

High-quality and high efficiency top solid indexable Drill

TPDB Plus Drill

KORLOY
TECH-NEWS



- Improved productivity and excellent machining quality through stable machining
- Versatility in machining various surfaces, structural Steel, and medium / large diameter machining

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TPDB Plus Drill

In various industries, there are demands of excellent performance and machining time reduction to improve machining efficiency. Thus, the demand for efficient cutting tools leads to a continuous increase.

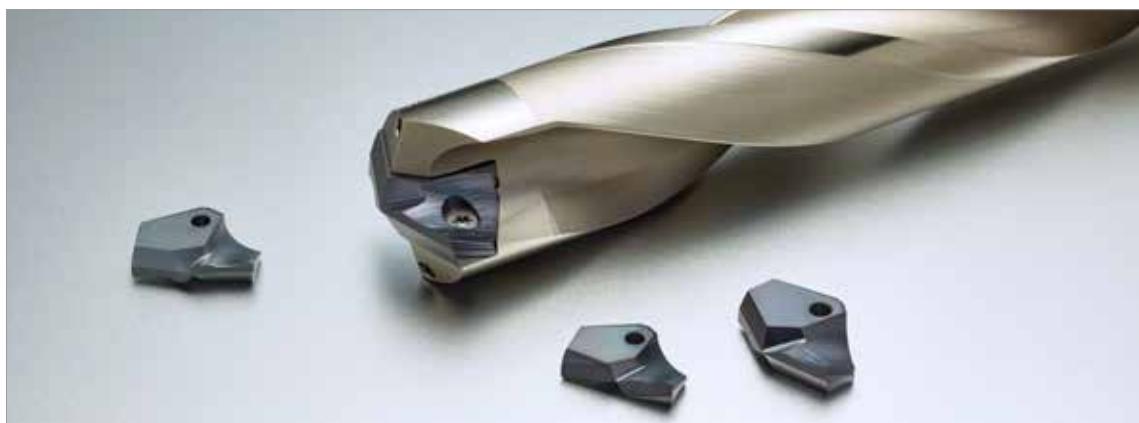
To respond to these market demands, KORLOY launching the **TPDB Plus Drill**, a high-quality and high-efficiency indexable Drill that enhances machining quality and production efficiency.

The **TPDB Plus Drill** with high helix flutes ensures smooth chip evacuation during machining, greatly enhancing hole surface finish, roundness, and machining quality. Additionally, **TPDBP-H** dedicated hole machining in structural Steel, and **TPDB-DS** for medium / large diameter Drilling provide multi-faceted usability across different industries.

The **TPDBP-H** insert with unique lowcutting resistance cutting edge improves centering and provides excellent machining quality even in vibration-prone machining environments by reducing machining load. In addition, the high helix angle applied flutes prevents vibration and unexpected tool breakage caused by chip blockage, thereby enhancing machining stability and productivity.

TPDB-DS is a Drill designed for machining medium/large diameter workpieces, applying a strong clamping structure. The specially designed clamping system and screw clamping method enable stable machining in high cutting load machining environments.

Additionally, the double-margin design provides excellent hole surface finish and precision. Highly precise and efficient top solid indexable Drill Excellent machinability.



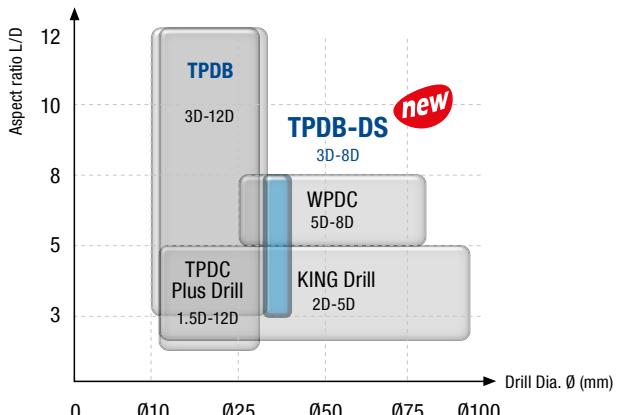
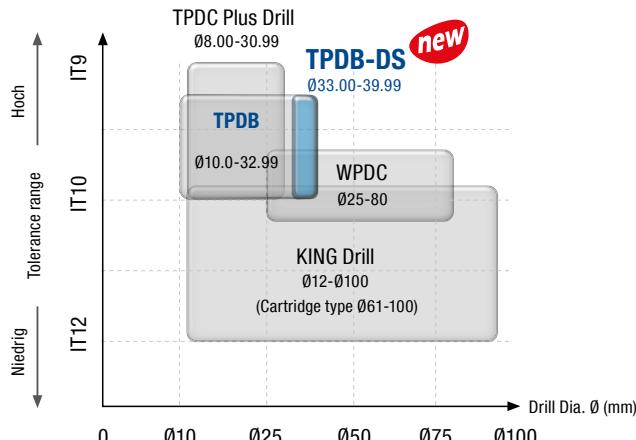
Excellent machinability

- Excellent hole machining performance with specified cutting edge designs per applications
- Good chip evacuation with high helix angle application

Improved productivity

- Reduced cycle time through tool simplification
- Durable holder with special surface treatment

Application range

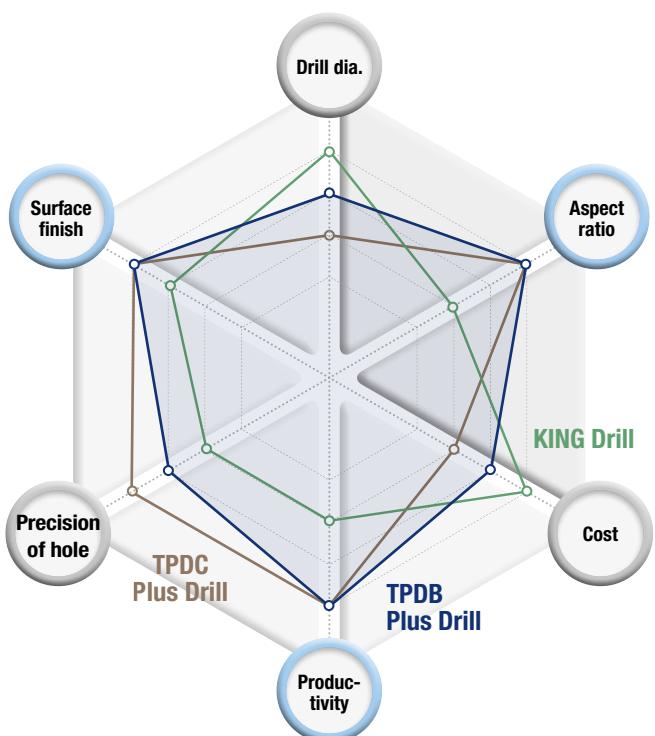


Tool		Application range					
		Drill (Ø)	Tolerance of hole	Surface finish (Ra)	Aspect ratio (Aspect ratio)	Tolerance of Drill dia.	Workpiece material
TPDB Plus Drill	TPDB Plus	10.0 - 32.99	0 - +0.1	$\leq 2.0 \mu\text{m}$	3, 5, 8, 10, 12	h7	P K
	TPDB-DS	33.0 - 39.99	0 - +0.2	$\leq 2.5 \mu\text{m}$	3, 5, 8		P K
	TPDBP-H	14.0 - 32.99	0 - +0.1	$\leq 2.5 \mu\text{m}$	3, 5, 8		P

Applicable industries

Generation of wind and nuclear power	Shipbuilding	Railway construction	Aircraft	Automobile

Indexable Drill selection guide



TPDB Plus Drill new

- Good surface finish
- High productivity
- 3D, 5D, 8D, 10D, 12D



TPDC Plus Drill

- One step clamping
- High precision of hole
- 1.5D, 3D, 5D, 8D, 10D, 12D



KING Drill

- 4 corners (central and peripheral)
- 2D, 3D, 4D, 5D

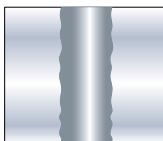
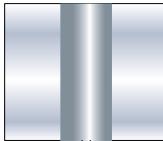
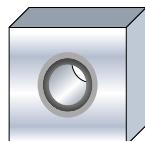


Tool	Drill Dia.	Aspect ratio	Cost	Productivity	Precision of hole	Surface finish
TPDB Plus Drill new	★★★	★★★★	★★★	★★★★	★★★	★★★★
TPDC Plus Drill	★★	★★★★	★★	★★★★	★★★★	★★★★
KING Drill	★★★★	★★	★★★★	★★	★★	★★★

TPDB Plus - types of damage to Drill and solutions

Scratches on the margin		
	Factor	<ul style="list-style-type: none"> • Lack of coolant lubrication • Lack of coolant in deep Drilling due to MQL system • Bend of Drill due to improperly placed holder or using a long holder • Low rigidity or large concentricity
	Solution	<ul style="list-style-type: none"> • Use more coolant • Place workpiece tightly and check the concentricity • Check the precision of installment of Drill (below 0.03 mm) • Reduce the cutting speed
Wear on the margin		
	Factor	<ul style="list-style-type: none"> • Due to machining pure metal or heat resisting alloy • Less back taper due to using a holder for a long time • Unstable machining at the end of hole due to interruption • Lack of coolant lubrication on the peripheral section of holder contacting workpiece
	Solution	<ul style="list-style-type: none"> • Set up proper tool life and manage its usage • Check the shape of machining part • Check the kind and concentration of coolant
Chipping on the corner		
	Factor	<ul style="list-style-type: none"> • Interrupted machining (end of hole is inclined or curved shape, junction hole the middle of hole.) • Chattering in Drilling due to unstable clamping, low rigidity of machine or bending of Drill • Chattering due to unstable clamping of Drill
	Solution	<ul style="list-style-type: none"> • Check the part of machining • Machine in lower cutting speed • Place workpiece tightly • Check the performance of the machine • Check the precision of installment of Drill (below 0.03 mm)
Wear on the rake face		
	Factor	<ul style="list-style-type: none"> • Low cutting speed • Machining free-cutting Steel • Erosion of chip and flute • Lack of coolant lubrication
	Solution	<ul style="list-style-type: none"> • Increase cutting speed • Set a lower thinning angle • Reduce the honing • Use more coolant
Chipping on the rake face		
	Factor	<ul style="list-style-type: none"> • Fracture on the cutting edge partially due to pre-treatment on the center of hole • Unstable chip evacuation due to step Drilling and external coolant • Chattering in Drilling and low precision of holder installment
	Solution	<ul style="list-style-type: none"> • Check if there is pre-machining or not • It is recommended to use internal coolant in step Drilling • Check the state of clamping workpiece and the precision of Drill installment (below 0.03 mm)

TPDB Plus - Types of damage to workpiece and check points

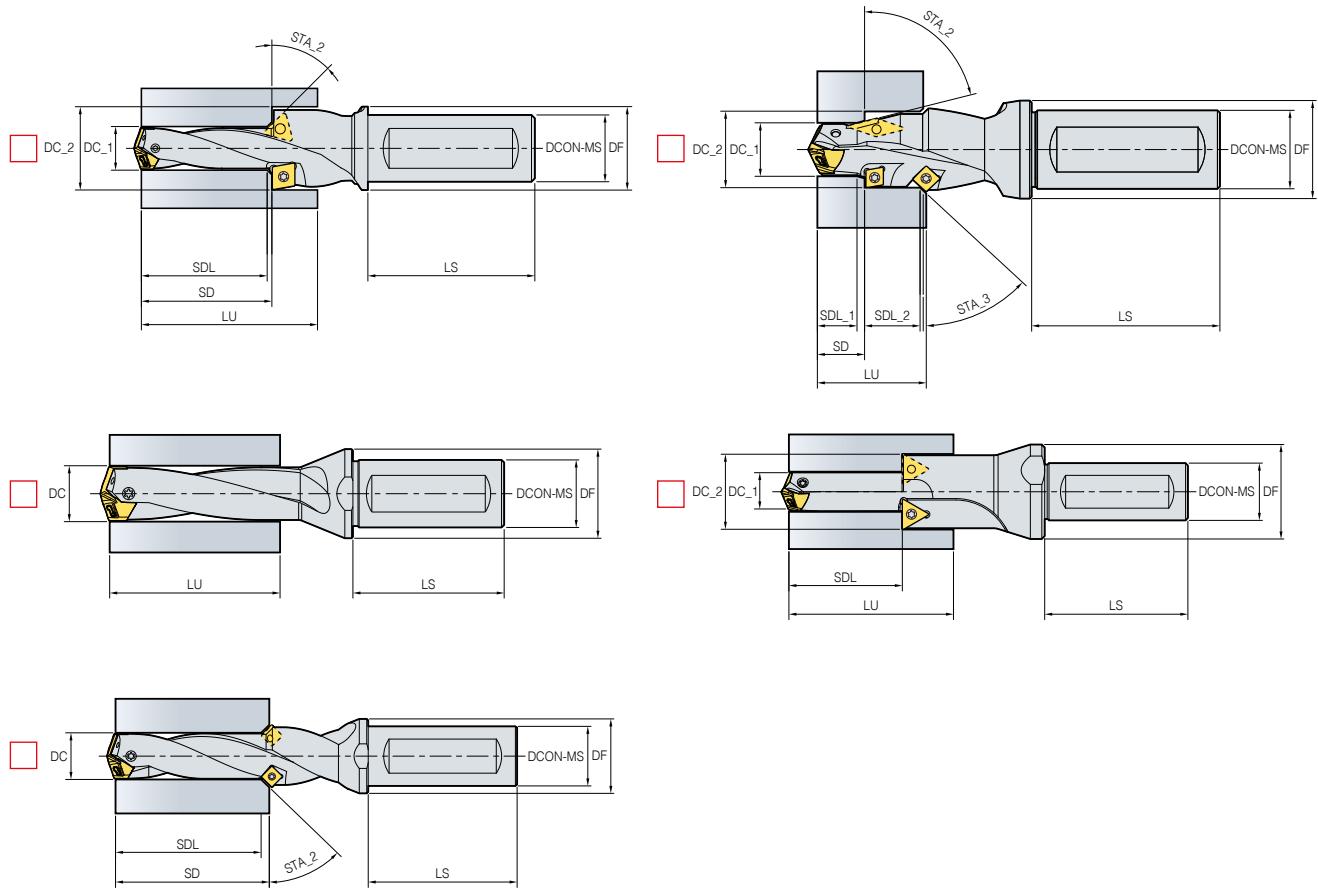
Poor surface finish (rough, scratch, etc.)			
	Factor	<ul style="list-style-type: none"> • Low rigidity of machine and improperly clamped workpiece • Large concentricity and lack of coolant 	
	Solution	<ul style="list-style-type: none"> • Clamp the workpiece properly and check the concentricity • Increase the amount and pressure of coolant 	
Remained lots of burr at the end of the Drilled hole			
	Factor	<ul style="list-style-type: none"> • High feed and excessive honing of the cutting edge • Exceeded cutting tool's tool life (too much wear and chipping) 	
	Solution	<ul style="list-style-type: none"> • Reduce feed (especially at the end of hole) and use a new Drill • Increase point angle or reduce honing 	
Flaking the end of the Drilled hole			
	Factor	<ul style="list-style-type: none"> • Machining of low toughness materials as cast iron • Rapid feed and excessive honing of the cutting edge • Exceeded cutting tool's tool life (too much wear and chipping) 	
	Solution	<ul style="list-style-type: none"> • Reduce the feed (especially at the end of hole) and use a new Drill • Reduce honing on the cutting edge 	
Thermal deformation and oxidation of the end of the Drilled hole			
	Factor	<ul style="list-style-type: none"> • Rapid feed and lack of coolant • Excessive cutting load, exceeded cutting tool's tool life (too much wear and chipping) 	
	Solution	<ul style="list-style-type: none"> • Reduce the feed and honing on the cutting edge • Use more coolant and use a new Drill 	

