

G

DRILLS

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



Technical Information for Drills

G02 KRLOY Drills

G04 Available Insert

Indexable Drills

G06 Technical Information for KING DRILL

G12 KING DRILL

G21 Technical information of KING DRILL
(for through coolant system with a lathe)

G22 King drill(for through coolant system with a lathe)

G25 Technical Information for KING DRILL
(for large diameter drilling)

G26 King Drill for large diameter drilling

G27 Technical Information for TPDC

G31 TPDC

G30 TPDC Available Insert

G32 Technical Information for TPDB

G35 TPDB Available Insert

G36 TPDB

G39 Technical Information for WPDC

G42 Center Drill

G43 WPDC

Solid Drills

G45 Technical Information for Mach Drill plus

G47 Mach Drill plus

G52 Technical Information for Mach Drill

G56 Mach Drill

G64 Technical Information for Mach long Drill plus

G66 Mach long Drill plus

G69 Technical Information for Mach long Drill

G71 Mach long Drill

G72 Mach step Drills Order Form

G73 Technical Information for Vulcan Drill

G74 Vulcan Drill

G76 Technical Information for Carbide Drill

G77 Carbide Drill

G79 Burnishing Drill

G80 Top solid Drill

G81 PCD Drill

G82 Technical Information for Gun Drill

G86 Gun Drill

Reamer

G88 Technical Information for Indexable Reamer

G91 Available Insert for Indexable Reamer

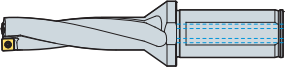
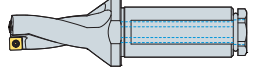
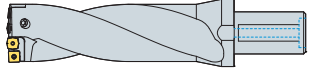
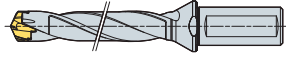
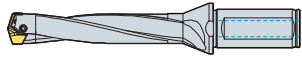
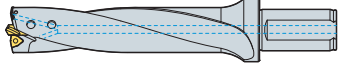
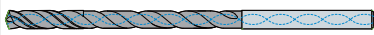
G92 Indexable Reamer

G94 Chucking / Machine Reamer

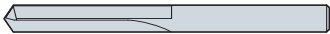
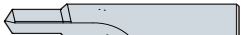
G97 PCD Reamer

G98 Cermet Reamer

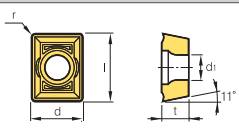
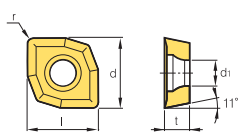
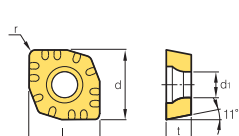
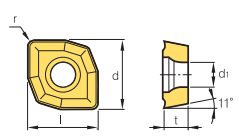
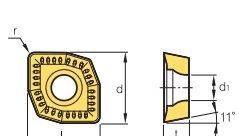
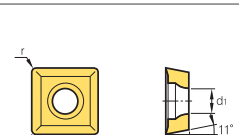
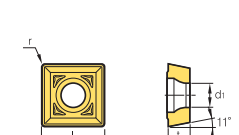
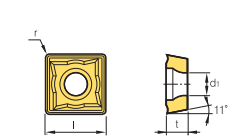
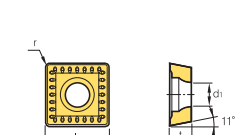
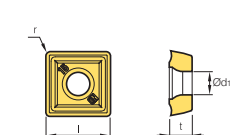
G99 Broach Reamer

Type	Designation		Shape	Drills Dia.	Aspect ratio	Page
Indexable Drills	KING-DRILL <i>New</i>	K□D	 Available Insert : SP□T, XO□T	Ø12.0~Ø60.5	2D~5D	G12 ~ G20
	KING-DRILL HP <i>New</i>	K□D..HP	 Available Insert : SP□T, XO□T	Ø12.0~Ø60.5	2D~5D	G22 ~ G24
	KING-DRILL <i>New</i> (for large diameter drilling)	K□D	 Available Insert : SP□T, XO□T	Ø61.0~Ø100.0	2D~4D	G26
	TPDC <i>New</i>	TPDC	 Available Insert : TPD□□□□CP	Ø12.0~Ø19.99	3D~8D	G27 ~ G31
	TPDB	TPDB	 Available Insert : TPD□□□B	Ø61.0~Ø100.0	3D~8D	G36 ~ G38
	Indexable Drills & Drill with center	WPDC	 Available Insert : WC□T	Ø25.0~Ø80.0	5D~8D	G43 ~ G44
Solid Drills	Mach Drill <i>New</i> Plus	MSDP		Ø1.0~Ø2.4	3D~7D	G47
		MSDPH		Ø2.5~Ø20.0	3D~7D	G48 ~ G51
	Mach Drill	MSD		Ø2.5~Ø20.0	3D~7D	G56 ~ G59
		MSDH		Ø2.5~Ø20.0	3D~7D	G60 ~ G63
	Mach long Drill <i>New</i> Plus	MLD□□□□N		Ø3.0~Ø10.0	10D~25D	G66 ~ G68
	Mach long Drill	MLDP		Ø3.0~Ø10.0	-	G71
		MLD		Ø3.0~Ø10.0	10D~25D	G71
	Vulcan Drill	VZD		Ø12.6~Ø40.5	2.5D, 5D	G74 ~ G75
	Carbide Drill	SSD		Ø1.0~Ø15.0	-	G77 ~ G78



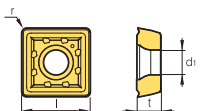
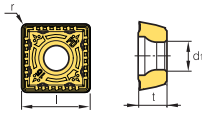
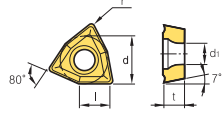
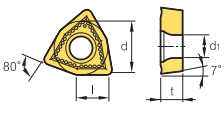
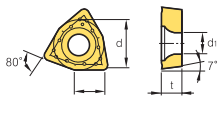
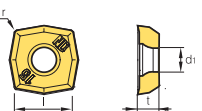
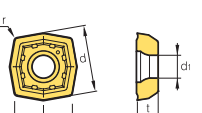
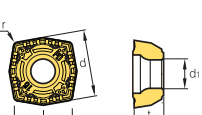
Type	Designation		Shape	Drills Dia.	Aspect ratio	Page
Solid Drills	Burnishing Drill	BDS		Ø4.0~Ø16.0	5D~7D	G79
		BDT		Ø4.2~Ø10.3	2D~4D	G79
	Top solid Drill	TSDM		Ø8.0~Ø25.0	5D~8D	G80
	PCD Drill	PDD		Ø5.0~Ø12.0	5D	G81
	Gun Drill	KGDS		Ø2.0~Ø33.0	50D~100D	G86
		KGDT		Ø6.0~Ø26.5	50D~100D	G87
Reamer	Indexable Reamer	IRT	 Available Insert : RI	Ø10.0~Ø31.0	3D~5D	G92
		IRB	 Available Insert : RI	Ø10.0~Ø31.0	3D~5D	G93
	Chucking / Machine Reamer	SCRS		Ø5.0~Ø20.0	2D~3D	G95
		SCRH		Ø5.0~Ø20.0	2D~3D	G95
		TCRS		Ø7.0~Ø30.0	2D~3D	G96
		TMRS		Ø7.0~Ø30.0	3D~5D	G96
	PCD Reamer	PDR		Ø5.0~Ø20.0	3D~5D	G97
	Cermet Reamer 	KCR		Ø6.0~Ø30.0	3D~7D	G98
	Broach Reamer 	HBRE		Ø3.0~Ø25.0	3D~7D	G99

Available Insert

Picture	Designation	Coated										Uncoated		Dimensions (mm)					Geometry	Page	
		NC3120	NC3030	NC5330	PC5300	PC3530	PC3535	PC3500	NCM325	PC9530	NCM335	PC6510	H01	G10	l	d	t	r			d ₁
	040203-DF													6.2	4.7	2.4	0.3	2.3		-	
	222408-DA													8.3	8.2	2.5	0.8	2.8		-	
	252808-DA													9.3	9.2	3.3	0.8	3.4			
	293208-DA													10.3	10.2	3.3	0.8	3.4			
	334008-DA													13	12.9	3.97	0.8	4.0			
	415008-DA													15.3	15.2	4.76	0.8	4.5			
	516012-DA													18.3	18.2	5.18	1.2	5.5			
	222408-DR													8.3	8.2	2.5	0.8	2.8		-	
	252808-DR													9.3	9.2	3.3	0.8	3.4			
	293208-DR													10.3	10.2	3.3	0.8	3.4			
	334008-DR													13	12.9	3.97	0.8	4.0			
	415008-DR													15.3	15.2	4.76	0.8	4.5			
	516012-DR													18.3	18.2	5.18	1.2	5.5			
	222408-DM													8.3	8.2	2.5	0.8	2.8		-	
	252808-DM													9.3	9.2	3.3	0.8	3.4			
	293208-DM													10.3	10.2	3.3	0.8	3.4			
	334008-DM													13	12.9	3.97	0.8	4.0			
	415008-DM													15.3	15.2	4.76	0.8	4.5			
	516012-DM													18.3	18.2	5.18	1.2	5.5			
	222408-DS													8.3	8.2	2.5	0.8	2.8		-	
	252808-DS													9.3	9.2	3.3	0.8	3.4			
	293208-DS													10.3	10.2	3.3	0.8	3.4			
	334008-DS													13	12.9	3.97	0.8	4.0			
	415008-DS													15.3	15.2	4.76	0.8	4.5			
	516012-DS													18.3	18.2	5.18	1.2	5.5			
	050203-DA													5.3	-	2.4	0.3	2.3		-	
	060204-DA													6.2	-	2.5	0.4	2.5			
	070204-DA													7.2	-	2.5	0.4	2.8			
	050203-DF													5.3	-	2.4	0.3	2.3		-	
	060204-DF													6.2	-	2.5	0.4	2.5			
	070204-DF													7.2	-	2.5	0.4	2.8			
	050203-DM													5.3	-	2.4	0.3	2.3		-	
	060204-DM													6.2	-	2.5	0.4	2.5			
	070204-DM													7.2	-	2.5	0.4	2.8			
	050203-DS													5.3	-	2.4	0.3	2.3		-	
	060204-DS													6.2	-	2.5	0.4	2.5			
	070204-DS													7.2	-	2.5	0.4	2.8			
	040204-ND												●	4.7	-	2.4	0.4	2.3		G12 ~ G24	
	050204-ND												●	5.1	-	2.4	0.4	2.3			
	060205-ND												●	6.2	-	2.5	0.5	2.5			
	07T208-ND												●	7.5	-	2.8	0.7	2.8			
	090308-ND												●	9.2	-	3.3	0.8	3.4			
	11T308-ND												●	11.0	-	4.0	0.8	4.0			
	130410-ND												●	13.0	-	4.5	1.0	4.5			
	15M510-ND												●	15.2	-	5.0	1.0	5.5			
	180510-ND												●	18.2	-	5.5	1.0	6.0			

● : Stock Item

 Available Insert

Picture	Designation	Coated										Uncoated		Dimensions (mm)					Geometry	Page		
		NC3120	NC3220	NC3030	NC5330	PC5300	PC5335	PC3530	PC3500	NCM325	PC9530	NCM335	PC6510	H01	G10	l	d	t			r	d ₁
	060205-LD					●										6.2	-	2.5	0.5	2.5		G12 ~ G24
	07T208-LD					●										7.5	-	2.8	0.7	2.8		
	090308-LD					●										9.2	-	3.3	0.8	3.4		
	11T308-LD					●										11.0	-	4.0	0.8	4.0		
	130410-LD					●										13.0	-	4.5	1.0	4.5		
	15M510-LD					●										15.2	-	5.0	1.0	5.5		
	180510-LD					●										18.2	-	5.5	1.0	6.0		
	040204-PD				●	●			●				●			4.7	-	2.4	0.4	2.3		G12 ~ G24
	050204-PD				●	●			●				●			5.1	-	2.4	0.4	2.3		
	060205-PD				●	●			●				●			6.2	-	2.5	0.5	2.5		
	07T208-PD				●	●			●				●			7.5	-	2.8	0.7	2.8		
	090308-PD				●	●			●				●			9.2	-	3.3	0.8	3.4		
	11T308-PD				●	●			●				●			11.0	-	4.0	0.8	4.0		
	130410-PD				●	●			●				●			13.0	-	4.5	1.0	4.5		
	15M510-PD				●	●			●				●			15.2	-	5.0	1.0	5.5		
	180510-PD				●	●			●				●			18.2	-	5.5	1.0	6.0		
	030204-C21															3.8	5.56	2.38	0.4	2.5		G43 G44
	040204-C21															4.3	6.35	2.38	0.4	2.8		
	050308-C21															5.4	7.94	3.18	0.8	3.4		
	06T308-C21															6.5	9.525	3.97	0.8	4.4		
	080408-C21															8.7	12.7	4.76	0.8	5.5		
	030208-C20N					●										3.8	5.56	2.38	0.8	2.8		-
	040208-C20N					●										4.3	6.35	2.38	0.8	3.0		
	050308-C20N					●										5.4	7.94	3.18	0.8	3.4		
	06T308-C20N					●										6.5	9.525	3.97	0.8	3.7		
	080408-C20N					●										8.7	12.7	4.76	0.8	4.3		
	080412-C20N					●										8.7	12.7	4.76	1.2	4.3		
	030204-C21N					●										3.8	5.56	2.38	0.4	2.55		G43 G44
	040204-C21N					●										4.3	6.35	2.38	0.4	2.8		
	040208-C21N					●										4.3	6.35	2.38	0.8	2.8		
	050308-C21N					●										5.4	7.94	3.18	0.8	3.4		
	06T308-C21N					●										6.5	9.525	3.97	0.8	4.4		
	080408-C21N					●										8.7	12.7	4.76	0.8	5.5		
	040204-ND												●			4.3	4.9	2.4	0.4	2.3		-
	050204-ND												●			4.8	5.4	2.4	0.4	2.3		
	060204-ND												●			5.8	6.6	2.5	0.4	2.5		
	07T205-ND												●			6.9	7.8	2.8	0.5	2.8		
	090305-ND												●			8.4	9.6	3.3	0.5	3.4		
	11T306-ND												●			10.0	11.4	4.0	0.6	4.0		
	130406-ND												●			11.9	13.6	4.5	0.6	4.5		
	15M508-ND												●			13.9	15.9	5.0	0.8	5.5		
	180508-ND												●			16.5	18.9	5.5	0.8	6.0		
	060204-LD					●										5.8	6.6	2.5	0.4	2.5		G12 ~ G24
	07T205-LD					●										6.9	7.8	2.8	0.5	2.8		
	090305-LD					●										8.4	9.6	3.3	0.5	3.4		
	11T306-LD					●										10.0	11.4	4.0	0.6	4.0		
	130406-LD					●										11.9	13.6	4.5	0.6	4.5		
	15M508-LD					●										13.9	15.9	5.0	0.8	5.5		
	180508-LD					●										16.5	18.9	5.5	0.8	6.0		
	040204-PD				●											4.3	4.9	2.4	0.4	2.3		G12 ~ G24
	050204-PD				●											4.8	5.4	2.4	0.4	2.3		
	060204-PD				●											5.8	6.6	2.5	0.4	2.5		
	07T205-PD				●											6.9	7.8	2.8	0.5	2.8		
	090305-PD				●											8.4	9.6	3.3	0.5	3.4		
	11T306-PD				●											10.0	11.4	4.0	0.6	4.0		
	130406-PD				●											11.9	13.6	4.5	0.6	4.5		
	15M508-PD				●											13.9	15.9	5.0	0.8	5.5		
	180508-PD				●											16.5	18.9	5.5	0.8	6.0		

● : Stock Item

Optimized insert design for maximum drilling efficiency

KING DRILL *New*

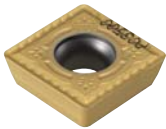
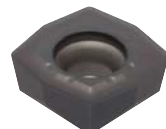
▶ Code system of holder

K	5D	200	25		—	07
KING / KORLOY	Aspect ratio(L/D)	Drill Dia.	One decimal place marked	Shank shape		Inscribed circle of insert
	2D, 2.5D, 3D, 3.5D, 4D, 4.5D, 5D	Ø20.0 (One decimal place marked)	Ø20, Ø25 Ø32, Ø40	No mark : Flange Shank, Weldone HP : Flange Shank, Weldon, PT Tap F1 : Flange Shank, Whistle Notch F2 : Flange Shank, Without Side Lock S : Straight Shank, Weldone S1 : Straight Shank, Whistle Notch S2 : Straight Shank, Without Side Lock M0, M1, M2, M3... : MT0, MT1, MT2, MT3... H63, H100 : HSK63, HSK100 B30, B40, B50 : BT30, BT40, BT50		05, 06, 07, 09 11 13, 15, 18

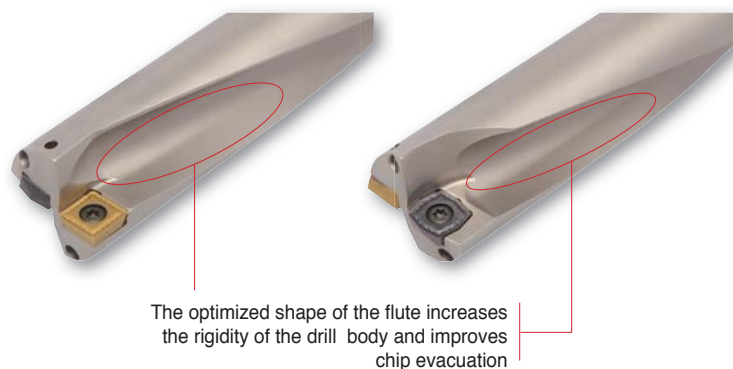
▶ Features of Insert

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.

Chip breaker	PD		LD	
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)	
Insert	Peripheral insert	Central insert	Peripheral insert	Central insert
Shape				
Grades for workpiece	NC5330 : P, M, K PC3500 : P PC5300 : P, M, K, S PC6510 : K		PC5335 : P, M	PC5335 : P, M

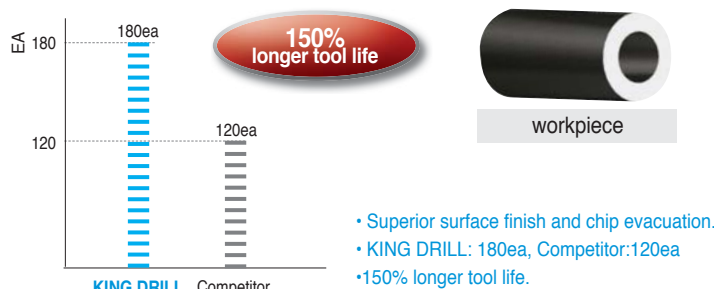
Optimized flute system - 2 coolant holes applied



Application examples

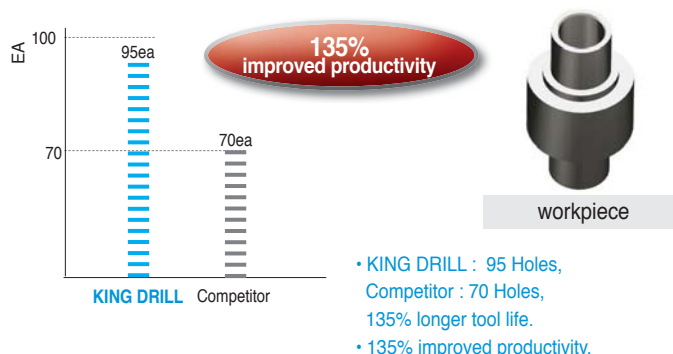
Track link bush

- **Cutting condition** : $vc(m/min)=120$, $fn(mm/rev)=0.1$
Through coolant system
- **Tools : Applicable inserts** SPMT07T208-PD(PC3500)
XOMT07T205-PD(PC5300)
Holder K5D20025-07
- **Machine** : drilling machine



Track link bush

- **Workpiece** : SCM415H
- **Cutting condition** : Competitor's $vc(m/min)=125$, $fn(mm/rev)=0.1$
Korloy's $vc(m/min)=140$, $fn(mm/rev)=0.12$
- **Tools : Applicable inserts** SPMT090308-PD(PC3500)
XOMT090305-PD(PC5300)
Holder K3D27032-09
- **Machine** : MCT



Recommended cutting condition

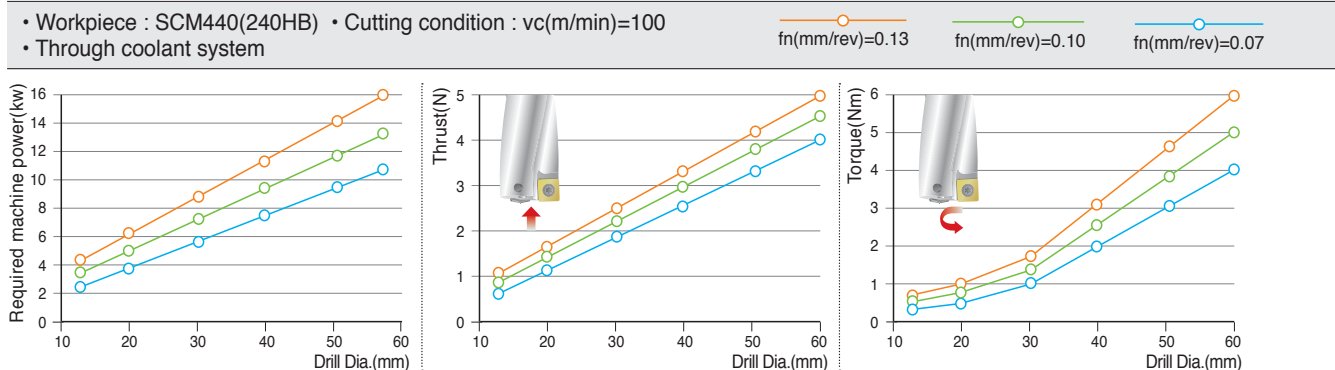
Workpiece				Insert			vc(m/min)	Depth of cut = 2D, 3D, 4D Feed rate (mm/rev) per drill dia.(mm)				
ISO	Workpiece	Hardness (HB)	Chip Breaker	Grade		Ø12~Ø16		Ø17~Ø23	Ø24~Ø29	Ø30~Ø42	Ø43~Ø60	
				Central	Peripheral							
P	Carbon steel	Low carbon steel	80~180	LD	PC5335	PC5335	120(60~170)	0.04~0.08	0.04~0.08	0.04~0.08	0.04~0.08	0.04~0.08
				PD	PC5300	PC3500	150(120~180)					
		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	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	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

- 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.

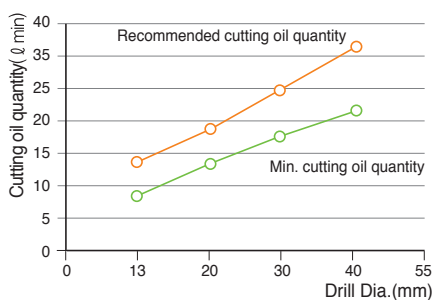
G Technical Information for KING DRILL

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.



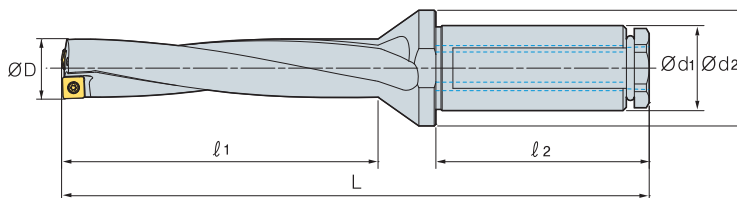
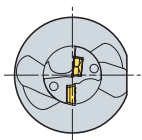
Cutting oil quantity



- Workpiece : SCM440(240HB)
- Cutting condition : $vc(m/min)=100$
- Through coolant system

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

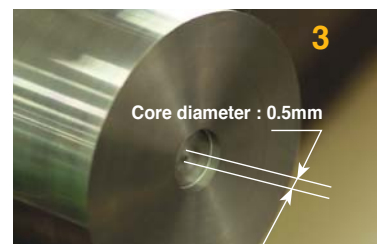
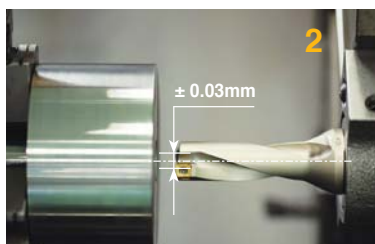
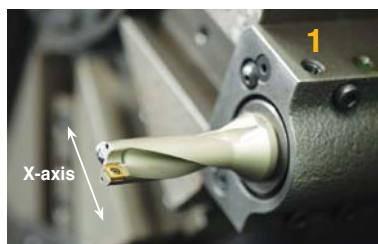
Drill tolerance and hole tolerance



(mm)

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

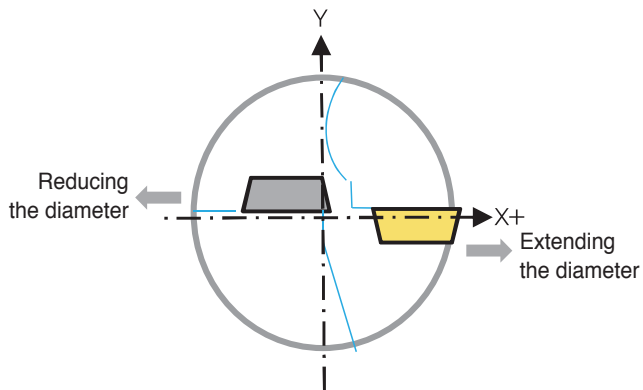
Notice for setting the drill in the lathe



- Set the peripheral insert parallel to the X axis. (based on the side lock)
- If the machined core is 0.5mm 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 with moving to the x axis. Please refer to the table showing the range of adjusting drilling diameter below.
- The more the drilling diameter is extended or reduced, the more the drill loses drilling balance. In this case, reduce the feed or cutting speed in machining.
- Reducing the machining diameter excessively could damage the holder.

