150	240	185	275	220	310		
	310-32-□	31	175	265	218	308	260	350	WC□T050308-C21N	CD0835
	320-32-□	32	175	265	218	308	260	350		
	330-32-□	33	175	265	218	308	260	350		
	340-32-□	34	175	265	218	308	260	350		
	350-32-□	35	175	265	218	308	260	350		
	360-32-□	36	200	290	250	340	300	390		
	370-32-□	37	200	290	250	340	300	390		
	380-32-□	38	200	290	250	340	300	390		
	390-32-□	39	200	290	250	340	300	390		
	400-32-□	40	200	290	250	340	300	390		

Applicable inserts **G04~05**

* We can provide if you order exact diameter
Ex) machining hole 32.5 mm * 6.5D ···› WPDC325-32-6.5

WPDC (5D/6.5D/8D)

Single insert catridge type



(mm)

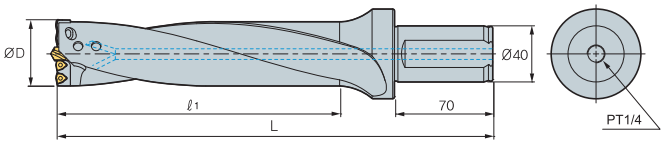
Designation		ØD	5D		6.5D		8D		Insert	Center drill	Cartridge	
			ℓ1	L	ℓ1	L	ℓ1	L			Inner	Outer
WPDC	410-40-□	41	225	330	283	388	340	445	WC□T06T308-C21N	CDH1035	CWP4145C	CWP410P
	420-40-□	42	225	330	283	388	340	445				CWP420P
	430-40-□	43	225	330	283	388	340	445				CWP430P
	440-40-□	44	225	330	283	388	340	445				CWP440P
	450-40-□	45	225	330	283	388	340	445				CWP450P
	460-40-□	46	250	355	315	420	380	485			CWP4650C	CWP460P
	470-40-□	47	250	355	315	420	380	485				CWP470P
	480-40-□	48	250	355	315	420	380	485				CWP480P
	490-40-□	49	250	355	315	420	380	485				CWP490P
	500-40-□	50	250	355	315	420	380	485				CWP500P
	510-40-□	51	275	380	348	453	420	525	WC□T080408-C21N	CDH1238	CWP5155C	CWP510P
	520-40-□	52	275	380	348	453	420	525				CWP520P
	530-40-□	53	275	380	348	453	420	525				CWP530P
	540-40-□	54	275	380	348	453	420	525				CWP540P
	550-40-□	55	275	380	348	453	420	525				CWP550P
	560-40-□	56	300	405	380	485	460	565			CWP5659C	CWP560P
	570-40-□	57	300	405	380	485	460	565				CWP570P
	580-40-□	58	300	405	380	485	460	565				CWP580P
	590-40-□	59	300	405	380	485	460	565				CWP590P

Applicable inserts **G04~05**

* We can provide if you order exact diameter
Ex) machining hole 47.5 mm * 5D -> WPDC475-40-5

WPDC (5D/6.5D/8D)

Dual insert cartridge type



(mm)

Designation		ØD	5D		6.5D		8D		Insert	Center drill	Cartridge	
			ℓ1	L	ℓ1	L	ℓ1	L			Inner	Outer
WPDC	6065-40-□	60~65	325	430	423	528	520	625	WC□T050308-C21N	CDH1238	CWP6065C	CWP6065P
	6570-40-□	65~70	350	455	455	560	560	665			CWP6570C	CWP6570P
	7075-40-□	70~75	375	480	488	593	600	705			CWP7075C	CWP7075P
	7580-40-□	75~80	400	505	520	625	640	745	WC□T06T308-C21N	CDH1645	CWP7580C	CWP7580P

Applicable inserts **G04~05**

* We can provide if you order exact diameter
Ex) machining hole 70.5 mm * 6.5D -> WPDC705-40-6.5