Solutions for troubles

↑ Increase ↓ Decrease ○ Use

Trouble	Designation	Solution														
		Cutting condition					Tool shape				Grade		The others			
		vc	fn	Coolant	fn (in beginning)	Depth of cut	Relief angle	Point angle	Thinning angle	Honing	Flute width rate	Toughness	Hardness	Rigidity of machine	Chattering of machine	Fixing workpiece
Chipping	<ul style="list-style-type: none"> • Improper cutting conditions • Low rigidity of tool • Built-up edge • Improper grade • Chattering 	↓	↓	○			↓		↓	↑		↑	↑	↑	↓	↓
Wear	• Excessive cutting speed (wear on margin)	↓	↓	○									↑			
	• Low cutting speed (wear in the center of Drill)	↑	↓	○									↑			
Fracture	<ul style="list-style-type: none"> • Improper cutting conditions • Too much cutting load • Too long overhang • Less rigidity of machine 	↓	↓	○	↓	↓							↑	↑	↑	↓
Poor chip evacuation	• Improper cutting conditions		↓	○		↓				↑						
Poor surface finish	<ul style="list-style-type: none"> • Built-up edge • Chattering • Improper cutting conditions 	↑	↓	○	↓			↓		↓			↑	↓	↑	↓
Poor accuracy of hole	• Low cutting speed (wear in the center of Drill)	↑	↓										↑	↓		↓

TPDB Plus - Special Drill order form



Hole type

Blind hole Through hole

Coolant type

Internal External

Special note

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

Shank type

Plain

Flat

Weldon

Whistle Notch

TPDB Plus - Code system

Insert

TPD	150	B	PC5300
Top Solid Piercing Drill	Drill dia. Ø 150: Ø15.0 mm	Insert type B: Blade type	Grade PC5300

Holder

TPD	B	150	20	8	P
Top Solid Piercing Drill	Insert type B: Blade type	Drill dia. Ø 150: Ø15.0 mm	Shank dia. Ø 20: Ø 20 mm	Aspect ratio (L/D) 3D, 5D, 8D, 10D, 12D	PlusDrill

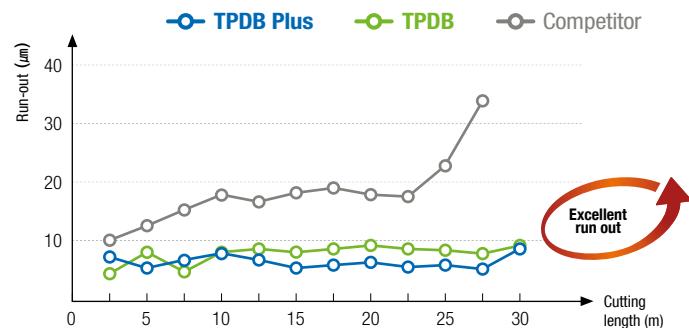
Features

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



TPDB Plus - Run-out

Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	$vc = 90 \text{ m/min} \cdot fn = 0.25 \text{ mm/rev}$
	$ap = 120 \text{ mm} \cdot \text{wet 20 bar}$
Tool	
Insert	TPD250B (PC5300)
Holder	TPDB250-32-5-P (Drill dia. Ø = 25 mm)



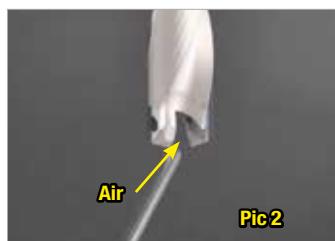
How to clamp an insert

Clamping an insert to a holder



- ① Put an insert on the tip seat of the holder.
- ② As the [Pic. 1], push the insert to the v-shaped groove of the holder.
- ③ Screw and clamp the insert.

Changing the used insert to a new one



- ① Unscrew and separate the used insert from the holder.
- ② As the [Pic. 2], clean the insert seat.
- ③ Put a new insert on the tip seat.
- ④ As the [Pic. 3], clamp the insert pushing it with a hand not to separate from the holder.



Empfohlene Cutting condition

ISO	Workpiece			Specific cutting force (N/mm²)	Brinell Hardness (HB)	Grade	vc (m/min)	Aspect ratio = 3D, 5D			
	Workpiece material		KS					fn (mm/rev)			
	Carbon steel	Alloy steel ≤ 5%	Alloy steel > 5%					010-016.9	017-026.9	027-032.9	
P	Carbon steel	C = 0.10 - 0.25%	SM15C SM25C	C15 C25	1500	90 - 200	PC5335 PC330P	80 - 140	0.30 - 0.15	0.35 - 0.20	0.40 - 0.25
		C = 0.25 - 0.55%	SM35C SM45C	C35 C45	1600	125 - 225	PC5335 PC330P	80 - 140	0.30 - 0.15	0.35 - 0.20	0.40 - 0.25
		C = 0.55 - 0.80%	SM58C	C60	1700	150 - 250	PC5335 PC330P	70 - 130	0.30 - 0.15	0.35 - 0.20	0.40 - 0.25
K	Alloy steel ≤ 5%	non-hardened	SCM440	42CrMo4	1700	180	PC5300	80 - 140	0.35 - 0.18	0.38 - 0.23	0.43 - 0.28
		Hardened and Tempered	SCM445	-	2050	350	PC5300	50 - 100	0.35 - 0.18	0.38 - 0.23	0.43 - 0.28
	Alloy steel > 5%	Annealed	STD11	-	1950	200	PC5300	50 - 90	0.30 - 0.18	0.35 - 0.20	0.40 - 0.25
		Tool steel	STD61	X40CrMoV5-1	3000	352	PC5300	40 - 80	0.30 - 0.18	0.35 - 0.20	0.40 - 0.25
	Gray cast iron		GC250 GC350	250 350	900	150 - 230	PC5300	80 - 140	0.35 - 0.18	0.40 - 0.20	0.45 - 0.25
	Ductile cast iron		GCD400 GCD500 GCD600	400-15 150-10 600-3	870	160 - 260	PC5300	70 - 130	0.35 - 0.18	0.40 - 0.20	0.45 - 0.25

In case of 8D, machine in 20 - 30% lower cutting conditions than the mentioned above, or machine the beginning of hole (1.5D) before Drilling.

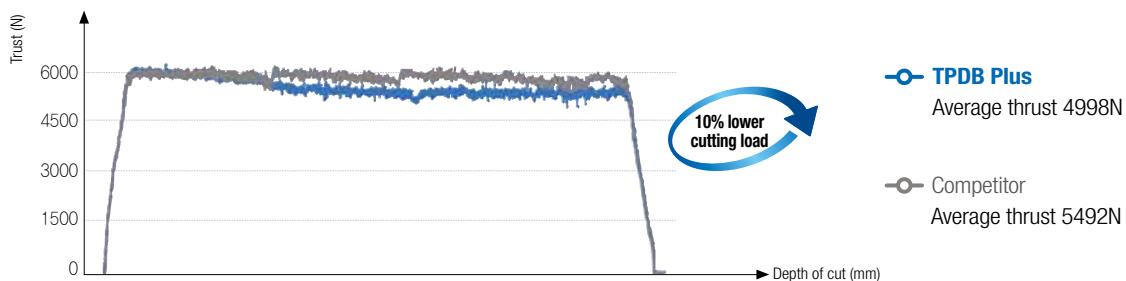
In interrupted machining, reduce the feed to 0.1- 0.15 machining around the interrupted part.

Refer to the 'Recommended Drilling method' on the page 12 for Drilling of 10D - 12D.

TPDB Plus - Performance evaluation

Cutting load

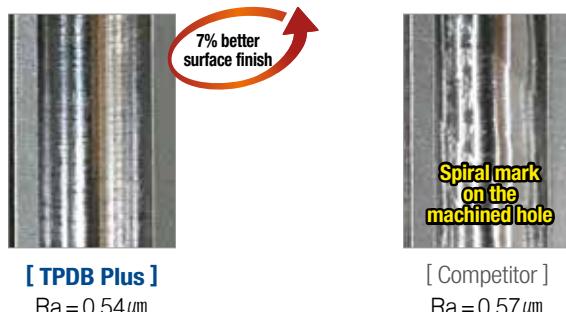
Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	$v_c = 120 \text{ m/min} \cdot f_n = 0.25 \text{ mm/rev} \cdot a_p = 120 \text{ mm} \cdot \text{wet (20 bar)}$
Tool	Insert TPD250B (PC5300) Holder TPDB250-32-5-P (Drill Dia. Ø = 25 mm)



» Secured stable cutting load with excellent chip evacuation through applying low cutting resistance cutting edge and high helix flutes.

Surface finish

Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	$v_c = 120 \text{ m/min} \cdot f_n = 0.35 \text{ mm/rev} \cdot a_p = 120 \text{ mm} \cdot \text{wet (20 bar)}$
Tool	Insert TPD250B (PC5300) Holder TPDB250-32-5-P (Drill Dia. Ø = 25 mm)