(mm)							
Drill dia.	Range of adjusting drilling diameter(Ø)	Drill dia.	Range of adjusting drilling diameter(Ø)	Drill dia.	Range of adjusting drilling diameter(Ø)	Drill dia.	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		

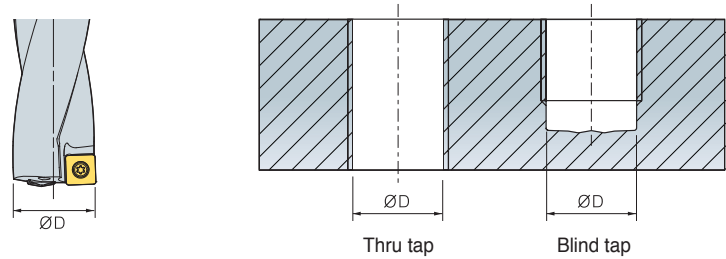
▶ Insert and parts

Drill dia.	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

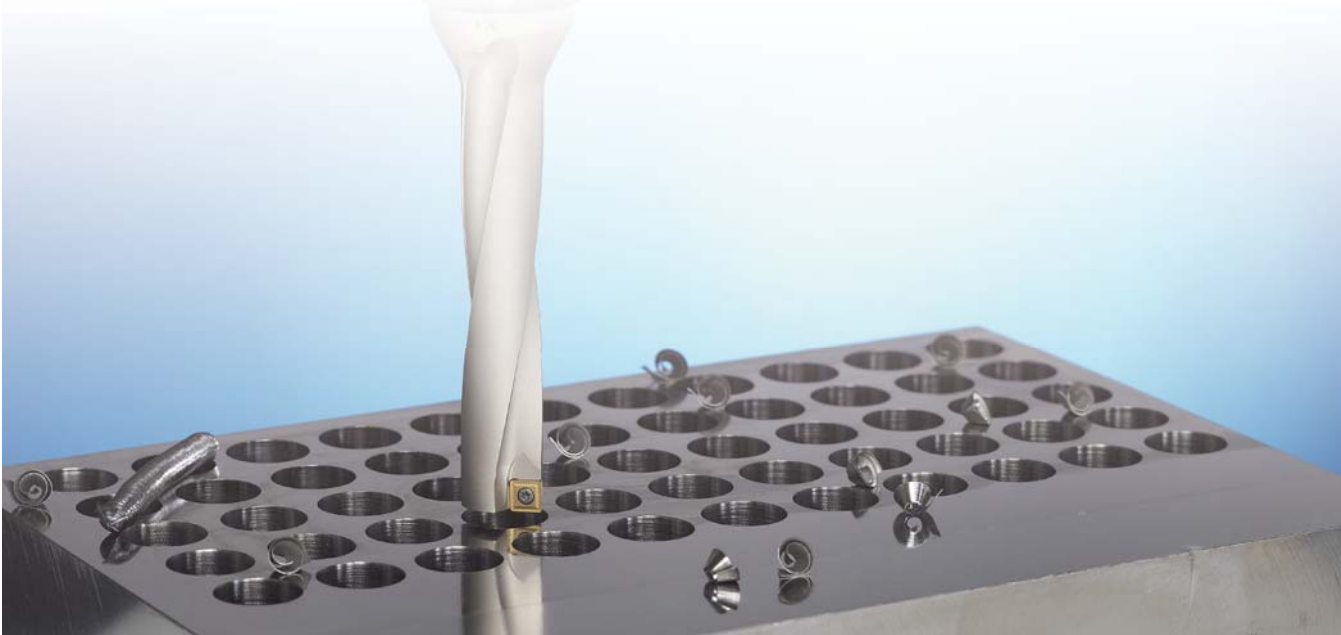
- In clamping an insert, please clean the tip seat and apply CASMOLY1000 on the screw.
- Please make sure to use a Korloy-produced wrench and screw only.

 KING DRILL - for machining a tap foundation hole

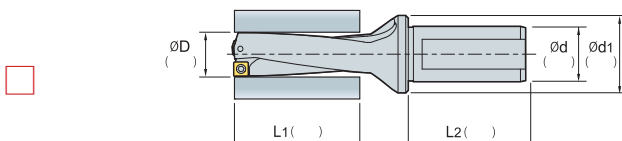
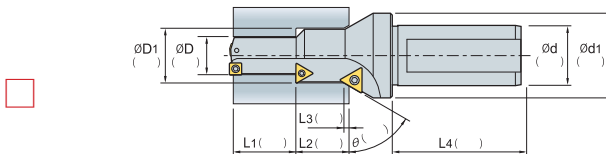
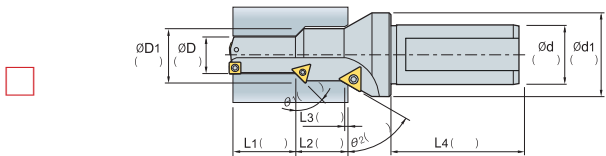
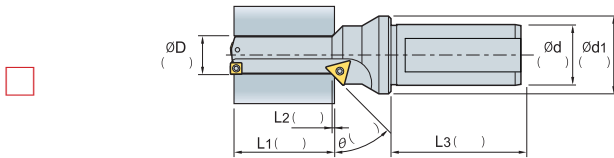
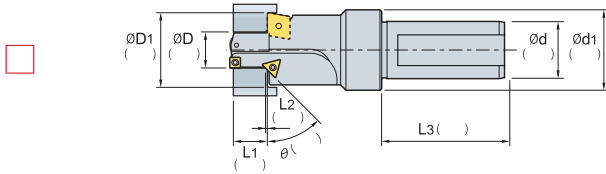
• There are two types of specifications of tap, metric and inch. The King drill is available for machining both thru tap and blind tap.



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

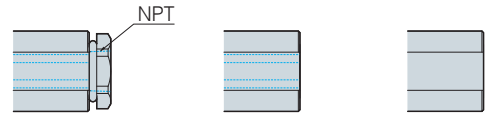


Special drill order form



■ Coolant type

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



■ Hole type

- ☐ Blind hole
 ☐ Thru hole

■ Types of shank

- ☐ Flat Type
☐ Weldon Type
☐ Whistle Notch Type

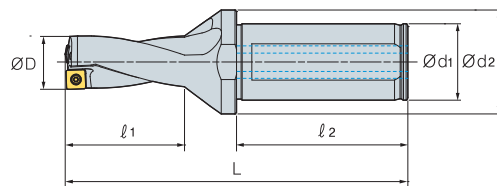
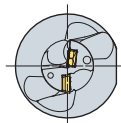
■ Location of side lock

- ☐ Parallel to peripheral insert(standard)
☐ 90°angle to peripheral insert(standard)
☐ 180°angle to peripheral insert(standard)
☐ 270° angle to peripheral insert(standard)

■ Note

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

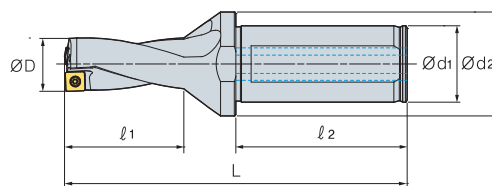
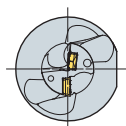
KING DRILL-2D *New*



(mm)

Designation	ØD	Ød1	Ød2	l ₁	l ₂	L	Insert	Screw 	Wrench 
K2D									
12020-04	12.0	20	25	27	50	91	SP□T040204-PD XO□T040204-PD	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-PD XO□T050204-PD	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	SP□T060205-PD XO□T060204-PD	FTKA02206S	TW07P
16525-06	16.5	25	34	35	56	107			
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-PD XO□T07T205-PD	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-PD XO□T090305-PD	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-PD XO□T11T306-PD	FTKA03508	TW15S
30532-11	30.5	32	44	63	60	150			
31032-11	31.0	32	44	65	60	152			
31532-11	31.5	32	44	65	60	152			
32032-11	32.0	32	44	67	60	154			
32532-11	32.5	32	44	67	60	154			
33032-11	33.0	32	44	69	60	157			
33532-11	33.5	32	44	69	60	157			
34032-11	34.0	32	44	71	60	159			
34532-11	34.5	32	44	71	60	159			
35032-11	35.0	32	44	73	60	161			
35532-11	35.5	32	44	73	60	161			

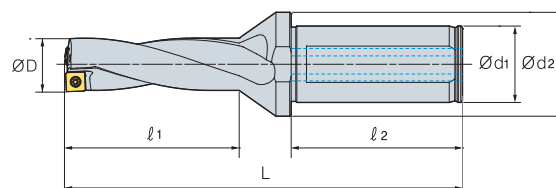
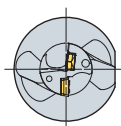
 Applicable inserts G06


KING DRILL-2D *New*

(mm)

Designation	ØD	Ød1	Ød2	l ₁	l ₂	L	Insert	Screw 	Wrench
K2D									
36040-13	36.0	40	48	76	70	176	SP□T130410-PD XO□T130406-PD	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-PD XO□T15M508-PD	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	SP□T180510-PD XO□T180508-PD	FTNA0511	TW20-100
50540-15	50.5	40	58	105	70	212			
51040-18	51.0	40	68	108	70	218			
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 *New*



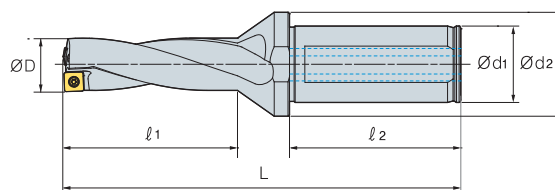
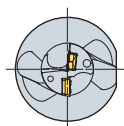
(mm)

Designation	ØD	Ød ₁	Ød ₂	l ₁	l ₂	L	Insert	Screw 	Wrench 
K3D									
12020-04*	12.0	20	25	39	50	103	SP□T040204-PD XO□T040204-PD	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-PD XO□T050204-PD	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-PD XO□T060204-PD	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	SP□T07T208-PD XO□T07T205-PD	FTKA02565	TW07S
20025-07	20.0	25	34	63	56	138			
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	SP□T090308-PD XO□T090305-PD	FTKA0307	TW09S
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			
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	SP□T090308-PD XO□T090305-PD	FTKA0307	TW09S
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	SP□T090308-PD XO□T090305-PD	FTKA0307	TW09S
29032-09*	29.0	32	44	90	60	174			
29532-09	29.5	32	44	90	60	174			

Applicable inserts **G06**

The items marked * can machine a tap foundation hole.

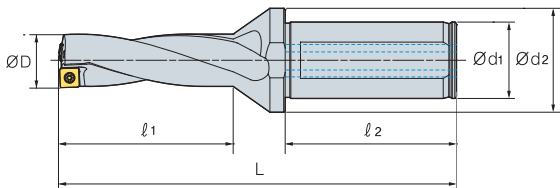
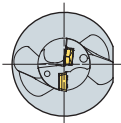


KING DRILL-3D *New*

(mm)

Designation		ØD	Ød ₁	Ød ₂	ℓ ₁	ℓ ₂	L	Insert	Screw 	Wrench 
K3D	30032-11*	30.0	32	44	93	60	180	SPCJT11T308-PD XOCJT11T306-PD	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	SPCJT130410-PD XOCJT130406-PD	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	SPCJT15M510-PD XOCJT15M508-PD	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				

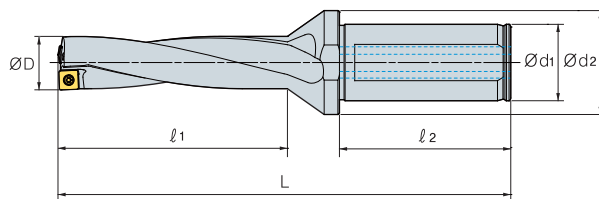
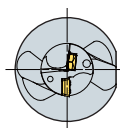
KING DRILL-3D *New*



(mm)

Designation		ØD	Ød ₁	Ød ₂	ℓ ₁	ℓ ₂	L	Insert	 Screw	 Wrench
K3D	51040-18	51.0	40	68	159	70	269	SP□T180510-PD XO□T180508-PD	 FTNA0511	 TW20-100
	51540-18	51.5	40	68	159	70	269			
	52040-18	52.0	40	68	162	70	272			
	52540-18	52.5	40	68	162	70	272			
	53040-18	53.0	40	68	165	70	275			
	53540-18	53.5	40	68	165	70	275			
	54040-18	54.0	40	68	168	70	278			
	54540-18	54.5	40	68	168	70	278			
	55040-18	55.0	40	68	171	70	281			
	55540-18	55.5	40	68	171	70	281			
	56040-18	56.0	40	68	174	70	286			
	56540-18	56.5	40	68	174	70	286			
	57040-18	57.0	40	68	178	70	290			
	57540-18	57.5	40	68	178	70	290			
	58040-18	58.0	40	68	182	70	294			
	58540-18	58.5	40	68	182	70	294			
	59040-18	59.0	40	68	186	70	298			
	59540-18	59.5	40	68	186	70	298			
	60040-18	60.0	40	68	190	70	302			
	60540-18	60.5	40	68	190	70	302			

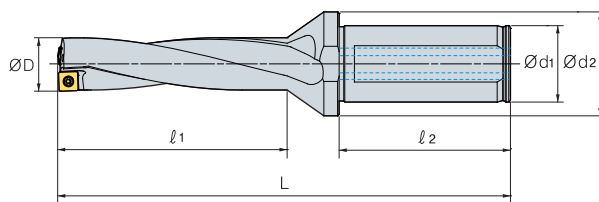
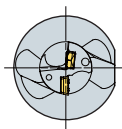
 Applicable inserts G06

KING DRILL-4D *New*

(mm)

Designation		ØD	Ød1	Ød2	l ₁	l ₂	L	Insert	Screw	Wrench
K4D	12020-04	12.0	20	25	51	50	115	SPLIT040204-PD XOCT040204-PD	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	SPLIT050204-PD XOCT050204-PD	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	SPLIT060205-PD XOCT060204-PD	FTKA02206S	TW07P
	16525-06	16.5	25	34	67	56	139			
	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	SPLIT07T208-PD XOCT07T205-PD	FTKA02565	TW07S
	19525-06	19.5	25	34	79	56	152			
	20025-07	20.0	25	34	83	56	158			
	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	SPLIT090308-PD XOCT090305-PD	FTKA0307	TW09S
	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			
	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	SPLIT11T308-PD XOCT11T306-PD	FTKA03508	TW15S
	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			
	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 *New*

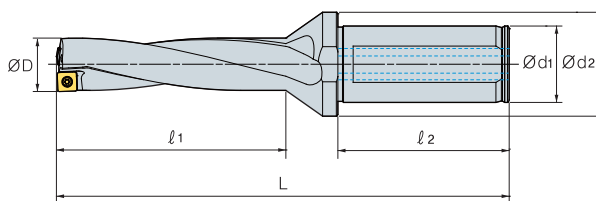
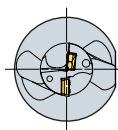


(mm)

Designation		ØD	Ød1	Ød2	l ₁	l ₂	L	Insert	Screw 	Wrench 
K4D	36040-13	36.0	40	48	148	70	248	SP□T130410-PD XO□T130406-PD	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-PD XO□T15M508-PD	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-PD XO□T180508-PD	FTNA0511	TW20-100
	51540-18	51.5	40	68	210	70	320			
	52040-18	52.0	40	68	214	70	324			
	52540-18	52.5	40	68	214	70	324			
	53040-18	53.0	40	68	218	70	328			
	53540-18	53.5	40	68	218	70	328			
	54040-18	54.0	40	68	222	70	332			
	54540-18	54.5	40	68	222	70	332			
	55040-18	55.0	40	68	226	70	336			
	55540-18	55.5	40	68	226	70	336			
	56040-18	56.0	40	68	230	70	342			
	56540-18	56.5	40	68	230	70	342			
	57040-18	57.0	40	68	235	70	347			
	57540-18	57.5	40	68	235	70	347			
	58040-18	58.0	40	68	240	70	352			
	58540-18	58.5	40	68	240	70	352			
	59040-18	59.0	40	68	245	70	357			
	59540-18	59.5	40	68	245	70	357			
	60040-18	60.0	40	68	250	70	362			
	60540-18	60.5	40	68	250	70	362			

Applicable inserts G06



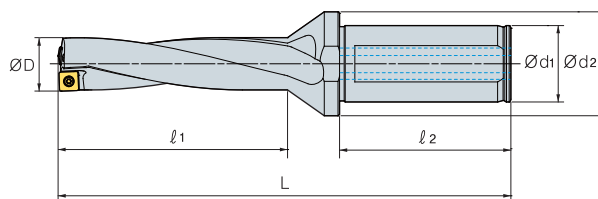
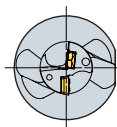
KING DRILL-5D *New*

(mm)

Designation		ØD	Ød1	Ød2	l ₁	l ₂	L	Insert	Screw	Wrench
K5D	12020-04	12.0	20	25	63	50	127	SPCIT040204-PD XOCIT040204-PD	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	SPCIT050204-PD XOCIT050204-PD	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	SPCIT060205-PD XOCIT060204-PD	FTKA02206S	TW07P
	16525-06	16.5	25	34	83	56	155			
	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	SPCIT07T208-PD XOCIT07T205-PD	FTKA02565	TW07S
	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	SPCIT090308-PD XOCIT090305-PD	FTKA0307	TW09S
	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	SPCIT11T308-PD XOCIT11T306-PD	FTKA03508	TW15S
	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	SPCIT11T308-PD XOCIT11T306-PD	FTKA03508	TW15S
	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	SPCIT11T308-PD XOCIT11T306-PD	FTKA03508	TW15S
	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	SPCIT11T308-PD XOCIT11T306-PD	FTKA03508	TW15S
	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	SPCIT11T308-PD XOCIT11T306-PD	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	SPCIT11T308-PD XOCIT11T306-PD	FTKA03508	TW15S
	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	SPCIT11T308-PD XOCIT11T306-PD	FTKA03508	TW15S
	34532-11	34.5	32	44	173	60	261			
	35032-11	35.0	32	44	178	60	266			
	35532-11	35.5	32	44	178	60	266			

Applicable inserts G06

KING DRILL-5D *New*



(mm)

Designation		ØD	Ød ₁	Ød ₂	l ₁	l ₂	L	Insert	Screw	Wrench
K5D	36040-13	36.0	40	48	184	70	284	SP□T130410-PD XO□T130406-PD	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-PD XO□T15M508-PD	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-PD XO□T180508-PD	FTNA0511	TW20-100
	51540-18	51.5	40	68	261	70	371			
	52040-18	52.0	40	68	266	70	376			
	52540-18	52.5	40	68	266	70	376			
	53040-18	53.0	40	68	271	70	381			
	53540-18	53.5	40	68	271	70	381			
	54040-18	54.0	40	68	276	70	386			
	54540-18	54.5	40	68	276	70	386			
	55040-18	55.0	40	68	281	70	391			
	55540-18	55.5	40	68	281	70	391			
	56040-18	56.0	40	68	286	70	398			
	56540-18	56.5	40	68	286	70	398			
	57040-18	57.0	40	68	292	70	404			
	57540-18	57.5	40	68	292	70	404			
	58040-18	58.0	40	68	298	70	410			
	58540-18	58.5	40	68	298	70	410			
	59040-18	59.0	40	68	304	70	416			
	59540-18	59.5	40	68	304	70	416			
	60040-18	60.0	40	68	310	70	422			
	60540-18	60.5	40	68	310	70	422			

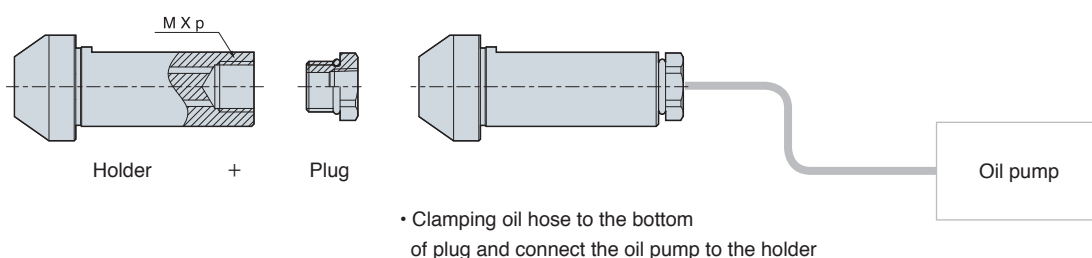
Applicable inserts G06



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

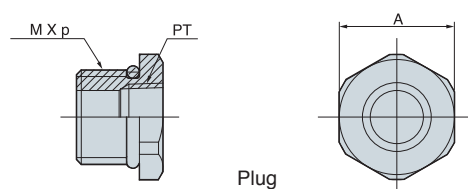
KING DRILL ^{New} (for through coolant system with a lathe)

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



(mm)

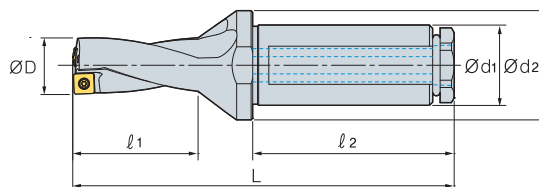
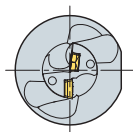
Tap type	Diameter	Shank Dia.	M x p	Plug
K□D120~16020HP-□□	Ø12.0 ~ Ø16.0	Ø20	M12 x 1.5	PLG12PT18
K□D161~23525HP-□□	Ø16.1 ~ Ø23.5	Ø25	M16 x 1.5	PLG16PT18
K□D236~35532HP-□□	Ø23.6 ~ Ø35.5	Ø32	M20 x 2.0	PLG20PT14
K□D356~60940HP-□□	Ø35.6 ~ Ø60.5	Ø40	M27 x 2.0	PLG27PT38



- 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 through coolant system with a lathe)-2D New

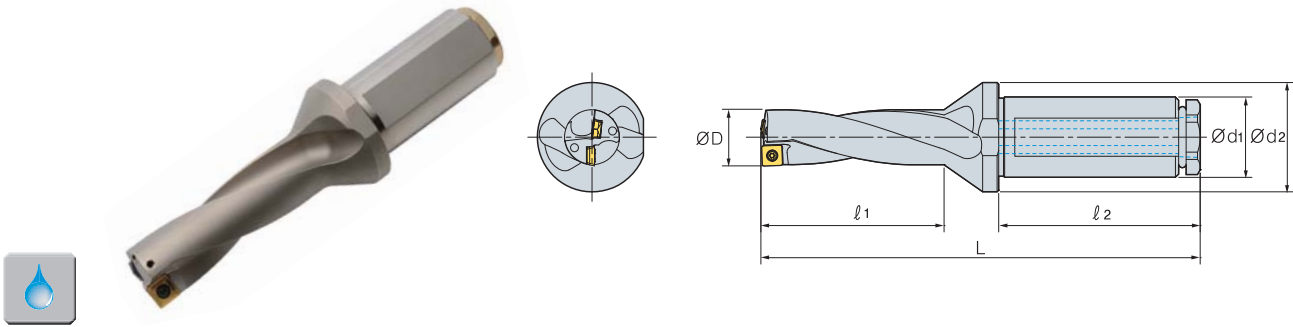


(mm)

Designation		ØD	Ød ₁	Ød ₂	l ₁	l ₂	L	Insert	Screw 	Wrench 
K2D	13020HP-04	13.0	20	25	29	50	93	SP□T040204-PD XO□T040204-PD	FTNA0204	TW06P
	14020HP-05	14.0	20	25	31	50	96	SP□T050204-PD XO□T050204-PD	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			
	18025HP-06	18.0	25	34	39	56	112	SP□T060205-PD XO□T060204-PD	FTKA02206S	TW07P
	19025HP-06	19.0	25	34	41	56	114			
	20025HP-07	20.0	25	34	43	56	118			
	21025HP-07	21.0	25	34	45	56	120	SP□T07T208-PD XO□T07T205-PD	FTKA02565	TW07S
	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-PD XO□T090305-PD	FTKA0307	TW09S
	25032HP-09	25.0	32	44	53	60	135			
	26032HP-09	26.0	32	44	55	60	137			
	27032HP-09	27.0	32	44	57	60	140			
	28032HP-09	28.0	32	44	59	60	143			
	29032HP-09	29.0	32	44	61	60	145			

 Applicable inserts **G06**

KING DRILL(for through coolant system with a lathe)-3D New

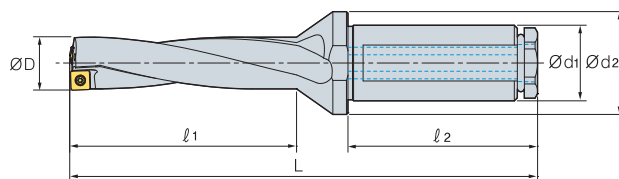
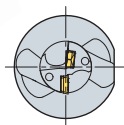


(mm)

Designation		ØD	Ød ₁	Ød ₂	ℓ ₁	ℓ ₂	L	Insert	 Screw	 Wrench
K3D	13020HP-04	13.0	20	25	42	50	106	SP□T040204-PD XO□T040204-PD	FTNA0204	TW06P
	13520HP-04	13.5	20	25	42	50	106			
	14020HP-05	14.0	20	25	45	50	110			
	14520HP-05	14.5	20	25	45	50	110			
	15020HP-05	15.0	20	25	48	50	114	SP□T050204-PD XO□T050204-PD	FTNA0204	TW06P
	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			
	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	SP□T060205-PD XO□T060204-PD	FTKA02206S	TW07P
	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			
	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	SP□T07T208-PD XO□T07T205-PD	FTKA02565	TW07S
	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			
	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	SP□T090308-PD XO□T090305-PD	FTKA0307	TW09S
	27032HP-09	27.0	32	44	84	60	167			
	27532HP-09	27.5	32	44	84	60	167			
	28032HP-09	28.0	32	44	87	60	171			
	28532HP-09	28.5	32	44	87	60	171			
	29032HP-09	29.0	32	44	90	60	174			
	29532HP-09	29.5	32	44	90	60	174			

↻ Applicable inserts **G06**

KING DRILL(for through coolant system with a lathe)-4D



(mm)

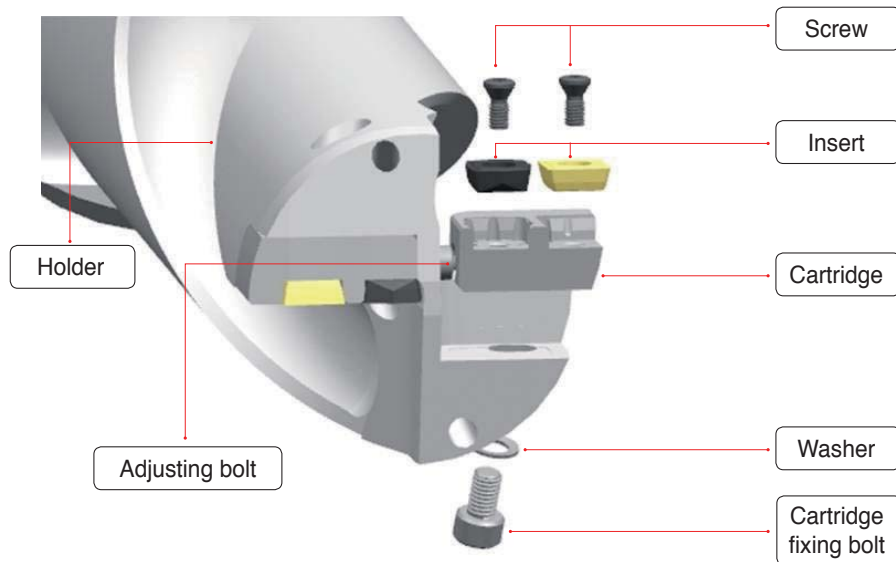
Designation		ØD	Ød ₁	Ød ₂	l ₁	l ₂	L	Insert	Screw 	Wrench 
K4D	13020HP-04	13.0	20	25	29	50	93	SP□T040204-PD XO□T040204-PD	FTNA0204	TW06P
	14020HP-05	14.0	20	25	59	50	124	SP□T050204-PD XO□T050204-PD	FTNA0204	TW06P
	15020HP-05	15.0	20	25	63	50	129			
	16020HP-05	16.0	20	25	67	50	133			
	17025HP-06	17.0	25	34	71	56	143	SP□T060205-PD XO□T060204-PD	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-PD XO□T07T205-PD	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	SP□T090308-PD XO□T090305-PD	FTKA0307	TW09S
	24032HP-09	24.0	32	44	99	60	181			
	25032HP-09	25.0	32	44	103	60	185			
	26032HP-09	26.0	32	44	107	60	189			
	27032HP-09	27.0	32	44	111	60	194			
	28032HP-09	28.0	32	44	115	60	199			
	29032HP-09	29.0	32	44	119	60	203			

 Applicable inserts G06

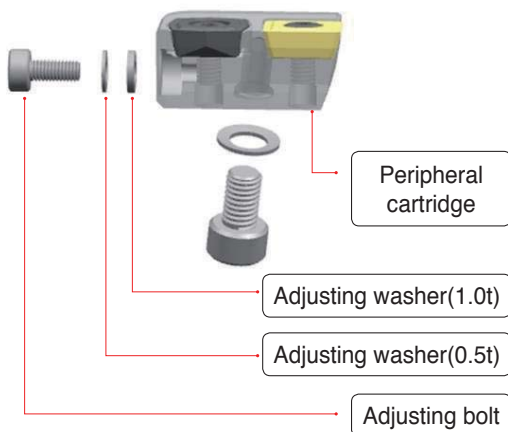
High rigidity drill produces cost efficiency due to cartridge replacement.