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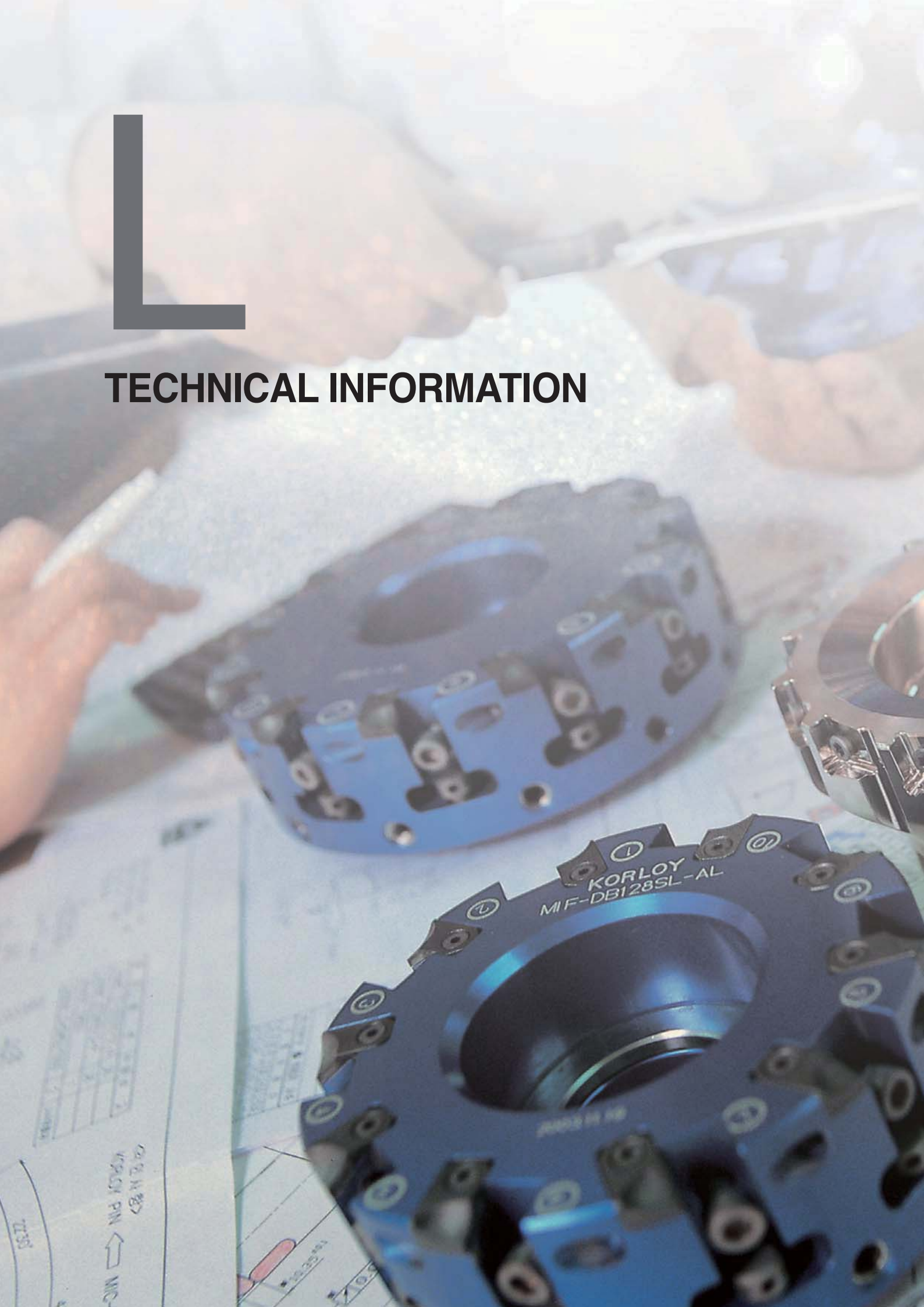
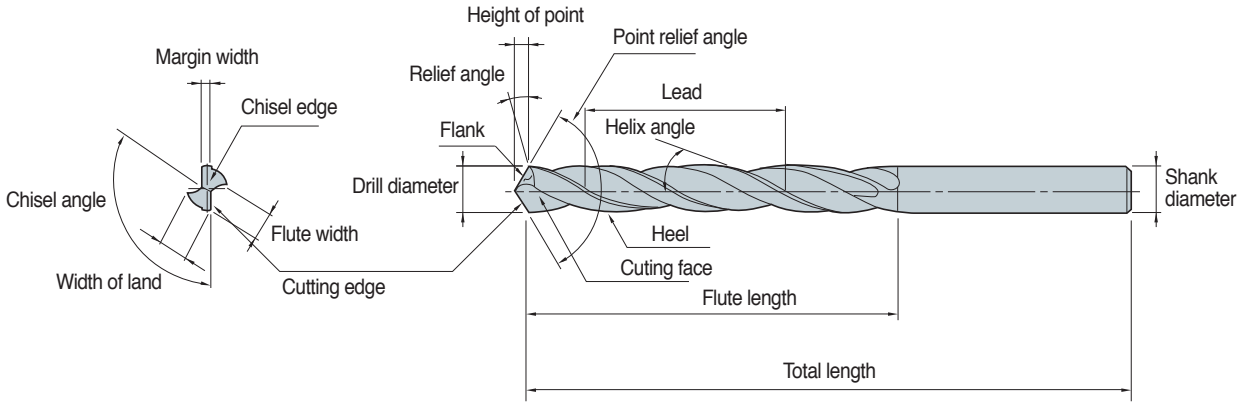
TECHNICAL INFORMATION