» Hohe Surface finish durch stabile Spanform und Spanabfuhr

Chip control

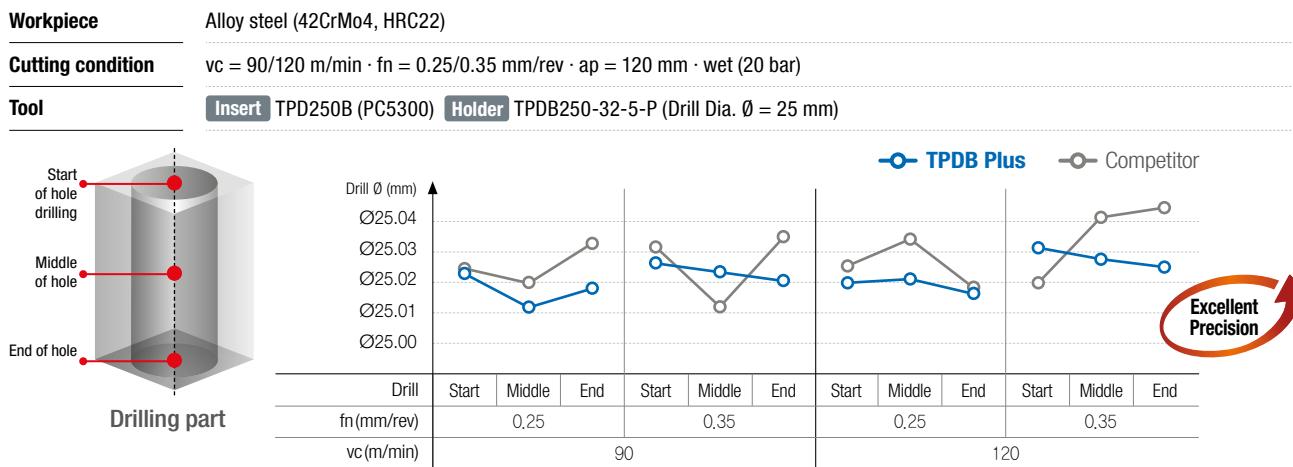
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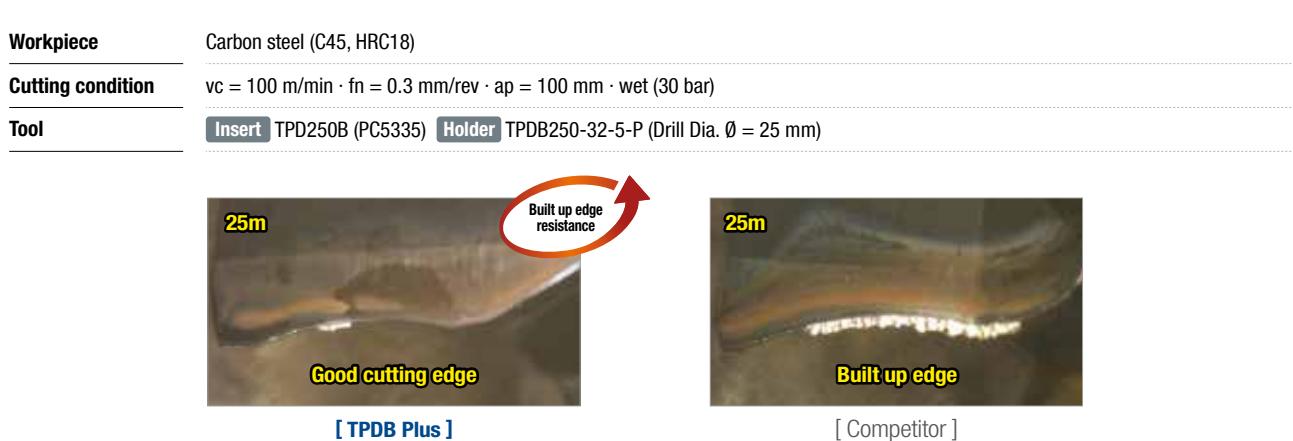
» Regular chip shape

TPDB Plus - Performance evaluation

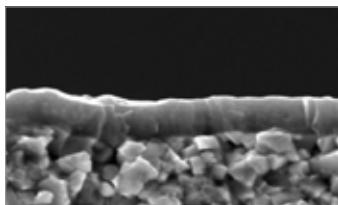
Machining precision



Wear resistance

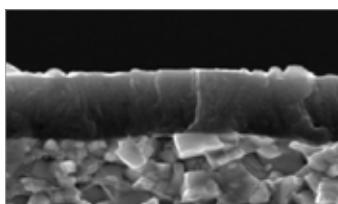


TPDB Plus - Grade features



PC5300

- Applying PVD coating with high hardness and stability in machining at high temperature
- Stable Drilling due to high cutting edge strength and excellent chipping resistance
- Optimal grade for Drilling alloy Steel and Cast iron



PC5335

- Applying PVD coating with high toughness and excellent lubrication
- Coating layer highly adhering to substrate
- Optimal grade for general structural Carbon steel (FE360B, etc.) and machine structural Carbon steel (C45, etc.) machining

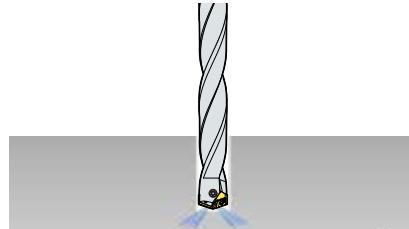
Recommended Drilling method (10D, 12D)

Machine a pilot hole 1.5xD



- Machine a pilot hole with the depth of cut as 0.5D and at 30% lower speed using a 1.5D or 3D Drill.

Start drilling



- After the pilot hole, replace the pilot Drill to a Drill for further operation and machine in recommended cutting conditions.

Good surface finish



Result of general Drilling



Result of recommended Drilling

Precaution in Drilling

Angled surface



The approach angle between Drill and the workpiece at the beginning and the end should be less than 6°. Reduce the feed (fn) to 30-50% than general cutting conditions at the beginning and the end of angled surface.

Stacked plates



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

Plunging



Irregular cutting resistance in plunging could cause fracture and deformation of the Drill

Boring



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

Checklist for the Drilling

- Workpiece clamping condition
- Rotational state of the main axial in the machining equipment
- Holder condition
- Clamped drill's Run-out : Max. 0.03 mm
- Coolant supply condition (pressure, flow rate, concentration)
- Chip evacuation condition

Coolant application system

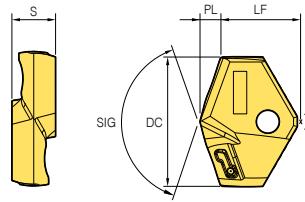
- Adequate supply of cutting fluid at the entrance of the hole
- Minimum cutting fluid pressure: 5 bar or above
- Minimum flow rate : 5ℓ/min or above



Replacement of holders and screws

Worn part	How to check	Description
Pic. 1 	Pic. 2 	<ul style="list-style-type: none"> In case of Drilling for a long time as shown in the [Pic. 1] the 'A' part is torn and twisted due to torque. As shown in the [Pic. 2] check the gap between the insert and the tip seat turning the clamped insert from side to side. If there is a gap between them, replace the used holder to a new one.
Pic. 3 	Pic. 4 	<ul style="list-style-type: none"> The insert could move up or down due to the load on the Z-axis in Drilling over an extended period of time which causes wear on the 'B' part as shown the [Pic. 3]. After clamping an insert, if the insert is moving or there is a gap between the insert and the tip seat as shown in the [Pic. 4] replace the used holder to a new one.
Pic. 5 		<ul style="list-style-type: none"> After an extended period of use, the screw can be worn as shown in the 'C' part of [Pic. 5] which could decrease the clamping force of the insert. When the screw is worn, replace the old screw to a new one among the enclosed extras. Spreading the grease on the screw makes it last longer.
Pic. 6 ① Check the 'D' and 'E' parts as shown in the [Pic. 6]. ② Check whether the chips are getting longer or not.		<ul style="list-style-type: none"> Winding or jamming of long and tiny chips in Drilling causes wear or scratch on the 'D' part as shown in the [Pic. 6] due to chattering from machining in improper cutting conditions. In that case, reset the cutting conditions and check the Run-out before machining. The excessive wear of the part 'E' as shown in the [Pic. 6] relating to chip curling might cause long chips.

TPDB Plus - Holder

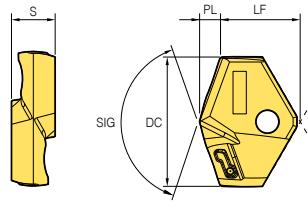


Designation	Grade		Dimension (mm)				
	PC5300	PC5335	DC	LF	PL	SIG	S
TPD	100B	▲	10.0	6.0	1.58	140	3.5
	101B	▲	10.1	6.0	1.59	140	3.5
	102B	▲	10.2	6.0	1.61	140	3.5
	103B	▲	10.3	6.0	1.62	140	3.5
	105B	▲	10.5	5.9	1.66	140	3.5
	108B	▲	10.8	5.9	1.70	140	3.5
	110B	▲	11.0	6.9	1.73	140	3.5
	111B	▲	11.1	6.9	1.75	140	3.5
	115B	▲	11.5	6.8	1.81	140	3.5
	118B	▲	11.8	6.7	1.86	140	3.5
	120B	▲	12.0	7.0	2.07	140	3.5
	121B	▲	12.1	7.0	2.08	140	3.5
	122B	▲	12.2	7.0	2.10	140	3.5
	123B	▲	12.3	7.0	2.12	140	3.5
	124B	▲	12.4	7.0	2.13	140	3.5
	125B	▲	12.5	7.0	2.15	140	3.5
	126B	▲	12.6	6.9	2.17	140	3.5
	130B	▲	13.0	7.9	2.24	140	4.0
	132B	▲	13.2	7.8	2.27	140	4.0
	135B	▲	13.5	7.8	2.32	140	4.0
	137B	▲	13.7	7.7	2.36	140	4.0
	140B	▲	14.0	8.2	2.41	140	4.0
	141B	▲	14.1	8.2	2.43	140	4.0
	142B	▲	14.2	8.2	2.44	140	4.0
	143B	▲	14.3	8.1	2.46	140	4.0
	144B	▲	14.4	8.1	2.48	140	4.0
	145B	▲	14.5	8.1	2.50	140	4.0
	146B	▲	14.6	8.1	2.51	140	4.0
	147B	▲	14.7	8.1	2.53	140	4.0
	150B	▲	15.0	8.5	2.58	140	4.0
	151B	▲	15.1	8.5	2.60	140	4.0
	152B	▲	15.2	8.5	2.62	140	4.0
	154B	▲	15.4	8.5	2.65	140	4.0
	155B	▲	15.5	8.4	2.67	140	4.0
	157B	▲	15.7	8.4	2.70	140	4.0
	158B	▲	15.8	8.4	2.72	140	4.0
	159B	○	15.9	8.4	2.74	140	4.0
	160B	▲	16.0	9.4	2.75	140	5.5
	161B	▲	16.1	9.3	2.77	140	5.5
	162B	▲	16.2	9.3	2.79	140	5.5
	163B	▲	16.3	9.3	2.81	140	5.5
	164B	▲	16.4	9.3	2.82	140	5.5
	165B	▲	16.5	9.3	2.84	140	5.5
	166B	▲	16.6	9.2	2.86	140	5.5
	167B	▲	16.7	9.2	2.88	140	5.5
	170B	▲	17.0	9.7	2.93	140	5.5
	171B	▲	17.1	9.7	2.94	140	5.5

TPD inserts not listed in the range of Ø10,00 - Ø32,99 can be made to order.

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TPDB Plus - Holder

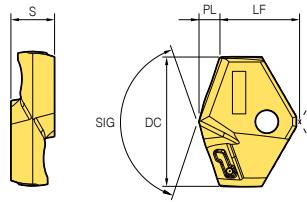


Designation	Grade		Dimension (mm)				
	PC5300	PC5335	DC	LF	PL	SIG	S
TPD	172B	▲	17.2	9.6	2.96	140	5.5
	173B	●	17.3	9.6	2.98	140	5.5
	174B	▲	17.4	9.6	3.00	140	5.5
	175B	▲ ●	17.5	9.6	3.01	140	5.5
	176B	▲	17.6	9.6	3.03	140	5.5
	177B	▲	17.7	9.6	3.05	140	5.5
	178B	▲	17.8	9.5	3.06	140	5.5
	180B	▲ ▲	18.0	10.5	3.10	140	6.0
	181B	▲	18.1	10.5	3.12	140	6.0
	182B	▲	18.2	10.5	3.13	140	6.0
	185B	▲ ●	18.5	10.4	3.19	140	6.0
	186B	▲ ●	18.6	10.4	3.20	140	6.0
	187B	▲	18.7	10.4	3.22	140	6.0
	190B	▲ ▲	19.0	10.8	3.27	140	6.0
	191B	▲	19.1	10.8	3.29	140	6.0
	192B	▲	19.2	10.8	3.31	140	6.0
	193B	▲	19.3	10.8	3.32	140	6.0
	195B	▲	19.5	10.7	3.36	140	6.0
	196B	▲	19.6	10.7	3.37	140	6.0
	197B	▲	19.7	10.7	3.39	140	6.0
	198B	▲	19.8	10.7	3.41	140	6.0
	199B	▲	19.9	10.7	3.42	140	6.0
	200B	▲ ▲	20.0	11.7	3.44	140	6.5
	201B	▲	20.1	11.6	3.46	140	6.5
	202B	▲	20.2	11.6	3.48	140	6.5
	204B	▲	20.4	11.6	3.51	140	6.5
	205B	▲	20.5	11.6	3.53	140	6.5
	206B	▲	20.6	11.6	3.55	140	6.5
	210B	▲ ▲	21.0	12.0	3.62	140	6.5
	211B	▲	21.1	12.0	3.63	140	6.5
	212B	▲	21.2	12.0	3.65	140	6.5
	213B	▲	21.3	11.9	3.67	140	6.5
	215B	▲	21.5	11.9	3.70	140	6.5
	217B	▲	21.7	11.9	3.74	140	6.5
	219B	▲	21.9	11.8	3.77	140	6.5
	220B	▲ ▲	22.0	12.3	3.79	140	7.0
	222B	▲	22.2	12.3	3.82	140	7.0
	223B	▲	22.3	12.3	3.84	140	7.0
	225B	▲	22.5	12.2	3.87	140	7.0
	227B	▲	22.7	12.2	3.91	140	7.0
	230B	▲	23.0	12.6	3.96	140	7.0
	235B	▲	23.5	12.6	4.05	140	7.0
	237B	▲	23.7	12.5	4.08	140	7.0
	240B	▲ ▲	24.0	13.0	4.13	140	7.5
	242B	▲	24.2	12.9	4.17	140	7.5
	244B	▲	24.4	12.9	4.20	140	7.5
	245B	▲	24.5	12.9	4.22	140	7.5

TPD inserts not listed in the range of Ø10,00 - Ø32,99 can be made to order.