KING DRILL (for large diameter drilling) *New*

- Cartridge type for $\varnothing 61 \sim \varnothing 100$ drilling.
- Peripheral cartridge can adjust the drilling diameter within 5mm.
- Easy to adjust drilling diameter with adjusting bolt.



▶ Adjustment of drill diameter

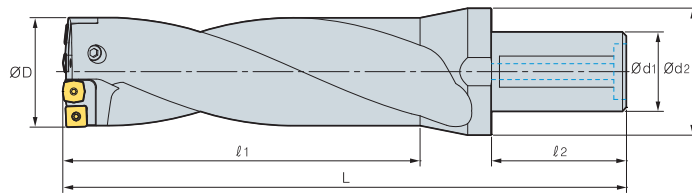


Adjustment $\varnothing$ (mm)	Adjusting Washer	
	Designation	Width(mm)
1	WA0305	0.5
2	WA0310	1.0
3	WA0305 + WA0310	1.5
4	WA0310 x 2	2.0
5	WA0305 + WA0310 x 2	2.5

※ Adjusting washer adjusts the drilling diameter within 5mm.



KING DRILL(for large diameter drilling) *New*



(mm)

Designation		ØD	Ød ₁	Ød ₂	ℓ ₁	ℓ ₂	L	Cartridge		 Screw	 Wrench
								Internal	External		
K2D	616550-11	61~65	50	80	130	80	255	KDC6165C	KDC6165P	FTKA03508	TW15S
	657050-13	65~70	50	88	140	80	265	KDC6570C	KDC6570P	FTKA0410	TW15S
	707550-13	70~75	50	88	150	80	275	KDC7075C	KDC7075P	FTKA0410	TW15S
	758050-13	75~80	50	88	160	80	285	KDC7580C	KDC7580P	FTKA0410	TW15S
	808550-15	80~85	50	88	170	80	295	KDC8085C	KDC8085P	FTNC04511	TW20S
	859050-15	85~90	50	95	180	80	305	KDC8590C	KDC8590P	FTNC04511	TW20S
	909550-15	90~95	50	95	190	80	315	KDC9095C	KDC9095P	FTNC04511	TW20S
	9510050-18	95~100	50	95	200	80	325	KDC95100C	KDC95100P	FTNA0511	TW20-100
K3D	616550-11	61~65	50	80	195	80	320	KDC6165C	KDC6165P	FTKA03508	TW15S
	657050-13	65~70	50	88	210	80	335	KDC6570C	KDC6570P	FTKA0410	TW15S
	707550-13	70~75	50	88	225	80	350	KDC7075C	KDC7075P	FTKA0410	TW15S
	758050-13	75~80	50	88	240	80	365	KDC7580C	KDC7580P	FTKA0410	TW15S
	808550-15	80~85	50	88	255	80	380	KDC8085C	KDC8085P	FTNC04511	TW20S
	859050-15	85~90	50	95	270	80	395	KDC8590C	KDC8590P	FTNC04511	TW20S
	909550-15	90~95	50	95	285	80	410	KDC9095C	KDC9095P	FTNC04511	TW20S
	9510050-18	95~100	50	95	300	80	425	KDC95100C	KDC95100P	FTNA0511	TW20-100
K4D	616550-11	61~65	50	80	260	80	385	KDC6165C	KDC6165P	FTKA03508	TW15S
	657050-13	65~70	50	88	280	80	405	KDC6570C	KDC6570P	FTKA0410	TW15S
	707550-13	70~75	50	88	300	80	425	KDC7075C	KDC7075P	FTKA0410	TW15S
	758050-13	75~80	50	88	320	80	445	KDC7580C	KDC7580P	FTKA0410	TW15S
	808550-15	80~85	50	88	340	80	465	KDC8085C	KDC8085P	FTNC04511	TW20S
	859050-15	85~90	50	95	360	80	485	KDC8590C	KDC8590P	FTNC04511	TW20S
	909550-15	90~95	50	95	380	80	505	KDC9095C	KDC9095P	FTNC04511	TW20S
	9510050-18	95~100	50	95	400	80	525	KDC95100C	KDC95100P	FTNA0511	TW20-100

Applicable inserts G06

Parts

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



Cone Shaped Head Indexable Drill

TPDC *New*

- Clamping design
 - One step clamp system → Increased stability
 - Clamping system allowing to change inserts while the holder is attached on the machine → Shortened setting time
- Optimized blade design
 - Excellent chip control → 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

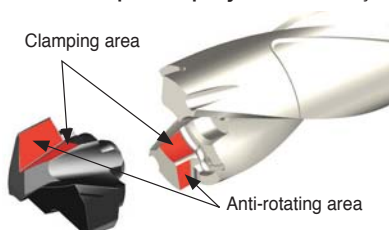
TPD	C	5D	–	150	20	–	75
<u>Top solid Piercing Drill</u>	<u>Insert type</u> C : Cone type	<u>Aspect ratio(L/D)</u> 3D, 5D, 8D		<u>Drill dia.</u> 150 : Ø15.0	<u>Shank dia.</u> 20 : Ø20		<u>Flute length(mm)</u>

▶ Code system of insert

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

Features of Clamping System

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



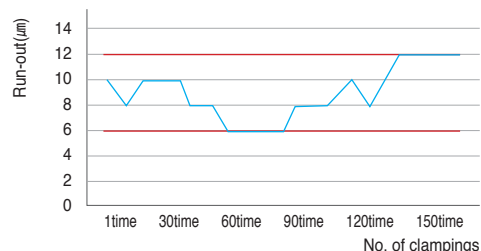
- **Clamping area** : Easy and fast tool change
- **Anti-rotating area** : Performs as a stopper
- Clamping and anti-rotating area make an acute angle to prevent insert rotation while machining

Durability test

- **Workpiece** : SCM440(HRC22)
- **Cutting condition** : Drill dia.(mm) = Ø15.0
vc(m/min) = 90
fn(mm/rev) = 0.25, ap(mm) = 60
wet
- **Tools** : **Insert** TPD1500CP(PC5335)
Holder TPDC5D-15020-75

→ After using 40 inserts, the setting run-out remains below 15 μ m

Sustainability test

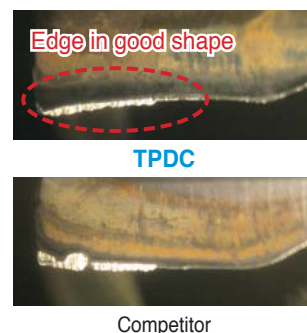
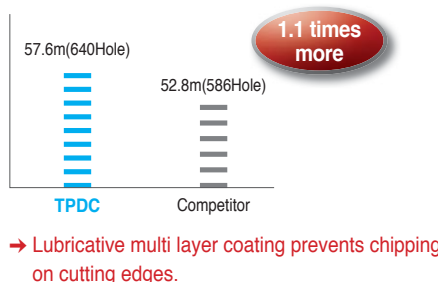


→ After clamping 150 times, the drill run-out remains

Cutting Performance

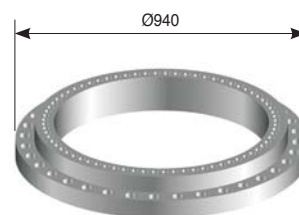
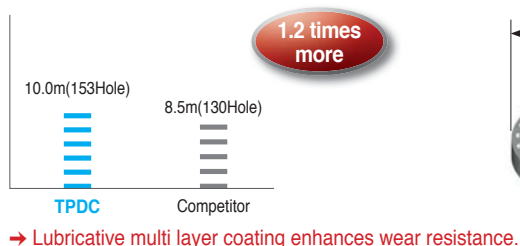
Part of machine

- **Workpiece** : Alloy steel (SCM440, HRC22)
- **Cutting condition** : Drill dia.(mm) = Ø19.0
vc(m/min) = 100
fn(mm/rev) = 0.3
ap(mm) = 90
wet
- **Tools** : **Insert** TPD1900CP (PC5335)
Holder TPDC5D-19025-95



Part of machine

- **Workpiece** : Carbon steel (SM45C, HRC40)
- **Cutting condition** : Drill dia.(mm) = Ø18.0
vc(m/min) = 60
fn(mm/rev) = 0.15
ap(mm) = 65
wet
- **Tools** : **Insert** TPD1800CP (PC5335)
Holder TPDC5D-18025-90



Recommended Cutting Condition

Workpiece			Grade	vc	Depth of cut = 3D, 5D	
ISO	Workpiece	HB			Feed rate (mm/rev) per drill dia.(mm)	
				m/min	Ø12.00~Ø15.99	Ø16.00~Ø25.99
P	Carbon steel	Low carbon steel	PC5335	110(80~140)	0.15~0.30	0.20~0.35
		High carbon steel	PC5335	100(70~130)	0.15~0.30	0.20~0.35
	Alloy steel	Low alloy steel	PC5335	110(80~140)	0.18~0.35	0.23~0.38
		Low pre-hardened steel	PC5335	75(50~100)	0.18~0.35	0.23~0.38
		High alloy steel	PC5335	70(50~90)	0.18~0.30	0.20~0.35
		High pre-hardened steel	PC5335	60(40~80)	0.18~0.30	0.20~0.35

- 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.

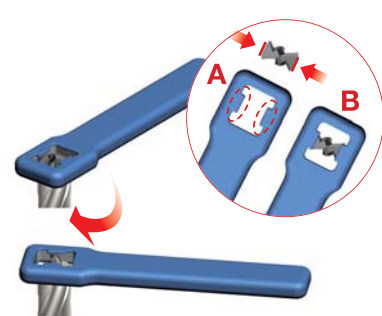
▶ How to Make Good Insert Clamping



① Clean the mounting seat with air or cloth.



② Put an insert on the holder.



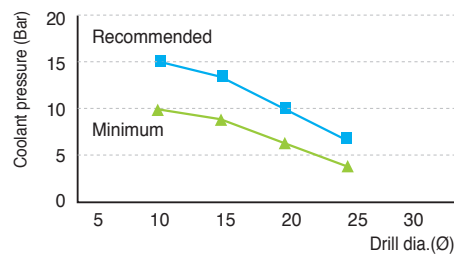
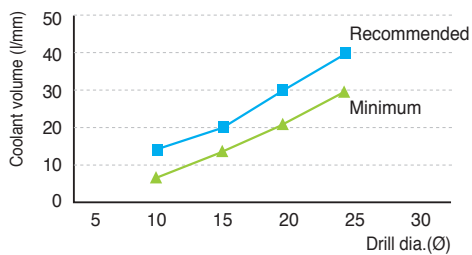
③ A part of wrench and B part of insert must be parallel to each other before clamp the insert.
Turn the wrench clockwise to finish clamping.



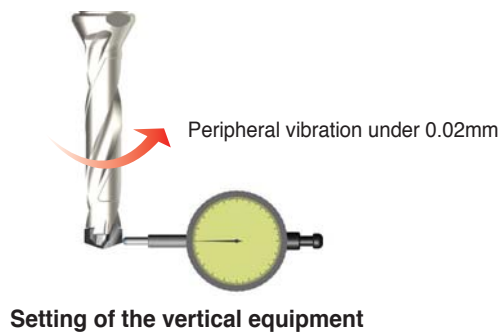
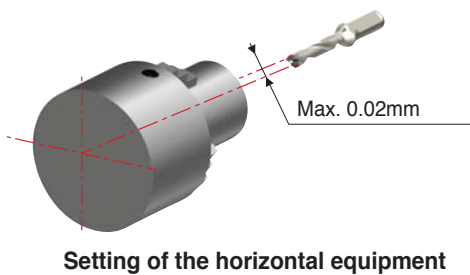
Clamped state

▶ Coolant Tip

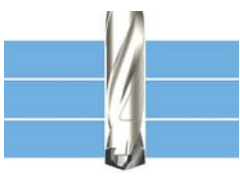
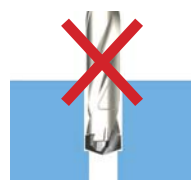
- **Workpiece** : SCM440(HRC22)
- **Cutting condition** : $vc(m/min) = 100$, wet



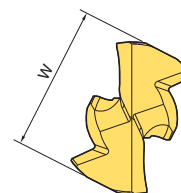
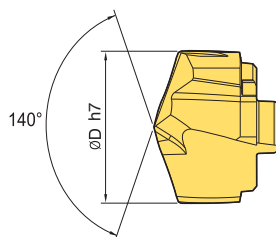
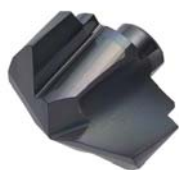
▶ Precautions When Setting



▶ Precautions When Drilling

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

TPDC Insert *New*



(mm)

Designation		Drill dia. (ØD)	W	Grade	Holder	Wrench
TPD	1200CP	12.0	11.4	PC5335	TPDC(3, 5, 8)D-12016-(36, 60, 96)	TPDC-W12
	1220CP	12.2			TPDC(3, 5, 8)D-12516-(38, 63, 100)	
	1250CP	12.5				
	1260CP	12.6				
	1300CP	13.0	12.3	PC5335		TPDC(3, 5, 8)D-13016-(39, 65, 104)
	1350CP	13.5			TPDC(3, 5, 8)D-13516-(41, 68, 108)	
	1400CP	14.0	13.4	PC5335	TPDC(3, 5, 8)D-14016-(42, 70, 112)	TPDC-W14
	1420CP	14.2				
	1430CP	14.3			TPDC(3, 5, 8)D-14516-(44, 73, 116)	
	1450CP	14.5				
	1500CP	15.0	14.3	PC5335	TPDC(3, 5, 8)D-15020-(45, 75, 120)	TPDC-W15
	1550CP	15.5				
	1600CP	16.0	15.3	PC5335	TPDC(3, 5, 8)D-16020-(48, 80, 128)	TPDC-W16
	1630CP	16.3				
	1650CP	16.5				
	1670CP	16.7				
	1700CP	17.0	16.3	PC5335	TPDC(3, 5, 8)D-17020-(51, 85, 136)	TPDC-W17
	1750CP	17.5				
	1770CP	17.7				
	1800CP	18.0				
	1810CP	18.1	17.3	PC5335	TPDC(3, 5, 8)D-18025-(54, 90, 144)	TPDC-W18
	1850CP	18.5				
	1860CP	18.6				
	1870CP	18.7				
	1900CP	19.0	18.3	PC5335	TPDC(3, 5, 8)D-19025-(57, 95, 152)	TPDC-W19
	1920CP	19.2				
	1950CP	19.5				
	1970CP	19.7				

※ Order made items available

Recommended Torque per Wrench

(mm)

Designation	Drill dia.(ØD)	Torque(Nm)
TPDC-W12	12.0 ~ 12.9	2.5
TPDC-W13	13.0 ~ 13.9	2.5
TPDC-W14	14.0 ~ 14.9	2.5
TPDC-W15	15.0 ~ 15.9	2.5
TPDC-W16	16.0 ~ 16.9	2.5
TPDC-W17	17.0 ~ 17.9	3.5
TPDC-W18	18.0 ~ 18.9	3.5
TPDC-W19	19.0 ~ 19.9	3.5



TPDC3D/5D/8D *New*

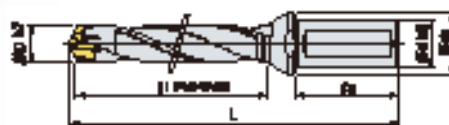


Fig.1

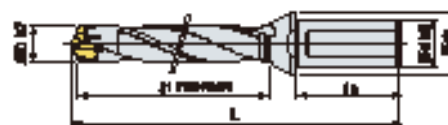


Fig.2

(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
	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
8D	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

※ The shank is based on DIN6535 and ISO9677.

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

TPDB *New*

- 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.

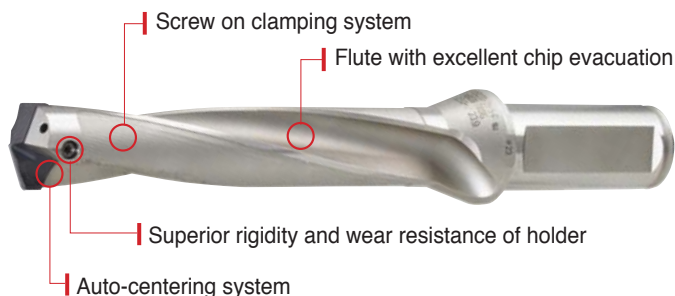
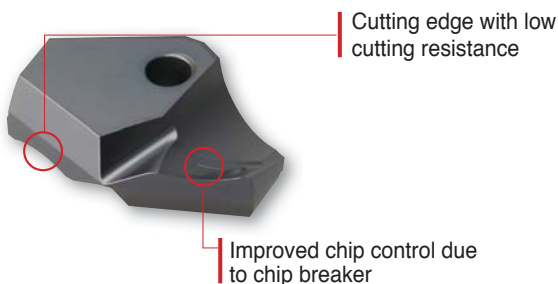
Code system of holder



Code system of Insert



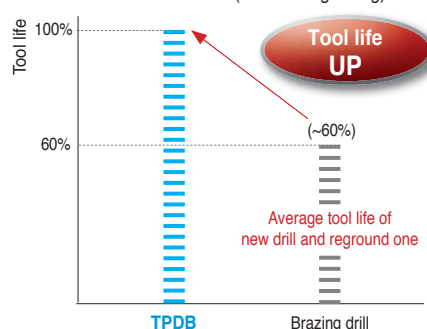
Features



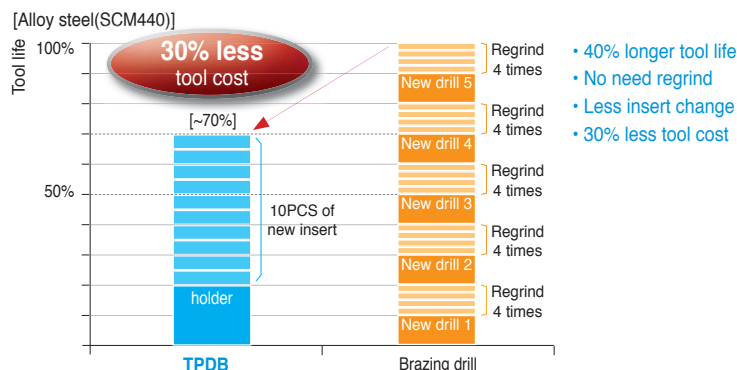
Tool Cost

Comparison of 1 insert tool life

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



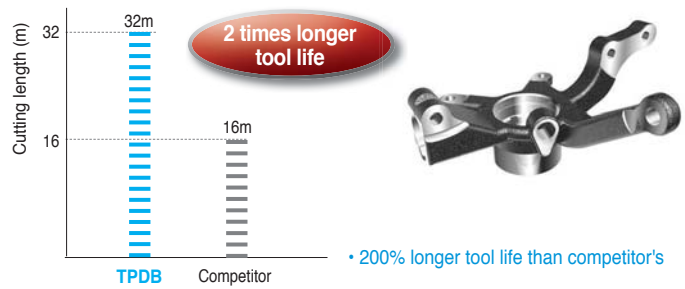
Comparison of tool cost when machining 1000PCS of workpiece



Application example

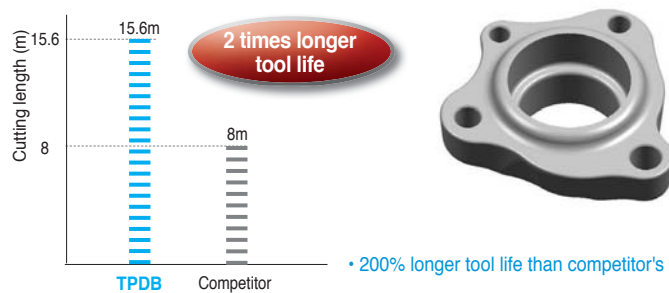
Part of automobile

- **Workpiece** : GCD 500
- **Cutting condition** : $vc(m/min)=98$
 $fn(mm/rev)=0.31$
 $ap(mm)=40$
 Inner coolant system
- **Tools** : Insert TPD195B(PC5300)
 Holder TPDB195-25-3
- **Machine** : MCT (vertical)



Part of heavy equipment

- **Workpiece** : Hot Forged Steel
- **Cutting condition** : $vc(m/min)=85$
 $fn(mm/rev)=0.2$
 $ap(mm)=20$
 Inner coolant system
- **Tools** : Insert TPD210B(PC5300)
 Holder TPDB210-25-3
- **Machine** : MCT (vertical)



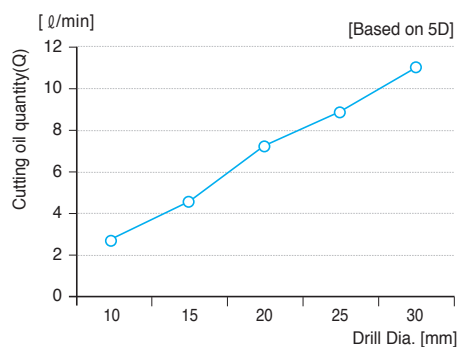
Recommended Cutting Condition

Workpiece				Grade	vc	Depth of cut = 3D~5D Feed rate (mm/rev) per drill dia.(mm)		
ISO	Workpiece	HB	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	400~	PC5300	35(20~50)	0.10~0.20	0.12~0.22	0.13~0.25

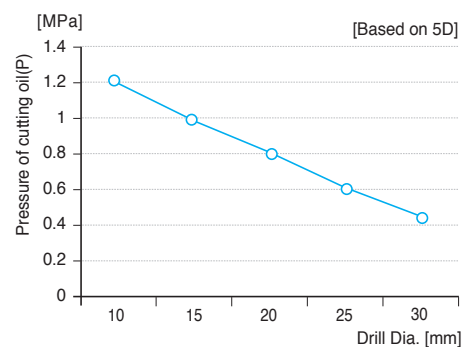
- In case of 8D, reduce the cutting conditions to 40~50% or machine the beginning of hole first.(1.5D)
- In case of interrupted machining, reduce the feed to 30~50% machining around the interrupted part.

Technical information

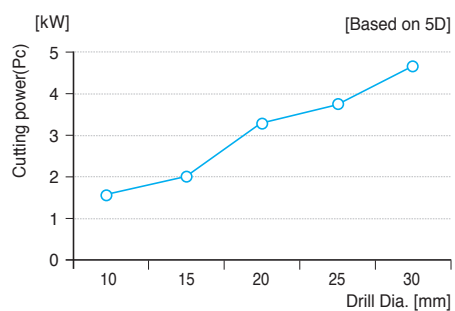
Cutting oil quantity



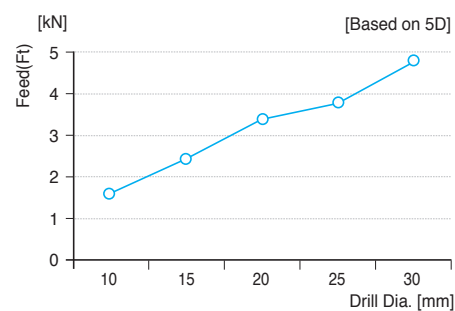
Pressure of cutting oil



Cutting power



Feed



How to clamp a TPDB insert

Clamping an insert on a holder



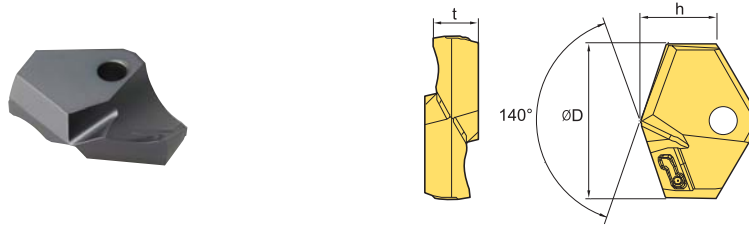
- Put an insert in the holder.
- As the Fig.1, clamp the insert while pushing it to the V shaped groove of the holder.
- Screw the insert.

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 Insert *New*



(mm)

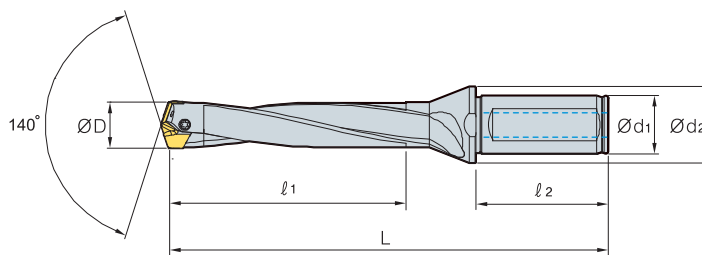
Designation	Grade	ØD	h	t
TPD	100B~109B	PC5300	10.0 ~ 10.9	5.5
	110B~119B	PC5300	11.0 ~ 11.9	5.8
	120B~129B	PC5300	12.0 ~ 12.9	6.3
	130B~139B	PC5300	13.0 ~ 13.9	6.5
	140B~149B	PC5300	14.0 ~ 14.9	6.8
	150B~159B	PC5300	15.0 ~ 15.9	7.0
	160B~169B	PC5300	16.0 ~ 16.9	7.7
	170B~179B	PC5300	17.0 ~ 17.9	7.9
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

Parts

(mm)

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

TPDB-3D *New*



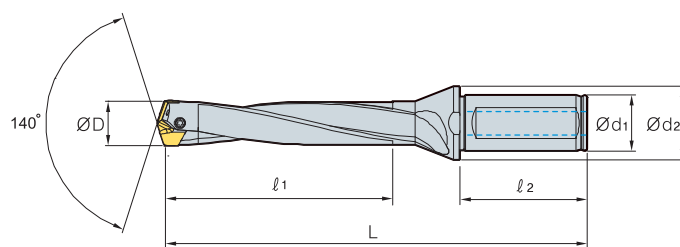
(mm)

Designation		ØD	Ød ₁	Ød ₂	ℓ ₁	ℓ ₂	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	

→ Applicable inserts G35



TPDB-5D *New*

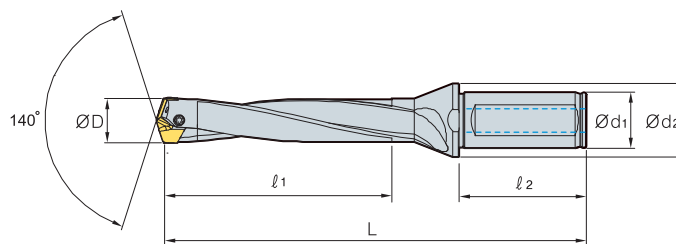


(mm)

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	

Applicable inserts **G35**

TPDB-8D *New*



(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

→ Applicable inserts G35



Convenient and quickly adjustable drill height

WPDC

Indexable drill clamped with center drill

▶ Code System for Drill

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

▶ Code System for Cartridge

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

▶ Code System for Center Drill

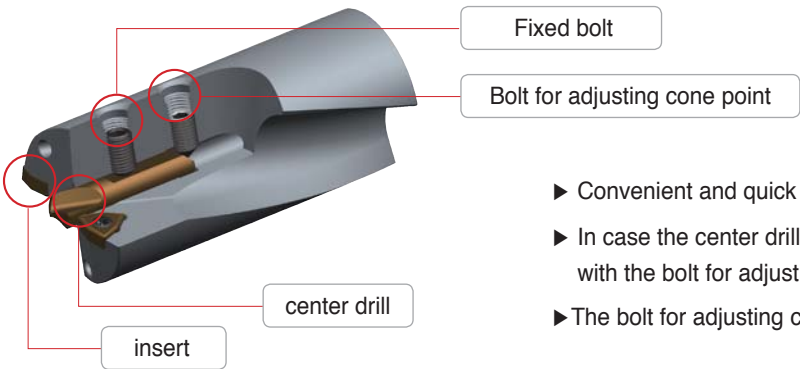
CD	H	1035
Type	Coolant	Diameter × Length of Tool
Center Drill	H : Coolant Unmarked : None	0630 : Ø6 X 30 0835 : Ø8 X 35 1035 : Ø10 X 35 1238 : Ø12 X 38 1645 : Ø16 X 45

▶ Grade of Center Drill

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

▶ How to clamp the drills

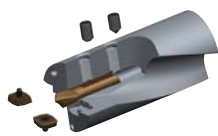
Feature of corn-point system



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

Clamping

1



Place a center drill.