The shape of drills and the names



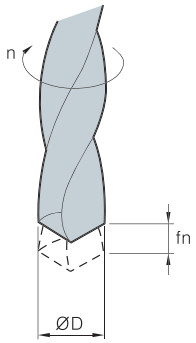
Shape and the feature of cutting

Helix angle	Plays rake angle of cutting edge's role. If helix angle increases Cutting force decreases. On the other hand If helix angle is too big Drill rigidity decreases Poor machinability ◀ low - Helix angle - high ▶ Smooth chip evacuation Hard workpiece (hardened steel) ◀ low - Helix angle - high ▶ Soft material (aluminum etc)
Length of flute	The path of both chip evacuation and cooling lubricant Too big length of flute weakens drill rigidity and too small length of flute worsens chip evacuation to breakage
Point angle	Point angle has big influence on cutting performance. It mainly depends on workpiece. In case of standard drills Point angle is generally 118 thrust resistance decrease ◀ low - Point angle - high ▶ thrust resistance increase Torque increase, Burr on exit increase ◀ low - Point angle - high ▶ Torque decrease, Burr on exit decrease Soft material (aluminum etc) ◀ low - Point angle - high ▶ Hard workpiece (hardened steel)
Margin	While machining Margin is the part of contact between workpiece and drill's external. It prevents bending and plays guide's role It depends on drill size Cutting force decrease ◀ small - Margin - big ▶ Cutting force increase Poor guide ◀ small - Margin - big ▶ Good guide
Web thickness	Web is the part of center of drill and drill's rigidity depends on the web. Drill needs cutting edge, chisel edge, at the tip of drill because drill makes a hole at the beginning of drilling . When web thickness is big Thinning is needed to reduce cutting force Cutting force decrease ◀ small - Web thickness - big ▶ Cutting force increase Rigidity decrease ◀ small - Web thickness - big ▶ Rigidity increase Good chip evacuation ◀ small - Web thickness - big ▶ Bad chip evacuation Soft material (aluminum etc) ◀ small - Web thickness - big ▶ Hard workpiece (hardened steel)
Back taper	Drill diameter size is getting smaller from point to shank in order to avoid the friction between drill periphery and workpiece. The decrease of diameter divided by flute length 100mm generally becomes 0.04~0.1mm. As for high performance drills and drills for hole shrinkage workpiece during operation have big back taper
Thinning	In general drills Thrust effects on chisel over 50%. Chisel edge length depends on web thickness and chisel angle. But if web is thin Drill rigidity weaken. Therefore without web thickness change Thinning makes chisel edge short or gives rake angle. In other words, Thinning makes rake angle at chisel and improves chip evacuation and decrease thrust

Types of	Edge shape	Feature	Korloy's drills
X type		Good centering High central thickness Crank shaft	Mach solid drill (MSD) Vulcan drill (VZD)
S type		For wide use For general Easy regrinding	Solid drill (SSD)

