KORLOY
TECH-NEWS

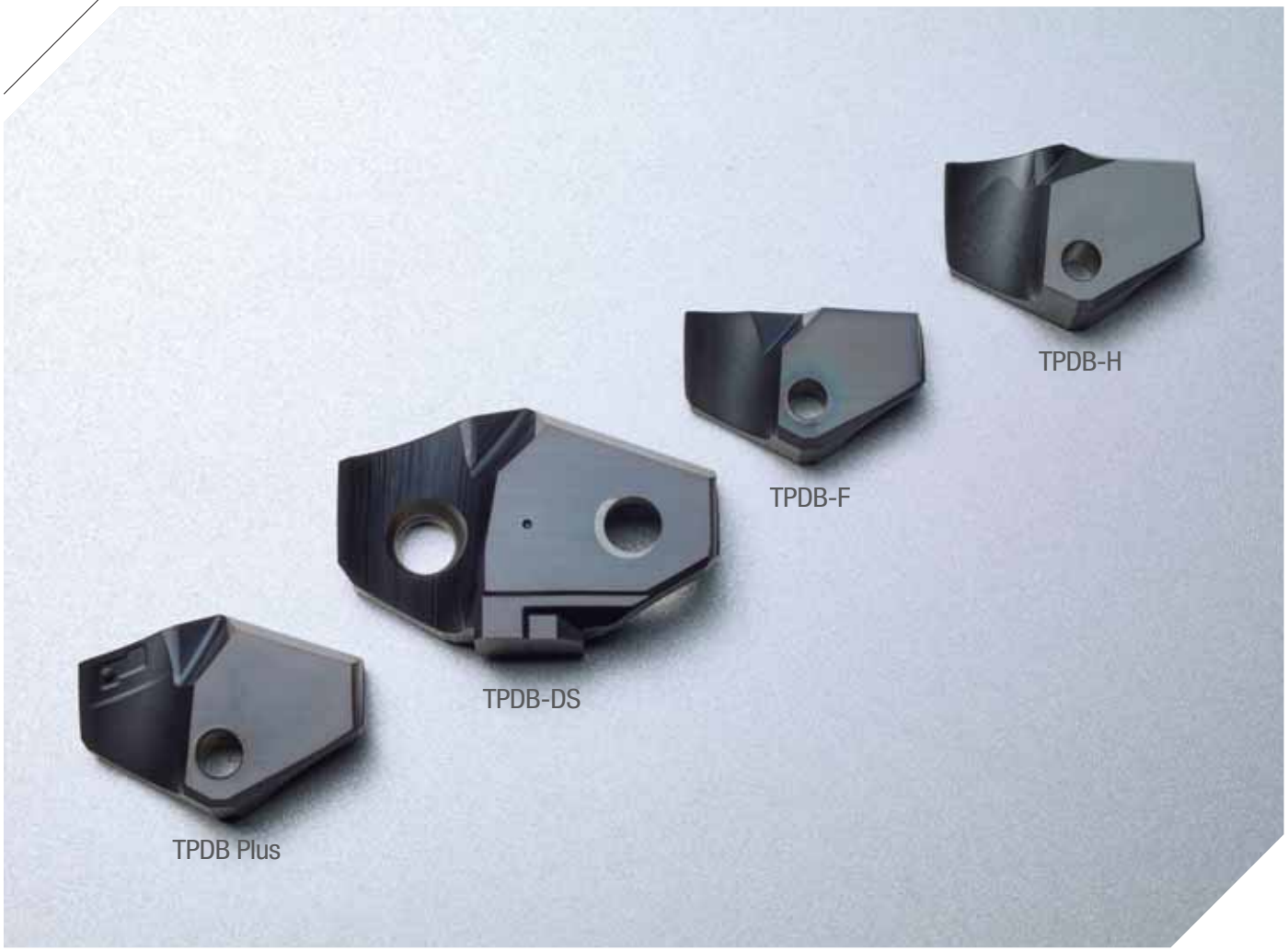
TPDB Plus Drill

TPDB Plus, TPDB-DS, TPDB-F, TPDB-H

[Standard] [Medium/large dia.] [Flat] [H-Beam]

High-quality and high efficiency top solid indexable Drill

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



KORLOY

KORLOY
TECH-NEWS

Highly precise and efficient top solid indexable Drill

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, TPDB-F for machining various surfaces, TPDB-H dedicated hole machining in structural Steel, and TPDB-DS for medium / large diameter Drilling provide multi-faceted usability across different industries.

The **TPDB-F** is capable of machining sloping surfaces, curved surfaces, flanges, and boring on various workpiece surfaces, and it is suitable for basic hole machining on flat bottom surfaces. By minimizing the number of tools required and reducing tool change time, it is possible to expect decreasing cycle time.

The **TPDB-H** insert with unique low-cutting 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.

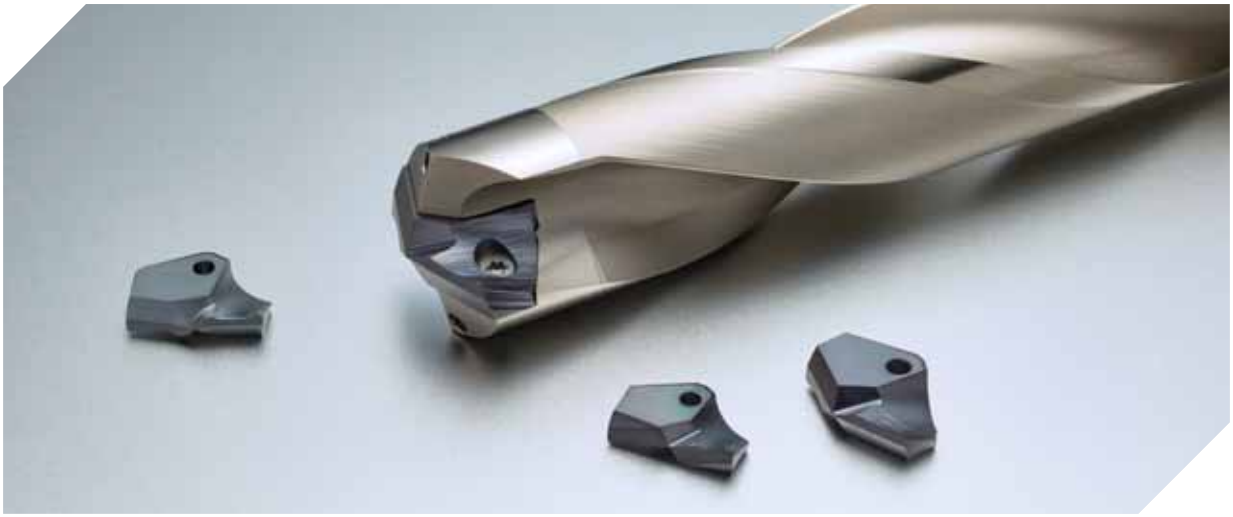
TPDB-DS is a Drill designed for machining medium/large diameter workpieces, applying a strong clamping structure. The specially designed clamping system and screw clamping method enable stable machining in high cutting load machining environments. Additionally, the double-margin design provides excellent hole surface finish and precision.

» Excellent machinability

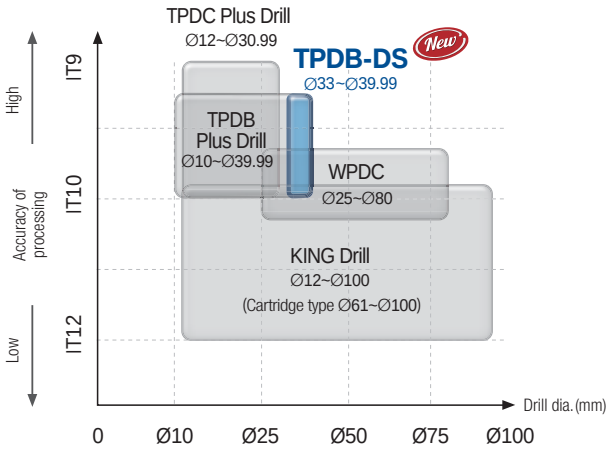
- Excellent hole machining performance with specified cutting edge designs per applications
- Good chip evacuation with high helix angle application

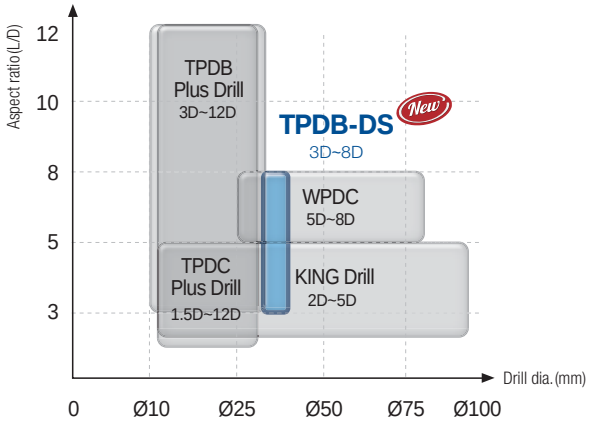
» Improved productivity

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



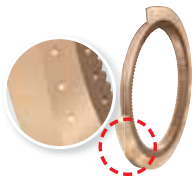
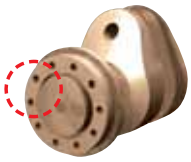
Application range



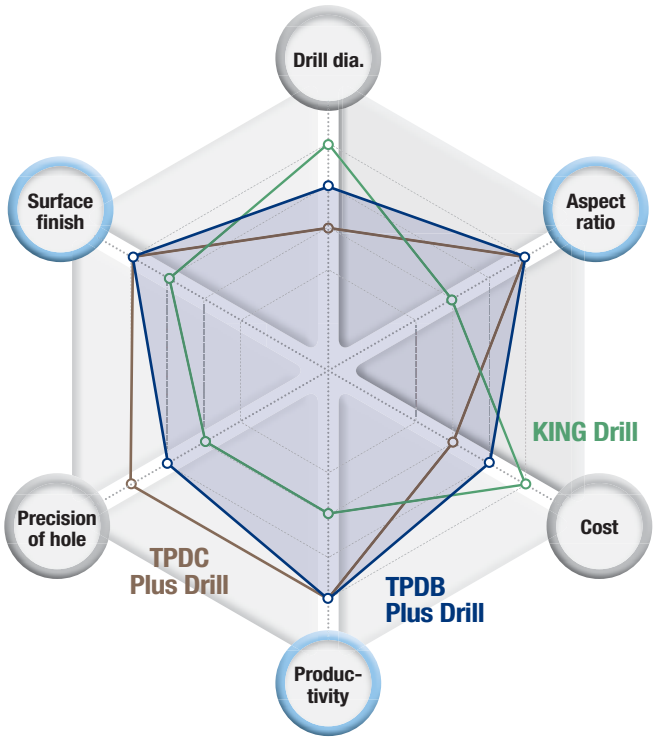


Tool		Application range					
		Drill dia.(Ø)	Tolerance of hole	Surface finish of hole (Ra)	Aspect ratio (L/D)	Tolerance of Drill dia.	Workpiece material
TPDB Plus Drill	TPDB Plus	10.0~32.99	0~+0.1	≤ 2.0㎛	3, 5, 8, 10, 12	h7	P, K
	TPDB-DS	33.0~39.99	0~+0.2	≤ 2.5㎛	3, 5, 8		P, K
	TPDB-F	14.0~30.99	0~+0.1	≤ 2.5㎛	1.5		P
	TPDB-H	14.0~30.99	0~+0.1	≤ 2.5㎛	3, 4, 8		P