2



Clamp insert and cartridge.

3



Adjust the center drill with the bolt for adjusting cone point.

4



Clamp the center drill firmly with fixing bolt.

5

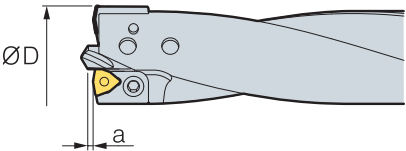


Reassure the clamp with bolt for adjusting cone point.

- ※ Caution
- (1) Use safety covers for your safety when clamping the center drill and insert.
 - (2) When machining, be careful of the drill disk.

Length of the 'a' part of center drill

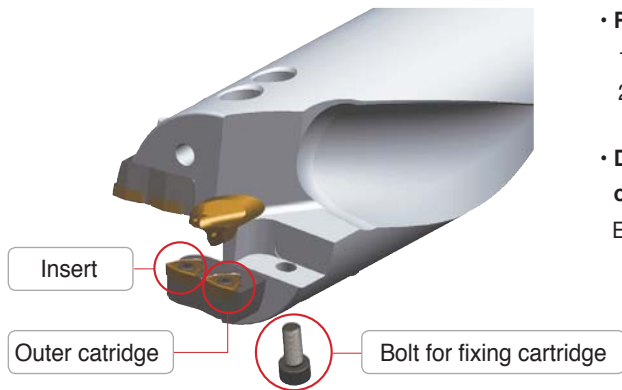
The length of 'a' being too short can cause bad surface finish or high cutting load.
On the other hand, the length of 'a' being too long can make tool failure and chattering while drilling.



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



• Range of adjustable drill diameter

1. Single cartridge type(Drill diameter $\varnothing 41 \sim \varnothing 59$) $\rightarrow -1.0\text{mm}$
2. Dual cartridge type(Drill diameter $\varnothing 60 \sim \varnothing 80$) $\rightarrow -5.0\text{mm}$

• Diameter of the standard drills is provided with maximum size of standards.

Ex) WPDC6570-40-6.5 $\rightarrow$ Drill diameter 70.0mm

- 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.

Ex) How to adjust drill diameter to $\varnothing 66.0$ machining with WPDC6570-40-8

$\rightarrow$ To make the drill diameter of outer cartridge to $\varnothing 66.0$, machine 2.0mm. ($\varnothing 70.0 - \varnothing 66.0 = 4 \rightarrow 4 \div 2 = 2(\text{radius})$)

▶ Recommended Cutting Condition

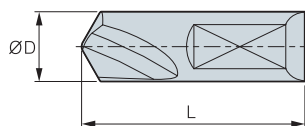
Workpiece			Chip Breaker	Grade	vc m/min	Depth of cut = 5D, 6.5D, 8D Feed rate (mm/rev) per drill dia.(mm)					
ISO	Workpiece	HB				$\sim \varnothing 30$	$\varnothing 31 \sim \varnothing 40$	$\varnothing 41 \sim \varnothing 50$	$\varnothing 51 \sim \varnothing 59$	$\varnothing 60 \sim \varnothing 75$	$\varnothing 76 \sim \varnothing 80$
P	Carbon steel	Low carbon steel ($\sim 0.25\%$)	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
		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
	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
		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
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
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
		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
		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
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
	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
S	Heat resisting alloy	Heat resisting 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

Parts of WPDC type indexable drills

Deaignation	ØD	Insert			Center drill			Catridge			
		Insert						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		KHA0510					
WPDC290~300-32-	29~30					KHA0610	KHC0610				
WPDC310~350-32-	31~35	WC T050308-C21N	FTKA0307	TW09S	CD0835	KHA0610					
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	CDH1645	KHA1020	KHA1020
WPDC6570-40-	65~70	CWP6570C	CWP6570P								
WPDC7075-40-	70~75	CWP7075C	CWP7075P								
WPDC7580-40-	75~80	WC T06T308-C21N	FTKA03508	TW15S				CWP7580C	CWP7580T	BHA0612	

Applicable inserts G06

Center drill



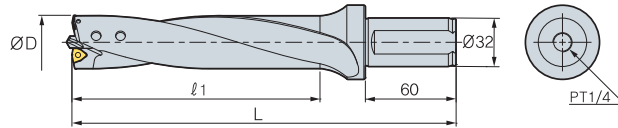
(mm)

Designation	Grade	ØD	L	Oil-hole
CD 0630	PC40H	6	30	×
CD 0835	PC40H	8	35	×
CDH 1035	PC40H	10	35	○
CDH 1238	PC40H	12	38	○
CDH 1645	PC40H	16	45	○

• This is HSS with Tin coating

WPDC-5D/6.5D/8D

Standard type

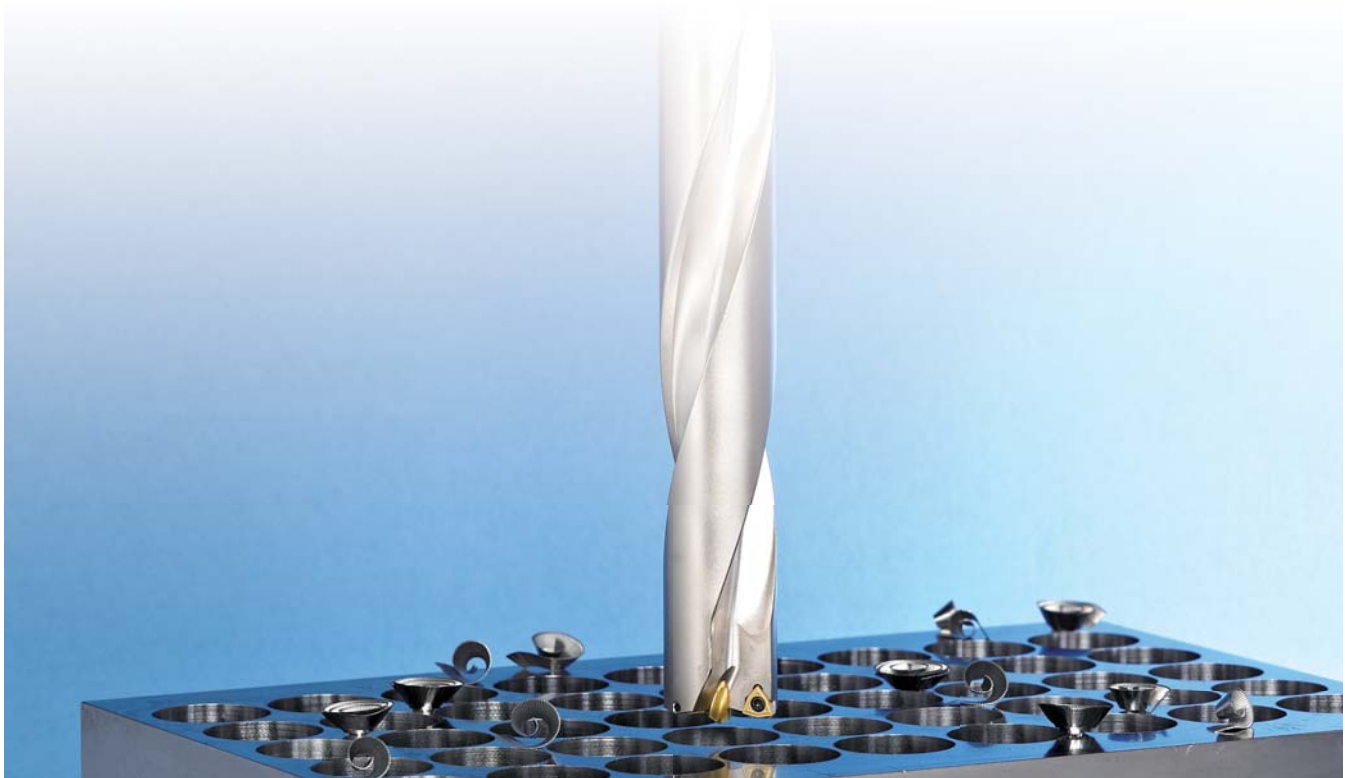


(mm)

Designation		ØD	5D		6.5D		8D		Insert	Center drill
			ℓ ₁	L	ℓ ₁	L	ℓ ₁	L		
WPDC	250-32-□	25	150	240	185	275	220	310	WC□T030204-C21N	CD0630
	260-32-□	26	150	240	185	275	220	310	WC□T040204-C21N	
	270-32-□	27	150	240	185	275	220	310		
	280-32-□	28	150	240	185	275	220	310		
	290-32-□	29	150	240	185	275	220	310		
	300-32-□	30	150	240	185	275	220	310		
	310-32-□	31	175	265	218	308	260	350	WC□T050308-C21N	CD0835
	320-32-□	32	175	265	218	308	260	350		
	330-32-□	33	175	265	218	308	260	350		
	340-32-□	34	175	265	218	308	260	350		
	350-32-□	35	175	265	218	308	260	350		
	360-32-□	36	200	290	250	340	300	390		
	370-32-□	37	200	290	250	340	300	390		
	380-32-□	38	200	290	250	340	300	390		
	390-32-□	39	200	290	250	340	300	390		
	400-32-□	40	200	290	250	340	300	390		

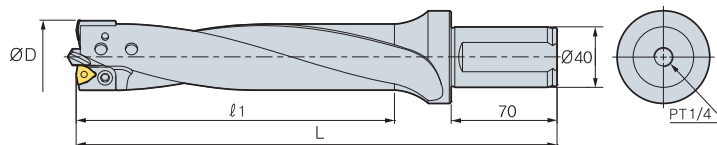
→ Applicable inserts **G06**

* 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)

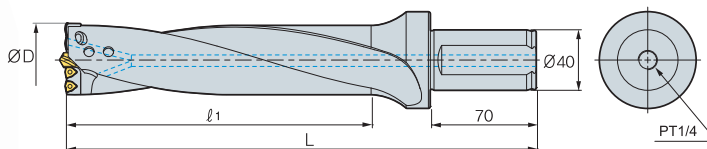
Designation	ØD	5D		6.5D		8D		Insert	Center drill	Cartridge	
		l ₁	L	l ₁	L	l ₁	L			Inner	Outer
WPDC	410-40-□	41	225	330	283	388	340	WC□T06T308-C21N	CDH1035	CWP4145C	CWP410P
	420-40-□	42	225	330	283	388	340				CWP420P
	430-40-□	43	225	330	283	388	340				CWP430P
	440-40-□	44	225	330	283	388	340				CWP440P
	450-40-□	45	225	330	283	388	340				CWP450P
	460-40-□	46	250	355	315	420	380			CWP4650C	CWP460P
	470-40-□	47	250	355	315	420	380				CWP470P
	480-40-□	48	250	355	315	420	380				CWP480P
	490-40-□	49	250	355	315	420	380				CWP490P
	500-40-□	50	250	355	315	420	380				CWP500P
	510-40-□	51	275	380	348	453	420	WC□T080408-C21N	CDH1238	CWP5155C	CWP510P
	520-40-□	52	275	380	348	453	420				CWP520P
	530-40-□	53	275	380	348	453	420				CWP530P
	540-40-□	54	275	380	348	453	420				CWP540P
	550-40-□	55	275	380	348	453	420				CWP550P
	560-40-□	56	300	405	380	485	460			CWP5659C	CWP560P
	570-40-□	57	300	405	380	485	460				CWP570P
	580-40-□	58	300	405	380	485	460				CWP580P
	590-40-□	59	300	405	380	485	460				CWP590P

➔ Applicable inserts **G06**

* 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	
		l ₁	L	l ₁	L	l ₁	L			Inner	Outer
WPDC	6065-40-□	60~65	325	430	423	528	520	WC□T050308-C21N	CDH1238	CWP6065C	CWP6065P
	6570-40-□	65~70	350	455	455	560	560			CWP6570C	CWP6570P
	7075-40-□	70~75	375	480	488	593	600			CWP7075C	CWP7075P
	7580-40-□	75~80	400	505	520	625	640	WC□T06T308-C21N	CDH1645	CWP7580C	CWP7580P

➔ Applicable inserts **G06**

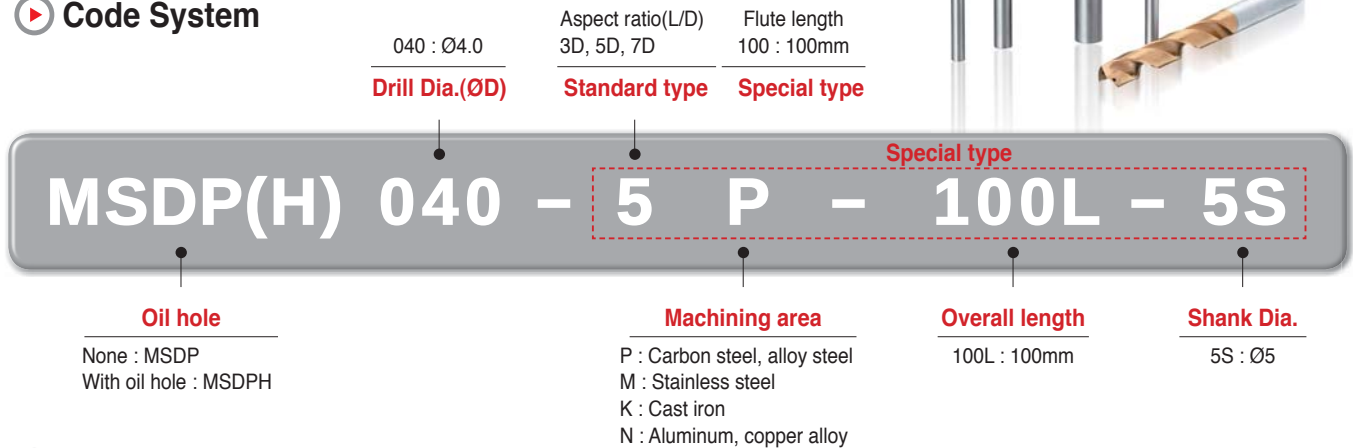
* We can provide if you order exact diameter
Ex) machining hole 70.5mm * 6.5D -> WPDC705-40-6.5

Highly efficient hole making for various workpieces
including automobile components

MSD Plus *New*

Mach Solid Drill Plus

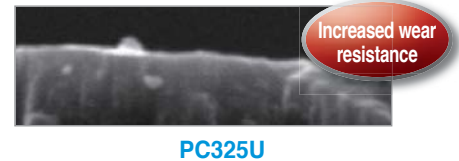
Code System



Features

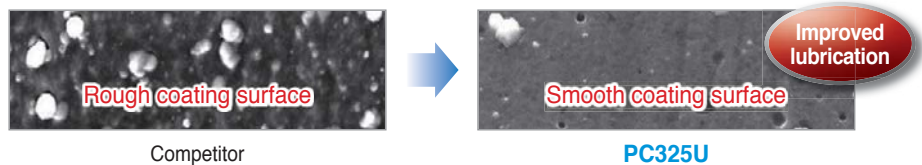
New grade (PC325U)

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



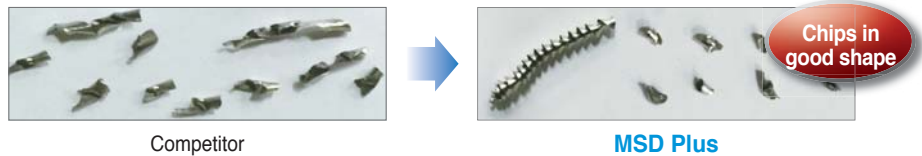
Surface of coating layer

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

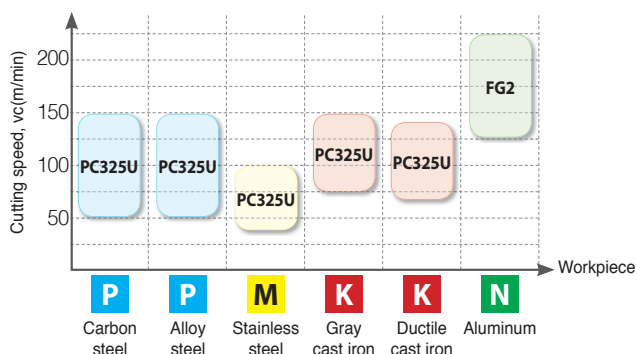


Chip control

- **Workpiece** : STS304
- **Cutting condition** : $vc(m/min)=90$
 $fn(mm/rev)=0.2$
 $ap(mm)=30$, wet
- **Tools** : MSDP(H)060-5M(PC325U)

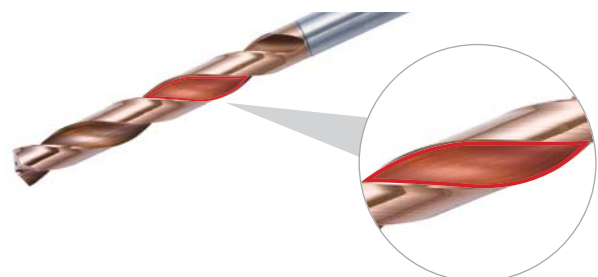


Application area



Flute shape

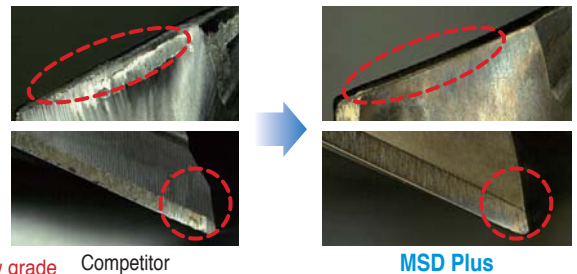
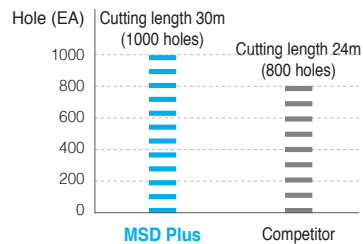
- Improved chip evacuation thanks to wider chip pocket



Cutting Performance

Part of automobile

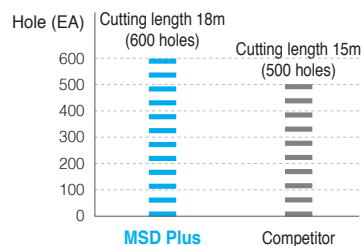
- **Workpiece** : SM45C
- **Cutting condition** : vc(m/min)=124
fn(mm/rev)=0.15
ap(mm)=30
Through coolant
- **Tools** : MSDPH060-5P(PC325U)



→ Lubricative coating layer of the new grade PC325U maximizes wear resistance.

Part of automobile

- **Workpiece** : SM53C
- **Cutting condition** : vc(m/min)=60
fn(mm/rev)=0.25
ap(mm)=30
External coolant
- **Tools** : MSDP120-5P(PC325U)



→ Special treatment on coating surface minimized frictional resistance.

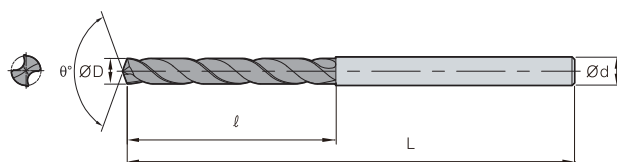
Recommended Cutting Conditions

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~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	250 over	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	250 over	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) *New*

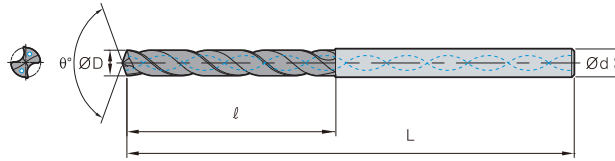


Terminology	P	M	K	N
Grade	PC325U			FG2
Tolerance(drill Dia.)	h7			
Tolerance(shank Dia.)	h6			
Point angle	140°			135°
Twist angle	30°			
Thinning	X type			
Coolant	External system			
P Steel M Stainless steel K Cast iron N Non-ferrous metal				

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	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) *New*



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			

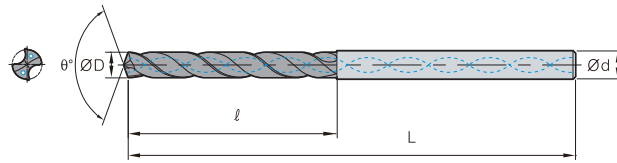
P Steel M Stainless steel K Cast iron N Non-ferrous metal

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



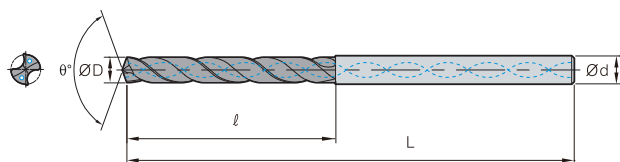
MSDP(H)-□ (P/M/K/N) *New*

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)	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) *New*



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				

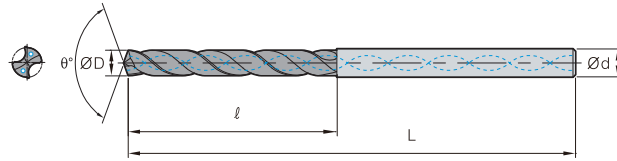
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(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) *New*



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			

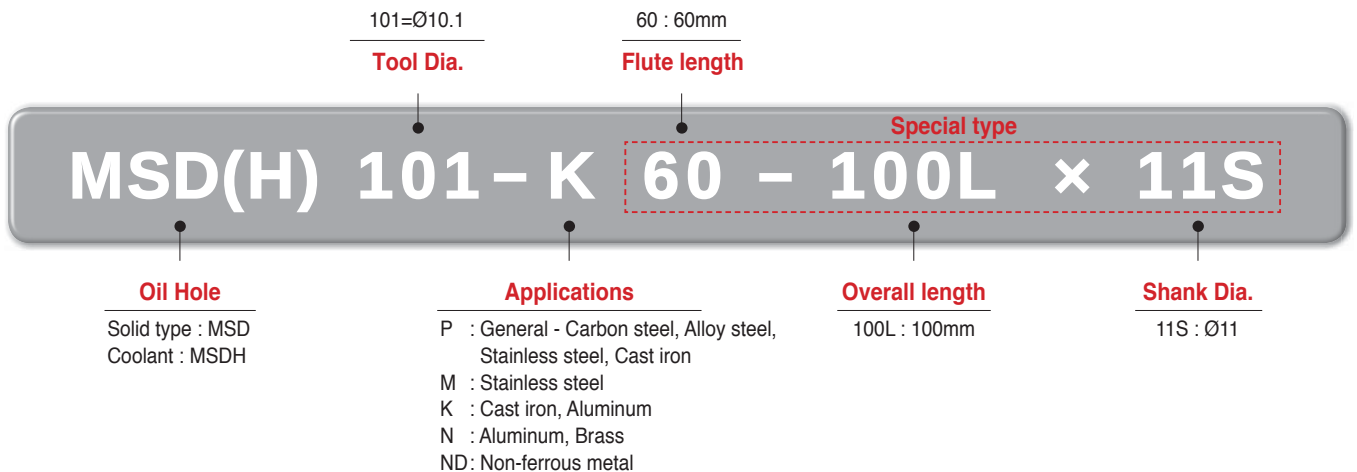
P Steel M Stainless steel K Cast iron N Non-ferrous metal

(mm)								
Designation	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSDP(H)								
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

Various designations of MSD & MSDH enable to do any drilling

Mach solid drill

▶ Code system



▶ Features

▶ Optimally designed chip pocket

- Wide and deep chip pocket improve chip control to minimizing friction during an operation

▶ A curvilinear edge

- A curvilinear edge offers excellent wear resistance and shock resistance by dispersing the cutting load

▶ 3D, 5D, 7D Standardization

- For example) diameter Ø10mm and depth 30mm and outer coolant system, Take MSD100-3P!

▶ MSD : Solid Type & MSDH : Through oil-hole type

- Various designations of MSD & MSDH enable to do any drilling

▶ Low cutting resistance edge

- The MSD & MSDH low cutting resistance edge guarantees a better surface roughness and chip control while allowing the drill to center itself

▶ Rigid neck of drill

- The new design of this drill has an increased rigidity at neck.
This prevents breakage of neck on the drill

▶ Line-up as per workpiece

- P : Steel (Carbon steel, Alloy steel)
General - Carbon steel, Alloy steel, Stainless steel, Cast iron Low cutting resistance edge, Ultra micro grain substrate, K-Black coating
- K : Cast iron, Die casting, Ductile cast iron
Coolant system : Through / Outer(MQL)
- M : Stainless steel, Reduced built-up edge and cutting resistance
Coolant system : Through / Outer(MQL)
- N : Aluminum(Carbide drills), Medium & Low speed cutting performance
Coolant system : Through / Outer(MQL)
- ND : Non-ferrous metal, High speed, High efficiency performance
Improved welding resistance due to applied DLC coating
Coolant system : Through / Outer(MQL)



▶ Features

▶ Low cutting resistance edge

- Uniformity in cutting edge treatment : Reinforces equalized quality in every machined part
- Protecting workpiece : Low cutting resistance edge operates well in medium to finishing machining, workpiece protection and good surface roughness
- Better chip breaking : Based on our cutting processes studies, our drills assure better chip breaking in high or low speeds

▶ Features of TiAlN Coating

- Decreasing of micro particle → Chipping free from macro particle
- Better hardness and toughness → Covering wide cutting speed and feed rate range
- Special coating layer at most-outer edge → Special TiAlN with better lubrication guarantees welding resistance
- Pre-treatment before coating process → Higher adhesion by pre-treatment



▶ Specification line-up

Line-up as per aspect ratio (L:Overall length, D:Tool Dia.)