Major cutting formulas

Cutting speed	Feed	Helix angle	Machining time
$vc = \frac{\pi \cdot D \cdot n}{1000}$ (m/min)	$fn = \frac{vf}{n}$ (mm/rev)	$\delta = \tan^{-1}\left(\frac{\pi D}{L}\right)$	$tc = \frac{ld}{n \cdot fn}$ (min)
• vc: Cutting speed (m/min) • D: Drill diameter (mm) • n: Revolution per minute (min^{-1}) • π: Circular constant (3.14)	• fn: Feed per revolution (mm/rev) • vf: Feed per minute (mm/min) • n: Revolution per minute (min^{-1})	• δ: Helix angle • D: Drill diameter (mm) • L: Lead (mm) • π: Circular constant (3.14)	• tc: Machining time (min) • n: Revolution per minute (min^{-1}) • ld: Drilling time (mm) • fn: Feed (mm/rev)



Cutting torque and thrust (calculation formulas)

$Md = KD^2 \times (0.0631 + 1.686 \times fn)$ (kg·cm)

$T = 57.95KDfn^{0.85}$ (kg)

• Md: Cutting torque (kg·cm)
• T: Cutting thrust (kg)
• D: Drill diameter (mm)
• fn: Feed per revolution (mm/rev)
• K: Material coefficient

Workpiece material (SAE/AISI)		Tensile strength (kgf)	Hardness (HB)	Material coefficient K
Cast iron	Cast iron (Gray)	21	177	1.00
	Cast iron	28	198	1.39
	Cast iron (Ductile)	35	224	1.88
General steel	1020(carbon steel C 0.2%)	55	160	2.22
	1112(C 0.12, S 0.2%)	62	183	1.42
	1335(Mn 1.75%)	63	197	1.45
Nickel Chrome steel	3115 (Ni 1.25, Cr 0.6, Mn 0.5)	53	163	1.56
	3120 (Ni 1.25, Cr 0.6, Mn 0.7)	69	174	2.02
	3140	88	241	2.32
Chrome molybdenum steel	4115 (Cr 0.5, Mo 0.11, Mn 0.8)	63	167	1.62
	4130 (Cr 0.95, Mo 0.2, Mn 0.5)	77	229	2.10
	4140 (Cr 0.95, Mo 0.2, Mn 0.85)	94	269	2.41
Nickel molybdenum steel	4615 (Ni 1.8, Mo 0.25, Mn 0.5)	75	212	2.12
	4820 (Ni 3.5, Mo 0.25, Mn 0.6)	140	390	3.44
Chrome steel	5150 (Cr 0.8, Mn 0.8)	95	277	2.46
Chrome vanadium steel	6115 (Cr 0.6, Mn 0.6, V 0.12)	58	174	2.08
	6120 (Cr 0.8, Mn 0.8, V 0.1)	80	255	2.22

Cutting torque and thrust (empirical formula)

$Md = K_1 d^2 \cdot fn^m$
$T = K_2 d \cdot fn^n$

• Md: Cutting torque (kg·cm)
• T: Thrust (kg)
• fn: Feed (mm/rev)
• d: Drill diameter (mm)
• K_1, K_2, m, n: Experimental Data Characteristic value

Workpiece	K_1	m	K_2	n
Soft steel	5.9	1.00	125.0	0.88
Rolled steel	3.5	1.00	55.0	0.88
7-3 brass	2.5	0.94	44.4	0.87
Aluminum	1.5	0.90	33.3	0.78
Zinc	1.4	0.88	27.0	0.74
Gun metal	2.0	0.94	21.6	0.75
Galvanized iron	0.3	0.57	6.4	0.55