Applicable industries

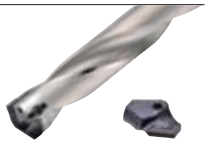
Generation of wind and nuclear power	Shipbuilding	Railway and construction	Aircraft	Automobile
				

Indexable Drill selection guide



TPDB Plus Drill

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

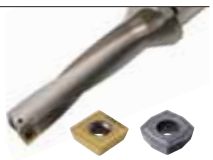


TPDC Plus Drill

- 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

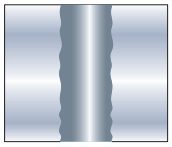
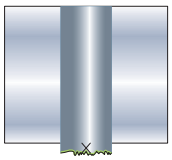
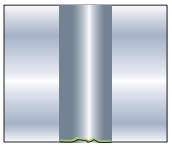
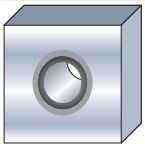


Tool	Drill dia.	Aspect ratio	Cost	Productivity	Precision of hole	Surface finish
TPDB Plus Drill	★★★	★★★★	★★★	★★★★	★★★	★★★★
TPDC Plus Drill	★★	★★★★	★★	★★★★	★★★★	★★★★
KING Drill	★★★★	★★	★★★★	★★	★★	★★★

Types of damage to Drill and solutions

Scratches on the margin		
	**Factor**	• 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	• 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**	• 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	• 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**	• Interrupted machining (end of hole is inclined or curved shape, junction hole in 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	• 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**	• Low cutting speed • Machining free-cutting Steel • Erosion of chip and flute • Lack of coolant lubrication
	Solution	• Increase cutting speed • Set a lower thinning angle • Reduce the honing • Use more coolant
Chipping on the rake face		
	**Factor**	• 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	• 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)

Types of damage to workpiece and check points

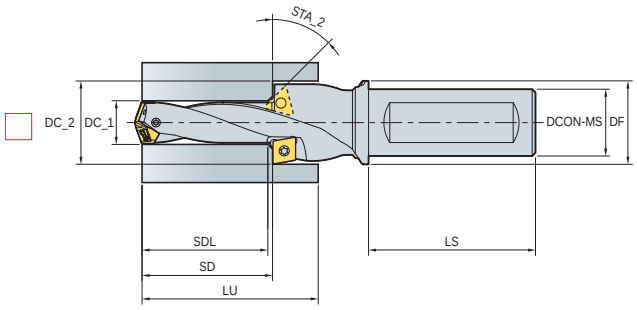
Poor surface finish (rough, scratch, etc.)		
	**Factor**	• Low rigidity of machine and improperly clamped workpiece • Large concentricity and lack of coolant
	Solution	• Clamp the workpiece properly and check the concentricity • Increase the amount and pressure of coolant
Remained lots of burr at the end of the Drilled hole		
	**Factor**	• High feed and excessive honing of the cutting edge • Exceeded cutting tool's tool life (too much wear and chipping)
	Solution	• 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**	• 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	• Reduce the feed. (especially at the end of hole) • Use a new Drill • Reduce honing on the cutting edge
Thermal deformation and oxidation of the end of the Drilled hole		
	**Factor**	• Rapid feed • Lack of coolant • Excessive cutting load • Exceeded cutting tool's tool life (too much wear and chipping)
	Solution	• Reduce the feed and honing on the cutting edge • Use more coolant and use a new Drill

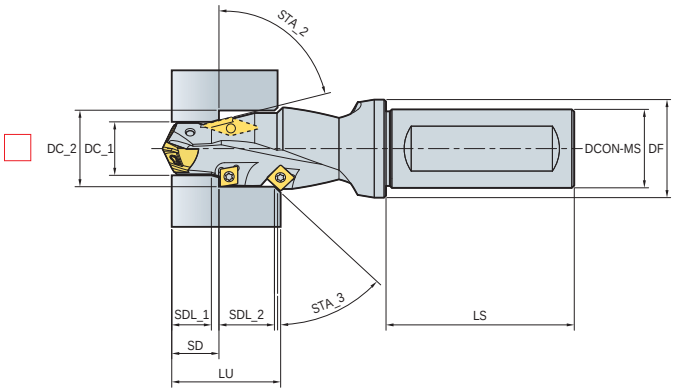
Solutions for troubles

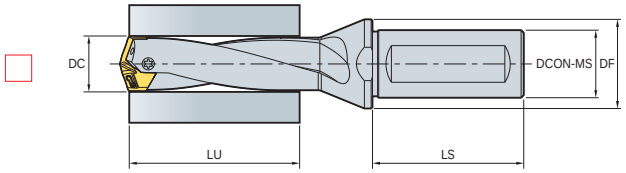
↑ Increase ↓ Decrease ○ Use

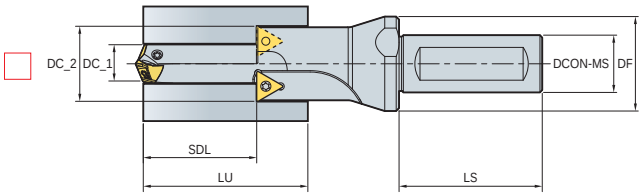
Trouble	Designation	Solution															
		Cutting condition					Tool shape					Grade		The other			
		vc	fn	Coolant	fn (in the beginning)	Depth of cut	Relief angle	Point angle	Thinning angle	Honing	Flute width rate	Toughness	Hardness	Rigidity of machine	Chattering of machine	Fixing workpiece	Overhang
Chipping	• 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	• Improper cutting conditions • Too much cutting load • Too long overhang • Less rigidity of machine	↓	↓	○	↓	↓								↑		↑	↓
Poor chip evacuation	• Improper cutting conditions		↓	○		↓					↑						
Poor surface finish	• Built-up edge • Chattering • Improper cutting conditions	↑	↓	○	↓			↓		↓				↑	↓	↑	↓
Poor accuracy of hole	• Low cutting speed (wear in the center of Drill)	↑	↓											↑	↓		↓

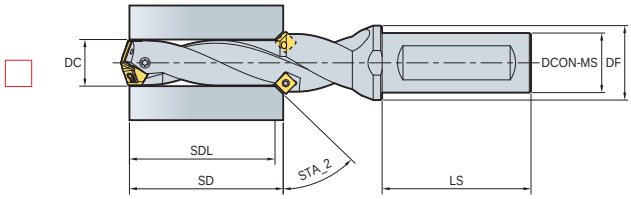
Special Drill order form











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 type

☐  Flat type

☐  Weldon type

☐  Whistle notch type

TPDB Plus

Code system

Insert

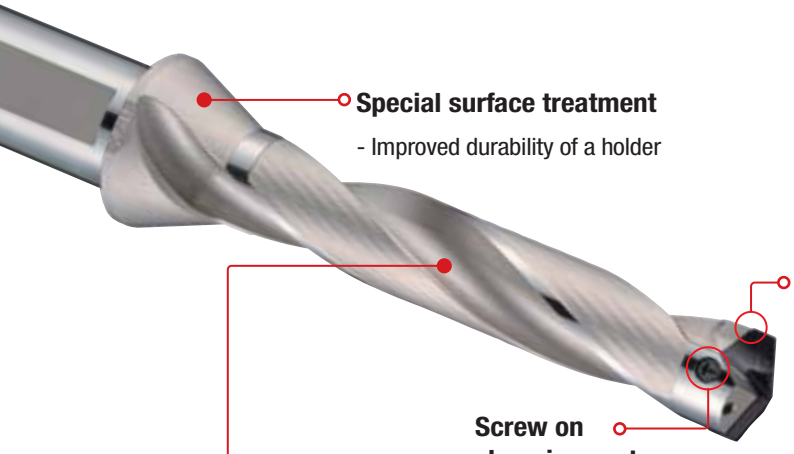
TPD	200	B
Top solid Piercing Drill	Drill dia. 200 : Ø20.0	Insert type B : Blade type

Holder

TPD	B	200	-	25	-	5	-	P
Top solid Piercing Drill	Insert type B : Blade type	Drill dia. 200 : Ø20.0		Shank dia. 25 : Ø25		Aspect ratio (L/D) 3D, 5D, 8D, 10D, 12D		Plus

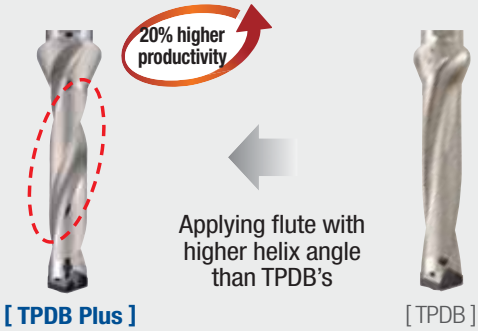
Features

- **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



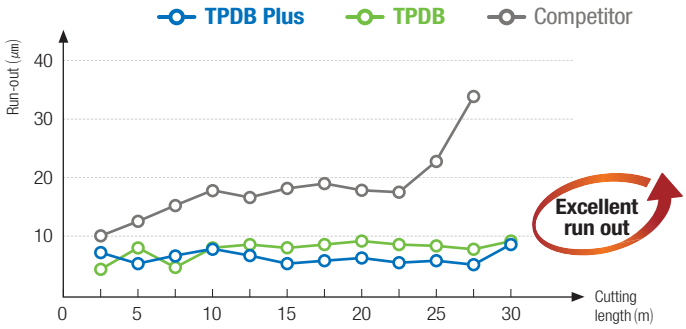
High helix angle

- **High productivity**
  - Stable chip evacuation realizes stable machinability
  - Decreased cycle time by applying improved cutting conditions
- **Improvement in machining quality**
  - Good surface finish and regular size of the hole



Run-out

Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	vc (m/min) = 90, fn (mm/rev) = 0.25, ap (mm) = 120, wet (20 bar)
Tool	Insert TPD250B (PC5300)
	Holder TPDB250-32-5-P (Drill dia. = Ø25 mm)



How to clamp an insert

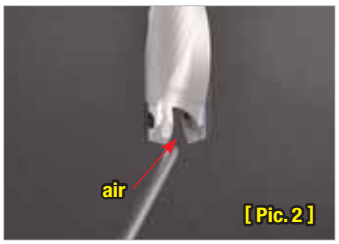
Clamping an insert to a holder

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.

Recommended cutting conditions

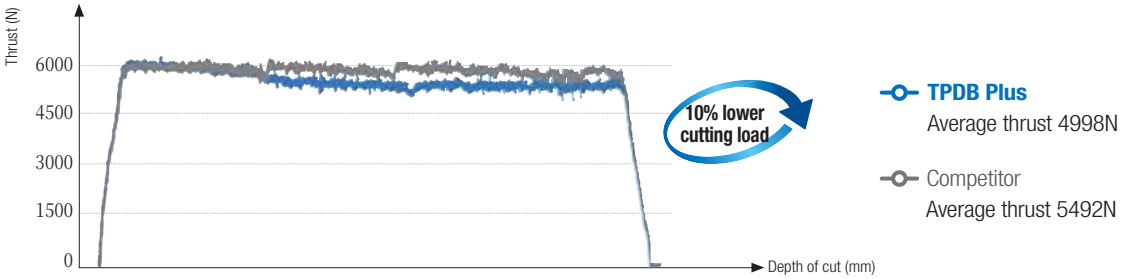
Workpiece					Specific cutting force (N/mm²)	Brinell hardness (HB)	Grade	vc (m/min)	Aspect ratio (L/D) = 3D, 5D fn (mm/rev)		
ISO	Workpiece material		KS	ISO					Ø10~Ø16.9	Ø17~Ø26.9	Ø27~Ø32.9
P	Carbon steel	C = 0.10~0.25%	SM15C SM25C	C15 C25	1500	90~200	PC5335 PC330P	80~140	0.30~0.15	0.35~0.20	0.40~0.25
		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
	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
		Hardened tool steel	STD61	X40CrMoV5-1	3000	352	PC5300	40~80	0.30~0.18	0.35~0.20	0.40~0.25
K	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.