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TPDB Plus - Insert



Designation	Grade		Dimension (mm)				
	PC5300	PC5335	DC	LF	PL	SIG	S
TPD	247B	▲	24.7	12.9	4.25	140	7.5
	250B	▲	25.0	13.2	4.43	140	7.5
	251B	▲	25.1	13.2	4.44	140	7.5
	252B	▲	25.2	13.1	4.46	140	7.5
	253B	▲	25.3	13.1	4.48	140	7.5
	255B	▲	25.5	13.1	4.52	140	7.5
	256B	▲	25.6	13.0	4.53	140	7.5
	258B	▲	25.8	13.0	4.57	140	7.5
	259B	▲	25.9	13.0	4.59	140	7.5
	260B	▲	26.0	13.5	4.60	140	8.5
	262B	▲	26.2	13.5	4.64	140	8.5
	265B	▲	26.5	13.4	4.69	140	8.5
	270B	▲	27.0	14.3	4.78	140	8.5
	275B	▲	27.5	14.2	4.87	140	8.5
	280B	▲	28.0	15.1	4.96	140	9.5
	285B	▲	28.5	15.1	5.05	140	9.5
	290B	▲	29.0	15.5	5.13	140	9.5
	295B	▲	29.5	15.4	5.22	140	9.5
	300B	▲	30.0	15.6	5.46	140	10.0
	310B	▲	31.0	16.0	5.64	140	10.0
	320B	▲	32.0	16.3	5.82	140	10.0
	329B	▲	32.9	16.1	5.99	140	10.0

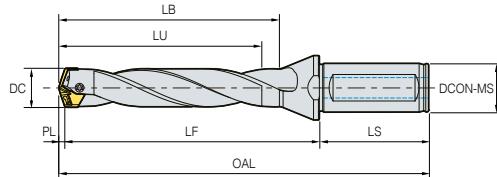
Parts

Designation	Drill Dia. Ø DC (mm)	Screw	Wrench	Torque (N · m)
TPD	100B - 129B	FTNB0209-P	TW06P	0.4
	130B - 149B	FTNB02512-P	TW07S	0.8
	150B - 179B	FTNB02514-P	TW07S	0.8
	180B - 199B	FTNB0316-P	TW09S	1.2
	200B - 239B	FTNB0319	TW09S	1.2
	240B - 259B	FTNB03522	TW15S	3.0
	260B - 279B	FTNB03524	TW15S	3.0
	280B - 299B	FTNB0426	TW15S	3.0
	300B - 329B	FTNB0528	TW20-100	4.0

TPD inserts not listed in the range of Ø10,00 - Ø32,99 can be made to order.

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TPDB-P - 3D

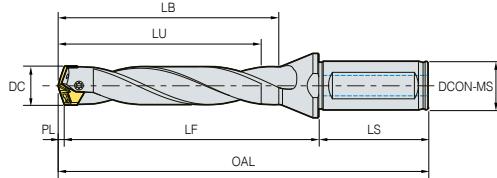


(mm)

Designation	Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Insert
TPDB	100-16-3-P	▲	10.0 - 10.4	16.0	31.58	47.02	37.08	48.0	96.6	1.58
	105-16-3-P	▲	10.5 - 10.9	16.0	33.16	47.94	38.91	48.0	97.6	1.66
	110-16-3-P	▲	11.0 - 11.4	16.0	34.73	49.97	40.73	48.0	99.7	1.73
	115-16-3-P	▲	11.5 - 11.9	16.0	36.31	50.89	42.56	48.0	100.7	1.81
	120-16-3-P	▲	12.0 - 12.4	16.0	38.07	53.83	44.57	48.0	103.9	2.07
	125-16-3-P	▲	12.5 - 12.9	16.0	39.65	55.75	46.40	48.0	105.9	2.15
	130-16-3-P	▲	13.0 - 13.4	16.0	41.24	59.06	48.24	48.0	109.3	2.24
	135-16-3-P	▲	13.5 - 13.9	16.0	42.82	60.98	50.07	48.0	111.3	2.32
	140-16-3-P	▲	14.0 - 14.4	16.0	44.41	63.09	51.91	48.0	113.5	2.41
	145-16-3-P	▲	14.5 - 14.9	16.0	46.00	66.00	53.75	48.0	116.5	2.50
	150-20-3-P	▲	15.0 - 15.4	20.0	47.58	68.12	55.58	50.0	120.7	2.58
	155-20-3-P	▲	15.5 - 15.9	20.0	49.17	70.03	57.42	50.0	122.7	2.67
	160-20-3-P	▲	16.0 - 16.4	20.0	50.75	72.15	59.25	50.0	124.9	2.75
	165-20-3-P	▲	16.5 - 16.9	20.0	52.34	74.06	61.09	50.0	126.9	2.84
	170-20-3-P	▲	17.0 - 17.4	20.0	53.93	77.17	62.93	50.0	130.1	2.93
	175-20-3-P	▲	17.5 - 17.9	20.0	55.51	79.09	64.76	50.0	132.1	3.01
	180-25-3-P	▲	18.0 - 18.4	25.0	57.10	81.10	66.60	56.0	140.2	3.10
	185-25-3-P	▲	18.5 - 18.9	25.0	58.69	83.01	68.44	56.0	142.2	3.19
	190-25-3-P	▲	19.0 - 19.4	25.0	60.27	86.03	70.27	56.0	145.3	3.27
	195-25-3-P	▲	19.5 - 19.9	25.0	61.86	87.94	72.11	56.0	147.3	3.36
	200-25-3-P	▲	20.0 - 20.4	25.0	63.44	90.06	73.94	56.0	149.5	3.44
	205-25-3-P	▲	20.5 - 20.9	25.0	65.03	91.97	75.78	56.0	151.5	3.53
	210-25-3-P	▲	21.0 - 21.4	25.0	66.62	91.08	77.62	60.0	154.7	3.62
	215-25-3-P	▲	21.5 - 21.9	25.0	68.20	93.00	79.45	60.0	156.7	3.70
	220-25-3-P	▲	22.0 - 22.4	25.0	69.79	95.11	81.29	60.0	158.9	3.79
	225-25-3-P	▲	22.5 - 22.9	25.0	71.37	97.03	83.12	60.0	160.9	3.87
	230-25-3-P	▲	23.0 - 23.4	25.0	72.96	100.14	84.96	60.0	164.1	3.96
	235-25-3-P	▲	23.5 - 23.9	25.0	74.55	102.05	86.80	60.0	166.1	4.05
	240-32-3-P	▲	24.0 - 24.4	32.0	76.13	108.17	88.63	60.0	172.3	4.13
	245-32-3-P	▲	24.5 - 24.9	32.0	77.72	110.08	90.47	60.0	174.3	4.22
	250-32-3-P	▲	25.0 - 25.4	32.0	79.43	113.07	92.43	60.0	177.5	4.43
	255-32-3-P	▲	25.5 - 25.9	32.0	81.02	114.98	94.27	60.0	179.5	4.52
	260-32-3-P	▲	26.0 - 26.9	32.0	82.60	117.10	96.10	60.0	181.7	4.60
	270-32-3-P	▲	27.0 - 27.9	32.0	85.78	122.12	99.78	60.0	186.9	4.78
	280-32-3-P	▲	28.0 - 28.9	32.0	88.96	126.04	103.46	60.0	191.0	4.96
	290-32-3-P	▲	29.0 - 29.9	32.0	92.13	131.07	107.13	60.0	196.2	5.13
	300-32-3-P	▲	30.0 - 30.9	32.0	95.46	133.94	110.96	60.0	199.4	5.46
	310-32-3-P	▲	31.0 - 31.9	32.0	98.64	138.96	114.64	60.0	204.6	5.64
	320-32-3-P	▲	32.0 - 32.9	32.0	101.82	140.98	118.32	60.0	206.8	5.82

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TPDB-P - 5D

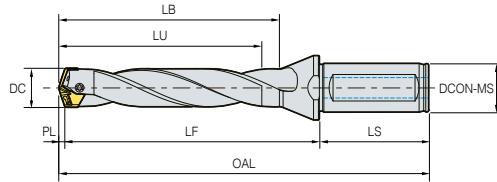


(mm)

Designation	Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Insert	
100-16-5-P	▲	10.0 - 10.4	16.0	51.58	67.02	57.08	48.0	116.6	1.58	TPD100B - 104B	
105-16-5-P	▲	10.5 - 10.9	16.0	54.16	68.94	59.91	48.0	118.6	1.66	TPD105B - 109B	
110-16-5-P	▲	11.0 - 11.4	16.0	56.73	71.97	62.73	48.0	121.7	1.73	TPD110B - 114B	
115-16-5-P	▲	11.5 - 11.9	16.0	59.31	74.89	65.56	48.0	124.7	1.81	TPD115B - 119B	
120-16-5-P	▲	12.0 - 12.4	16.0	62.07	78.03	68.57	48.0	128.1	2.07	TPD120B - 124B	
125-16-5-P	▲	12.5 - 12.9	16.0	64.65	81.05	71.40	48.0	131.2	2.15	TPD125B - 129B	
130-16-5-P	▲	13.0 - 13.4	16.0	67.24	85.06	74.24	48.0	135.3	2.24	TPD130B - 134B	
135-16-5-P	▲	13.5 - 13.9	16.0	69.82	88.08	77.07	48.0	138.4	2.32	TPD135B - 139B	
140-16-5-P	▲	14.0 - 14.4	16.0	72.41	91.09	79.91	48.0	141.5	2.41	TPD140B - 144B	
145-16-5-P	▲	14.5 - 14.9	16.0	75.00	95.10	82.75	48.0	145.6	2.50	TPD145B - 149B	
150-20-5-P	▲	15.0 - 15.4	20.0	77.58	98.12	85.58	50.0	150.7	2.58	TPD150B - 154B	
155-20-5-P	▲	15.5 - 15.9	20.0	80.17	101.03	88.42	50.0	153.7	2.67	TPD155B - 159B	
160-20-5-P	▲	16.0 - 16.4	20.0	82.75	104.15	91.25	50.0	156.9	2.75	TPD160B - 164B	
165-20-5-P	▲	16.5 - 16.9	20.0	85.34	107.06	94.09	50.0	159.9	2.84	TPD165B - 169B	
170-20-5-P	▲	17.0 - 17.4	20.0	87.93	111.17	96.93	50.0	164.1	2.93	TPD170B - 174B	
175-20-5-P	▲	17.5 - 17.9	20.0	90.51	114.09	99.76	50.0	167.1	3.01	TPD175B - 179B	
180-25-5-P	▲	18.0 - 18.4	25.0	93.10	117.10	102.60	56.0	176.2	3.10	TPD180B - 184B	
185-25-5-P	▲	18.5 - 18.9	25.0	95.69	120.01	105.44	56.0	179.2	3.19	TPD185B - 189B	
190-25-5-P	▲	19.0 - 19.4	25.0	98.27	124.03	108.27	56.0	183.3	3.27	TPD190B - 194B	
TPDB	195-25-5-P	▲	19.5 - 19.9	25.0	100.86	126.94	111.11	56.0	186.3	3.36	TPD195B - 199B
	200-25-5-P	▲	20.0 - 20.4	25.0	103.44	130.06	113.94	56.0	189.5	3.44	TPD200B - 204B
	205-25-5-P	▲	20.5 - 20.9	25.0	106.03	132.97	116.78	56.0	192.5	3.53	TPD205B - 209B
	210-25-5-P	▲	21.0 - 21.4	25.0	108.62	133.08	119.62	60.0	196.7	3.62	TPD210B - 214B
	215-25-5-P	▲	21.5 - 21.9	25.0	111.20	136.00	122.45	60.0	199.7	3.70	TPD215B - 219B
	220-25-5-P	▲	22.0 - 22.4	25.0	113.79	139.11	125.29	60.0	202.9	3.79	TPD220B - 224B
	225-25-5-P	▲	22.5 - 22.9	25.0	116.37	142.03	128.12	60.0	205.9	3.87	TPD225B - 229B
	230-25-5-P	▲	23.0 - 23.4	25.0	118.96	146.14	130.96	60.0	210.1	3.96	TPD230B - 234B
	235-25-5-P	▲	23.5 - 23.9	25.0	121.55	149.05	133.80	60.0	213.1	4.05	TPD235B - 239B
	240-32-5-P	▲	24.0 - 24.4	32.0	124.13	156.17	136.63	60.0	220.3	4.13	TPD240B - 244B
	245-32-5-P	▲	24.5 - 24.9	32.0	126.72	159.08	139.47	60.0	223.3	4.22	TPD245B - 249B
	250-32-5-P	▲	25.0 - 25.4	32.0	129.43	163.07	142.43	60.0	227.5	4.43	TPD250B - 254B
	255-32-5-P	▲	25.5 - 25.9	32.0	132.02	165.98	145.27	60.0	230.5	4.52	TPD255B - 259B
	260-32-5-P	▲	26.0 - 26.9	32.0	134.60	169.10	148.10	60.0	233.7	4.60	TPD260B - 269B
	270-32-5-P	▲	27.0 - 27.9	32.0	139.78	176.12	153.78	60.0	240.9	4.78	TPD270B - 279B
	280-32-5-P	▲	28.0 - 28.9	32.0	144.96	182.04	159.46	60.0	247.0	4.96	TPD280B - 289B
	290-32-5-P	▲	29.0 - 29.9	32.0	150.13	189.07	165.13	60.0	254.2	5.13	TPD290B - 299B
	300-32-5-P	▲	30.0 - 30.9	32.0	155.46	193.94	170.96	60.0	259.4	5.46	TPD300B - 309B
	310-32-5-P	▲	31.0 - 31.9	32.0	160.64	200.96	176.64	60.0	266.6	5.64	TPD310B - 319B
	320-32-5-P	▲	32.0 - 32.9	32.0	165.82	204.98	182.32	60.0	270.8	5.82	TPD320B - 329B