MSD□□□-7P



MSD□□□-5P



MSD□□□-3P

Line-up as per aspect ratio (Mach Drills : Ø2.5mm~Ø20mm)

Various choices as per aspect ratio (3D,5D,7D)

- For example) Solid, Ø10.2mm, 50mm

Piercing = $50 \div 10.2 \div 5 \rightarrow$ MSD102-5P

Line-up as per coolant type



MSD Type



MSDH Type

Wide choices for coolant type

- For example) Solid type : MSD,
Through coolant type : MSDH

▶ Line-up as per workpiece

P	General - Carbon steel, Alloy steel, Stainless steel, Cast iron
M	Stainless steel
K	Cast iron, Aluminum
N	Aluminum, Brass
ND	Non-ferrous metal

▶ Cutting condition formula

$$vc = \frac{\pi \times D \times n}{1000} \text{ (m/min)}, \quad fn = \frac{vf}{n} \text{ (mm/rev)} \left[n = \frac{vc \times 1000}{\pi \times D} \text{ (min}^{-1}\text{)}, \quad vf = fn \times n \text{ (mm/min)} \right]$$

n : Revolution per minute(min⁻¹)

vc : Cutting speed(m/min)

vf : Feed per minute(mm/min)

fn : Feed per revolution(mm/rev)

D : Drill Dia.(mm)

π : 3.1416

Recommended cutting condition

Mach Drill : Solid Type [MSD ○○○-□P,M,K]

Tool Dia. Workpiece		Ø2.5 ~ Ø5.0		Ø5.1 ~ Ø8.0		Ø8.1 ~ Ø10.0		Ø10.1 ~ Ø12.0		Ø12.1 ~ Ø14.0		Ø14.1 ~ Ø20.0	
		vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)
Mild steel, Alloy steel, General steel (Under H _R C25)	SCM440	40~70 (55)	0.15 ~0.25	50~110 (65)	0.20 ~0.35	50~110 (70)	0.20 ~0.35	50~120 (75)	0.25 ~0.35	50~120 (75)	0.25 ~0.35	60~120 (80)	0.25 ~0.40
	SM45C	40~80 (60)	0.15 ~0.25	50~120 (70)	0.20 ~0.30	50~120 (75)	0.20 ~0.30	60~120 (80)	0.20 ~0.30	60~120 (80)	0.25 ~0.35	70~120 (90)	0.30 ~0.40
High alloy steel, High carbon steel (Over H _R C25)	STD11	15~35 (30)	0.08 ~0.15	20~40 (30)	0.10 ~0.20	20~50 (35)	0.10 ~0.20	20~60 (35)	0.15 ~0.25	20~60 (40)	0.15 ~0.25	30~65 (40)	0.15 ~0.25
Stainless steel	STS	15~30 (25)	0.05 ~0.10	15~45 (25)	0.10 ~0.20	15~50 (30)	0.10 ~0.20	20~60 (35)	0.10 ~0.20	20~65 (35)	0.10 ~0.20	20~70 (40)	0.10 ~0.20
Cast iron	GC	40~90 (70)	0.15 ~0.30	50~120 (80)	0.20 ~0.35	50~120 (80)	0.20 ~0.35	60~130 (90)	0.25 ~0.35	60~130 (95)	0.25 ~0.40	60~140 (95)	0.25 ~0.40
	GCD	40~80 (60)	0.10 ~0.25	50~110 (75)	0.20 ~0.35	50~110 (80)	0.20 ~0.35	50~130 (80)	0.25 ~0.35	50~130 (85)	0.25 ~0.35	60~130 (90)	0.25 ~0.40

Mach Drill : Through oil-hole Type [MSDH ○○○-□P,M,K]

Tool Dia. Workpiece		vc(m/min)	Ø2.5~ Ø4.0	Ø4.1~ Ø8.0	Ø8.1~ Ø12.0	Ø12.1~ Ø16.0	Ø16.1~ Ø20.0
			fn(mm/rev)	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)	fn(mm/rev)
Mild steel, Alloy steel, General steel (Under H _R C25)	SCM440	60~140	0.15~0.35	0.15~0.35	0.20~0.35	0.25~0.40	0.30~0.40
	SM45C	60~140	0.15~0.30	0.15~0.30	0.20~0.30	0.25~0.35	0.30~0.40
High alloy steel, High carbon steel (Over H _R C25)	STD11	40~80	0.08~0.20	0.08~0.20	0.10~0.25	0.15~0.25	0.15~0.30
Stainless steel	STS	25~80	0.05~0.20	0.05~0.20	0.10~0.25	0.10~0.25	0.15~0.30
Cast iron	GC	55~155	0.15~0.35	0.15~0.35	0.20~0.35	0.25~0.40	0.25~0.40
	GCD	55~145	0.10~0.35	0.10~0.35	0.20~0.35	0.25~0.35	0.25~0.40

- Note) 1. Decrease cutting speed 30%~40% contrast with recommended condition when machining forged steel
 2. Decrease cutting condition considering the overhang of drill, machined rigidity, precision of spindle, clamping and surface of workpiece, etc.
 3. For longer tool life, Please apply to step feed at every 1.5D
 4. Put the drill clamping between edge groove and shank boundary part in order to be located in the suitable position
 5. Coolant pressure for through hole type = 3~5kg/cm³, volume = 2~5l/min
 6. Cutting formula :

Mach Drills : Through coolant type [MSD(H) ○○○-□N) cemented carbide

Tool Dia. Workpiece		Ø2.5~ Ø4.0		Ø5.1~ Ø10.0		Ø10.1~ Ø16.0		Ø16.1~ Ø20.0	
		vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)
Aluminum	Alloy steel (Al6061)	60~100	0.20~0.35	90~100	0.30~0.40	100~120	0.30~0.40	100~120	0.30~0.45
	Die-casting (AC,ADC)	60~100	0.20~0.35	90~100	0.30~0.40	100~120	0.30~0.40	100~120	0.30~0.45
Copper alloy(CI100)		60~80	0.08~0.15	60~100	0.10~0.20	80~100	0.10~0.25	80~100	0.10~0.25

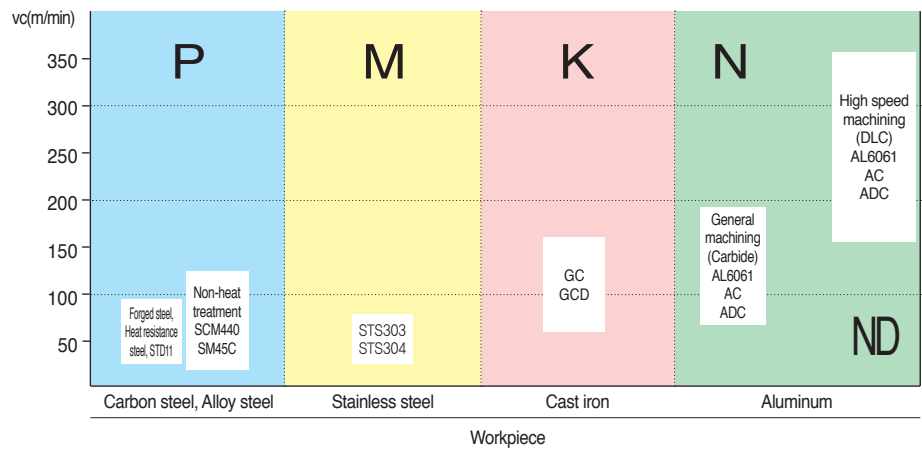
Mach Drills : Through coolant type [MSDH ○○○-□ND) DLC coated

Tool Dia. Workpiece		Ø2.5~ Ø4.0		Ø5.1~ Ø10.0		Ø10.1~ Ø16.0		Ø16.1~ Ø20.0	
		vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)	vc(m/min)	fn(mm/rev)
Aluminum	Alloy steel (Al6061)	80~160	0.08~0.30	80~180	0.12~0.35	80~180	0.15~0.40	80~200	0.15~0.45
	Die-casting (AC,ADC)	80~180	0.08~0.30	80~200	0.12~0.35	80~200	0.15~0.40	80~200	0.15~0.45
Copper alloy(CI100)		80~160	0.08~0.15	80~180	0.10~0.20	80~180	0.10~0.25	80~200	0.10~0.25

- Note) Recommended cutting speed is one of the important factors for the drill performance. In case of using further cutting speed or feed rate than recommended conditions to improve the productivity, please apply it after enough tests because it could be occurred some problems like early wear, built-up edge, chipping, fracture, etc.

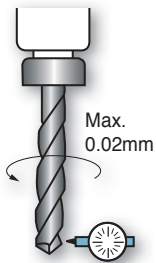


Recommended cutting condition by series

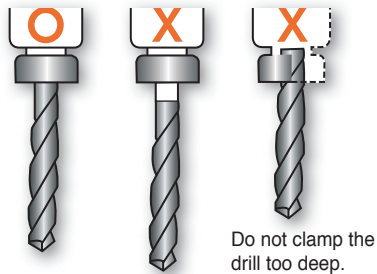


Setting of drills

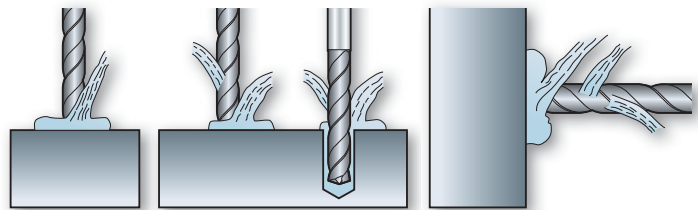
Outer tolerance



Setting condition



Coolant (External system)



To improve machining method

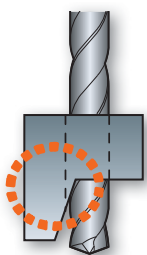
Machining for strength of wheel



Using short flute length

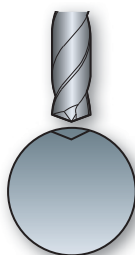
Improvement of drilling

Piercing stage



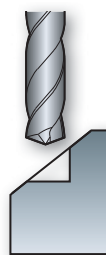
Decrease feed 1/2

Circular surface



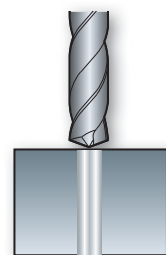
First, center drilling with large point angle

Inclined surface



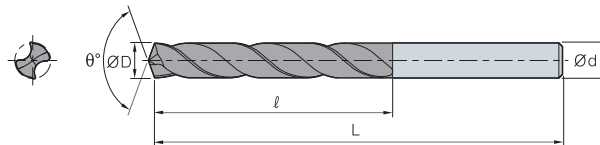
First, facing with endmills

Boring



No recommendation

MSD-□ (P/M/K/N)



Terminology	P	M	K	N
Grade	PC205F			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 metals				

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

(mm)

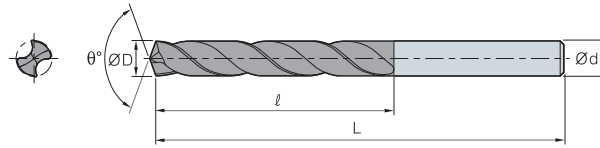
Designation		ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
				ℓ	L	ℓ	L	ℓ	L
MSD	025-□P,M,K,N	2.5	3.0	20	65	25	70	30	75
	026-□P,M,K,N	2.6	3.0	20	65	25	70	30	75
	027-□P,M,K,N	2.7	3.0	20	65	25	70	30	75
	028-□P,M,K,N	2.8	3.0	20	65	25	70	30	75
	029-□P,M,K,N	2.9	3.0	20	65	25	70	30	75
	030-□P,M,K,N	3.0	3.0	20	65	25	70	30	75
	031-□P,M,K,N	3.1	4.0	25	71	34	80	40	86
	032-□P,M,K,N	3.2	4.0	25	71	34	80	40	86
	033-□P,M,K,N	3.3	4.0	25	71	34	80	40	86
	034-□P,M,K,N	3.4	4.0	25	71	34	80	40	86
	035-□P,M,K,N	3.5	4.0	25	71	34	80	40	86
	036-□P,M,K,N	3.6	4.0	25	71	34	80	40	86
	037-□P,M,K,N	3.7	4.0	25	71	34	80	40	86
	038-□P,M,K,N	3.8	4.0	25	71	34	80	40	86
	039-□P,M,K,N	3.9	4.0	25	71	34	80	40	86
	040-□P,M,K,N	4.0	4.0	25	71	34	80	40	86
	041-□P,M,K,N	4.1	5.0	30	77	43	90	50	97
	042-□P,M,K,N	4.2	5.0	30	77	43	90	50	97
	043-□P,M,K,N	4.3	5.0	30	77	43	90	50	97
	044-□P,M,K,N	4.4	5.0	30	77	43	90	50	97
	045-□P,M,K,N	4.5	5.0	30	77	43	90	50	97
	046-□P,M,K,N	4.6	5.0	30	77	43	90	50	97
	047-□P,M,K,N	4.7	5.0	30	77	43	90	50	97
	048-□P,M,K,N	4.8	5.0	30	77	43	90	50	97
	049-□P,M,K,N	4.9	5.0	30	77	43	90	50	97
	050-□P,M,K,N	5.0	5.0	30	77	43	90	50	97
	051-□P,M,K,N	5.1	6.0	35	81	48	96	60	108
	052-□P,M,K,N	5.2	6.0	35	81	48	96	60	108
	053-□P,M,K,N	5.3	6.0	35	81	48	96	60	108
	054-□P,M,K,N	5.4	6.0	35	81	48	96	60	108
	055-□P,M,K,N	5.5	6.0	35	81	48	96	60	108
	056-□P,M,K,N	5.6	6.0	35	81	48	96	60	108
	057-□P,M,K,N	5.7	6.0	35	81	48	96	60	108
	058-□P,M,K,N	5.8	6.0	35	81	48	96	60	108
	059-□P,M,K,N	5.9	6.0	35	81	48	96	60	108
	060-□P,M,K,N	6.0	6.0	35	81	48	96	60	108
	061-□P,M,K,N	6.1	7.0	40	84	56	105	70	120
	062-□P,M,K,N	6.2	7.0	40	84	56	105	70	120
	063-□P,M,K,N	6.3	7.0	40	84	56	105	70	120
	064-□P,M,K,N	6.4	7.0	40	84	56	105	70	120
	065-□P,M,K,N	6.5	7.0	40	84	56	105	70	120
	066-□P,M,K,N	6.6	7.0	40	84	56	105	70	120
	067-□P,M,K,N	6.7	7.0	40	84	56	105	70	120
	068-□P,M,K,N	6.8	7.0	40	84	56	105	70	120

※ Order made items : MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1)Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012 - M × 60 - 80L × 11S



MSD-□ (P/M/K/N)

Terminology	P	M	K	N
Grade	PC205F			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

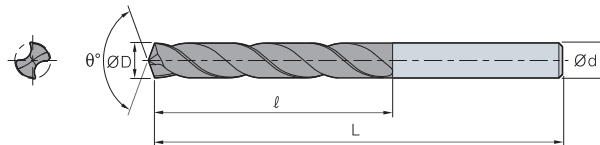
		(mm)							
Designation	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N		
			ℓ	L	ℓ	L	ℓ	L	
MSD									
069-□P,M,K,N	6.9	7.0	40	84	56	105	70	120	
070-□P,M,K,N	7.0	7.0	40	84	56	105	70	120	
071-□P,M,K,N	7.1	8.0	45	90	60	105	80	120	
072-□P,M,K,N	7.2	8.0	45	90	60	110	80	130	
073-□P,M,K,N	7.3	8.0	45	90	60	110	80	130	
074-□P,M,K,N	7.4	8.0	45	90	60	110	80	130	
075-□P,M,K,N	7.5	8.0	45	90	60	110	80	130	
076-□P,M,K,N	7.6	8.0	45	90	60	110	80	130	
077-□P,M,K,N	7.7	8.0	45	90	60	110	80	130	
078-□P,M,K,N	7.8	8.0	45	90	60	110	80	130	
079-□P,M,K,N	7.9	8.0	45	90	60	110	80	130	
080-□P,M,K,N	8.0	8.0	45	90	60	110	80	130	
081-□P,M,K,N	8.1	9.0	48	97	72	125	90	143	
082-□P,M,K,N	8.2	9.0	48	97	72	125	90	143	
083-□P,M,K,N	8.3	9.0	48	97	72	125	90	143	
084-□P,M,K,N	8.4	9.0	48	97	72	125	90	143	
085-□P,M,K,N	8.5	9.0	48	97	72	125	90	143	
086-□P,M,K,N	8.6	9.0	48	97	72	125	90	143	
087-□P,M,K,N	8.7	9.0	48	97	72	125	90	143	
088-□P,M,K,N	8.8	9.0	48	97	72	125	90	143	
089-□P,M,K,N	8.9	9.0	48	97	72	125	90	143	
090-□P,M,K,N	9.0	9.0	48	97	72	125	90	143	
091-□P,M,K,N	9.1	10.0	52	106	75	129	95	150	
092-□P,M,K,N	9.2	10.0	52	106	75	129	95	150	
093-□P,M,K,N	9.3	10.0	52	106	75	129	95	150	
094-□P,M,K,N	9.4	10.0	52	106	75	129	95	150	
095-□P,M,K,N	9.5	10.0	52	106	75	129	95	150	
096-□P,M,K,N	9.6	10.0	52	106	75	129	95	150	
097-□P,M,K,N	9.7	10.0	52	106	75	129	95	150	
098-□P,M,K,N	9.8	10.0	52	106	75	129	95	150	
099-□P,M,K,N	9.9	10.0	52	106	75	129	95	150	
100-□P,M,K,N	10.0	10.0	52	106	75	129	95	150	
101-□P,M,K,N	10.1	11.0	56	111	83	140	105	160	
102-□P,M,K,N	10.2	11.0	56	111	83	140	105	160	
103-□P,M,K,N	10.3	11.0	56	111	83	140	105	160	
104-□P,M,K,N	10.4	11.0	56	111	83	140	105	160	
105-□P,M,K,N	10.5	11.0	56	111	83	140	105	160	
106-□P,M,K,N	10.6	11.0	56	111	83	140	105	160	
107-□P,M,K,N	10.7	11.0	56	111	83	140	105	160	
108-□P,M,K,N	10.8	11.0	56	111	83	140	105	160	
109-□P,M,K,N	10.9	11.0	56	111	83	140	105	160	
110-□P,M,K,N	11.0	11.0	56	111	83	140	105	160	
111-□P,M,K,N	11.1	12.0	60	118	90	148	114	172	
112-□P,M,K,N	11.2	12.0	60	118	90	148	114	172	

※ Order made items : MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1)Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012 - M × 60 - 80L × 11S

MSD-□ (P/M/K/N)



Terminology	P	M	K	N
Grade	PC205F			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 metals				

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

(mm)

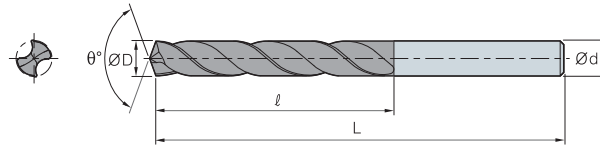
Designation	ØD	Ød	3P,M,K,N		5P,M,K,N		7P,M,K,N	
			ℓ	L	ℓ	L	ℓ	L
MSD								
113-□P,M,K,N	11.3	12.0	60	118	90	148	114	172
114-□P,M,K,N	11.4	12.0	60	118	90	148	114	172
115-□P,M,K,N	11.5	12.0	60	118	90	148	114	172
116-□P,M,K,N	11.6	12.0	60	118	90	148	114	172
117-□P,M,K,N	11.7	12.0	60	118	90	148	114	172
118-□P,M,K,N	11.8	12.0	60	118	90	148	114	172
119-□P,M,K,N	11.9	12.0	60	118	90	148	114	172
120-□P,M,K,N	12.0	12.0	60	118	90	148	114	172
121-□P,M,K,N	12.1	13.0	65	125	98	158	124	184
122-□P,M,K,N	12.2	13.0	65	125	98	158	124	184
123-□P,M,K,N	12.3	13.0	65	125	98	158	124	184
124-□P,M,K,N	12.4	13.0	65	125	98	158	124	184
125-□P,M,K,N	12.5	13.0	65	125	98	158	124	184
126-□P,M,K,N	12.6	13.0	65	125	98	158	124	184
127-□P,M,K,N	12.7	13.0	65	125	98	158	124	184
128-□P,M,K,N	12.8	13.0	65	125	98	158	124	184
129-□P,M,K,N	12.9	13.0	65	125	98	158	124	184
130-□P,M,K,N	13.0	13.0	65	125	98	158	124	184
131-□P,M,K,N	13.1	14.0	70	132	105	167	133	195
132-□P,M,K,N	13.2	14.0	70	132	105	167	133	195
133-□P,M,K,N	13.3	14.0	70	132	105	167	133	195
134-□P,M,K,N	13.4	14.0	70	132	105	167	133	195
135-□P,M,K,N	13.5	14.0	70	132	105	167	133	195
136-□P,M,K,N	13.6	14.0	70	132	105	167	133	195
137-□P,M,K,N	13.7	14.0	70	132	105	167	133	195
138-□P,M,K,N	13.8	14.0	70	132	105	167	133	195
139-□P,M,K,N	13.9	14.0	70	132	105	167	133	195
140-□P,M,K,N	14.0	14.0	70	132	105	167	133	195
141-□P,M,K,N	14.1	15.0	75	139	108	172	138	202
142-□P,M,K,N	14.2	15.0	75	139	108	172	138	202
143-□P,M,K,N	14.3	15.0	75	139	108	172	138	202
144-□P,M,K,N	14.4	15.0	75	139	108	172	138	202
145-□P,M,K,N	14.5	15.0	75	139	108	172	138	202
146-□P,M,K,N	14.6	15.0	75	139	108	172	138	202
147-□P,M,K,N	14.7	15.0	75	139	108	172	138	202
148-□P,M,K,N	14.8	15.0	75	139	108	172	138	202
149-□P,M,K,N	14.9	15.0	75	139	108	172	138	202
150-□P,M,K,N	15.0	15.0	75	139	108	172	138	202
151-□P,M,K,N	15.1	16.0	80	146	112	178	144	210
152-□P,M,K,N	15.2	16.0	80	146	112	178	144	210
153-□P,M,K,N	15.3	16.0	80	146	112	178	144	210
154-□P,M,K,N	15.4	16.0	80	146	112	178	144	210
155-□P,M,K,N	15.5	16.0	80	146	112	178	144	210
156-□P,M,K,N	15.6	16.0	80	146	112	178	144	210

※ Order made items : MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1)Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012 - M × 60 - 80L × 11S



MSD-□ (P/M/K/N)

Terminology	P	M	K	N
Grade	PC205F			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

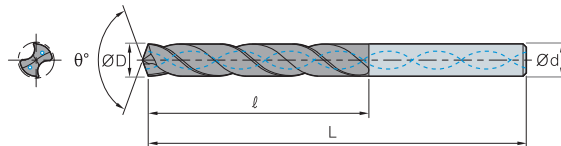
				3P,M,K,N		5P,M,K,N		7P,M,K,N	
Designation		ØD	Ød	ℓ	L	ℓ	L	ℓ	L
MSD	157-□P,M,K,N	15.7	16.0	80	146	112	178	144	210
	158-□P,M,K,N	15.8	16.0	80	146	112	178	144	210
	159-□P,M,K,N	15.9	16.0	80	146	112	178	144	210
	160-□P,M,K,N	16.0	16.0	80	146	112	178	144	210
	161-□P,M,K,N	16.1	17.0	85	151	120	186	153	220
	162-□P,M,K,N	16.2	17.0	85	151	120	186	153	220
	163-□P,M,K,N	16.3	17.0	85	151	120	186	153	220
	164-□P,M,K,N	16.4	17.0	85	151	120	186	153	220
	165-□P,M,K,N	16.5	17.0	85	151	120	186	153	220
	166-□P,M,K,N	16.6	17.0	85	151	120	186	153	220
	167-□P,M,K,N	16.7	17.0	85	151	120	186	153	220
	168-□P,M,K,N	16.8	17.0	85	151	120	186	153	220
	169-□P,M,K,N	16.9	17.0	85	151	120	186	153	220
	170-□P,M,K,N	17.0	17.0	85	151	120	186	153	220
	171-□P,M,K,N	17.1	18.0	85	153	120	188	162	230
	172-□P,M,K,N	17.2	18.0	85	153	120	188	162	230
	173-□P,M,K,N	17.3	18.0	85	153	120	188	162	230
	174-□P,M,K,N	17.4	18.0	85	153	120	188	162	230
	175-□P,M,K,N	17.5	18.0	85	153	120	188	162	230
	176-□P,M,K,N	17.6	18.0	85	153	120	188	162	230
	177-□P,M,K,N	17.7	18.0	85	153	120	188	162	230
	178-□P,M,K,N	17.8	18.0	85	153	120	188	162	230
	179-□P,M,K,N	17.9	18.0	85	153	120	188	162	230
	180-□P,M,K,N	18.0	18.0	85	153	120	188	162	230
	181-□P,M,K,N	18.1	19.0	88	157	124	193	171	240
	182-□P,M,K,N	18.2	19.0	88	157	124	193	171	240
	183-□P,M,K,N	18.3	19.0	88	157	124	193	171	240
	184-□P,M,K,N	18.4	19.0	88	157	124	193	171	240
	185-□P,M,K,N	18.5	19.0	88	157	124	193	171	240
	186-□P,M,K,N	18.6	19.0	88	157	124	193	171	240
	187-□P,M,K,N	18.7	19.0	88	157	124	193	171	240
	188-□P,M,K,N	18.8	19.0	88	157	124	193	171	240
	189-□P,M,K,N	18.9	19.0	88	157	124	193	171	240
	190-□P,M,K,N	19.0	19.0	88	157	124	193	171	240
	191-□P,M,K,N	19.1	20.0	90	160	130	200	180	250
	192-□P,M,K,N	19.2	20.0	90	160	130	200	180	250
	193-□P,M,K,N	19.3	20.0	90	160	130	200	180	250
	194-□P,M,K,N	19.4	20.0	90	160	130	200	180	250
	195-□P,M,K,N	19.5	20.0	90	160	130	200	180	250
	196-□P,M,K,N	19.6	20.0	90	160	130	200	180	250
	197-□P,M,K,N	19.7	20.0	90	160	130	200	180	250
	198-□P,M,K,N	19.8	20.0	90	160	130	200	180	250
	199-□P,M,K,N	19.9	20.0	90	160	130	200	180	250
	200-□P,M,K,N	20.0	20.0	90	160	130	200	180	250

※ Order made items : MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1)Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012 - M × 60 - 80L × 11S

MSDH-□ (P/M/K/N)



Terminology	P	M	K	N	ND
Grade	PC205F			FG2	PD3000-1
Tolerance(drill Dia.)	h7				
Tolerance(shank Dia.)	h6				
Point angle	140°		135°		140°
Twist angle	30°				
Thinning	X type			N type	
Coolant	Through system				
P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy					

