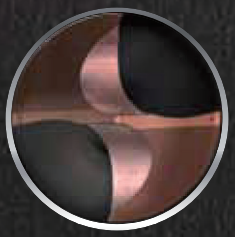
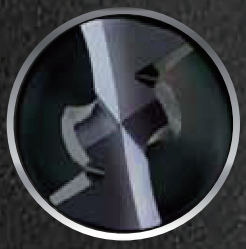
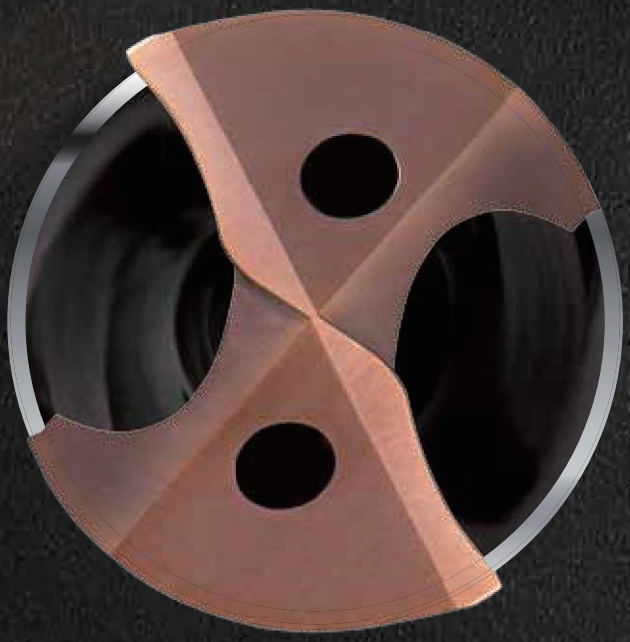


Technical Information **KORLOY**

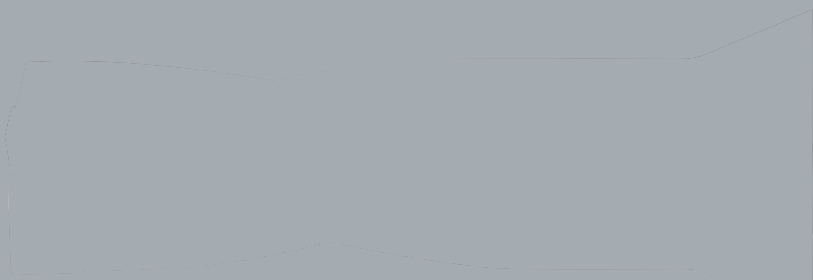
HOLE MAKING SOLUTION





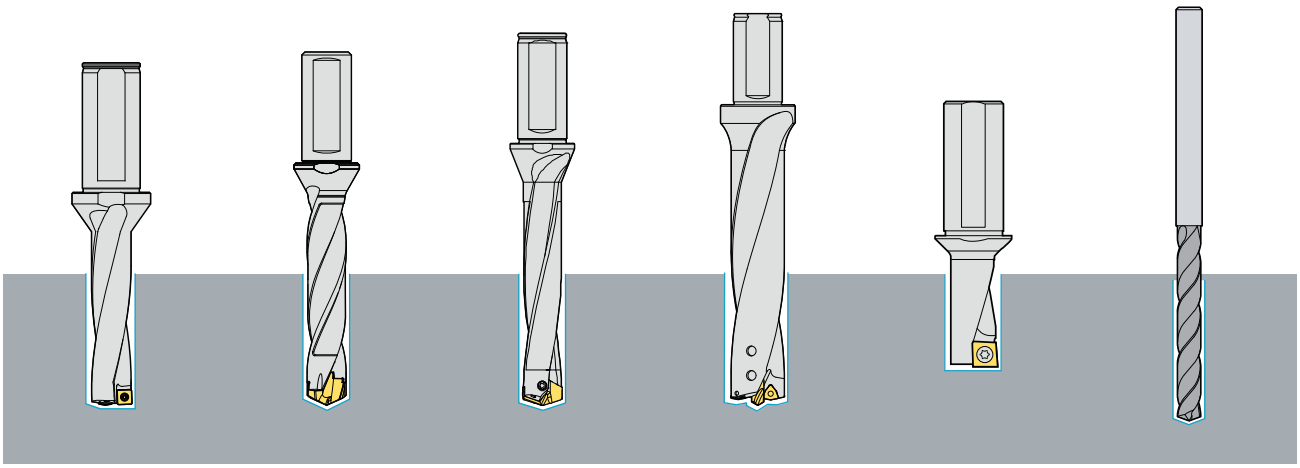
KORLOY

Hole Making Solution



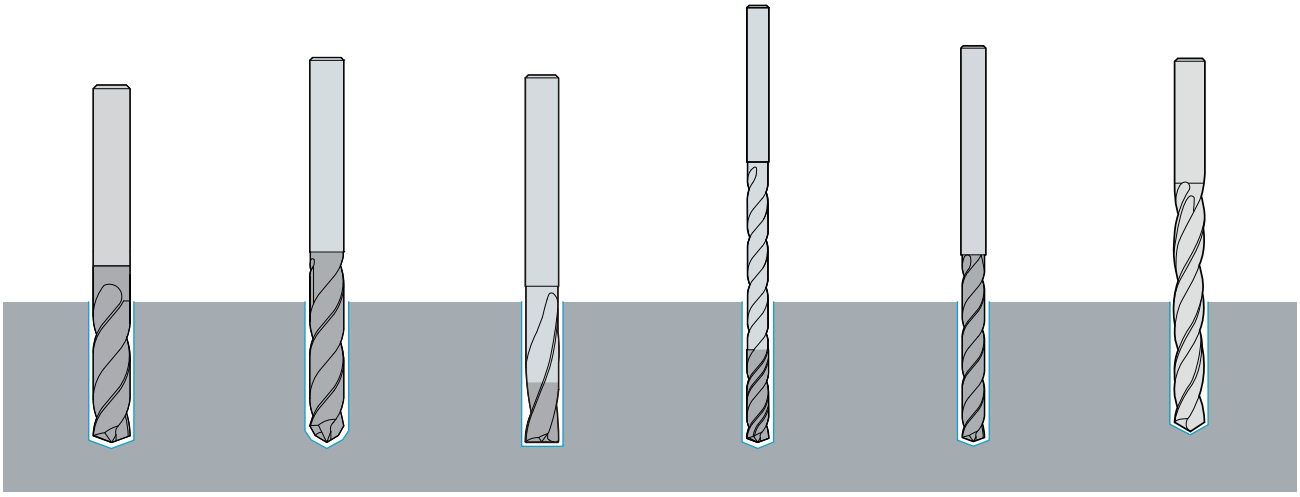
HOLE MAKING APPLICATION GUIDE

[Drilling]



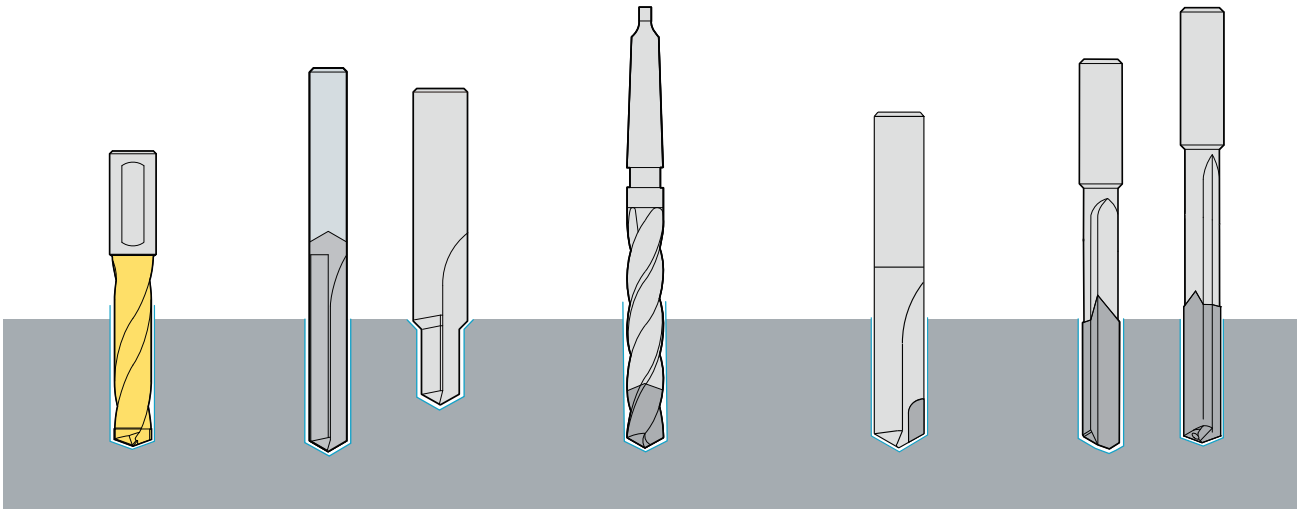
King Drill | TPDC | TPDB | WPDC | Multi Turn | MSD Plus

[Drilling]



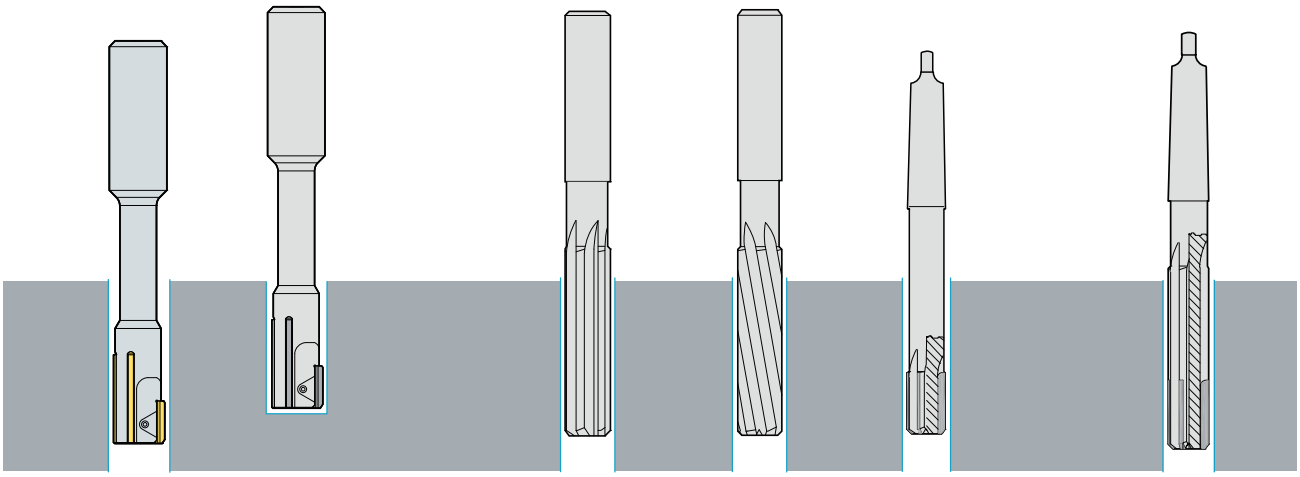
MSD Plus-S | MSD Plus CFRP | MSFD | MLD Plus | ESDP | SSD Plus

[Drilling]



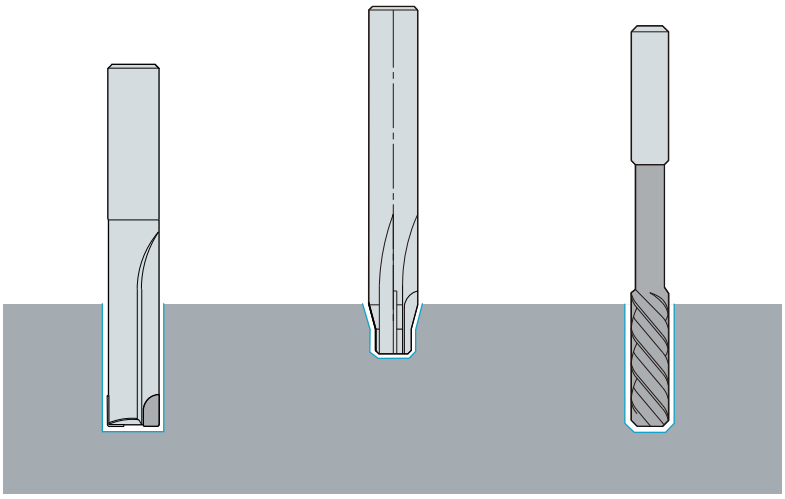
Vulcan Drill | Burnishing Drill | Top Solid Drill | PCD Drill | Gun Drill

[Reaming]



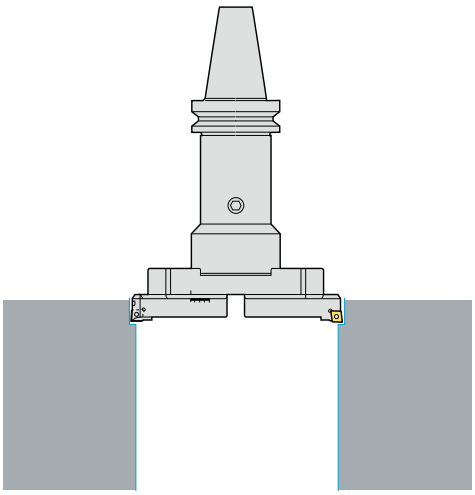
Indexable Reamer | Chucking Reamer | Machine Reamer

[Reaming]



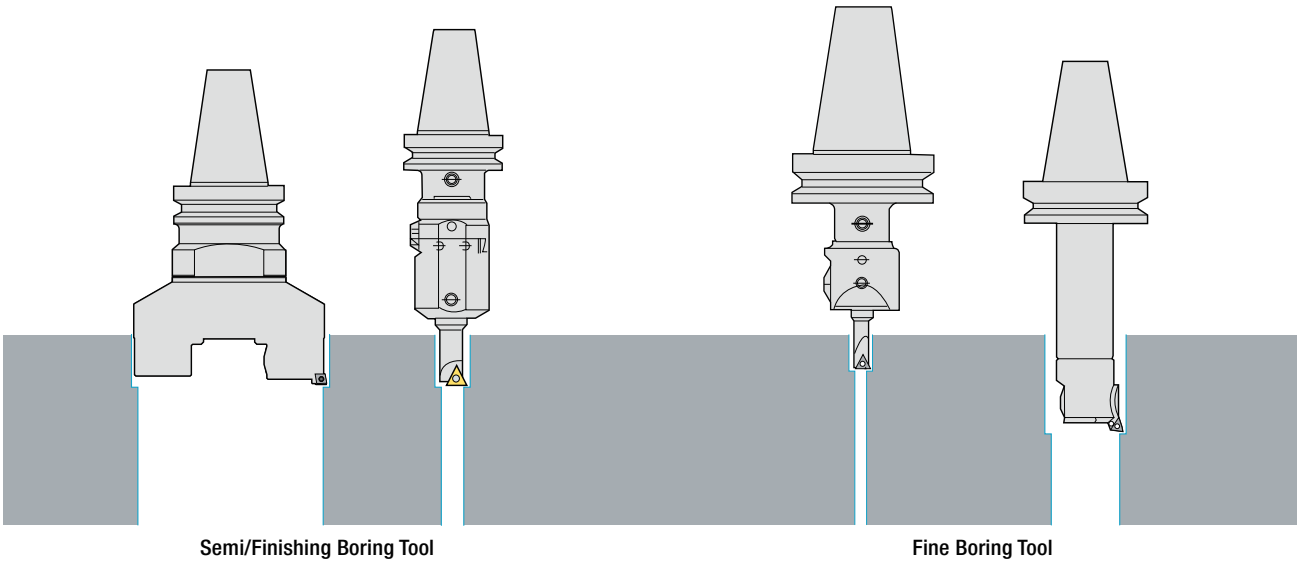
PCD Reamer | Cermet Reamer | Broach Reamer

[Boring]



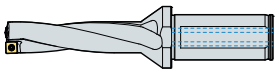
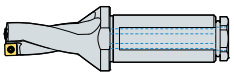
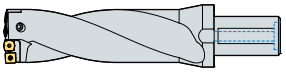
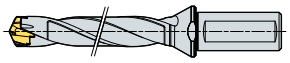
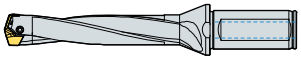
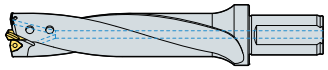
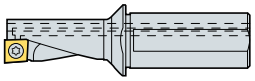
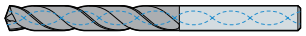
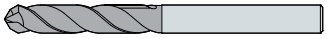
Rough Boring Tool

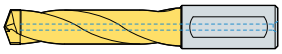
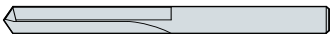
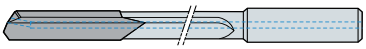
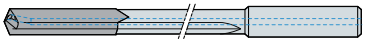
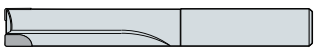
[Boring]



Semi/Finishing Boring Tool | Fine Boring Tool

INDEX FOR HOLE MAKING

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	010~014, 020~028
	King Drill HP	**K□D..HP**	 Available insert: SP□T, XO□T	Ø12.0~Ø60.5	2D~4D	015, 029~031
	King Drill (for large diameter drilling)	**K□D**	 Available insert: SP□T, XO□T	Ø61.0~Ø100.0	2D~4D	016~017, 032
	TPDC	**TPDC**	 Available insert: TPD□□□□CP	Ø12.0~Ø30.9	3D~12D	033~041
	TPDB	**TPDB**	 Available insert: TPD□□□B	Ø10.0~Ø32.9	3D~8D	042~050
	Indexable Drills & Drill with center	**WPDC**	 Available insert: WC□T	Ø25.0~Ø80.0	5D~8D	051~056
	Multi Turn	**MT**		Ø10.0~Ø32.0	-	057~061
Solid Drills	**Mach Solid Drill Plus**	**MSDP**		Ø1.0~Ø20.0	3D~7D	064~066
		MSDPH		Ø2.5~Ø20.0	3D~7D	067~070
	MSD Plus-S	**MSDPH-S**		Ø3.0~Ø16.0	3D~5D	071~078
	Mach Solid Drill Plus CFRP	**MSDP-C**		Ø3.0~Ø12.7	5D	079~081
	Mach Solid Flat Drill	**MSFD**		Ø2.5~Ø12.0	2D	082~088
		MSFDH		Ø2.5~Ø12.0	3D	089~090
	Mach Long Drill Plus	**MLD□□□□N**		Ø3.0~Ø10.0	10D~25D	091~095
	ESDP	**ESDP**		Ø1.0~Ø20.0	-	096~103

Type	Designation		Shape	Drills dia.	Aspect ratio	Page
	Carbide Drill	SSDP		Ø1.0~Ø15.0	-	104~106
	Vulcan Drill	VZD		Ø12.6~Ø40.5	-	107~110
	Burnishing Drill	BDS		Ø4.0~Ø16.0	5D~7D	111
		BDT		Ø4.2~Ø10.3	2D~4D	111
	Top solid Drill	TSDM		Ø8.0~Ø25.0	5D~8D	112
	PCD Drill	PDD		Ø5.0~Ø12.0	5D	113
	Gun Drill	KGDS		Ø2.0~Ø33.0	50D~100D	114~118
		KGDT		Ø6.0~Ø26.5	50D~100D	119
Reamer	Indexable Reamer	IRT		Ø10.0~Ø31.0	3D~5D	122~126
		IRB	 Available Insert: RI	Ø10.0~Ø31.0	3D~5D	127
	Chucking/Machine Reamer	SCRS	 Available Insert: RI	Ø5.0~Ø20.0	2D~3D	128~129
		SCRH		Ø5.0~Ø20.0	2D~3D	129
		TCRS		Ø7.0~Ø30.0	2D~3D	130
		TMRS		Ø7.0~Ø30.0	3D~5D	130
	PCD Reamer	PDR		Ø5.0~Ø20.0	3D~5D	131
	Cermet Reamer	KCR		Ø6.0~Ø30.0	3D~7D	132
	Broach Reamer	HBRE		Ø3.0~Ø25.0	3D~7D	134

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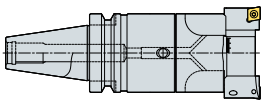
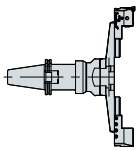
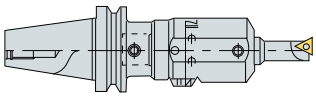
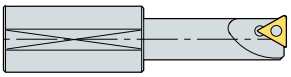
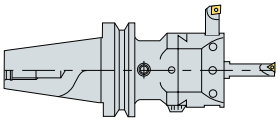
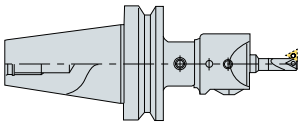
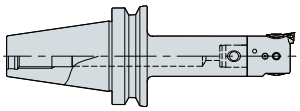
Type	Designation		Shape	Drills dia.	Aspect ratio	Page
Boring Tools	**Rough Boring Tool**	**DBC**		Ø28.0~Ø175.0		137
		TBC		Ø130.0~Ø540.0		138~139
	Semi/Finishing Boring Tool	**FBC**		Ø130.0~Ø540.0		140~141
		SMB		Ø7.0~Ø37.0		142
		KMB		Ø7.0~Ø101.0		143
	Fine Boring Tool	**SMH**		Ø5.5~Ø33.0		144
		FBH		Ø20.0~Ø172.0		145~148

HOLE MAKING SOLUTION

Contents

HOLE MAKING SOLUTION

Part 1

King Drill

· Optimized insert design for maximum drilling efficiency

Code system of holder

K	5D	200	25	□	–	07
KING/KORLOY	Aspect ratio (L/D)	Tool Dia.	shank dia.	Shank shape		Inscribed circle of insert

Aspect ratio (L/D)
2D, 3D, 4D, 5D

Tool Dia.
Ø20.0
(One decimal place marked)

shank dia.
Ø20, Ø25
Ø32, Ø40

Shank shape
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

Inscribed circle of insert
05, 06, 07, 09
11 13, 15, 18

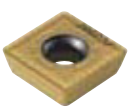
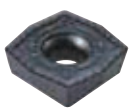
Features

- 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

Recommended cutting condition

Workpiece				Insert			vc (m/min)	Depth of cut = 2D, 3D, 4D Feed rate (mm/rev) per drill dia. (mm)				
ISO		Workpiece	Hardness (HB)	Chip breaker	Grade							
					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

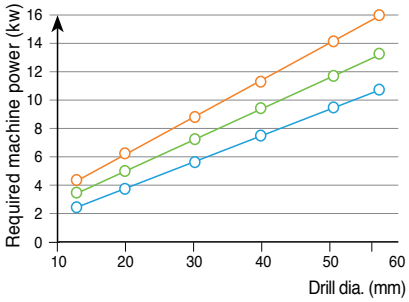
Required machine power

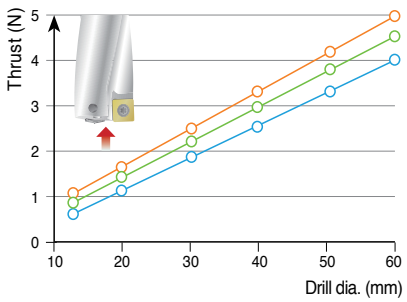
- The graphs below show the cutting force required in drilling
- Machining with the King Drill and a machine with high rigidity and power

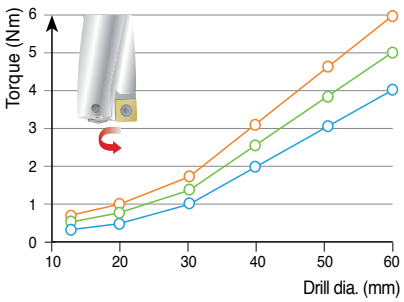
Workpiece SCM440 (240HB)

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

fn (mm/rev) = 0.13 fn (mm/rev) = 0.10 fn (mm/rev) = 0.07







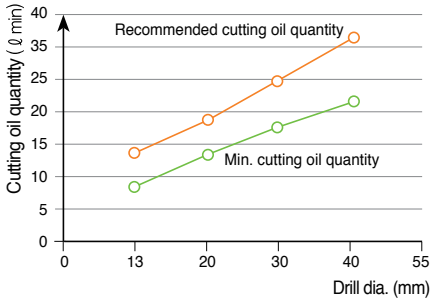
King Drill

Cutting oil quantity

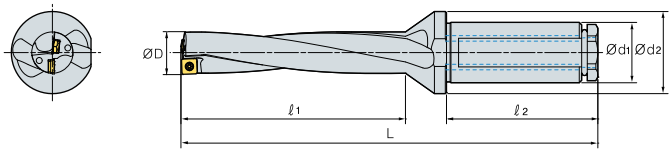
Workpiece SCM440 (240HB)

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

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



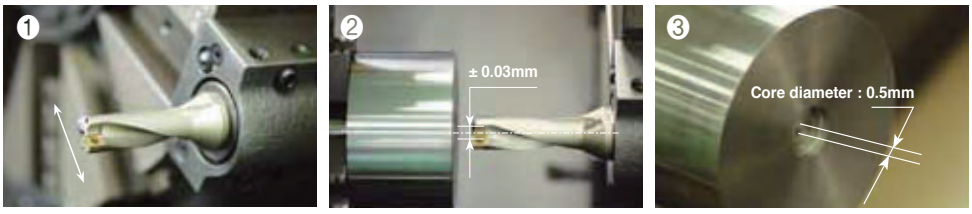
Drill tolerance and hole tolerance



(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

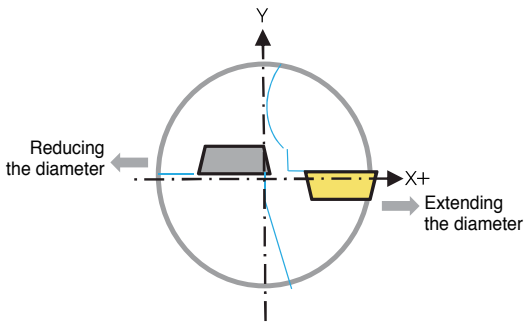


- Set the peripheral insert parallel to the X axis. (based on the side lock)
- If the machined core is 0.5mm after machining 5mm, that is the proper setting

※ 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



King Drill

(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

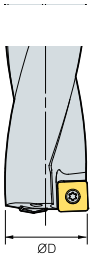
Drill dia. (mm)	Peripheral insert	Central insert	Screw	Wrench	Torque (Nm)
Ø12.0~Ø13.5	SP□T040204-□□	XO□T040204-□□	FTNA0204	TW06P	0.4
Ø13.6~Ø16.0	SP□T050204-□□	XO□T050204-□□	FTNA0204	TW06P	0.4
Ø16.1~Ø19.5	SP□T060205-□□	XO□T060204-□□	FTKA02206S	TW07P	0.8
Ø19.6~Ø23.5	SP□T07T208-□□	XO□T07T205-□□	FTKA02565	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

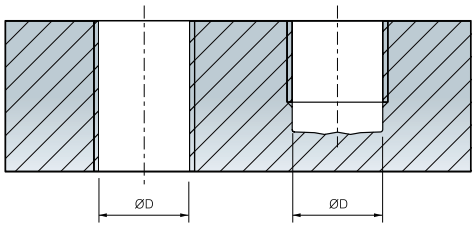
• In clamping an insert, please clean the tip seat and apply CASMOLY1000 on the screw
• Please make sure to use a Korloy-produced wrench and screw only

King Drill

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





Thru tap Blind tap

(mm)

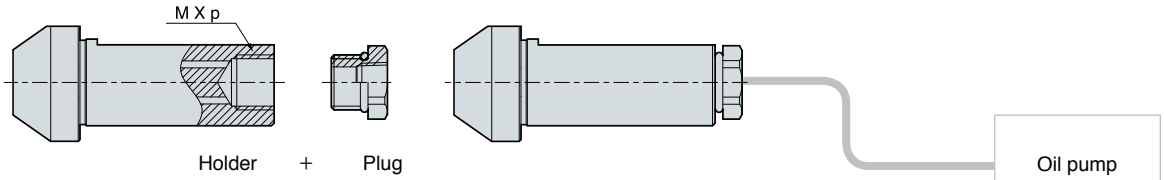
Tap type	Thread	ØD	Designation	Reference
Metric	M14 x 2.0	12.0	K3D12020-04	G14
	M16 x 2.0	14.0	K3D14020-05	G14
	M18 x 2.5	15.5	K3D15520-05	G14
	M20 x 2.5	17.5	K3D17525-06	G14
	M22 x 2.5	19.5	K3D19525-06	G14
	M24 x 3.0	21.0	K3D21025-07	G14
	M27 x 3.0	24.0	K3D24032-09	G14
	M30 x 3.5	26.5	K3D26532-09	G14
	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

King Drill (For through coolant system with a lathe)

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

Features

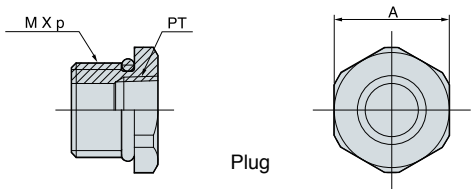
- Through coolant system with drill holder, plug, oil-hole hose and oil-hole pump
- PT TAP in the plug is combined to PT TAP connected to oil hose
- Available to use the drill without a plug in milling machine



• 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	M12 x 1.5	PLG12PT18
K□D161~23525HP-□□	Ø16.1 ~ Ø23.5	Ø25	M16 x 1.5	PLG16PT18
K□D236~35532HP-□□	Ø23.6 ~ Ø35.5	Ø32	M20 x 2.0	PLG20PT14
K□D356~60940HP-□□	Ø35.6 ~ Ø60.5	Ø40	M27 x 2.0	PLG27PT38



• Plug is assembled

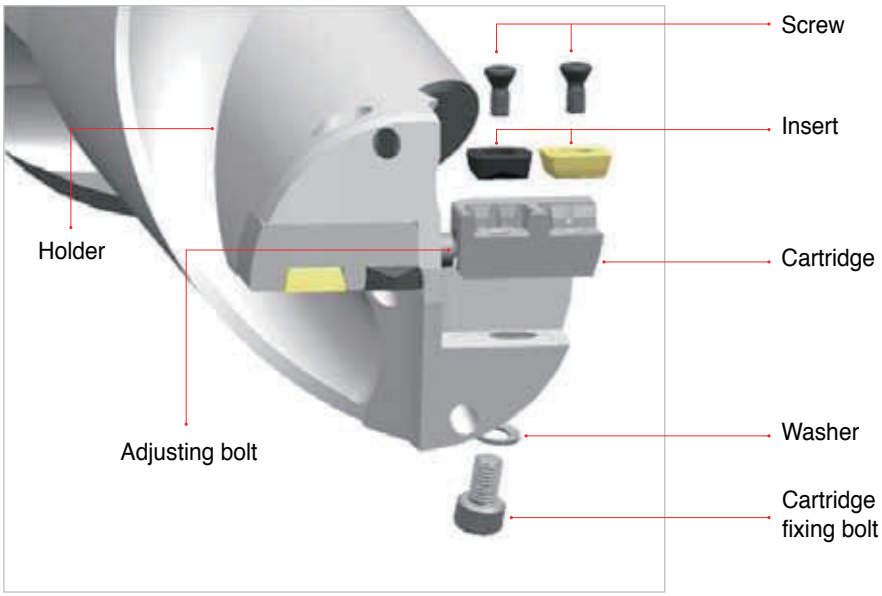
Plug type	M x p	PT tap	A
PLG12PT18	M12 x 1.5	1/8	16
PLG16PT18	M16 x 1.5	1/8	19
PLG20PT14	M20 x 2.0	1/4	26
PLG27PT38	M27 x 2.0	3/8	35

King Drill (For large diameter drilling)

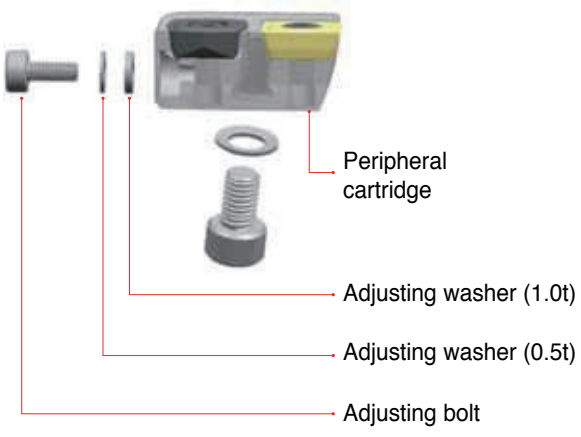
High rigidity drill produces cost efficiency due to cartridge replacement

Features

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



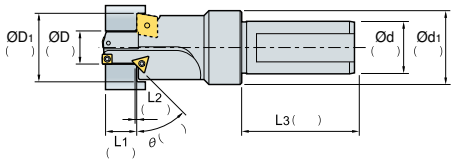
Adjustment of drill diameter

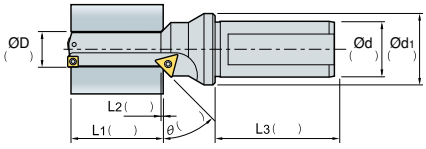


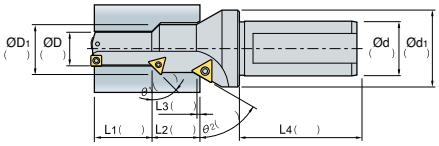
Adjustment Ø (mm)	Adjusting washer	
	Designation	Width (mm)
1	WA0305	0.5
2	WA0310	1.0
3	WA0305 + WA0310	1.5
4	WA0310 x 2	2.0
5	WA0305 + WA0310 x 2	2.5

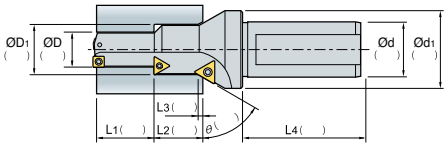
※ Adjusting washer adjusts the drilling diameter within 5 mm

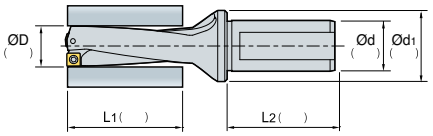
Special drill order form

☐ 

☐ 

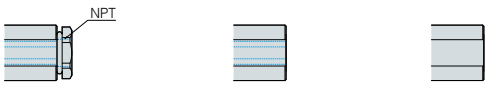
☐ 

☐ 

☐ 

Coolant type

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



Hole type

☐ Blind hole ☐ Thru hole

Types of shank

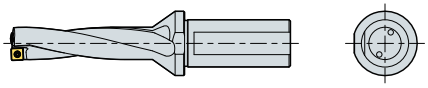
☐  Flat Type

☐  Weldon Type

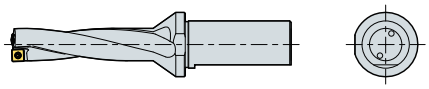
☐  Whistle Notch Type

Location of side lock

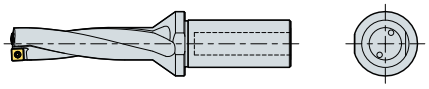
☐ Parallel to peripheral insert (standard)



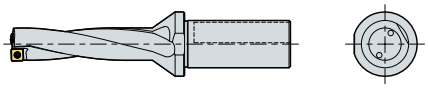
☐ 90°angle to peripheral insert (standard)



☐ 180°angle to peripheral insert (standard)



☐ 270° angle to peripheral insert (standard)



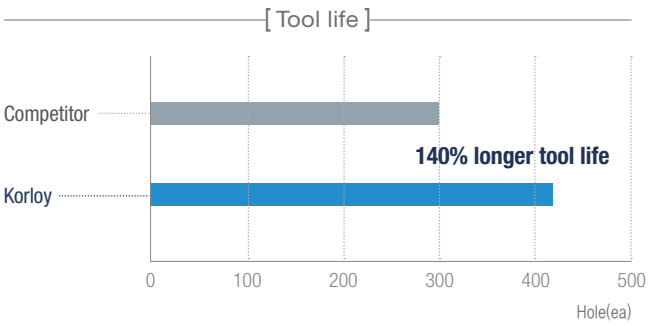
Note

- 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

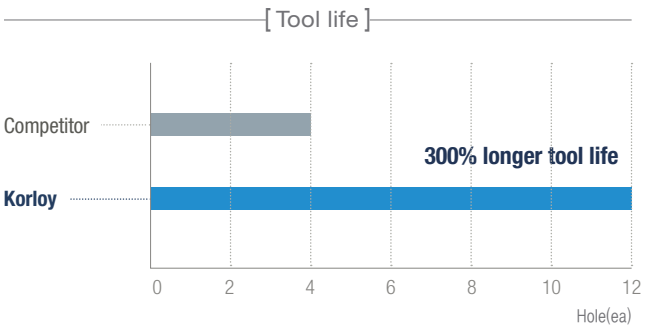
Application Example 1

Cutting conditions	
Holder	K3D14020-05
Insert	**SPMT050204-PD** **XOMT050204-PD**
Grade	PC5300
Workpiece	SCM440
Cutting speed	vc = 80 (m/min)
Feed	fn = 0.05 (mm/rev)
Depth of cut	ap = 38 (mm)
Coolant	Internal coolant supply



Application Example 2

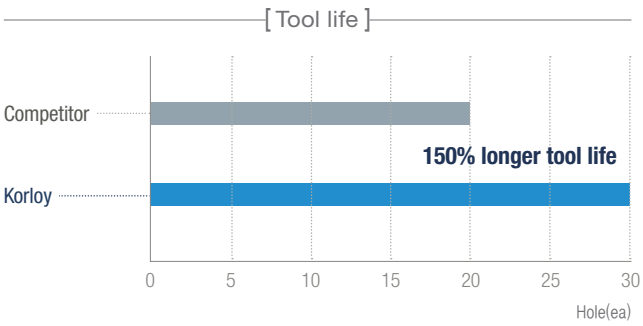
Cutting conditions	
Holder	K3D43040-15
Insert	**SPMT15M510-LD** **XOMT15M508-LD**
Grade	PC5335
Workpiece	Inconel 718
Cutting speed	vc = 35 (m/min)
Feed	fn = 0.05 (mm/rev)
Depth of cut	ap = 50 (mm)
Coolant	Internal coolant supply



King Drill

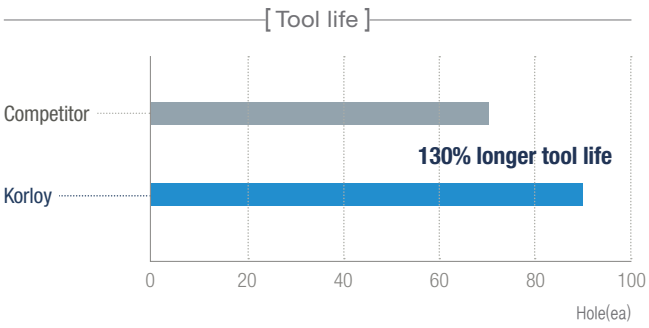
Application Example 3

Cutting conditions	
Holder	K3D58040-18
Insert	**SPMT180510-PD** **XOMT180508-PD**
Grade	PC3500
Workpiece	STF4
Cutting speed	vc = 109 (m/min)
Feed	fn = 0.13 (mm/rev)
Depth of cut	ap = 98 (mm)
Coolant	Internal coolant supply

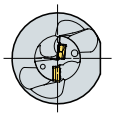


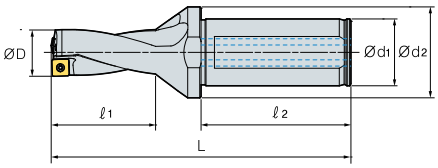
Application Example 4

Cutting conditions	
Holder	K3D38040-13
Insert	**SPMT130410-PD** **XOMT130406-PD**
Grade	PC5300
Workpiece	S53C
Cutting speed	vc = 120 (m/min)
Feed	fn = 0.12 (mm/rev)
Depth of cut	ap = 95 (mm)
Coolant	Internal coolant supply



King Drill-2D

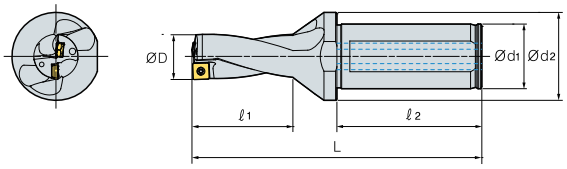




(mm)

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			

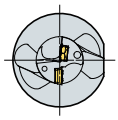
King Drill-2D

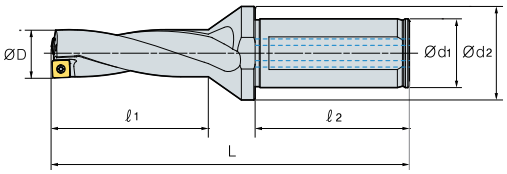


(mm)