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TPDB-P - 8D

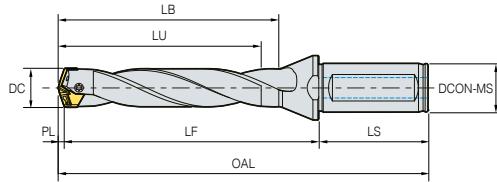


(mm)

Designation	Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Insert
TPDB	100-16-8-P	▲	10.0 - 10.4	16.0	81.58	97.02	87.08	48.0	146.6	1.58
	105-16-8-P	▲	10.5 - 10.9	16.0	85.66	100.94	91.41	48.0	150.6	1.66
	110-16-8-P	▲	11.0 - 11.4	16.0	89.73	104.97	95.73	48.0	154.7	1.73
	115-16-8-P	▲	11.5 - 11.9	16.0	93.81	108.89	100.06	48.0	158.7	1.81
	120-16-8-P	▲	12.0 - 12.4	16.0	98.07	114.03	104.57	48.0	164.1	2.07
	125-16-8-P	▲	12.5 - 12.9	16.0	102.15	118.55	108.90	48.0	168.7	2.15
	130-16-8-P	▲	13.0 - 13.4	16.0	106.24	124.06	113.24	48.0	174.3	2.24
	135-16-8-P	▲	13.5 - 13.9	16.0	110.32	128.58	117.57	48.0	178.9	2.32
	140-16-8-P	▲	14.0 - 14.4	16.0	114.41	133.09	121.91	48.0	183.5	2.41
	145-16-8-P	▲	14.5 - 14.9	16.0	118.50	138.60	126.25	48.0	189.1	2.50
	150-20-8-P	▲	15.0 - 15.4	20.0	122.58	143.12	130.58	50.0	195.7	2.58
	155-20-8-P	▲	15.5 - 15.9	20.0	126.67	147.53	134.92	50.0	200.2	2.67
	160-20-8-P	▲	16.0 - 16.4	20.0	130.75	152.15	139.25	50.0	204.9	2.75
	165-20-8-P	▲	16.5 - 16.9	20.0	134.84	156.56	143.59	50.0	209.4	2.84
	170-20-8-P	▲	17.0 - 17.4	20.0	138.93	162.17	147.93	50.0	215.1	2.93
	175-20-8-P	▲	17.5 - 17.9	20.0	143.01	166.59	152.26	50.0	219.6	3.01
	180-25-8-P	▲	18.0 - 18.4	25.0	147.10	171.10	156.60	56.0	230.2	3.10
	185-25-8-P	▲	18.5 - 18.9	25.0	151.19	175.51	160.94	56.0	234.7	3.19
	190-25-8-P	▲	19.0 - 19.4	25.0	155.27	181.03	165.27	56.0	240.3	3.27
	195-25-8-P	▲	19.5 - 19.9	25.0	159.36	185.44	169.61	56.0	244.8	3.36
	200-25-8-P	▲	20.0 - 20.4	25.0	163.44	190.06	173.94	56.0	249.5	3.44
	205-25-8-P	▲	20.5 - 20.9	25.0	167.53	194.47	178.28	56.0	254.0	3.53
	210-25-8-P	▲	21.0 - 21.4	25.0	171.62	196.08	182.62	60.0	259.7	3.62
	215-25-8-P	▲	21.5 - 21.9	25.0	175.70	200.50	186.95	60.0	264.2	3.70
	220-25-8-P	▲	22.0 - 22.4	25.0	179.79	205.11	191.29	60.0	268.9	3.79
	225-25-8-P	▲	22.5 - 22.9	25.0	183.87	209.73	195.62	60.0	273.6	3.87
	230-25-8-P	▲	23.0 - 23.4	25.0	187.96	215.14	199.96	60.0	279.1	3.96
	235-25-8-P	▲	23.5 - 23.9	25.0	192.05	219.55	204.30	60.0	283.6	4.05
	240-32-8-P	▲	24.0 - 24.4	32.0	196.13	228.17	208.63	60.0	292.3	4.13
	245-32-8-P	▲	24.5 - 24.9	32.0	200.22	232.58	212.97	60.0	296.8	4.22
	250-32-8-P	▲	25.0 - 25.4	32.0	204.43	238.07	217.43	60.0	302.5	4.43
	255-32-8-P	▲	25.5 - 25.9	32.0	208.52	242.48	221.77	60.0	307.0	4.52
	260-32-8-P	▲	26.0 - 26.9	32.0	212.60	247.10	226.10	60.0	311.7	4.60
	270-32-8-P	▲	27.0 - 27.9	32.0	220.78	257.12	234.78	60.0	321.9	4.78
	280-32-8-P	▲	28.0 - 28.9	32.0	228.96	266.04	243.46	60.0	331.0	4.96
	290-32-8-P	▲	29.0 - 29.9	32.0	237.13	276.07	252.13	60.0	341.2	5.13
	300-32-8-P	▲	30.0 - 30.9	32.0	245.46	283.94	260.96	60.0	349.4	5.46
	310-32-8-P	▲	31.0 - 31.9	32.0	253.64	293.96	269.64	60.0	359.6	5.64
	320-32-8-P	▲	32.0 - 32.9	32.0	261.82	300.98	278.32	60.0	366.8	5.82

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TPDB-P - 10D

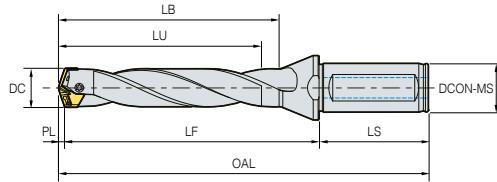


(mm)

Designation	Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Insert
TPDB	100-16-10-P	●	10.0 - 10.4	16.0	101.58	117.02	107.08	48.0	166.6	1.58
	105-16-10-P	●	10.5 - 10.9	16.0	106.66	121.94	112.41	48.0	171.6	1.66
	110-16-10-P	●	11.0 - 11.4	16.0	111.73	126.97	117.73	48.0	176.7	1.73
	115-16-10-P	●	11.5 - 11.9	16.0	116.81	131.89	123.06	48.0	181.7	1.81
	120-16-10-P	▲	12.0 - 12.4	16.0	122.07	138.03	128.57	48.0	188.1	2.07
	125-16-10-P	▲	12.5 - 12.9	16.0	127.15	143.55	133.90	48.0	193.7	2.15
	130-16-10-P	▲	13.0 - 13.4	16.0	132.24	150.06	139.24	48.0	200.3	2.24
	135-16-10-P	●	13.5 - 13.9	16.0	137.32	155.58	144.57	48.0	205.9	2.32
	140-16-10-P	▲	14.0 - 14.4	16.0	142.41	161.09	149.91	48.0	211.5	2.41
	145-16-10-P	●	14.5 - 14.9	16.0	147.50	167.60	155.25	48.0	218.1	2.50
	150-20-10-P	●	15.0 - 15.4	20.0	152.58	173.12	160.58	50.0	225.7	2.58
	155-20-10-P	●	15.5 - 15.9	20.0	157.67	178.53	165.92	50.0	231.2	2.67
	160-20-10-P	▲	16.0 - 16.4	20.0	162.75	184.15	171.25	50.0	236.9	2.75
	165-20-10-P	▲	16.5 - 16.9	20.0	167.84	189.56	176.59	50.0	242.4	2.84
	170-20-10-P	●	17.0 - 17.4	20.0	172.93	196.17	181.93	50.0	249.1	2.93
	175-20-10-P	▲	17.5 - 17.9	20.0	178.01	201.59	187.26	50.0	254.6	3.01
	180-25-10-P	▲	18.0 - 18.4	25.0	183.10	207.10	192.60	56.0	266.2	3.10
	185-25-10-P	●	18.5 - 18.9	25.0	188.19	212.51	197.94	56.0	271.7	3.19
	190-25-10-P	●	19.0 - 19.4	25.0	193.27	219.03	203.27	56.0	278.3	3.27
	195-25-10-P	●	19.5 - 19.9	25.0	198.36	224.44	208.61	56.0	283.8	3.36
	200-25-10-P	▲	20.0 - 20.4	25.0	203.44	230.06	213.94	56.0	289.5	3.44
	205-25-10-P	●	20.5 - 20.9	25.0	208.53	235.47	219.28	56.0	295.0	3.53
	210-25-10-P	▲	21.0 - 21.4	25.0	213.62	238.08	224.62	60.0	301.7	3.62
	215-25-10-P	●	21.5 - 21.9	25.0	218.70	243.50	229.95	60.0	307.2	3.70
	220-25-10-P	▲	22.0 - 22.4	25.0	223.79	249.11	235.29	60.0	312.9	3.79
	225-25-10-P	●	22.5 - 22.9	25.0	228.87	254.73	240.62	60.0	318.6	3.87
	230-25-10-P	●	23.0 - 23.4	25.0	233.96	261.14	245.96	60.0	325.1	3.96
	235-25-10-P	●	23.5 - 23.9	25.0	239.05	266.55	251.30	60.0	330.6	4.05
	240-32-10-P	●	24.0 - 24.4	32.0	244.13	276.17	256.63	60.0	340.3	4.13
	245-32-10-P	●	24.5 - 24.9	32.0	249.22	281.58	261.97	60.0	345.8	4.22
	250-32-10-P	●	25.0 - 25.4	32.0	254.43	288.07	267.43	60.0	352.5	4.43
	255-32-10-P	●	25.5 - 25.9	32.0	259.52	293.48	272.77	60.0	358.0	4.52
	260-32-10-P	▲	26.0 - 26.9	32.0	264.60	299.10	278.10	60.0	363.7	4.60
	270-32-10-P	●	27.0 - 27.9	32.0	274.78	311.12	288.78	60.0	375.9	4.78
	280-32-10-P	●	28.0 - 28.9	32.0	284.96	322.04	299.46	60.0	387.0	4.96
	290-32-10-P	●	29.0 - 29.9	32.0	295.13	334.07	310.13	60.0	399.2	5.13
	300-32-10-P	●	30.0 - 30.9	32.0	305.46	343.94	320.96	60.0	409.4	5.46
	310-32-10-P	●	31.0 - 31.9	32.0	315.64	355.96	331.64	60.0	421.6	5.64
	320-32-10-P	●	32.0 - 32.9	32.0	325.82	364.98	342.32	60.0	430.8	5.82

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TPDB-P - 12D



(mm)

Designation	Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Insert
TPDB	100-16-12-P	●	10.0 - 10.4	16.0	121.58	137.02	127.08	48.0	186.6	1.58
	105-16-12-P	●	10.5 - 10.9	16.0	127.66	142.94	133.41	48.0	192.6	1.66
	110-16-12-P	●	11.0 - 11.4	16.0	133.73	148.97	139.73	48.0	198.7	1.73
	115-16-12-P	●	11.5 - 11.9	16.0	139.81	154.89	146.06	48.0	204.7	1.81
	120-16-12-P	▲	12.0 - 12.4	16.0	146.07	162.03	152.57	48.0	212.1	2.07
	125-16-12-P	▲	12.5 - 12.9	16.0	152.15	168.55	158.90	48.0	218.7	2.15
	130-16-12-P	▲	13.0 - 13.4	16.0	158.24	176.06	165.24	48.0	226.3	2.24
	135-16-12-P	●	13.5 - 13.9	16.0	164.32	182.58	171.57	48.0	232.9	2.32
	140-16-12-P	▲	14.0 - 14.4	16.0	170.41	189.09	177.91	48.0	239.5	2.41
	145-16-12-P	●	14.5 - 14.9	16.0	176.50	196.60	184.25	48.0	247.1	2.50
	150-20-12-P	●	15.0 - 15.4	20.0	182.58	203.12	190.58	50.0	255.7	2.58
	155-20-12-P	●	15.5 - 15.9	20.0	188.67	209.53	196.92	50.0	262.2	2.67
	160-20-12-P	▲	16.0 - 16.4	20.0	194.75	216.15	203.25	50.0	268.9	2.75
	165-20-12-P	▲	16.5 - 16.9	20.0	200.84	222.56	209.59	50.0	275.4	2.84
	170-20-12-P	●	17.0 - 17.4	20.0	206.93	230.17	215.93	50.0	283.1	2.93
	175-20-12-P	▲	17.5 - 17.9	20.0	213.01	236.59	222.26	50.0	289.6	3.01
	180-25-12-P	▲	18.0 - 18.4	25.0	219.10	243.10	228.60	56.0	302.2	3.10
	185-25-12-P	●	18.5 - 18.9	25.0	225.19	249.51	234.94	56.0	308.7	3.19
	190-25-12-P	●	19.0 - 19.4	25.0	231.27	257.03	241.27	56.0	316.3	3.27
	195-25-12-P	●	19.5 - 19.9	25.0	237.36	263.44	247.61	56.0	322.8	3.36
	200-25-12-P	▲	20.0 - 20.4	25.0	243.44	270.06	253.94	56.0	329.5	3.44
	205-25-12-P	●	20.5 - 20.9	25.0	249.53	276.47	260.28	56.0	336.0	3.53
	210-25-12-P	▲	21.0 - 21.4	25.0	255.62	280.08	266.62	60.0	343.7	3.62
	215-25-12-P	●	21.5 - 21.9	25.0	261.70	286.50	272.95	60.0	350.2	3.70
	220-25-12-P	▲	22.0 - 22.4	25.0	267.79	293.11	279.29	60.0	356.9	3.79
	225-25-12-P	●	22.5 - 22.9	25.0	273.87	299.73	285.62	60.0	363.6	3.87
	230-25-12-P	●	23.0 - 23.4	25.0	279.96	307.14	291.96	60.0	371.1	3.96
	235-25-12-P	●	23.5 - 23.9	25.0	286.05	313.55	298.30	60.0	377.6	4.05
	240-32-12-P	●	24.0 - 24.4	32.0	292.13	324.17	304.63	60.0	388.3	4.13
	245-32-12-P	●	24.5 - 24.9	32.0	298.22	330.58	310.97	60.0	394.8	4.22
	250-32-12-P	●	25.0 - 25.4	32.0	304.43	338.07	317.43	60.0	402.5	4.43
	255-32-12-P	●	25.5 - 25.9	32.0	310.52	344.48	323.77	60.0	409.0	4.52
	260-32-12-P	▲	26.0 - 26.9	32.0	316.60	351.10	330.10	60.0	415.7	4.60
	270-32-12-P	●	27.0 - 27.9	32.0	328.78	365.12	342.78	60.0	429.9	4.78
	280-32-12-P	●	28.0 - 28.9	32.0	340.96	378.04	355.46	60.0	443.0	4.96
	290-32-12-P	●	29.0 - 29.9	32.0	353.13	392.07	368.13	60.0	457.2	5.13
	300-32-12-P	●	30.0 - 30.9	32.0	365.46	403.94	380.96	60.0	469.4	5.46
	310-32-12-P	●	31.0 - 31.9	32.0	377.64	417.96	393.64	60.0	483.6	5.64
	320-32-12-P	●	32.0 - 32.9	32.0	389.82	428.98	406.32	60.0	494.8	5.82