Tool failures and solutions

Trouble		Causes	Solutions																	
			Cutting condition					Tool shape						Grade		etc				
			Cutting speed	Feed	Step feed	Initial feed	Coolant	Relief angle	Point angle	Thinning angle	Honing	Flute width rate	Thinning	Toughness	Hardness	Machine rigidity	Machine vibration	Guide bush	Clamping workpiece
Chipping		• Too sharp cutting edge (too big relief angle) (thinning edge is too sharp)						⬇		⬇	⬆			⬆					
		• Excessive cutting speed	⬇				●												
		• Built-up edge					●	⬇		⬇	⬆			⬆					
		• Vibration and chattering	⬇													⬆	⬇		●
Wear		• Excessive cutting speed (Abnormal wear at margin)	⬇				●												
		• Insufficient cutting speed (Abnormal wear at center)	⬆				●												
Chip		• Long chip	⬆	⬆			●				⬇								
		• Over lap	⬆	⬆															
		• Chip burning	⬆				●												
Hole precision burr, poor surface finish		• Tool clamping precision				⬇			⬇		⬇					⬆	⬇		●
		• Excessive feed, sharp point angle		⬇					⬆		⬇								
		• Excessive cutting speed (Considered tool grade)	⬆				●	⬇	◉						⬆				
Fracture	Breakage on contact	• Poor surface finish			●	⬇												●	
		• Insufficient machine rigidity														⬆			●
		• Improper cutting condition	⬆	⬇															
	Breakage at hole bottom	• Crooked hole	⬆						⬆				●				⬇	●	
		• Chip clogging		⬇	●							⬆							

⬆: Increase ⬇: Decrease ●: use ◉: Correct use

Hole size for threading

● Metric coarse screw threads

Specification	Hole diameter
M1 X 0.25	0.75
M1.1 X 0.25	0.85
M1.2 X 0.25	0.95
M1.4 X 0.3	1.1
M1.6 X 0.35	1.25
M1.7 X 0.35	1.35
M1.8 X 0.35	1.45
M2 X 0.4	1.6
M2.2 X 0.45	1.75
M2.3 X 0.4	1.9
M2.5 X 0.45	2.1
M2.6 X 0.45	2.2
M3 X 0.6	2.4
M3 X 0.5	2.5
M3.5 X 0.6	2.9
M4 X 0.75	3.25
M4 X 0.7	3.3
M4.5 X 0.75	3.8
M5 X 0.9	4.1
M5 X 0.8	4.2
M5.5 X 0.9	4.6
M6 X 1	5
M7 X 1	6
M8 X 1.25	6.8
M9 X 1.25	7.8
M10 X 1.5	8.5
M11 X 1.5	9.5
M12 X 1.75	10.3
M14 X 2	12
M16 X 2	14
M18 X 2.5	15.5
M20 X 2.5	17.5
M22 X 2.5	19.5
M24 X 3	21
M27 X 3	24
M30 X 3.5	26.5
M33 X 3.5	29.5
M36 X 4	32
M39 X 4	35
M42 X 4.5	37.5
M45 X 4.5	40.5
M48 X 5	43

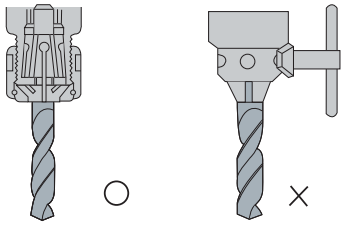
● Metric coarse screw threads

Specification	Hole diameter
M2.5 X 0.35	2.2
M3 X 0.35	2.7
M3.5 X 0.35	3.2
M4 X 0.5	3.5
M4.5 X 0.5	4
M5 X 0.5	4.5
M5.5 X 0.5	5
M6 X 0.75	5.3
M7 X 0.75	6.3
M8 X 1	7
M8 X 0.75	7.3
M9 X 1	8
M9 X 0.75	8.3
M10 X 1.25	8.8
M10 X 1	9
M10 X 0.75	9.3
M11 X 1	10
M11 X 0.75	10.3
M12 X 1.5	10.5
M12 X 1.25	10.8
M12 X 1	11
M14 X 1.5	12.5
M14 X 1	13
M15 X 1.5	13.5
M15 X 1	14
M16 X 1.5	14.5
M16 X 1	15
M17 X 1.5	15.5
M17 X 1	16
M18 X 2	16
M18 X 1.5	16.5
M18 X 1	17
M20 X 2	18
M20 X 1.5	18.5
M20 X 1	19
M22 X 2	20
M22 X 1.5	20.5
M22 X 1	21
M24 X 2	22
M24 X 1.5	22.5
M24 X 1	23
M25 X 2	23
M25 X 1.5	23.5
M25 X 1	24
M26 X 1.5	24.5
M27 X 2	25

Cautions

● Selection of drill chuck

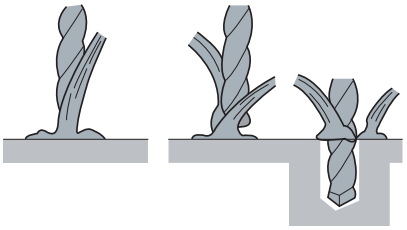
• Collect chuck is favorable Because it has strong grip power
(General drill-chuck and Keyless chuck don't have enough grip power.)