	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			

King Drill-3D



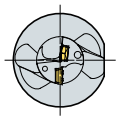


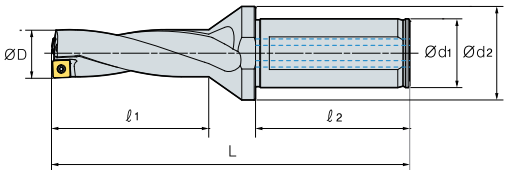
(mm)

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			

The items marked ＊can machinea tap foundation hole

King Drill-3D



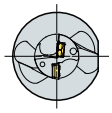


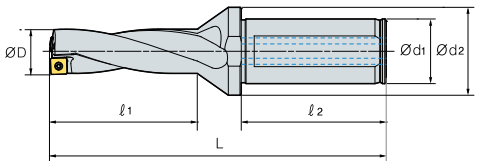
(mm)

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			

The items marked ＊can machinea tap foundation hole

King Drill-3D

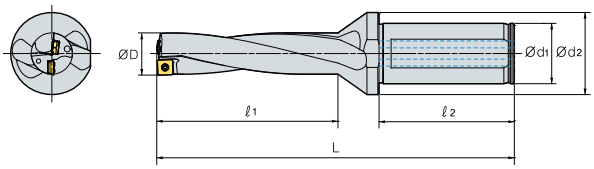




(mm)

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			

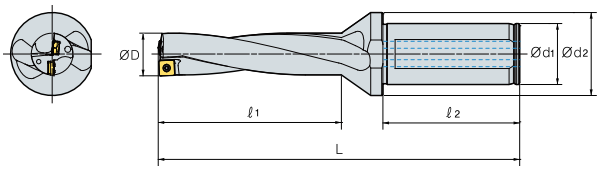
King Drill-4D



(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			

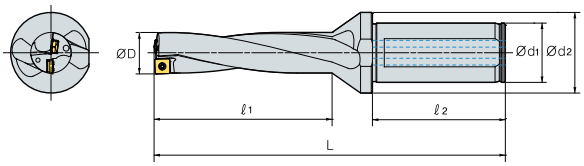
King Drill-4D



(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			

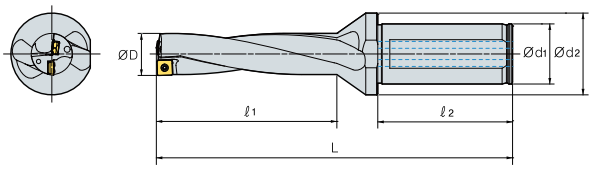
King Drill-5D



(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			

King Drill-5D

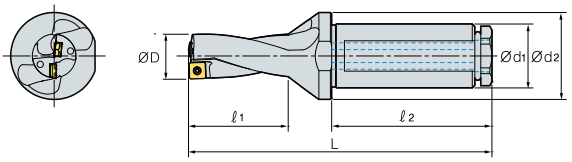


(mm)

	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			

King Drill-2D

For through coolant system with a lathe

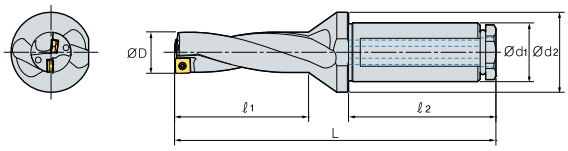


(mm)

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			

King Drill-3D

For through coolant system with a lathe

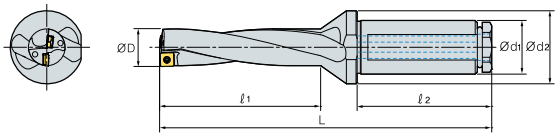


(mm)

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			

King Drill-4D

For through coolant system with a lathe

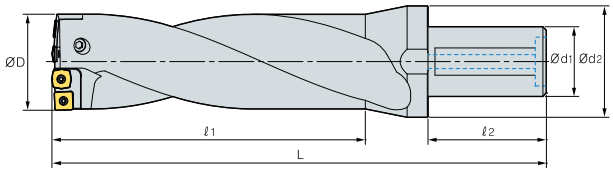


(mm)

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			

King Drill

For large diameter drilling



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

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

TPDC

Cone shaped head indexable drill

- **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 → Possibility to use for various types of workpieces
- **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

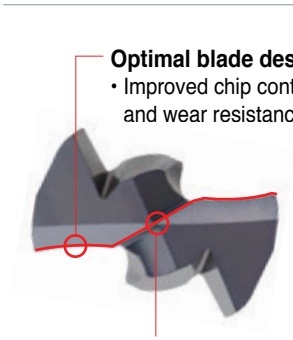
Code system of holder

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

Code system of insert

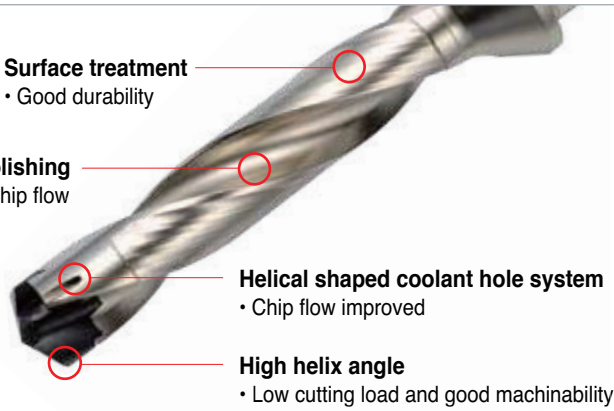
TPD	1500	C	P
Top solid piercing drill	Drill dia. 1500: Ø15.00	Insert type C: Cone type	Machining area **P**: Steel, Universal **M**: Stainless steel **K**: Cast iron **N**: Aluminium **C**: Carbon fiber Reinforced plastic

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

TPDC

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)

Cutting conditions Drill dia.(mm) = Ø15.0

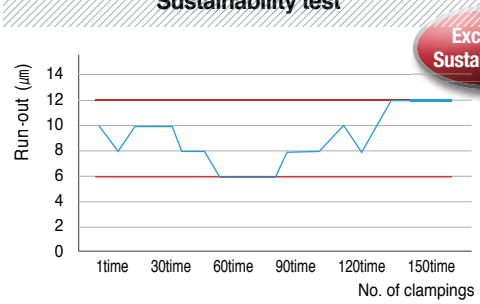
vc (m/min) = 100, **fn** (mm/rev) = 0.25, **ap** (mm) = 60, Wet

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

Recommended cutting condition

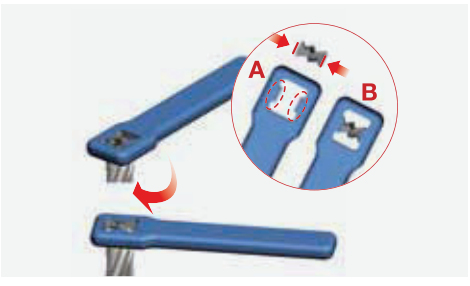
Workpiece				Grade	vc	Depth of cut = 3D, 5D Feed rate (mm/rev) per drill dia. (mm)	
ISO		Workpiece	HB		m/min	Ø12.00~Ø15.99	Ø16.00~Ø25.99
P	Carbon steel	Low carbon steel	80~120	PC5335	110 (80~140)	0.15~0.30	0.20~0.35
		High carbon steel	180~280	PC5335	100 (70~130)	0.15~0.30	0.20~0.35
	Alloy steel	Low alloy steel	140~260	PC5335	110 (80~140)	0.18~0.35	0.23~0.38
		Low pre-hardened steel	200~400	PC5335	75 (50~100)	0.18~0.35	0.23~0.38
		High alloy steel	260~320	PC5335	70 (50~90)	0.18~0.30	0.20~0.35
		High pre-hardened steel	300~450	PC5335	60 (40~80)	0.18~0.30	0.20~0.35
N	Aluminum	Aluminum	30~150	H01	200(90~220)	0.35~0.50	0.40~0.70
		Copper alloy	150~160	H01	200(90~220)	0.35~0.50	0.40~0.70

• 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

How to make good insert clamping

① Clean the mounting seat with air or cloth

② Put an insert on the holder



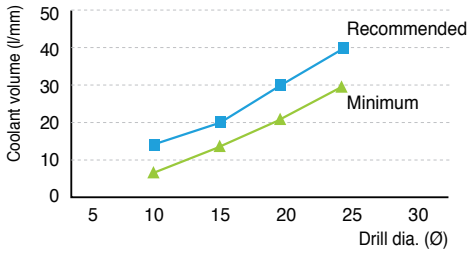
③ A part of wrench and B part of insert must be parallel to each other before clamp the insert Turn the wrench clockwise to finish clamping

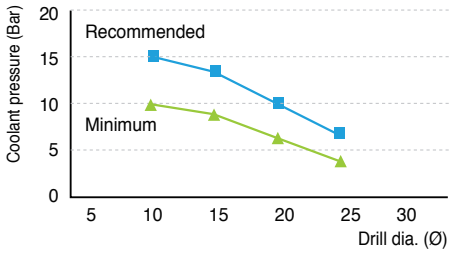
Clamped state

How to make good insert clamping

Workpiece SCM440 (HRC22)

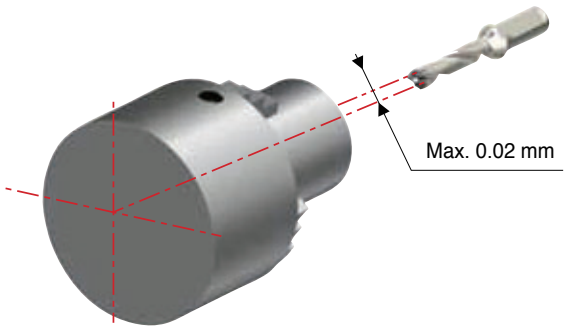
Cutting conditions **Drill dia.**(mm) = Ø15.0, **vc** (m/min) = 100, Wet



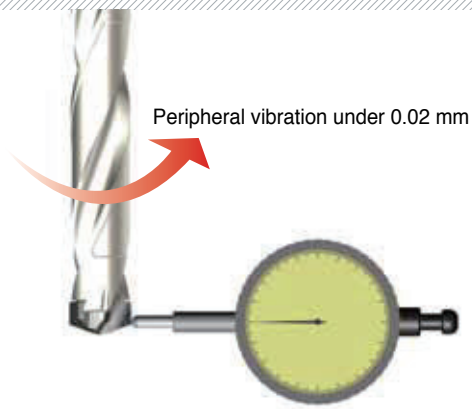


Precautions when setting

Setting of the horizontal equipment



Setting of the vertical equipment



Precautions when drilling

Ramping

1. A slope inclined more than 6° is not allowed
2. When entering, reduce the feed to 30~50%

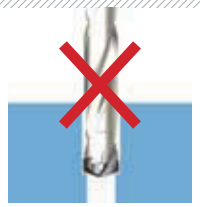
Overlapped

1. Space between panels affects chip evacuation problem
2. Do not make space between panels

Plunging

Not allowed

Boring



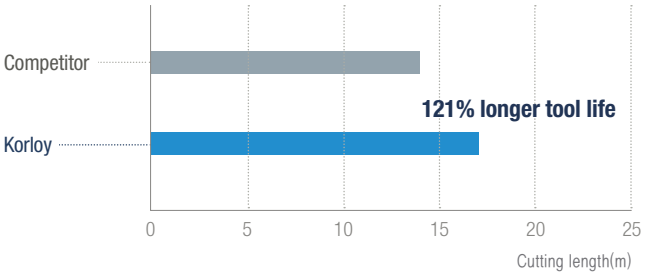
Not allowed

TPDC

Application Example 1

Cutting conditions	
Holder	TPDC5D-16020-80
Insert	**TPD1610CP**
Grade	PC330P
Workpiece	SM45C
Cutting speed	vc = 60 (m/min)
Feed	fn = 0.11 (mm/rev)
Depth of cut	ap = 65 (mm)
Coolant	Internal coolant supply

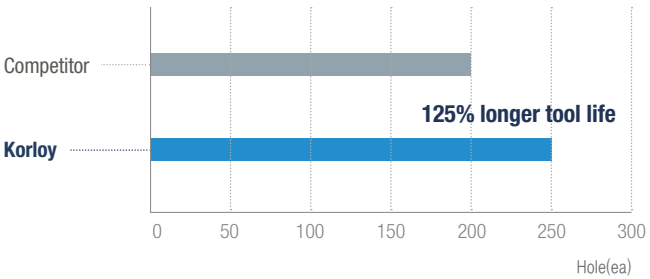
[Tool life]



Application Example 2

Cutting conditions	
Holder	TPDC8D-14016-112
Insert	**TPD1400CP**
Grade	PC5335
Workpiece	SCM920HVS(MS125-42)
Cutting speed	vc = 65 (m/min)
Feed	fn = 0.09 (mm/rev)
Depth of cut	ap = 75 (mm)
Coolant	Internal coolant supply

[Tool life]

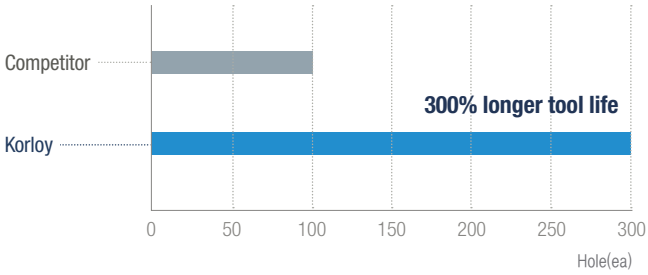


TPDC

Application Example 3

Cutting conditions	
Holder	TPDC8D-13016-104
Insert	**TPD1300CP**
Grade	PC5335
Workpiece	SCM440
Cutting speed	vc = 81.6 (m/min)
Feed	fn = 0.2(mm/rev)
Depth of cut	ap = 95 (mm)
Coolant	Internal coolant supply

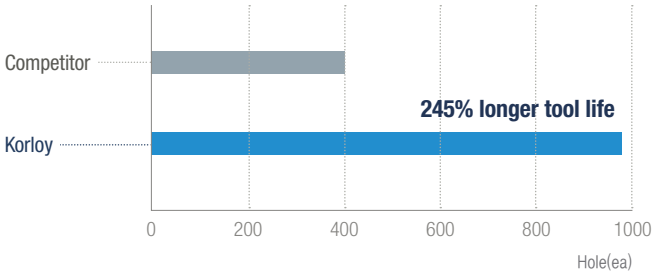
[Tool life]



Application Example 4

Cutting conditions	
Holder	TPDC3D-19025-57
Insert	**TPD1950CP**
Grade	PC5335
Workpiece	FCD450
Cutting speed	vc = 110 (m/min)
Feed	fn = 0.10 (mm/rev)
Depth of cut	ap = 20 (mm)
Coolant	Internal coolant supply

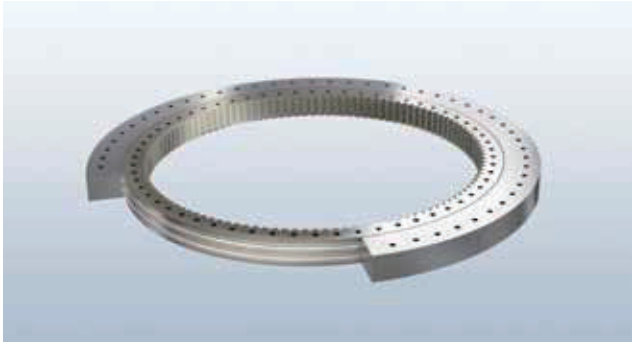
[Tool life]



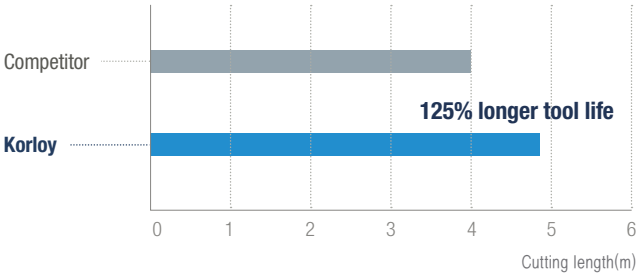
TPDC

Application Example 5

Cutting conditions	
Holder	TPDC5D-18025-90
Insert	**TPD1800CP**
Grade	PC5335
Workpiece	SM45C(HRC35)
Cutting speed	vc = 50 (m/min)
Feed	fn = 0.14 (mm/rev)
Depth of cut	ap = 52 (mm)
Coolant	Internal coolant supply



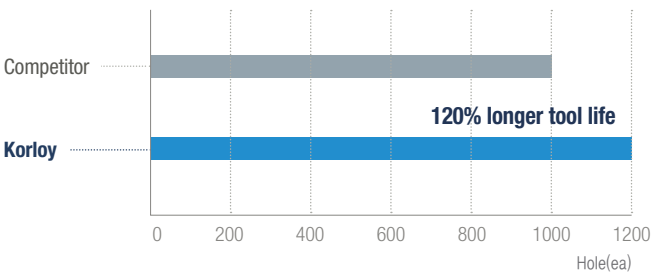
[Tool life]



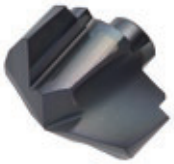
Application Example 6

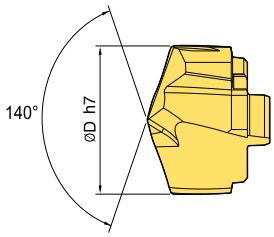
Cutting conditions	
Holder	TPDC3D-19025-57
Insert	**TPD1960CP**
Grade	PC330P
Workpiece	S235JR
Cutting speed	vc = 85 (m/min)
Feed	fn = 0.27 (mm/rev)
Depth of cut	ap = 12mm*3 (mm)
Coolant	Internal coolant supply

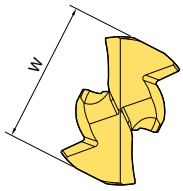
[Tool life]



TPDC Insert







(mm)

Designation		Drill dia. (ØD)	W	Coated	Un- coated	Holder	Wrench
				PC5335	H01		
TPD	1200CP,N	12.0	11.4	●		TPDC(3, 5, 8)D-12016-(36, 60, 96)	TPDC-W12
	1220CP,N	12.2					
	1250CP,N	12.5				TPDC(3, 5, 8)D-12516-(38, 63, 100)	
	1260CP,N	12.6					
	1300CP,N	13.0	12.3	●		TPDC(3, 5, 8)D-13016-(39, 65, 104)	TPDC-W13
	1350CP,N	13.5				TPDC(3, 5, 8)D-13516-(41, 68, 108)	
	1400CP,N	14.0	13.4	●		TPDC(3, 5, 8)D-14016-(42, 70, 112)	TPDC-W14
	1420CP,N	14.2					
	1430CP,N	14.3					
	1450CP,N	14.5				TPDC(3, 5, 8)D-14516-(44, 73, 116)	
	1500CP,N	15.0	14.3	●		TPDC(3, 5, 8)D-15020-(45, 75, 120)	TPDC-W15
	1550CP,N	15.5					
	1600CP,N	16.0	15.3	●		TPDC(3, 5, 8)D-16020-(48, 80, 128)	TPDC-W16
	1630CP,N	16.3					
	1650CP,N	16.5					
	1670CP,N	16.7					
	1700CP,N	17.0	16.3	●		TPDC(3, 5, 8)D-17020-(51, 85, 136)	TPDC-W17
	1750CP,N	17.5					
	1770CP,N	17.7					
	1800CP,N	18.0	17.3	●		TPDC(3, 5, 8)D-18025-(54, 90, 144)	TPDC-W18
	1810CP,N	18.1					
	1850CP,N	18.5					
	1860CP,N	18.6					
	1870CP,N	18.7					
	1900CP,N	19.0	18.3	●		TPDC(3, 5, 8)D-19025-(57, 95, 152)	TPDC-W19
	1920CP,N	19.2					
	1950CP,N	19.5					
	1970CP,N	19.7					
	2000CP,N	20.0	19.2	●		TPDC(3,5,8)D-20025-(60,100,160)	TPDC-W20
	2050CP,N	20.5					
	2100CP,N	21.0	20.1	●		TPDC(3,5,8)D-21025-(63,105,168)	TPDC-W21
	2150CP,N	21.5					
	2200CP,N	22.0	21	●		TPDC(3,5,8)D-22025-(66,110,176)	TPDC-W22
	2250CP,N	22.5					
	2260CP,N	22.6					
	2270CP,N	22.7					
	2300CP,N	23.0	21.9	●		TPDC(3,5,8)D-23025-(69,115,184)	TPDC-W23
	2350CP,N	23.5					
	2400CP,N	24.0	22.9	●		TPDC(3,5,8)D-24032-(72,120,192)	TPDC-W24
	2450CP,N	24.5					
	2500CP,N	25.0	23.9	●		TPDC(3,5,8)D-25032-(75,125,200)	TPDC-W25
	2530CP,N	25.3					
	2550CP,N	25.5					
	2580CP,N	25.8					
	2590CP,N	25.9					
	2600CP,N	26.0	24.9	●		TPDC(3, 5, 8)D-26032-(78,130,208)	TPDC-W26
	2650CP,N	26.5					
	2700CP,N	27.0	25.9	●		TPDC(3, 5, 8)D-27032-(81,135,216)	TPDC-W27
	2750CP,N	27.5					
	2800CP,N	28.0	26.9	●		TPDC(3, 5, 8)D-28032-(84,140,224)	TPDC-W28
	2850CP,N	28.5					
	2900CP,N	29.0	27.9	●		TPDC(3, 5, 8)D-29032-(87,145,232)	TPDC-W29
	2950CP,N	29.5					
	3000CP,N	30.0	28.9	●		TPDC(3, 5, 8)D-30032-(90,150,240)	TPDC-W30
	3050CP,N	30.5					

※ Order made items available

TPDC Insert

Parts (Recommended torque per wrench)

(mm)

Designation	Drill dia. (ØD)	Torque (Nm)
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
TPDC-W18	18	2.5
TPDC-W19	19	2.5
TPDC-W20	20	3.5

Designation	Drill dia. (ØD)	Torque (Nm)
TPDC-W21	21	3.5
TPDC-W22	22	3.5
TPDC-W23	23	3.5
TPDC-W24	24	3.5
TPDC-W25	25	3.5
TPDC-W26	26	5.5
TPDC-W27	27	5.5
TPDC-W28	28	5.5
TPDC-W29	29	5.5
TPDC-W30	30	5.5

TPDC 3D/5D/8D

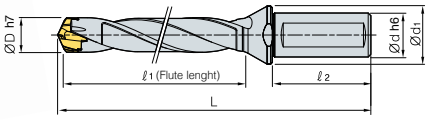


Fig.1

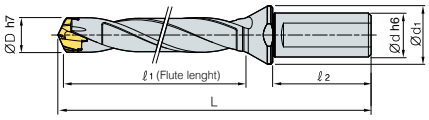


Fig.2

(mm)

Designation		ØD	Ød	Ød$_1$	ℓ$_1$	ℓ$_2$	L	Insert	Fig.
TPDC	**3D-12016-36**	12.00~12.49	16	20	36	48	99	TPD1200C□-1249C□	1
	3D-12516-38	12.50~12.99	16	20	38	48	101	TPD1250C□-1299C□	1
	3D-13016-39	13.00~13.49	16	20	39	48	103	TPD1300C□-1349C□	1
	3D-13516-41	13.50~13.99	16	20	41	48	105	TPD1350C□-1399C□	1
	3D-14016-42	14.00~14.49	16	20	42	48	106	TPD1400C□-1449C□	1
	3D-14516-44	14.50~14.99	16	20	44	48	107	TPD1450C□-1499C□	1
	3D-15020-45	15.00~15.99	20	25	45	50	113	TPD1500C□-1599C□	2
	3D-16020-48	16.00~16.99	20	25	48	50	117	TPD1600C□-1699C□	2
	3D-17020-51	17.00~17.99	20	25	51	50	120	TPD1700C□-1799C□	2
	3D-18025-54	18.00~18.99	25	33	54	56	132	TPD1800C□-1899C□	2
	3D-19025-57	19.00~19.99	25	33	57	56	135	TPD1900C□-1999C□	2
	3D-20025-60	20.00~20.99	25	33	60	56	138	TPD2000C□-2099C□	2
	3D-21025-63	21.00~21.99	25	33	63	56	141	TPD2100C□-2199C□	2
	3D-22025-66	22.00~22.99	25	33	66	56	145	TPD2200C□-2299C□	2
	3D-23025-69	23.00~23.99	25	33	69	56	149	TPD2300C□-2399C□	2
	3D-24032-72	24.00~24.99	32	43	72	60	159	TPD2400C□-2499C□	2
	3D-25032-75	25.00~25.99	32	43	75	60	162	TPD2500C□-2599C□	2
	3D-26032-78	26.00~26.99	32	43	78	60	173	TPD2600C□-2699C□	2

TPDC 3D/5D/8D

(mm)

Designation		ØD	Ød	Ød$_1$	ℓ$_1$	ℓ$_2$	L	Insert	Fig.
TPDC	3D-27032-81	27.50~27.99	32	43	81	60	176	TPD2700C□-2799C□	2
	3D-28032-84	28.00~28.99	32	43	84	60	180	TPD2800C□-2899C□	2
	3D-29032-87	29.50~29.99	32	43	87	60	185	TPD2900C□-2999C□	2
	3D-30032-90	30.00~30.99	32	43	90	60	188	TPD3000C□-3099C□	2
	5D-12016-60	12.00~12.49	16	20	60	48	123	TPD1200C□-1249C□	1
	5D-12516-63	12.50~12.99	16	20	63	48	126	TPD1250C□-1299C□	1
	5D-13016-65	13.00~13.49	16	20	65	48	129	TPD1300C□-1349C□	1
	5D-13516-68	13.50~13.99	16	20	68	48	132	TPD1350C□-1399C□	1
	5D-14016-70	14.00~14.49	16	20	70	48	134	TPD1400C□-1449C□	1
	5D-14516-73	14.50~14.99	16	20	73	48	136	TPD1450C□-1499C□	1
	5D-15020-75	15.00~15.99	20	25	75	50	143	TPD1500C□-1599C□	2
	5D-16020-80	16.00~16.99	20	25	80	50	149	TPD1600C□-1699C□	2
	5D-17020-85	17.00~17.99	20	25	85	50	154	TPD1700C□-1799C□	2
	5D-18025-90	18.00~18.99	25	33	90	56	168	TPD1800C□-1899C□	2
	5D-19025-95	19.00~19.99	25	33	95	56	173	TPD1900C□-1999C□	2
	5D-20025-100	20.00~20.99	25	33	100	56	178	TPD2000C□-2099C□	2
	5D-21025-105	21.00~21.99	25	33	105	56	183	TPD2100C□-2199C□	2
	5D-22025-110	22.00~22.99	25	33	110	56	189	TPD2200C□-2299C□	2
	5D-23025-115	23.00~23.99	25	33	115	56	195	TPD2300C□-2399C□	2
	5D-24032-120	24.00~24.99	32	43	120	60	207	TPD2400C□-2499C□	2
	5D-25032-125	25.00~25.99	32	43	125	60	212	TPD2500C□-2599C□	2
	5D-26032-130	26.00~26.99	32	43	130	60	225	TPD2600C□-2699C□	2
	5D-27032-135	27.00~27.99	32	43	135	60	230	TPD2700C□-2799C□	2
	5D-28032-140	28.00~28.99	32	43	140	60	236	TPD2800C□-2899C□	2
	5D-29032-145	29.00~29.99	32	43	145	60	243	TPD2900C□-2999C□	2
	5D-30032-150	30.00~30.99	32	43	150	60	248	TPD3000C□-3099C□	2
	8D-12016-96	12.00~12.49	16	20	96	48	159	TPD1200C□-1249C□	1
	8D-12516-100	12.50~12.99	16	20	100	48	163	TPD1250C□-1299C□	1
	8D-13016-104	13.00~13.49	16	20	104	48	168	TPD1300C□-1349C□	1
	8D-13516-108	13.50~13.99	16	20	108	48	173	TPD1350C□-1399C□	1
	8D-14016-112	14.00~14.49	16	20	112	48	176	TPD1400C□-1449C□	1
	8D-14516-116	14.50~14.99	16	20	116	48	180	TPD1450C□-1499C□	1
	8D-15020-120	15.00~15.99	20	25	120	50	188	TPD1500C□-1599C□	2
	8D-16020-128	16.00~16.99	20	25	128	50	197	TPD1600C□-1699C□	2
	8D-17020-136	17.00~17.99	20	25	136	50	205	TPD1700C□-1799C□	2
	8D-18025-144	18.00~18.99	25	33	144	56	222	TPD1800C□-1899C□	2
	8D-19025-152	19.00~19.99	25	33	152	56	230	TPD1900C□-1999C□	2
	8D-20025-160	20.00~20.99	25	33	160	56	238	TPD2000C□-2099C□	2
	8D-21025-168	21.00~21.99	25	33	168	56	246	TPD2100C□-2199C□	2
	8D-22025-176	22.00~22.99	25	33	176	56	255	TPD2200C□-2299C□	2
	8D-23025-184	23.00~23.99	25	33	184	56	264	TPD2300C□-2399C□	2
	8D-24032-192	24.00~24.99	32	43	192	60	279	TPD2400C□-2499C□	2
	8D-25032-200	25.00~25.99	32	43	200	60	287	TPD2500C□-2599C□	2
	8D-26032-208	26.00~26.99	32	43	208	60	303	TPD2600C□-2699C□	2
	8D-27032-216	27.00~27.99	32	43	216	60	311	TPD2700C□-2799C□	2
	8D-28032-224	28.00~28.99	32	43	224	60	320	TPD2800C□-2899C□	2
	8D-29032-232	29.00~29.99	32	43	232	60	330	TPD2900C□-2999C□	2
	8D-30032-240	30.00~30.99	32	43	240	60	338	TPD3000C□-3099C□	2

※ The shank is based on DIN6535 and ISO9677

TPDB

High precision grinding and superior clamping precision with auto-centering system

- High precision clamping system - High precision grinding and superior clamping precision with auto-centering system
- Screw on clamping system - Easy clamping system of TPDB insert
- Sharp cutting edge - Improved chip evacuation, low cutting load, longer tool life with ultra-fine substrate and exclusive coating layer
- Holder with excellent durability - Holder with high rigidity and superb wear resistance due to special surface treatment

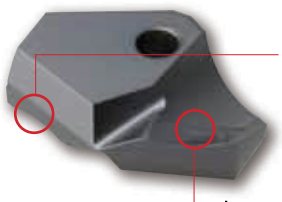
Code system of holder

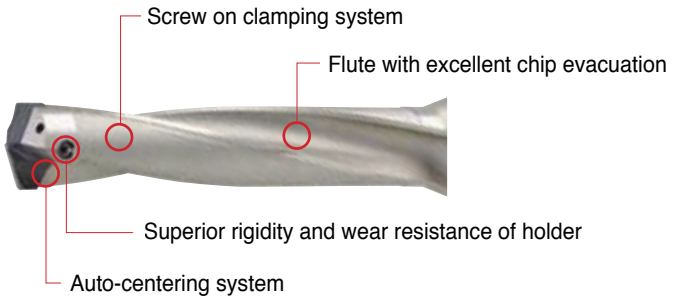
TPD	B	200	-	25	-	5
Top solid piercing drill	Insert type B: Blade type	Drill dia. 200: ∅20.0		Shank dia. 25: ∅25		Aspect ratio 3D, 5D, 8D

Code system of insert

TPD	200	B
Top solid piercing drill	Drill dia. 200: ∅20.0	Insert type B: Blade type

Features

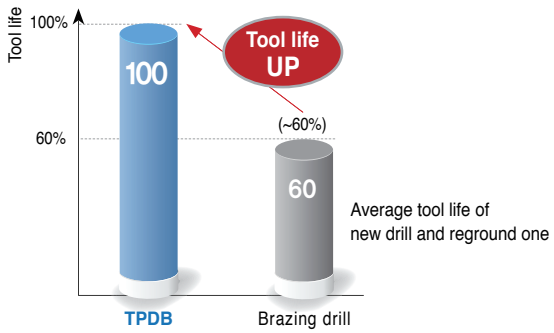




Tool cost

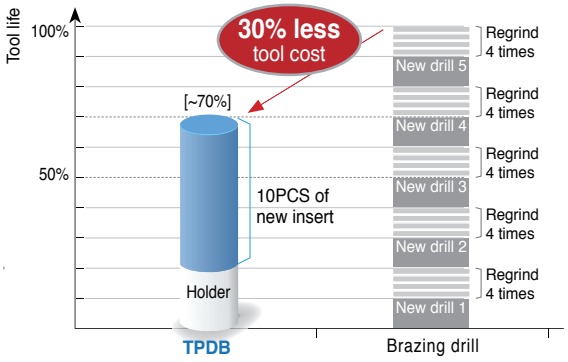
Comparison of 1 insert tool life

- Exclusive coating and substrate
- Usable till the end of wear (no need regrinding)



Comparison of tool cost when machining 1000PCS of workpiece

- 40% longer tool life
- Less insert change
- No need regrind
- 30% less tool cost



Recommended cutting condition

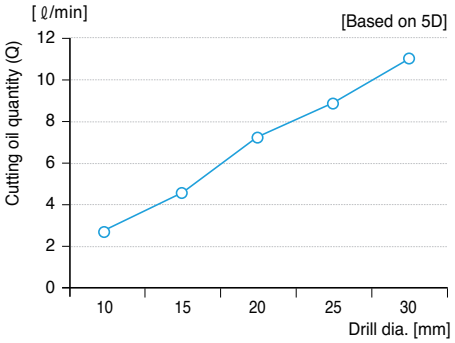
Workpiece				Grade	vc	Depth of cut = 3D~5D Feed rate (mm/rev) per drill dia. (mm)		
ISO		Workpiece	HB		m/min	10~15.9	16~24.9	25~32.9
P	Carbon steel	Low carbon steel	80~120	PC5300, PC5335	110 (80~140)	0.15~0.30	0.20~0.35	0.25~0.40
		High carbon steel	180~280	PC5300, PC5335	100 (70~130)	0.15~0.30	0.20~0.35	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 pre-hardened steel	200~400	PC5300	75 (50~100)	0.18~0.35	0.23~0.38	0.28~0.43
		High alloy steel	260~320	PC5300	70 (50~90)	0.18~0.30	0.20~0.35	0.25~0.40
		High pre-hardened steel	300~450	PC5300	60 (40~80)	0.18~0.30	0.20~0.35	0.25~0.40
M	Stainless steel	Austenite series	135~275	PC5300	50 (30~70)	0.13~0.25	0.15~0.30	0.17~0.33
		Ferrite series Martensite series	13~275	PC5300	55 (40~70)	0.13~0.25	0.15~0.30	0.17~0.33
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
S	Heat resisting steel	Ni-heat resisting alloy	130~400	PC5300	40 (20~60)	0.10~0.20	0.12~0.22	0.13~0.25
		Ti-heat resisting alloy	130~400	PC5300	40 (20~60)	0.10~0.20	0.12~0.22	0.13~0.25
		High-hardened steel	Over 400	PC5300	35 (20~50)	0.10~0.20	0.12~0.22	0.13~0.25

- In case of 8D, reduce the cutting conditions to 40~50% or machine the beginning of hole first.(1.5D)
- In case of interrupted machining, reduce the feed to 30~50% machining around the interrupted part

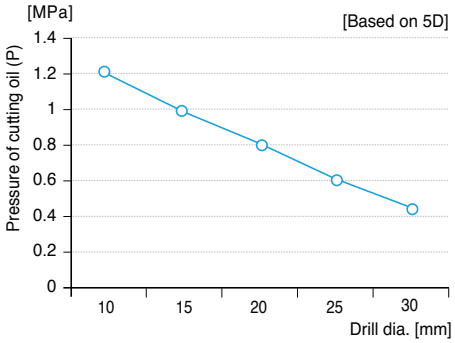
TPDB

Technical information

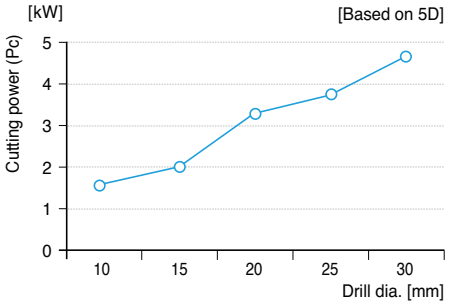
Cutting oil quantity



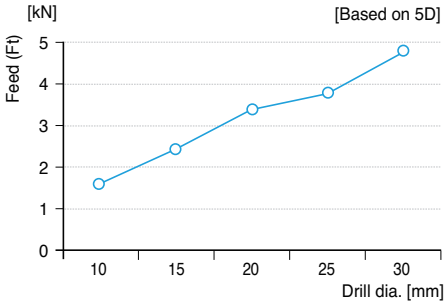
Pressure of cutting oil



Cutting power



Feed



How to clamp a TPDB insert

Clamping an insert on a holder

- Put an insert in the holder
- As the Fig.1, clamp the insert while pushing it to the V shaped groove of the holder
- Screw the insert

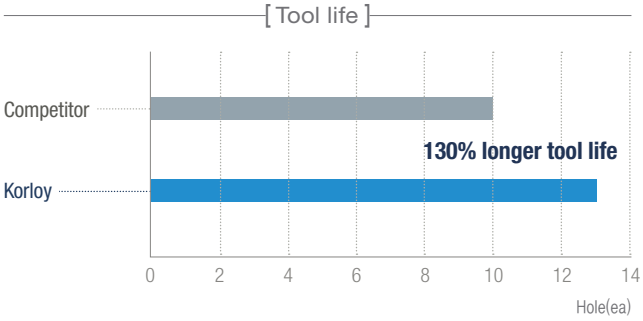
Changing an insert on the machine

- Separate the insert from the holder
- As the Fig.2, clean the insert seat
- Place the insert to the mounting seat
- As the Fig.3, clamp the insert while pushing it to the V shaped groove of the holder

TPDB

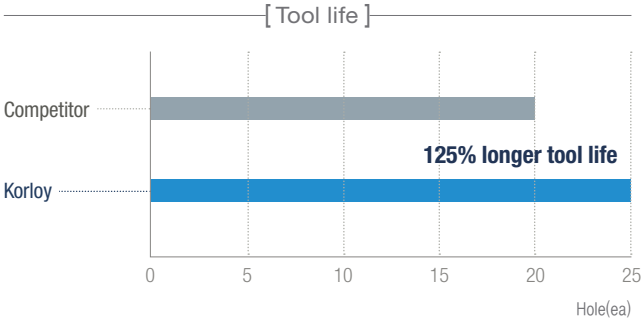
Application Example 1

Cutting conditions	
Insert	TPD220B
Grade	PC5335
Workpiece	SS440
Cutting speed	vc = 85 (m/min)
Feed	fn = 0.2 (mm/rev)
Depth of cut	ap = 20 (mm)
Coolant	Internal coolant supply



Application Example 2

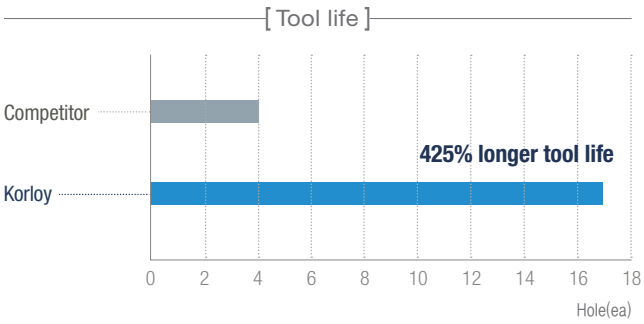
Cutting conditions	
Insert	TPD160B
Grade	PC5300
Workpiece	S20C
Cutting speed	vc = 90 (m/min)
Feed	fn = 0.12 (mm/rev)
Depth of cut	ap = 70 (mm)
Coolant	Internal coolant supply



TPDB

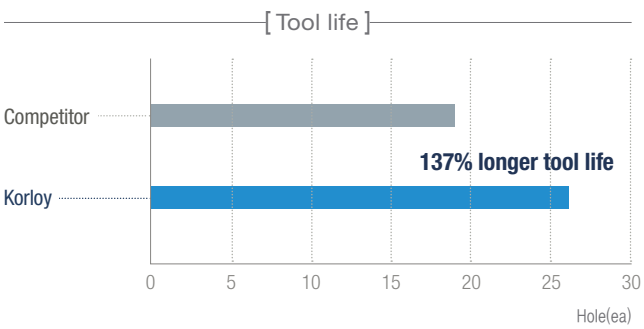
Application Example 3

Cutting conditions	
Insert	**TPD290B**
Grade	PC5300
Workpiece	STS316L
Cutting speed	vc = 36.5 (m/min)
Feed	fn = 0.12 (mm/rev)
Depth of cut	ap = 150 (mm)
Coolant	Internal coolant supply

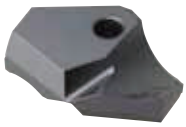


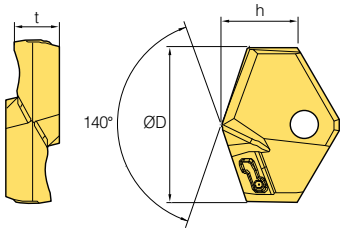
Application Example 4

Cutting conditions	
Insert	**TPD179B**
Grade	PC5300
Workpiece	SA516
Cutting speed	vc = 85 (m/min)
Feed	fn = 0.2 (mm/rev)
Depth of cut	ap = 18 (mm)
Coolant	Internal coolant supply