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

Code system

Insert

TPD	360	B	DS	PC5300
Top solid Piercing Drill	Drill dia. Ø 360: Ø 36.0 mm	Insert type B: Blade type	Margin shape DS: Double margin shape	Grade PC5300

Holder

TPD	B	360	40	5	P
Top solid Piercing Drill	Holder type B: Blade type	Drill dia. Ø 360: Ø 36.0 mm	Shank dia. Ø 40: Ø 40.0 mm	Aspect ratio L/D 3D, 5D, 8D	PlusDrill

Features

- A curved linear insert with high helix angle applied holder, which has low cutting load and excellent chip handling performance.
- Excellent clamping stability with a specially designed clamping section and 2 screws-on clamping methods.
- Improved wear resistance and durability through special surface treatment.

Screw-on clamping

- Good clamping stability due to 2 screws-on clamping method

Cutting edge shape for low cutting resistance

- Less cutting load and better chip control

Applied double margin

- Increased cutting stability
- Better surface finish on inner wall of the hole
- Higher precision of hole size

Applied key preventing insert misalignment

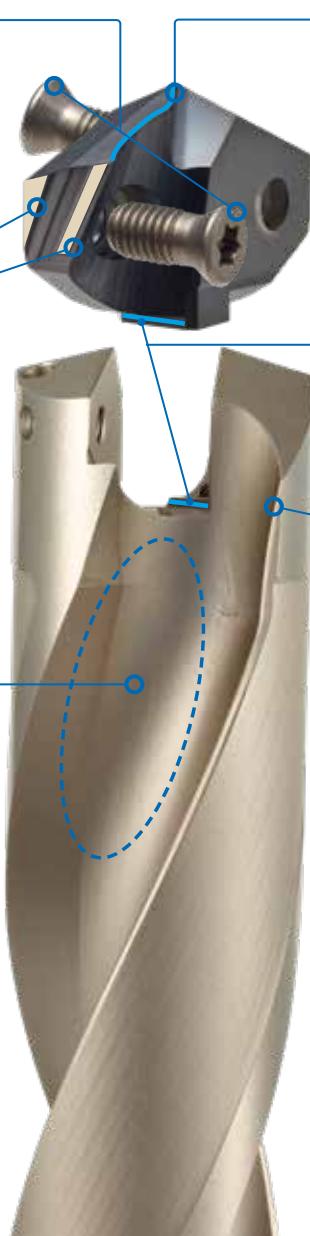
- High precision of clamping

2-stufige Form

- Sorgt für eine gute Spanabfuhr

Special surface treatment

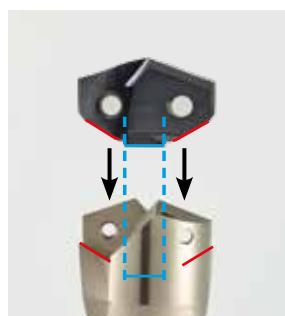
- High durability of the holder



TPDB-DS - How to clamp an insert



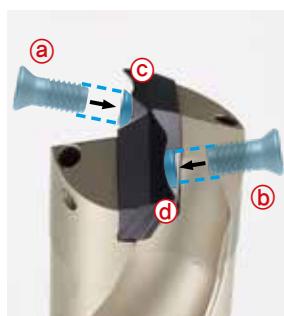
① Clean the tip seat.



② Put an insert in.



③ Lightly press the insert while screwing to prevent it from rotating.



④ Screw the screws in the order of ② to ④ which put screws first and tighten them in turn.

Recommended cutting conditions

ISO	Workpiece			Trust (N/mm ²)	Brinell Hardness (HB)	Grade	vc (m/min)	Aspect ratio = 3D, 5D		
	Workpiece material		KS					fn (mm/rev)		
P	Carbon steel	C = 0.10 - 0.25%	SM15C SM25C	C15 C25	1500	90 - 200	PC5300	80 - 140	0.4 - 0.25	
		C = 0.25 - 0.55%	SM35C SM45C	C35 C45	1600	125 - 225	PC5300	80 - 140	0.4 - 0.25	
		C = 0.55 - 0.80%	SM58C	C60	1700	150 - 250	PC5300	70 - 130	0.4 - 0.25	
K	Alloy steel ≤ 5%	Non-hardened	SCM440	42CrMo4	1700	180	PC5300	80 - 130	0.45 - 0.25	
		Hardened and Tempered	SCM445	-	2050	350	PC5300	60 - 110	0.45 - 0.25	
	Alloy steel > 5%	Annealed	STD11	-	1950	200	PC5300	60 - 100	0.4 - 0.25	
		Tool steel	STD61	X40CrMoV5-1	3000	352	PC5300	50 - 90	0.35 - 0.2	
Gray cast iron		GC250 GC350	250 350	900	150-230	PC5300	80-140	0.45-0.25		
Ductile cast iron		GCD400 GCD500 GCD600	400-15 150-10 600-3	870	160-260	PC5300	70-130	0.45-0.25		

For 8D, reduce the recommended cutting conditions by 20% to 30% from the machining depth to 0.5D during the entry then proceed with the above-mentioned cutting conditions. For interrupted machining, reduce the feed to 0.1 to 0.15 in the vicinity of the interrupted cutting area.

TPDB-DS - Performance evaluation

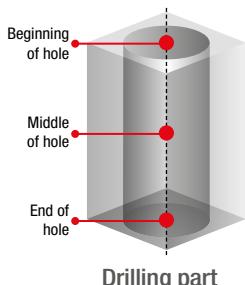
Machining precision

Workpiece

Alloy steel (42CrMo4, HRC22)

Cutting condition
 $vc = 70/90/110 \text{ m/min} \cdot fn = 0.25/0.35 \text{ mm/rev} \cdot ap = 150 \text{ mm} \cdot \text{wet (20 bar)}$
Tool

Insert TPD360B-DS (PC5300) Holder TPDB360-40-5-P (Drill Dia. Ø = 36 mm)



» Improved machining precision through double margin and stable chip evacuation.

Wear resistance

Workpiece

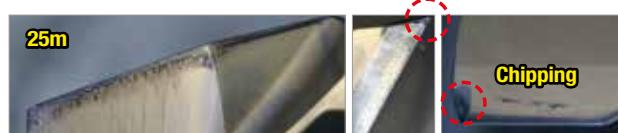
Alloy steel (42CrMo4, HRC22)

Cutting condition
 $vc = 90 \text{ m/min} \cdot fn = 0.3 \text{ mm/rev} \cdot ap = 150 \text{ mm} \cdot \text{wet (20 bar)}$
Tool

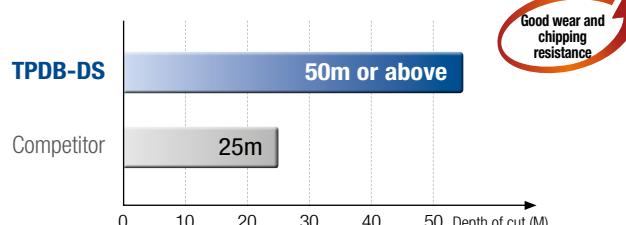
Insert TPD360B-DS (PC5300) Holder TPDB360-40-5-P (Drill Dia. Ø = 36 mm)



[TPDB-DS]



[Competitor]



» Increased maximum tool life with more stable chipping resistance compared to the competitor's

Cutting surface finish / chip surface finish

Workpiece

Alloy steel (42CrMo4, HRC22)

Cutting condition
 $vc = 90 \text{ m/min} \cdot fn = 0.35 \text{ mm/rev} \cdot ap = 150 \text{ mm} \cdot \text{wet (20 bar)}$
Tool

Insert TPD360B-DS (PC5300) Holder TPDB360-40-5-P (Drill Dia. Ø = 36 mm)



[TPDB-DS]



Good surface finish and chip control



[Competitor]

» Good surface finish due to stable chip formation and effective chip evacuation

Precaution in Drilling

Angled surface



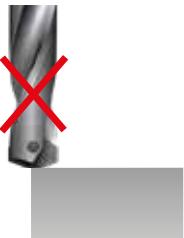
The approach angle between Drill and the workpiece at the beginning and the end should be less than 6°.
Reduce the feed (f_n) to 30-50% than general cutting conditions at the beginning and the end of angled surface.

Stacked plates



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

Plunging



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

Boring



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

Drilling checklist

- Workpiece clamping condition
- Rotational state of the main axial in the machining equipment
- Holder condition
- Clamped drill's Run-out : Max. 0.03 mm
- Coolant supply condition (pressure, flow rate, concentration)
- Chip evacuation condition

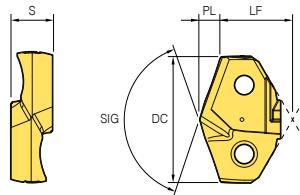
Coolant application system

- Adequate supply of cutting fluid at the entrance of the hole
- Minimum cutting fluid pressure: 5 bar or above
- Minimum flow rate: 5ℓ/min or above



Dry

TPDB-DS - Insert



(mm)

Designation	Grade	DC	LF	PL	SIG	S	
	PC5300						
TPD	330B-DS	▲	33.0	18.16	5.38	140	10.5
	335B-DS	○	33.5	18.06	5.48	140	10.5
	340B-DS	▲	34.0	18.54	5.55	140	11.0
	345B-DS	○	34.5	18.47	5.64	140	11.0
	350B-DS	▲	35.0	19.47	5.71	140	11.5
	355B-DS	○	35.5	19.38	5.80	140	11.5
	360B-DS	▲	36.0	20.40	5.87	140	11.5
	365B-DS	○	36.5	20.31	5.97	140	11.5
	370B-DS	▲	37.0	20.79	6.04	140	12.0
	375B-DS	○	37.5	20.70	6.13	140	12.0
	380B-DS	▲	38.0	21.62	6.20	140	12.0
	385B-DS	○	38.5	21.53	6.29	140	12.0
	390B-DS	▲	39.0	22.01	6.36	140	12.5
	395B-DS	○	39.5	21.92	6.46	140	12.5

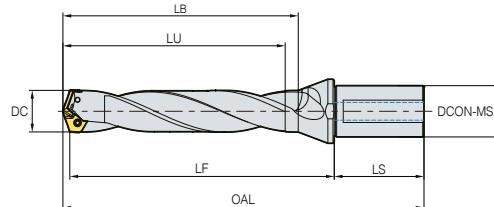
Parts

Designation		Drill Dia. Ø DC (mm)	Screw	Wrench
TPD	330B-DS - 339B-DS	33.0 - 33.9	FTKA0410	TW15S
	340B-DS - 349B-DS	34.0 - 34.9	FTKA0410	TW15S
	350B-DS - 359B-DS	35.0 - 35.9	FTKA0410	TW15S
	360B-DS - 369B-DS	36.0 - 36.9	FTNC04511	TW20S
	370B-DS - 379B-DS	37.0 - 37.9	FTNC04511	TW20S
	380B-DS - 389B-DS	38.0 - 38.9	FTNA0511	TW20S
	390B-DS - 399B-DS	39.0 - 39.9	FTNA0511	TW20S

TPD inserts not listed in the range of Ø33,00 - Ø39,99 can be made to order.