Performance evaluation

Cutting load

Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	vc (m/min) = 120, fn (mm/rev) = 0.25, ap (mm) = 120, wet (20 bar)
Tool	**Insert** TPD250B (PC5300) **Holder** TPDB250-32-5-P (Drill dia. = Ø25 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	vc (m/min) = 120, fn (mm/rev) = 0.35, ap (mm) = 120, wet (20 bar)
Tool	**Insert** TPD250B (PC5300) **Holder** TPDB250-32-5-P (Drill dia. = Ø25 mm)

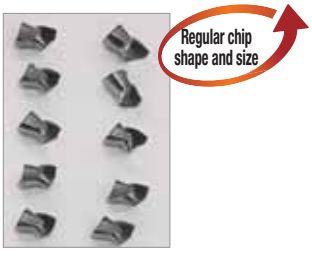
[TPDB Plus]
Ra = 0.54㎛

[Competitor]
Ra = 0.57㎛

» Good surface finish due to stable chip shape and chip evacuation

Chip control

Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	vc (m/min) = 120, fn (mm/rev) = 0.35, ap (mm) = 120, wet (20 bar)
Tool	**Insert** TPD250B (PC5300) **Holder** TPDB250-32-5-P (Drill dia. = Ø25 mm)



[TPDB Plus]

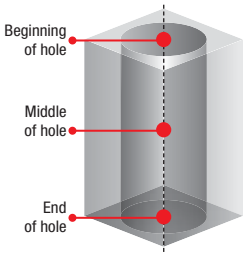
[Competitor]

» Regular chip shape

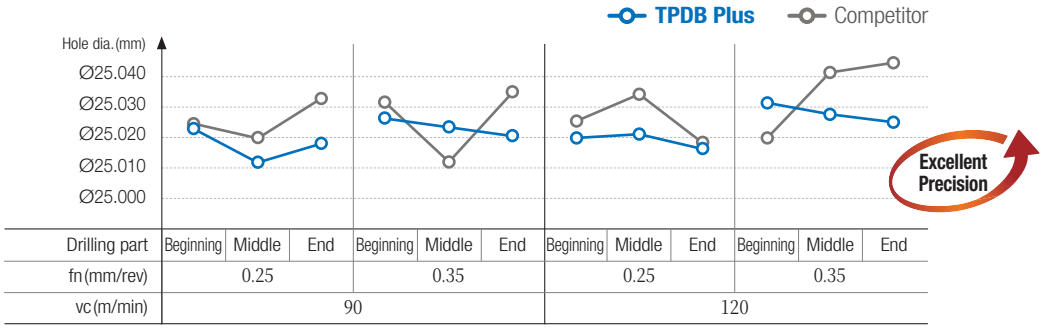
Performance evaluation

Machining precision

Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	vc (m/min) = 90/120, fn (mm/rev) = 0.25/0.35, ap (mm) = 120, wet (20 bar)
Tool	Insert TPD250B (PC5300) Holder TPDB250-32-5-P (Drill dia. = Ø25 mm)



[Drilling part]



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

» High precision cutting due to stable chip evacuation

Wear resistance

Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	vc (m/min) = 100, fn (mm/rev) = 0.3, ap (mm) = 100, wet (30 bar)
Tool	Insert TPD250B (PC5300) Holder TPDB250-32-5-P (Drill dia. = Ø25 mm)

[TPDB Plus]

[Competitor]

» Improved built up edge and chipping resistance lead stable wear on TPDB Plus insert's edge and obtain longer Max. tool life.

Workpiece	Carbon steel (C45, HRC18)
Cutting condition	vc (m/min) = 100, fn (mm/rev) = 0.3, ap (mm) = 100, wet (30 bar)
Tool	Insert TPD250B (PC5335) Holder TPDB250-32-5-P (Drill dia. = Ø25 mm)

[TPDB Plus]

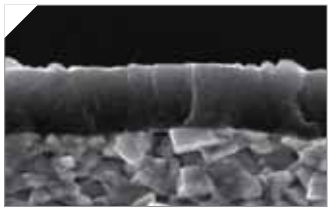
[Competitor]

» Sharper cutting edge than competitor's improves built up edge resistance and tool life.

Grade features

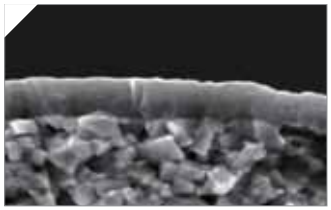
PC5300

- 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

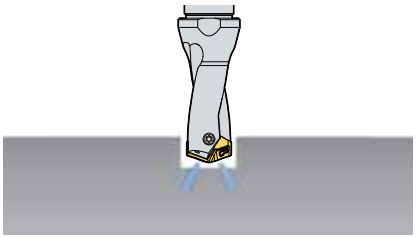


PC330P

- Applying PVD coating with high surface finish and excellent lubrication
- Coating layer with excellent hardness at high temperature and oxidation resistance
- Optimal grade for welding structural Carbon steel (E355DD, etc.)

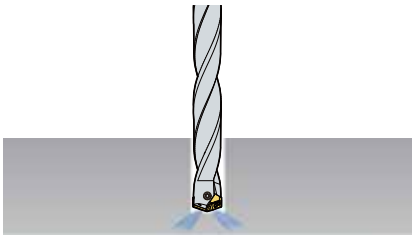
Recommended Drilling method (10D, 12D)

Machine a pilot hole (with a pilot Drill)

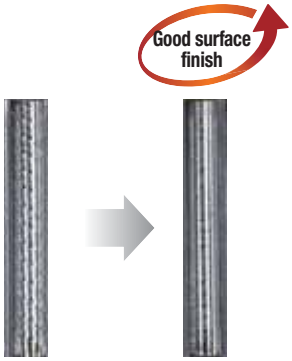


- Machine a pilot hole with the depth of cut as 0.5D and at 30% lower speed using a 1.5D or 3D Drill.

Start Drilling



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



Result of general Drilling

Result of recommended Drilling

Precaution in Drilling

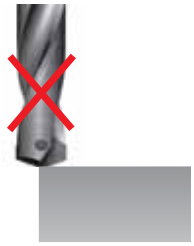
Angled surface Drilling

- 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.

Stacked plates Drilling

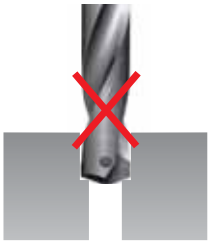
- Gap between the plates could make wrong chip evacuation causing fracture of the Drill.
- Place stacked plates without any gap between each.

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.

Basic checklist for the Drilling operations

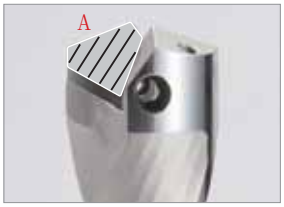
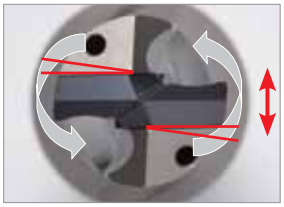
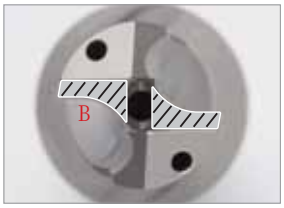
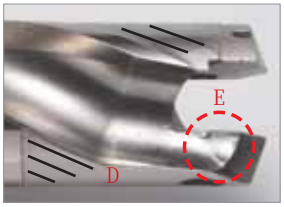
- Workpiece clamping condition
- Rotational state of the main axial in the machining equipment
- Holder condition
- Clamped drill's Run-out : Max. 0.03mm
- Coolant supply condition(pressure, flow rate, concentration)
- Chip evacuation condition

Coolant application system

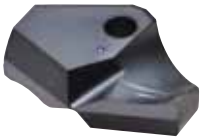
- Adequate supply of cutting fluid at the entrance of the hole
- Minimum cutting fluid pressure : 5 bar or above
- Minimum flow rate : 5ℓ/min or avobe

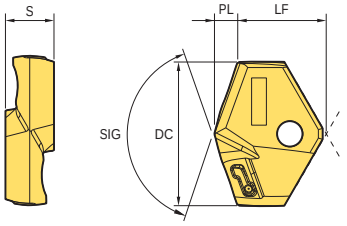
[Dry]

Replacement of holders and screws

Worn part	How to check	Description
[Pic.1] 	**[Pic.2]** Check the gap 	• In case of Drilling for a long time as shown in the **[Pic.1]** the 'A' part is torn and twisted due to torque. • As shown in the **[Pic.2]** check the gap between the insert and the tip seat turning the clamped insert from side to side. If there is a gap between them, replace the used holder to a new one.
[Pic.3] 	**[Pic.4]** Check the moving 	• The insert could move up or down due to the load on the Z-axis in Drilling over an extended period of time which causes wear on the 'B' part as shown the **[Pic.3]**. • After clamping an insert, if the insert is moving or there is a gap between the insert and the tip seat as shown in the **[Pic.4]** replace the used holder to a new one.
[Pic.5] 	Check the moving 	• After an extended period of use, the screw can be worn as shown in the '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.		• 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.