• Collect chuck • General drill-chuck

● Coolant supply

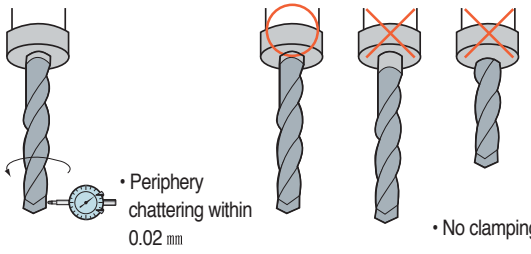
• Supply enough coolant around hole entrance
• Standard cutting oil pressure: 3~5 kg/㎠, Flux: 2~5 l/min



• Supply much coolant at hole entrance

● Mounting drill

• When mounting drill Periphery chattering should be within 0.02 ㎜
• Flute should not be clamped

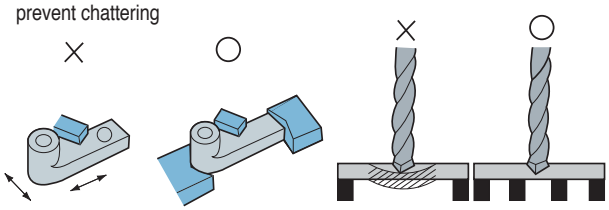


• Periphery chattering within 0.02 ㎜

• No clamping flute

● How to clamp workpiece

• At high performance drilling High thrust, torque and horizontal cutting force work at the same time so that workpiece should be clamped strongly to prevent chattering



• Uniformed and strong clamping is needed (Right and left, up and down)

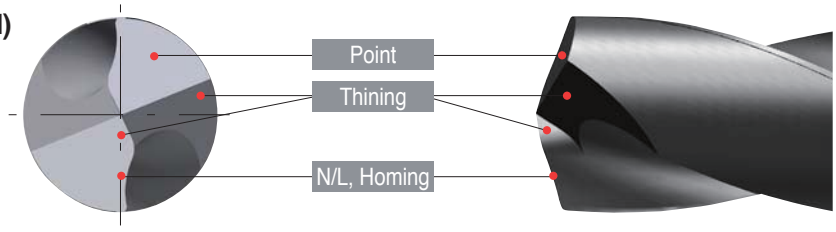
• Strong clamping is needed because bending causes chipping

Notice

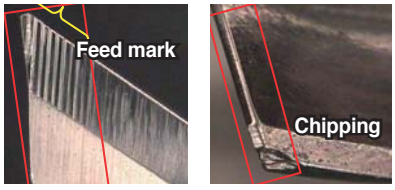
1) For better drill's life, small damage and wear are favorable to be regrinding
2) Damage and wear size should be within 1.5 ㎜ for regrinding
3) If drill has crack, regrinding is impossible
4) Ordering for regrinding is acceptable or purchase regrinding machine

Regrinding procedures

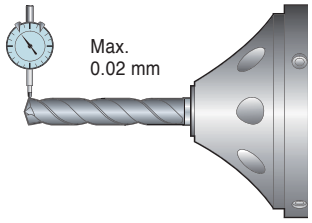
● Regrinding mathod (Mach Drill)



1) Preparation Determination of regrinding areas
- Check the cutting edge for damage and wear If large fracture is found, remove it by rough grinding



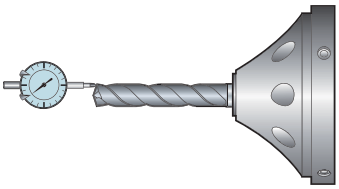
2) Grinding operation Drills setting
- Drill is clamped to collet chuck Chattering is kept within 0.02 mm