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TPDB-DS - 3D / 5D / 8D



(mm)

	Designation	Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Insert
TPDB	330-40-3-P	▲	33.0 - 33.9	40	104.4	140.3	117.6	70	215.7	5.38	TPD330B - 339B-DS
	340-40-3-P	▲	34.0 - 34.9	40	107.5	144.4	121.1	70	219.9	5.55	TPD340B - 349B-DS
	350-40-3-P	▲	35.0 - 35.9	40	110.7	148.5	124.7	70	224.2	5.71	TPD350B - 359B-DS
	360-40-3-P	▲	36.0 - 36.9	40	113.9	152.6	128.3	70	228.5	5.87	TPD360B - 369B-DS
	370-40-3-P	▲	37.0 - 37.9	40	117.0	156.7	131.8	70	232.7	6.04	TPD370B - 379B-DS
	380-40-3-P	▲	38.0 - 38.9	40	120.2	160.8	135.4	70	237.0	6.20	TPD380B - 389B-DS
	390-40-3-P	▲	39.0 - 39.9	40	123.4	164.9	139.0	70	241.3	6.36	TPD390B - 399B-DS
	330-40-5-P	▲	33.0 - 33.9	40	170.4	206.3	183.6	70	281.7	5.38	TPD330B - 339B-DS
	340-40-5-P	▲	34.0 - 34.9	40	175.5	212.4	189.1	70	287.9	5.55	TPD340B - 349B-DS
	350-40-5-P	▲	35.0 - 35.9	40	180.7	218.5	194.7	70	294.2	5.71	TPD350B - 359B-DS
	360-40-5-P	▲	36.0 - 36.9	40	185.9	224.6	200.3	70	300.5	5.87	TPD360B - 369B-DS
	370-40-5-P	▲	37.0 - 37.9	40	191.0	230.7	205.8	70	306.7	6.04	TPD370B - 379B-DS
	380-40-5-P	▲	38.0 - 38.9	40	196.2	236.8	211.4	70	313.0	6.20	TPD380B - 389B-DS
	390-40-5-P	▲	39.0 - 39.9	40	201.4	242.9	217.0	70	319.3	6.36	TPD390B - 399B-DS
	330-40-8-P	○	33.0 - 33.9	40	269.4	305.3	282.6	70	380.7	5.38	TPD330B - 339B-DS
	340-40-8-P	○	34.0 - 34.9	40	277.5	314.4	291.1	70	389.9	5.55	TPD340B - 349B-DS
	350-40-8-P	○	35.0 - 35.9	40	285.7	323.5	299.7	70	399.2	5.71	TPD350B - 359B-DS
	360-40-8-P	○	36.0 - 36.9	40	293.9	332.6	308.3	70	408.5	5.87	TPD360B - 369B-DS
	370-40-8-P	○	37.0 - 37.9	40	302.0	341.7	316.8	70	417.7	6.04	TPD370B - 379B-DS
	380-40-8-P	○	38.0 - 38.9	40	310.2	350.8	325.4	70	427.0	6.20	TPD380B - 389B-DS
	390-40-8-P	○	39.0 - 39.9	40	318.4	359.9	334.0	70	436.3	6.36	TPD390B - 399B-DS

*: If you order a precise machining specification, we can supply this.

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TPDBP-H new

Code system

Insert

TPD	200	BP	H	PC340UL
Top solid Piercing Drill	Drill dia. Ø 200: Ø20.0 mm	Insert type B: Blade type P: Plus	H-Beam	Grade PC340UL

Holder 3D

TPD	BP	220	25S	3	H
Top solid Piercing Drill	Holder type B: Blade type P: Plus	Drill dia. Ø 220: Ø22.0 mm	Shank dia. Ø 25: Ø 25 mm S: Straight shaft (Weldon)	Aspect ratio L/D 3D	H-Beam

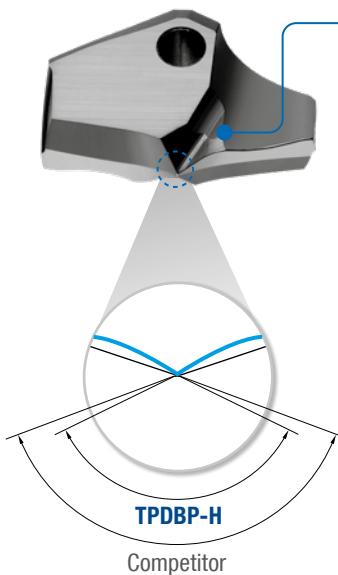
Holder 5D / 8D

TPD	BP	220	25	545	5	H
Top solid Piercing Drill	Holder type B: Blade type P: Plus	Drill dia. Ø 220: Ø22.0 mm	Shank dia. Ø 25: Ø 25 mm	Depth of cut Available cutting depth max: 54.5 mm	Aspect ratio L/D 5D, 8D	H-Beam

Features

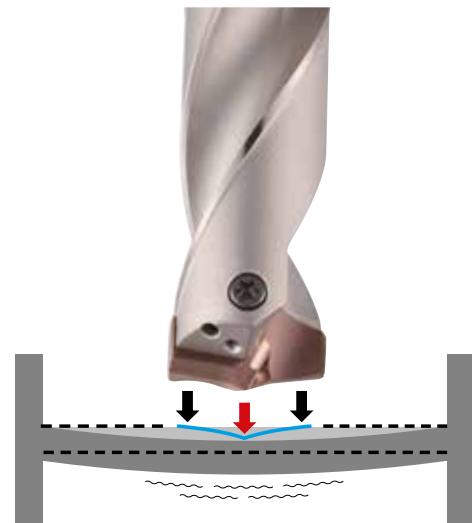
- **High precision clamping system** - High precision clamping due highly precise grinding and auto-centering
- **Screw on clamping system** - Easy to replace insert
- **Edge design with excellent centering** - Low cutting load and good chip control
- **High durability holder** - Improved wear resistance and durability with special surface treatment implementation
- **Holder with good chip evacuation** - Good chip evacuation and reduced cutting load with high helix angle
- **Optimally designed oil hole** - Long tool life

Insert features



2-step thinning shape
- Good chip control

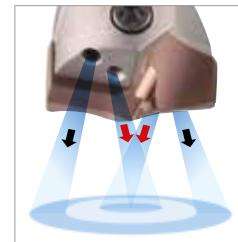
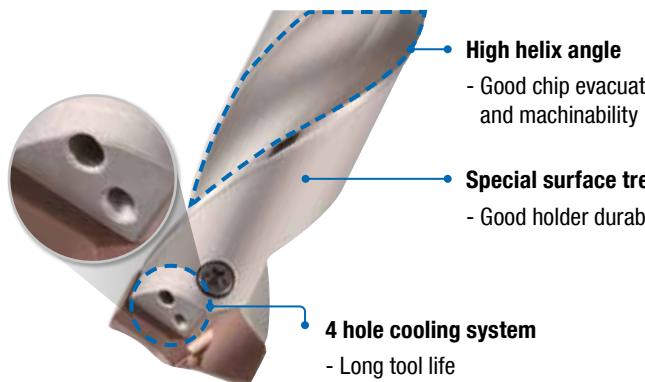
Double R point cutting edge
- Stable centering and machinability



Applied Double R point edge design is optimized for excellent centering and stable machinability.

Machinability and productivity are improved by minimizing both workpiece's bending and chipping at edge corner section.

TPDBP-H - Holder features



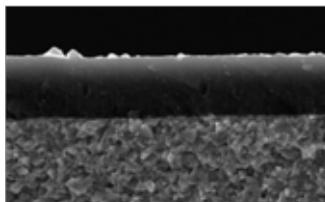
TPDBP-H



Competitor

Concentrated coolant injection on delicate cutting edge increases tool life.

Grade features



PC340UL

- Substrate with high toughness and excellent fracture resistance
- PVD coating technology with high lubricity and resistance to weld build-up
- High wear resistance and stable machining with excellent surface roughness

Performance evaluation

Chip control

Workpiece	Carbon steel (SS275, SM355A)
Cutting condition	$v_c = 80 \text{ m/min} \cdot f_n = 0.20 \text{ mm/rev}$ $a_p = 30 \text{ mm} \cdot \text{wet}$
Tool	Insert TPD270B-H (PC340UL) Holder TPDB270-32-4-H (Drill dia. $\varnothing = 29 \text{ mm}$)



SS275



SM355A

good Chip control

Wear resistance

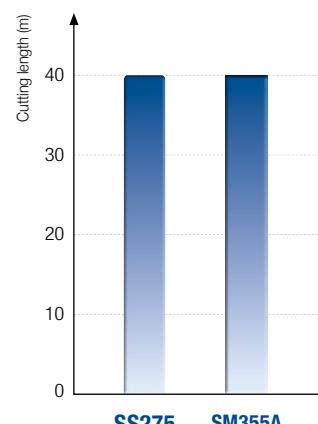
Workpiece	Carbon steel (SS275)
Cutting condition	$v_c = 65 \text{ m/min} \cdot f_n = 0.25 \text{ mm/rev}$ $a_p = 30 \text{ mm} \cdot \text{wet}$
Tool	Insert TPD220B-H (PC340UL) Holder TPDB220-25-4-H (Drill dia. $\varnothing = 22 \text{ mm}$)
Workpiece	Carbon steel (SM355A)
Cutting condition	$v_c = 70 \text{ m/min} \cdot f_n = 0.25 \text{ mm/rev}$ $a_p = 30 \text{ mm} \cdot \text{wet}$
Tool	Insert TPD270B-H (PC340UL) Holder TPDB270-32-4-H (Drill dia. $\varnothing = 27 \text{ mm}$)



SS275

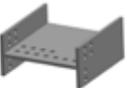


SM355A



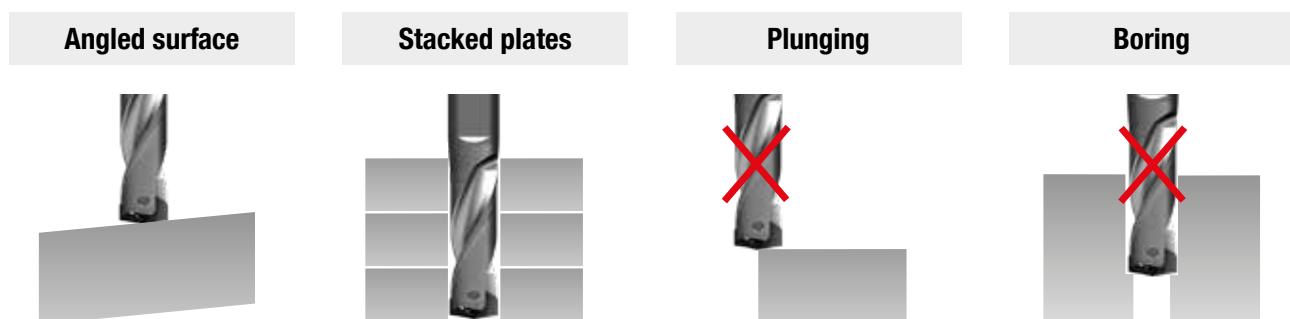
» Normal wear and still usable

TPDBP-H - Workpiece and recommended cutting conditions

ISO	Workpiece			Yield Strength (Mpa, min)	Brinell Hardness (HB)	Grade	vc (m/min)	Aspect ratio = 3D, 5D, 8D					
	Workpiece material		KS					fn (mm/rev)					
	H-Beam							014 - 021.9	022 - 030.9				
P	Angle		SS275 (SS400*) SM355 (SM490*) SHN355 (SHN490*)	275 355 355 (t≤16)	A36 A572	PC340UL	60 - 75	0.25 - 0.2	0.3 - 0.2				
	Plate							0.25 - 0.2	0.3 - 0.2				
	Plate (Stacked)						55 - 65	0.25 - 0.15	0.25 - 0.15				

* : Old symbol

Precaution in Drilling



The approach angle between Drill and the workpiece at the beginning and the end should be less than 6°.

Reduce the feed (fn) to 30-50% than general cutting conditions at the beginning and the end of angled surface.

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

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

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

TPDBP-H - Performance evaluation

Carbon steel (SM355)



Cutting condition $vc = 60 \text{ m/min} \cdot fn = 0.25 \text{ mm/rev} \cdot ap 50 \text{ mm} \cdot \text{Nass}$

Tool Insert TPD240B-H (PC340UL)

Holder TPDB240-32-3-H (Drill dia. Ø = 24 mm)

Tool life 60 m (Normal wear)

» Stable chip evacuation ensures tool life as 60 m in even machining with over 40 mm thickness.

Carbon steel (SM355)



Cutting condition $vc = 70 \text{ m/min} \cdot fn = 0.25 \text{ mm/rev} \cdot ap 24 \text{ mm} \cdot \text{Nass}$

Tool Insert TPD270B-H (PC340UL)

Holder TPDB270-32-3-H (Drill dia. Ø = 27 mm)

Tool life 40 m (Normal wear)

» High speed and high feed machining saves machining hours.

Carbon steel (SS275)



Cutting condition $vc = 60 \text{ m/min} \cdot fn = 0.20 \text{ mm/rev} \cdot ap 12 \text{ mm} \cdot \text{Nass}$

Tool Insert TPD270B-H (PC340UL)

Holder TPDB220-32-3-H (Drill dia. Ø = 22 mm)

Tool life 35 m (Normal wear)

» Stable machinability and long tool life are realized in machining various workpieces such as SM355, SS275, SHN355 etc.