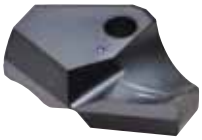
Insert

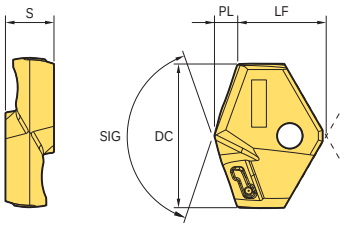




(mm)

Designation		Coated			DC	LF	PL	SIG	S
		PC5300	PC5335	PC330P					
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
	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





(mm)

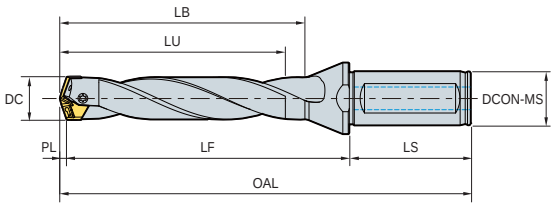
Designation		Coated			DC	LF	PL	SIG	S
		PC5300	PC5335	PC330P					
TPD	196B	●			19.6	10.7	3.37	140	6.0
	197B	●			19.7	10.7	3.39	140	6.0
	198B	●			19.8	10.7	3.41	140	6.0
	199B	●			20.0	11.7	3.44	140	6.5
	200B	●	●	●	20.1	11.6	3.46	140	6.5
	201B	●			20.2	11.6	3.48	140	6.5
	202B	●			20.4	11.6	3.51	140	6.5
	204B	●			20.5	11.6	3.53	140	6.5
	205B	●			20.6	11.6	3.55	140	6.5
	206B	●			21.0	12.0	3.62	140	6.5
	210B	●	●	●	21.1	12.0	3.63	140	6.5
	211B	●			21.2	12.0	3.65	140	6.5
	212B	●			21.3	11.9	3.67	140	6.5
	213B	●			21.5	11.9	3.70	140	6.5
	215B	●			21.7	11.9	3.74	140	6.5
	217B	●			21.9	11.8	3.77	140	6.5
	219B	●			22.0	12.3	3.79	140	7.0
	220B	●	●		22.2	12.3	3.82	140	7.0
	222B	●			22.3	12.3	3.84	140	7.0
	223B	●			22.5	12.2	3.87	140	7.0
	225B	●			22.7	12.2	3.91	140	7.0
	227B	●			23.0	12.6	3.96	140	7.0
	230B	●	●		23.5	12.6	4.05	140	7.0
	235B	●			23.7	12.5	4.08	140	7.0
	237B	●			24.0	13.0	4.13	140	7.5
	240B	●	●		24.2	12.9	4.17	140	7.5
	242B	●			24.4	12.9	4.20	140	7.5
	244B	●			24.5	12.9	4.22	140	7.5
	245B	●			24.7	12.9	4.25	140	7.5
	247B	●			25.0	13.2	4.43	140	7.5
	250B	●	●		25.1	13.2	4.44	140	7.5
	251B	●			25.2	13.1	4.46	140	7.5
	252B	●			25.3	13.1	4.48	140	7.5
	253B	●			25.5	13.1	4.52	140	7.5
	255B	●			25.6	13.1	4.53	140	7.5
	256B	●			25.8	13.0	4.57	140	7.5
	258B	●			25.9	13.0	4.59	140	7.5
	259B	●			26.0	13.5	4.60	140	8.5
	260B	●	●		26.2	13.5	4.64	140	8.5
	262B	●			26.5	13.4	4.69	140	8.5
	265B	●			27.0	14.3	4.78	140	8.5
	270B	●		●	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

※ TPD Inserts not list above within the range of Ø10.00 ~ Ø32.99 can be made to order ●: Stock item

Parts

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

TPDB-P (3D)

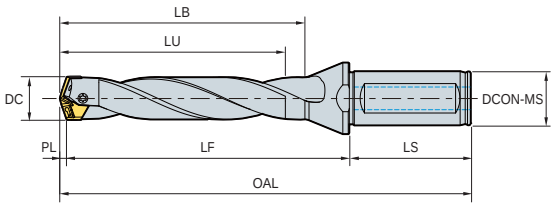


(mm)

	Designation	Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Applicable insert
TPDB	100-16-3-P	●	10.0 - 10.4	16.0	31.58	47.02	37.08	48.0	96.6	1.58	TPD100B ~ 104B
	105-16-3-P	●	10.5 - 10.9	16.0	33.16	47.94	38.91	48.0	97.6	1.66	TPD105B ~ 109B
	110-16-3-P	●	11.0 - 11.4	16.0	34.73	49.97	40.73	48.0	99.7	1.73	TPD110B ~ 114B
	115-16-3-P	●	11.5 - 11.9	16.0	36.31	50.89	42.56	48.0	100.7	1.81	TPD115B ~ 119B
	120-16-3-P	●	12.0 - 12.4	16.0	38.07	53.83	44.57	48.0	103.9	2.07	TPD120B ~ 124B
	125-16-3-P	●	12.5 - 12.9	16.0	39.65	55.75	46.40	48.0	105.9	2.15	TPD125B ~ 129B
	130-16-3-P	●	13.0 - 13.4	16.0	41.24	59.06	48.24	48.0	109.3	2.24	TPD130B ~ 134B
	135-16-3-P	●	13.5 - 13.9	16.0	42.82	60.98	50.07	48.0	111.3	2.32	TPD135B ~ 139B
	140-16-3-P	●	14.0 - 14.4	16.0	44.41	63.09	51.91	48.0	113.5	2.41	TPD140B ~ 144B
	145-16-3-P	●	14.5 - 14.9	16.0	46.00	66.00	53.75	48.0	116.5	2.50	TPD145B ~ 149B
	150-20-3-P	●	15.0 - 15.4	20.0	47.58	68.12	55.58	50.0	120.7	2.58	TPD150B ~ 154B
	155-20-3-P	●	15.5 - 15.9	20.0	49.17	70.03	57.42	50.0	122.7	2.67	TPD155B ~ 159B
	160-20-3-P	●	16.0 - 16.4	20.0	50.75	72.15	59.25	50.0	124.9	2.75	TPD160B ~ 164B
	165-20-3-P	●	16.5 - 16.9	20.0	52.34	74.06	61.09	50.0	126.9	2.84	TPD165B ~ 169B
	170-20-3-P	●	17.0 - 17.4	20.0	53.93	77.17	62.93	50.0	130.1	2.93	TPD170B ~ 174B
	175-20-3-P	●	17.5 - 17.9	20.0	55.51	79.09	64.76	50.0	132.1	3.01	TPD175B ~ 179B
	180-25-3-P	●	18.0 - 18.4	25.0	57.10	81.10	66.60	56.0	140.2	3.10	TPD180B ~ 184B
	185-25-3-P	●	18.5 - 18.9	25.0	58.69	83.01	68.44	56.0	142.2	3.19	TPD185B ~ 189B
	190-25-3-P	●	19.0 - 19.4	25.0	60.27	86.03	70.27	56.0	145.3	3.27	TPD190B ~ 194B
	195-25-3-P	●	19.5 - 19.9	25.0	61.86	87.94	72.11	56.0	147.3	3.36	TPD195B ~ 199B
	200-25-3-P	●	20.0 - 20.4	25.0	63.44	90.06	73.94	56.0	149.5	3.44	TPD200B ~ 204B
	205-25-3-P	●	20.5 - 20.9	25.0	65.03	91.97	75.78	56.0	151.5	3.53	TPD205B ~ 209B
	210-25-3-P	●	21.0 - 21.4	25.0	66.62	91.08	77.62	60.0	154.7	3.62	TPD210B ~ 214B
	215-25-3-P	●	21.5 - 21.9	25.0	68.20	93.00	79.45	60.0	156.7	3.70	TPD215B ~ 219B
	220-25-3-P	●	22.0 - 22.4	25.0	69.79	95.11	81.29	60.0	158.9	3.79	TPD220B ~ 224B
	225-25-3-P	●	22.5 - 22.9	25.0	71.37	97.03	83.12	60.0	160.9	3.87	TPD225B ~ 229B
	230-25-3-P	●	23.0 - 23.4	25.0	72.96	100.14	84.96	60.0	164.1	3.96	TPD230B ~ 234B
	235-25-3-P	●	23.5 - 23.9	25.0	74.55	102.05	86.80	60.0	166.1	4.05	TPD235B ~ 239B
	240-32-3-P	●	24.0 - 24.4	32.0	76.13	108.17	88.63	60.0	172.3	4.13	TPD240B ~ 244B
	245-32-3-P	●	24.5 - 24.9	32.0	77.72	110.08	90.47	60.0	174.3	4.22	TPD245B ~ 249B
	250-32-3-P	●	25.0 - 25.4	32.0	79.43	113.07	92.43	60.0	177.5	4.43	TPD250B ~ 254B
	255-32-3-P	●	25.5 - 25.9	32.0	81.02	114.98	94.27	60.0	179.5	4.52	TPD255B ~ 259B
	260-32-3-P	●	26.0 - 26.9	32.0	82.60	117.10	96.10	60.0	181.7	4.60	TPD260B ~ 269B
	270-32-3-P	●	27.0 - 27.9	32.0	85.78	122.12	99.78	60.0	186.9	4.78	TPD270B ~ 279B
	280-32-3-P	●	28.0 - 28.9	32.0	88.96	126.04	103.46	60.0	191.0	4.96	TPD280B ~ 289B
	290-32-3-P	●	29.0 - 29.9	32.0	92.13	131.07	107.13	60.0	196.2	5.13	TPD290B ~ 299B
	300-32-3-P	●	30.0 - 30.9	32.0	95.46	133.94	110.96	60.0	199.4	5.46	TPD300B ~ 309B
	310-32-3-P	●	31.0 - 31.9	32.0	98.64	138.96	114.64	60.0	204.6	5.64	TPD310B ~ 319B
	320-32-3-P	●	32.0 - 32.9	32.0	101.82	140.98	118.32	60.0	206.8	5.82	TPD320B ~ 329B

●: Stock item

TPDB-P (5D)

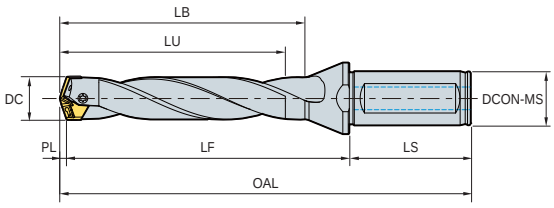


(mm)

Designation		Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Applicable insert
TPDB	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
	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

TPDB-P (8D)

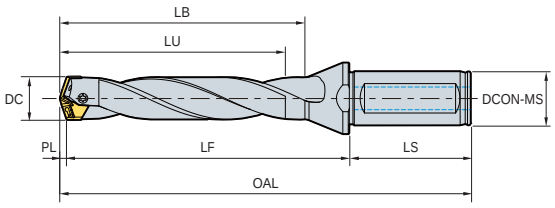


(mm)