TPDB Insert





(mm)

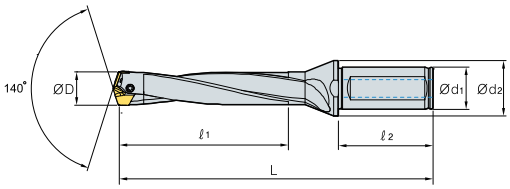
Designation		Grade	ØD	h	t
TPD	100B~109B	PC5300, PC5335	10.0 ~ 10.9	5.5	3.5
	110B~119B	PC5300, PC5335	11.0 ~ 11.9	5.8	3.5
	120B~129B	PC5300, PC5335	12.0 ~ 12.9	6.3	3.5
	130B~139B	PC5300, PC5335	13.0 ~ 13.9	6.5	4.0
	140B~149B	PC5300, PC5335	14.0 ~ 14.9	6.8	4.0
	150B~159B	PC5300, PC5335	15.0 ~ 15.9	7.0	4.0
	160B~169B	PC5300, PC5335	16.0 ~ 16.9	7.7	5.5
	170B~179B	PC5300, PC5335	17.0 ~ 17.9	7.9	5.5
	180B~189B	PC5300, PC5335	18.0 ~ 18.9	8.1	6.0
	190B~199B	PC5300, PC5335	19.0 ~ 19.9	8.3	6.0
	200B~209B	PC5300, PC5335	20.0 ~ 20.9	9.7	6.5
	210B~219B	PC5300, PC5335	21.0 ~ 21.9	9.4	6.5
	220B~229B	PC5300, PC5335	22.0 ~ 22.9	9.6	7.0
	230B~239B	PC5300, PC5335	23.0 ~ 23.9	9.8	7.0
	240B~249B	PC5300, PC5335	24.0 ~ 24.9	10.7	7.5
	250B~259B	PC5300, PC5335	25.0 ~ 25.9	10.9	7.5
	260B~269B	PC5300, PC5335	26.0 ~ 26.9	11.0	8.5
	270B~279B	PC5300, PC5335	27.0 ~ 27.9	11.8	8.5
	280B~289B	PC5300, PC5335	28.0 ~ 28.9	12.6	9.5
	290B~299B	PC5300, PC5335	29.0 ~ 29.9	12.9	9.5
	300B~309B	PC5300, PC5335	30.0 ~ 30.9	13	10
	310B~319B	PC5300, PC5335	31.0 ~ 31.9	13.3	10
	320B~329B	PC5300, PC5335	32.0 ~ 32.9	13.5	10

Parts

(mm)

Designation		Drill dia. (ØD)	Screw	Wrench	Torque (NM)
TPD	100B~129B	10.0 ~ 12.9	FTNB0209	TW06P	0.4
	130B~149B	13.0 ~ 14.9	FTNB02512	TW07S	0.8
	150B~179B	15.0 ~ 17.9	FTNB02514	TW07S	0.8
	180B~199B	18.0 ~ 19.9	FTNB0316	TW09S	1.2
	200B~239B	20.0 ~ 23.9	FTNB0319	TW09S	1.2
	240B~259B	24.0 ~ 25.9	FTNB03522	TW15S	3
	260B~279B	26.0 ~ 27.9	FTNB03524	TW15S	3
	280B~299B	28.0 ~ 29.9	FTNB0426	TW15S	3
	300B~329B	30.0 ~ 32.9	FTNB0528	TW20-100	4

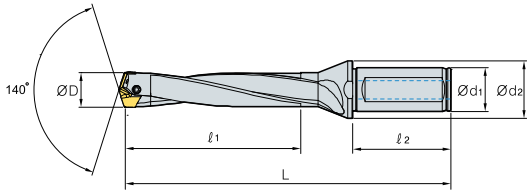
TPDB-3D



(mm)

Designation		ØD	Ød1	Ød2	ℓ1	ℓ2	L	Insert
TPDB	100-16-3	10.0 ~ 10.4	16	20	30.0	48	95	TPD100B ~ 104B
	105-16-3	10.5 ~ 10.9	16	20	31.5	48	96	TPD105B ~ 109B
	110-16-3	11.0 ~ 11.4	16	20	33.0	48	98	TPD110B ~ 114B
	115-16-3	11.5 ~ 11.9	16	20	34.5	48	99	TPD115B ~ 119B
	120-16-3	12.0 ~ 12.4	16	20	36.0	48	102	TPD120B ~ 124B
	125-16-3	12.5 ~ 12.9	16	20	37.5	48	104	TPD125B ~ 129B
	130-16-3	13.0 ~ 13.4	16	20	39.0	48	107	TPD130B ~ 134B
	135-16-3	13.5 ~ 13.9	16	20	40.5	48	109	TPD135B ~ 139B
	140-16-3	14.0 ~ 14.4	16	20	42.0	48	111	TPD140B ~ 144B
	145-16-3	14.5 ~ 14.9	16	20	43.5	48	114	TPD145B ~ 149B
	150-20-3	15.0 ~ 15.4	20	25	45.0	50	118	TPD150B ~ 154B
	155-20-3	15.5 ~ 15.9	20	25	46.5	50	120	TPD155B ~ 159B
	160-20-3	16.0 ~ 16.4	20	25	48.0	50	122	TPD160B ~ 164B
	165-20-3	16.5 ~ 16.9	20	25	49.5	50	124	TPD165B ~ 169B
	170-20-3	17.0 ~ 17.4	20	25	51.0	50	127	TPD170B ~ 174B
	175-20-3	17.5 ~ 17.9	20	25	52.5	50	129	TPD175B ~ 179B
	180-25-3	18.0 ~ 18.4	25	33	54.0	56	137	TPD180B ~ 184B
	185-25-3	18.5 ~ 18.9	25	33	55.5	56	139	TPD185B ~ 189B
	190-25-3	19.0 ~ 19.4	25	33	57.0	56	142	TPD190B ~ 194B
	195-25-3	19.5 ~ 19.9	25	33	58.5	56	144	TPD195B ~ 199B
	200-25-3	20.0 ~ 20.4	25	33	60.0	56	146	TPD200B ~ 204B
	205-25-3	20.5 ~ 20.9	25	33	61.5	56	148	TPD205B ~ 209B
	210-25-3	21.0 ~ 21.4	25	33	63.0	60	151	TPD210B ~ 214B
	215-25-3	21.5 ~ 21.9	25	33	64.5	60	153	TPD215B ~ 219B
	220-25-3	22.0 ~ 22.4	25	33	66.0	60	155	TPD220B ~ 224B
	225-25-3	22.5 ~ 22.9	25	33	67.5	60	157	TPD225B ~ 229B
	230-25-3	23.0 ~ 23.4	25	33	69.0	60	160	TPD230B ~ 234B
	235-25-3	23.5 ~ 23.9	25	33	70.5	60	162	TPD235B ~ 239B
	240-32-3	24.0 ~ 24.4	32	43	72.0	60	168	TPD240B ~ 244B
	245-32-3	24.5 ~ 24.9	32	43	73.5	60	170	TPD245B ~ 249B
	250-32-3	25.0 ~ 25.4	32	43	75.0	60	173	TPD250B ~ 254B
	255-32-3	25.5 ~ 25.9	32	43	76.5	60	175	TPD255B ~ 259B
	260-32-3	26.0 ~ 26.9	32	43	78.0	60	177	TPD260B ~ 269B
	270-32-3	27.0 ~ 27.9	32	43	81.0	60	182	TPD270B ~ 279B
	280-32-3	28.0 ~ 28.9	32	43	84.0	60	186	TPD280B ~ 289B
	290-32-3	29.0 ~ 29.9	32	43	87.0	60	191	TPD290B ~ 299B
	300-32-3	30.0 ~ 30.9	32	43	90.0	60	194	TPD300B ~ 309B
	310-32-3	31.0 ~ 31.9	32	43	93.0	60	199	TPD310B ~ 319B
	320-32-3	32.0 ~ 32.9	32	43	96.0	60	201	TPD320B ~ 329B

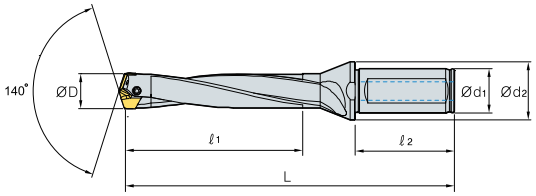
TPDB-5D



(mm)

Designation		ØD	Ød$_1$	Ød$_2$	ℓ$_1$	ℓ$_2$	L	Insert
TPDB	100-16-5	10.0 ~ 10.4	16	20	50.0	48	115	TPD100B ~ 104B
	105-16-5	10.5 ~ 10.9	16	20	52.5	48	117	TPD105B ~ 109B
	110-16-5	11.0 ~ 11.4	16	20	55.0	48	120	TPD110B ~ 114B
	115-16-5	11.5 ~ 11.9	16	20	57.5	48	123	TPD115B ~ 119B
	120-16-5	12.0 ~ 12.4	16	20	60.0	48	126	TPD120B ~ 124B
	125-16-5	12.5 ~ 12.9	16	20	62.5	48	129	TPD125B ~ 129B
	130-16-5	13.0 ~ 13.4	16	20	65.0	48	133	TPD130B ~ 134B
	135-16-5	13.5 ~ 13.9	16	20	67.5	48	136	TPD135B ~ 139B
	140-16-5	14.0 ~ 14.4	16	20	70.0	48	139	TPD140B ~ 144B
	145-16-5	14.5 ~ 14.9	16	20	72.5	48	143	TPD145B ~ 149B
	150-20-5	15.0 ~ 15.4	20	25	75.0	50	148	TPD150B ~ 154B
	155-20-5	15.5 ~ 15.9	20	25	77.5	50	151	TPD155B ~ 159B
	160-20-5	16.0 ~ 16.4	20	25	80.0	50	154	TPD160B ~ 164B
	165-20-5	16.5 ~ 16.9	20	25	82.5	50	157	TPD165B ~ 169B
	170-20-5	17.0 ~ 17.4	20	25	85.0	50	161	TPD170B ~ 174B
	175-20-5	17.5 ~ 17.9	20	25	87.5	50	164	TPD175B ~ 179B
	180-25-5	18.0 ~ 18.4	25	33	90.0	56	173	TPD180B ~ 184B
	185-25-5	18.5 ~ 18.9	25	33	92.5	56	176	TPD185B ~ 189B
	190-25-5	19.0 ~ 19.4	25	33	95.0	56	180	TPD190B ~ 194B
	195-25-5	19.5 ~ 19.9	25	33	97.5	56	183	TPD195B ~ 199B
	200-25-5	20.0 ~ 20.4	25	33	100.0	56	186	TPD200B ~ 204B
	205-25-5	20.5 ~ 20.9	25	33	102.5	56	189	TPD205B ~ 209B
	210-25-5	21.0 ~ 21.4	25	33	105.0	60	193	TPD210B ~ 214B
	215-25-5	21.5 ~ 21.9	25	33	107.5	60	196	TPD215B ~ 219B
	220-25-5	22.0 ~ 22.4	25	33	110.0	60	199	TPD220B ~ 224B
	225-25-5	22.5 ~ 22.9	25	33	112.5	60	202	TPD225B ~ 229B
	230-25-5	23.0 ~ 23.4	25	33	115.0	60	206	TPD230B ~ 234B
	235-25-5	23.5 ~ 23.9	25	33	117.5	60	209	TPD235B ~ 239B
	240-32-5	24.0 ~ 24.4	32	43	120.0	60	216	TPD240B ~ 244B
	245-32-5	24.5 ~ 24.9	32	43	122.5	60	219	TPD245B ~ 249B
	250-32-5	25.0 ~ 25.4	32	43	125.0	60	223	TPD250B ~ 254B
	255-32-5	25.5 ~ 25.9	32	43	127.5	60	226	TPD255B ~ 259B
	260-32-5	26.0 ~ 26.9	32	43	130.0	60	229	TPD260B ~ 269B
	270-32-5	27.0 ~ 27.9	32	43	135.0	60	236	TPD270B ~ 279B
	280-32-5	28.0 ~ 28.9	32	43	140.0	60	242	TPD280B ~ 289B
	290-32-5	29.0 ~ 29.9	32	43	145.0	60	249	TPD290B ~ 299B
	300-32-5	30.0 ~ 30.9	32	43	150.0	60	254	TPD300B ~ 309B
	310-32-5	31.0 ~ 31.9	32	43	155.0	60	261	TPD310B ~ 319B
	320-32-5	32.0 ~ 32.9	32	43	160.0	60	265	TPD320B ~ 329B

TPDB-8D



(mm)

Designation		ØD	Ød$_1$	Ød$_2$	ℓ$_1$	ℓ$_2$	L	Insert
TPDB	**100-16-8**	10.0 ~ 10.4	16	20	80	48	145.0	TPD100B ~ 104B
	105-16-8	10.5 ~ 10.9	16	20	84	48	149.0	TPD105B ~ 109B
	110-16-8	11.0 ~ 11.4	16	20	88	48	153.0	TPD110B ~ 114B
	115-16-8	11.5 ~ 11.9	16	20	92	48	157.0	TPD115B ~ 119B
	120-16-8	12.0 ~ 12.4	16	20	96	48	162.0	TPD120B ~ 124B
	125-16-8	12.5 ~ 12.9	16	20	100	48	166.5	TPD125B ~ 129B
	130-16-8	13.0 ~ 13.4	16	20	104	48	172.0	TPD130B ~ 134B
	135-16-8	13.5 ~ 13.9	16	20	108	48	176.5	TPD135B ~ 139B
	140-16-8	14.0 ~ 14.4	16	20	112	48	181.0	TPD140B ~ 144B
	145-16-8	14.5 ~ 14.9	16	20	116	48	186.5	TPD145B ~ 149B
	150-20-8	15.0 ~ 15.4	20	25	120	50	193.0	TPD150B ~ 154B
	155-20-8	15.5 ~ 15.9	20	25	124	50	197.5	TPD155B ~ 159B
	160-20-8	16.0 ~ 16.4	20	25	128	50	202.0	TPD160B ~ 164B
	165-20-8	16.5 ~ 16.9	20	25	132	50	206.5	TPD165B ~ 169B
	170-20-8	17.0 ~ 17.4	20	25	136	50	212.0	TPD170B ~ 174B
	175-20-8	17.5 ~ 17.9	20	25	140	50	216.5	TPD175B ~ 179B
	180-25-8	18.0 ~ 18.4	25	33	144	56	227.0	TPD180B ~ 184B
	185-25-8	18.5 ~ 18.9	25	33	148	56	231.5	TPD185B ~ 189B
	190-25-8	19.0 ~ 19.4	25	33	152	56	237.0	TPD190B ~ 194B
	195-25-8	19.5 ~ 19.9	25	33	156	56	241.5	TPD195B ~ 199B
	200-25-8	20.0 ~ 20.4	25	33	160	56	246.0	TPD200B ~ 204B
	205-25-8	20.5 ~ 20.9	25	33	164	56	250.5	TPD205B ~ 209B
	210-25-8	21.0 ~ 21.4	25	33	168	60	256.0	TPD210B ~ 214B
	215-25-8	21.5 ~ 21.9	25	33	172	60	260.5	TPD215B ~ 219B
	220-25-8	22.0 ~ 22.4	25	33	176	60	265.0	TPD220B ~ 224B
	225-25-8	22.5 ~ 22.9	25	33	180	60	269.5	TPD225B ~ 229B
	230-25-8	23.0 ~ 23.4	25	33	184	60	275.0	TPD230B ~ 234B
	235-25-8	23.5 ~ 23.9	25	33	188	60	279.5	TPD235B ~ 239B
	240-32-8	24.0 ~ 24.4	32	43	192	60	288.0	TPD240B ~ 244B
	245-32-8	24.5 ~ 24.9	32	43	196	60	292.5	TPD245B ~ 249B
	250-32-8	25.0 ~ 25.4	32	43	200	60	298.0	TPD250B ~ 254B
	255-32-8	25.5 ~ 25.9	32	43	204	60	302.5	TPD255B ~ 259B
	260-32-8	26.0 ~ 26.9	32	43	208	60	307.0	TPD260B ~ 269B
	270-32-8	27.0 ~ 27.9	32	43	216	60	317.0	TPD270B ~ 279B
	280-32-8	28.0 ~ 28.9	32	43	224	60	326.0	TPD280B ~ 289B
	290-32-8	29.0 ~ 29.9	32	43	232	60	336.0	TPD290B ~ 299B
	300-32-8	30.0 ~ 30.9	32	43	240	60	344.0	TPD300B ~ 309B
	310-32-8	31.0 ~ 31.9	32	43	248	60	354.0	TPD310B ~ 319B
	320-32-8	32.0 ~ 32.9	32	43	256	60	361.0	TPD320B ~ 329B

WPDC

Convenient and quickly adjustable drill height

- Indexable Drill Clamped with Center Drill

Code system of holder

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: ∅41.0 6570: ∅65~70	32: ∅32 40: ∅40	5: 5D 6.5: 6.5D 8: 8D

Code system for cartridge

CWP	4145	C
Type	**Drill dia.**	**Insert type**
CWP: Cartridge-WPDC	4145: ∅41~45 450 : ∅45.0	**C:** Central **P:** Peripheral

Code system for center drill

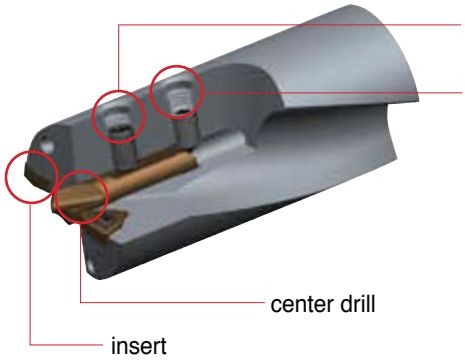
CD	H	1035
Type	**Coolant**	**Diameter × length of tool**
Center Dril	**H:** Coolant **Unmarked:** None	0630: ∅6X30 0835: ∅8X35 1035: ∅10X35 1238: ∅12X38 1645: ∅16X45

Grade of center drill

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

WPDC

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

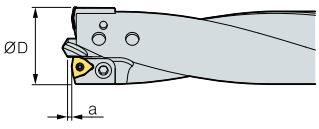
Clamping

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

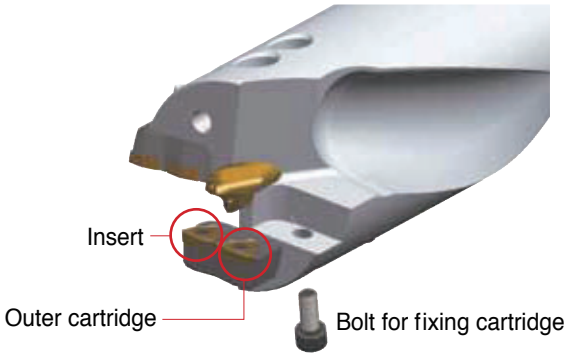
- The length of ‘a’ being too short can cause bad surface finish or high cutting load
- On the other hand, the length of ‘a’ being too long can make tool failure and chattering while drilling



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

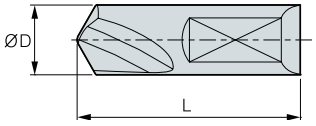
Workpiece				Chip breaker	Grade	vc	Depth of cut = 5D, 6.5D, 8D Feed rate (mm/rev) per drill dia. (mm)					
ISO		Workpiece	HB			m/min	~Ø30	Ø31~Ø40	Ø41~Ø50	Ø51~Ø59	Ø60~Ø75	Ø76~Ø80
P	Carbon steel	Low carbon steel (~0.25%)	80~180	C21N	PC5335	190 (160~220)	0.07~0.11	0.08~0.12	0.10~0.14	0.12~0.16	0.12~0.16	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	Alloyed aluminum	Alloyed 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

WPDC

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

Center Drill



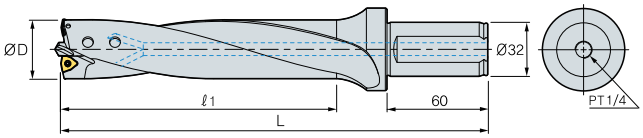
(mm)

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



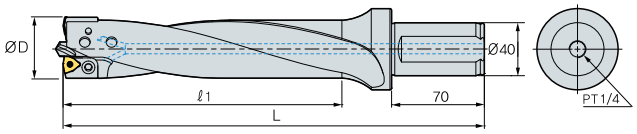
(mm)

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		

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

WPDC-5D/6.5D/8D

Single insert cartridge type



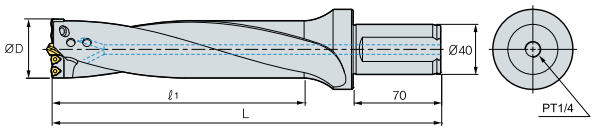
(mm)

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

* We can provide if you order exact diameter **Ex)** machining hole 47.5mm * 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

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

Multi Turn

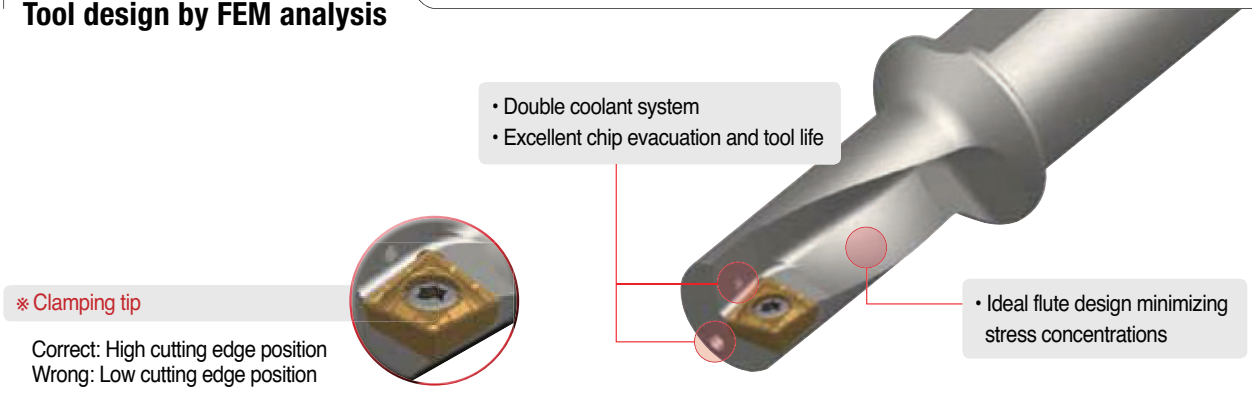
Holder code system

MT	20	R	-	2.25D
Brand Name	Tool Dia.	Hand		Aspect ratio

Insert code system

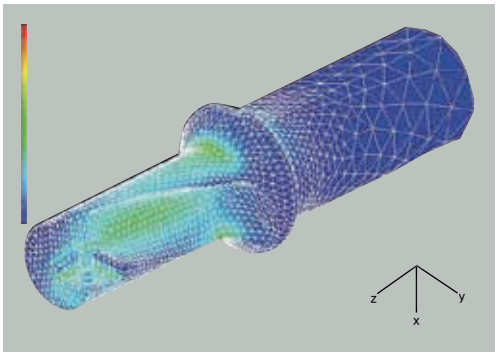
Q	C	M	T	08	03	04	-	CM
Insert shape	Relief angle	Tolerance	Cross Section Type	Cutting Edge Length	Height of Cutting Edge	Nose Radius		Chip Breaker

Tool design by FEM analysis



※ Clamping tip

Correct: High cutting edge position
Wrong: Low cutting edge position

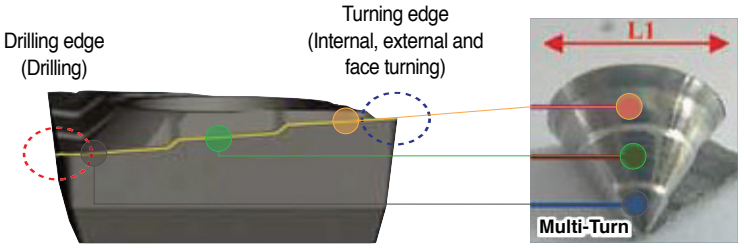


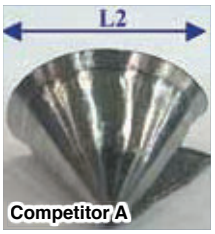
• Minimized stress during cutting, prevented damage from vibration and longer tool life

Optimized design

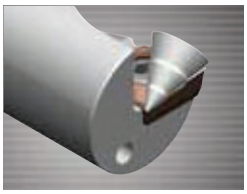
Multi Turn

Creative stepping cutting edge





- Special chip formed by edge geometry better chip
- Evacuation due to small radius width of chip curl

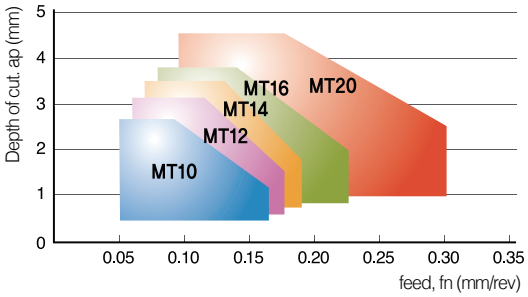


Comparison	Multi turn	Competitor A	Competitor B
Feed fn (mm/rev) = 0.08			
Feed fn (mm/rev) = 0.10			
Chip width (rate)	80%	100%	120%

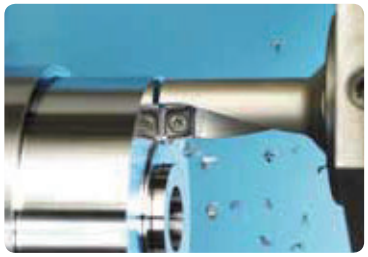
User's guide

External/Internal turning

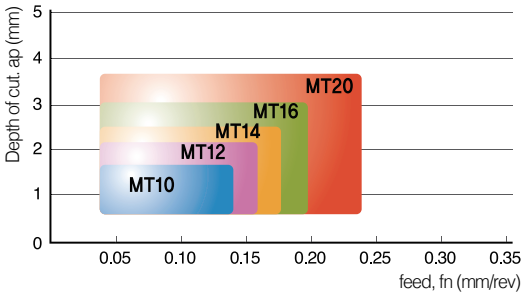
● Application range



Facing

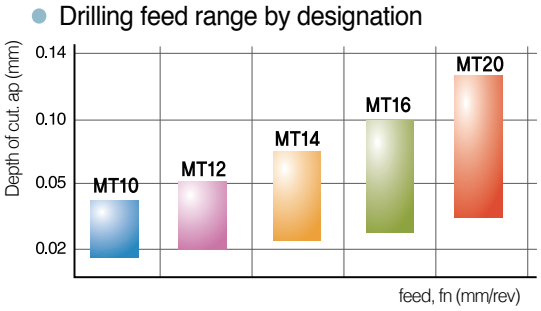


● Appication ranges of facing



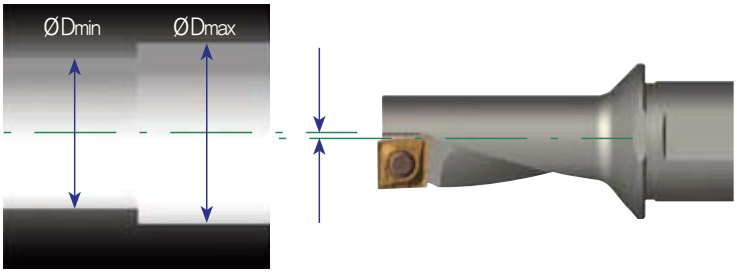
Multi Turn

Drilling



Offset (Diameter compensation)

Disignation	Machined diameter (mm)	ØDmin (mm)	ØDmax (mm)
MT10R/L-2.25D	10	9.85	10.35
MT12R/L-2.25D	12	11.85	12.35
MT14R/L-2.25D	14	13.85	14.35
MT16R/L-2.25D	16	15.85	16.35
MT20R/L-2.25D	20	19.85	20.35
MT25R/L-2.25D	25	24.85	25.35
MT32R/L-2.25D	32	31.85	32.35

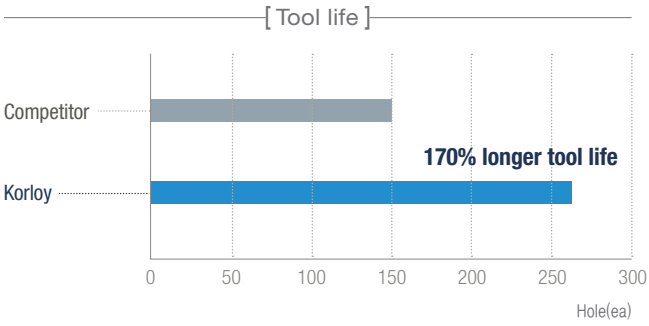


Drill diameter is adjustable by the offset compensation

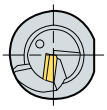
Multi Turn

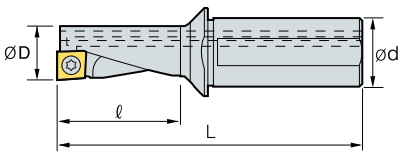
Application Example 1

Cutting conditions	
Holder	MT32R-2.25D
Insert	**QCMT170508-CM**
Grade	NC3220
Workpiece	SCR420
Cutting speed	vc = 230 (m/min)
Feed	fn = 0.2 (mm/rev)
Depth of cut	ap = 45 (mm)
Coolant	Internal coolant supply



MT(Multi-Turn)

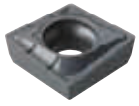
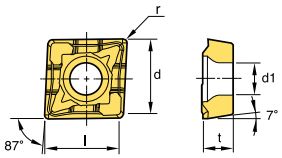
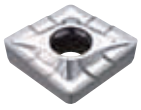
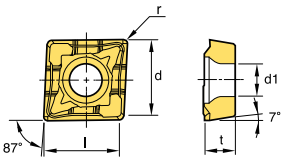




(mm)

Designation		ØD	Ød	ℓ	L	Insert	Screw	Wrench
MT	10R/L-2.25D	10	12	22.5	69.5	QC□T050204	FTNA0204S	TW06P
	12R/L-2.25D	12	16	27.0	78.0	QC□T060204	FTNA02205S	TW06P
	14R/L-2.25D	14	16	31.5	83.5	QC□T070304	FTKA02555	TW07P
	16R/L-2.25D	16	20	36.0	94.0	QC□T080304	FTNA0306	TW09P
	20R/L-2.25D	20	25	45.0	111.0	QC□T10T304	FTNA03508	TW15P
	25R/L-2.25D	25	32	56.5	130.0	QC□T130408	FTNC04509	TW20S
	32R/L-2.25D	32	40	72.0	160.0	QC□T170508	FTNC04511	TW20S

Insert

Picture	Designation		Coated				Uncoated		Dimensions (mm)					Configuration
			NC3120	NC3225	NC6315	PC5300	H01	H05	l	d	t	r	Ød1	
	QCMT	050204-CM		●	●	●			5.0	5.4	2.10	0.4	2.3	
		060204-CM		●	●	●			6.0	6.4	2.38	0.4	2.5	
		070304-CM		●	●	●			7.0	7.4	3.18	0.4	2.8	
		080304-CM		●	●	●			8.0	8.4	3.18	0.4	3.4	
		10T304-CM		●	●	●			10.0	10.4	3.97	0.4	4.0	
		130408-CM		●	●	●			12.7	13.5	4.76	0.8	5.5	
		170508-CM		●	●	●			16.7	17.5	5.56	0.8	5.5	
	QCGT	050204-CA					●		5.0	5.4	2.10	0.4	2.3	
		060204-CA					●		6.0	6.4	2.38	0.4	2.5	
		070304-CA					●		7.0	7.4	3.18	0.4	2.8	
		080304-CA					●		8.0	8.4	3.18	0.4	3.4	
		10T304-CA					●		10.0	10.4	3.97	0.4	4.0	
		130408-CA					●		12.7	13.5	4.76	0.8	5.5	
		170508-CA					●		16.7	17.5	5.56	0.8	5.5	

● : Stock item

SOLID DRILL

Part 2

MSD Plus (Mach Solid Drill Plus)

· Highly efficient hole making for various workpieces including automobile components

Code system

Special type

MSDP(H) 040 – 5 P – 100L – 5S

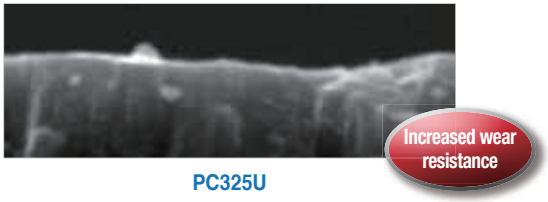
Oil hole	Drill dia.(ØD)	Standard type	Machining area	Overall length	Shank dia.
None: MSDP With oil hole: MSDPH	040: Ø4.0	Aspect ratio (L/D) 3D, 5D, 7D	**P**: Carbon steel, alloy steel **M**: Stainless steel **K**: Cast iron **N**: Aluminum, copper alloy	100L: 100mm	5S: Ø5

Special type
Flute length
100: 100mm

Features

New grade (PC325U)

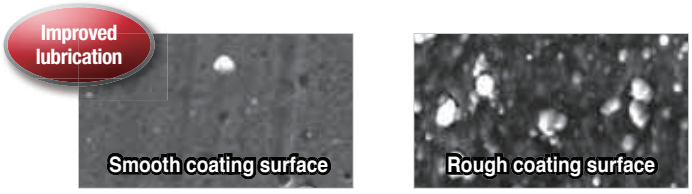
- Lubricative coating layer improves welding resistance at middle to high speed.
- Increase wear resistance in machining carbon steel



PC325U

Surface of coating layer

- Increased welding resistance and lower cutting load
- Reduced frictional resistance at cutting edges and on the flute



PC325U | Competitor

Chip control

Workpiece SCM440

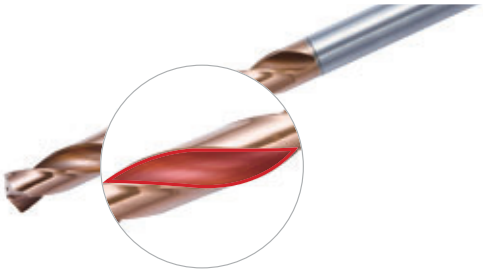
Cutting conditions **vc** (m/min) = 90, **fn** (mm/rev) = 0.2
ap (mm) = 30, wet

Tools MSDPH060-5P (PC325U)

MSD Plus | Competitor

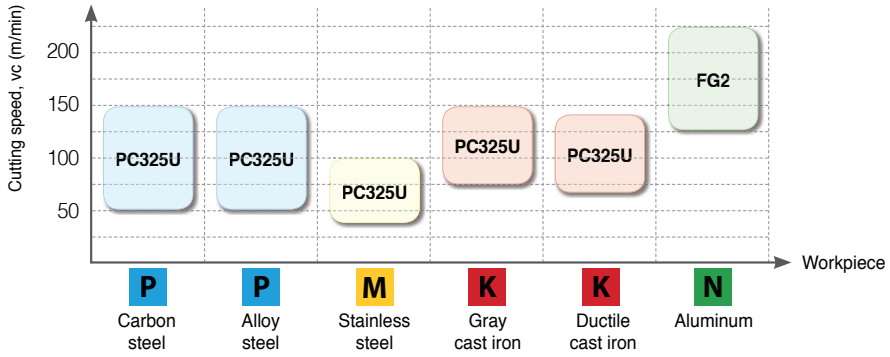
Flute shape

- Improved chip evacuation thanks to wider chip pocket



MSD Plus

Application area

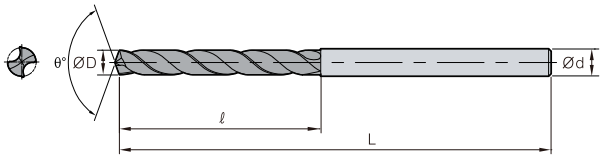


Recommended cutting condition

Workpiece				Grade	vc (m/min)	Depth of cut = 10D~25D Feed rate (mm/rev) per drill dia. (mm)				
ISO		Workpiece	HB			Ø1.0~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0	Ø16.1~Ø20.0
P	Carbon steel	Low carbon steel	80~120	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		High carbon steel	Over 250	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
	Alloy steel	Low alloy steel	140~260	PC325U	90 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		Hardened low alloy steel	200~400	PC325U	60 (50~100)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		High alloy steel	50~260	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
		Hardened high alloy steel	Over 250	PC325U	50 (40~80)	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
M	Stainless steel	Austenite series	135~275	PC325U	45 (25~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
		Ferrite series Martensite series	135~275	PC325U	50 (30~80)	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
K	Cast iron	Gray cast iron	150~230	PC325U	100 (80~150)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
		Ductile cast iron	160~260	PC325U	90 (70~140)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40
N	Aluminum	Aluminum alloy	30~150	FG2	150 (125~220)	0.24~0.38	0.38~0.53	0.53~0.75	0.61~0.85	0.68~0.98
	Copper alloy	Copper alloy	150~160	FG2	150 (125~220)	0.10~0.15	0.16~0.24	0.20~0.30	0.25~0.36	0.30~0.40

• Cutting conditions above are for the case of less than 5D depth of cut and through coolant system applied
• In case of external coolant system, reduce the above feed values by 20%

MSDP- □(P/M/K/N)



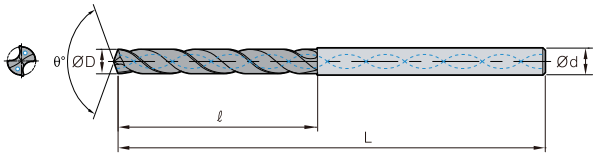
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N	
				ℓ	L	ℓ	L
MSDP	**010 - □ P,M,K,N**	1.0	3.0	6	45	12	66
	011 - □ P,M,K,N	1.1	3.0	7	45	12	66
	012 - □ P,M,K,N	1.2	3.0	8	45	12	66
	013 - □ P,M,K,N	1.3	3.0	8	45	12	66
	014 - □ P,M,K,N	1.4	3.0	9	45	12	66
	015 - □ P,M,K,N	1.5	3.0	9	45	12	66
	016 - □ P,M,K,N	1.6	3.0	10	45	15	66
	017 - □ P,M,K,N	1.7	3.0	10	45	15	66
	018 - □ P,M,K,N	1.8	3.0	11	45	15	66
	019 - □ P,M,K,N	1.9	3.0	11	45	15	66
	020 - □ P,M,K,N	2.0	3.0	14	53	20	66
	021 - □ P,M,K,N	2.1	3.0	14	53	20	66
	022 - □ P,M,K,N	2.2	3.0	14	53	20	66
	023 - □ P,M,K,N	2.3	3.0	14	53	20	66
	024 - □ P,M,K,N	2.4	3.0	14	53	20	66

MSDP(H)- □(P/M/K/N)