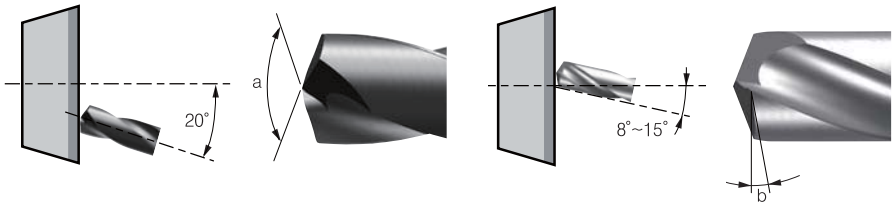


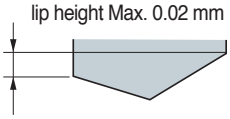
3) Grinding operation-Grinding point

- Check damage and wear at the point and remove it completely
- The difference of the lip height is kept within 0.02 mm

Point angle (a): 140°
Point relief angle (b)t: 8°~15°





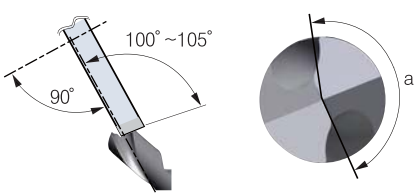


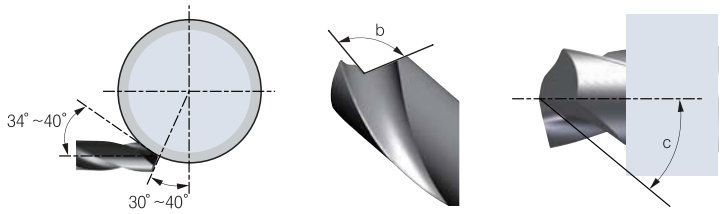
The difference of the lip height Max. 0.02 mm

4) Grinding operation-Thinning grinding

- Considering N/L width Cutting edge length from the center of drill axis should be 0.03~0.08mm for balancing
- Set the wheel to tilt drill axis by 34°~40°.

Thinning angle (a)°: 155°~160° Thining open angle (b): 100°~105°
Thinning relief angle (c): 34°~40°

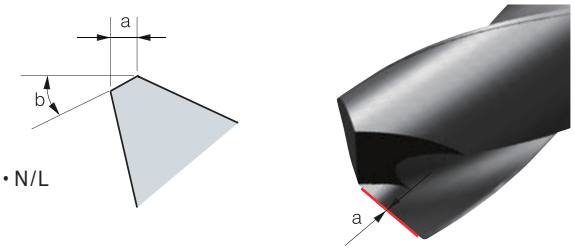




5) Grinding-N/L grinding and honing

- Using diamond chisel Grinds the width flat along point cutting edge
- After negaland operation Finishes with brush or handstone

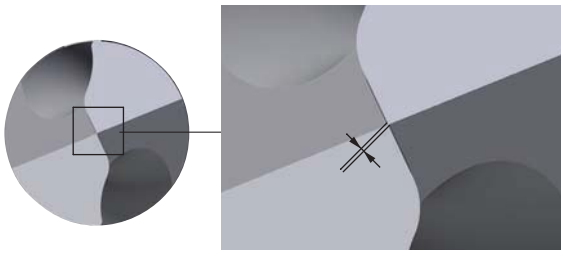
N/L width (a): 0.05mm~0.16mm/N/L angle (b): 24°~26°



● TIP

· Making point
- Without center drill, the point width should be below 0.10 mm

· Recommended grinding condition
- Diamond wheel: 240~400 mesh
- Diamond chisel: 400~600 mesh
- Diamond hand stone: 800~1500 mesh



Hexagonal socket bolt (clamping screw) size

● Counter boring and size of bolt hole for hexagonal socket bolt

ISO (d)	M3	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30
Ød1	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
Ød′	3.4	4.5	5.5	6.5	8.5	11	14	16	18	20	22	24	26	30	33
ØD	5.5	7	8.5	10	13	16	18	21	24	27	30	33	36	40	45
ØD′	5	8	9.5	11	14	17.5	20	23	26	29	32	35	39	43	48
H	3	4	5	6	8	10	12	14	16	18	20	22	24	27	30
H′	2.7	3.6	4.6	5.5	7.4	9.2	11.0	12.8	14.5	16.5	18.5	20.5	22.5	25	28
H″	3.3	4.4	5.4	6.5	8.6	10.8	13.0	15.2	17.5	19.5	21.5	23.5	25.5	29	32