	Designation	Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Applicable insert
TPDB	100-16-8-P	●	10.0 - 10.4	16.0	81.58	97.02	87.08	48.0	146.6	1.58	TPD100B ~ 104B
	105-16-8-P	●	10.5 - 10.9	16.0	85.66	100.94	91.41	48.0	150.6	1.66	TPD105B ~ 109B
	110-16-8-P	●	11.0 - 11.4	16.0	89.73	104.97	95.73	48.0	154.7	1.73	TPD110B ~ 114B
	115-16-8-P	●	11.5 - 11.9	16.0	93.81	108.89	100.06	48.0	158.7	1.81	TPD115B ~ 119B
	120-16-8-P	●	12.0 - 12.4	16.0	98.07	114.03	104.57	48.0	164.1	2.07	TPD120B ~ 124B
	125-16-8-P	●	12.5 - 12.9	16.0	102.15	118.55	108.90	48.0	168.7	2.15	TPD125B ~ 129B
	130-16-8-P	●	13.0 - 13.4	16.0	106.24	124.06	113.24	48.0	174.3	2.24	TPD130B ~ 134B
	135-16-8-P	●	13.5 - 13.9	16.0	110.32	128.58	117.57	48.0	178.9	2.32	TPD135B ~ 139B
	140-16-8-P	●	14.0 - 14.4	16.0	114.41	133.09	121.91	48.0	183.5	2.41	TPD140B ~ 144B
	145-16-8-P	●	14.5 - 14.9	16.0	118.50	138.60	126.25	48.0	189.1	2.50	TPD145B ~ 149B
	150-20-8-P	●	15.0 - 15.4	20.0	122.58	143.12	130.58	50.0	195.7	2.58	TPD150B ~ 154B
	155-20-8-P	●	15.5 - 15.9	20.0	126.67	147.53	134.92	50.0	200.2	2.67	TPD155B ~ 159B
	160-20-8-P	●	16.0 - 16.4	20.0	130.75	152.15	139.25	50.0	204.9	2.75	TPD160B ~ 164B
	165-20-8-P	●	16.5 - 16.9	20.0	134.84	156.56	143.59	50.0	209.4	2.84	TPD165B ~ 169B
	170-20-8-P	●	17.0 - 17.4	20.0	138.93	162.17	147.93	50.0	215.1	2.93	TPD170B ~ 174B
	175-20-8-P	●	17.5 - 17.9	20.0	143.01	166.59	152.26	50.0	219.6	3.01	TPD175B ~ 179B
	180-25-8-P	●	18.0 - 18.4	25.0	147.10	171.10	156.60	56.0	230.2	3.10	TPD180B ~ 184B
	185-25-8-P	●	18.5 - 18.9	25.0	151.19	175.51	160.94	56.0	234.7	3.19	TPD185B ~ 189B
	190-25-8-P	●	19.0 - 19.4	25.0	155.27	181.03	165.27	56.0	240.3	3.27	TPD190B ~ 194B
	195-25-8-P	●	19.5 - 19.9	25.0	159.36	185.44	169.61	56.0	244.8	3.36	TPD195B ~ 199B
	200-25-8-P	●	20.0 - 20.4	25.0	163.44	190.06	173.94	56.0	249.5	3.44	TPD200B ~ 204B
	205-25-8-P	●	20.5 - 20.9	25.0	167.53	194.47	178.28	56.0	254.0	3.53	TPD205B ~ 209B
	210-25-8-P	●	21.0 - 21.4	25.0	171.62	196.08	182.62	60.0	259.7	3.62	TPD210B ~ 214B
	215-25-8-P	●	21.5 - 21.9	25.0	175.70	200.50	186.95	60.0	264.2	3.70	TPD215B ~ 219B
	220-25-8-P	●	22.0 - 22.4	25.0	179.79	205.11	191.29	60.0	268.9	3.79	TPD220B ~ 224B
	225-25-8-P	●	22.5 - 22.9	25.0	183.87	209.73	195.62	60.0	273.6	3.87	TPD225B ~ 229B
	230-25-8-P	●	23.0 - 23.4	25.0	187.96	215.14	199.96	60.0	279.1	3.96	TPD230B ~ 234B
	235-25-8-P	●	23.5 - 23.9	25.0	192.05	219.55	204.30	60.0	283.6	4.05	TPD235B ~ 239B
	240-32-8-P	●	24.0 - 24.4	32.0	196.13	228.17	208.63	60.0	292.3	4.13	TPD240B ~ 244B
	245-32-8-P	●	24.5 - 24.9	32.0	200.22	232.58	212.97	60.0	296.8	4.22	TPD245B ~ 249B
	250-32-8-P	●	25.0 - 25.4	32.0	204.43	238.07	217.43	60.0	302.5	4.43	TPD250B ~ 254B
	255-32-8-P	●	25.5 - 25.9	32.0	208.52	242.48	221.77	60.0	307.0	4.52	TPD255B ~ 259B
	260-32-8-P	●	26.0 - 26.9	32.0	212.60	247.10	226.10	60.0	311.7	4.60	TPD260B ~ 269B
	270-32-8-P	●	27.0 - 27.9	32.0	220.78	257.12	234.78	60.0	321.9	4.78	TPD270B ~ 279B
	280-32-8-P	●	28.0 - 28.9	32.0	228.96	266.04	243.46	60.0	331.0	4.96	TPD280B ~ 289B
	290-32-8-P	●	29.0 - 29.9	32.0	237.13	276.07	252.13	60.0	341.2	5.13	TPD290B ~ 299B
	300-32-8-P	●	30.0 - 30.9	32.0	245.46	283.94	260.96	60.0	349.4	5.46	TPD300B ~ 309B
	310-32-8-P	●	31.0 - 31.9	32.0	253.64	293.96	269.64	60.0	359.6	5.64	TPD310B ~ 319B
	320-32-8-P	●	32.0 - 32.9	32.0	261.82	300.98	278.32	60.0	366.8	5.82	TPD320B ~ 329B

●: Stock item

TPDB-P (10D)

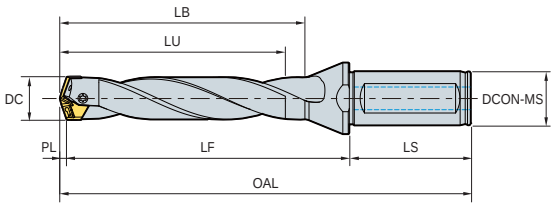


(mm)

Designation		Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Applicable insert
TPDB	100-16-10-P	●	10.0 - 10.4	16.0	101.58	117.02	107.08	48.0	166.6	1.58	TPD100B ~ 104B
	105-16-10-P	●	10.5 - 10.9	16.0	106.66	121.94	112.41	48.0	171.6	1.66	TPD105B ~ 109B
	110-16-10-P	●	11.0 - 11.4	16.0	111.73	126.97	117.73	48.0	176.7	1.73	TPD110B ~ 114B
	115-16-10-P	●	11.5 - 11.9	16.0	116.81	131.89	123.06	48.0	181.7	1.81	TPD115B ~ 119B
	120-16-10-P	●	12.0 - 12.4	16.0	122.07	138.03	128.57	48.0	188.1	2.07	TPD120B ~ 124B
	125-16-10-P	●	12.5 - 12.9	16.0	127.15	143.55	133.90	48.0	193.7	2.15	TPD125B ~ 129B
	130-16-10-P	●	13.0 - 13.4	16.0	132.24	150.06	139.24	48.0	200.3	2.24	TPD130B ~ 134B
	135-16-10-P	●	13.5 - 13.9	16.0	137.32	155.58	144.57	48.0	205.9	2.32	TPD135B ~ 139B
	140-16-10-P	●	14.0 - 14.4	16.0	142.41	161.09	149.91	48.0	211.5	2.41	TPD140B ~ 144B
	145-16-10-P	●	14.5 - 14.9	16.0	147.50	167.60	155.25	48.0	218.1	2.50	TPD145B ~ 149B
	150-20-10-P	●	15.0 - 15.4	20.0	152.58	173.12	160.58	50.0	225.7	2.58	TPD150B ~ 154B
	155-20-10-P	●	15.5 - 15.9	20.0	157.67	178.53	165.92	50.0	231.2	2.67	TPD155B ~ 159B
	160-20-10-P	●	16.0 - 16.4	20.0	162.75	184.15	171.25	50.0	236.9	2.75	TPD160B ~ 164B
	165-20-10-P	●	16.5 - 16.9	20.0	167.84	189.56	176.59	50.0	242.4	2.84	TPD165B ~ 169B
	170-20-10-P	●	17.0 - 17.4	20.0	172.93	196.17	181.93	50.0	249.1	2.93	TPD170B ~ 174B
	175-20-10-P	●	17.5 - 17.9	20.0	178.01	201.59	187.26	50.0	254.6	3.01	TPD175B ~ 179B
	180-25-10-P	●	18.0 - 18.4	25.0	183.10	207.10	192.60	56.0	266.2	3.10	TPD180B ~ 184B
	185-25-10-P	●	18.5 - 18.9	25.0	188.19	212.51	197.94	56.0	271.7	3.19	TPD185B ~ 189B
	190-25-10-P	●	19.0 - 19.4	25.0	193.27	219.03	203.27	56.0	278.3	3.27	TPD190B ~ 194B
	195-25-10-P	●	19.5 - 19.9	25.0	198.36	224.44	208.61	56.0	283.8	3.36	TPD195B ~ 199B
	200-25-10-P	●	20.0 - 20.4	25.0	203.44	230.06	213.94	56.0	289.5	3.44	TPD200B ~ 204B
	205-25-10-P	●	20.5 - 20.9	25.0	208.53	235.47	219.28	56.0	295.0	3.53	TPD205B ~ 209B
	210-25-10-P	●	21.0 - 21.4	25.0	213.62	238.08	224.62	60.0	301.7	3.62	TPD210B ~ 214B
	215-25-10-P	●	21.5 - 21.9	25.0	218.70	243.50	229.95	60.0	307.2	3.70	TPD215B ~ 219B
	220-25-10-P	●	22.0 - 22.4	25.0	223.79	249.11	235.29	60.0	312.9	3.79	TPD220B ~ 224B
	225-25-10-P	●	22.5 - 22.9	25.0	228.87	254.73	240.62	60.0	318.6	3.87	TPD225B ~ 229B
	230-25-10-P	●	23.0 - 23.4	25.0	233.96	261.14	245.96	60.0	325.1	3.96	TPD230B ~ 234B
	235-25-10-P	●	23.5 - 23.9	25.0	239.05	266.55	251.30	60.0	330.6	4.05	TPD235B ~ 239B
	240-32-10-P	●	24.0 - 24.4	32.0	244.13	276.17	256.63	60.0	340.3	4.13	TPD240B ~ 244B
	245-32-10-P	●	24.5 - 24.9	32.0	249.22	281.58	261.97	60.0	345.8	4.22	TPD245B ~ 249B
	250-32-10-P	●	25.0 - 25.4	32.0	254.43	288.07	267.43	60.0	352.5	4.43	TPD250B ~ 254B
	255-32-10-P	●	25.5 - 25.9	32.0	259.52	293.48	272.77	60.0	358.0	4.52	TPD255B ~ 259B
	260-32-10-P	●	26.0 - 26.9	32.0	264.60	299.10	278.10	60.0	363.7	4.60	TPD260B ~ 269B
	270-32-10-P	●	27.0 - 27.9	32.0	274.78	311.12	288.78	60.0	375.9	4.78	TPD270B ~ 279B
	280-32-10-P	●	28.0 - 28.9	32.0	284.96	322.04	299.46	60.0	387.0	4.96	TPD280B ~ 289B
	290-32-10-P	●	29.0 - 29.9	32.0	295.13	334.07	310.13	60.0	399.2	5.13	TPD290B ~ 299B
	300-32-10-P	●	30.0 - 30.9	32.0	305.46	343.94	320.96	60.0	409.4	5.46	TPD300B ~ 309B
	310-32-10-P	●	31.0 - 31.9	32.0	315.64	355.96	331.64	60.0	421.6	5.64	TPD310B ~ 319B
	320-32-10-P	●	32.0 - 32.9	32.0	325.82	364.98	342.32	60.0	430.8	5.82	TPD320B ~ 329B

●: Stock item

TPDB-P (12D)



(mm)