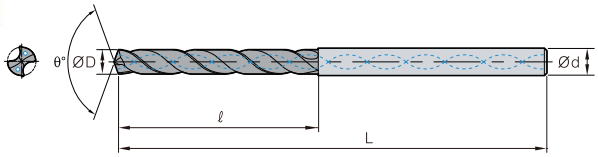
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	025 - □ P,M,K,N	2.5	3.0	14	53	20	66	30	70
	026 - □ P,M,K,N	2.6	3.0	17	53	20	66	30	70
	027 - □ P,M,K,N	2.7	3.0	17	53	20	66	30	70
	028 - □ P,M,K,N	2.8	3.0	17	53	20	66	30	70
	029 - □ P,M,K,N	2.9	3.0	17	53	20	66	30	70
	030 - □ P,M,K,N	3.0	3.0	17	53	20	66	30	70
	031 - □ P,M,K,N	3.1	4.0	20	58	28	74	30	70
	032 - □ P,M,K,N	3.2	4.0	20	58	28	74	30	70
	033 - □ P,M,K,N	3.3	4.0	20	58	28	74	30	70
	034 - □ P,M,K,N	3.4	4.0	20	58	28	74	37.5	75
	035 - □ P,M,K,N	3.5	4.0	20	58	28	74	37.5	75
	036 - □ P,M,K,N	3.6	4.0	22	58	32	74	37.5	75
	037 - □ P,M,K,N	3.7	4.0	22	58	32	74	37.5	75
	038 - □ P,M,K,N	3.8	4.0	22	58	32	74	37.5	75
	039 - □ P,M,K,N	3.9	4.0	22	58	32	74	37.5	75
	040 - □ P,M,K,N	4.0	4.0	22	58	32	74	37.5	75
	041 - □ P,M,K,N	4.1	5.0	24	62	36	82	37.5	75
	042 - □ P,M,K,N	4.2	5.0	24	62	36	82	37.5	75
	043 - □ P,M,K,N	4.3	5.0	24	62	36	82	45	85
	044 - □ P,M,K,N	4.4	5.0	24	62	36	82	45	85
	045 - □ P,M,K,N	4.5	5.0	24	62	36	82	45	85
	046 - □ P,M,K,N	4.6	5.0	26	62	38	82	45	85
	047 - □ P,M,K,N	4.7	5.0	26	62	38	82	45	85
	048 - □ P,M,K,N	4.8	5.0	26	62	38	82	50	90
	049 - □ P,M,K,N	4.9	5.0	26	62	38	82	50	90
	050 - □ P,M,K,N	5.0	5.0	26	62	38	82	50	90
	051 - □ P,M,K,N	5.1	6.0	28	66	44	82	50	90
	052 - □ P,M,K,N	5.2	6.0	28	66	44	82	50	90
	053 - □ P,M,K,N	5.3	6.0	28	66	44	82	50	90
	054 - □ P,M,K,N	5.4	6.0	28	66	44	82	50	90
	055 - □ P,M,K,N	5.5	6.0	28	66	44	82	57	97
	056 - □ P,M,K,N	5.6	6.0	28	66	44	82	57	97
	057 - □ P,M,K,N	5.7	6.0	28	66	44	82	57	97
	058 - □ P,M,K,N	5.8	6.0	28	66	44	82	57	97
	059 - □ P,M,K,N	5.9	6.0	28	66	44	82	57	97
	060 - □ P,M,K,N	6.0	6.0	28	66	44	82	57	97
	061 - □ P,M,K,N	6.1	7.0	34	74	50	91	66	106
	062 - □ P,M,K,N	6.2	7.0	34	74	50	91	66	106
	063 - □ P,M,K,N	6.3	7.0	34	74	50	91	66	106
	064 - □ P,M,K,N	6.4	7.0	34	74	50	91	66	106
	065 - □ P,M,K,N	6.5	7.0	34	74	50	91	66	106
	066 - □ P,M,K,N	6.6	7.0	34	74	50	91	66	106
	067 - □ P,M,K,N	6.7	7.0	34	74	50	91	66	106
	068 - □ P,M,K,N	6.8	7.0	34	74	50	91	66	106
	069 - □ P,M,K,N	6.9	7.0	34	74	50	91	76	116
	070 - □ P,M,K,N	7.0	7.0	34	74	50	91	76	116
	071 - □ P,M,K,N	7.1	8.0	41	79	53	91	76	116
	072 - □ P,M,K,N	7.2	8.0	41	79	53	91	76	116

MSDP(H)- □(P/M/K/N)



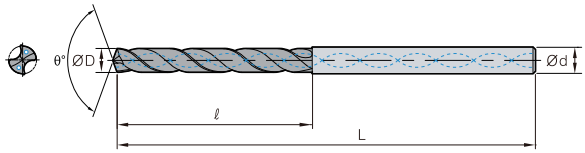
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	073 - □ P,M,K,N	7.3	8.0	41	79	53	91	76	116
	074 - □ P,M,K,N	7.4	8.0	41	79	53	91	76	116
	075 - □ P,M,K,N	7.5	8.0	41	79	53	91	76	116
	076 - □ P,M,K,N	7.6	8.0	41	79	53	91	76	116
	077 - □ P,M,K,N	7.7	8.0	41	79	53	91	76	116
	078 - □ P,M,K,N	7.8	8.0	41	79	53	91	76	116
	079 - □ P,M,K,N	7.9	8.0	41	79	53	91	76	116
	080 - □ P,M,K,N	8.0	8.0	43	84	58	98	87	131
	081 - □ P,M,K,N	8.1	9.0	43	84	58	98	87	131
	082 - □ P,M,K,N	8.2	9.0	43	84	58	98	87	131
	083 - □ P,M,K,N	8.3	9.0	43	84	58	98	87	131
	084 - □ P,M,K,N	8.4	9.0	43	84	58	98	87	131
	085 - □ P,M,K,N	8.5	9.0	43	84	58	98	87	131
	086 - □ P,M,K,N	8.6	9.0	43	84	58	98	87	131
	087 - □ P,M,K,N	8.7	9.0	43	84	58	98	87	131
	088 - □ P,M,K,N	8.8	9.0	43	84	58	98	87	131
	089 - □ P,M,K,N	8.9	9.0	43	84	58	98	87	131
	090 - □ P,M,K,N	9.0	9.0	43	84	58	98	87	131
	091 - □ P,M,K,N	9.1	10.0	47	89	61	105	95	139
	092 - □ P,M,K,N	9.2	10.0	47	89	61	105	95	139
	093 - □ P,M,K,N	9.3	10.0	47	89	61	105	95	139
	094 - □ P,M,K,N	9.4	10.0	47	89	61	105	95	139
	095 - □ P,M,K,N	9.5	10.0	47	89	61	105	95	139
	096 - □ P,M,K,N	9.6	10.0	47	89	61	105	95	139
	097 - □ P,M,K,N	9.7	10.0	47	89	61	105	95	139
	098 - □ P,M,K,N	9.8	10.0	47	89	61	105	95	139
	099 - □ P,M,K,N	9.9	10.0	47	89	61	105	95	139
	100 - □ P,M,K,N	10.0	10.0	47	89	61	105	95	139
	101 - □ P,M,K,N	10.1	11.0	55	95	68	114	106	155
	102 - □ P,M,K,N	10.2	11.0	55	95	68	114	106	155
	103 - □ P,M,K,N	10.3	11.0	55	95	68	114	106	155
	104 - □ P,M,K,N	10.4	11.0	55	95	68	114	106	155
	105 - □ P,M,K,N	10.5	11.0	55	95	68	114	106	155
	106 - □ P,M,K,N	10.6	11.0	55	95	68	114	106	155
	107 - □ P,M,K,N	10.7	11.0	55	95	68	114	106	155
	108 - □ P,M,K,N	10.8	11.0	55	95	68	114	106	155
	109 - □ P,M,K,N	10.9	11.0	55	95	68	114	106	155
	110 - □ P,M,K,N	11.0	11.0	55	95	68	114	106	155
	111 - □ P,M,K,N	11.1	12.0	55	102	71	120	114	163
	112 - □ P,M,K,N	11.2	12.0	55	102	71	120	114	163
	113 - □ P,M,K,N	11.3	12.0	55	102	71	120	114	163
	114 - □ P,M,K,N	11.4	12.0	55	102	71	120	114	163
	115 - □ P,M,K,N	11.5	12.0	55	102	71	120	114	163
	116 - □ P,M,K,N	11.6	12.0	55	102	71	120	114	163
	117 - □ P,M,K,N	11.7	12.0	55	102	71	120	114	163
	118 - □ P,M,K,N	11.8	12.0	55	102	71	120	114	163
	119 - □ P,M,K,N	11.9	12.0	55	102	71	120	114	163
	120 - □ P,M,K,N	12.0	12.0	55	102	71	120	114	163

MSDP(H)- □(P/M/K/N)



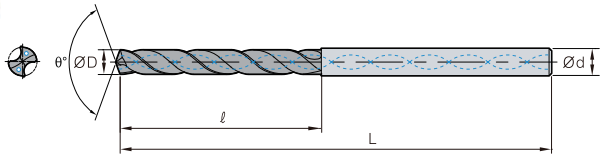
Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	Through/External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	121 - □ P,M,K,N	12.1	13.0	60	107	77	124	133	182
	122 - □ P,M,K,N	12.2	13.0	60	107	77	124	133	182
	123 - □ P,M,K,N	12.3	13.0	60	107	77	124	133	182
	124 - □ P,M,K,N	12.4	13.0	60	107	77	124	133	182
	125 - □ P,M,K,N	12.5	13.0	60	107	77	124	133	182
	126 - □ P,M,K,N	12.6	13.0	60	107	77	124	133	182
	127 - □ P,M,K,N	12.7	13.0	60	107	77	124	133	182
	128 - □ P,M,K,N	12.8	13.0	60	107	77	124	133	182
	129 - □ P,M,K,N	12.9	13.0	60	107	77	124	133	182
	130 - □ P,M,K,N	13.0	13.0	60	107	77	124	133	182
	131 - □ P,M,K,N	13.1	14.0	62	107	80	133	133	182
	132 - □ P,M,K,N	13.2	14.0	62	107	80	133	133	182
	133 - □ P,M,K,N	13.3	14.0	62	107	80	133	133	182
	134 - □ P,M,K,N	13.4	14.0	62	107	80	133	133	182
	135 - □ P,M,K,N	13.5	14.0	62	107	80	133	133	182
	136 - □ P,M,K,N	13.6	14.0	62	107	80	133	133	182
	137 - □ P,M,K,N	13.7	14.0	62	107	80	133	133	182
	138 - □ P,M,K,N	13.8	14.0	62	107	80	133	133	182
	139 - □ P,M,K,N	13.9	14.0	62	107	80	133	133	182
	140 - □ P,M,K,N	14.0	14.0	62	107	80	133	133	182
	141 - □ P,M,K,N	14.1	15.0	65	115	85	143	152	204
	142 - □ P,M,K,N	14.2	15.0	65	115	85	143	152	204
	143 - □ P,M,K,N	14.3	15.0	65	115	85	143	152	204
	144 - □ P,M,K,N	14.4	15.0	65	115	85	143	152	204
	145 - □ P,M,K,N	14.5	15.0	65	115	85	143	152	204
	146 - □ P,M,K,N	14.6	15.0	65	115	85	143	152	204
	147 - □ P,M,K,N	14.7	15.0	65	115	85	143	152	204
	148 - □ P,M,K,N	14.8	15.0	65	115	85	143	152	204
	149 - □ P,M,K,N	14.9	15.0	65	115	85	143	152	204
	150 - □ P,M,K,N	15.0	15.0	65	115	85	143	152	204
	151 - □ P,M,K,N	15.1	16.0	68	115	88	143	152	204
	152 - □ P,M,K,N	15.2	16.0	68	115	88	143	152	204
	153 - □ P,M,K,N	15.3	16.0	68	115	88	143	152	204
	154 - □ P,M,K,N	15.4	16.0	68	115	88	143	152	204
	155 - □ P,M,K,N	15.5	16.0	68	115	88	143	152	204
	156 - □ P,M,K,N	15.6	16.0	68	115	88	143	152	204
	157 - □ P,M,K,N	15.7	16.0	68	115	88	143	152	204
	158 - □ P,M,K,N	15.8	16.0	68	115	88	143	152	204
	159 - □ P,M,K,N	15.9	16.0	68	115	88	143	152	204
	160 - □ P,M,K,N	16.0	16.0	68	115	88	143	152	204
	161 - □ P,M,K,N	16.1	17.0	73	123	93	153	171	223
	162 - □ P,M,K,N	16.2	17.0	73	123	93	153	171	223
	163 - □ P,M,K,N	16.3	17.0	73	123	93	153	171	223
	164 - □ P,M,K,N	16.4	17.0	73	123	93	153	171	223
	165 - □ P,M,K,N	16.5	17.0	73	123	93	153	171	223
	166 - □ P,M,K,N	16.6	17.0	73	123	93	153	171	223
	167 - □ P,M,K,N	16.7	17.0	73	123	93	153	171	223
	168 - □ P,M,K,N	16.8	17.0	73	123	93	153	171	223

MSDP(H)- □(P/M/K/N)



Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance (drill Dia.)	h7			
Tolerance (shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External			

P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSDP(H)	169 - □ P,M,K,N	16.9	17.0	73	123	93	153	171	223
	170 - □ P,M,K,N	17.0	17.0	73	123	93	153	171	223
	171 - □ P,M,K,N	17.1	18.0	73	123	98	153	171	223
	172 - □ P,M,K,N	17.2	18.0	73	123	98	153	171	223
	173 - □ P,M,K,N	17.3	18.0	73	123	98	153	171	223
	174 - □ P,M,K,N	17.4	18.0	73	123	98	153	171	223
	175 - □ P,M,K,N	17.5	18.0	73	123	98	153	171	223
	176 - □ P,M,K,N	17.6	18.0	73	123	98	153	171	223
	177 - □ P,M,K,N	17.7	18.0	73	123	98	153	171	223
	178 - □ P,M,K,N	17.8	18.0	73	123	98	153	171	223
	179 - □ P,M,K,N	17.9	18.0	73	123	98	153	171	223
	180 - □ P,M,K,N	18.0	18.0	73	123	98	153	171	223
	181 - □ P,M,K,N	18.1	19.0	79	131	103	153	190	244
	182 - □ P,M,K,N	18.2	19.0	79	131	103	153	190	244
	183 - □ P,M,K,N	18.3	19.0	79	131	103	153	190	244
	184 - □ P,M,K,N	18.4	19.0	79	131	103	153	190	244
	185 - □ P,M,K,N	18.5	19.0	79	131	103	153	190	244
	186 - □ P,M,K,N	18.6	19.0	79	131	103	153	190	244
	187 - □ P,M,K,N	18.7	19.0	79	131	103	153	190	244
	188 - □ P,M,K,N	18.8	19.0	79	131	103	153	190	244
	189 - □ P,M,K,N	18.9	19.0	79	131	103	153	190	244
	190 - □ P,M,K,N	19.0	19.0	79	131	103	153	190	244
	191 - □ P,M,K,N	19.1	20.0	79	131	107	153	190	244
	192 - □ P,M,K,N	19.2	20.0	79	131	107	153	190	244
	193 - □ P,M,K,N	19.3	20.0	79	131	107	153	190	244
	194 - □ P,M,K,N	19.4	20.0	79	131	107	153	190	244
	195 - □ P,M,K,N	19.5	20.0	79	131	107	153	190	244
	196 - □ P,M,K,N	19.6	20.0	79	131	107	153	190	244
	197 - □ P,M,K,N	19.7	20.0	79	131	107	153	190	244
	198 - □ P,M,K,N	19.8	20.0	79	131	107	153	190	244
	199 - □ P,M,K,N	19.9	20.0	79	131	107	153	190	244
	200 - □ P,M,K,N	20.0	20.0	79	131	107	153	190	244

MSD Plus-S

· Specialized for heat-resistant alloys used in the aerospace, energy, power generation and automotive industries

- **Improved Productivity and Excellent Machinability** - Ensuring machinability with optimized blade design and chip pockets
- **Stronger Resistance to Wear** - Extended tool life due to excellent high temp resistance to chipping

Code system

Special type

MSDP(H) 060 – 5 S – 100L – 5S

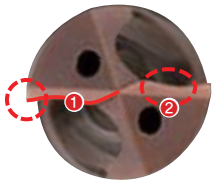
Oil hole	Drill dia.(ØD)	Standard type	Machining area	Overall length	Shank dia.
None: MSDP With oil hole: MSDPH	060: Ø6.0	Aspect ratio (L/D) 3D, 5D	S: HRSA	100L: 100mm	5S: Ø5

Special type
Flute length
50 : 50mm

Features

Cutting-edge design

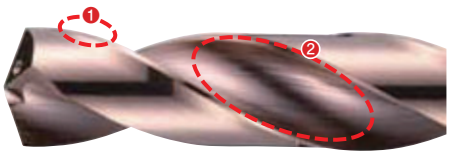
Notch-controlled blade design and specially treated cutting edges prevent chipping and breakage



❶ Cutting edges designed for low cutting resistance
❷ Tip relief angle and shape optimized for heat evacuation

Flute design

Optimized margin and back-tapered design

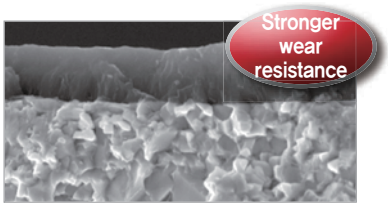


❶ Reduced friction resistance and cutting temperature
❷ Wider chip pockets improve chip evacuation

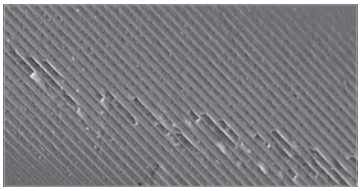
MSD Plus-S

The new grade PC325T

- Improved resistance to heat and oxidation thanks to the newly applied grade, PC325T
- Reduced friction resistance and improved chip evacuation due to excellent surface finish
- Exceptional wear resistance when machining heat-resistant alloys at high temperatures



PC325T



Smooth coating surface

Surface roughness

Workpiece Inconel718 (HRC40~45)
Cutting conditions **Tool dia.** (mm) = Ø10, vc (m/min) = 40, **fn** (mm/rev) = 0.09, **ap** (mm) = 30, wet
Tools MSDPH100-5S (PC325T)

MSD Plus-S

Competitor

Workpiece Ti-6Al-4V (HRC42~47)
Cutting conditions **Tool dia.** (mm) = Ø10, **vc** (m/min) = 40, **fn** (mm/rev) = 0.09, **ap** (mm) = 30, wet
Tools MSDPH100-5S (PC325T)

MSD Plus-S

Competitor

Recommended cutting condition

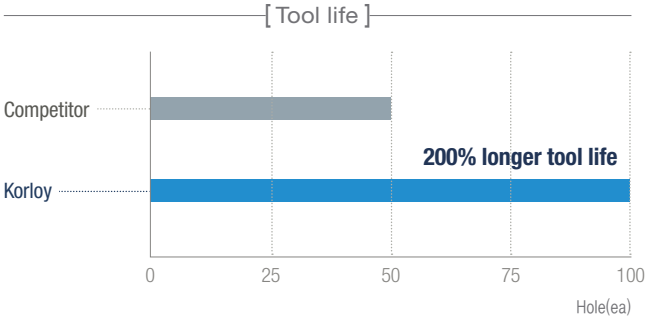
Workpiece				Grade	vc (m/min)	Depth of cut = 3D~5D			
						Feed rate, fn (mm/rev) per drill dia. (mm)			
ISO		Workpiece	HB			Ø2.5~Ø5.0	Ø5.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø16.0
S	HRSA (Inconel 718 and etc.)	Fe-base	25~35	PC325T	25~30	0.055~0.07	0.07~0.10	0.08~0.13	0.10~0.15
		Ni or Co base	35~45	PC325T	20~25	0.045~0.06	0.06~0.09	0.07~0.12	0.09~0.14
	Titanium alloy (Ti-6Al-4V and etc.)	Pure titanium	10~15	PC325T	40~50	0.07~0.11	0.09~0.14	0.12~0.18	0.16~0.23
		α and β alloys	35~45	PC325T	30~40	0.05~0.09	0.07~0.12	0.10~0.16	0.14~0.21

* Cutting conditions above are for the case of less than 5D depth of cut and through coolant system applied.

MSD Plus-S

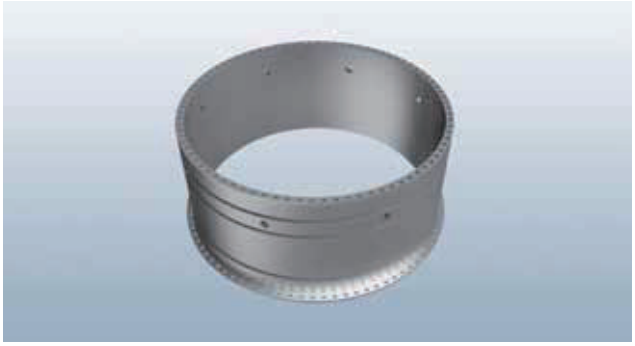
Application Example 1

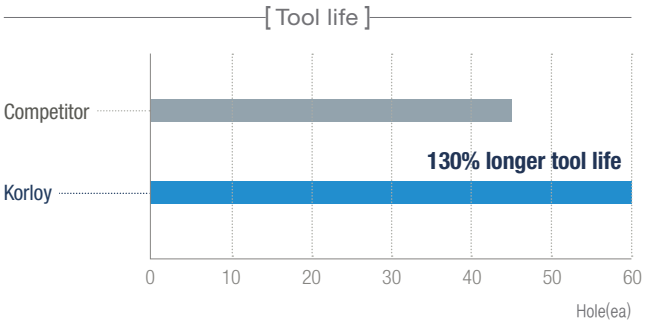
Cutting conditions	
Insert	MSDPH051-3S
Grade	PC325T
Workpiece	INCONEL718
Cutting speed	vc = 20 (m/min)
Feed	fn = 0.08 (mm/rev)
Depth of cut	ap = 10 (mm)
Coolant	Internal coolant supply



Application Example 2

Cutting conditions	
Insert	MSDPH098-3S
Grade	PC325T
Workpiece	INCONEL718
Cutting speed	vc = 14 (m/min)
Feed	fn = 0.05 (mm/rev)
Depth of cut	ap = 7 (mm)
Coolant	Internal coolant supply

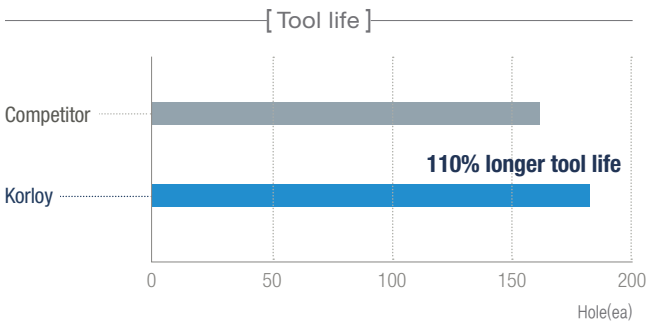




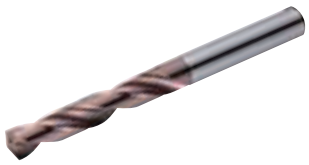
MSD Plus-S

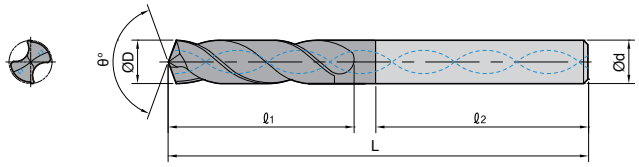
Application Example 3

Cutting conditions	
Insert	**MSDPH050-3S**
Grade	PC325T
Workpiece	INCONEL718
Cutting speed	vc = 22 (m/min)
Feed	fn = 0.085 (mm/rev)
Depth of cut	ap = 10 (mm)
Coolant	Internal coolant supply



MSDPH-S





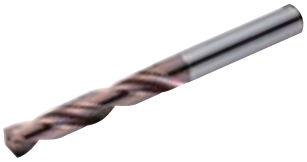
Specification	S
Grade	PC325T
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle (θ °)	140°
Twist angle	30°
Thinning	X type
Coolant	Internal
International standard	DIN 6537
Shank type	DIN 6535 HA

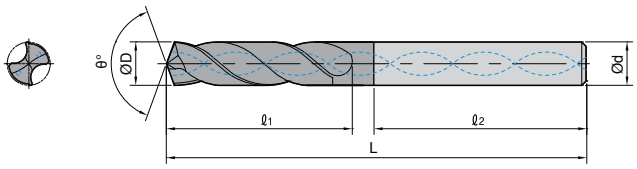
S HRSA

(mm)

Designation		ØD	Ød	3S		5S		ℓ2
				ℓ1	L	ℓ1	L	
MSDPH	030-□S	3.0	6	20	62	28	66	36
	031-□S	3.1	6	20	62	28	66	36
	0318-□S	3.18	6	20	62	28	66	36
	032-□S	3.2	6	20	62	28	66	36
	033-□S	3.3	6	20	62	28	66	36
	034-□S	3.4	6	20	62	28	66	36
	035-□S	3.5	6	20	62	28	66	36
	0357-□S	3.57	6	20	62	28	66	36
	036-□S	3.6	6	20	62	28	66	36
	037-□S	3.7	6	20	62	28	66	36
	038-□S	3.8	6	24	66	36	74	36
	039-□S	3.9	6	24	66	36	74	36
	0397-□S	3.97	6	24	66	36	74	36
	040-□S	4.0	6	24	66	36	74	36
	041-□S	4.1	6	24	66	36	74	36
	042-□S	4.2	6	24	66	36	74	36
	043-□S	4.3	6	24	66	36	74	36
	0437-□S	4.37	6	24	66	36	74	36
	044-□S	4.4	6	24	66	36	74	36
	045-□S	4.5	6	24	66	36	74	36
	046-□S	4.6	6	24	66	36	74	36
	047-□S	4.7	6	24	66	36	74	36
	0476-□S	4.76	6	28	66	44	82	36
	048-□S	4.8	6	28	66	44	82	36
	049-□S	4.9	6	28	66	44	82	36
	050-□S	5.0	6	28	66	44	82	36
	051-□S	5.1	6	28	66	44	82	36
	0516-□S	5.16	6	28	66	44	82	36
	052-□S	5.2	6	28	66	44	82	36
	053-□S	5.3	6	28	66	44	82	36
	054-□S	5.4	6	28	66	44	82	36
	055-□S	5.5	6	28	66	44	82	36
	0556-□S	5.56	6	28	66	44	82	36
	056-□S	5.6	6	28	66	44	82	36
	057-□S	5.7	6	28	66	44	82	36
	058-□S	5.8	6	28	66	44	82	36
	059-□S	5.9	6	28	66	44	82	36
	0595-□S	5.95	6	28	66	44	82	36
	060-□S	6.0	6	28	66	44	82	36

MSDPH-S





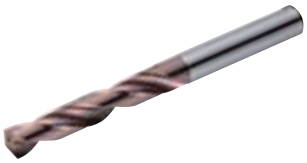
Specification	S
Grade	PC325T
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle (θ °)	140°
Twist angle	30°
Thinning	X type
Coolant	Internal
International standard	DIN 6537
Shank type	DIN 6535 HA

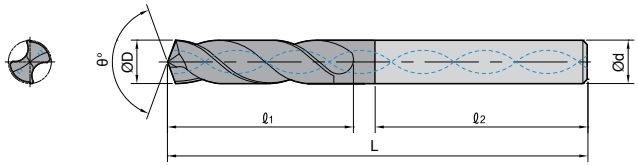
S HRSA

(mm)

Designation		ØD	Ød	3S		5S		ℓ2
				ℓ1	L	ℓ1	L	
MSDPH	061-□S	6.1	8	34	79	53	91	36
	062-□S	6.2	8	34	79	53	91	36
	063-□S	6.3	8	34	79	53	91	36
	0635-□S	6.35	8	34	79	53	91	36
	064-□S	6.4	8	34	79	53	91	36
	065-□S	6.5	8	34	79	53	91	36
	066-□S	6.6	8	34	79	53	91	36
	067-□S	6.7	8	34	79	53	91	36
	0675-□S	6.75	8	34	79	53	91	36
	068-□S	6.8	8	34	79	53	91	36
	069-□S	6.9	8	34	79	53	91	36
	070-□S	7.0	8	34	79	53	91	36
	071-□S	7.1	8	41	79	53	91	36
	0714-□S	7.14	8	41	79	53	91	36
	072-□S	7.2	8	41	79	53	91	36
	073-□S	7.3	8	41	79	53	91	36
	074-□S	7.4	8	41	79	53	91	36
	075-□S	7.5	8	41	79	53	91	36
	0754-□S	7.54	8	41	79	53	91	36
	076-□S	7.6	8	41	79	53	91	36
	077-□S	7.7	8	41	79	53	91	36
	078-□S	7.8	8	41	79	53	91	36
	079-□S	7.9	8	41	79	53	91	36
	0794-□S	7.94	8	41	79	53	91	36
	080-□S	8.0	8	41	79	53	91	36
	081-□S	8.1	10	47	89	61	103	40
	082-□S	8.2	10	47	89	61	103	40
	083-□S	8.3	10	47	89	61	103	40
	0833-□S	8.33	10	47	89	61	103	40
	084-□S	8.4	10	47	89	61	103	40
	085-□S	8.5	10	47	89	61	103	40
	086-□S	8.6	10	47	89	61	103	40
	087-□S	8.7	10	47	89	61	103	40
	0873-□S	8.73	10	47	89	61	103	40
	088-□S	8.8	10	47	89	61	103	40
	089-□S	8.9	10	47	89	61	103	40
	090-□S	9.0	10	47	89	61	103	40
	091-□S	9.1	10	47	89	61	103	40
	0913-□S	9.13	10	47	89	61	103	40

MSDPH-S





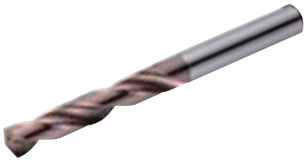
Specification	S
Grade	PC325T
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle (θ °)	140°
Twist angle	30°
Thinning	X type
Coolant	Internal
International standard	DIN 6537
Shank type	DIN 6535 HA

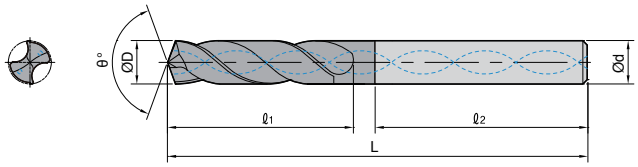
S HRSA

(mm)

Designation		ØD	Ød	3S		5S		ℓ2
				ℓ1	L	ℓ1	L	
MSDPH	092-□S	9.2	10	47	89	61	103	40
	093-□S	9.3	10	47	89	61	103	40
	094-□S	9.4	10	47	89	61	103	40
	095-□S	9.5	10	47	89	61	103	40
	0953-□S	9.53	10	47	89	61	103	40
	096-□S	9.6	10	47	89	61	103	40
	097-□S	9.7	10	47	89	61	103	40
	098-□S	9.8	10	47	89	61	103	40
	099-□S	9.9	10	47	89	61	103	40
	0992-□S	9.92	10	47	89	61	103	40
	100-□S	10.0	10	47	89	61	103	40
	101-□S	10.1	12	55	102	71	118	45
	102-□S	10.2	12	55	102	71	118	45
	103-□S	10.3	12	55	102	71	118	45
	1032-□S	10.32	12	55	102	71	118	45
	104-□S	10.4	12	55	102	71	118	45
	105-□S	10.5	12	55	102	71	118	45
	106-□S	10.6	12	55	102	71	118	45
	107-□S	10.7	12	55	102	71	118	45
	1072-□S	10.72	12	55	102	71	118	45
	108-□S	10.8	12	55	102	71	118	45
	109-□S	10.9	12	55	102	71	118	45
	110-□S	11.0	12	55	102	71	118	45
	111-□S	11.1	12	55	102	71	118	45
	1111-□S	11.11	12	55	102	71	118	45
	112-□S	11.2	12	55	102	71	118	45
	113-□S	11.3	12	55	102	71	118	45
	114-□S	11.4	12	55	102	71	118	45
	115-□S	11.5	12	55	102	71	118	45
	1151-□S	11.51	12	55	102	71	118	45
	116-□S	11.6	12	55	102	71	118	45
	117-□S	11.7	12	55	102	71	118	45
	118-□S	11.8	12	55	102	71	118	45
	119-□S	11.9	12	55	102	71	118	45
	1191-□S	11.91	12	55	102	71	118	45
	120-□S	12.0	12	55	102	71	118	45
	121-□S	12.1	14	60	107	77	124	45
	122-□S	12.2	14	60	107	77	124	45
	123-□S	12.3	14	60	107	77	124	45
	124-□S	12.4	14	60	107	77	124	45

MSDPH-S





Specification	S
Grade	PC325T
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h6
Point angle (θ °)	140°
Twist angle	30°
Thinning	X type
Coolant	Internal
International standard	DIN 6537
Shank type	DIN 6535 HA

S HRSA

(mm)

Designation		ØD	Ød	3S		5S		ℓ2
				ℓ1	L	ℓ1	L	
MSDPH	125-□S	12.5	14	60	107	77	124	45
	126-□S	12.6	14	60	107	77	124	45
	127-□S	12.7	14	60	107	77	124	45
	128-□S	12.8	14	60	107	77	124	45
	129-□S	12.9	14	60	107	77	124	45
	130-□S	13.0	14	60	107	77	124	45
	131-□S	13.1	14	60	107	77	124	45
	132-□S	13.2	14	60	107	77	124	45
	133-□S	13.3	14	60	107	77	124	45
	134-□S	13.4	14	60	107	77	124	45
	1349-□S	13.49	14	60	107	77	124	45
	135-□S	13.5	14	60	107	77	124	45
	136-□S	13.6	14	60	107	77	124	45
	137-□S	13.7	14	60	107	77	124	45
	138-□S	13.8	14	60	107	77	124	45
	139-□S	13.9	14	60	107	77	124	45
	140-□S	14.0	14	60	107	77	124	45
	141-□S	14.1	16	65	115	83	133	48
	142-□S	14.2	16	65	115	83	133	48
	1429-□S	14.29	16	65	115	83	133	48
	143-□S	14.3	16	65	115	83	133	48
	144-□S	14.4	16	65	115	83	133	48
	145-□S	14.5	16	65	115	83	133	48
	146-□S	14.6	16	65	115	83	133	48
	147-□S	14.7	16	65	115	83	133	48
	148-□S	14.8	16	65	115	83	133	48
	149-□S	14.9	16	65	115	83	133	48
	150-□S	15.0	16	65	115	83	133	48
	151-□S	15.1	16	65	115	83	133	48
	152-□S	15.2	16	65	115	83	133	48
	153-□S	15.3	16	65	115	83	133	48
	154-□S	15.4	16	65	115	83	133	48
	155-□S	15.5	16	65	115	83	133	48
	156-□S	15.6	16	65	115	83	133	48
	157-□S	15.7	16	65	115	83	133	48
	158-□S	15.8	16	65	115	83	133	48
	1587-□S	15.87	16	65	115	83	133	48
	159-□S	15.9	16	65	115	83	133	48
	160-□S	16.0	16	65	115	83	133	48

MSD Plus CFRP (Mach Solid Drill Plus for Machining CFRP)

· Optimized tool for hole making of CFRP

- Excellent wear resistance thanks due to the new diamond-coated grade, ND2100
- Reduced burrs when machining CFRP thanks to high rake cutting edges

Code system

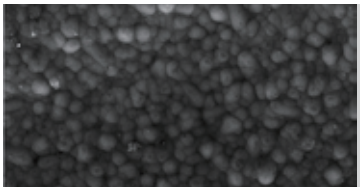
Special type

MSDP 060 – 5 C – 100L – 6S

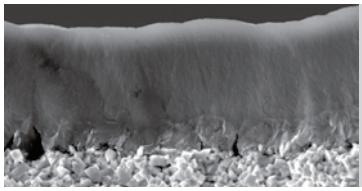
MSDP	060	5	C	100L	6S
Mach Solid Drill Plus	Drill dia.(ØD) 060: Ø6.0 (One decimal place marked)	Standard type Aspect ratio (L/D) Special type Flute length 100: 100mm	Machining area C: CFRP	Overall length 100L: 100mm	Shank dia. 6S: Ø6

Features

- Reduced thrust around corners thanks to the 2-step point angle
- Reduced burrs when drilling CFRP thanks to high rake cutting edges



High hardness diamond coating maintains well-cut shapes

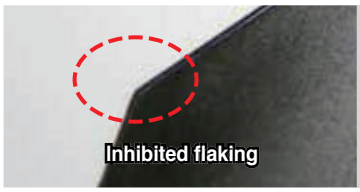


Diamond coating's strong grip to the substrate

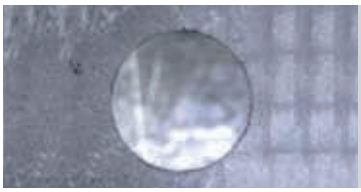
- Diamond Coating specialized in CFRP machining
- Diamond-coated substrate optimized for CFRP cutting

MSD Plus CFRP

Features



Less wear
and flaking on the rake
surface



Fewer burrs on
workpieces

• Inhibited burr creation by keeping cutting edges in good shape

Performance evaluation

Workpiece CFRP
Cutting conditions **vc** (m/min) = 100, **fn** (mm/rev) = 0.05, **ap** (mm) = 10, Air
Cutting length 7.2m (720 holes)
Tools MSDP060-5C (ND2100)

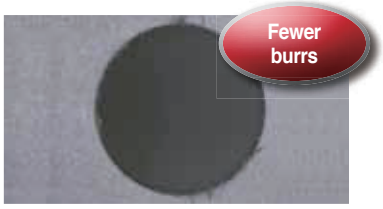
Improved performance quality

MSDP-C

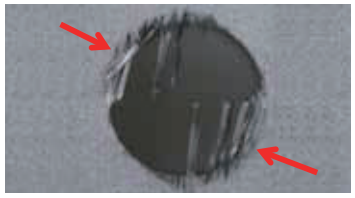
Competitor

Workpiece CFRP
Cutting conditions **vc** (m/min) = 100, **fn** (mm/rev) = 0.05, **ap** (mm) = 10, Air
Cutting length 7.2m (720 holes)
Tools MSDP060-5C (ND2100)

Machinability in high quality hole making



MSDP-C

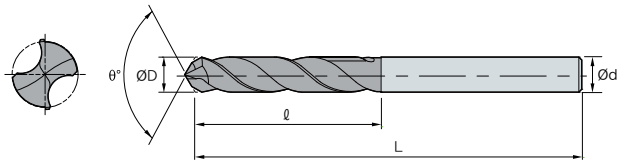


Competitor

Recommended cutting condition

Workpiece	Grade	vc (m/min)	Depth of cut = 5D Feed rate (mm/rev) per drill dia. (mm)		
			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
CFRP	ND2100	100 (100~150)	0.03~0.07	0.03~0.07	0.03~0.07

MSDP-5C



Specification	C
Grade	ND2100
Tolerance (drill Dia.)	m7
Tolerance (shank Dia.)	h6
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

C CFRP

(mm)

Designation		ØD	Ød	5C	
				ℓ	L
MSDP	030-5C	3	6	28	66
	040-5C	4	6	36	74
	0476-5C	4.76	6	44	82
	050-5C	5	6	44	82
	060-5C	6	6	44	82
	0635-5C	6.35	8	53	91
	070-5C	7	8	53	91
	0794-5C	7.94	8	53	91
	080-5C	8	8	53	91
	090-5C	9	10	61	103
	0952-5C	9.52	10	61	103
	100-5C	10	10	61	103
	110-5C	11	12	71	118
	1111-5C	11.11	12	71	118
	120-5C	12	12	71	118
	127-5C	12.7	14	71	124

MSFD (Mach Solid Flat Drill)

· The best tool for ramped, curved or flat workpieces

- High quality hole making capability with 180°-point angle
- Improved anti chipping and welding resistance by edge honing and chamfering
  Minimized creation of burrs compared to general drills

Code system

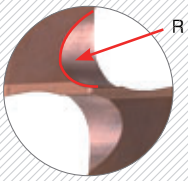
Special type

MSFD(H) 060 – 2 P – 100L – 6S

Oil hole	Drill dia.(ØD)	Standard type	Machining area	Overall length	Shank dia.
None: MSFD With oil hole: MSFDH	060: Ø6.0	Aspect ratio (L/D) 2D, 3D	**P:** General - Carbon steel, Alloy Steel	100L: 100mm	6S: Ø6

Special type
Flute length
100: 100mm

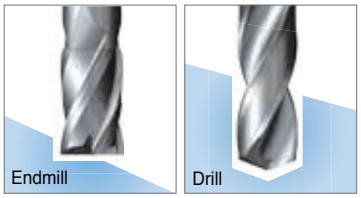
Features



- Excellent straightness with its 180°-point angle when drilling on ramped surface
- Stronger resistance to chipping through corner chamfering
- Widened chip pockets by the use of 'R' shape on the thinning part

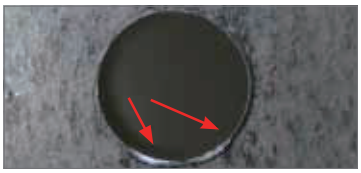
• Multi-functional capability - end milling and drilling using a single MSFD

MSFD



Conventional tools used and their application

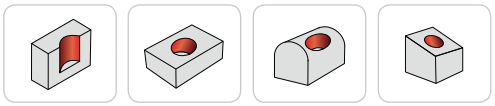
MSFD



Competitor

Wide applications

• A wide range of applications and improved cutting performance



Vertical | Flat surface | Curved surface | Ramped

Performance evaluation

Workpiece	SM48C
Cutting conditions	**vc** (m/min) = 80, **fn** (mm/rev) = 0.10, **ap** (mm) = 15, wet
Cutting length	7.2m (600 holes)
Tools	MSFD060-2P (PC325U)

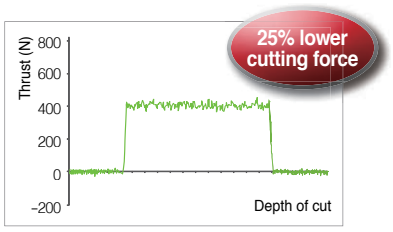
Prolongs tool life

MSFD

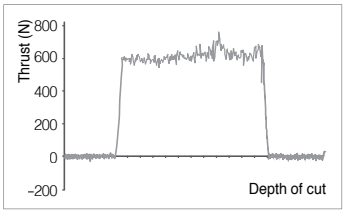
Competitor

Workpiece	SM45C
Cutting conditions	**vc** (m/min) = 70, **fn** (mm/rev) = 0.10, **ap** (mm) = 15, wet
Tools	MSDP060-3P (PC325U)