Carbon steel (SM355)



Cutting condition $vc = 65 \text{ m/min} \cdot fn = 0.20 \text{ mm/rev} \cdot ap 22 \text{ mm} \cdot \text{Nass}$

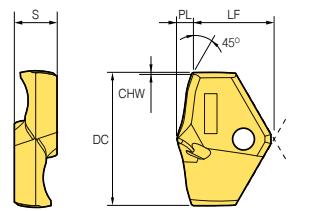
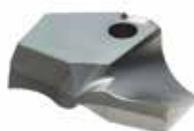
Tool Insert TPD240B-H (PC340UL)

Holder TPDB240-32-3-H (Drill dia. Ø = 24 mm)

Tool life 40 m (Normal wear)

» Minimized cutting load in horizontal machining ensures high quality machining.

TPDBP-H - Insert



Designation		Grade	DC	LF	PL	S	CHW
		PC340UL					
TPD	140BP-H	▲	14	9.45	1.17	4.0	0.05
	160BP-H	▲	16	10.73	1.39	5.5	0.07
	180BP-H	▲	18	12.15	1.51	6.0	0.07
	200BP-H	▲	20	13.45	1.67	6.5	0.07
	220BP-H	▲	22	14.54	1.89	7.0	0.09
	240BP-H	▲	24	15.56	2.02	7.5	0.09
	260BP-H	▲	26	16.35	2.23	8.5	0.09
	280BP-H	▲	28	18.26	2.32	9.5	0.11
	300BP-H	▲	30	19.03	2.61	10.0	0.11
	320BP-H	▲	32	19.85	2.79	10.0	0.11

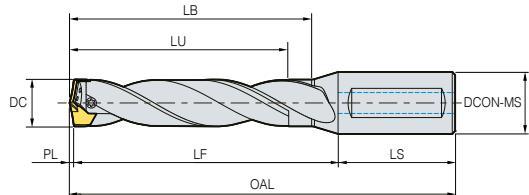
Parts

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

TPD inserts not listed in the range of Ø14.00 - Ø30.99 can be made to order.

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TPDBP-H - 3D

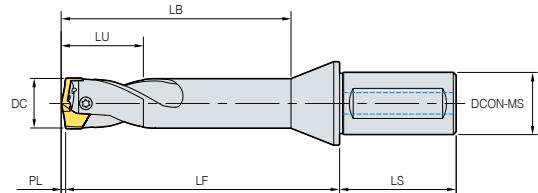


(mm)

Designation		Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Insert
TPDBP	140-16S-3-H	▲	14	16.0	35.67	48.83	43.17	48	98.0	1.17	TPD140-149BP-H
	160-20S-3-H	▲	16	20.0	40.89	55.11	49.39	50	106.5	1.39	TPD160-169BP-H
	180-20S-3-H	▲	18	20.0	46.01	62.49	55.51	50	114.0	1.51	TPD180-189BP-H
	200-25S-3-H	▲	20	25.0	51.17	76.33	61.67	56	128.0	1.67	TPD200-209BP-H
	220-25S-3-H	▲	22	25.0	56.39	76.11	67.89	56	134.0	1.89	TPD220-229BP-H
	240-32S-3-H	▲	24	32.0	61.52	84.78	74.02	60	146.8	2.02	TPD240-249BP-H
	260-32S-3-H	▲	26	32.0	66.73	87.77	80.23	60	150.0	2.23	TPD260-269BP-H
	300-32S-3-H	▲	30	32.0	77.11	99.39	92.61	60	162.0	2.61	TPD300-309BP-H
	320-32S-3-H	▲	32	32.0	82.29	105.21	98.79	60	168.0	2.79	TPD320-329BP-H

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

TPDBP-H - 5D

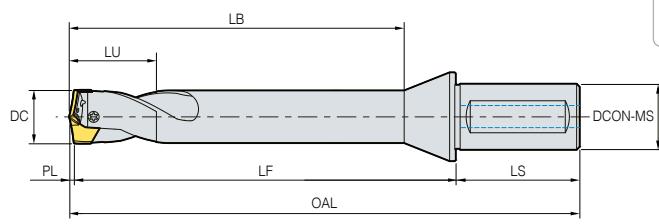


(mm)

Designation		Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Insert
TPDBP	140-16-345-5-H	▲	14	16	35.67	83.83	71.17	48	133.0	1.17	TPD140-149BP-H
	160-20-395-5-H	▲	16	20	40.89	95.11	81.39	50	146.5	1.39	TPD160-169BP-H
	180-20-445-5-H	▲	18	20	46.01	106.49	91.51	50	158.0	1.51	TPD180-189BP-H
	200-25-495-5-H	▲	20	25	51.17	123.33	101.67	56	175.0	1.67	TPD200-209BP-H
	220-25-545-5-H	▲	22	25	56.39	127.11	111.89	56	185.0	1.89	TPD220-229BP-H
	240-32-595-5-H	▲	24	32	61.52	144.78	122.02	60	206.8	2.02	TPD240-249BP-H
	260-32-645-5-H	▲	26	32	66.73	151.77	132.23	60	214.0	2.23	TPD260-269BP-H
	300-32-745-5-H	▲	30	32	77.11	171.39	152.61	60	234.0	2.61	TPD300-309BP-H
	320-32-795-5-H	▲	32	32	82.29	181.21	162.79	60	244.0	2.79	TPD320-329BP-H

The maximum flute length could be LB.

TPDBP-H - 8D



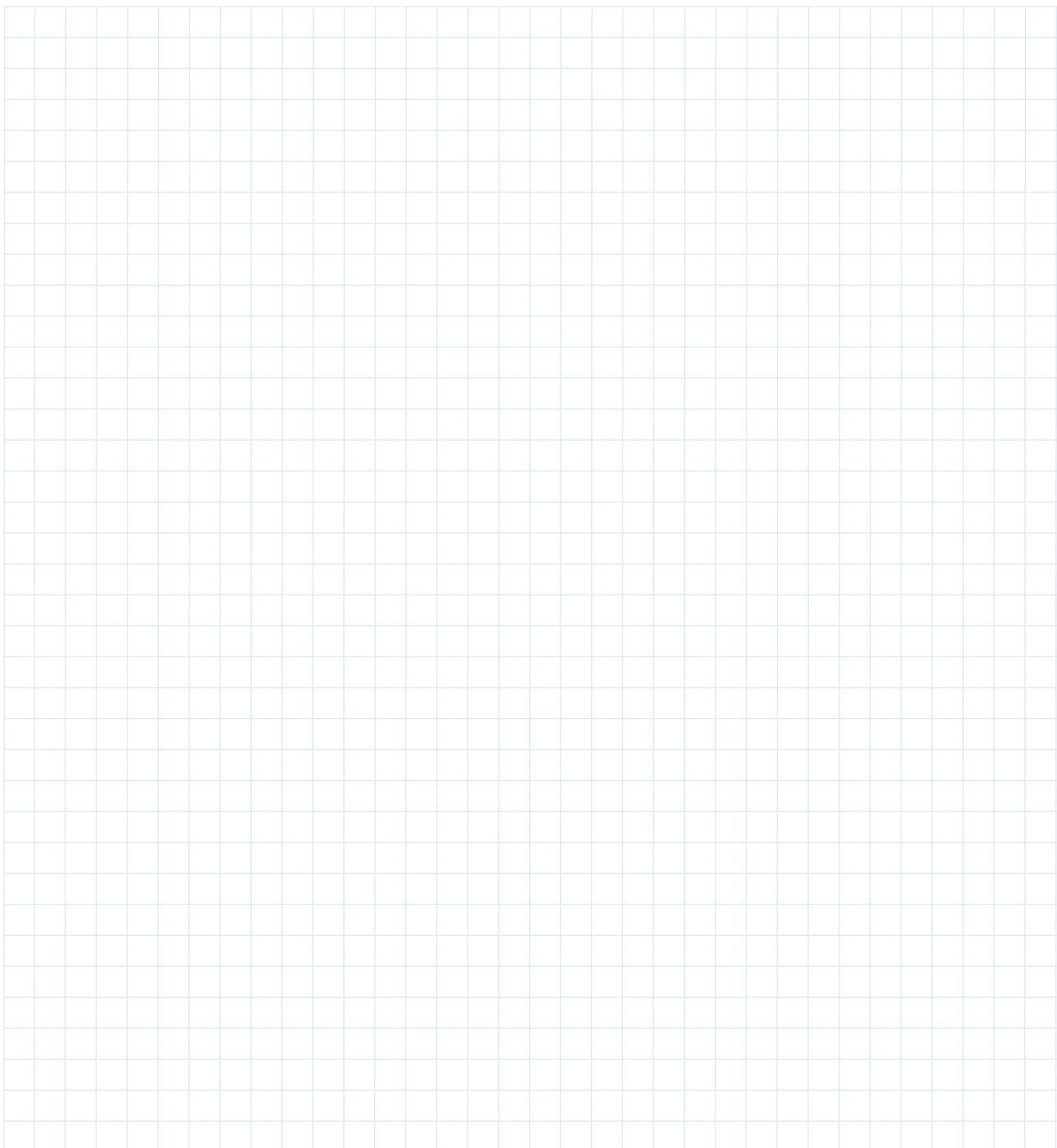
(mm)

Designation		Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Insert
TPDBP	140-16-345-8-H	▲	14	16	35.67	125.83	113.17	48	175.0	1.17	TPD140-149BP-H
	160-20-395-8-H	▲	16	20	40.89	143.11	129.39	50	194.5	1.39	TPD160-169BP-H
	180-20-445-8-H	▲	18	20	46.01	160.49	145.51	50	212.0	1.51	TPD180-189BP-H
	200-25-495-8-H	▲	20	25	51.17	183.33	161.67	56	235.0	1.67	TPD200-209BP-H
	220-25-545-8-H	▲	22	25	56.39	193.11	177.89	56	251.0	1.89	TPD220-229BP-H

The maximum flute length could be LB.

▲: Stock item Europe ●: Stock item Korea ○: Production on demand

Notes



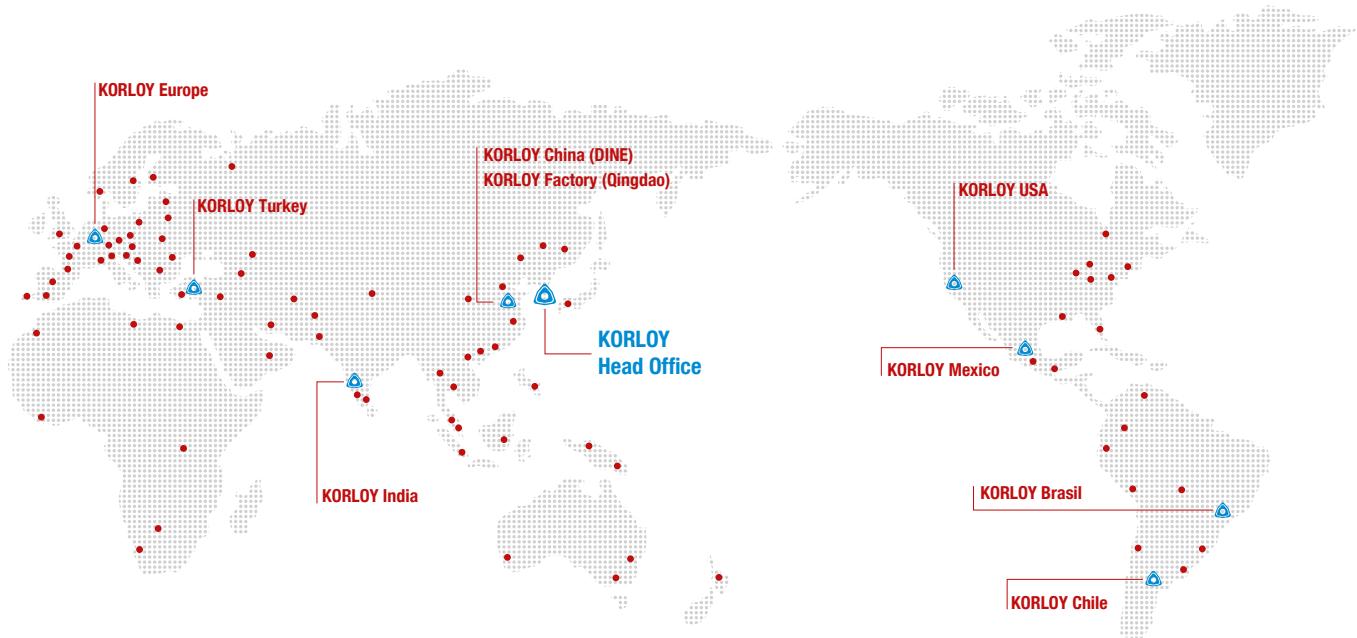
0 5 25mm

For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasses or safety cover to hedge possible dangers. Inappropriate usage or excessive cutting condition may lead tool's breakage or even the fragment's scattering.
- Clamp the workpiece tightly enough to prevent its movement while its machining.

Properly manage the tool change phase because the inordinately used tool can be easily broken under the excessive cutting load or severe wear, and it may threaten the operator's safety.
• Use safety cover because chips evacuated during cutting are hot and sharp and may cause burns and cuts. To remove chips safely, stop machining, put on protective gloves, and use a hook or other tools.

- Prepare for fire prevention measures as the use of the non-water soluble cutting oil may cause fire.
- Use safety cover and other safety supplies because the spare parts or the inserts can be pulled out due to centrifugal force while high speed machining.



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