	Designation	Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Applicable insert
TPDB	100-16-12-P	●	10.0 - 10.4	16.0	121.58	137.02	127.08	48.0	186.6	1.58	TPD100B ~ 104B
	105-16-12-P	●	10.5 - 10.9	16.0	127.66	142.94	133.41	48.0	192.6	1.66	TPD105B ~ 109B
	110-16-12-P	●	11.0 - 11.4	16.0	133.73	148.97	139.73	48.0	198.7	1.73	TPD110B ~ 114B
	115-16-12-P	●	11.5 - 11.9	16.0	139.81	154.89	146.06	48.0	204.7	1.81	TPD115B ~ 119B
	120-16-12-P	●	12.0 - 12.4	16.0	146.07	162.03	152.57	48.0	212.1	2.07	TPD120B ~ 124B
	125-16-12-P	●	12.5 - 12.9	16.0	152.15	168.55	158.90	48.0	218.7	2.15	TPD125B ~ 129B
	130-16-12-P	●	13.0 - 13.4	16.0	158.24	176.06	165.24	48.0	226.3	2.24	TPD130B ~ 134B
	135-16-12-P	●	13.5 - 13.9	16.0	164.32	182.58	171.57	48.0	232.9	2.32	TPD135B ~ 139B
	140-16-12-P	●	14.0 - 14.4	16.0	170.41	189.09	177.91	48.0	239.5	2.41	TPD140B ~ 144B
	145-16-12-P	●	14.5 - 14.9	16.0	176.50	196.60	184.25	48.0	247.1	2.50	TPD145B ~ 149B
	150-20-12-P	●	15.0 - 15.4	20.0	182.58	203.12	190.58	50.0	255.7	2.58	TPD150B ~ 154B
	155-20-12-P	●	15.5 - 15.9	20.0	188.67	209.53	196.92	50.0	262.2	2.67	TPD155B ~ 159B
	160-20-12-P	●	16.0 - 16.4	20.0	194.75	216.15	203.25	50.0	268.9	2.75	TPD160B ~ 164B
	165-20-12-P	●	16.5 - 16.9	20.0	200.84	222.56	209.59	50.0	275.4	2.84	TPD165B ~ 169B
	170-20-12-P	●	17.0 - 17.4	20.0	206.93	230.17	215.93	50.0	283.1	2.93	TPD170B ~ 174B
	175-20-12-P	●	17.5 - 17.9	20.0	213.01	236.59	222.26	50.0	289.6	3.01	TPD175B ~ 179B
	180-25-12-P	●	18.0 - 18.4	25.0	219.10	243.10	228.60	56.0	302.2	3.10	TPD180B ~ 184B
	185-25-12-P	●	18.5 - 18.9	25.0	225.19	249.51	234.94	56.0	308.7	3.19	TPD185B ~ 189B
	190-25-12-P	●	19.0 - 19.4	25.0	231.27	257.03	241.27	56.0	316.3	3.27	TPD190B ~ 194B
	195-25-12-P	●	19.5 - 19.9	25.0	237.36	263.44	247.61	56.0	322.8	3.36	TPD195B ~ 199B
	200-25-12-P	●	20.0 - 20.4	25.0	243.44	270.06	253.94	56.0	329.5	3.44	TPD200B ~ 204B
	205-25-12-P	●	20.5 - 20.9	25.0	249.53	276.47	260.28	56.0	336.0	3.53	TPD205B ~ 209B
	210-25-12-P	●	21.0 - 21.4	25.0	255.62	280.08	266.62	60.0	343.7	3.62	TPD210B ~ 214B
	215-25-12-P	●	21.5 - 21.9	25.0	261.70	286.50	272.95	60.0	350.2	3.70	TPD215B ~ 219B
	220-25-12-P	●	22.0 - 22.4	25.0	267.79	293.11	279.29	60.0	356.9	3.79	TPD220B ~ 224B
	225-25-12-P	●	22.5 - 22.9	25.0	273.87	299.73	285.62	60.0	363.6	3.87	TPD225B ~ 229B
	230-25-12-P	●	23.0 - 23.4	25.0	279.96	307.14	291.96	60.0	371.1	3.96	TPD230B ~ 234B
	235-25-12-P	●	23.5 - 23.9	25.0	286.05	313.55	298.30	60.0	377.6	4.05	TPD235B ~ 239B
	240-32-12-P	●	24.0 - 24.4	32.0	292.13	324.17	304.63	60.0	388.3	4.13	TPD240B ~ 244B
	245-32-12-P	●	24.5 - 24.9	32.0	298.22	330.58	310.97	60.0	394.8	4.22	TPD245B ~ 249B
	250-32-12-P	●	25.0 - 25.4	32.0	304.43	338.07	317.43	60.0	402.5	4.43	TPD250B ~ 254B
	255-32-12-P	●	25.5 - 25.9	32.0	310.52	344.48	323.77	60.0	409.0	4.52	TPD255B ~ 259B
	260-32-12-P	●	26.0 - 26.9	32.0	316.60	351.10	330.10	60.0	415.7	4.60	TPD260B ~ 269B
	270-32-12-P	●	27.0 - 27.9	32.0	328.78	365.12	342.78	60.0	429.9	4.78	TPD270B ~ 279B
	280-32-12-P	●	28.0 - 28.9	32.0	340.96	378.04	355.46	60.0	443.0	4.96	TPD280B ~ 289B
	290-32-12-P	●	29.0 - 29.9	32.0	353.13	392.07	368.13	60.0	457.2	5.13	TPD290B ~ 299B
	300-32-12-P	●	30.0 - 30.9	32.0	365.46	403.94	380.96	60.0	469.4	5.46	TPD300B ~ 309B
	310-32-12-P	●	31.0 - 31.9	32.0	377.64	417.96	393.64	60.0	483.6	5.64	TPD310B ~ 319B
	320-32-12-P	●	32.0 - 32.9	32.0	389.82	428.98	406.32	60.0	494.8	5.82	TPD320B ~ 329B

●: Stock item

TPDB-DS New

Code system

Insert

TPD	360	B	-	DS
Top solid Piercing Drill	Drill dia. 360 : Ø36.0	Insert type B : Blade type		Margin shape DS : Double margin shape

Holder

TPD	B	360	-	40	-	5	-	P
Top solid Piercing Drill	Insert type B : Blade type	Drill dia. 360 : Ø36.0		Shank dia. 40 : Ø40		Aspect ratio (L/D) 3D, 5D, 8D		Plus

Features

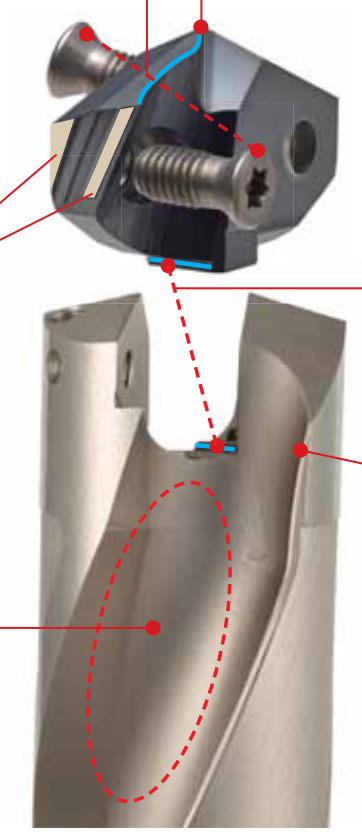
- A curved linear insert with high helix angle applied holder, which has low cutting load and excellent chip handling performance.
- Excellent clamping stability with a specially designed clamping section and 2 screws-on clamping methods.
- Improved wear resistance and durability through special surface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

Special surface treatment

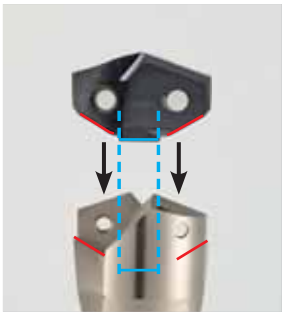
- High durability of the holder

2-steped flute shape

- Good chip evacuation

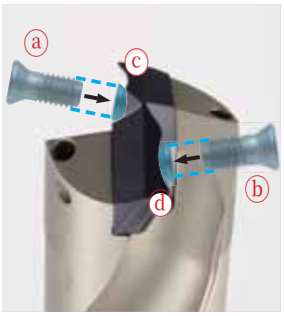
How to clamp an insert

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 ⓐ to ⓓ, which put screws first and tighten them in turn.

Recommended cutting conditions

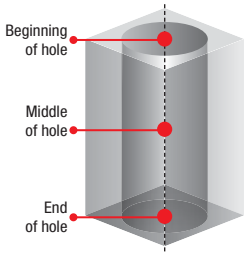
Workpiece					Specific cutting force (N/mm^2)	Brinell hardness (HB)	Grade	vc (m/min)	Aspect ratio (L/D) = 3D, 5D
ISO	Workpiece material		KS	ISO					fn (mm/rev)
P	Carbon steel	C = 0.10 ~ 0.25%	SM15C SM25C	C15 C25	1500	90 ~ 200	PC5300	80 ~ 140	0.4 ~ 0.25
		C = 0.25 ~ 0.55%	SM35C SM45C	C35 C45	1600	125 ~ 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
	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
		Hardened tool steel	STD61	X40CrMoV5-1	3000	352	PC5300	50 ~ 90	0.35 ~ 0.2
K	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.

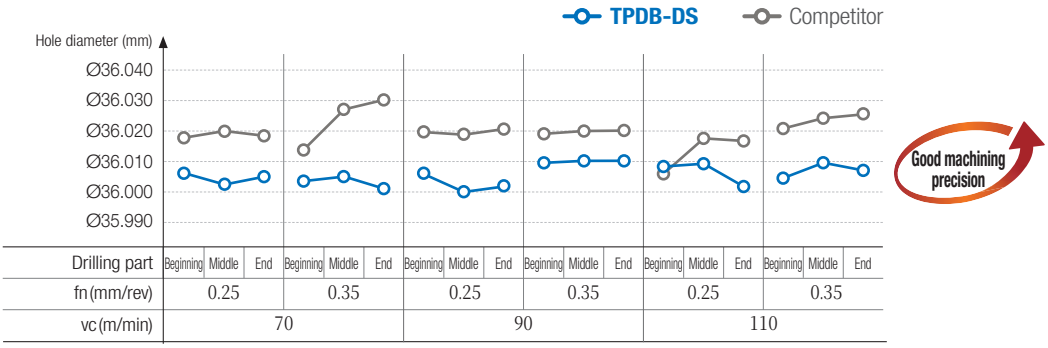
Performance evaluation

Machining precision

Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	vc (m/min) = 70/90/110, fn (mm/rev) = 0.25/0.35, ap (mm) = 150, wet (20 bar)
Tool	**Insert** TPD360B-DS (PC5300) **Holder** TPDB360-40-5-P (Drill dia. = Ø36 mm)



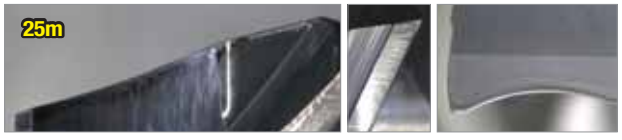
[Drilling part]



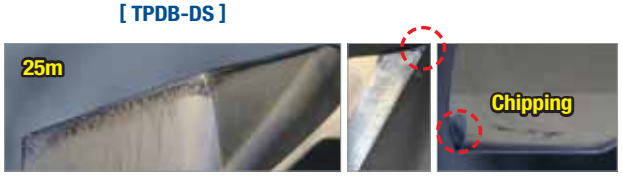
» Improved machining precision through double margin and stable chip evacuation

Wear resistance

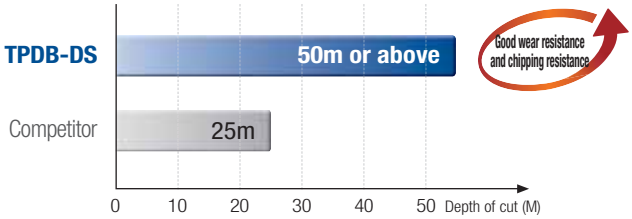
Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	vc (m/min) = 90, fn (mm/rev) = 0.3, ap (mm) = 150, wet (20 bar)
Tool	**Insert** TPD360B-DS (PC5300) **Holder** TPDB360-40-5-P (Drill dia. = Ø36 mm)



[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 (m/min) = 90, fn (mm/rev) = 0.35, ap (mm) = 150, wet (20 bar)
Tool	**Insert** TPD360B-DS (PC5300) **Holder** TPDB360-40-5-P (Drill dia. = Ø36 mm)

[TPDB-DS]

[Competitor]

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

Precaution in Drilling

Angled surface 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.