Stable hole size consistency and better surface finish



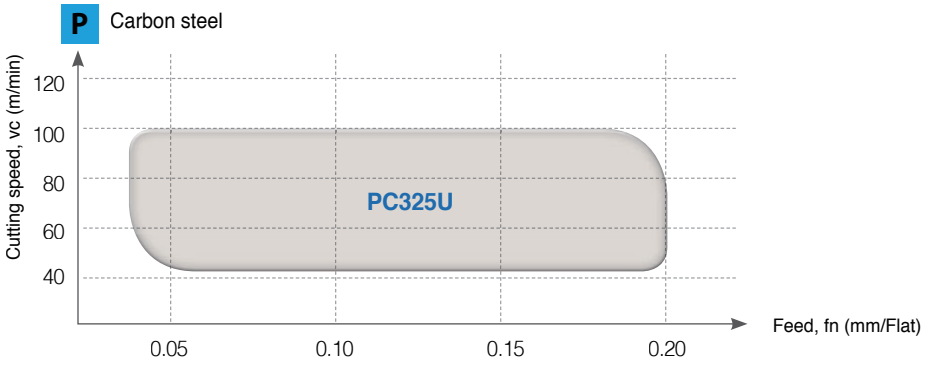
MSFD (Average thrust of 160N)



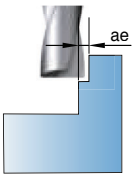
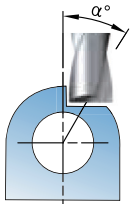
Competitor (Average thrust of 214N)

MSFD

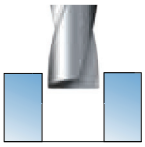
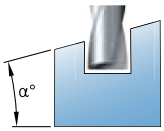
Application range



Application methods

Application type	Recommended machining conditions
	• Radial depth of cuts should be less than half the drill radius • In case of increasing depth of cuts, divide the machining process into two passes
	• Use the tool within 30° from the center of the curve • Reduce the feed rate when the tool penetrates the workpiece to the end part

Workpiece (Ø)	Slope angle (α°)	Performance	Applied (fn)
≤ Ø100	≤ 20°	◎	100%
	20°< ~40°	○	80%
	≥ 40°	△	60%

Application type	Recommended machining conditions
	• Reduce the feed rate by half the recommended condition when the tool enters the workpiece • Reduce the feed rate by half the recommended condition when the tool penetrates the workpiece to the end part • Recommended depth of cut is under 2D
	• Recommended slope angle range is under 30° • In case of machining at slope angle over 30°, reduce thefeed rate when the tool enters the workpiece

Slope angle (α°)	Performance	Applied (fn)
≤ 20°	◎	100%
20°< ~40°	○	80%
≥ 40°	△	60%

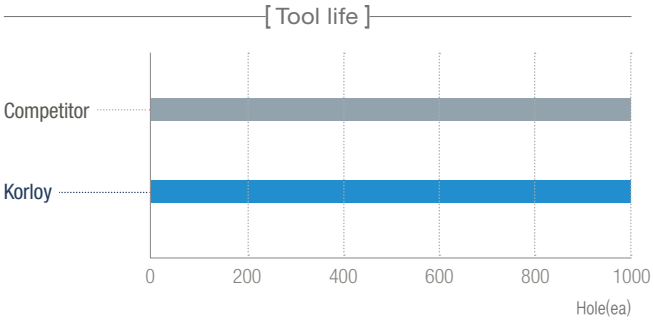
Recommended cutting condition

Workpiece			Grade	Cutting speed, vc (m/min)	Feed (Depth of cut = 2D~3D) Feed rate (mm/rev) per drill dia. (mm)		
ISO	Workpiece materials	Hardness (HB)			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0
P	Carbon steel	Low carbon steel	80~120	PC325U	75 (60~90)	0.03~0.10	0.05~0.15	0.10~0.20
		High carbon steel	180~280	PC325U	75 (60~80)	0.03~0.10	0.05~0.15	0.10~0.20
	Alloy steel	Low alloy steel	140~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20
		High alloy steel	50~260	PC325U	65 (50~80)	0.03~0.10	0.05~0.15	0.10~0.20

MSFD

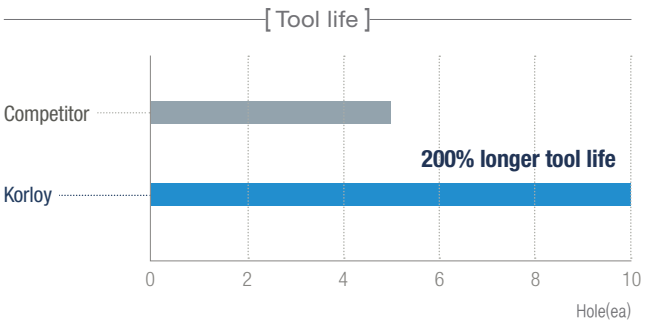
Application Example 1

Cutting conditions	
Insert	**MSFDS067-1.15P-53L-8S**
Grade	PC325U
Workpiece	SWRCH10 (Cold forging)
Cutting speed	vc = 50 (m/min)
Feed	fn = 0.10 (mm/rev)
Depth of cut	ap = 1.15 (mm)
Coolant	External coolant supply



Application Example 2

Cutting conditions	
Insert	**MSFDH077-3P**
Grade	PC325U
Workpiece	BS-S80(SUS)
Cutting speed	vc = 45 (m/min)
Feed	fn = 0.10 (mm/rev)
Depth of cut	ap = 40 (mm)
Coolant	Internal coolant supply

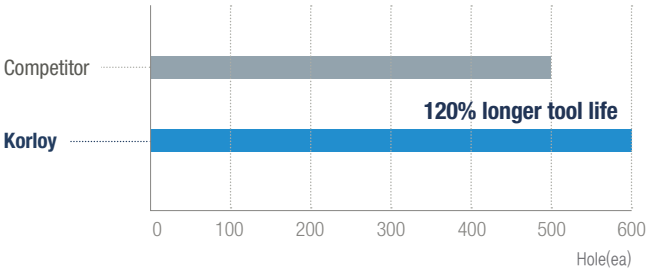


MSFD

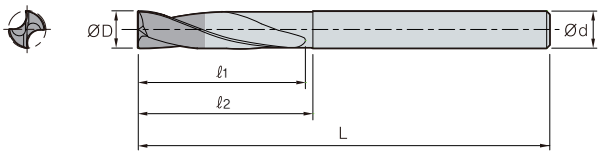
Application Example 3

Cutting conditions	
Insert	**MSFD090-2P**
Grade	PC325U
Workpiece	STS52-2
Cutting speed	vc = 90 (m/min)
Feed	fn = 0.08 (mm/rev)
Depth of cut	ap = 10 (mm)
Coolant	Internal coolant supply

[Tool life]



MSFD-2P



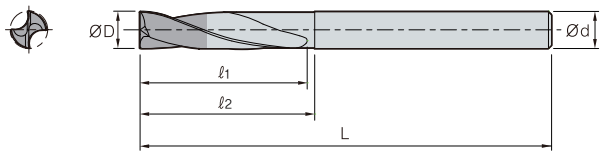
Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	20°
Thinning	R type
Coolant	External

P Steel

(mm)

Designation		ØD	Ød	2P		
				ℓ1	ℓ2	L
MSFD	025-2P	2.5	4.0	10.5	11.5	50
	026-2P	2.6	4.0	10.9	11.9	50
	027-2P	2.7	4.0	11.3	12.3	50
	028-2P	2.8	4.0	11.8	12.8	50
	029-2P	2.9	4.0	12.2	13.2	50
	030-2P	3.0	6.0	12.6	13.6	50
	031-2P	3.1	6.0	13.0	14.0	50
	032-2P	3.2	6.0	13.4	14.4	50
	033-2P	3.3	6.0	13.9	14.9	50
	034-2P	3.4	6.0	14.3	15.3	50
	035-2P	3.5	6.0	14.7	15.7	50
	036-2P	3.6	6.0	15.1	16.1	50
	037-2P	3.7	6.0	15.5	16.5	50
	038-2P	3.8	6.0	16.0	17.0	50
	039-2P	3.9	6.0	16.4	17.4	50
	040-2P	4.0	6.0	16.8	17.8	50
	041-2P	4.1	6.0	17.2	18.2	60
	042-2P	4.2	6.0	17.6	18.6	60
	043-2P	4.3	6.0	18.1	19.1	60
	044-2P	4.4	6.0	18.5	19.5	60
	045-2P	4.5	6.0	18.9	19.9	60
	046-2P	4.6	6.0	19.3	20.3	60
	047-2P	4.7	6.0	19.7	20.7	60
	048-2P	4.8	6.0	20.2	21.2	60
	049-2P	4.9	6.0	20.6	21.6	60
	050-2P	5.0	6.0	21.0	22.0	60
	051-2P	5.1	6.0	21.4	22.4	60
	052-2P	5.2	6.0	21.8	22.8	60
	053-2P	5.3	6.0	22.3	23.3	60
	054-2P	5.4	6.0	22.7	23.7	60
	055-2P	5.5	6.0	23.1	24.1	60
	056-2P	5.6	6.0	23.5	24.5	60
	057-2P	5.7	6.0	23.9	24.9	60
	058-2P	5.8	6.0	24.4	25.4	60
	059-2P	5.9	6.0	24.8	25.8	60
	060-2P	6.0	6.0	25.2	26.2	60
	061-2P	6.1	8.0	25.6	26.6	70
	062-2P	6.2	8.0	26.0	27.0	70
	063-2P	6.3	8.0	26.5	27.5	70
	064-2P	6.4	8.0	26.9	27.9	70
	065-2P	6.5	8.0	27.3	28.3	70
	066-2P	6.6	8.0	27.7	28.7	70
	067-2P	6.7	8.0	28.1	29.1	70
	068-2P	6.8	8.0	28.6	29.6	70
	069-2P	6.9	8.0	29.0	30.0	70

MSFD-2P



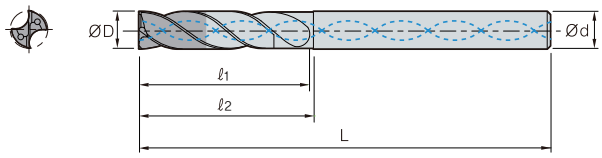
Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	20°
Thinning	R type
Coolant	External

P Steel

(mm)

Designation		ØD	Ød	2P		
				ℓ1	ℓ2	L
MSFD	070-2P	7.0	8.0	29.4	30.4	70
	071-2P	7.1	8.0	29.8	30.8	70
	072-2P	7.2	8.0	30.2	31.2	70
	073-2P	7.3	8.0	30.7	31.7	70
	074-2P	7.4	8.0	31.1	32.1	70
	075-2P	7.5	8.0	31.5	32.5	70
	076-2P	7.6	8.0	31.9	32.9	70
	077-2P	7.7	8.0	32.3	33.3	70
	078-2P	7.8	8.0	32.8	33.8	70
	079-2P	7.9	8.0	33.2	34.2	70
	080-2P	8.0	8.0	33.6	34.6	70
	081-2P	8.1	10.0	34.0	35.0	80
	082-2P	8.2	10.0	34.4	35.4	80
	083-2P	8.3	10.0	34.9	35.9	80
	084-2P	8.4	10.0	35.3	36.3	80
	085-2P	8.5	10.0	35.7	36.7	80
	086-2P	8.6	10.0	36.1	37.1	80
	087-2P	8.7	10.0	36.5	37.5	80
	088-2P	8.8	10.0	37.0	38.0	80
	089-2P	8.9	10.0	37.4	38.4	80
	090-2P	9.0	10.0	37.8	38.8	80
	091-2P	9.1	10.0	38.2	39.2	80
	092-2P	9.2	10.0	38.6	39.6	80
	093-2P	9.3	10.0	39.1	40.1	80
	094-2P	9.4	10.0	39.5	40.5	80
	095-2P	9.5	10.0	39.9	40.9	80
	096-2P	9.6	10.0	40.3	41.3	80
	097-2P	9.7	10.0	40.7	41.7	80
	098-2P	9.8	10.0	41.2	42.2	80
	099-2P	9.9	10.0	41.6	42.6	80
	100-2P	10.0	10.0	42.0	43	80
	101-2P	10.1	12.0	42.4	43.4	90
	102-2P	10.2	12.0	42.8	43.8	90
	103-2P	10.3	12.0	43.3	44.3	90
	104-2P	10.4	12.0	43.7	44.7	90
	105-2P	10.5	12.0	44.1	45.1	90
	106-2P	10.6	12.0	44.5	45.5	90
	107-2P	10.7	12.0	44.9	45.9	90
	108-2P	10.8	12.0	45.4	46.4	90
	109-2P	10.9	12.0	45.8	46.8	90
	110-2P	11.0	12.0	46.2	47.2	90
	111-2P	11.1	12.0	46.6	47.6	90
	112-2P	11.2	12.0	47.0	48.0	90
	113-2P	11.3	12.0	47.5	48.5	90
	114-2P	11.4	12.0	47.9	48.9	90
	115-2P	11.5	12.0	48.3	49.3	90
	116-2P	11.6	12.0	48.7	49.7	90
	117-2P	11.7	12.0	49.1	50.1	90
	118-2P	11.8	12.0	49.6	50.6	90
	119-2P	11.9	12.0	50.0	51.0	90
	120-2P	12.0	12.0	50.4	51.4	90

MSFDH-3P



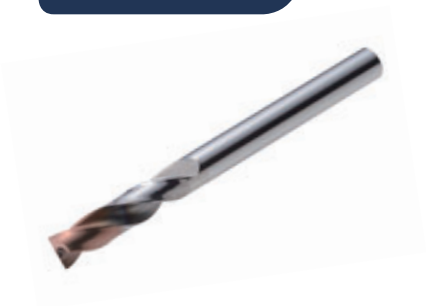
Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	20°
Thinning	R type
Coolant	Through

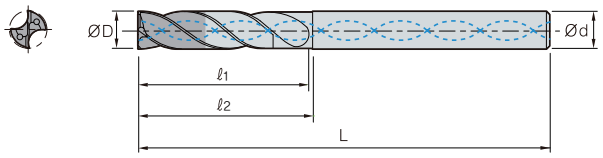
P Steel

(mm)

Designation		ØD	Ød	3P		
				ℓ1	ℓ2	L
MSFDH	025-3P	2.5	3.0	17	18	58
	026-3P	2.6	3.0	17	18	58
	027-3P	2.7	3.0	17	18	58
	028-3P	2.8	3.0	17	18	58
	029-3P	2.9	3.0	17	18	58
	030-3P	3.0	6.0	20	21	62
	031-3P	3.1	6.0	20	21	62
	032-3P	3.2	6.0	20	21	62
	033-3P	3.3	6.0	20	21	62
	034-3P	3.4	6.0	20	21	62
	035-3P	3.5	6.0	20	21	62
	036-3P	3.6	6.0	20	21	62
	037-3P	3.7	6.0	20	21	62
	038-3P	3.8	6.0	24	25	66
	039-3P	3.9	6.0	24	25	66
	040-3P	4.0	6.0	24	25	66
	041-3P	4.1	6.0	24	25	66
	042-3P	4.2	6.0	24	25	66
	043-3P	4.3	6.0	24	25	66
	044-3P	4.4	6.0	24	25	66
	045-3P	4.5	6.0	24	25	66
	046-3P	4.6	6.0	24	25	66
	047-3P	4.7	6.0	24	25	66
	048-3P	4.8	6.0	28	29	66
	049-3P	4.9	6.0	28	29	66
	050-3P	5.0	6.0	28	29	66
	051-3P	5.1	6.0	28	29	66
	052-3P	5.2	6.0	28	29	66
	053-3P	5.3	6.0	28	29	66
	054-3P	5.4	6.0	28	29	66
	055-3P	5.5	6.0	28	29	66
	056-3P	5.6	6.0	28	29	66
	057-3P	5.7	6.0	28	29	66
	058-3P	5.8	6.0	28	29	66
	059-3P	5.9	6.0	28	29	66
	060-3P	6.0	6.0	28	29	66
	061-3P	6.1	8.0	34	35	79
	062-3P	6.2	8.0	34	35	79
	063-3P	6.3	8.0	34	35	79
	064-3P	6.4	8.0	34	35	79
	065-3P	6.5	8.0	34	35	79
	066-3P	6.6	8.0	34	35	79
	067-3P	6.7	8.0	34	35	79
	068-3P	6.8	8.0	34	35	79
	069-3P	6.9	8.0	34	35	79
	070-3P	7.0	8.0	34	35	79
	071-3P	7.1	8.0	41	42	79
	072-3P	7.2	8.0	41	42	79

MSFDH-3P





Terminology	P
Grade	PC325U
Tolerance (drill Dia.)	H7
Tolerance (shank Dia.)	h6
Point angle	180°
Twist angle	20°
Thinning	R type
Coolant	Through

P Steel

(mm)

Designation		ØD	Ød	3P		
				ℓ1	ℓ2	L
MSFDH	073-3P	7.3	8.0	41	42	79
	074-3P	7.4	8.0	41	42	79
	075-3P	7.5	8.0	41	42	79
	076-3P	7.6	8.0	41	42	79
	077-3P	7.7	8.0	41	42	79
	078-3P	7.8	8.0	41	42	79
	079-3P	7.9	8.0	41	42	79
	080-3P	8.0	8.0	41	42	79
	081-3P	8.1	10.0	47	48	89
	082-3P	8.2	10.0	47	48	89
	083-3P	8.3	10.0	47	48	89
	084-3P	8.4	10.0	47	48	89
	085-3P	8.5	10.0	47	48	89
	086-3P	8.6	10.0	47	48	89
	087-3P	8.7	10.0	47	48	89
	088-3P	8.8	10.0	47	48	89
	089-3P	8.9	10.0	47	48	89
	090-3P	9.0	10.0	47	48	89
	091-3P	9.1	10.0	47	48	89
	092-3P	9.2	10.0	47	48	89
	093-3P	9.3	10.0	47	48	89
	094-3P	9.4	10.0	47	48	89
	095-3P	9.5	10.0	47	48	89
	096-3P	9.6	10.0	47	48	89
	097-3P	9.7	10.0	47	48	89
	098-3P	9.8	10.0	47	48	89
	099-3P	9.9	10.0	47	48	89
	100-3P	10.0	10.0	47	48	89
	101-3P	10.1	12.0	55	56	102
	102-3P	10.2	12.0	55	56	102
	103-3P	10.3	12.0	55	56	102
	104-3P	10.4	12.0	55	56	102
	105-3P	10.5	12.0	55	56	102
	106-3P	10.6	12.0	55	56	102
	107-3P	10.7	12.0	55	56	102
	108-3P	10.8	12.0	55	56	102
	109-3P	10.9	12.0	55	56	102
	110-3P	11.0	12.0	55	56	102
	111-3P	11.1	12.0	55	56	102
	112-3P	11.2	12.0	55	56	102
	113-3P	11.3	12.0	55	56	102
	114-3P	11.4	12.0	55	56	102
	115-3P	11.5	12.0	55	56	102
	116-3P	11.6	12.0	55	56	102
	117-3P	11.7	12.0	55	56	102
	118-3P	11.8	12.0	55	56	102
	119-3P	11.9	12.0	55	56	102
	120-3P	12.0	12.0	55	56	102

MLD Plus (Mach Long Solid Drill Plus)

· High precision results when machining deep holes

Code system

Special type

MLD 0600N - 10 P - 100L - 10S

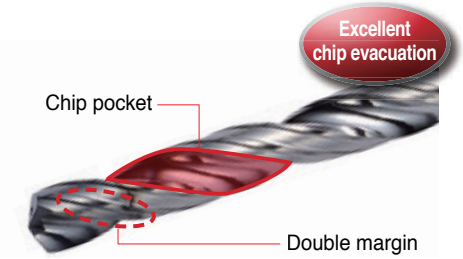
- **MLD** — Mach Long Solid Drill Plus (MLD Plus)
- **0600N** — Drill dia.(ØD)
  - 0600: Ø6.00
- **10** — Standard type
  - Aspect ratio (L/D)
  - 10D, 15D, 20D, 25D
  - Special type
    - Flute length
    - 100: 100mm
- **P** — Machining area
  - **P**: Carbon steel, Alloy Steel
  - **K**: Cast iron
  - **N**: Aluminum, Copper Alloy
- **100L** — Overall length
  - 100L: 100mm
- **10S** — Shank dia.
  - 10S: Ø10

Features

Cutting edge and flute shape

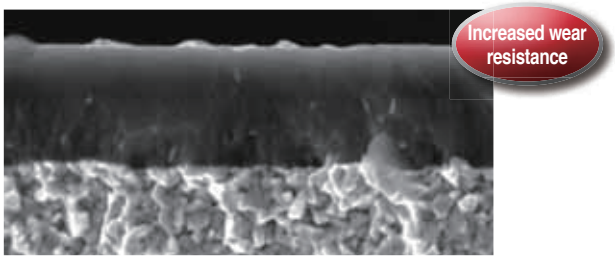
- Straight cutting edge provides better rigidity
- Excellent chip evacuation due to wider chip pocket and improved flute surface roughness
- Double margin secures machining stability

Cutting edge shape



New grade (PC315G)

- Ultra-fine substrate and new coating applied
- Lubricative coating layer improves chip evacuation with lower frictional resistance
- Longer tool life due to higher wear resistance

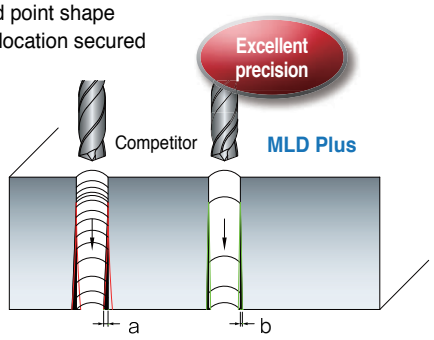


PC315G

MLD Plus

Degree of machining precision

- Improved machining precision
  - Bent holes reduced, Inside hole surface roughness improved
  - Hole size uniformity increased
- Improved point shape
  - Precise location secured



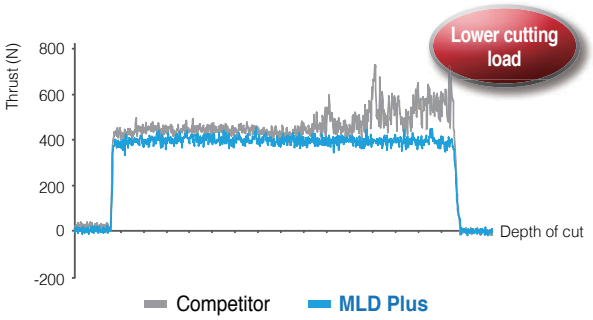
Reduced bent holes compared to competitors (a > b)

Cutting load

Workpiece SM45C

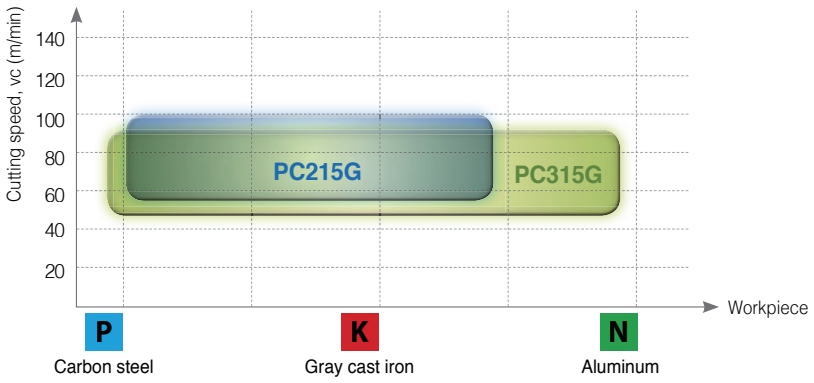
Cutting conditions **Drill Dia.**(m) = Ø6.0, **vc** (m/min) = 70
fn (mm/rev) = 0.10, **ap** (mm) = 15, wet

Tools MLD0600N-20P



Application range

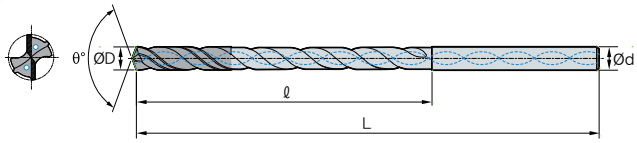
- **PC215G** – Excellent performance when machining cast iron and alloy steel at high speed
- **PC315G** – Universal grade excellent when machining carbon steel, cast iron, etc. at middle to low cutting speed



Recommended cutting condition

Workpiece				Grade	vc (m/min)	Depth of cut = 10D~25D Feed rate (mm/rev) per drill dia. (mm)		
ISO		Workpiece	HB	Recommended		Ø3.0~Ø5.0	Ø5.1~Ø8.0	Ø8.1~Ø10.0
P	Carbon steel	Low carbon steel	80~120	PC315G	80 (60~90)	0.10~0.15	0.15~0.20	0.20~0.25
		High carbon steel	180~280	PC315G	70 (60~80)	0.10~0.15	0.15~0.20	0.20~0.25
	Alloy steel	Low alloy steel	140~260	PC215G	80 (60~90)	0.10~0.15	0.12~0.17	0.15~0.20
		Low carbon steel	50~260	PC215G	70 (60~80)	0.08~0.15	0.10~0.15	0.15~0.20
K	Cast iron	Gray cast iron	150~230	PC215G	80 (60~100)	0.10~0.20	0.15~0.20	0.15~0.20
		Ductile cast iron	160~260	PC215G	70 (60~80)	0.10~0.20	0.15~0.20	0.15~0.20
N	Aluminum	Aluminum alloy	30~150	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25
	Copper alloy	Copper alloy	150~160	FG2	120 (100~150)	0.12~0.17	0.15~0.20	0.20~0.25

MLD - □□(P/K/N)



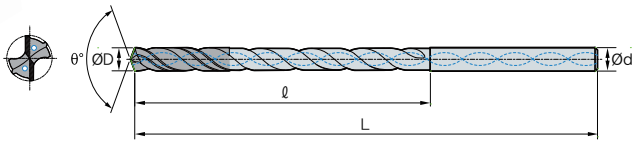
Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

P Steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	10P,K,N		15P,K,N		20P,K,N		25P,K,N	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD	0300N-□□P,K,N	3.0	3.0	40	90	55	105	70	120	-	-
	0310N-□□P,K,N	3.1	4.0	45	100	60	125	80	140	-	-
	0320N-□□P,K,N	3.2	4.0	45	100	60	125	80	140	-	-
	0330N-□□P,K,N	3.3	4.0	45	100	60	125	80	140	-	-
	0340N-□□P,K,N	3.4	4.0	50	100	65	125	85	140	-	-
	0350N-□□P,K,N	3.5	4.0	50	100	65	125	85	140	-	-
	0360N-□□P,K,N	3.6	4.0	50	100	65	125	85	140	-	-
	0370N-□□P,K,N	3.7	4.0	50	100	65	125	85	140	-	-
	0380N-□□P,K,N	3.8	4.0	50	100	75	125	90	140	-	-
	0390N-□□P,K,N	3.9	4.0	50	100	75	125	90	140	-	-
	0400N-□□P,K,N	4.0	4.0	50	100	75	125	90	140	115	165
	0410N-□□P,K,N	4.1	5.0	55	115	75	140	100	165	120	190
	0420N-□□P,K,N	4.2	5.0	55	115	75	140	100	165	120	190
	0430N-□□P,K,N	4.3	5.0	60	115	85	140	110	165	135	190
	0440N-□□P,K,N	4.4	5.0	60	115	85	140	110	165	135	190
	0450N-□□P,K,N	4.5	5.0	60	115	85	140	110	165	135	190
	0460N-□□P,K,N	4.6	5.0	60	115	85	140	110	165	135	190
	0470N-□□P,K,N	4.7	5.0	60	115	85	140	110	165	135	190
	0480N-□□P,K,N	4.8	5.0	65	115	90	140	115	165	140	190
	0490N-□□P,K,N	4.9	5.0	65	115	90	140	115	165	140	190

MLD - □□(P/K/N)



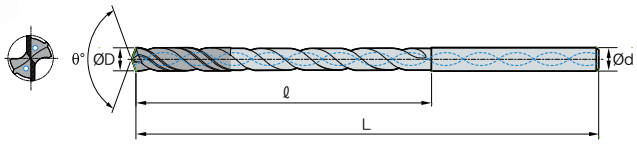
Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

P Steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	10P,K,N		15P,K,N		20P,K,N		25P,K,N	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD	0500N-□□P,K,N	5.0	5.0	65	115	90	140	115	165	140	190
	0510N-□□P,K,N	5.1	6.0	70	128	95	160	120	190	150	220
	0520N-□□P,K,N	5.2	6.0	70	128	95	160	120	190	150	220
	0530N-□□P,K,N	5.3	6.0	70	128	95	160	120	190	150	220
	0540N-□□P,K,N	5.4	6.0	78	128	110	160	140	190	170	220
	0550N-□□P,K,N	5.5	6.0	78	128	110	160	140	190	170	220
	0560N-□□P,K,N	5.6	6.0	78	128	110	160	140	190	170	220
	0570N-□□P,K,N	5.7	6.0	78	128	110	160	140	190	170	220
	0580N-□□P,K,N	5.8	6.0	78	128	110	160	140	190	170	220
	0590N-□□P,K,N	5.9	6.0	78	128	110	160	140	190	170	220
	0600N-□□P,K,N	6.0	6.0	78	128	110	160	140	190	170	220
	0610N-□□P,K,N	6.1	7.0	87	140	120	175	155	210	190	250
	0620N-□□P,K,N	6.2	7.0	87	140	120	175	155	210	190	250
	0630N-□□P,K,N	6.3	7.0	87	140	120	175	155	210	190	250
	0640N-□□P,K,N	6.4	7.0	87	140	120	175	155	210	190	250
	0650N-□□P,K,N	6.5	7.0	87	140	120	175	155	210	190	250
	0660N-□□P,K,N	6.6	7.0	87	140	120	175	155	210	190	250
	0670N-□□P,K,N	6.7	7.0	87	140	120	175	155	210	190	250
	0680N-□□P,K,N	6.8	7.0	90	140	125	175	160	210	200	250
	0690N-□□P,K,N	6.9	7.0	90	140	125	175	160	210	200	250

MLD - □□(P/K/N)



Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance (drill Dia.)	h7		
Tolerance (shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through		

P Steel K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	10P,K,N		15P,K,N		20P,K,N		25P,K,N	
				ℓ	L	ℓ	L	ℓ	L	ℓ	L
MLD	0700N-□□P,K,N	7.0	7.0	90	140	125	175	160	210	200	250
	0710N-□□P,K,N	7.1	8.0	100	155	135	195	170	230	-	-
	0720N-□□P,K,N	7.2	8.0	100	155	135	195	170	230	-	-
	0730N-□□P,K,N	7.3	8.0	100	155	135	195	170	230	-	-
	0740N-□□P,K,N	7.4	8.0	100	155	135	195	170	230	-	-
	0750N-□□P,K,N	7.5	8.0	100	155	135	195	170	230	-	-
	0760N-□□P,K,N	7.6	8.0	105	155	145	195	180	230	-	-
	0770N-□□P,K,N	7.7	8.0	105	155	145	195	180	230	-	-
	0780N-□□P,K,N	7.8	8.0	105	155	145	195	180	230	-	-
	0790N-□□P,K,N	7.9	8.0	105	155	145	195	180	230	-	-
	0800N-□□P,K,N	8.0	8.0	105	155	145	195	180	230	-	-
	0810N-□□P,K,N	8.1	9.0	110	165	155	210	195	260	-	-
	0820N-□□P,K,N	8.2	9.0	110	165	155	210	195	260	-	-
	0830N-□□P,K,N	8.3	9.0	110	165	155	210	195	260	-	-
	0840N-□□P,K,N	8.4	9.0	110	165	155	210	195	260	-	-
	0850N-□□P,K,N	8.5	9.0	110	165	155	210	195	260	-	-
	0860N-□□P,K,N	8.6	9.0	115	165	160	210	210	260	-	-
	0870N-□□P,K,N	8.7	9.0	115	165	160	210	210	260	-	-
	0880N-□□P,K,N	8.8	9.0	115	165	160	210	210	260	-	-
	0890N-□□P,K,N	8.9	9.0	115	165	160	210	210	260	-	-
	0900N-□□P,K,N	9.0	9.0	115	165	160	210	210	260	-	-
	0910N-□□P,K,N	9.1	10.0	125	190	170	240	-	-	-	-
	0920N-□□P,K,N	9.2	10.0	125	190	170	240	-	-	-	-
	0930N-□□P,K,N	9.3	10.0	125	190	170	240	-	-	-	-
	0940N-□□P,K,N	9.4	10.0	125	190	170	240	-	-	-	-
	0950N-□□P,K,N	9.5	10.0	125	190	170	240	-	-	-	-
	0960N-□□P,K,N	9.6	10.0	130	190	180	240	-	-	-	-
	0970N-□□P,K,N	9.7	10.0	130	190	180	240	-	-	-	-
	0980N-□□P,K,N	9.8	10.0	130	190	180	240	-	-	-	-
	0990N-□□P,K,N	9.9	10.0	130	190	180	240	-	-	-	-
	1000N-□□P,K,N	10.0	10.0	130	190	180	240	-	-	-	-

ESD Plus

· Highly efficient hole machining for various workpieces including automotive components

- **Great Value for Budget**
  Excellent performance and cost efficiency
- **Increased Wear Resistance**
  Strong wear resistance due to our new PC325U grade

Code system

Special type

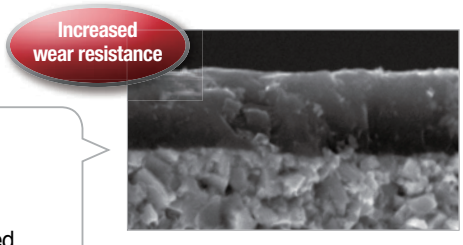
ESDP 040 - 5 P - 100L - 6S

- **ESDP** — Eco Solid Drill Plus
- **040** — Drill dia.(ØD)
  040: Ø4.0
- **5** — Standard type
  Aspect ratio (L/D)
  3D, 5D
- **100** — Special type
  Flute length
  100: 100mm
- **P** — Machining area
  P: Carbon steel, alloy steel
  M: Stainless steel
  K: Cast iron
  N: Aluminum, copper alloy
- **100L** — Overall length
  100L: 100mm
- **6S** — Shank dia.
  5S: Ø5

Features

New grade (PC325U)

- Lubricative coating layer improves welding resistance at middle to high speed.
- Increase wear resistance in machining carbon steel



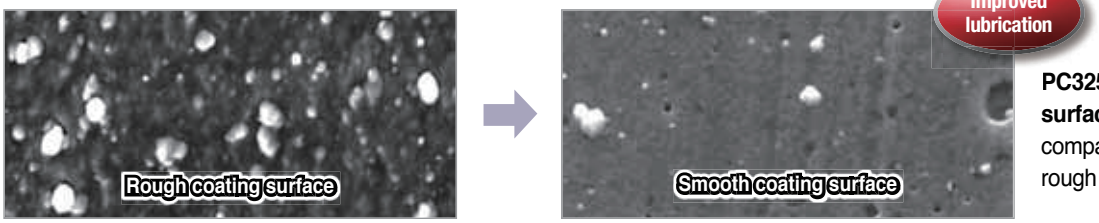
Increased **welding resistance** and wear **resistance** with new PC325U grade applied.

PC325U

ESD Plus

Surface of coating layer

- Excellent welding resistance and lower cutting load
- Reduced frictional resistance at cutting edges and on the flute



Competitor | PC325U

PC325U has a coating surface more lubricated compared to competitor's rough surface.

Chip control

Workpiece 42CrMo4*

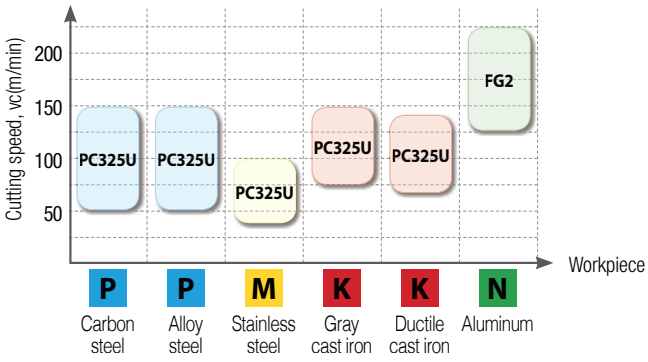
Cutting conditions **vc** (m/min) = 40, **fn** (mm/rev) = 0.1, **ap** (mm) = 30, Wet

Tools ESDP060-5P

Competitor | ESD Plus

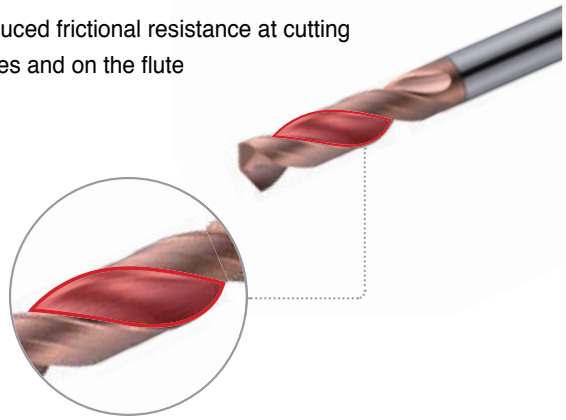
Good chip shape when machining with ESD Plus in wider applications compared to competitor's.

Application area



Flute shape

- Reduced frictional resistance at cutting edges and on the flute



* International standard: ISO

ESD Plus

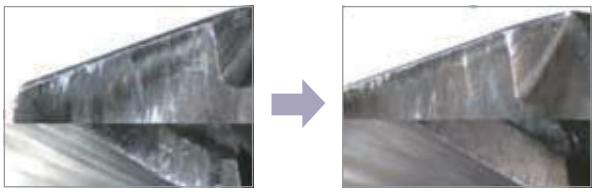
Performance evaluation

Comparison of wear

Workpiece 42CrMo4*

Cutting conditions **vc** (m/min) = 124, **fn** (mm/rev) = 0.15, **ap** (mm) = 30, External coolant

Tools ESDP060-5P



Competitor | **ESD Plus**

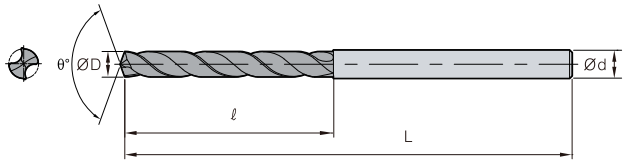
Recommended cutting condition

Workpiece				Grade	Cutting speed vc (m/min)	Depth of cut = 10D~25D				
						Feed rate (mm/rev) per drill dia. (mm)				
ISO		Workpiece materials	Hardness (HB)			Ø2.5~4.0	Ø4.1~8.0	Ø8.1~12.0	Ø12.1~16.0	Ø16.1~20.0
P	Carbon steel	Low carbon steel	80~120	PC325U	72 (64~120)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		High carbon steel	Over 250	PC325U	40 (32~64)	0.06~0.16	0.06~0.16	0.08~0.20	0.12~0.20	0.12~0.24
	Alloy steel	Low alloy steel	140~260	PC325U	72 (64~120)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		Hardened low alloy steel	200~400	PC325U	48 (40~80)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		High alloy steel	50~260	PC325U	40 (32~64)	0.06~0.16	0.06~0.16	0.08~0.20	0.12~0.20	0.12~0.24
		Hardened high alloy steel	Over 250	PC325U	40 (32~64)	0.06~0.16	0.06~0.16	0.08~0.20	0.12~0.20	0.12~0.24
M	Stainless steel	Austenite series	135~275	PC325U	36 (20~64)	0.04~0.16	0.04~0.16	0.08~0.20	0.08~0.20	0.12~0.24
		Ferrite series Martensite series	135~275	PC325U	40 (24~64)	0.04~0.16	0.04~0.16	0.08~0.20	0.08~0.20	0.12~0.24
K	Cast iron	Gray cast iron	150~230	PC325U	80 (64~120)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
		Ductile cast iron	160~260	PC325U	72 (56~112)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32
N	Aluminum	Aluminum alloy	30~150	FG2	120 (100~176)	0.19~0.30	0.30~0.42	0.42~0.60	0.49~0.68	0.54~0.78
	Copper alloy	Copper alloy	150~160	FG2	120 (100~176)	0.08~0.12	0.13~0.19	0.16~0.24	0.20~0.29	0.24~0.32

• Cutting conditions above are for the case of less than 5D depth of cut and external coolant system applied.