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

(mm)

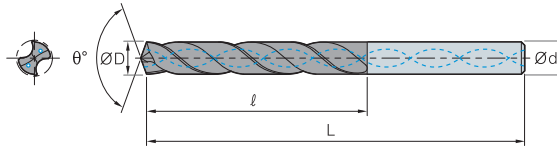
Designation		ØD	Ød	3P,M,K,N,ND		5P,M,K,N,ND		7P,M,K,N,ND	
				ℓ	L	ℓ	L	ℓ	L
MSDH	025-□P,M,K,N	2.5	3.0	20	65	25	70	30	75
	026-□P,M,K,N	2.6	3.0	20	65	25	70	30	75
	027-□P,M,K,N	2.7	3.0	20	65	25	70	30	75
	028-□P,M,K,N	2.8	3.0	20	65	25	70	30	75
	029-□P,M,K,N	2.9	3.0	20	65	25	70	30	75
	030-□P,M,K,N	3.0	3.0	20	65	25	70	30	75
	031-□P,M,K,N	3.1	4.0	25	71	34	80	40	86
	032-□P,M,K,N	3.2	4.0	25	71	34	80	40	86
	033-□P,M,K,N	3.3	4.0	25	71	34	80	40	86
	034-□P,M,K,N	3.4	4.0	25	71	34	80	40	86
	035-□P,M,K,N	3.5	4.0	25	71	34	80	40	86
	036-□P,M,K,N	3.6	4.0	25	71	34	80	40	86
	037-□P,M,K,N	3.7	4.0	25	71	34	80	40	86
	038-□P,M,K,N	3.8	4.0	25	71	34	80	40	86
	039-□P,M,K,N	3.9	4.0	25	71	34	80	40	86
	040-□P,M,K,N	4.0	4.0	25	71	34	80	40	86
	041-□P,M,K,N	4.1	5.0	30	77	43	90	50	97
	042-□P,M,K,N	4.2	5.0	30	77	43	90	50	97
	043-□P,M,K,N	4.3	5.0	30	77	43	90	50	97
	044-□P,M,K,N	4.4	5.0	30	77	43	90	50	97
	045-□P,M,K,N	4.5	5.0	30	77	43	90	50	97
	046-□P,M,K,N	4.6	5.0	30	77	43	90	50	97
	047-□P,M,K,N	4.7	5.0	30	77	43	90	50	97
	048-□P,M,K,N	4.8	5.0	30	77	43	90	50	97
	049-□P,M,K,N	4.9	5.0	30	77	43	90	50	97
	050-□P,M,K,N	5.0	5.0	30	77	43	90	50	97
	051-□P,M,K,N	5.1	6.0	35	81	48	96	60	108
	052-□P,M,K,N	5.2	6.0	35	81	48	96	60	108
	053-□P,M,K,N	5.3	6.0	35	81	48	96	60	108
	054-□P,M,K,N	5.4	6.0	35	81	48	96	60	108
	055-□P,M,K,N	5.5	6.0	35	81	48	96	60	108
	056-□P,M,K,N	5.6	6.0	35	81	48	96	60	108
	057-□P,M,K,N	5.7	6.0	35	81	48	96	60	108
	058-□P,M,K,N	5.8	6.0	35	81	48	96	60	108
	059-□P,M,K,N	5.9	6.0	35	81	48	96	60	108
	060-□P,M,K,N	6.0	6.0	35	81	48	96	60	108
	061-□P,M,K,N	6.1	7.0	40	84	56	105	70	120
	062-□P,M,K,N	6.2	7.0	40	84	56	105	70	120
	063-□P,M,K,N	6.3	7.0	40	84	56	105	70	120
	064-□P,M,K,N	6.4	7.0	40	84	56	105	70	120
	065-□P,M,K,N	6.5	7.0	40	84	56	105	70	120
	066-□P,M,K,N	6.6	7.0	40	84	56	105	70	120
	067-□P,M,K,N	6.7	7.0	40	84	56	105	70	120
	068-□P,M,K,N	6.8	7.0	40	84	56	105	70	120

※ Order made items : MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1)Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012 - M × 60 - 80L × 11S



MSDH-□ (P/M/K/N)

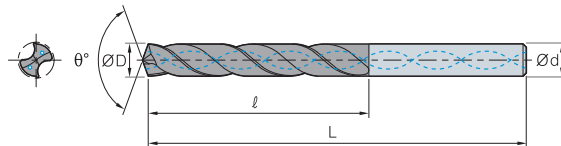
Terminology	P	M	K	N	ND
Grade	PC205F			FG2	PD3000-1
Tolerance(drill Dia.)	h7				
Tolerance(shank Dia.)	h6				
Point angle	140°		135°		140°
Twist angle	30°				
Thinning	X type				N type
Coolant	Through system				

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



		(mm)							
Designation		ØD	Ød	3P,M,K,N,ND		5P,M,K,N,ND		7P,M,K,N,ND	
				ℓ	L	ℓ	L	ℓ	L
MSDH	069-□P,M,K,N	6.9	7.0	40	84	56	105	70	120
	070-□P,M,K,N	7.0	7.0	40	84	56	105	70	120
	071-□P,M,K,N	7.1	8.0	45	90	60	105	80	120
	072-□P,M,K,N	7.2	8.0	45	90	60	110	80	130
	073-□P,M,K,N	7.3	8.0	45	90	60	110	80	130
	074-□P,M,K,N	7.4	8.0	45	90	60	110	80	130
	075-□P,M,K,N	7.5	8.0	45	90	60	110	80	130
	076-□P,M,K,N	7.6	8.0	45	90	60	110	80	130
	077-□P,M,K,N	7.7	8.0	45	90	60	110	80	130
	078-□P,M,K,N	7.8	8.0	45	90	60	110	80	130
	079-□P,M,K,N	7.9	8.0	45	90	60	110	80	130
	080-□P,M,K,N	8.0	8.0	45	90	60	110	80	130
	081-□P,M,K,N	8.1	9.0	48	97	72	125	90	143
	082-□P,M,K,N	8.2	9.0	48	97	72	125	90	143
	083-□P,M,K,N	8.3	9.0	48	97	72	125	90	143
	084-□P,M,K,N	8.4	9.0	48	97	72	125	90	143
	085-□P,M,K,N	8.5	9.0	48	97	72	125	90	143
	086-□P,M,K,N	8.6	9.0	48	97	72	125	90	143
	087-□P,M,K,N	8.7	9.0	48	97	72	125	90	143
	088-□P,M,K,N	8.8	9.0	48	97	72	125	90	143
	089-□P,M,K,N	8.9	9.0	48	97	72	125	90	143
	090-□P,M,K,N	9.0	9.0	48	97	72	125	90	143
	091-□P,M,K,N	9.1	10.0	52	106	75	129	95	150
	092-□P,M,K,N	9.2	10.0	52	106	75	129	95	150
	093-□P,M,K,N	9.3	10.0	52	106	75	129	95	150
	094-□P,M,K,N	9.4	10.0	52	106	75	129	95	150
	095-□P,M,K,N	9.5	10.0	52	106	75	129	95	150
	096-□P,M,K,N	9.6	10.0	52	106	75	129	95	150
	097-□P,M,K,N	9.7	10.0	52	106	75	129	95	150
	098-□P,M,K,N	9.8	10.0	52	106	75	129	95	150
	099-□P,M,K,N	9.9	10.0	52	106	75	129	95	150
	100-□P,M,K,N	10.0	10.0	52	106	75	129	95	150
	101-□P,M,K,N	10.1	11.0	56	111	83	140	105	160
	102-□P,M,K,N	10.2	11.0	56	111	83	140	105	160
	103-□P,M,K,N	10.3	11.0	56	111	83	140	105	160
	104-□P,M,K,N	10.4	11.0	56	111	83	140	105	160
105-□P,M,K,N	10.5	11.0	56	111	83	140	105	160	
106-□P,M,K,N	10.6	11.0	56	111	83	140	105	160	
107-□P,M,K,N	10.7	11.0	56	111	83	140	105	160	
108-□P,M,K,N	10.8	11.0	56	111	83	140	105	160	
109-□P,M,K,N	10.9	11.0	56	111	83	140	105	160	
110-□P,M,K,N	11.0	11.0	56	111	83	140	105	160	
111-□P,M,K,N	11.1	12.0	60	118	90	148	114	172	
112-□P,M,K,N	11.2	12.0	60	118	90	148	114	172	

MSDH-□ (P/M/K/N)



Terminology	P	M	K	N	ND
Grade	PC205F			FG2	PD3000-1
Tolerance(drill Dia.)	h7				
Tolerance(shank Dia.)	h6				
Point angle	140°		135°		140°
Twist angle	30°				
Thinning	X type			N type	
Coolant	Through system				
P Steel M Stainless steel K Cast iron N Non-ferrous metal ND Aluminum alloy					

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

(mm)

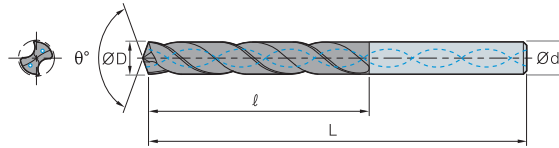
Designation	ØD	Ød	3P,M,K,N,ND		5P,M,K,N,ND		7P,M,K,N,ND	
			ℓ	L	ℓ	L	ℓ	L
MSDH								
113-□P,M,K,N	11.3	12.0	60	118	90	148	114	172
114-□P,M,K,N	11.4	12.0	60	118	90	148	114	172
115-□P,M,K,N	11.5	12.0	60	118	90	148	114	172
116-□P,M,K,N	11.6	12.0	60	118	90	148	114	172
117-□P,M,K,N	11.7	12.0	60	118	90	148	114	172
118-□P,M,K,N	11.8	12.0	60	118	90	148	114	172
119-□P,M,K,N	11.9	12.0	60	118	90	148	114	172
120-□P,M,K,N	12.0	12.0	60	118	90	148	114	172
121-□P,M,K,N	12.1	13.0	65	125	98	158	124	184
122-□P,M,K,N	12.2	13.0	65	125	98	158	124	184
123-□P,M,K,N	12.3	13.0	65	125	98	158	124	184
124-□P,M,K,N	12.4	13.0	65	125	98	158	124	184
125-□P,M,K,N	12.5	13.0	65	125	98	158	124	184
126-□P,M,K,N	12.6	13.0	65	125	98	158	124	184
127-□P,M,K,N	12.7	13.0	65	125	98	158	124	184
128-□P,M,K,N	12.8	13.0	65	125	98	158	124	184
129-□P,M,K,N	12.9	13.0	65	125	98	158	124	184
130-□P,M,K,N	13.0	13.0	65	125	98	158	124	184
131-□P,M,K,N	13.1	14.0	70	132	105	167	133	195
132-□P,M,K,N	13.2	14.0	70	132	105	167	133	195
133-□P,M,K,N	13.3	14.0	70	132	105	167	133	195
134-□P,M,K,N	13.4	14.0	70	132	105	167	133	195
135-□P,M,K,N	13.5	14.0	70	132	105	167	133	195
136-□P,M,K,N	13.6	14.0	70	132	105	167	133	195
137-□P,M,K,N	13.7	14.0	70	132	105	167	133	195
138-□P,M,K,N	13.8	14.0	70	132	105	167	133	195
139-□P,M,K,N	13.9	14.0	70	132	105	167	133	195
140-□P,M,K,N	14.0	14.0	70	132	105	167	133	195
141-□P,M,K,N	14.1	15.0	75	139	108	172	138	202
142-□P,M,K,N	14.2	15.0	75	139	108	172	138	202
143-□P,M,K,N	14.3	15.0	75	139	108	172	138	202
144-□P,M,K,N	14.4	15.0	75	139	108	172	138	202
145-□P,M,K,N	14.5	15.0	75	139	108	172	138	202
146-□P,M,K,N	14.6	15.0	75	139	108	172	138	202
147-□P,M,K,N	14.7	15.0	75	139	108	172	138	202
148-□P,M,K,N	14.8	15.0	75	139	108	172	138	202
149-□P,M,K,N	14.9	15.0	75	139	108	172	138	202
150-□P,M,K,N	15.0	15.0	75	139	108	172	138	202
151-□P,M,K,N	15.1	16.0	80	146	112	178	144	210
152-□P,M,K,N	15.2	16.0	80	146	112	178	144	210
153-□P,M,K,N	15.3	16.0	80	146	112	178	144	210
154-□P,M,K,N	15.4	16.0	80	146	112	178	144	210
155-□P,M,K,N	15.5	16.0	80	146	112	178	144	210
156-□P,M,K,N	15.6	16.0	80	146	112	178	144	210

※ Order made items : MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1)Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012 - M × 60 - 80L × 11S



MSDH-□ (P/M/K/N)

Terminology	P	M	K	N	ND
Grade	PC205F			FG2	PD3000-1
Tolerance(drill Dia.)	h7				
Tolerance(shank Dia.)	h6				
Point angle	140°		135°		140°
Twist angle	30°				
Thinning	X type				N type
Coolant	Through system				

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



		(mm)							
Designation	ØD	Ød	3P,M,K,N,ND		5P,M,K,N,ND		7P,M,K,N,ND		
			ℓ	L	ℓ	L	ℓ	L	
MSDH	157-□P,M,K,N	15.7	16.0	80	146	112	178	144	210
	158-□P,M,K,N	15.8	16.0	80	146	112	178	144	210
	159-□P,M,K,N	15.9	16.0	80	146	112	178	144	210
	160-□P,M,K,N	16.0	16.0	80	146	112	178	144	210
	161-□P,M,K,N	16.1	17.0	85	151	120	186	153	220
	162-□P,M,K,N	16.2	17.0	85	151	120	186	153	220
	163-□P,M,K,N	16.3	17.0	85	151	120	186	153	220
	164-□P,M,K,N	16.4	17.0	85	151	120	186	153	220
	165-□P,M,K,N	16.5	17.0	85	151	120	186	153	220
	166-□P,M,K,N	16.6	17.0	85	151	120	186	153	220
	167-□P,M,K,N	16.7	17.0	85	151	120	186	153	220
	168-□P,M,K,N	16.8	17.0	85	151	120	186	153	220
	169-□P,M,K,N	16.9	17.0	85	151	120	186	153	220
	170-□P,M,K,N	17.0	17.0	85	151	120	186	153	220
	171-□P,M,K,N	17.1	18.0	85	153	120	188	162	230
	172-□P,M,K,N	17.2	18.0	85	153	120	188	162	230
	173-□P,M,K,N	17.3	18.0	85	153	120	188	162	230
	174-□P,M,K,N	17.4	18.0	85	153	120	188	162	230
	175-□P,M,K,N	17.5	18.0	85	153	120	188	162	230
	176-□P,M,K,N	17.6	18.0	85	153	120	188	162	230
	177-□P,M,K,N	17.7	18.0	85	153	120	188	162	230
	178-□P,M,K,N	17.8	18.0	85	153	120	188	162	230
	179-□P,M,K,N	17.9	18.0	85	153	120	188	162	230
	180-□P,M,K,N	18.0	18.0	85	153	120	188	162	230
	181-□P,M,K,N	18.1	19.0	88	157	124	193	171	240
	182-□P,M,K,N	18.2	19.0	88	157	124	193	171	240
	183-□P,M,K,N	18.3	19.0	88	157	124	193	171	240
	184-□P,M,K,N	18.4	19.0	88	157	124	193	171	240
	185-□P,M,K,N	18.5	19.0	88	157	124	193	171	240
	186-□P,M,K,N	18.6	19.0	88	157	124	193	171	240
	187-□P,M,K,N	18.7	19.0	88	157	124	193	171	240
	188-□P,M,K,N	18.8	19.0	88	157	124	193	171	240
	189-□P,M,K,N	18.9	19.0	88	157	124	193	171	240
	190-□P,M,K,N	19.0	19.0	88	157	124	193	171	240
	191-□P,M,K,N	19.1	20.0	90	160	130	200	180	250
	192-□P,M,K,N	19.2	20.0	90	160	130	200	180	250
	193-□P,M,K,N	19.3	20.0	90	160	130	200	180	250
	194-□P,M,K,N	19.4	20.0	90	160	130	200	180	250
	195-□P,M,K,N	19.5	20.0	90	160	130	200	180	250
	196-□P,M,K,N	19.6	20.0	90	160	130	200	180	250
	197-□P,M,K,N	19.7	20.0	90	160	130	200	180	250
	198-□P,M,K,N	19.8	20.0	90	160	130	200	180	250
	199-□P,M,K,N	19.9	20.0	90	160	130	200	180	250
	200-□P,M,K,N	20.0	20.0	90	160	130	200	180	250

※ Order made items : MSD□□□-Material (P,M,K,N) × Flute length - Total length L × Shank diameter S

Ex.1)Workpiece : SM45C, Machined diameter : Ø10.1mm, Flute length : 60mm, Total length : 80mm, Shank diameter : Ø11 → MSD101-P × 60 - 80L × 11S

Ex.2)Workpiece : STS303, Machined diameter : Ø10.12mm, Flute length : Flute length:60mm, Total length : 80mm, Shank diameter : Ø11 → MSD1012 - M × 60 - 80L × 11S

G Technical Information for Mach Long Solid Drill Plus

High precision results when machining deep holes

MLD Plus *New*

Mach Long Solid Drill Plus



Code System

0600 : Ø6.00	Aspect ratio(L/D) 10D, 15D, 20D, 25D	Flute length 100 : 100mm
Drill Dia.(ØD)	Standard type	Special type

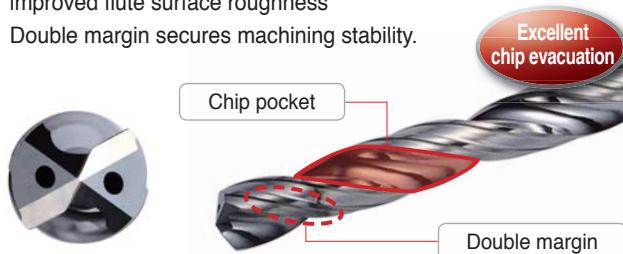
MLD 0600N - 10 P - 100L - 10S

Mach Long Solid Drill Plus (MLD Plus)	Machining area P : Carbon steel, alloy steel K : Cast iron N : Aluminum, copper alloy	Overall length 100L : 100mm	Shank Dia. 10S : Ø10
--	--	--------------------------------	-------------------------

Features

Cutting edge and flute shape

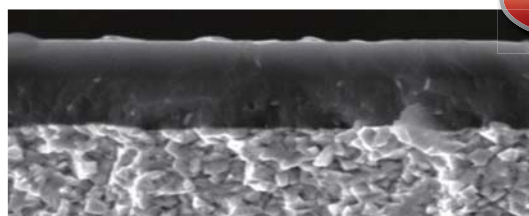
- Straight cutting edge provides better rigidity.
- Excellent chip evacuation due to wider chip pocket and improved flute surface roughness
- Double margin secures machining stability.



Cutting edge shape

New grade(PC315G)

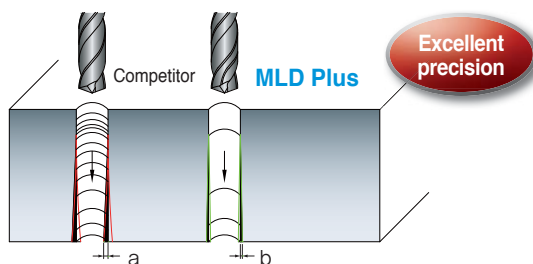
- Ultra fine substrate and new coating applied
- Lubricative coating layer improves chip evacuation with lower frictional resistance.
- Longer tool life due to higher wear resistance



PC315G

Degree of machining precision

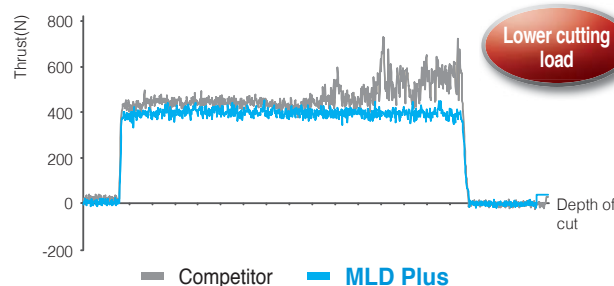
- Improved machining precision
 - Bent holes reduced
 - Inside hole surface roughness improved
 - Hole size uniformity increased
- Improved point shape
 - Precise location secured



Reduced bent holes compared to competitors (a > b)

Cutting load

- **Workpiece** : SM45C
- **Cutting condition** : Drill Dia.(m) = Ø6.0, vc(m/min) = 70
fn(mm/rev)=0.12, ap(mm)=60, wet
- **Tools** : MLD0600N-20P



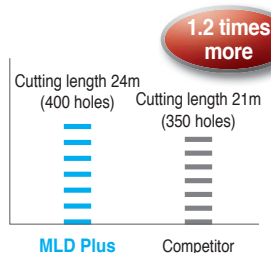
▶ Cutting Performance

Part of automobile

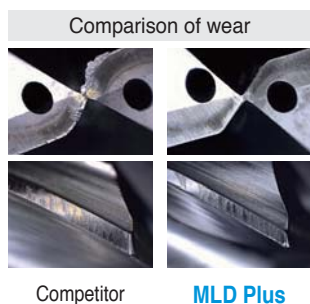
■ **Workpiece** : SM45C

■ **Cutting condition** : $vc(m/min)=70$
 $fn(mm/rev) = 0.12$
 $ap(mm) = 60$
 Through coolant

■ **Tools** : MLD0400N-20P (PC315G)



→ New grade PC315G's coating layer has been applied to improve wear resistance when machining carbon steel materials.

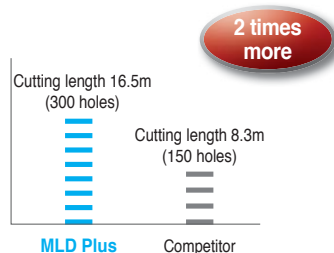


Part of automobile

■ **Workpiece** : SCM440H

■ **Cutting condition** : $vc(m/min)=70$
 $fn(mm/rev) = 0.12$
 $ap(mm) = 55$
 Through coolant(MQL)

■ **Tools** : MLD0570N-15P (PC315G)

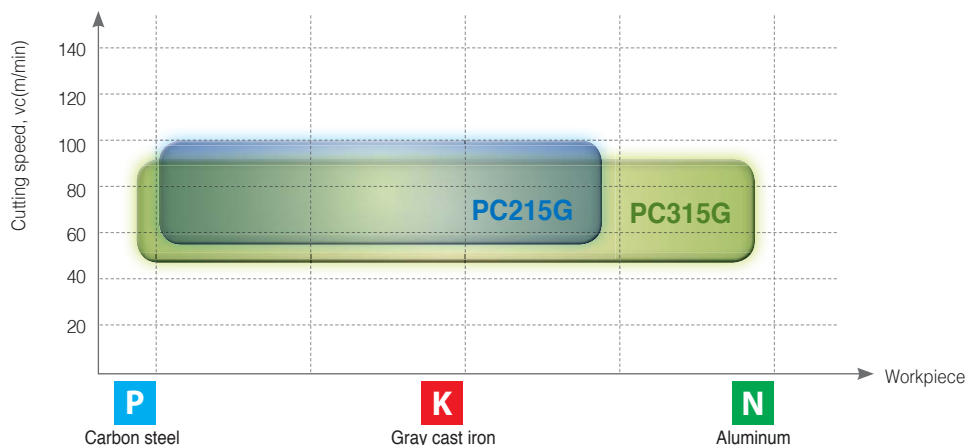


→ Double margin has been applied to improve stability and machining precision.

▶ Application Area

► **PC215G** – Excellent performance when machining cast iron and alloy steel at high speed

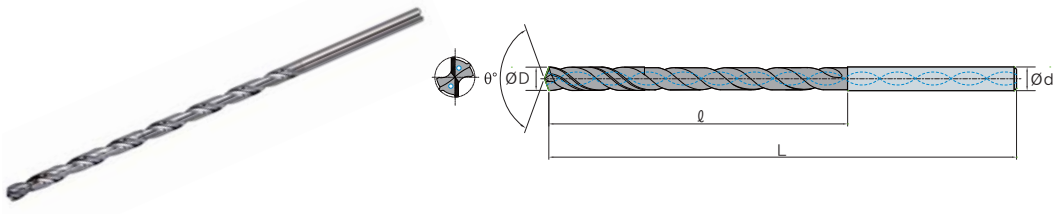
► **PC315G** – Universal grade excellent when machining carbon steel, cast iron, etc. at middle to low cutting speed



▶ Recommended Cutting Condition

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

MLD-□□ (P/K/N) *New*



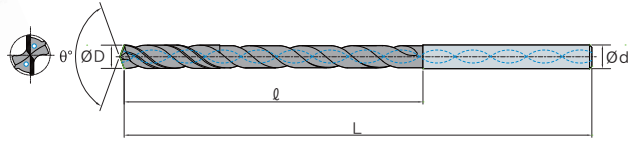
Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through system		

P Steel K Cast iron N Non-ferrous metal

(mm)											
Designation		ØD	Ød	10D		15D		20D		25D	
				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) *New*

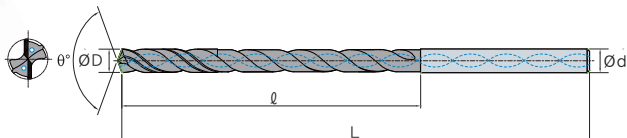


Terminology	P	K	N
Grade	PC215G PC315G		FG2
Tolerance(drill Dia.)	h7		
Tolerance(shank Dia.)	h6		
Point angle	135°		
Twist angle	30°		
Thinning	X type		
Coolant	Through system		

P Steel K Cast iron N Non-ferrous metal

		(mm)									
Designation	ØD	Ød	10D		15D		20D		25D		
			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) *New*



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 system		

P Steel K Cast iron N Non-ferrous metal

(mm)

Designation	ØD	Ød	10D		15D		20D		25D	
			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	-	-	-	-



Stable deep hole drilling with specially designed low cutting resistance

Mach Long Solid Drill

- Over 20D deep hole drilling is possible without step drilling
- The stable hole drilling due to specially designed low cutting resistance
- Special chip pocket has designed for effective chip evacuation
- Optimized design for drill rigidity to prevent the bending of the drill when entering operation
- The lubrication & thermal resistance of coating has been increased by adapting new TiAlN



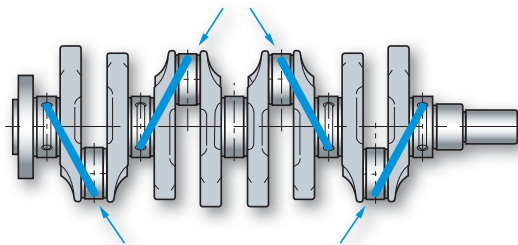
▶ Code system

MLD(P) 1200 - 10 - 100L × 11S

Special type

Type	Tool Dia.	MLDP	Overall length	Shank Dia.
Mach Long Drill : MLD Pilot Drills For MLD : MLDP	1200=Ø12.00	FLUTE length 10 = 10mm MLD Depth of drilling 10 = D X 10	100L : 100mm	11S : Ø11

▶ Mach Long Drills - Deep hole drilling



Application example (Oil hole for crank shaft, 20D)

Mach Long Drills are ideal for.....