Stacked plates Drilling

- 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

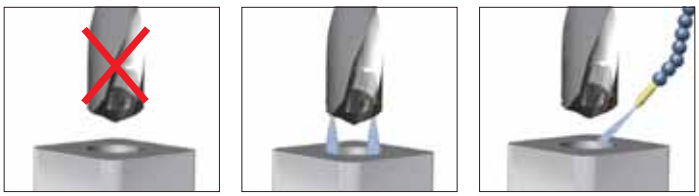
- Boring is not recommended due to wear and chipping in the corner of the insert.

Basic checklist for the Drilling operations

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

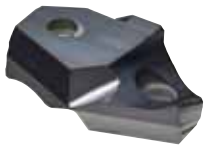
Coolant application system

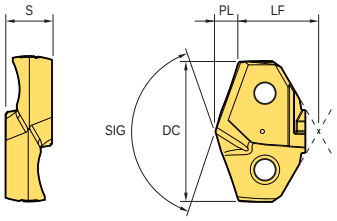
- Adequate supply of cutting fluid at the entrance of the hole
- Minimum cutting fluid pressure : 5 bar or above
- Minimum flow rate : 5ℓ/min or avobe



[Dry]

Insert





(mm)

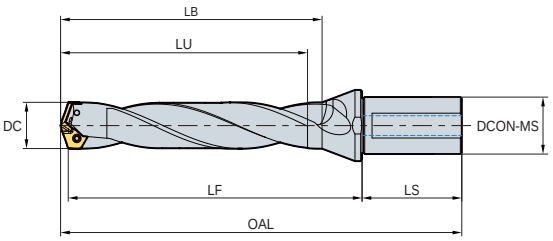
Designation		Coated PC5300	DC	LF	PL	SIG	S
TPD	330B-DS	●	33.0	18.16	5.38	140	10.5
	335B-DS		33.5	18.06	5.48	140	10.5
	340B-DS	●	34.0	18.54	5.55	140	11.0
	345B-DS		34.5	18.47	5.64	140	11.0
	350B-DS	●	35.0	19.47	5.71	140	11.5
	355B-DS	●	35.5	19.38	5.80	140	11.5
	360B-DS	●	36.0	20.40	5.87	140	11.5
	365B-DS		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

※ TPD Inserts not list above within the range of Ø33.00 ~ Ø39.99 can be made to order ●: Stock item

Parts

Designation		Drill dia. 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

TPDB-DS (3D, 5D, 8D)



(mm)

Designation		Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Applicable 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

※ We can provide if you order exact machining specification. ●: Stock item

TPDB-F New

Code system

Insert

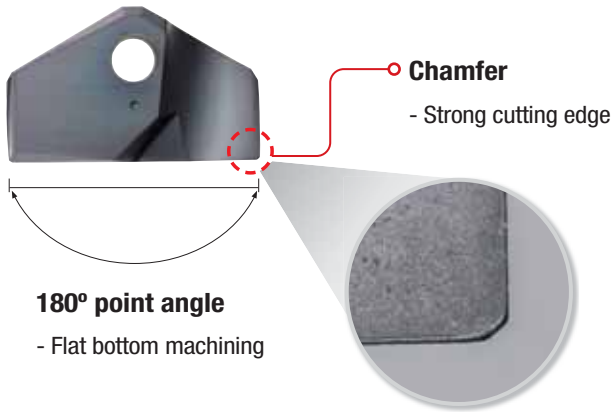
TPD	200	B	-	F
Top solid Piercing Drill	Drill dia. 200 : Ø20.0	Insert type B : Blade type		Cutting edge F : Flat FC : Flat Candle

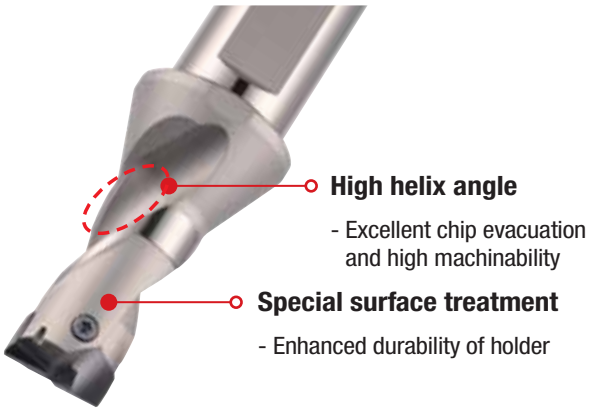
Holder

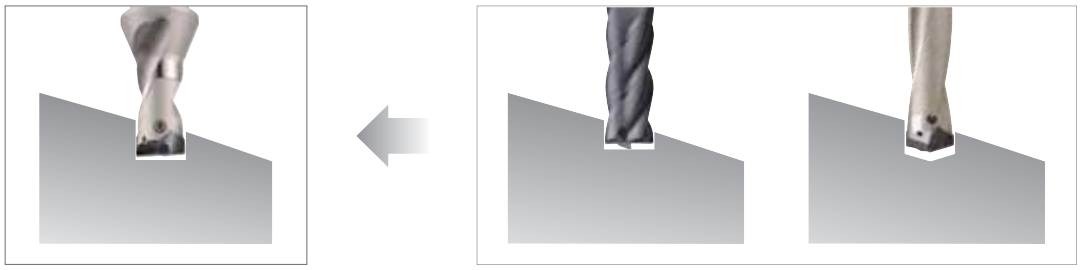
TPD	B	220	-	25	-	1.5	-	F
Top solid Piercing Drill	Insert type B : Blade type	Drill dia. 220 : Ø22.0		Shank dia. 25 : Ø25		Aspect ratio (L/D) 1.5D		Flat

Features

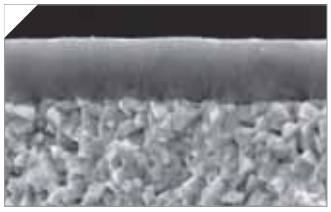
- **High precision clamping system** - High precision clamping due to high precise grinding and auto-centering
- **Screw on clamping system** - Easy to replace insert
- **Cutting edge with 180º point angle** - Flat bottom machining
- **Low cutting load cutting edge** - Low cutting load and excellent 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







Grade features



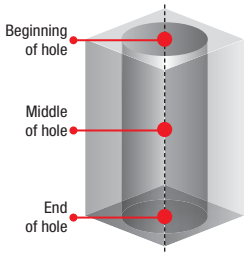
PC5400

- PVD coating technology with high lubrication, built up edge resistance and chipping resistance
- Excellent chipping resistance due to high toughness coating with high adhesive strength
- Enhanced fracture resistance and stable machinability due to ultra-fine substrate with high toughness substrate

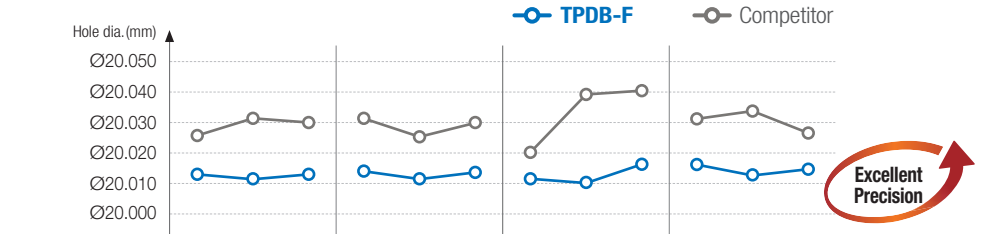
Performance evaluation

Machining precision

Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	vc (m/min) = 70/90, fn (mm/rev) = 0.2/0.3, ap (mm) = 30, wet (20 bar)
Tool	**Insert** TPD200B-F (PC5400) **Holder** TPDB200-25-1.5-F (Drill dia. = Ø20 mm)



[Drilling part]

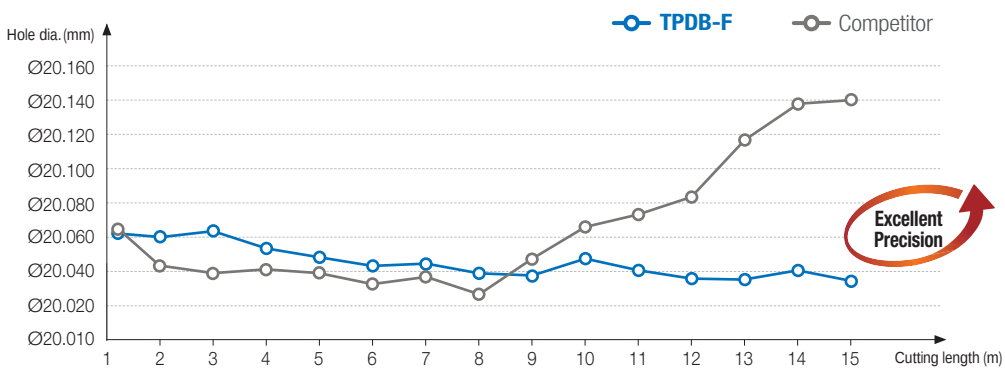


Drilling part	Beginning	Middle	End	Beginning	Middle	End	Beginning	Middle	End	Beginning	Middle	End
fn (mm/rev)	0.2			0.3			0.2			0.3		
vc (m/min)	70						90					

» Cutting edge with low cutting load enhances high precision.

Workpiece	Alloy steel (42CrMo4, HRC22), Angled surface 15°
Cutting condition	vc (m/min) = 70, fn (mm/rev) = 0.21, ap (mm) = 20, wet (20 bar)
Tool	**Insert** TPD200B-F (PC5400) **Holder** TPDB200-25-1.5-F (Drill dia. = Ø20 mm)

[Angled surface Drilling]



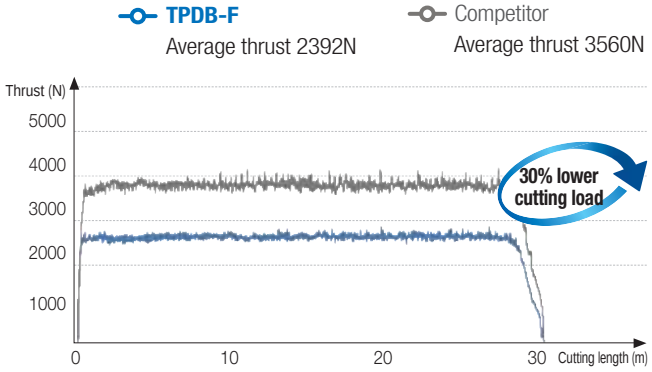
» Cutting edge with low cutting load enhances high precision.

Performance evaluation

Cutting load

Workpiece	Alloy steel (42CrMo4, HRC22)
Cutting condition	vc (m/min) = 70, fn (mm/rev) = 0.25,
	ap (mm) = 30, wet (20 bar)
Tool	Insert TPD200B-F (PC5400)
	Holder TPDB200-25-1.5-F (Drill dia. = Ø20 mm)

» The sharp point shape reduces cutting load.



Wear resistance

Workpiece	Alloy steel (42CrMo4, HRC22), Angled surface 15°
Cutting condition	vc (m/min) = 70, fn (mm/rev) = 0.21,
	ap (mm) = 20, wet (20 bar)
Tool	Insert TPD200B-F (PC5400)
	Holder TPDB200-25-1.5-F (Drill dia. = Ø20 mm)

» Enhanced chipping resistance increases too life due to stable wear on the cutting edge.