* International standard: ISO

ESDP - □□P



Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

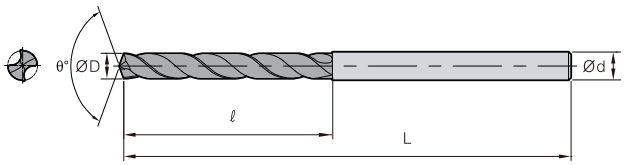
P Steel M Stainless steel
K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P		5P	
				ℓ	L	ℓ	L
ESDP	010-□P	1.0	3	5	45	8	45
	011-□P	1.1	3	6	45	9	45
	012-□P	1.2	3	6	45	10	45
	013-□P	1.3	3	7	45	10	45
	014-□P	1.4	3	7	45	11	45
	015-□P	1.5	3	7	45	11	45
	016-□P	1.6	3	8	45	12	45
	017-□P	1.7	3	8	45	12	45
	018-□P	1.8	3	9	45	13	45
	019-□P	1.9	3	9	45	14	45
	020-□P	2.0	3	10	50	18	50
	021-□P	2.1	3	10	50	18	50
	022-□P	2.2	3	12	50	18	50
	023-□P	2.3	3	12	50	18	50
	024-□P	2.4	3	12	50	18	50
	025-□P	2.5	3	12	50	18	50
	026-□P	2.6	3	12	50	18	50
	027-□P	2.7	3	15	50	18	50
	028-□P	2.8	3	15	50	18	50
	029-□P	2.9	3	15	50	18	50
	030-□P	3.0	3	16	55	20	55
	031-□P	3.1	4	16	55	20	55
	032-□P	3.2	4	16	55	20	55
	033-□P	3.3	4	16	55	20	55
	034-□P	3.4	4	16	55	20	55
	035-□P	3.5	4	16	55	20	55
	036-□P	3.6	4	18	55	25	55
	037-□P	3.7	4	18	55	25	55
	038-□P	3.8	4	20	55	25	55
	039-□P	3.9	4	20	55	25	55
	040-□P	4.0	4	20	55	25	55
	041-□P	4.1	5	20	55	25	55
	042-□P	4.2	5	20	63	33	63
	043-□P	4.3	5	23	63	33	63
	044-□P	4.4	5	23	63	33	63
	045-□P	4.5	5	23	63	33	63
	046-□P	4.6	5	23	63	33	63
	047-□P	4.7	5	23	63	33	63
	048-□P	4.8	5	25	63	33	63
	049-□P	4.9	5	25	63	33	63
	050-□P	5.0	5	25	63	33	63

※ Pre-orders can be made in advance for non-stock items.

ESDP - □□P



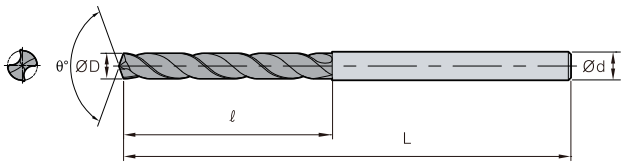
Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

P Steel M Stainless steel
K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P		5P	
				ℓ	L	ℓ	L
ESDP	051-□P	5.1	6	25	63	33	63
	052-□P	5.2	6	28	66	36	66
	053-□P	5.3	6	28	66	36	66
	054-□P	5.4	6	28	66	36	66
	055-□P	5.5	6	28	66	36	66
	056-□P	5.6	6	28	66	36	66
	057-□P	5.7	6	28	66	36	66
	058-□P	5.8	6	28	66	36	66
	059-□P	5.9	6	28	66	36	66
	060-□P	6.0	6	30	66	36	66
	061-□P	6.1	7	30	66	36	66
	062-□P	6.2	7	32	75	42	75
	063-□P	6.3	7	32	75	42	75
	064-□P	6.4	7	32	75	42	75
	065-□P	6.5	7	32	75	42	75
	066-□P	6.6	7	32	75	42	75
	067-□P	6.7	7	32	75	42	75
	068-□P	6.8	7	32	75	42	75
	069-□P	6.9	7	32	75	42	75
	070-□P	7.0	7	32	75	42	75
	071-□P	7.1	8	32	75	42	75
	072-□P	7.2	8	36	80	46	80
	073-□P	7.3	8	36	80	46	80
	074-□P	7.4	8	36	80	46	80
	075-□P	7.5	8	36	80	46	80
	076-□P	7.6	8	36	80	46	80
	077-□P	7.7	8	36	80	46	80
	078-□P	7.8	8	36	80	46	80
	079-□P	7.9	8	36	80	46	80
	080-□P	8.0	8	36	80	46	80
	081-□P	8.1	9	36	80	46	80
	082-□P	8.2	9	38	85	50	85
	083-□P	8.3	9	38	85	50	85
	084-□P	8.4	9	38	85	50	85
	085-□P	8.5	9	38	85	50	85
	086-□P	8.6	9	40	85	50	85
	087-□P	8.7	9	40	85	50	85
	088-□P	8.8	9	40	85	50	85
	089-□P	8.9	9	40	85	50	85
	090-□P	9.0	9	40	85	50	85

ESDP - □□P



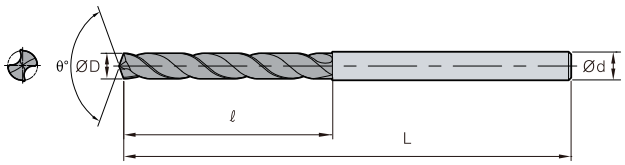
Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

P Steel M Stainless steel
K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	3P		5P	
				ℓ	L	ℓ	L
ESDP	091-□P	9.1	10	42	85	50	85
	092-□P	9.2	10	42	90	55	90
	093-□P	9.3	10	42	90	55	90
	094-□P	9.4	10	42	90	55	90
	095-□P	9.5	10	42	90	55	90
	096-□P	9.6	10	45	90	55	90
	097-□P	9.7	10	45	90	55	90
	098-□P	9.8	10	45	90	55	90
	099-□P	9.9	10	45	90	55	90
	100-□P	10.0	10	45	90	55	90
	101-5P	10.1	11	-	-	55	90
	102-5P	10.2	11	-	-	57	95
	103-5P	10.3	11	-	-	57	95
	104-5P	10.4	11	-	-	57	95
	105-5P	10.5	11	-	-	57	95
	106-5P	10.6	11	-	-	57	95
	107-5P	10.7	11	-	-	57	95
	108-5P	10.8	11	-	-	57	95
	109-5P	10.9	11	-	-	57	95
	110-5P	11.0	11	-	-	57	95
	111-5P	11.1	12	-	-	57	95
	112-5P	11.2	12	-	-	63	102
	113-5P	11.3	12	-	-	63	102
	114-5P	11.4	12	-	-	63	102
	115-5P	11.5	12	-	-	63	102
	116-5P	11.6	12	-	-	63	102
	117-5P	11.7	12	-	-	63	102
	118-5P	11.8	12	-	-	63	102
	119-5P	11.9	12	-	-	63	102
	120-5P	12.0	12	-	-	63	102

ESDP - □□P



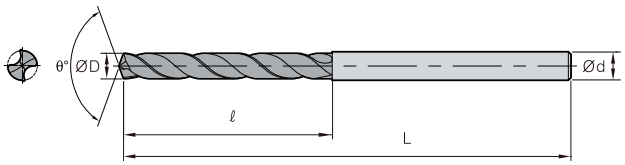
Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

P Steel M Stainless steel
K Cast iron N Non-ferrous metal

(mm)

Designation		ØD	Ød	5P	
				ℓ	L
ESDP	121-5P	12.1	13	63	102
	122-5P	12.2	13	63	102
	123-5P	12.3	13	63	102
	124-5P	12.4	13	63	102
	125-5P	12.5	13	63	102
	126-5P	12.6	13	63	102
	127-5P	12.7	13	63	102
	128-5P	12.8	13	63	102
	129-5P	12.9	13	63	102
	130-5P	13.0	13	63	102
	131-5P	13.1	14	63	102
	132-5P	13.2	14	65	107
	133-5P	13.3	14	65	107
	134-5P	13.4	14	65	107
	135-5P	13.5	14	65	107
	136-5P	13.6	14	65	107
	137-5P	13.7	14	65	107
	138-5P	13.8	14	65	107
	139-5P	13.9	14	65	107
	140-5P	14.0	14	65	107
	141-5P	14.1	15	65	107
	142-5P	14.2	15	68	115
	143-5P	14.3	15	68	115
	144-5P	14.4	15	68	115
	145-5P	14.5	15	68	115
	146-5P	14.6	15	68	115
	147-5P	14.7	15	68	115
	148-5P	14.8	15	68	115
	149-5P	14.9	15	68	115
	150-5P	15.0	15	68	115
	151-5P	15.1	16	68	115
	152-5P	15.2	16	70	120
	153-5P	15.3	16	70	120
	154-5P	15.4	16	70	120
	155-5P	15.5	16	70	120
	156-5P	15.6	16	70	120
	157-5P	15.7	16	70	120
	158-5P	15.8	16	70	120
	159-5P	15.9	16	70	120
	160-5P	16.0	16	70	120
	161-5P	16.1	17	70	120
	162-5P	16.2	17	70	120
	163-5P	16.3	17	70	120
	164-5P	16.4	17	70	120
	165-5P	16.5	17	72	125
	166-5P	16.6	17	72	125
	167-5P	16.7	17	72	125
	168-5P	16.8	17	72	125

ESDP - □□P



Specification	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			

P Steel M Stainless steel
K Cast iron N Non-ferrous metal

(mm)

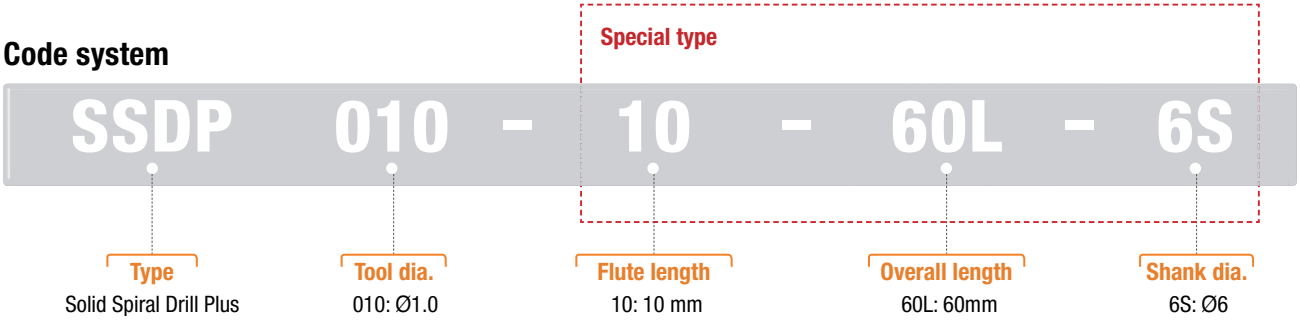
Designation		ØD	Ød	5P	
				ℓ	L
ESDP	169-5P	16.9	17	72	125
	170-5P	17.0	17	72	125
	171-5P	17.1	18	72	125
	172-5P	17.2	18	72	125
	173-5P	17.3	18	72	125
	174-5P	17.4	18	72	125
	175-5P	17.5	18	75	130
	176-5P	17.6	18	75	130
	177-5P	17.7	18	75	130
	178-5P	17.8	18	75	130
	179-5P	17.9	18	75	130
	180-5P	18.0	18	75	130
	181-5P	18.1	19	75	130
	182-5P	18.2	19	75	130
	183-5P	18.3	19	75	130
	184-5P	18.4	19	75	130
	185-5P	18.5	19	78	130
	186-5P	18.6	19	78	130
	187-5P	18.7	19	78	130
	188-5P	18.8	19	78	130
	189-5P	18.9	19	78	130
	190-5P	19.0	19	78	130
	191-5P	19.1	20	78	130
	192-5P	19.2	20	78	130
	193-5P	19.3	20	78	130
	194-5P	19.4	20	78	130
	195-5P	19.5	20	82	135
	196-5P	19.6	20	82	135
	197-5P	19.7	20	82	135
	198-5P	19.8	20	82	135
	199-5P	19.9	20	82	135
	200-5P	20.0	20	82	135

SSD Plus

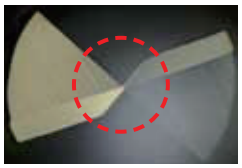
· High quality solid drill for high performance

- Improved chip control thanks to the new flute design
- Higher quality machining achieved from improved surface finish and forming
- Increased productivity thanks to stable tool life
- A variety of workpiece materials available including mild steel and non-ferrous

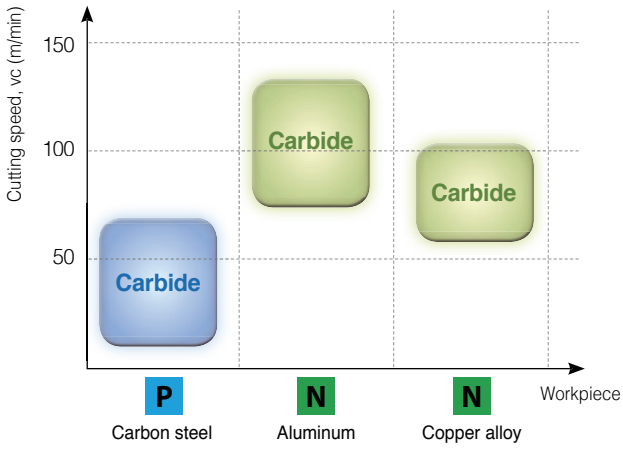
Code system



Features

Division	Shape	Application area
SSD Plus (SSDP)		P, N
existing SSD		N

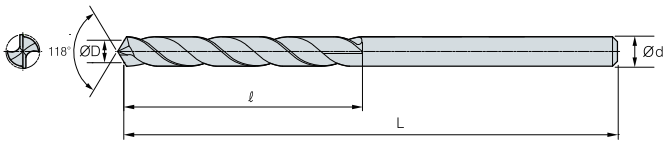
Application range



Recommended cutting condition

Workpiece				Grade	vc (m/min)	Depth of cut = 10D~25D Feed rate (mm/rev) per drill dia.(mm)			
ISO		Workpiece	HB			Ø2.5~Ø4.0	Ø4.1~Ø8.0	Ø8.1~Ø12.0	Ø12.1~Ø15.0
P	Carbon steel	Low carbon steel	80~120	Carbide	35 (20~65)	0.02~0.06	0.04~0.08	0.06~0.12	0.10~0.16
N	Aluminum	Aluminum alloy	30~150		100 (94~120)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18
	Copper alloy	Copper alloy	150~160		80 (65~95)	0.03~0.06	0.05~0.08	0.08~0.12	0.12~0.18

SSDP



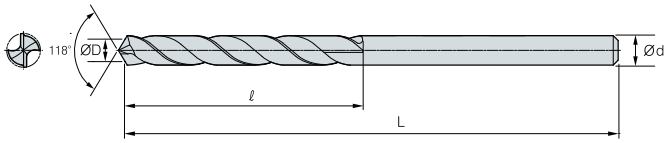
Coating	×
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h7
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

(mm)

Designation		ØD = Ød	ℓ	L
SSDP	010	1.0	10	32
	011	1.1	10	32
	012	1.2	10	32
	013	1.3	10	32
	014	1.4	10	32
	015	1.5	13	35
	016	1.6	13	35
	017	1.7	13	35
	018	1.8	13	35
	019	1.9	13	35
	020	2.0	18	40
	021	2.1	18	40
	022	2.2	18	40
	023	2.3	18	40
	024	2.4	18	40
	025	2.5	22	45
	026	2.6	22	45
	027	2.7	22	45
	028	2.8	22	45
	029	2.9	22	45
	030	3.0	25	50
	031	3.1	25	50
	032	3.2	25	50
	033	3.3	28	50
	034	3.4	28	50
	035	3.5	28	50
	036	3.6	30	55
	037	3.7	30	55
	038	3.8	30	55
	039	3.9	30	55
	040	4.0	30	55
	041	4.1	34	60
	042	4.2	34	60
	043	4.3	34	60
	044	4.4	34	60
	045	4.5	34	60
	046	4.6	38	65
	047	4.7	38	65

Designation		ØD = Ød	ℓ	L
SSDP	048	4.8	38	65
	049	4.9	38	65
	050	5.0	38	65
	051	5.1	38	65
	052	5.2	38	65
	053	5.3	38	65
	054	5.4	38	65
	055	5.5	38	65
	056	5.6	40	75
	057	5.7	40	75
	058	5.8	40	75
	059	5.9	40	75
	060	6.0	40	75
	061	6.1	40	75
	062	6.2	40	75
	063	6.3	40	75
	064	6.4	40	75
	065	6.5	40	75
	066	6.6	46	80
	067	6.7	46	80
	068	6.8	46	80
	069	6.9	46	80
	070	7.0	46	80
	071	7.1	46	80
	072	7.2	46	80
	073	7.3	46	80
	074	7.4	46	80
	075	7.5	46	80
	076	7.6	50	85
	077	7.7	50	85
	078	7.8	50	85
	079	7.9	50	85
	080	8.0	50	85
	081	8.1	50	85
	082	8.2	50	85
	083	8.3	50	85
	084	8.4	50	85
	085	8.5	50	85

SSDP



Coating	×
Tolerance (drill Dia.)	h7
Tolerance (shank Dia.)	h7
Point angle	118°
Twist angle	30°
Thinning	X type
Coolant	External

(mm)

Designation	ØD = Ød	ℓ	L
SSDP 086	8.6	50	95
SSDP 087	8.7	50	95
SSDP 088	8.8	50	95
SSDP 089	8.9	50	95
SSDP 090	9.0	50	95
SSDP 091	9.1	50	95
SSDP 092	9.2	50	95
SSDP 093	9.3	50	95
SSDP 094	9.4	50	95
SSDP 095	9.5	50	95
SSDP 096	9.6	50	100

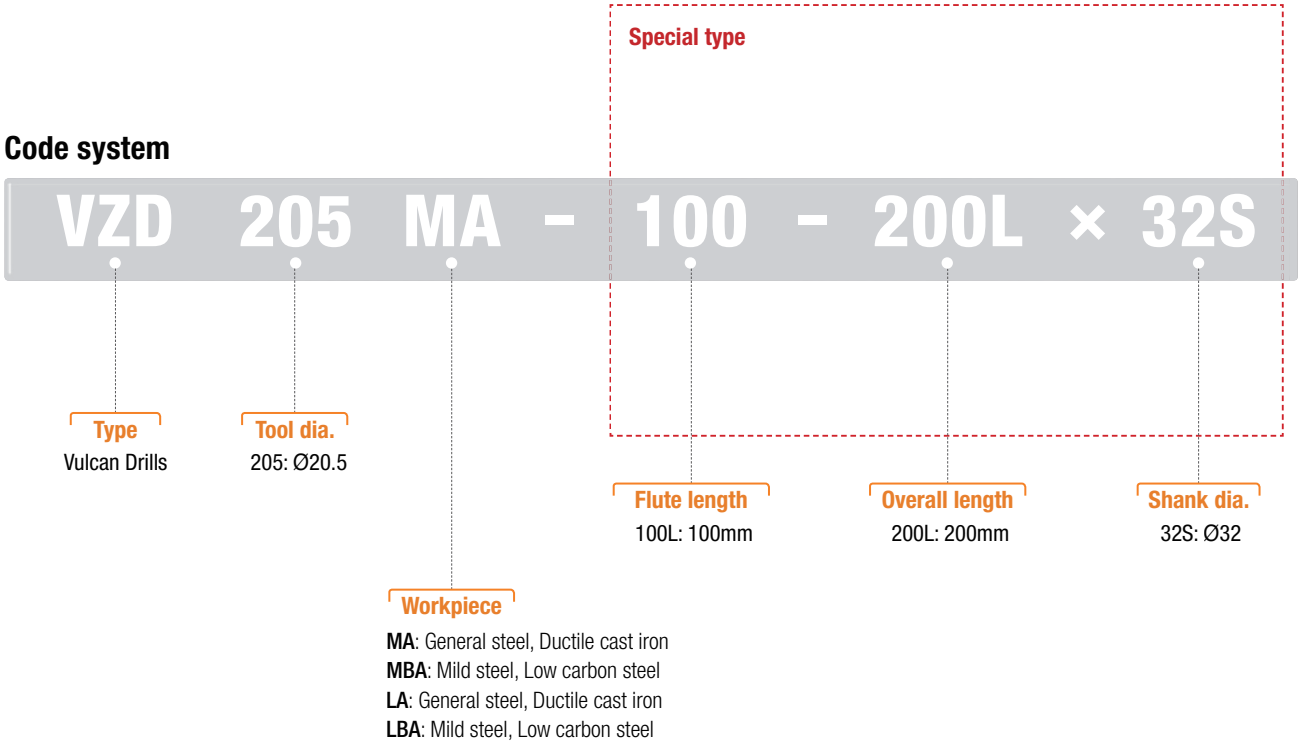
Designation	ØD = Ød	ℓ	L
SSDP 097	9.7	50	100
SSDP 098	9.8	50	100
SSDP 099	9.9	50	100
SSDP 100	10.0	50	100
SSDP 105	10.5	60	115
SSDP 110	11.0	60	115
SSDP 115	11.5	65	120
SSDP 120	12.0	65	120
SSDP 125	12.5	65	125
SSDP 130	13.0	65	125
SSDP 150	15.0	70	130

Vulcan Drill

· High feed and precision machining with our specially designed point edge

- High feed and precision machining due to specially designed point edge
- Vulcan drills ensure longer tool life under high speed condition because of increased thermal & wear resistance. It also uses a PVD coating with an exclusive substrate to help maintain reduced frictional resistance
- Low cutting resistance by the best design of clearance angle is possible to increase feed
- Smoother chip control due to improved chip breakage
- Rmax: 6~25s, Hole tolerance: IT8 ~ 10
- Strong shock resistance ensures long tool life under the heavy interrupted machining

Code system



Vulcan Drill

Application range

- **PC215G** – Excellent performance when machining cast iron and alloy steel at high speed
- **PC315G** – Universal grade excellent when machining carbon steel, cast iron, etc. at middle to low cutting speed

Notice

Unsuitable drilling

- Avoid the inclination or unevenness of entering and piercing section of hole as possible
- Reduce the feed 0.1~0.15mm/rev when drilling at inclined and unevenness

Clamping of workpiece

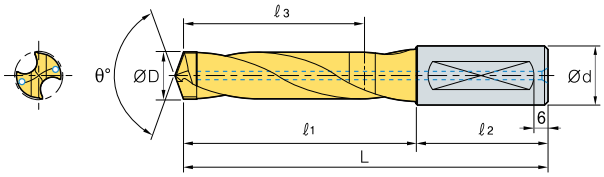
- In case of wide flat panel or rotation by horizontal component, please clamp to be prevented bending of central part of workpiece for high efficiency

Recommended cutting condition

Form	Workpiece	Hardness	~Ø15		~Ø20		~Ø40	
			vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)	vc (m/min)	fn (mm/rev)
MA LA	Mild steel, General steel, Alloy steel	Under HB250	40~90 (65)	0.15~0.30 (0.20)	40~90 (65)	0.20~0.40 (0.30)	40~90 (70)	0.20~0.45 (0.35)
	General steel, Alloy steel	Under HB320	40~90 (60)	0.10~0.25 (0.20)	40~90 (60)	0.15~0.35 (0.25)	40~90 (65)	0.20~0.40 (0.30)
	Mold steel	HB250	40~70 (50)	0.10~0.25 (0.20)	40~70 (50)	0.15~0.30 (0.25)	40~70 (50)	0.20~0.35 (0.30)
	Stainless steel	HB250	30~50 (45)	0.10~0.20 (0.15)	30~50 (45)	0.15~0.25 (0.20)	30~50 (45)	0.20~0.30 (0.25)
	Ductile cast iron	-	50~100 (70)	0.20~0.35 (0.30)	50~100 (70)	0.20~0.40 (0.35)	50~100 (70)	0.25~0.50 (0.40)
MBA LBA	Mild steel, General steel, Alloy steel	Under HB250	40~90 (75)	0.20~0.40 (0.30)	40~90 (75)	0.20~0.40 (0.30)	40~90 (80)	0.20~0.45 (0.35)
	General steel, Alloy steel	Under HB320	35~80 (55)	0.15~0.30 (0.25)	35~80 (55)	0.15~0.30 (0.25)	40~80 (60)	0.15~0.40 (0.30)

Vulcan Drill (VZD)

MA, MAB



Type	MA	MBA
Grade	PC230F	
Tolerance (drill Dia.)	h7	
Tolerance (shank Dia.)	h7	
Point angle	140°	150°
Twist angle	25°	20°
Thinning	X type	
Coolant	Through	

(mm)

Designation		ØD	Ød	L	ℓ1	ℓ2	ℓ3
VZD	126~135MA, MBA	12.6~13.5	16	110	62	48	44
	136~145MA, MBA	13.6~14.5	16	115	67	48	48
	146~155MA, MBA	14.6~15.5	20	125	75	50	55
	156~165MA, MBA	15.6~16.5	20	130	80	50	59
	166~175MA, MBA	16.6~17.5	20	135	85	50	63
	176~185MA, MBA	17.6~18.5	20	140	90	50	66
	186~195MA, MBA	18.6~19.5	25	155	99	56	74
	196~205MA, MBA	19.6~20.5	25	155	99	56	73
	206~215MA, MBA	20.6~21.5	25	155	99	56	72
	216~225MA, MBA	21.6~22.5	25	160	104	56	76
	226~235MA, MBA	22.6~23.5	25	160	104	56	74
	236~245MA, MBA	23.6~24.5	32	170	110	60	79
	246~255MA, MBA	24.6~25.5	32	170	110	60	78
	256~265MA, MBA	25.6~26.5	32	175	115	60	82
	266~275MA, MBA	26.6~27.5	32	175	115	60	80
	276~285MA, MBA	27.6~28.5	32	180	120	60	84
	286~295MA, MBA	28.6~29.5	32	185	125	60	88
	296~305MA, MBA	29.6~30.5	32	185	125	60	87
	306~315MA, MBA	30.6~31.5	40	205	135	70	95
	316~325MA, MBA	31.6~32.5	40	210	140	70	98
	326~335MA, MBA	32.6~33.5	40	215	145	70	101
	336~345MA, MBA	33.6~34.5	40	220	150	70	104
	346~355MA, MBA	34.6~35.5	40	225	155	70	107
	356~365MA, MBA	35.6~36.5	40	225	155	70	110
	366~375MA, MBA	36.6~37.5	40	230	160	70	113
	376~385MA, MBA	37.6~38.5	40	235	165	70	116
	386~395MA, MBA	38.6~39.5	40	240	170	70	119
	396~405MA, MBA	39.6~40.5	40	245	175	70	122

※ VZD□□□MA: For General steel, Ductile cast iron
MBA: For Mild steel, Low carbon steel

※ Order made items: VZD□□□M□ × Flute length - Total length L

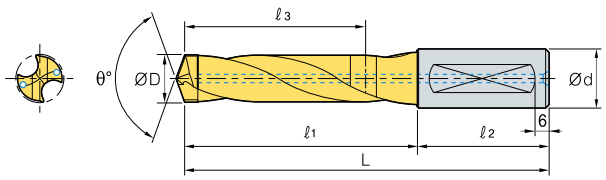
Ex.1) MA Type, Machined diameter: Ø18.6 mm, Flute length: 110 mm, Total length: 200 mm
--- VZD186MA × 110-200L

Ex.2) MA Type, Machined diameter: Ø18.63, Flute length: 110 mm, Total length: 200 mm
--- VZD1863MA × 110-200L

Ex.3) MA Type, Machined diameter: Ø18.6, Standard
--- VZD186MA

Vulcan Drill (VZD)

LA, LBA



Type	LA	LBA
Grade	PC230F	
Tolerance (drill Dia.)	h7	
Tolerance (shank Dia.)	h7	
Point angle	140°	150°
Twist angle	25°	20°
Thinning	X type	
Coolant	Through	

(mm)

Designation		ØD	Ød	L	ℓ1	ℓ2	ℓ3
VZD	126~135LA, LBA	12.6~13.5	16	140	92	48	74
	136~145LA, LBA	13.6~14.5	16	145	97	48	78
	146~155LA, LBA	14.6~15.5	20	155	105	50	85
	156~165LA, LBA	15.6~16.5	20	165	115	50	94
	166~175LA, LBA	16.6~17.5	20	170	120	50	98
	176~185LA, LBA	17.6~18.5	20	175	125	50	101
	186~195LA, LBA	18.6~19.5	25	190	134	56	109
	196~205LA, LBA	19.6~20.5	25	195	139	56	113
	206~215LA, LBA	20.6~21.5	25	195	139	56	112
	216~225LA, LBA	21.6~22.5	25	200	144	56	116
	226~235LA, LBA	22.6~23.5	25	210	154	56	124
	236~245LA, LBA	23.6~24.5	32	220	160	60	129
	246~255LA, LBA	24.6~25.5	32	225	165	60	133
	256~265LA, LBA	25.6~26.5	32	230	170	60	137
	266~275LA, LBA	26.6~27.5	32	235	175	60	141
	276~285LA, LBA	27.6~28.5	32	240	180	60	144
	286~295LA, LBA	28.6~29.5	32	245	185	60	148
	296~305LA, LBA	29.6~30.5	32	255	195	60	157
	306~315LA, LBA	30.6~31.5	40	275	205	70	166
	316~325LA, LBA	31.6~32.5	40	280	210	70	172
	326~335LA, LBA	32.6~33.5	40	280	215	70	173
	336~345LA, LBA	33.6~34.5	40	290	220	70	177
	346~355LA, LBA	34.6~35.5	40	295	225	70	181
	356~365LA, LBA	35.6~36.5	40	300	230	70	183
	366~375LA, LBA	36.6~37.5	40	305	235	70	188
	376~385LA, LBA	37.6~38.5	40	315	245	70	193
	386~395LA, LBA	38.6~39.5	40	320	250	70	198
	396~405LA, LBA	39.6~40.5	40	325	255	70	203

※ VZD□□□LA: For General steel, Ductile cast iron
LBA: For Mild steel, Low carbon steel

※ Order made items: VZD□□□M□ × Flute length - Total length L

Ex.1) LA Type, Machined diameter: Ø18.6 mm, Flute length: 110 mm, Total length: 200 mm
--- VZD186LA × 110-200L

Ex.2) LA Type, Machined diameter: Ø18.63, Flute length: 110 mm, Total length: 200 mm
--- VZD1863LA × 110-200L

Ex.3) LA Type, Machined diameter: Ø18.6, Standard
--- VZD186LA

Burnishing Drill

Recommended cutting condition

Workpiece	Cutting speed vc (m/min)	Feed rate (mm/rev) per drill dia. (mm)				
		Ø2.0~Ø3.0	Ø3.5~Ø5.0	Ø5.5~Ø8.0	Ø8.5~Ø12	Ø12.5~Ø18
Aluminum alloy, Copper alloy	30~60	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
Aluminum alloy for die castings	50~80	0.02~0.05	0.03~0.10	0.04~0.15	0.05~0.20	0.05~0.30
Cast iron (GC) Ductile cast	25~60	0.01~0.04	0.02~0.08	0.05~0.12	0.05~0.20	0.05~0.30
Iron (GCD)	20~50	0.01~0.03	0.02~0.05	0.03~0.08	0.04~0.12	0.05~0.15

Burnishing Drill-BDS

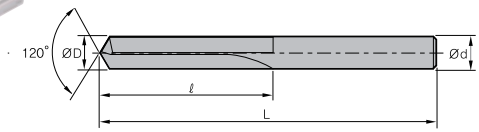


Fig.1

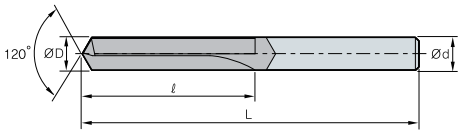


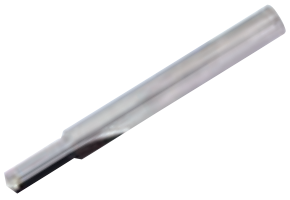
Fig.2

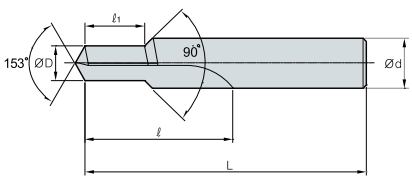
(mm)

Designation		ØD	Ød	ℓ	L	Fig.
BDS	040S	4.0	4.0	35	80	1
	050S	5.0	5.0	40	85	1
	060S	6.0	6.0	50	95	1
	070S	7.0	7.0	55	100	1
	080S	8.0	8.0	65	110	1
	090S	9.0	9.0	70	120	1
	100S	10.0	10.0	80	130	1
	110S	11.0	11.0	90	140	1
	120B	12.0	12.0	95	150	2
	130B	13.0	16.0	105	160	2
	140B	14.0	16.0	110	170	2
	150B	15.0	16.0	120	185	2
	160B	16.0	16.0	125	190	2

Step Burnishing Drill-BDT

For tapping a foundation hole





(mm)

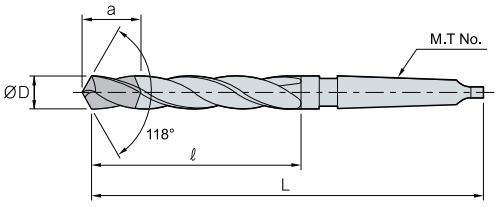
Designation		ØD	Ød	ℓ	ℓ1	L	Tap
BDT	M05080-ℓ1	4.2	6.0	35	9~15	90	M5XP0.8
	M06100-ℓ1	5.0	7.0	40	11~18	95	M6XP1.0
	M08125-ℓ1	6.8	10.0	50	15~24	105	M8XP1.25
	M10125-ℓ1	8.8	12.0	55	17~30	110	M10XP1.25
	M10150-ℓ1	8.5	12.0	55	17~30	110	M10XP1.5
	M12125-ℓ1	10.8	14.0	60	19~36	120	M12XP1.25
	M12150-ℓ1	10.5	14.0	60	19~36	120	M12XP1.5
	M12175-ℓ1	10.3	14.0	60	19~36	120	M12XP1.75

Top Solid Drill

Recommended cutting condition

Diameter	Cutting condition	Ductile cast iron	Gray cast iron	Soft steel
Ø8~Ø10	vc (m/min)	30 (20~35)	40 (20~60)	100 (50~150)
	fn (mm/rev)	0.30 (0.20~0.40)	0.30 (0.20~0.40)	0.15 (0.10~0.20)
Ø10.1~Ø15	vc (m/min)	50 (30~70)	60 (30~80)	130 (70~200)
	fn (mm/rev)	0.35 (0.30~0.40)	0.35 (0.30~0.40)	0.15 (0.10~0.20)
Ø15.1~Ø25	vc (m/min)	60 (50~60)	75 (50~100)	150 (100~250)
	fn (mm/rev)	0.35 (0.30~0.45)	0.40 (0.30~0.50)	0.15 (0.10~0.20)

Top Solid Drill-TSDM



(mm)

Designation		ØD	L	ℓ	a	M.T No
TSDM	080~085	8.0~8.5	168	85	25	1
	086~090	8.6~9.0	172	88	25	1
	091~095	9.1~9.5	175	92	26	1
	096~100	9.6~10.0	178	95	26	1
	101~105	10.1~10.5	182	98	26	1
	106~110	10.6~11.0	185	102	26	1
	111~115	11.1~11.5	188	105	26	1
	116~120	11.6~12.0	192	108	26	1
	121~125	12.1~12.5	195	112	26	1
	126~130	12.6~13.0	198	115	26	2
	131~135	13.1~13.5	202	118	27	2
	136~140	13.6~14.0	205	122	27	2
	141~145	14.1~14.5	222	122	27	2
	146~150	14.6~15.0	225	125	27	2
	151~155	15.1~15.5	228	125	27	2
	156~160	15.6~16.0	230	130	27	2
	161~165	16.1~16.5	232	132	27	2
	166~170	16.6~17.0	234	135	27	2
	171~180	17.1~18.0	240	140	27	2
	181~190	18.1~19.0	245	145	27	2
	191~200	19.1~20.0	250	150	30	2
	201~210	20.1~21.0	255	155	30	2
	211~220	21.1~22.0	260	160	30	2
	221~230	22.1~23.0	265	165	30	2
	231~250	23.1~25.0	285	165	34	3

※ Ordrer form : TSDM125

PCD Drill

· High accuracy hole machining for aluminum alloy

- High accuracy hole machining for aluminum alloy
- Drilling tolerance: IT7~8 class
- Recommendation with high accuracy and high spindle machine

Code system

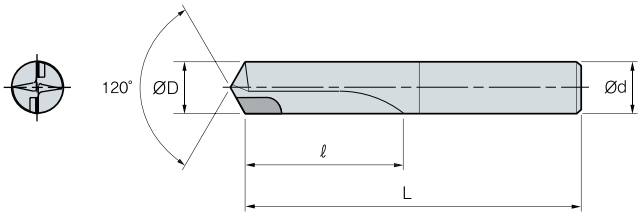
PDD — PCD Drill

065 — Diameter
065: Ø6.5

Recommended cutting condition

Workpiece	vc (m/min)	fn (mm/rev)
Aluminum alloy	50~250	0.05~0.20 0.10~0.40

PDD



(mm)

Designation		ØD	Ød	ℓ	L
PDD	0500	5.0	5.0	30	80
	0550	5.5	5.5	30	80
	0600	6.0	6.0	30	80
	0650	6.5	6.5	40	95
	0700	7.0	7.0	40	95
	0750	7.5	7.5	45	100
	0800	8.0	8.0	45	100
	0850	8.5	8.5	50	110
	0900	9.0	9.0	50	110
	0950	9.5	9.5	55	115
	1000	10.0	10.0	55	115
	1050	10.5	10.5	60	120
	1100	11.0	11.0	60	120
	1150	11.5	11.5	65	125
	1200	12.0	12.0	65	125

Gun Drill

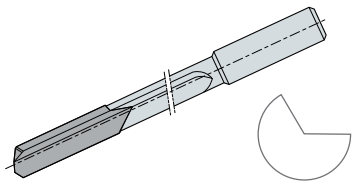
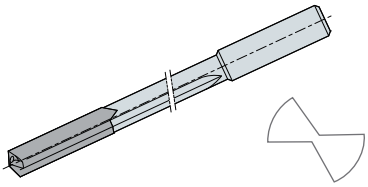
· Stable performance and hole quality with our unique cutting edge and guide pad available regrinding

- High efficiency in deep hole machining
- High accuracy (Hole tolerance: IT9, surface finish: Ra0.1~3.0S)
- Stable Quality due to unique cutting edge and guide pad available regrinding
- Used drill can recycle as change part of carbide
- Depending on request, the drills can change geometry of cutting edge and drive specification
- For ordering, please check length of drill

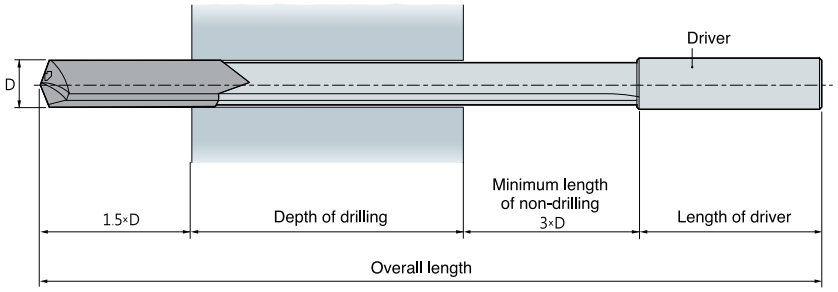
Code system

KGD	S	12.05	-	1500	/	D30
KORLOY Gun Drill	Lib type **S:** Single **T:** Twin	Drill dia. Ø12.05		Length of drill 1500 mm		Drive no. D30

Features

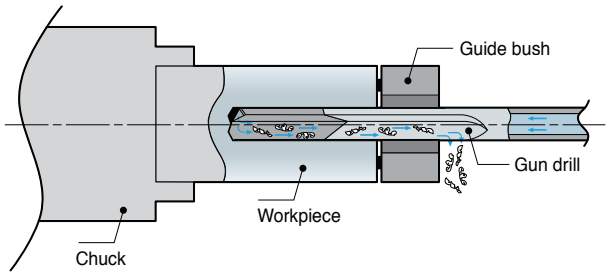
	Single lip type	Twin lip type
Shape		
Drill Dia.	Ø2.0~Ø33.0	Ø6.0~Ø26.5
Depth of drilling	≥ 2,000 mm	≥ 1,000 mm
Tolerance	IT9	IT10
Surface finish	Ra 0.1~3.0 μm	Ra 1.0~4.0 μm
Application	For all kinds of workpiece machining	• Workpieces with good chip evacuation • Machining of at higher feed than single lip type's

- Refer to the code system and the above drawing when ordering
- Refer to the page 68 for the size of a driver
- The overall length can be chosen by order



Gun Drill

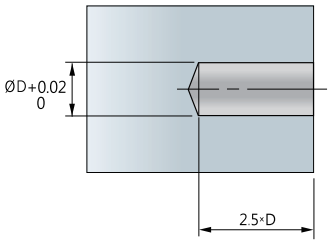
Application of Gun Drill on exclusive machine