- ▶ Deep and inclined hole drilling of crank shaft
- ▶ Deep hole drilling of cam shaft
- ▶ Deep hole drilling of mold and machinery
→ Deep hole drilling aspect ratio over 15D

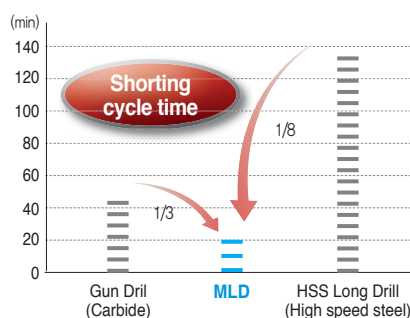
Advantages of MLD

- ▶ Shorting cycle time for better productivity
- ▶ Tool guide bush is not required
- ▶ Reduce idle time by prolonged tool life
- ▶ Green coolant solutions(MQL) to protect environment

▶ MLD productivity : MLD0680-20 (Ø6.8mm x 140 x 170L x 7S)

Tool	vc(m/min)	fn(mm/rev)	n(min ⁻¹)	vf(mm/min)	Coolant	Step operation
Gun Drills (Carbide)	100	0.04	4,683	187	Through coolant oil	No required
High Speed Steel Long Drills	15	0.10	703	70	Outer coolant oil	15mm / 9times
Mach Long Drills	80	0.14	3,747	525	MQL- Air 0.5MPa, Oil 20cc/h	No required

▶ Cycle time

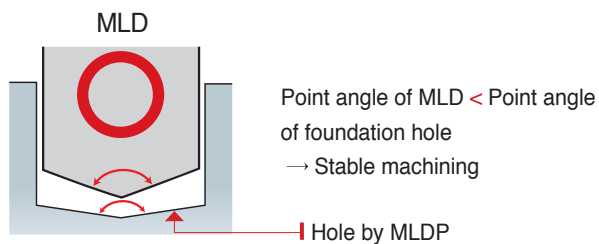


Advantages of MLD against conventional drills

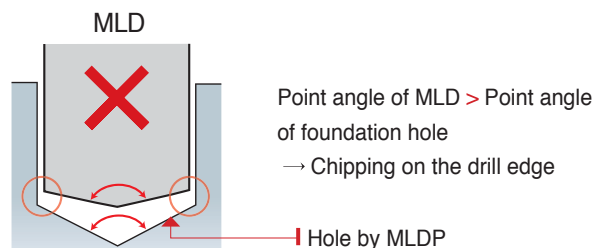
- ▶ Decreasing cycle time up to 1/3 ~ 1/8 times
- ▶ Increasing productivity by process reduction
- ▶ It is easy to reduce running cost
- ▶ Improving of effective working condition
- ▶ Drill guide bush is not required

Function of MLD & MLDP

Relationship of point angle between MLD & MLDP

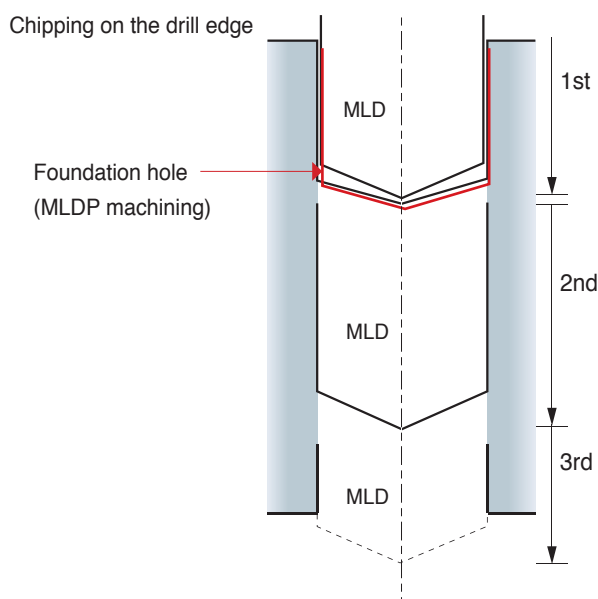


Large point angle of Pilot Drill : **Stable condition**



Small point angle of Pilot Drill : **Unstable condition**

To make the optimal of MLD



1st. Pilot drilling

- $vc(m/min)$ = Normal
- $fn(mm/rev)$ = Normal

2nd. Deep drilling by MLD

Approach the drill 1mm less than the depth of MLDP drilling.

- $vc(m/min)$ = 15
- $fn(mm/rev)$ = 0.5

2nd MLD drilling (Machining stage)

- $vc(m/min)$ = Normal
- $fn(mm/rev)$ = Normal

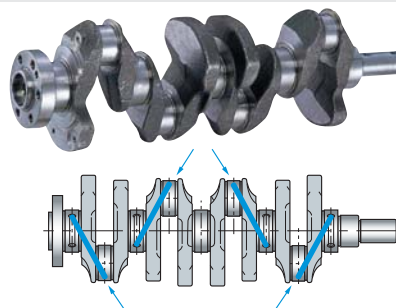
3rd MLD drilling (Piercing stage)

- $vc(m/min)$ = Normal
- $fn(mm/rev)$ = Normal feed / 2

Application example

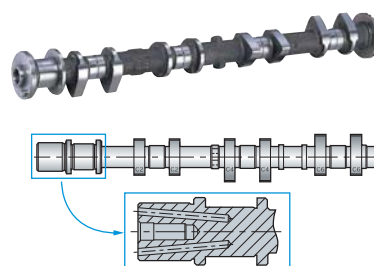
Part of automobile

- **Workpiece** SCM440H, HB255~330
- **Cutting condition** $vc(m/min)$ = 70
 $fn(mm/rev)$ = 0.18
MQL(30cc/hour)
 $Air(MPa)$ = 0.7
- **Designation** MLD0600-22A (Ø6mm, Aspect ratio 18D)
- **Machine** Horizontal milling machine
- **Tool life** 1000 holes

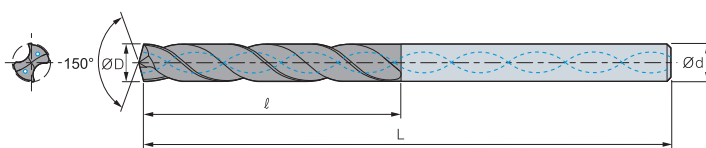


Part of automobile

- **Workpiece** GC250
- **Cutting condition** $vc(m/min)$ = 63
 $fn(mm/rev)$ = 0.1
water-soluble cutting fluid(3kg/cm², 2 l/min)
- **Designation** MLD0400-25A (Ø4mm, Aspect ratio 16D)
- **Machine** Rotary milling machine
- **Tool life** 440 holes



MLDP(Mach Pilot Drills with oil hole)



Grade	PC205F
Tolerance(drill Dia.)	x6
Twist angle	h6
Tolerance	150°
Point angle	30°
Thinning	X type
Coolant	Through system

(mm)

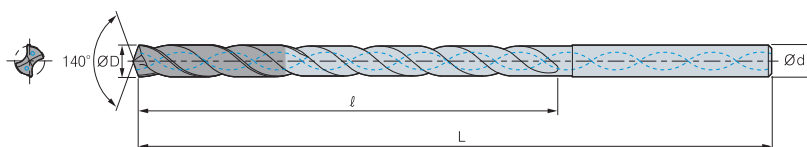
Designation	ØD	Ød	5 (ℓ / ØD = 5)		7 (ℓ / ØD = 7)	
			ℓ	L	ℓ	L
MLDP 0300-□	3.0	3.0	25	70	30	75
0400-□	4.0	4.0	34	80	40	86
0500-□	5.0	5.0	43	90	50	97
0600-□	6.0	6.0	48	96	60	108
0700-□	7.0	7.0	56	105	70	120
0800-□	8.0	8.0	60	110	80	130
0900-□	9.0	9.0	72	125	90	143
1000-□	10.0	10.0	75	129	95	150

※ Order made items : MLDP□□□□ × Flute length - Total length L × Shank diameter S

Ex.1) Machined diameter : Ø5.8mm, Flute length : 50mm, Total length : 100mm, MLDP0580 × 50-100L × 6S

※ Precautions needed by tooling as NMLD and MLDP are one set.

MLD(Mach long Drills)



Grade	PC205F
Tolerance(drill Dia.)	h7
Twist angle	h6
Tolerance	140°
Point angle	30°
Thinning	X type
Coolant	Through system

(mm)

Designation	ØD	Ød	20 (ℓ / ØD = 20)		25 (ℓ / ØD = 25)	
			ℓ	L	ℓ	L
MLD 0300-□	3.0	3.0	60	110	75	120
0400-□	4.0	4.0	80	130	100	150
0500-□	5.0	5.0	100	150	125	175
0600-□	6.0	6.0	120	170	150	200
0700-□	7.0	7.0	140	190	175	225
0800-□	8.0	8.0	160	210	200	250
0900-□	9.0	9.0	180	230	-	-
1000-□	10.0	10.0	200	250	-	-

※ Order made items : MLD□□□□ -Aspect ratio

Ex.1) Machined diameter : Ø5.3mm, Flute length : 120mm, Total length : 180mm, MLD0530-22(Aspect ratio)

※ The last alphabet of the code refers to whether the product has been upgraded.

Tolerance code

Drill Dia. (ØD)		h6	h7	x6
Over	Under			
-	3	0 ~ - 0.006	0 ~ - 0.010	+ 0.020 ~ + 0.026
3	6	0 ~ - 0.008	0 ~ - 0.012	+ 0.028 ~ + 0.036
6	10	0 ~ - 0.009	0 ~ - 0.015	+ 0.034 ~ + 0.043
10	14	0 ~ - 0.011	0 ~ - 0.018	+ 0.040 ~ + 0.051
14	18	0 ~ - 0.011	0 ~ - 0.018	+ 0.045 ~ + 0.056
18	24	0 ~ - 0.013	0 ~ - 0.021	+ 0.054 ~ + 0.067

Code system for mach step drill

MSD(H)S

Solid type : MSDS
Oil-hole type : MSDHS

Tool
Dia. ×

ØD

Effective
flute length –

ℓ₁

Flute
length –

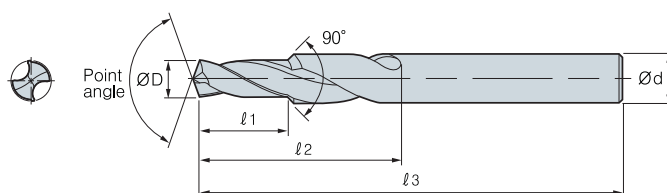
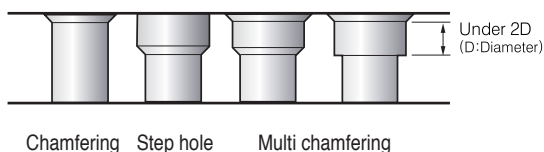
ℓ₂

Overall
length(L) ×

(ℓ₃)L

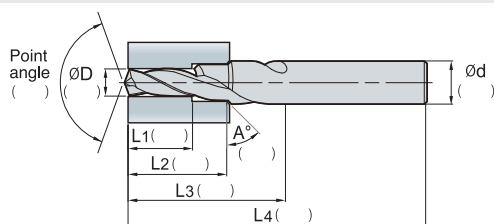
Shank
Dia.(S)

(Ød)S



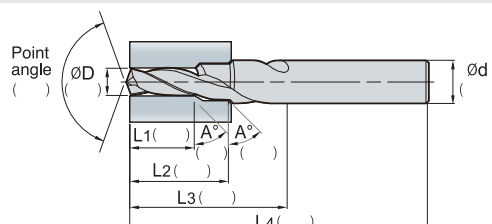
☐ Multi chamfering

(Coolant : Through system ☐ External system ☐)



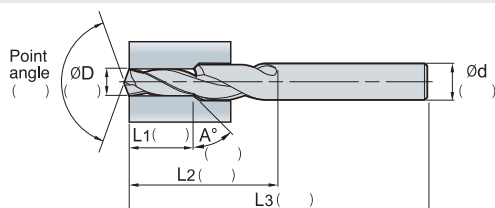
☐ Multi chamfering

(Coolant : Through system ☐ External system ☐)



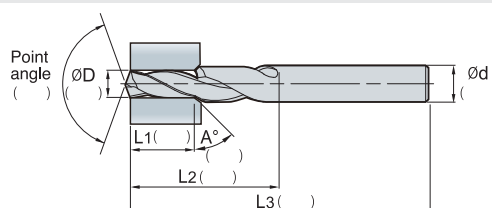
☐ Step hole

(Coolant : Through system ☐ External system ☐)



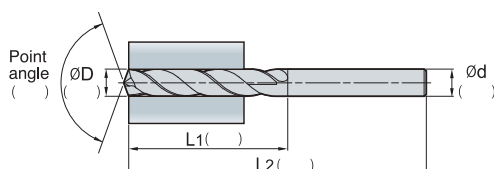
☐ Chamfering

(Coolant : Through system ☐ External system ☐)



☐ Drilling

(Coolant : Through system ☐ External system ☐)



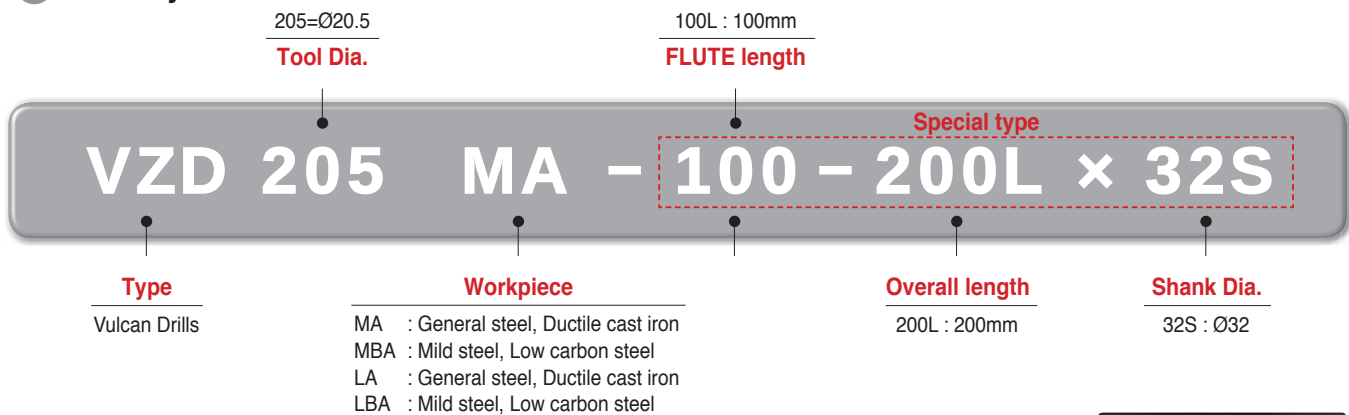
High feed and precision machining with our specially designed point edge

Vulcan Drill

- 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



Application for Vulcan Drill

Workpiece - General steel, Alloy steel, Mild steel, Dice steel, Stainless steel, Cast iron, Ductile cast iron, Non-ferrous metal, etc



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

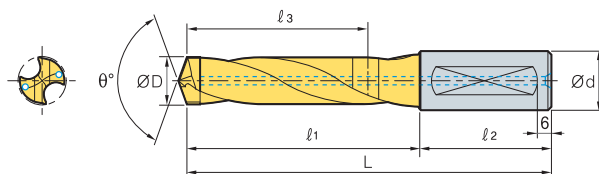
Clamping of workpiece

- 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, MBA



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

(mm)

Designation	ØD	Ød	L	l ₁	l ₂	l ₃
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 x Flute length - Total length L

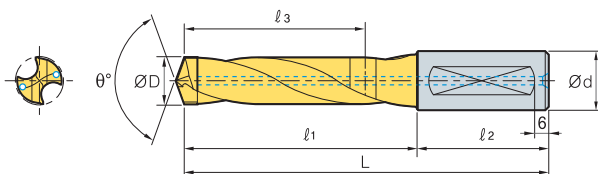
Ex.1) MA Type, Machined diameter : Ø18.6mm, Flute length : 110mm, Total length : 200mm
--- VZD186MA x 110-200L

Ex.2) MA Type, Machined diameter : Ø18.63, Flute length : 110mm, Total length : 200mm
--- VZD1863MA x 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°
Type	X type	
Coolant	Through system	



(mm)

Designation	ØD	Ød	L	l ₁	l ₂	l ₃
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 : Ø18.6mm, Flute length : 110mm, Total length : 200mm
--- VZD186LA × 110-200L

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

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

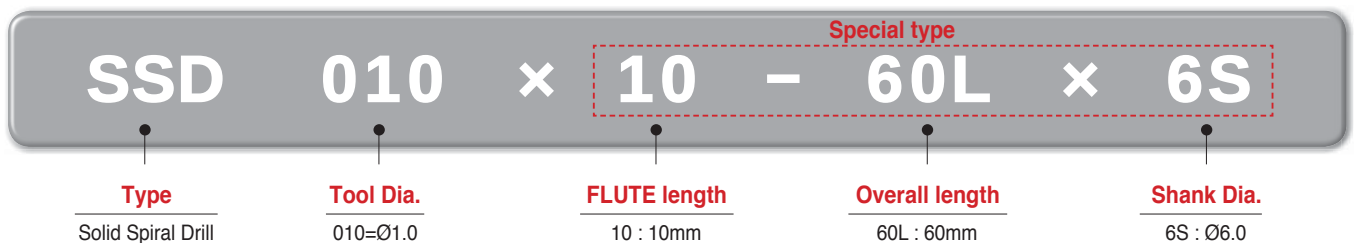
Guarantees excellent chip evacuation and surface roughness by specially designed flute and high rigidity of drill

Carbide Drill

One of the most important aspects of hole-drilling is hole precision and the tool life of the drill. These carbide drills are produced with a super fine exclusive substrate from Korloy designed to meet stress, hardness, and resistance to plastic deformation requirements of today's machining

- Long tool life by improving wear resistance and toughness for small hole drilling(Ø1mm~ Ø4mm)
- Increment of productivity by come true high feed because of specially designed cutting edge to low cutting resistance.(Ø4~ Ø15)
- Available to various workpiece as cast iron, non-ferrous metal, etc.
- Guarantees excellent chip evacuation and surface roughness by specially designed flute and high rigidity of drill

Code system

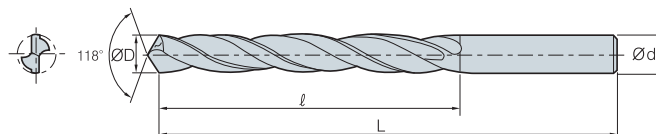


Recommended cutting condition

Workpiece	Strength	Revolution as per drill Dia.(min ⁻¹)							Feed rate (mm/rev) per drill dia.(mm)		Coolant
		Ø5	Ø10	Ø15	Ø20	Ø25	Ø30	Ø40	Ø5~Ø12	Ø15~Ø40	
SM10C~SM45C	50	2900	1600	1100	1000	800	700	600	0.03~0.06	0.03~0.06	Cutting oil
SM55C	70	2300	1530	1050	920	765	640	560	0.03~0.06	0.06~0.12	Cutting oil
SM55C·Pre-hardened steel	100	2200	1500	1000	900	750	650	550	0.03	0.06	Cutting oil
Pre-hardened steel	150~180	700	340	250	190	160	140	120	0.02	0.04	Cutting oil
Cr-Ni steel	100	2200	1200	800	652	550	460	380	0.03	0.06	Cutting oil
Mn-steel	40~110	700	340	260	190	170	150	120	0.04	0.08	Dry
Casting	200~300	2000	1500	800	600	450	400	350	0.03	0.06	Dry
Malleable iron	200	2400	1500	900	650	500	420	380	0.03	0.06	Dry
Chiled casting	65Hs	350	200	150	100	80	70	55	0.01	0.02	Dry
Copper	60~80	6000	4000	2500	2000	1400	1000	800	0.06	0.12	Dry
Brass	80~120	5000	3500	2000	1500	1400	1200	1000	0.05	0.10	Dry
Bronze casting	60~120	3500	2500	1800	1500	1200	1000	900	0.04	0.08	Dry
Aluminum	60~120	16000	8500	5700	4500	3700	3100	2800	0.1	0.2	Dry
Al alloy (Si13%)	40	8000	4500	2800	2100	1750	1050	700	0.05	0.15	Dry
Synthetic resin	90~120	8000	5400	2800	2100	1750	1050	200	0.05	0.15	Dry



Carbide Drill-SSD



Coating	x
Tolerance(drill Dia.)	h8
Tolerance(shank Dia.)	h7
Point angle	118°
Twist angle	30°
Thinning	S type
Coolant	External system

					(mm)				
	Designation	ØD = Ød	ℓ	L		Designation	ØD = Ød	ℓ	L
SSD	010	1.0	10	32	SSD	048	4.8	38	65
	011	1.1	10	32		049	4.9	38	65
	012	1.2	10	32		050	5.0	38	65
	013	1.3	10	32		051	5.1	38	65
	014	1.4	10	32		052	5.2	38	65
	015	1.5	13	35		053	5.3	38	65
	016	1.6	13	35		054	5.4	38	65
	017	1.7	13	35		055	5.5	38	65
	018	1.8	13	35		056	5.6	40	75
	019	1.9	13	35		057	5.7	40	75
	020	2.0	18	40		058	5.8	40	75
	021	2.1	18	40		059	5.9	40	75
	022	2.2	18	40		060	6.0	40	75
	023	2.3	18	40		061	6.1	40	75
	024	2.4	18	40		062	6.2	40	75
	025	2.5	22	45		063	6.3	40	75
	026	2.6	22	45		064	6.4	40	75
	027	2.7	22	45		065	6.5	40	75
	028	2.8	22	45		066	6.6	46	80
	029	2.9	22	45		067	6.7	46	80
	030	3.0	25	50		068	6.8	46	80
	031	3.1	25	50		069	6.9	46	80
	032	3.2	25	50		070	7.0	46	80
	033	3.3	25	50		071	7.1	46	80
	034	3.4	25	50		072	7.2	46	80
	035	3.5	25	50		073	7.3	46	80
	036	3.6	30	55		074	7.4	46	80
	037	3.7	30	55		075	7.5	46	80
	038	3.8	30	55		076	7.6	46	80
	039	3.9	30	55		077	7.7	46	80
	040	4.0	30	55		078	7.8	46	80
	041	4.1	34	60		079	7.9	46	80
	042	4.2	34	60		080	8.0	50	85
	043	4.3	34	60		081	8.1	50	85
	044	4.4	34	60		082	8.2	50	85
	045	4.5	34	60		083	8.3	50	85
	046	4.6	38	65		084	8.4	50	85
	047	4.7	38	65		085	8.5	50	85

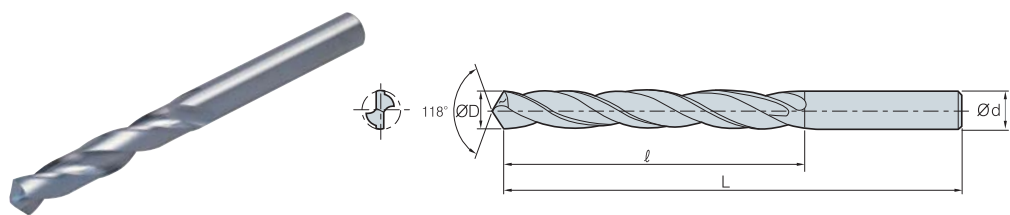
※ Drill diameter : Available from Ø0.6

※ Order made items : SSD × Flute length - Total length L

Ex.1) Genetal type, Machined diameter : Ø8.2mm, Flute length : 60mm, Total length : 90mm --- SSD082 × 60 - 90L

Ex.2) Genetal type, Machined diameter : Ø8.2mm --- SSD082

Carbide Drill-SSD



Coating	x
Tolerance(drill Dia.)	h8
Tolerance(shank Dia.)	h7
Point angle	118°
Twist angle	30°
Thinning	S type
Coolant	External system

					(mm)				
Designation		ØD = Ød	ℓ	L	Designation		ØD = Ød	ℓ	L
SSD	086	8.6	50	95	SSD	097	9.7	50	100
	087	8.7	50	95		098	9.8	50	100
	088	8.8	50	95		099	9.9	50	100
	089	8.9	50	95		100	10.0	50	100
	090	9.0	50	95		105	10.5	60	120
	091	9.1	50	95		110	11.0	60	120
	092	9.2	50	95		115	11.5	65	125
	093	9.3	50	95		120	12.0	65	125
	094	9.4	50	95		125	12.5	65	125
	095	9.5	50	95		130	13.0	65	125
	096	9.6	50	100		150	15.0	70	130

※ Drill diameter : Available from Ø0.6

※ Order made items : SSD × Flute length - Total length L

Ex.1) Genetal type, Machined diameter : Ø8.2mm, Flute length : 60mm, Total length : 90mm --- SSD082 × 60 - 90L

Ex.2) Genetal type, Machined diameter : Ø8.2mm --- SSD082

Burnishing Drill

Recommended cutting condition

Workpiece	Cutting speed vc(m/min)	Feed rate (mm/rev) per drill dia.(mm)				
		Ø2.0~ 3.0	Ø3.5~ 5.0	Ø5.5~ 8.0	Ø8.5~ 12	Ø12.5~ 18
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

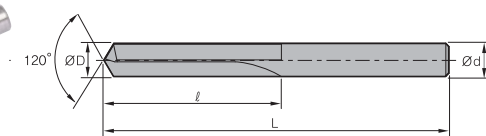


Fig.1

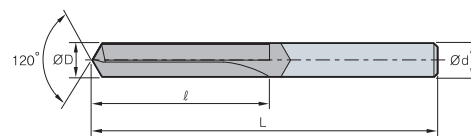


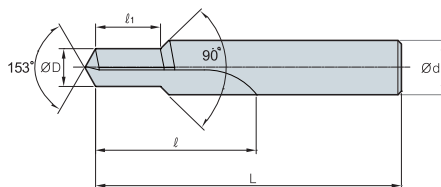
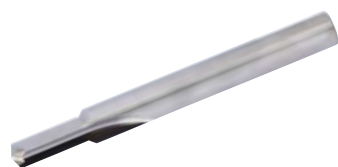
Fig.2

(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)

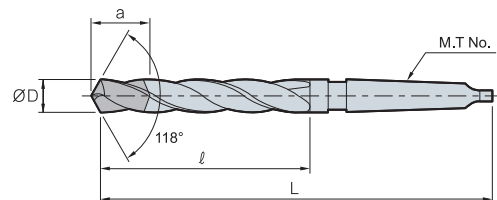
Designation		ØD	Ød	ℓ	ℓ₁	L	Tap
BDT	M05080-ℓ 1	4.2	6.0	35	9~15	90	M5XP0.8
	M06100-ℓ 1	5.0	7.0	40	11~18	95	M6XP1.0
	M08125-ℓ 1	6.8	10.0	50	15~24	105	M8XP1.25
	M10125-ℓ 1	8.8	12.0	55	17~30	110	M10XP1.25
	M10150-ℓ 1	8.5	12.0	55	17~30	110	M10XP1.5
	M12125-ℓ 1	10.8	14.0	60	19~36	120	M12XP1.25
	M12150-ℓ 1	10.5	14.0	60	19~36	120	M12XP1.5
	M12175-ℓ 1	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

※ Order form : TSDM125



High accuracy hole machining for aluminum alloy

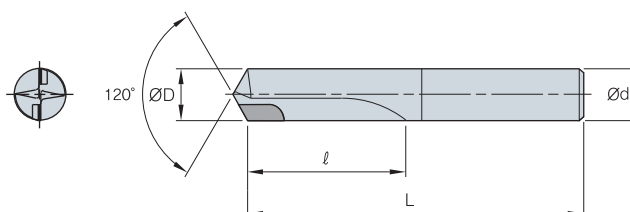
PCD Drill

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

▶ Code system**▶ Recommended cutting condition**

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

PDD



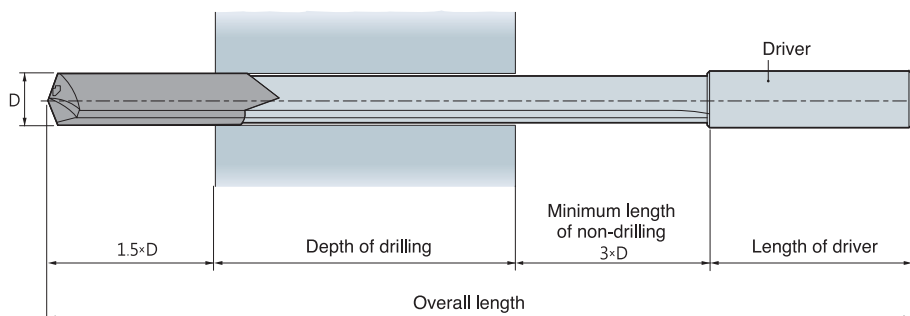
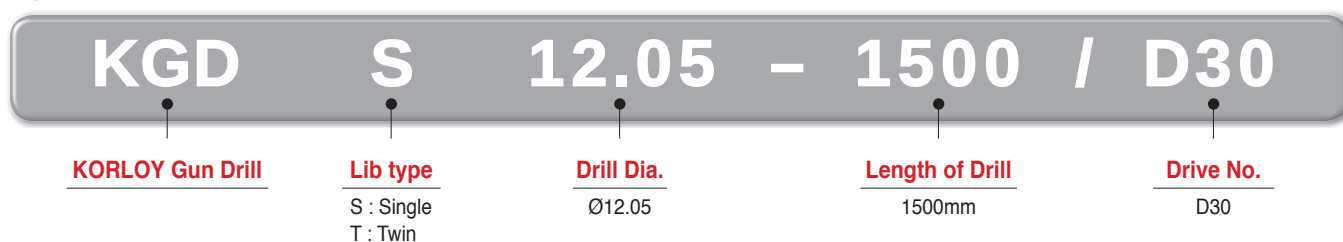
		(mm)			
Designation		ØD	Ød	ℓ	L
PDD	0500	5.0	5.0	30	80
	0550	5.5	5.5	30	80
	0600	6.0	6.0	30	80
	0650	6.5	6.5	40	95
	0700	7.0	7.0	40	95
	0750	7.5	7.5	45	100
	0800	8.0	8.0	45	100
	0850	8.5	8.5	50	110
	0900	9.0	9.0	50	110
	0950	9.5	9.5	55	115
	1000	10.0	10.0	55	115
	1050	10.5	10.5	60	120
	1100	11.0	11.0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

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

Gun Drill

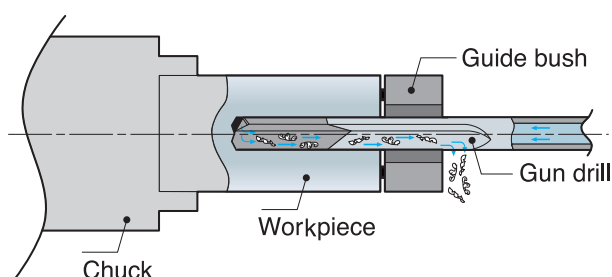
- High efficiency in deep hole machining
- High accuracy (Hole tolerance : IT9, surface finish : Ra0.1~3.0S)
- Stable Quality due to unique cutting edge and guide pad available regrinding
- Used drill can recycle as change part of carbide
- Depending on request, The drills can change geometry of cutting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

Code system



- 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.

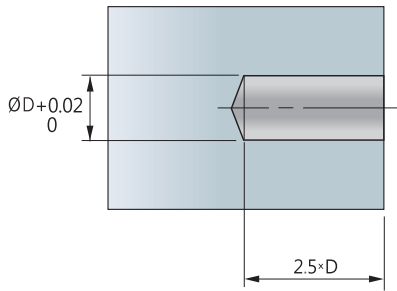
Application of Gun Drill on exclusive machine



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

Application of Gun Drill on machining center

1 Machining of a pilot hole

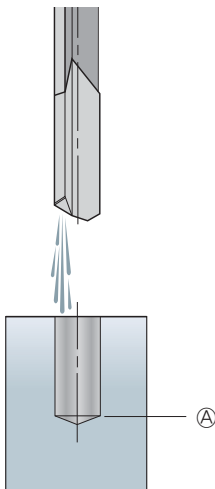


1. A pilot hole is necessary in machining on a machining center instead of a guide bush.
2. The diameter of the pilot hole should be 0.01~0.02(H7) larger bigger than one of the Gun Drill diameter and the depth of drilling should be about 2.5×D.
3. Use Mach Drill(MSD) for machining of a pilot hole.



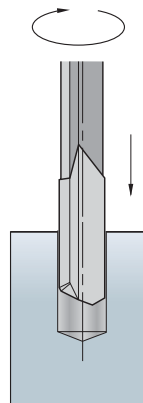
MSD

2 Moving the Gun Drill to the pilot hole



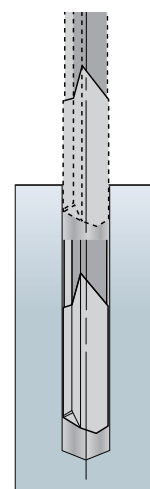
1. The Gun Drill should not drill before entering into the pilot hole.
2. Coolant is necessary for gun drilling.

3 Start Gun Drilling.



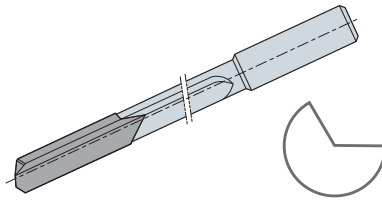
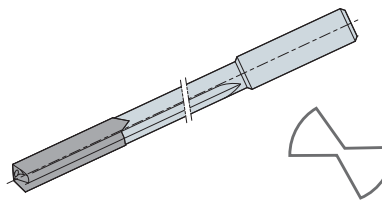
1. Rotate the spindle.
2. Machine with drilling to vertical axis.

4 After gun drilling



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

Features

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

Recommended cutting condition

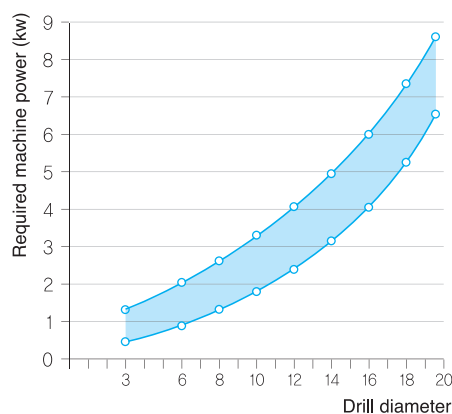
Workpiece	Hardness (HB)	Cutting speed vc(m/min)	Feed rate (mm/rev) per drill dia.(mm)					
			~Ø4	~Ø6	~Ø10	~Ø14	~Ø24	Ø25~
Carbon steel Alloy steel	~150	100~150	0.005~0.015	0.010~0.025	0.015~0.035	0.020~0.050	0.030~0.070	0.040~0.080
	150~250	80~120	0.005~0.010	0.010~0.020	0.015~0.030	0.020~0.040	0.030~0.060	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

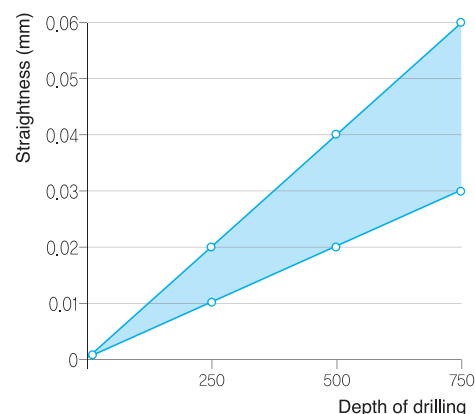
The factors below determines the straightness of hole.

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

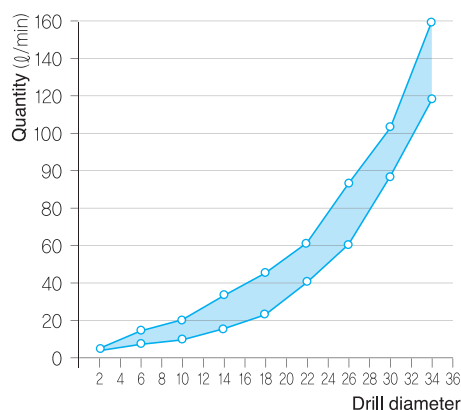
Required machine power



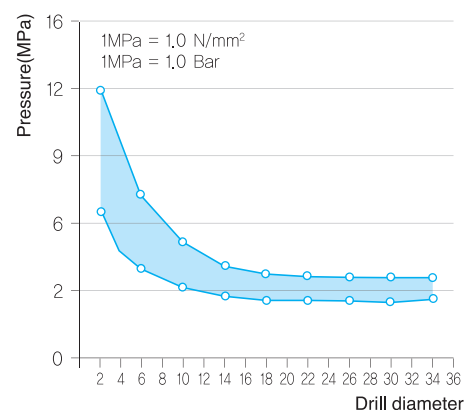
Straightness



Quantity of coolant



Pressure of coolant

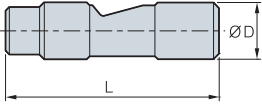
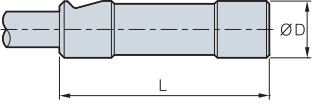
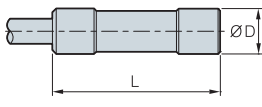
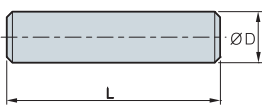
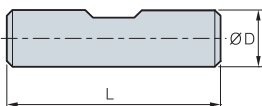
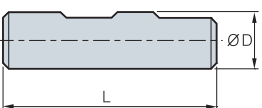
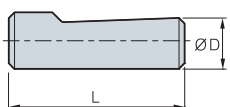
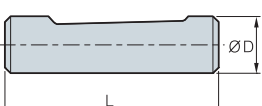


The above graph shows general information and it is changeable depending on kind of tool, workpieces, and cutting conditions etc.

- **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 μ m. 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



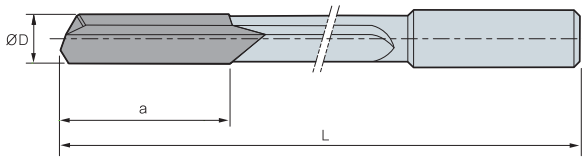
Driver standard

Type	Shape	No.	ØD×L		Carbide Type	
			ØD×L	Thread	Tipped	Solid
Central Clamping Surface 15°		D01	10*40		●	●
		D02	16*45		●	
		D03	19.05*69.8		●	
		D04	25*70		●	
		D05	25.4*69.8		●	
Frontal Clamping Surface 15°		D06	16*50		●	
Central Clamping Tapered		D07	12.7*38.1		●	●
		D08	16*70			
		D09	19.05*69.8		●	
		D10	20*70			
Cylindrical DIN1835A DIN6535HA		D11	4*28		●	●
		D12	6*36		●	●
		D13	10*40		●	●
		D14	16*48		●	●
		D15	20*50		●	
		D16	25*56		●	
Weldon DIN1835B		D17	10*40		●	●
		D18	12*45		●	●
		D19	16*48		●	●
		D20	20*50		●	●
Weldon DIN6535HB		D21	25*56		●	
		D22	32*60		●	
		D23	40*70			
Whistle Notch DIN1835E		D24	10*40		●	●
		D25	12*45		●	●
		D26	16*48		●	●
		D27	20*50		●	●
		D28	25*56		●	
		D29	32*60		●	
Whistle Notch DIN6535HE		D30	10*40		●	●
		D31	12*45		●	●
		D32	16*48		●	●
		D33	20*50		●	●

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

Gun Drill-KGDS

Single Lip type



Designation discription	
○.○○	Diameter
□□□□	Length
D△△	Driver code no.

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

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

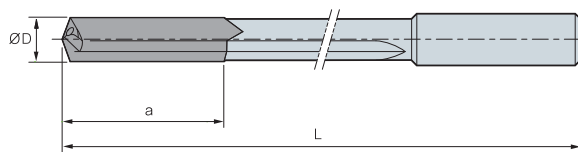
Available overall length

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



Gun Drill-KGDT

Twin Lip type



Designation discription	
○.○○	Diameter
□□□□	Length
D△△	Driver code no.

Designation		ØD	a
KGDT			
○.○○-□□□□ / D△△		6.00~6.49	35
○.○○-□□□□ / D△△		6.50~6.99	35
○.○○-□□□□ / D△△		7.00~7.49	38
○.○○-□□□□ / D△△		7.50~7.99	38
○.○○-□□□□ / D△△		8.00~8.49	38
○.○○-□□□□ / D△△		8.50~8.99	38
○.○○-□□□□ / D△△		9.00~8.49	40
○.○○-□□□□ / D△△		9.50~9.99	40
○.○○-□□□□ / D△△		10.00~10.49	40
○.○○-□□□□ / D△△		10.50~10.99	40
○.○○-□□□□ / D△△		11.00~11.49	45
○.○○-□□□□ / D△△		11.50~11.99	45
○.○○-□□□□ / D△△		12.00~12.49	45
○.○○-□□□□ / D△△		12.50~12.99	48
○.○○-□□□□ / D△△		13.00~13.99	48
○.○○-□□□□ / D△△		14.00~14.99	48
○.○○-□□□□ / D△△		15.00~15.99	48
○.○○-□□□□ / D△△		16.00~16.99	50
○.○○-□□□□ / D△△		17.00~17.99	50
○.○○-□□□□ / D△△		18.00~18.99	50
○.○○-□□□□ / D△△		19.00~19.99	50
○.○○-□□□□ / D△△		20.00~20.99	55
○.○○-□□□□ / D△△		21.00~21.99	55
○.○○-□□□□ / D△△		22.00~22.99	55
○.○○-□□□□ / D△△		23.00~23.99	60
○.○○-□□□□ / D△△		24.00~24.99	60
○.○○-□□□□ / D△△		25.00~25.99	65
○.○○-□□□□ / 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				
		250mm	500mm	1000mm	1500mm	2000mm
KGDT	6.00 ~ 26.50	○	○	○		

Mass production and High performance

Indexable Reamer

- 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

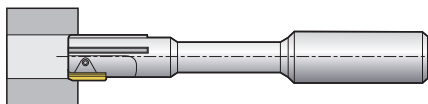
IR	T	12.000	-	16	135	-	16
Type	Application	Reamer Dia.		Shank Dia.	length		Insert size
Indexable Reamer	T : Throughout hole machining B : Blind hole machining	12.000 : Ø12.0		16 : Ø16	135 : 135		15 : 15.0×3.0 16 : 16.0×3.5 17 : 17.0×4.5 22 : 22.0×6.5

▶ Insert code system

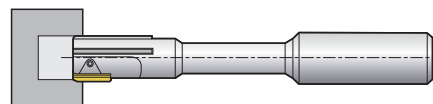
RI	16	-	B	06
Type	Insert size		Insert reed type	Angle of C/B
Reamer Insert	15 : 15.0×3.0 16 : 16.0×3.5 17 : 17.0×4.5 22 : 22.0×6.5		A : Excellent surface finish, low cutting condition B : General surface finish, high cutting condition C : Aluminum and copper alloy D : Blind hole, low feed	00 : 0°, Cast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

▶ Application

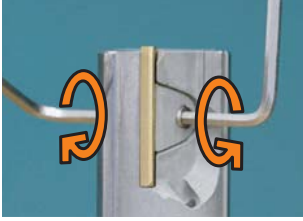
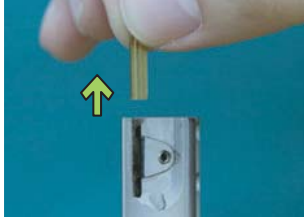
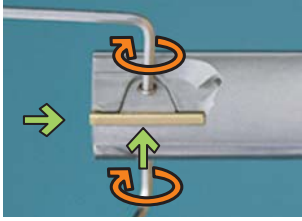
Throughout hole machining(IRT type)



Stuffed hole machining (IRB type)



▶ How to set an insert

- | | | | |
|--|--|--|--|
| <p>1</p>  <p>1. Screw the wedge screw counter clockwise with the exclusive wrench.</p> | <p>2</p>  <p>2. Screw the clamp screw.
① Top side : counter clockwise
② Lower side : clockwise</p> | <p>3</p>  <p>3. Remove the insert and clean the pocket.</p> | <p>4</p>  <p>4. Put the insert up to the edge stopper and clamp the insert.
① Top side : clockwise
② Lower side : counterclockwise</p> |
|--|--|--|--|

▶ Exclusive fixture



- ▶ Designation : KIRSD-210
- ▶ Maximum diameter of reamer : $\varnothing 60 \times 210 \text{mm}$
- ▶ 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

- | | | |
|--|--|---|
| <p>1</p>  <p>1. Adjust the gauge to '0'.</p> | <p>2</p>  <p>2. Rotate the reamer for the insert to touch the gauge.</p> | <p>3</p>  <p>3. Set the back taper and adjust the insert height with screw the wedge screw.
① Top side of insert : $+0.015 \sim +0.020 \text{mm}$
② Bottom side of insert : $+0.005 \sim +0.010 \text{mm}$
③ Back taper : $0.010 \sim 0.015 \text{mm}$</p> |
|--|--|---|

▶ 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 than 0.010~0.015mm 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.

▶ Recommended cutting condition

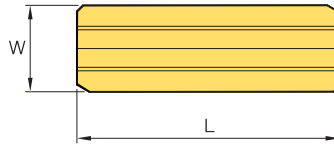
Workpiece	Insert Type		Feed rate (mm/rev) per drill dia.(mm)	Cutting speed vc(m/min)		
	Rake angle	Leed type		Coated	Uncoated	Cermet
Carbon steel General steel	6	A	0.1~0.4	60~80	40~60	110~160
		B	0.1~0.3	80~120	60~80	
		D	0.05~0.2			
Mild steel Alloy steel	6	A	0.1~0.4	40~60	20~40	110~160
		B	0.1~0.3	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  (NYLOK)	Clamp Wrench 	Wedge Wrench 
10.0~11.9	CV 15	AW2430	DHA0308	HSO306	HW15L	HW15L
12.0~17.9	CV 16	AW2435				
18.0~27.9	CV 17	AW3240	DHA0409	HSO406	HW20L	HW20L
28.0~31.9	CV 22	AW3260				



Indexable Reamer Insert



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

※ ○ This is recommended grade as for insert type

Angle of chip breaker

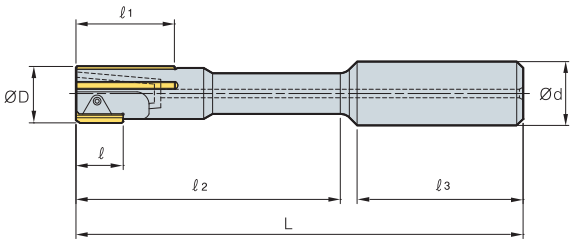
	00	06	12
Shape			
Application	For cast iron machining	For general machining	For stainless and aluminum machining

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

Throughout hole

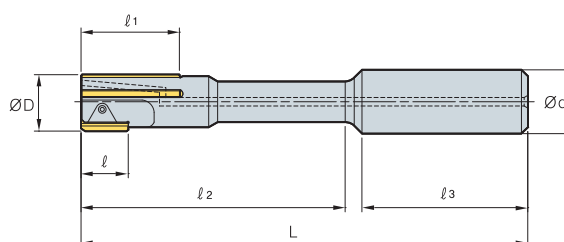


(mm)									
	Designation	$\varnothing D$	ℓ	ℓ_1	ℓ_2	ℓ_3	L	$\varnothing d$	Insert
IRT	10.000-16125-15	10	15	30	75	45	125	16	RI 15
	11.000-16125-15	11	15	30	75	45	125	16	RI 15
	12.000-16135-16	12	16	30	85	45	135	16	RI 16
	13.000-16135-16	13	16	30	85	45	135	16	RI 16
	14.000-16135-16	14	16	30	85	45	135	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

Applicable inserts G82



Indexable Reamer - IRB

Stuffed hole


(mm)

	Designation	ØD	l	l ₁	l ₂	l ₃	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

 Applicable inserts **G82**

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

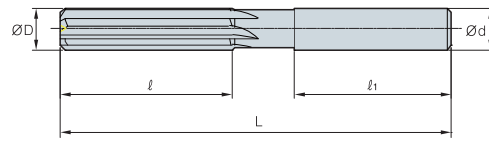


Fig.1

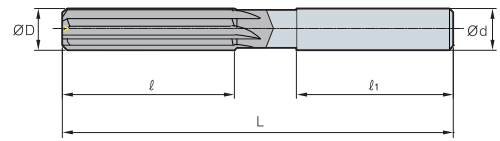


Fig.2

								(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

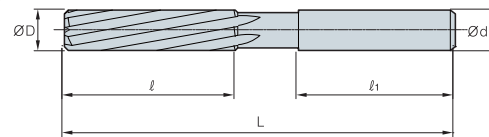


Fig. 1

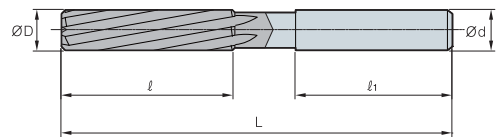
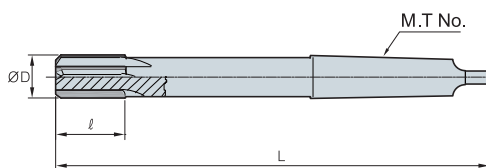


Fig. 2

								(mm)
Designation	No. of flute	ØD	Ød	ℓ	ℓ₁	L	Fig.	
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

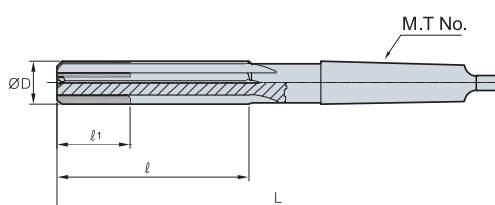
Chucking Reamer - TCRS



(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

Machine Reamer - TMRS



(mm)

Designation		No. of flute	ØD	ℓ	ℓ ₁	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

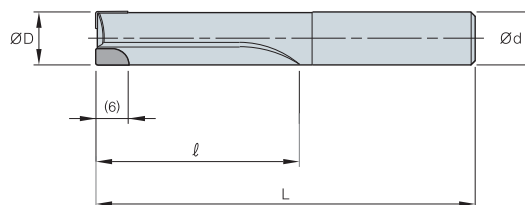
Code system

PDR	2	070
Type	Tooth	Diameter
PCD Reamer	2 : 2flute	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

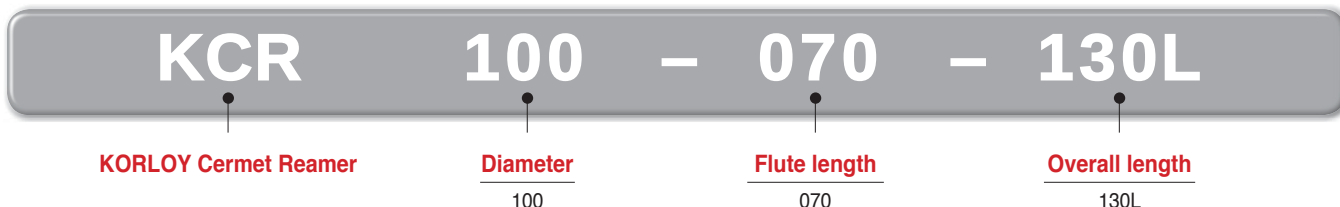


(mm)						
Designation	No. of flute	ØD	Ød	ℓ	L	
PDR	2050	2	5.0	6.0	30	65
	2060	2	6.0	6.0	40	75
	2070	2	7.0	8.0	40	75
	2080	2	8.0	8.0	40	75
	2090	2	9.0	10.0	40	85
	2100	2	10.0	10.0	40	85
	2120	2	12.0	12.0	50	95
	2140	2	14.0	16.0	50	95
	2150	2	15.0	16.0	50	100
	4160	4	16.0	16.0	50	100
	4180	4	18.0	20.0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

Cermet Reamer *New*

- 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, tool life than carbide reamer

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

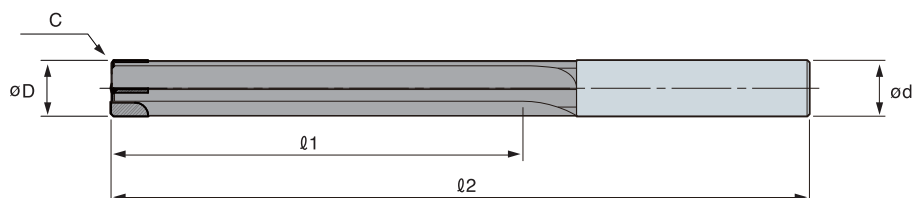
Application example



- **Cutting condition**
- Workpiece : S55CR
 - Hardness : 23~30HRC
 - fn(mm/rev) : 0.4
 - vc(m/min) : 20

Cermet Reamer - KCR

Standard type

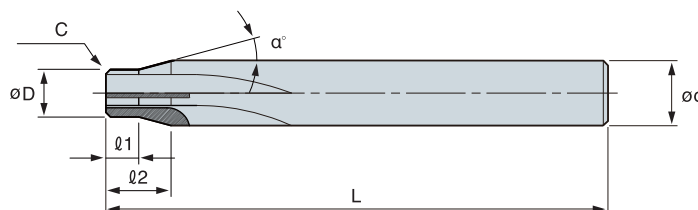


(mm)

	Designation	Flute	ØD	Ød	l ₁	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



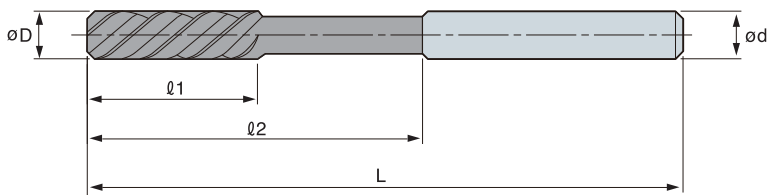
(mm)

	Designation	Flute	ØD	Ød	l ₁	l ₂	L	α°
KCR	~ - L	2~4	8.0~25.9	12~30	7~18	2~15	70	10°~60°

Broach Reamer *New*

- Optimal for thru 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		Flute	ØD	Ød	l ₁	l ₂	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