• The guide bush is necessary for centering before gun-drilling

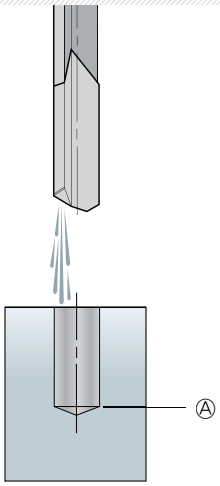
Application of Gun Drill on machining center

1 Machining of a pilot hole



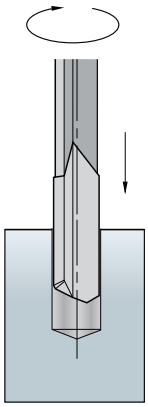
1. A pilot hole is necessary in machining on a machining center instead of a guide bush
2. The diameter of the pilot hole should be 0.01~0.02 (H7) larger bigger than one of the Gun Drill diameter and the depth of drilling should be about 2.5×D
3. Use Mach Drill (MSD) for machining of a pilot hole

2 Moving the Gun Drill to the pilot hole



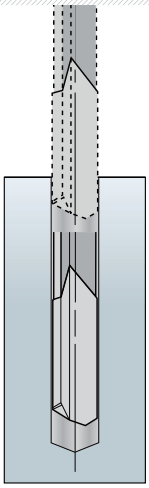
1. The Gun Drill should not drill before entering the pilot hole
2. Coolant is necessary for gun drilling

3 Start Gun Drilling



1. Rotate the spindle
2. Machine with drilling to vertical axis

4 After Gun Drilling



1. Return the drill
2. Stop drilling and supplying coolant
3. Remove the Gun Drill

Recommended cutting condition

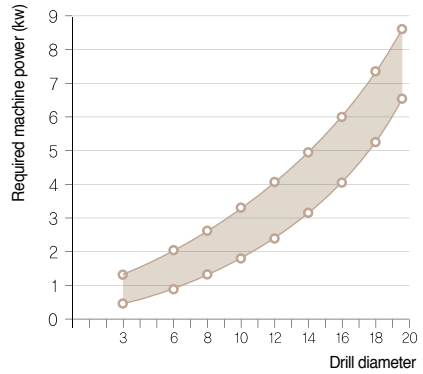
Workpiece	Hardness (HB)	Cutting speed vc (m/min)	Feed rate (mm/rev) per drill dia.(mm)					
			~Ø4	~Ø6	~Ø10	~Ø14	~Ø24	Ø25~
Carbon steel Alloy steel	~150	100~150	0.005~0.015	0.010~0.025	0.015~0.035	0.020~0.050	0.030~0.070	0.040~0.080
	150~250	80~120	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.030~0.060	0.030~0.060
	250~350	50~100	0.005~0.010	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.020~0.040
	350~	~30	-	0.005~0.010	0.005~0.010	0.010~0.020	0.020~0.035	0.020~0.035
Stainless steel	~250	50~80	0.005~0.015	0.010~0.020	0.010~0.020	0.010~0.030	0.020~0.035	0.020~0.040
	250~350	40~50	-	0.005~0.015	0.010~0.015	0.010~0.020	0.010~0.020	0.010~0.020
Cast iron	~220	80~100	0.010~0.0120	0.020~0.040	0.030~0.050	0.040~0.080	0.080~0.120	0.100~0.150
	220~	40~80	0.005~0.010	0.005~0.015	0.010~0.020	0.015~0.030	0.020~0.050	0.025~0.070
Aluminum alloy	-	180~250	0.010~0.020	0.020~0.040	0.030~0.060	0.040~0.080	0.100~0.180	0.150~0.200
Light alloy	-	120~200	0.005~0.010	0.010~0.020	0.020~0.025	0.020~0.030	0.030~0.040	0.040~0.060

Technical information

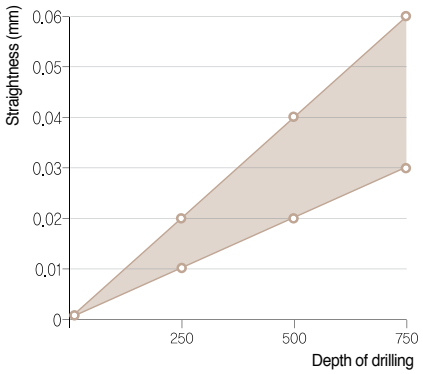
The factors below determine the straightness of hole

• Drill diameter and depth of drilling • Cutting condition and kind of application • Kind of workpiece and machine • Drill bush

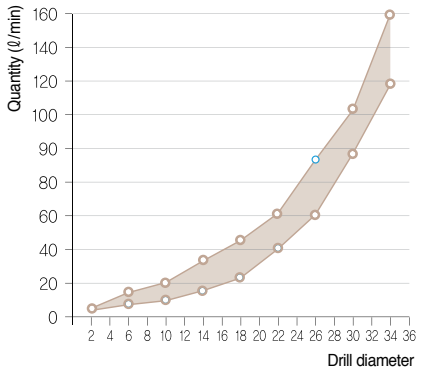
Required machine power



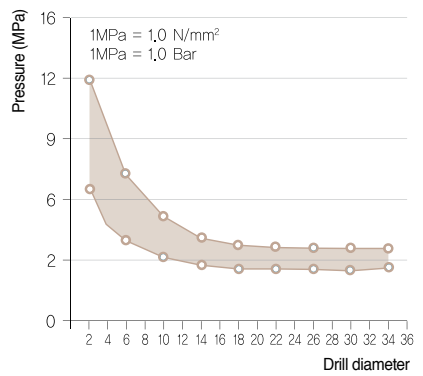
Straightness



Quantity of coolant



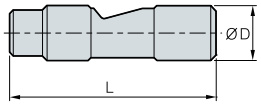
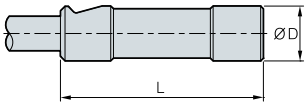
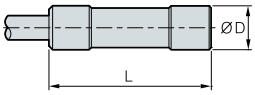
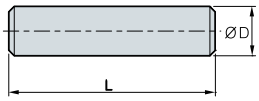
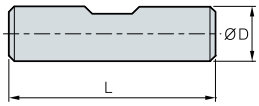
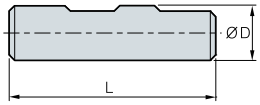
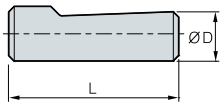
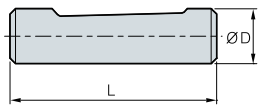
Pressure of coolant



The above graph shows general information and it is changeable depending on kind of tool, workpieces, and cutting conditions etc

- **Pressure and quantity of coolant** _____ High pressure of coolant ensures excellent chip evacuation and cooling the cutting edge
- **Use a filter for removing impurities** ____ The diameter of a filter should be less than 20㎛. Impurities could make bad flow of coolant, wear on a tool, and high load on the cooling pump
- **Temperature of coolant** _____ Proper temperature of coolant: 20°C~22°C / Do not use coolant at 50°C above

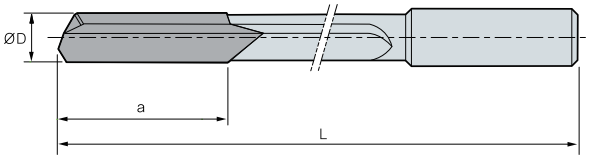
Recommended cutting condition

Type	Shape	No.	ØD×L		Carbide type	
			ØD×L	Thread	Tipped	Solid
Central clamping surface 15°		D01	10x40		●	●
		D02	16x45		●	
		D03	19.05x69.8		●	
		D04	25x70		●	
		D05	25.4x69.8		●	
Frontal clamping surface 15°		D06	16x50		●	
Central clamping tapered		D07	12.7x38.1		●	●
		D08	16x70			
		D09	19.05x69.8		●	
		D10	20x70			
Cylindrical DIN1835A DIN6535HA		D11	4x28		●	●
		D12	6x36		●	●
		D13	10x40		●	●
		D14	16x48		●	●
		D15	20x50		●	
		D16	25x56		●	
Weldon DIN1835B		D17	10x40		●	●
		D18	12x45		●	●
		D19	16x48		●	●
		D20	20x50		●	●
Weldon DIN6535HB		D21	25x56		●	
		D22	32x60		●	
		D23	40x70			
Whistle Notch DIN1835E		D24	10x40		●	●
		D25	12x45		●	●
		D26	16x48		●	●
		D27	20x50		●	●
		D28	25x56		●	
		D29	32x60		●	
Whistle notch DIN6535HE		D30	10x40		●	●
		D31	12x45		●	●
		D32	16x48		●	●
		D33	20x50		●	●

* Special types are available for quotation with shape and size information

Gun Drill-KGDS

Single Lip type



Designation description	
O.OO	Diameter
□□□□	Length
D□□	Driver code no.

(mm)

Designation		ØD	a
KGDS	O.OO – □□□□ /D□□	2.00~2.49	18
	O.OO – □□□□ /D□□	2.50~2.99	18
	O.OO – □□□□ /D□□	3.00~3.49	19
	O.OO – □□□□ /D□□	3.50~3.99	19
	O.OO – □□□□ /D□□	4.00~4.49	23
	O.OO – □□□□ /D□□	4.50~4.99	23
	O.OO – □□□□ /D□□	5.00~5.49	24
	O.OO – □□□□ /D□□	5.50~5.99	26
	O.OO – □□□□ /D□□	6.00~6.49	27
	O.OO – □□□□ /D□□	6.50~6.99	28
	O.OO – □□□□ /D□□	7.00~7.49	29
	O.OO – □□□□ /D□□	7.50~7.99	30
	O.OO – □□□□ /D□□	8.00~8.49	31
	O.OO – □□□□ /D□□	8.50~8.99	31
	O.OO – □□□□ /D□□	9.00~8.49	31
	O.OO – □□□□ /D□□	9.50~9.99	31
	O.OO – □□□□ /D□□	10.00~10.49	31
	O.OO – □□□□ /D□□	10.50~10.99	32
	O.OO – □□□□ /D□□	11.00~11.49	35
	O.OO – □□□□ /D□□	11.50~11.99	35
	O.OO – □□□□ /D□□	12.00~12.49	38
	O.OO – □□□□ /D□□	12.50~12.99	38
	O.OO – □□□□ /D□□	13.00~13.99	38
	O.OO – □□□□ /D□□	14.00~14.99	38
	O.OO – □□□□ /D□□	15.00~15.99	39
	O.OO – □□□□ /D□□	16.00~16.99	39
	O.OO – □□□□ /D□□	17.00~17.99	40
	O.OO – □□□□ /D□□	18.00~18.99	41
	O.OO – □□□□ /D□□	19.00~19.99	41
	O.OO – □□□□ /D□□	20.00~20.99	44
	O.OO – □□□□ /D□□	21.00~21.99	46
	O.OO – □□□□ /D□□	22.00~22.99	49
	O.OO – □□□□ /D□□	23.00~23.99	51
	O.OO – □□□□ /D□□	24.00~24.99	52
	O.OO – □□□□ /D□□	25.00~25.99	54
	O.OO – □□□□ /D□□	26.00~26.99	54
	O.OO – □□□□ /D□□	27.00~27.99	54
	O.OO – □□□□ /D□□	28.00~28.99	54
	O.OO – □□□□ /D□□	29.00~29.99	56
	O.OO – □□□□ /D□□	30.00~30.99	59
	O.OO – □□□□ /D□□	31.00~31.99	61
	O.OO – □□□□ /D□□	32.00~32.99	61

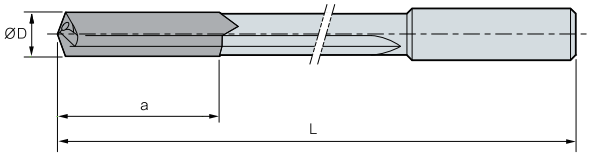
※ When ordering, please mark the overall length and driver number (or drawing)

Available overall length

Designation	Drill Dia.	Overall length				
		250 mm	500 mm	1000 mm	1500 mm	2000 mm
KGDS	2.00~2.99	○	○			
	3.00~3.49	○	○	○		
	3.50~32.99	○	○	○	○	○

Gun Drill-KGDT

Twin Lip type



Designation description	
O.OO	Diameter
□□□□	Length
D□□	Driver code no.

Designation		ØD	a
KGDT	O.OO – □□□□ /D□□	6.00~6.49	35
	O.OO – □□□□ /D□□	6.50~6.99	35
	O.OO – □□□□ /D□□	7.00~7.49	38
	O.OO – □□□□ /D□□	7.50~7.99	38
	O.OO – □□□□ /D□□	8.00~8.49	38
	O.OO – □□□□ /D□□	8.50~8.99	38
	O.OO – □□□□ /D□□	9.00~8.49	40
	O.OO – □□□□ /D□□	9.50~9.99	40
	O.OO – □□□□ /D□□	10.00~10.49	40
	O.OO – □□□□ /D□□	10.50~10.99	40
	O.OO – □□□□ /D□□	11.00~11.49	45
	O.OO – □□□□ /D□□	11.50~11.99	45
	O.OO – □□□□ /D□□	12.00~12.49	45
	O.OO – □□□□ /D□□	12.50~12.99	48
	O.OO – □□□□ /D□□	13.00~13.99	48
	O.OO – □□□□ /D□□	14.00~14.99	48
	O.OO – □□□□ /D□□	15.00~15.99	48
	O.OO – □□□□ /D□□	16.00~16.99	50
	O.OO – □□□□ /D□□	17.00~17.99	50
	O.OO – □□□□ /D□□	18.00~18.99	50
	O.OO – □□□□ /D□□	19.00~19.99	50
	O.OO – □□□□ /D□□	20.00~20.99	55
	O.OO – □□□□ /D□□	21.00~21.99	55
	O.OO – □□□□ /D□□	22.00~22.99	55
	O.OO – □□□□ /D□□	23.00~23.99	60
	O.OO – □□□□ /D□□	24.00~24.99	60
	O.OO – □□□□ /D□□	25.00~25.99	65
	O.OO – □□□□ /D□□	26.00~26.50	65

※ When ordering, please mark the overall length and driver number (or drawing)

Available overall length

Designation	Drill Dia.	Overall length				
		250 mm	500 mm	1000 mm	1500 mm	2000 mm
KGDT	6.00~26.50	○	○	○		

REAMER

Part 3

Indexable Reamer

· Mass production and High performance

- Suitable for mass production and high performance
- Using PCD or coated insert for high speed machining
- Excellent high accuracy and adjustable machining hole
- Using accuracy chucking system (Hydraulic, rotating type arbor)
- Using inner coolant type machine to evacuate chips
- Using suitable holder and insert
- As insert setting, using setting fixture (KIRSD-210)

Code system

IR T 12.000 - 16 135 - 16

Type	Reamer dia.	Reamer dia.	Shank Dia.	Length	Insert size
Indexable Reamer	T: Throughout hole machining B: Blind hole machining	12.000: Ø12.0	16: Ø16	135: 135	15: 15.0×3.0 16: 16.0×3.5 17: 17.0×4.5 22: 22.0×6.5

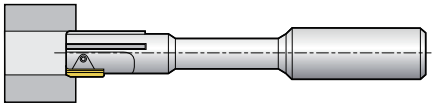
Insert code system

RI 16 - B 16

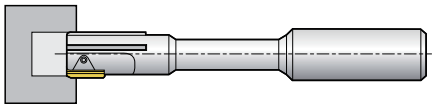
Type	Insert size	Insert reed type	Length
Reamer Insert	15: 15.0×3.0 16: 16.0×3.5 17: 17.0×4.5 22: 22.0×6.5	A: Excellent surface finish, low cutting condition B: General surface finish, high cutting condition C: Aluminum and copper alloy D: Blind hole, low feed	00: 0°, Cast iron 06: 6°, General steel 12: 12°, Stainless, Al

Application

Throughout hole machining (IRT type)



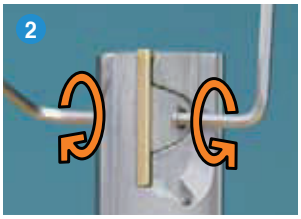
Stuffed hole machining (IRB type)



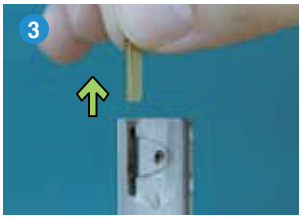
Indexable Reamer

How to set an insert

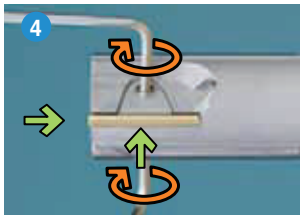
1. Screw the wedge screw counter clockwise with the exclusive wrench



2. Screw the clamp screw
   ① Top side: counter clockwise
   ② Lower side: clockwise



3. Remove the insert and clean the pocket



4. Put the insert up to the edge stopper and clamp the insert
   ① Top side: clockwise
   ② Lower side: counterclockwise

Exclusive fixture

- Designation: KIRSD-210
- Maximum diameter of reamer: Ø60×210 mm
- The fixture is also available for setting special reamer and mono tool
- Special reamers (out of maximum setting range) are available quotation

How to set an insert with fixture

1. Adjust the gauge to '0'

2. Rotate the reamer for the insert to touch the gauge

3. Set the back taper and adjust the insert height with screw the wedge screw
   ① Top side of insert: +0.015~ +0.020 mm
   ② Bottom side of insert: +0.005~ +0.010 mm
   ③ Back taper: 0.010~0.015 mm

Back taper

- Ensures low cutting load and excellent surface finish with good chip evacuation
- Inaccurate back taper could cause unstable machining with wear of insert
- The size of back taper of insert down side should be less to 0.010~0.015 mm than one of insert upper side

Insert setting with a micrometer

- Lathe with both centers or bench center are also available

Notice: The setting with a micrometer is not recommended due to chipping on the cutting edge

Indexable Reamer

Recommended cutting condition

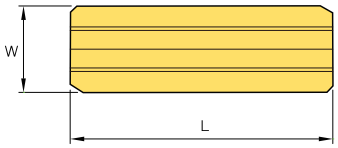
Workpiece	Insert type		Feed rate (mm/rev) per drill dia. (mm)	Cutting speed vc (m/min)		
	Rake angle	Lead type		Coated	Uncoated	Cermet
Carbon steel General steel	6	A	0.1~0.4	60~80	40~60	110~160
		B	0.1~0.3	80~120	60~80	
		D	0.05~0.2			
Mild steel Alloy steel	6	A	0.1~0.4	40~60	20~40	110~160
		B	0.1~0.3	80~120	60~80	
		D	0.05~0.2			
High alloy steel Tool steel	6	A	0.1~0.4	20~60	20~40	20~60
		B	0.1~0.3	40~80	40~60	40~80
		D	0.05~0.2			
Stainless steel	12	A	0.1~0.3	40~60	20~40	40~60
		B	0.1~0.2	60~80	40~60	60~80
		D	0.05~0.2			
Cast iron	0.6	A	0.1~0.3	60~100	40~60	
		B	0.1~0.25	80~120	60~80	
		D	0.05~0.2			
Alloyed aluminum	12	B	0.1~0.3		160~200	
		C	0.15~0.3		150~250	
		D	0.05~0.2		110~200	
Alloyed copper	0	B	0.1~0.2		80~100	
		D	0.05~0.2			
Non-ferrous alloy	0	B	0.1~0.3		10~70	

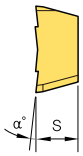
Parts

Reamer size	Clamp	Wedge	Clamp Screw	Wedge Screw	Clamp Wrench	Wedge Wrench
				 (NYLOK)		
10.0~11.9	CV 15	AW2430	DHA0308	HS0306	HW15L	HW15L
12.0~17.9	CV 16	AW2435				
18.0~27.9	CV 17	AW3240	DHA0409	HS0406	HW20L	HW20L
28.0~31.9	CV 22	AW3260				

Indexable Reamer

Indexable Reamer Insert

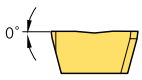
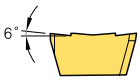
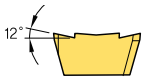




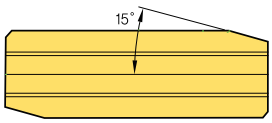
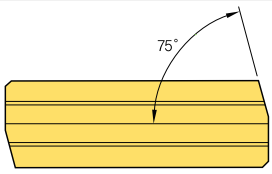
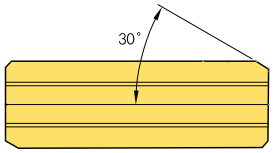
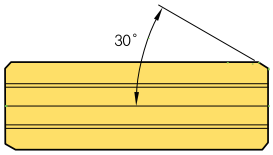
(mm)

Designation		Grade			Dimensions			Reed type	Rake angle (α°)
		K10 (Uncoated)	BPK110 (TiAlN)	BPK210 (TiN)	L	W	S		
RI	15-A06			O	15	3.0	1.5	A	6°
	15-A12	O			15	3.0	1.5	A	12°
	15-B06		O	O	15	3.0	1.5	B	6°
	15-B12		O		15	3.0	1.5	B	12°
	16-A06			O	16	3.5	1.5	A	6°
	16-A12	O			16	3.5	1.5	A	12°
	16-B06		O	O	16	3.5	1.5	B	6°
	16-B12		O		16	3.5	1.5	B	12°
	17-A06			O	17	4.5	2.0	A	6°
	17-A12	O			17	4.5	2.0	A	12°
	17-B06		O	O	17	4.5	2.0	B	6°
	17-B12		O		17	4.5	2.0	B	12°
	22-A06			O	22	6.5	3.0	A	6°
	22-A12	O			22	6.5	3.0	A	12°
	22-B06		O	O	22	6.5	3.0	B	6°
	22-B12		O		22	6.5	3.0	B	12°

Insert lead type

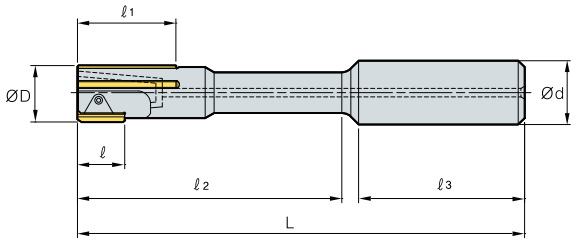
Division	00	06	12
Shape			
Application	For cast iron machining	For general machining	For stainless and aluminum machining

Insert lead type

Type	Shape	Working condition	Type	Shape	Working condition
A		For excellent surface, low cutting condition	C		For aluminum and copper alloy machining
B		For general application, high cutting condition	D		For blind hole machining, low feed

Indexable Reamer-IRT

Stuffed hole

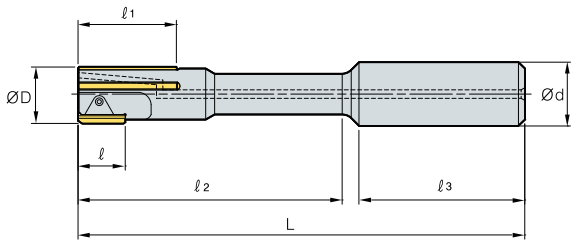


(mm)

	Designation	ØD	ℓ	ℓ1	ℓ2	ℓ3	L	Ød	Insert
IRT	**10.000-16125-15**	10	15	30	75	45	125	16	RI 15
	11.000-16125-15	11	15	30	75	45	125	16	RI 15
	12.000-16135-16	12	16	30	85	45	135	16	RI 16
	13.000-16135-16	13	16	30	85	45	135	16	RI 16
	14.000-16135-16	14	16	30	85	45	135	16	RI 16
	15.000-16135-16	15	16	30	85	45	135	16	RI 16
	16.000-20155-16	16	16	30	100	50	155	20	RI 16
	17.000-20155-16	17	16	30	100	50	155	20	RI 16
	18.000-20155-17	18	17	30	100	50	155	20	RI 17
	19.000-20155-17	19	17	30	100	50	155	20	RI 17
	20.000-25165-17	20	17	30	110	56	165	25	RI 17
	21.000-25165-17	21	17	30	110	56	165	25	RI 17
	22.000-25165-17	22	17	30	110	56	165	25	RI 17
	23.000-25165-17	23	17	30	110	56	165	25	RI 17
	24.000-25165-17	24	17	30	110	56	165	25	RI 17
	25.000-25165-17	25	17	30	110	56	165	25	RI 17
	26.000-25165-17	26	17	30	110	56	165	25	RI 17
	27.000-25165-17	27	17	30	110	56	165	25	RI 17
	28.000-32165-22	28	22	30	110	56	165	32	RI 22
	29.000-32165-22	29	22	30	110	56	165	32	RI 22
	30.000-32165-22	30	22	30	110	56	165	32	RI 22
	31.000-32165-22	31	22	30	110	56	165	32	RI 22

Indexable Reamer-IRB

Mach pilot drills with oil hole



(mm)

	Designation	ØD	ℓ	ℓ1	ℓ2	ℓ3	L	Ød	Insert
IRB	10.000-16125-15	10	15	30	75	45	125	16	RI 15
	11.000-16125-15	11	15	30	75	45	125	16	RI 15
	12.000-16135-16	12	16	30	85	45	135	16	RI 16
	13.000-16135-16	13	16	30	85	45	135	16	RI 16
	14.000-16135-16	14	16	30	85	45	135	16	RI 16
	15.000-16135-16	15	16	30	85	45	135	16	RI 16
	16.000-20155-16	16	16	30	100	50	155	20	RI 16
	17.000-20155-16	17	16	30	100	50	155	20	RI 16
	18.000-20155-17	18	17	30	100	50	155	20	RI 17
	19.000-20155-17	19	17	30	100	50	155	20	RI 17
	20.000-25165-17	20	17	30	110	56	165	25	RI 17
	21.000-25165-17	21	17	30	110	56	165	25	RI 17
	22.000-25165-17	22	17	30	110	56	165	25	RI 17
	23.000-25165-17	23	17	30	110	56	165	25	RI 17
	24.000-25165-17	24	17	30	110	56	165	25	RI 17
	25.000-25165-17	25	17	30	110	56	165	25	RI 17
	26.000-25165-17	26	17	30	110	56	165	25	RI 17
	27.000-25165-17	27	17	30	110	56	165	25	RI 17
	28.000-32165-22	28	22	30	110	56	165	32	RI 22
	29.000-32165-22	29	22	30	110	56	165	32	RI 22
	30.000-32165-22	30	22	30	110	56	165	32	RI 22
	31.000-32165-22	31	22	30	110	56	165	32	RI 22

Chucking/Machine Reamer

Recommended cutting condition

Workpiece	Hardness (HB)	Cutting condition	Diameter		
			~Ø9	Ø10~25	Ø26~60
Steel	~100kg/mm^2	vc (m/min)	8~12	8~12	8~12
		fn (mm/rev)	0.15~0.25	0.20~0.40	0.30~0.50
	100~140kg/mm^2	vc (m/min)	5~10	5~10	5~10
		fn (mm/rev)	0.10~0.20	0.15~0.25	0.20~0.40
Cast iron	HB~220	vc (m/min)	6~12	6~12	8~15
		fn (mm/rev)	0.15~0.30	0.30~0.50	0.40~0.80
	HB 220~	vc (m/min)	5~10	5~10	8~12
		fn (mm/rev)	0.10~0.20	0.20~0.35	0.30~0.50
Brass	HB 50~120	vc (m/min)	8~12	10~15	10~15
		fn (mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
Bronze	HB 60~100	vc (m/min)	8~12	10~15	10~15
		fn (mm/rev)	0.10~0.15	0.15~0.25	0.25~0.40
Alloyed aluminum	HB 90~120	vc (m/min)	15~25	15~25	20~30
		fn (mm/rev)	0.15~0.25	0.25~0.40	0.40~0.70
Synthetic resins	-	vc (m/min)	15~30	20~35	30~40
		fn (mm/rev)	0.15~0.25	0.25~0.40	0.40~0.50

Chucking Reamer-SCRS

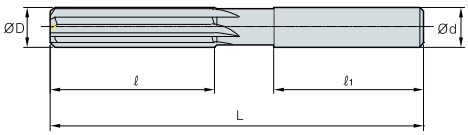


Fig.1

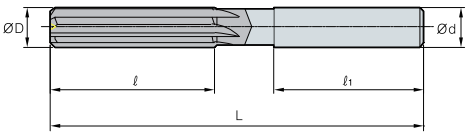


Fig.2

(mm)

Designation		No. of flute	ØD	Ød	ℓ	ℓ1	L	Fig.
SCRS	050S	4	5.0	6.0	20	40	100	1
	060S	4	6.0	6.0	20	40	115	1
	070S	4	7.0	8.0	20	40	125	1
	080S	4	8.0	8.0	20	40	135	1
	090S	4	9.0	10.0	20	45	140	1
	100B	4	10.0	10.0	25	50	145	2
	110B	4	11.0	12.0	25	50	150	2
	120B	4	12.0	12.0	25	50	160	2
	130B	4	13.0	16.0	25	50	165	2
	140B	6	14.0	16.0	25	50	170	2
	150B	6	15.0	16.0	30	50	180	2
	160B	6	16.0	16.0	30	50	190	2
	180B	6	18.0	20.0	30	55	210	2
	200B	6	20.0	20.0	40	60	230	2

Chucking Reamer-SCRH

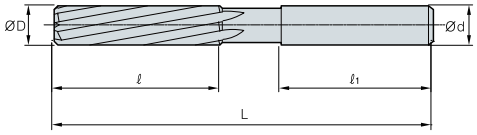


Fig.1

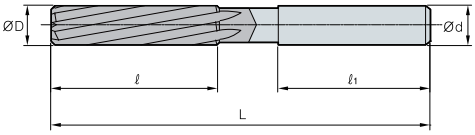
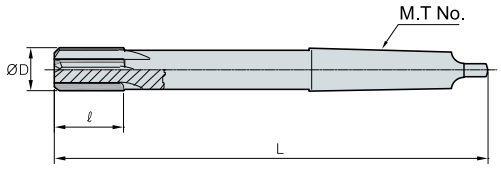


Fig.2

(mm)

Designation		No. of flute	ØD	Ød	ℓ	ℓ1	L	Fig.
SCRH	050S	4	5.0	6.0	20	40	100	1
	060S	4	6.0	6.0	20	40	115	1
	070S	4	7.0	8.0	20	40	125	1
	080S	4	8.0	8.0	20	40	135	1
	090S	4	9.0	10.0	20	45	140	1
	100B	4	10.0	10.0	25	50	145	2
	110B	4	11.0	12.0	25	50	150	2
	120B	4	12.0	12.0	25	50	160	2
	130B	4	13.0	16.0	25	50	165	2
	140B	6	14.0	16.0	25	50	170	2
	150B	6	15.0	16.0	30	50	180	2
	160B	6	16.0	16.0	30	50	190	2
	180B	6	18.0	20.0	30	55	210	2
	200B	6	20.0	20.0	40	60	230	2

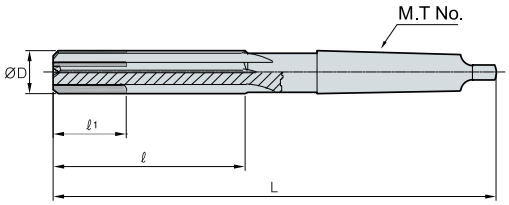
Chucking Reamer-TCRS



(mm)

Designation		No. of flute	ØD	ℓ	L	M.T No.
TCRS	**070**	4	7.0	20	150	1
	080	4	8.0	20	150	1
	090	4	9.0	20	160	1
	100	4	10.0	25	160	1
	110	4	11.0	25	170	1
	120	4	12.0	25	170	1
	130	4	13.0	25	180	1
	140	6	14.0	25	190	1
	150	6	15.0	30	200	2
	160	6	16.0	30	200	2
	180	6	18.0	30	220	2
	200	6	20.0	40	230	2
	250	6	25.0	40	260	3
	280	8	28.0	40	270	3
	300	8	30.0	50	290	3

Chucking Reamer-TMRS



(mm)

Designation		No. of flute	ØD	ℓ	ℓ1	L	M.T No.
TMRS	**070**	4	7.0	60	60	150	1
	080	4	8.0	70	70	150	1
	090	4	9.0	70	70	160	1
	100	4	10.0	75	75	170	1
	110	4	11.0	75	75	170	1
	120	4	12.0	80	40	180	1
	130	4	13.0	85	40	190	1
	140	6	14.0	90	45	210	1
	150	6	15.0	90	45	215	2
	160	6	16.0	100	50	220	2
	180	6	18.0	105	50	225	2
	200	6	20.0	120	50	240	2
	250	6	25.0	130	50	270	3
	280	8	28.0	140	50	280	3
	300	8	30.0	150	50	290	3

PCD Reamer

Code system

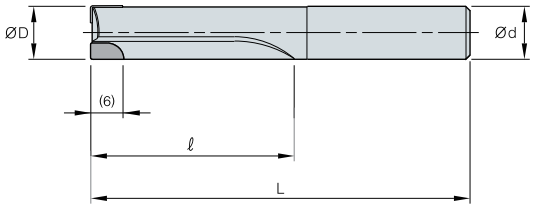
PDR 2 070

- PDR — Type: PCD Reamer
- 2 — No. of Flute: 2: 2Flute
- 070 — Diameter: 070: Ø7.0

Recommended cutting condition (For high speed and high precision machining)

Workpiece	vc (m/min)	fn (mm/rev)
Aluminum alloy	50~250	0.05~0.20

PCD Reamer-PDR



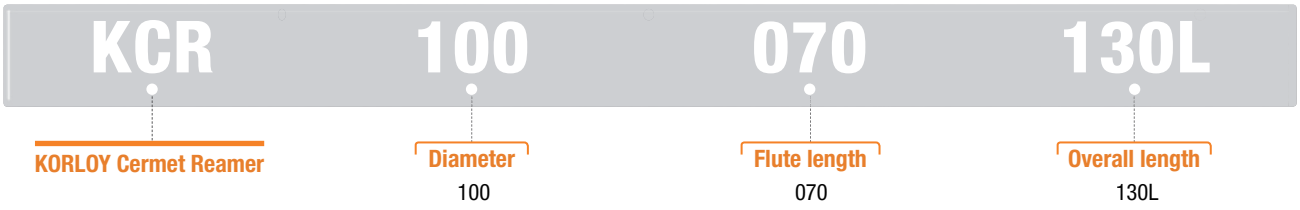
(mm)

Designation		No. of flute	ØD	Ød	ℓ	L
PDR	2050	2	5.0	6.0	30	65
	2060	2	6.0	6.0	40	75
	2070	2	7.0	8.0	40	75
	2080	2	8.0	8.0	40	75
	2090	2	9.0	10.0	40	85
	2100	2	10.0	10.0	40	85
	2120	2	12.0	12.0	50	95
	2140	2	14.0	16.0	50	95
	2150	2	15.0	16.0	50	100
	4160	4	16.0	16.0	50	100
	4180	4	18.0	20.0	60	110
	4200	4	20.0	20.0	60	110

Cermet Reamer

- Cermet reamer realizes high performance in high hardness steel machining (lower performance in casting machining)
- High machinability and wear resistance extend the tool life
- Over 30% higher productivity, surface roughness, and tool life than carbide reamer

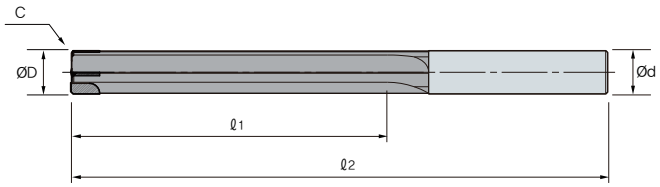
Insert code system



Recommended cutting condition

Workpiece	Hardness	fz (mm/t)	vc (m/min)
Carbon steel	Under 30HRC	0.1~0.4	50~80
High carbon steel, Alloy steel	30~40HRC	0.1~0.4	80~120
	40~50HRC	0.1~0.4	50~80
Alloy steel	More than 50HRC	0.05~0.2	30~60

Cermet Reamer-KCR

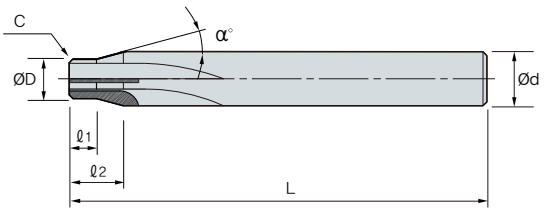


Standard type

(mm)

Designation		No. of flute	ØD	Ød	ℓ1	L
KCR	060~079-25-70L	2	6.0~7.9	8	25	70
	080~099-035-90L	2	8.0~9.9	10	35	90
	100~119-050-100L	4	10.0~11.9	12	50	100
	120~159-060-110L	4	12.0~15.9	12	60	110
	160~199-060-110L	4	16.0~19.9	16	60	110
	200~259-060-110L	4	20.0~25.9	20	60	110
	260~300-070-130L	4	26.0~30	25	70	130

• The length of flute and overhang length of reamer are available for quotation • The maximum overhang length is 150mm



Special type

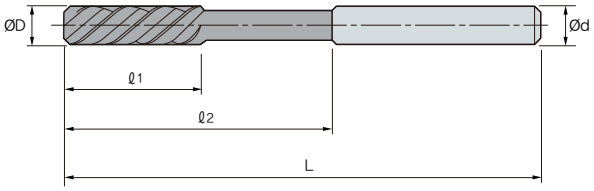
(mm)

Designation		No. of flute	ØD	Ød	ℓ1	ℓ2	L	α°
KCR	□□□~□□□-□□□L	2~4	8.0~25.9	12~30	7~18	2~15	70	10°~60°

Broach Reamer

- Optimal for through hole machining with high precision with long tool life
- High helix angle (45 degree) improves machinability
- Superior surface roughness and high precision
- Strong cutting edge and excellent chip evacuation
- Dia. Ø3.0~Ø25.0

Broach Reamer-HBRE



(mm)

Designation		No. of flute	ØD	Ød	ℓ1	ℓ2	L	Type
HBRE	**030**	3	3.0	3.0	20	40	70	Solid
	040	3	4.0	4.0	25	40	70	Solid
	060	4	6.0	6.0	30	50	80	Solid
	080	4	8.0	8.0	30	60	100	Solid
	100	4	10.0	10.0	30	60	100	Solid
	120	4	12.0	12.0	40	70	120	Top Solid
	160	6	16.0	16.0	40	80	130	Top Solid
	200	6	20.0	20.0	50	90	150	Top Solid
	250	6	25.0	25.0	50	90	150	Top Solid

BORING TOOLS

Part 4

BORING TOOLS

Rough Boring Tool

DBC

TBC

Semi/Finishing Boring Tool

FBC

SMB

KMB

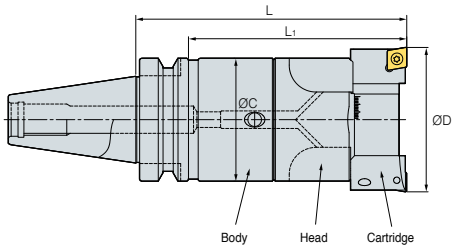
Fine Boring Tool

SMH

FBH

DBC

BT-DBC



(mm)

Designation				Boring range ØD		L	Max. Boring depth
Micro boring head		Body (Basic holder)		Min	Max		
DBC2528S	0.3	BT30-MD25F-90R	0.4	28	35	140	93
DBC3235S	0.4	BT30-MD32F-80R	0.4	35	46	145	114
DBC4046S	0.6	BT30-MD40F-80R	0.5	46	58	150	119
DBC5058S	1.1	BT30-MD50F-70	0.8	58	74	150	128
DBC2528S	0.3	BT40-MD25F-105R	1.9	28	35	165	100
DBC3235S	0.4	BT40-MD32F-115R	2.4	35	46	180	110
DBC4046S	0.6	BT40-MD40F-110R	2.7	46	58	180	130
DBC5058S	1.1	BT40-MD50F-100R	2.7	58	74	180	130
DBC6374S	2.0	BT40-MD63F-90	3.6	74	94	180	150
DBC8094S	3.5	BT40-MD80F-100	4.8	94	120	200	173
DBC2528S	0.3	BT50-MD25F-120R	4.7	28	35	180	100
DBC3235S	0.4	BT50-MD32F-235R	5.3	35	46	300	180
DBC4046S	0.6	BT50-MD40F-230R	5.6	46	58	300	250
DBC5058S	1.1	BT50-MD50F-250R	6.5	58	74	330	280
DBC6374S	2.0	BT50-MD63F-240R	8.4	74	94	330	280
DBC8094S	3.5	BT50-MD80F-175	9.5	94	120	275	225
DBC120S	5.3	BT50-MD80F-175	9.5	120	175	275	235

Parts

Division	Spare parts								
	Basic								
	Head	Spring pin	Wrench bolt	Wrench	Cartridge	Set screw	Wrench	Clamp screw	Torx wrench
Type									
DBC2528S	DBC2528	SP0308	BX0415	LW-3	BCC28	BT0306	LW-1.5	FTKA02565	TRX7
DBC3235S	DBC3235	SP0410	BX0515	LW-4	BCC35	BT0308			
DBC4046S	DBC4046	SP0516	BX0620	LW-5	BCC46	BT0410	LW-2	FTNA0408	TRX15
DBC5058S	DBC5058	SP0616			BCC58	BT0412			
DBC6374S	DBC6374	SP1018	BX0830	LW-6	BCC74	BT0516	LW-2.5	BFTX0511N	TRX20
DBC8094S	DBC8094	SP1020	BX1035	LW-8	BCC94	BT0620	LW-3		
DBC120S	DBC120N	SP1020	BX0830	LW-6.0	BCC120	BT0830	LW-4.0	BFTX0511N	TRX20

TBC

· Balance cut tool for Rough boring

- Wide boring range for big diameters: Ø130~Ø540mm
- Stable structure against for cutting load - Assembly by dove-tail structure
- Interconvert with FBC
  - Common boring head and rail adopted, different cartridge
- Light-weight (5%~20% reduced)
- Various cartridge approach angle: 15°, 45°

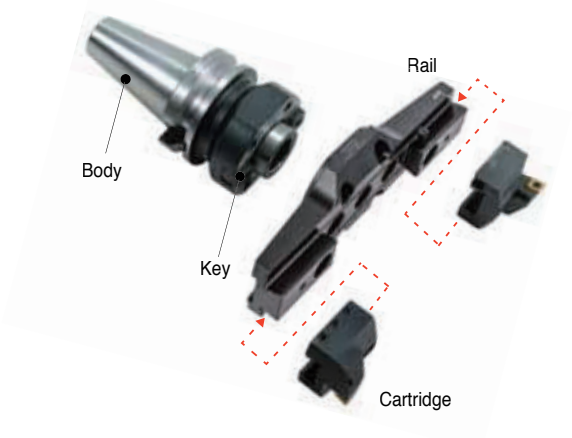
Code system

BT50 – FMD50 – 85 + TBC 130S

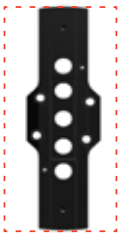
Body

Head set

TBC boring tool structure & features



Cartridge: BCC1348
Incert: CCMT1204□□
CNMG1204□□



Less weight and more margin for chip evacuation

Enhanced strength and weight

TBC boring tool cutting condition

Workpiece	Grade (HRC)	Cutting condition		
		Tip (Grade)	Cutting speed (m/min)	Feed per revolution f (mm/rev)
ALL	ADC12	"N"Material	"N"Material	0.1
Mild steel	SS41 (HB160)	P Material	P Material	0.1
Steel	S45C (H250)	P Material	P Material	0.1
Stainless steel	SUS304	M Material	M Material	0.1
Cast-iron	FC25 (HB250)	K Material	K Material	0.1

Boring range

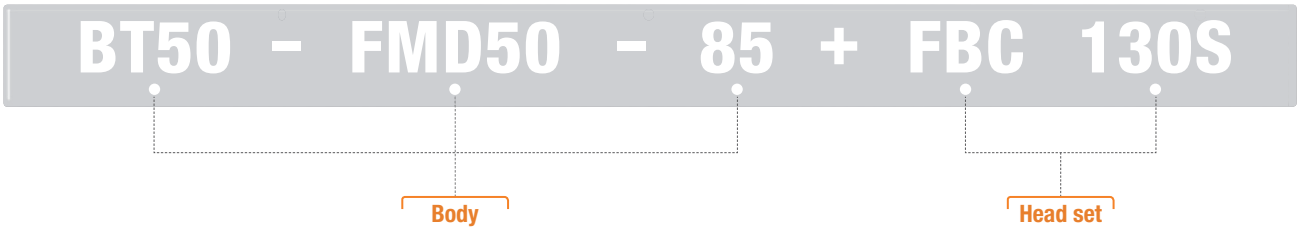
Grade	Dia (Ø)		Body	Head set	Insert
	min	max			
TBC130	130	180	FMD50	TBC130S	CCMT1204□□
TBC175	175	225	FMD50	TBC175S	CCMT1204□□
TBC220	220	270	FMD50	TBC220S	CCMT1204□□
TBC265	265	315	FMD50	TBC265S	CCMT1204□□
TBC310	310	390	FMD50	TBC310S	CCMT1204□□
TBC385	385	465	FMD50	TBC385S	CCMT1204□□
TBC460	460	540	FMD50	TBC460S	CCMT1204□□

FBC

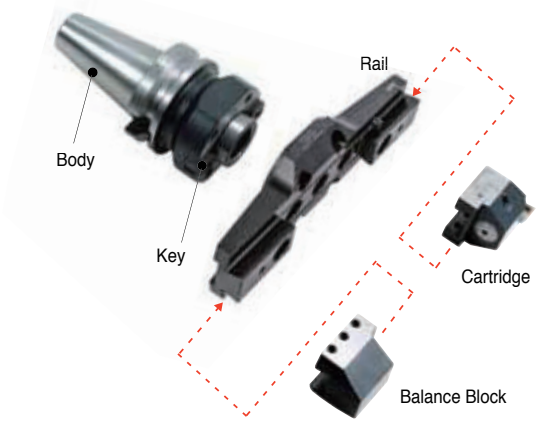
· Balance cut tool for Fine boring

- Wide boring range for big diameters: Ø130 ~ Ø540 mm
- Interconvert with TBC
  - Common boring head and rail adopted, different cartridge [micro cartridge+balancing block]
- Various Insert according to bite
  - Applicable insert: CCMT09T3/1204, TPMT1103 (Cermet, cBN, PCD)

Code system



FBC boring tool structure & features



Cartridge
FCC130

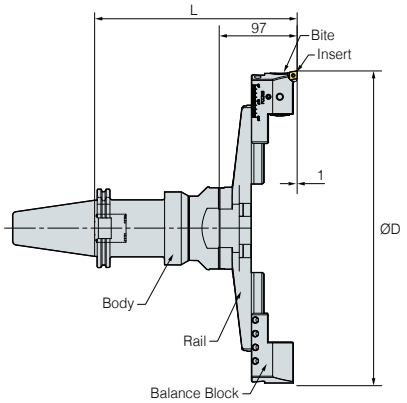
Balance Block
FCB130

Incert
CCGT09T3□□
CCMT1204□□
TPGT1103□□

FBC boring tool cutting condition

Grade	Dia (Ø)		Head set	Insert
	min	max		
FBC130	130	180	FBC130S (TBR130+FCC130+FCB130)	FBB130-C09 (CCMT09T3□□, CCGT09T3□□) FBB130-C12 (CCMT1204□□) FBB130-T11 (TPMT1103□□,TPGT1103□□L)
FBC175	175	225	FBC175S (TBR175+FCC130+FCB130)	
FBC220	220	270	FBC220S (TBR220+FCC130+FCB130)	
FBC265	265	315	FBC265S (TBR265+FCC130+FCB130)	
FBC310	310	390	FBC310S (TBR310+FCC310+FCB310)	
FBC385	385	465	FBC385S (TBR385+FCC310+FCB310)	
FBC460	460	540	FBC460S (TBR460+FCC310+FCB310)	

TBC, FBC

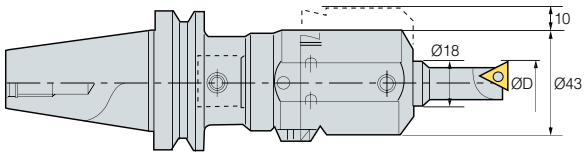


(mm)

Designation											Boring range	
Body				Rough boring (TBC)			Finish boring (FBC)					
			kg	TBC HEAD SET (Rail+Cartridge)	L	kg	FBC HEAD SET (Rail+Cartridge+Balance block)	L	kg		Min	Max
BT50 -	FMD50 -	85	5.9	TBC130S (TBR130+BCC1348)	175	3.5	FBC130S (TBR130+FCC130+FCB130)	182	3.8		130	180
		155	7.9	TBC130S (TBR130+BCC1348)	245	3.5	FBC130S (TBR130+FCC130+FCB130)	252	3.8		130	180
		205	9.7	TBC130S (TBR130+BCC1348)	295	3.5	FBC130S (TBR130+FCC130+FCB130)	302	3.8		130	180
		255	10.4	TBC130S (TBR130+BCC1348)	345	3.5	FBC130S (TBR130+FCC130+FCB130)	352	3.8		130	180
		85	5.9	TBC175S (TBR175+BCC1348)	175	3.9	FBC175S (TBR175+FCC130+FCB130)	182	4.1		175	225
		155	7.9	TBC175S (TBR175+BCC1348)	245	3.9	FBC175S (TBR175+FCC130+FCB130)	252	4.1		175	225
		205	9.7	TBC175S (TBR175+BCC1348)	295	3.9	FBC175S (TBR175+FCC130+FCB130)	302	4.1		175	225
		255	10.4	TBC175S (TBR175+BCC1348)	345	3.9	FBC175S (TBR175+FCC130+FCB130)	352	4.1		175	225
		85	5.9	TBC220S (TBR220+BCC1348)	175	4.3	FBC220S (TBR220+FCC130+FCB130)	182	4.5		220	270
		155	7.9	TBC220S (TBR220+BCC1348)	245	4.3	FBC220S (TBR220+FCC130+FCB130)	252	4.5		220	270
		205	9.7	TBC220S (TBR220+BCC1348)	295	4.3	FBC220S (TBR220+FCC130+FCB130)	302	4.5		220	270
		255	10.4	TBC220S (TBR220+BCC1348)	345	4.3	FBC220S (TBR220+FCC130+FCB130)	352	4.5		220	270
		85	5.9	TBC265S (TBR265+BCC1348)	175	4.5	FBC265S (TBR265+FCC130+FCB130)	182	4.6		265	315
		155	7.9	TBC265S (TBR265+BCC1348)	245	4.5	FBC265S (TBR265+FCC130+FCB130)	252	4.6		265	315
		205	9.7	TBC265S (TBR265+BCC1348)	295	4.5	FBC265S (TBR265+FCC130+FCB130)	302	4.6		265	315
		255	10.4	TBC265S (TBR265+BCC1348)	345	4.5	FBC265S (TBR265+FCC310+FCB310)	352	4.6		265	315
		85	5.9	TBC310S (TBR310+BCC1354)	175	5.5	FBC310S (TBR310+FCC310+FCB310)	182	5.5		310	390
		155	7.9	TBC310S (TBR310+BCC1354)	245	5.5	FBC310S (TBR310+FCC310+FCB310)	252	5.5		310	390
		205	9.7	TBC310S (TBR310+BCC1354)	295	5.5	FBC310S (TBR310+FCC310+FCB310)	302	5.5		310	390
		255	10.4	TBC310S (TBR310+BCC1354)	345	5.5	FBC310S (TBR310+FCC310+FCB310)	352	5.5		310	390
		85	5.9	TBC385S (TBR385+BCC1354)	175	5.8	FBC385S (TBR385+FCC310+FCB310)	182	5.8		385	465
		155	7.9	TBC385S (TBR385+BCC1354)	245	5.8	FBC385S (TBR385+FCC310+FCB310)	252	5.8		385	465
		205	9.7	TBC385S (TBR385+BCC1354)	295	5.8	FBC385S (TBR385+FCC310+FCB310)	302	5.8		385	465
		255	10.4	TBC385S (TBR385+BCC1354)	345	5.8	FBC385S (TBR385+FCC310+FCB310)	352	5.8		385	465
		85	5.9	TBC460S (TBR460+BCC1354)	175	12.8	FBC460S (TBR460+FCC310+FCB310)	182	12.8		460	540
		155	7.9	TBC460S (TBR460+BCC1354)	245	12.8	FBC460S (TBR460+FCC310+FCB310)	252	12.8		460	540
		205	9.7	TBC460S (TBR460+BCC1354)	295	12.8	FBC460S (TBR460+FCC310+FCB310)	302	12.8		460	540
		255	10.4	TBC460S (TBR460+BCC1354)	345	12.8	FBC460S (TBR460+FCC310+FCB310)	352	12.8		460	540

• Bites for FBC are sold separately

BT-SMB — Small Micro Boring Bar



1DIV = Ø0.02mm

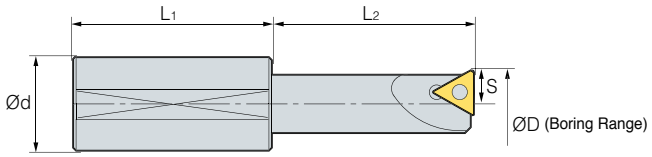
(mm)

Designation			Head (Modular)	Boring bite	L	L_1	kg
BT40 -	**MD40F -**	**60**	SMB4022	BB18-O(S)	122.5	60	2.8
BT50 -	**MD40F -**	**60**	SMB4022	BB18-O(S)	122.5	60	5.4

Boring head	Bite	MD NO.	L	kg
SMB4022	BB18-O(S)	BTOO-MD40T	62.5	0.6

• Through coolant system not available

Boring bite: BBtype (For SMB)



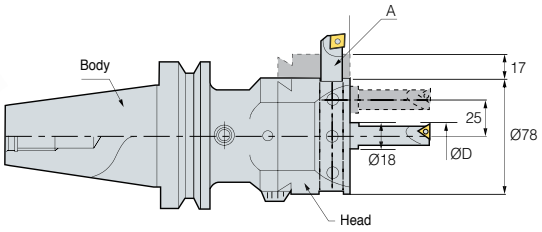
(mm)

Designation		Boring range		S	L_1	L_2	Insert	Insert screw
		Min	Max					
BB	**18-7(S)**	7	27	3.5	30	30	TBGT0601□□L	BFTX0204A
	18-9(S)	9	29	4.5	30	40	TPGT0802□□L	BFTX0204A
	18-11(S)	11	31	5.5	30	45	TPGT1103□□L	BFTX0307A
	18-13(S)	13	33	6.5	40	45	TPGT1103□□L	BFTX0307A
	18-15(S)	15	35	7.5	40	50	TPGT1103□□L	BFTX0307A
	18-17(S)	17	37	8.5	40	50	TPGT1103□□L	BFTX0307A

Parts

Division	Spare parts				
	Basic			Option	
	Boring head	Taper screw	Wrench	Boring bite	Basic holder
Type					
SMB	SMB4022	BTT1013F	LW-5	BB18	MD40F

BT-KMB Micro Boring



1DIV = Ø0.02mm

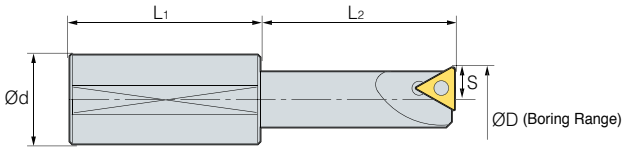
(mm)

Designation			Head (Modular)	Boring bite	L	L_1	kg
BT40 -	MD63F -	64	KMB6336	BB18-□(S)	141	64	5.5
BT50 -	MD63F -	75	KMB6336	BB18-□(S)	152	75	7.0

Boring head	Bite	MD NO.	L	kg
KMB6336	BB18-□(S)	BT□□-MD63F	77	2.2

• Through coolant system is optional

Boring bite: BBtype (For KMB)



(mm)

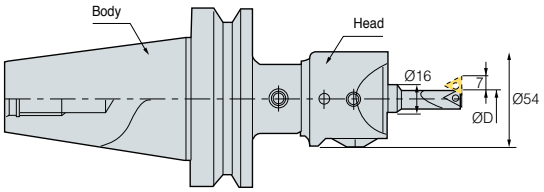
Designation		Boring range (Center)		Boring range (Side)		S	L_1	L_2	Insert	Insert Screw
		Min	Max	Min	Max					
BB	18-7(S)	7	40	43	91	3.5	30	30	TBGT0601□□L	BFTX0204A
	18-9(S)	9	42	45	93	4.5	30	40	TPGT0802□□L	BFTX0204A
	18-11(S)	11	44	47	95	5.5	30	45	TPGT1103□□L	BFTX0307A
	18-13(S)	13	46	49	97	6.5	40	45	TPGT1103□□L	BFTX0307A
	18-15(S)	15	48	51	99	7.5	40	50	TPGT1103□□L	BFTX0307A
	18-17(S)	17	50	53	101	8.5	40	50	TPGT1103□□L	BFTX0307A

Parts

Division	Spare parts				
	Basic			Option	
	Boring head	Taper screw	Wrench	Boring bite	Basic holder
Type					
KMB	KMB6336	BTT1620F	LW-8	BB18	MD63F

BT-SMH

Small Micro Boring Bar (For High Precision)



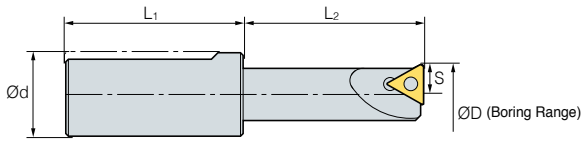
(mm)

Designation	Head (Modular)	Boring bite	L	L_1	kg
BT40 - MD40F - 60	SMH4022	BB16-O(S)	109	60	3.0
BT50 - MD40F - 60	SMH4022	BB16-O(S)	109	60	6.0

Boring head	Bite	MD NO.	L	kg
SMH4022	BB18-O(S)	BTOO-MD40F	49	2.7

• Through coolant system not available

Boring bite: BBtype (For SMH)



(mm)

Designation		Boring range ØD Min	Boring range ØD Max	S	L_1	L_2	Insert	Insert screw	Wrench
BB	**16-5(S)**	5.5	19	2.75	34	20	WBGT0601□□L	BFTX0203A	TRX06
	16-7(S)	7	21	3.5	34	30	TBGT0601□□L	BFTX0204A	TRX06
	16-9(S)	9	23	4.5	34	40	TPGT0802□□L	BFTX0204A	TRX06
	16-11(S)	11	25	5.5	34	45	TPGT1103□□L	BFTX0307A	TRX10
	16-15(S)	15	29	7.5	34	50	TPGT1604□□L	BFTX0307A	TRX10
	16-19(S)	19	33	9.5	34	60	TPGT1103□□L	BFTX0410A	TRX15

Parts

Division	Spare parts				
	Basic			Option	
	Boring head	Taper screw	Wrench	Boring bite	Basic holder
Type					
SMH	SMH4022	BTT1013F	LW-5	BB16	MD40F

FBH/B

· FBH back boring & balanced type

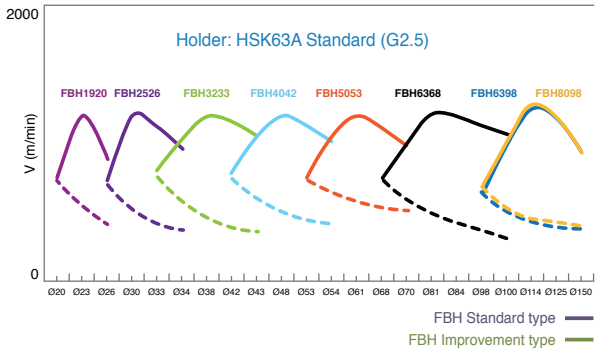
- High speed boring and back boring capability
- High precision balancing: G2.5, Head: G6.3
- Min. adjustment range: 2㎛

Code system

FBH	32	-	33	16
Fine boring head	MD		Min. Boring dia.	Balance type

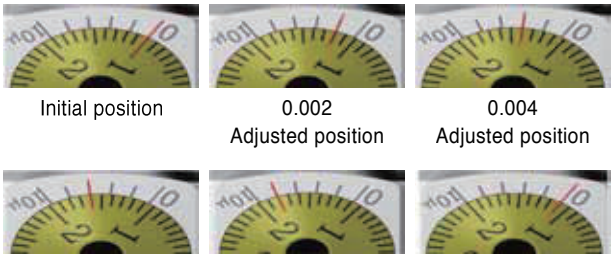
Working permission speed

FBH WORKING PERMISSION SPEED



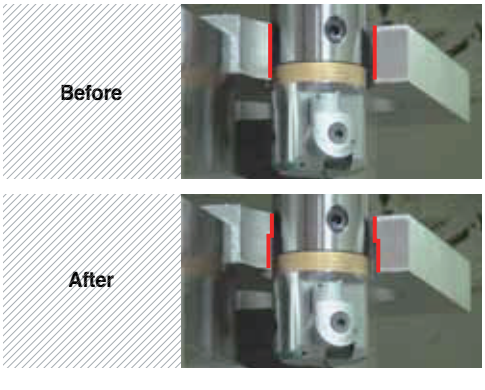
Boring range adjustment method

2㎛ Boring range



Initial position	0.002 Adjusted position	0.004 Adjusted position
0.006 Adjusted position	0.008 Adjusted position	0.010 Adjusted position

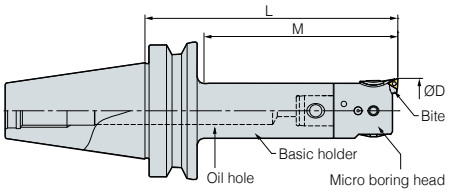
Back boring



Adjusting machining direction available

Easy change of machining direction only by adjusting the bite

BT-FBH/B — Micro Boring Balance type



(mm)

Designation						Boring range ØD		L	Max. Boring depth	kg
Head	Bite	Body (Basic holder)				Min	Max			
FBH1920B	FBB20N-□-□□	BT30 -	MD19F -	70R		20 (24)	26 (30)	103	60	0.5
FBH2526B	FBB26N-□-□□		MD25F -	90R		26 (32)	34 (40)	127	80	0.7
FBH3233B	FBB33N-□-□□		MD32F -	80R		33 (40)	43 (50)	121	80	0.8
FBH4042B	FBB42N-□-□□		MD40F -	80R		42 (50)	54 (62)	127	96	1.1
FBH5053B	FBB53N-□-□□		MD50F -	70		53 (65)	70 (82)	127	97	1.7
FBH1920B	FBB20N-□-□□	BT40 -	MD19F -	70R		20 (24)	26 (30)	103	45	1.9
FBH2526B	FBB26N-□-□□		MD25F -	95R		26 (32)	34 (40)	133	59	2
FBH3233B	FBB33N-□-□□		MD32F -	100R		33 (40)	43 (50)	141	77	2.5
FBH4042B	FBB42N-□-□□		MD40F -	115R		42 (50)	54 (62)	162	107	3.1
FBH5053B	FBB53N-□-□□		MD50F -	105		53 (65)	70 (82)	162	135	3.5
FBH6368B	FBB68N-□-□□		MD63F -	110		68 (90)	100 (122)	181	154	6.3
FBH6398B	FBB68N-□-□□		MD63F -	135		98 (120)	150 (172)	206	179	7.1
FBH8098B	FBB68N-□-□□		MD80F -	100		98 (120)	150 (172)	171	144	8.3
FBH1920B	FBB20N-□-□□	BT50 -	MD19F -	85		20 (24)	26 (30)	118	80	5.2
FBH2526B	FBB26N-□-□□		MD25F -	105R		26 (32)	34 (40)	142	59	5.8
FBH3233B	FBB33N-□-□□		MD32F -	110R		33 (40)	43 (50)	151	77	6
FBH4042B	FBB42N-□-□□		MD40F -	195R		42 (50)	54 (62)	242	130	6.3
FBH5053B	FBB53N-□-□□		MD50F -	225R		53 (65)	70 (82)	282	182	6.6
FBH6368B	FBB68N-□-□□		MD63F -	230R		68 (90)	100 (122)	301	220	7.2
FBH6398B	FBB68N-□-□□		MD63F -	195R		98 (120)	150 (172)	266	191	8.5
FBH8098B	FBB68N-□-□□		MD80F -	175		98 (120)	150 (172)	246	208	12.8

- FBB bites are divided into two sorts Normal type: FBB□□N, Scalable type: FBB□□N-1
  There are also the other options for your insert type: FBB□□N-□-C09 or T11
  FBB□□N, FBB□□N-1: TPGT, TPGW0802□□L
  FBB□□N-□-C: CCMT,CCGT0602□□L
  FBB□□N-□-C09: CCMT,CCGT09T3□□L
  FBB□□N-□-T11: TPGT1103□□L

- Through coolant system available

FBH — Micro Boring Head

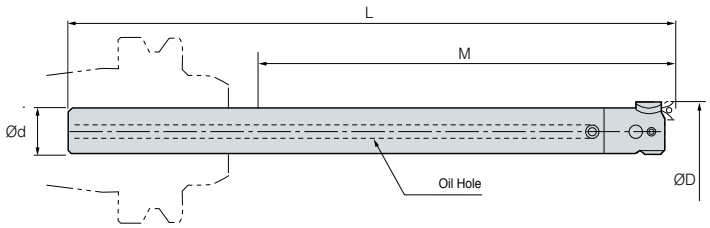
FBH1920B — New Type

(mm)

Designation		Boring range ØD		L	Scale ring 1rev. adjustable range	MD No.	kg
		Min	Max				
FBH -	1920B	20	26 (30)	33	Ø0.4 mm	MD1911	0.06
	2526B	26	34 (40)	37	Ø0.4 mm	MD2514	0.12
	3233B	33	43 (50)	41	Ø0.5 mm	MD3218	0.24
	4042B	42	54 (62)	47	Ø0.5 mm	MD4022	0.41
	5053B	53	70 (82)	57	Ø0.6 mm	MD5028	0.8
	6368B	68	100 (122)	71	Ø0.8 mm	MD6336	1.7
	6398B	98	150 (172)	71	Ø0.8 mm	MD6336	2.35

- Stock of basic holders, heads and bites are separately managed
- ( ): Max. boring diameter of extension type

S-FBH/B Small Micro Boring

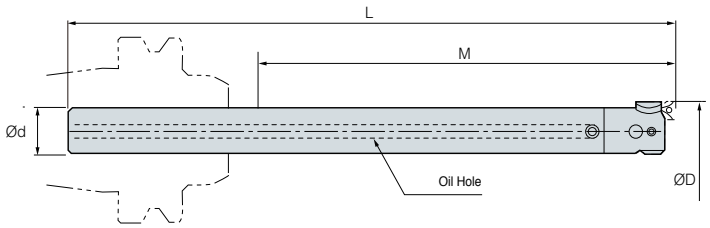


(mm)

Designation			Shank dia ød	Boring range ØD		L	M	Designation			kg
				Min	Max			Basic shank	Boring head	Bite	
S19W -	FBH20B -	120	19	20	26	190	120	S19W-MD19F-157	FBH1920B	FBB20N	0.6
		140	19	20	26	210	140	S19W-MD19F-177	FBH1920B	FBB20N	0.7
		160	19	20	26	230	160	S19W-MD19F-197	FBH1920B	FBB20N	0.8
S25W -	FBH26B -	150	25	26	34	235	150	S25W-MD25F-197.5	FBH2526B	FBB26N	1.4
		175	25	26	34	260	175	S25W-MD25F-222.5	FBH2526B	FBB26N	1.6
		200	25	26	34	285	200	S25W-MD25F-247.5	FBH2526B	FBB26N	2
S32W -	FBH33B -	180	32	33	43	280	180	S32W-MD32F-239	FBH3233B	FBB33N	2.8
		240	32	33	43	340	240	S32W-MD32F-299	FBH3233B	FBB33N	3.5
S19 -	FBH20B -	40	19	20	26	110	40	S19-MD19F-77	FBH1920B	FBB20N	0.1
		80	19	20	26	150	80	S19-MD19F-117	FBH1920B	FBB20N	0.2
S25 -	FBH26B -	50	25	26	34	135	50	S25-MD25F-97.5	FBH2526B	FBB26N	0.4
		100	25	26	34	185	100	S25-MD25F-147.5	FBH2526B	FBB26N	0.6
S32 -	FBH33B -	90	32	33	43	190	90	S32-MD32F-149	FBH3233B	FBB33N	1.1
		120	32	33	43	220	120	S32-MD32F-179	FBH3233B	FBB33N	1.2

• Through coolant system available

S-FBH Mini Small Micro Boring



(mm)

Designation			Shank dia ød	Boring range ØD		L	M	Designation			kg
				Min	Max			Basic shank	Boring head	Bite	
S14W	FBH15	85	14	15	18	155	85	S14W-M6-123	FBH15	FBB15-C	0.2
	FBH15	110	14	15	18	180	110	S14W-M6-148	FBH15	FBB15-C	0.3
S16W	FBH18	95	16	18	22	165	95	S16W-M8-128	FBH18	FBB15-C	0.3
	FBH18	125	16	18	22	195	120	S16W-M8-158	FBH18	FBB15-C	0.4
S14	FBH15	40	14	15	18	110	40	S14-M6-78	FBH15	FBB15-C	0.1
S16	FBH18	45	16	18	22	115	45	S16-M8-78	FBH18	FBB15-C	0.1

• Through coolant system available

S-FBH

Parts

Spare parts		
Type (FBH)	**Lock screw**	**Clamp screw**
FBH1920B	BTF0404	BXC0304
FBH2526B	BTF0505	BXC0405
FBH3233B	BTF0606	BXC0506
FBH4042B	BTF0808	BXC0610
FBH5053B	BTF0812	BXC0610
FBH6368B	BTF1016	BXC0810
FBH6398B	BTF1012	BXC0810
FBH8098B	BTF1014	BXC0810

FBB — Bite (New type)

Designation	Boring range	Insert	Insert screw	Clamp bolt
FBB15C	Ø15~Ø18 mm Ø18~Ø22 mm	CCET0301-□□L	FTNA01633	BFTX02506N
FBB20N	Ø20~Ø26 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0304
FBB20N-C		CCET0401□□L	BFTX0204N	
FBB20N-1	Ø24~Ø30 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB20N-1-C		CCET0401□□L	BFTX0204N	
FBB26N	Ø26~Ø34 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0405
FBB26N-C		CCET0401□□L	BFTX0204N	
FBB26N-1	Ø32~Ø40 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB26N-1-C		CCET0401□□L	BFTX0204N	
FBB33N	Ø33~Ø43 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0506
FBB33N-C		CCMT0602□□/CCGT0602□□	BFTX02506N	
FBB33N-1	Ø41~Ø50 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB33N-1-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB42N	Ø42~Ø54 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0610
FBB42N-		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB42N-11		TPGT1103□□L	BFTX0307A	
FBB42N-1	Ø50~Ø62 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB42N-1-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB42N-1-T11		TPGT1103□□L	BFTX0307A	
FBB53N	Ø53~Ø70 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB53N-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB53N-11		TPGT1103□□L	BFTX0307A	
FBB53N-1	Ø65~Ø82 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB53N-1-C		CCMT0602□□/CCGT0602□□L	BFTX02506N	
FBB53N-1-C09		CCMT09T3□□/CCGT09T3□□L	BFTX0409N	
FBB53N-1-T11		TPGT1103□□L	BFTX0307A	
FBB68N	Ø68~Ø100 mm Ø98~Ø150 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	BXC0810
FBB68N-C		CCMT09T3□□/CCGT09T3□□L	BFTX0409N	
FBB68N-11		TPGT1103□□L	BFTX0307A	
FBB68N-1	Ø90~Ø122 mm Ø120~Ø172 mm	TPGT0802□□L/TPGW0802□□	BFTX0204A	
FBB68N-1-C09		CCMT09T3□□/CCGT09T3□□L	BFTX0409N	
FBB68N-1-T11		TPGT1103□□L	BFTX0307A	

MODULAR SYSTEM

Part 5

MODULAR SYSTEM

Arbors

BT/HSK-MD

Extension Bar

EXT

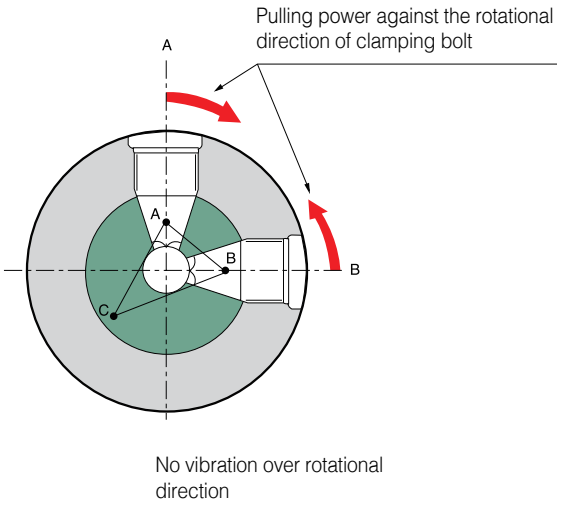
Reducer Bar

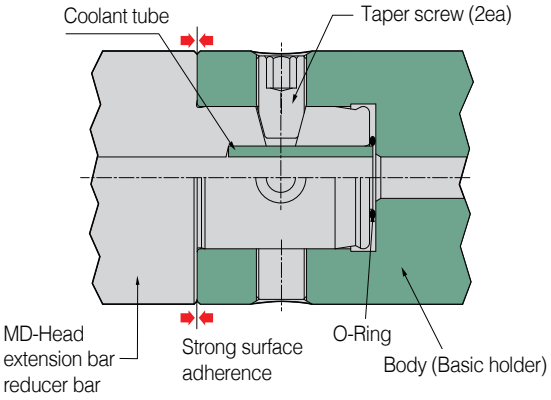
RDC

Modular System Series

· Versatile tooling system that can flexibly react to FMS

- Versatile tooling system conforming to FMS specification
- Flexible combination of tool units according to conditions of subject
- Joining with a specially designed screw provides high accuracy (error less than 5μm) and ease of detach for one step setting
- Cutting edge of boring system aligned with the groove of drive key
- Corresponding accuracy and stiffness compared to uni-body type





BT-MD

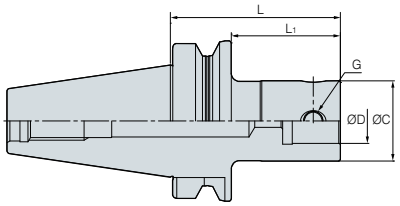


Fig. 1

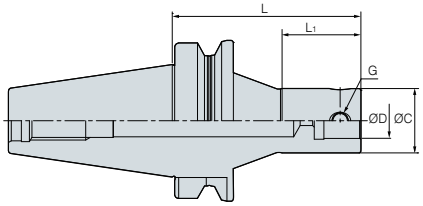
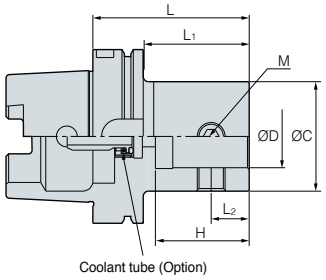


Fig. 2

(mm)

Designation		ØC	ØD	L	L_1	G		Fig.
BT30 -	**MD19F - 70**	19	11	70	45	M5	0.4	1
	MD25F - 90	25	14	90	63	M6	0.3	1
	MD32F - 80	32	18	80	55	M8	0.4	1
	MD40F - 45	40	22	45	22	M8	0.4	1
	MD40F - 60	40	22	60	36	M10	0.5	1
	MD40F - 80	40	22	80	56	M10	0.5	1
	MD50F- 70	50	28	70	48	M12	0.8	3
BT40 -	**MD19F- 70**	19	11	70	40	M5	1.8	1
	MD25F- 95	25	14	95	63	M6	1.9	1
	MD25F- 105R	25	14	105	40	M6	1.9	2
	MD32F- 100	32	18	100	70	M8	2.3	1
	MD32F- 115R	32	18	115	45	M8	2.4	2
	MD40F- 60	40	22	60	31	M10	2.7	1
	MD40F- 110R	40	22	110	60	M10	2.7	2
	MD40F- 115	40	22	115	83	M10	2.7	1
	MD50F- 105	50	28	105	73	M12	2.7	1
	MD63F- 64	63	36	64	37	M16	3.3	1
	MD63F- 110	63	36	110	83	M16	3.6	1
	MD63F- 135	63	36	135	108	M16	4.6	1
	MD80F- 100	80	45	100	73	M16	4.8	3
BT50 -	**MD19F- 85**	19	11	85	44	M5	4.3	1
	MD25F- 105	25	14	105	62	M6	4.5	1
	MD25F- 120R	25	14	120	40	M6	4.7	2
	MD32F- 110	32	18	110	67	M8	5.1	1
	MD32F- 115R	32	18	115	45	M8	5.1	2
	MD32F- 235R	32	18	235	115	M8	5.3	2
	MD40F- 60	40	22	60	22	M10	5.0	1
	MD40F- 195	40	22	195	152	M10	5.4	1
	MD40F- 230R	40	22	230	180	M10	5.6	2
	MD50F- 125	50	28	125	82	M12	6.0	1
	MD50F- 225	50	28	225	182	M12	6.4	1
	MD50F- 250R	50	28	250	81	M12	6.5	2
	MD63F- 75	63	36	75	35	M16	6.0	1
	MD63F- 130	63	36	130	87	M16	6.8	1
	MD63F- 195	63	36	195	152	M16	8.0	1
	MD63F- 230	63	36	230	187	M16	8.4	1
	MD80F- 75	80	45	75	36	M16	9.1	1
	MD80F- 110	80	45	110	69	M16	9.4	1
	MD80F- 175	80	45	175	134	M16	9.5	1
	MD90F- 75	90	45	75	34	M16	9.3	1
	MD90F- 145	90	45	145	104	M16	9.9	1
	MD90F- 195	90	45	195	154	M16	10.2	1

HSK-MD



(mm)

Designation		ØC	ØD	L	L_1	L_2	H	M
HSK 63A -	MD19F - 60	19	11	60	34	6.5	15.5	M5
	MD25F - 60	25	14	60	31	8	18.5	M6
	MD32F - 65	32	18	65	31	11	23.5	M8
	MD40F - 70	40	22	70	41	13	29	M10
	MD50F - 85	50	28	85	58	17	36	M12
	MD63F - 95	63	36	95	69	22	54	M16

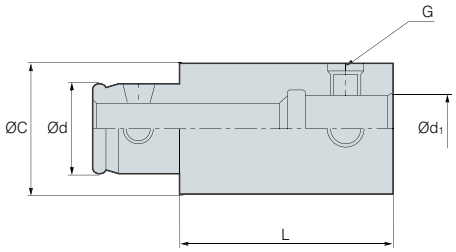
• Through coolant system available

Parts

Division	Spare parts	
	Basic	Option
	Taper screw	Wrench
Type		
MD19F	BTT0506F	LW-2.5
MD25F	BTT0608F	LW-3
MD32F	BTT0810F	LW-4
MD40F	BTT1013F	LW-5
MD50F	BTT1215F	LW-6
MD63F	BTT1620F	LW-8
MD80F	BTT1626F	LW-8
MD90F	BTT1631F	LW-8

EXT

Extension Bar



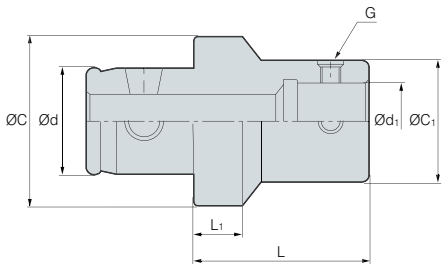
(mm)

Designation		ØC	Ød	L	Ød1	G
EXT -	1930F	19	11	30	11	M5
	1950F	19	11	50	11	M5
	2530F	25	14	30	14	M6
	2550F	25	14	50	14	M6
	3235F	32	18	35	18	M8
	3260F	32	18	60	18	M8
	4040F	40	22	40	22	M10
	4090F	40	22	90	22	M12
	5050F	50	28	50	28	M12
	50100F	50	28	100	28	M12
	6360F	63	36	60	36	M16
	63120F	63	36	120	36	M16
	8070F	80	45	70	45	M16
	80120F	80	45	120	45	M16
	9080F	90	45	80	45	M16
	90130F	90	45	130	45	M16

• Through coolant system available

RDC

Reducer Bar



(mm)

Designation		Ød	ØC1	Ød1	ØC	L	L1	G
RDC -	3225F	18	25	14	32	30	9	M6
	4025F	22	25	14	40	30	9	M6
	4032F	22	32	18	40	30	9	M8
	5025F	28	25	14	50	30	9	M6
	5032F	28	32	18	50	30	9	M8
	5040F	28	40	22	50	40	10	M10
	6325F	36	25	14	63	30	9	M6
	6332F	36	32	18	63	30	9	M8
	6340F	36	40	22	63	40	10	M10
	6350F	36	50	28	63	45	10	M12
	8032F	45	32	18	80	30	9	M6
	8040F	45	40	22	80	40	10	M10
	8050F	45	50	28	80	45	10	M12
	8063F	45	63	36	80	50	13	M16

Parts

Division	Spare parts		
	Basic		Option
	Taper screw	Spring pin	Wrench
Type			
MD19F	BTT0506F	-	LW-2.5
MD25F	BTT0608F	SP0308	LW-3
MD32F	BTT0810F	SP0410	LW-4
MD40F	BTT1013F	SP0516	LW-5
MD50F	BTT1215F	SP0616	LW-6
MD63F	BTT1620F	SP0818	LW-8
MD80F	BTT1626F	SP1020	LW-8
MD90F	BTT1631F	SP1020	LW-8

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