[TPDB-F]

[Competitor]

Surface finish

Workpiece	Alloy steel (42CrMo4, HRC22), Angled surface 15°
Cutting condition	vc (m/min) = 90, fn (mm/rev) = 0.18,
	ap (mm) = 20, wet (20 bar)
Tool	Insert TPD150B-F (PC5400)
	Holder TPDB150-16-1.5-F (Drill dia. = Ø15 mm)

» Low cutting load cutting edge ensures good surface finish.

[TPDB-F]

[Competitor]

Chip control

Workpiece	Carbon steel (C45, HRC18)
Cutting condition	vc (m/min) = 90, fn (mm/rev) = 0.25,
	ap (mm) = 30, wet (20 bar)
Tool	Insert TPD200B-F (PC5400)
	Holder TPDB200-25-1.5-F (Drill dia. = Ø20 mm)

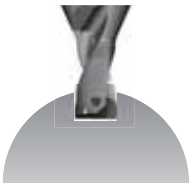
» Stable chip curling controls chip shape.

[TPDB-F]

[Competitor]

Recommended cutting conditions

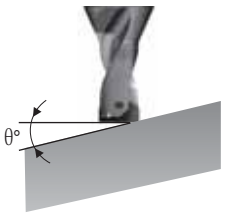
Workpiece					Specific cutting force (N/mm^2)	Brinell hardness (HB)	Grade	vc (m/min)	Aspect ratio (L/D) = 1.5D	
									fn (mm/rev)	
ISO	Workpiece material		KS	ISO					Ø14 ~ Ø21.9	Ø22 ~ Ø30.9
P	Carbon steel	C = 0.10 ~ 0.25%	SM15C SM25C	C15 C25	1500	90 ~ 200	PC5400	60 ~ 100	0.3 ~ 0.2	0.32 ~ 0.22
		C = 0.25 ~ 0.55%	SM35C SM45C	C35 C45	1600	125 ~ 225	PC5400	60 ~ 100	0.3 ~ 0.2	0.32 ~ 0.22
		C = 0.55 ~ 0.80%	SM58C	C60	1700	150 ~ 250	PC5400	50 ~ 90	0.3 ~ 0.2	0.32 ~ 0.22
	Alloy steel ≤ 5%	Non-hardened	SCM440	42CrMo4	1700	180	PC5400	50 ~ 90	0.3 ~ 0.2	0.32 ~ 0.22
		Hardened and Tempered	SCM445	-	2050	350	PC5400	40 ~ 80	0.2 ~ 0.2	0.32 ~ 0.22
	Alloy steel > 5%	Annealed	STD11	-	1950	200	PC5400	40 ~ 80	0.28 ~ 0.18	0.3 ~ 0.2
		Hardened tool steel	STD61	X40CrMoV5-1	3000	352	PC5400	30 ~ 70	0.28 ~ 0.18	0.3 ~ 0.2

Type	Flat surface Drilling	Angled surface Drilling	Curved surface Drilling	Plunging	Boring
Pic.					
1.5D	○	○	○	○	○

※ Please refer to the precaution in Drilling in case of angled surface, curved surface Drilling, plunging and boring.

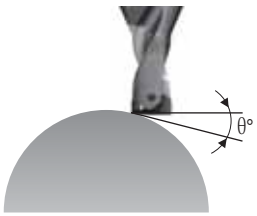
Precaution in Drilling

Angled surface Drilling



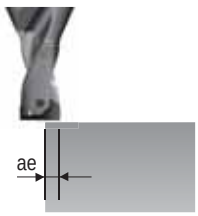
- Reduce the feed (fn) to 30% than general cutting conditions at the beginning and the end of angled surface. (In case, θ is over 30°, reduce it to 50%.)

Curved surface Drilling



- Reduce the feed (fn) to 30% than general cutting conditions at the beginning of curved surface. (In case, θ is over 30°, reduce it to 50%.)

Plunging

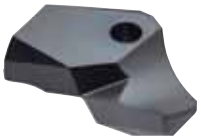


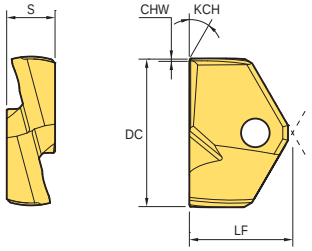
- Reduce the depth of cut (ae) to shorter than 1/2 of Drill diameter.
- In case, the depth of cut is longer than Drill diameter, plunge with divided depth of cut.

Boring

- Reduce the feed (fn) to 30% than general cutting conditions at the beginning of boring.
- Start with 2 mm stepping before boring to prevent long chip.

Insert





(mm)

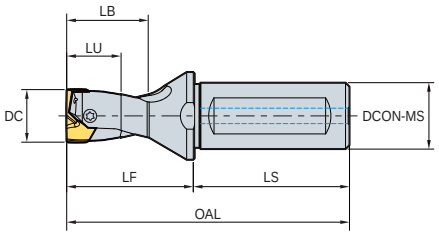
Designation		Coated PC5400	DC	LF	CHW	KCH	S
TPD	140B-F		14.0	8.9	0.055	60	4.0
	145B-F		14.5	8.9	0.055	60	4.0
	150B-F		15.0	9.4	0.055	60	4.0
	155B-F		15.5	9.4	0.055	60	4.0
	160B-F		16.0	10.4	0.055	60	5.5
	165B-F		16.5	10.4	0.055	60	5.5
	170B-F		17.0	10.9	0.055	60	5.5
	175B-F		17.5	10.9	0.055	60	5.5
	180B-F		18.0	11.9	0.055	60	6.0
	185B-F		18.5	11.9	0.055	60	6.0
	190B-F		19.0	12.4	0.055	60	6.0
	195B-F		19.5	12.4	0.055	60	6.0
	200B-F		20.0	12.9	0.055	60	6.5
	205B-F		20.5	12.9	0.055	60	6.5
	210B-F		21.0	13.4	0.055	60	6.5
	215B-F		21.5	13.4	0.055	60	6.5
	220B-F		22.0	13.9	0.055	60	7.0
	225B-F		22.5	13.9	0.055	60	7.0
	230B-F		23.0	14.4	0.055	60	7.0
	235B-F		23.5	14.4	0.055	60	7.0
	240B-F		24.0	14.9	0.055	60	7.5
	245B-F		24.5	14.9	0.055	60	7.5
	250B-F		25.0	15.4	0.055	60	7.5
	255B-F		25.5	15.4	0.055	60	7.5
	260B-F		26.0	15.9	0.055	60	8.5
	265B-F		26.5	15.9	0.055	60	8.5
	270B-F		27.0	16.9	0.055	60	8.5
	275B-F		27.5	16.9	0.055	60	8.5
	280B-F		28.0	17.9	0.055	60	9.5
	285B-F		28.5	17.9	0.055	60	9.5
	290B-F		29.0	18.4	0.055	60	9.5
	295B-F		29.5	18.4	0.055	60	9.5
	300B-F		30.0	18.9	0.055	60	10.0
	305B-F		30.5	18.9	0.055	60	10.0

※ TPD Inserts not list above within the range of Ø14.00 ~ Ø30.99 can be made to order ●: Stock item

Parts

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

TPDB-F (1.5D)



(mm)

Designation		Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	Applicable insert
TPDB	140-16-1.5-F		14.0 - 14.4	16.0	21.00	38.0	28.0	48.0	86.0	TPD140B-F ~ 144B-F
	145-16-1.5-F		14.5 - 14.9	16.0	21.75	39.0	29.0	48.0	87.0	TPD145B-F ~ 149B-F
	150-20-1.5-F		15.0 - 15.4	20.0	22.50	43.0	30.0	50.0	93.0	TPD150B-F ~ 154B-F
	155-20-1.5-F		15.5 - 15.9	20.0	23.25	44.0	31.0	50.0	94.0	TPD155B-F ~ 159B-F
	160-20-1.5-F		16.0 - 16.4	20.0	24.00	45.0	32.0	50.0	95.0	TPD160B-F ~ 164B-F
	165-20-1.5-F		16.5 - 16.9	20.0	24.75	46.0	33.0	50.0	96.0	TPD165B-F ~ 169B-F
	170-20-1.5-F		17.0 - 17.4	20.0	25.50	47.0	34.0	50.0	97.0	TPD170B-F ~ 174B-F
	175-20-1.5-F		17.5 - 17.9	20.0	26.25	48.0	35.0	50.0	98.0	TPD175B-F ~ 179B-F
	180-20-1.5-F		18.0 - 18.4	20.0	27.00	49.0	36.0	50.0	99.0	TPD180B-F ~ 184B-F
	185-20-1.5-F		18.5 - 18.9	20.0	27.75	50.0	37.0	50.0	100.0	TPD185B-F ~ 189B-F
	190-25-1.5-F		19.0 - 19.4	25.0	28.50	45.0	38.0	56.0	101.0	TPD190B-F ~ 194B-F
	195-25-1.5-F		19.5 - 19.9	25.0	29.25	46.0	39.0	56.0	102.0	TPD195B-F ~ 199B-F
	200-25-1.5-F		20.0 - 20.4	25.0	30.00	60.0	40.0	56.0	116.0	TPD200B-F ~ 204B-F
	205-25-1.5-F		20.5 - 20.9	25.0	30.75	61.0	41.0	56.0	117.0	TPD205B-F ~ 209B-F
	210-25-1.5-F		21.0 - 21.4	25.0	31.50	62.0	42.0	56.0	118.0	TPD210B-F ~ 214B-F
	215-25-1.5-F		21.5 - 21.9	25.0	32.25	63.0	43.0	56.0	119.0	TPD215B-F ~ 219B-F
	220-25-1.5-F		22.0 - 22.4	25.0	33.00	64.0	44.0	56.0	120.0	TPD220B-F ~ 224B-F
	225-25-1.5-F		22.5 - 22.9	25.0	33.75	65.0	45.0	56.0	121.0	TPD225B-F ~ 229B-F
	230-25-1.5-F		23.0 - 23.4	25.0	34.50	66.0	46.0	56.0	122.0	TPD230B-F ~ 234B-F
	235-25-1.5-F		23.5 - 23.9	25.0	35.25	67.0	47.0	56.0	123.0	TPD235B-F ~ 239B-F
	240-32-1.5-F		24.0 - 24.4	32.0	36.00	68.5	48.0	60.0	128.5	TPD240B-F ~ 244B-F
	245-32-1.5-F		24.5 - 24.9	32.0	36.75	69.5	49.0	60.0	129.5	TPD245B-F ~ 249B-F
	250-32-1.5-F		25.0 - 25.4	32.0	37.50	70.5	50.0	60.0	130.5	TPD250B-F ~ 254B-F
	255-32-1.5-F		25.5 - 25.9	32.0	38.25	71.5	51.0	60.0	131.5	TPD255B-F ~ 259B-F
	260-32-1.5-F		26.0 - 26.4	32.0	39.00	72.5	52.0	60.0	132.5	TPD260B-F ~ 264B-F
	265-32-1.5-F		26.5 - 26.9	32.0	39.75	73.5	53.0	60.0	133.5	TPD265B-F ~ 269B-F
	270-32-1.5-F		27.0 - 27.4	32.0	40.50	74.5	54.0	60.0	134.5	TPD270B-F ~ 274B-F
	275-32-1.5-F		27.5 - 27.9	32.0	41.25	75.5	55.0	60.0	135.5	TPD275B-F ~ 279B-F
	280-32-1.5-F		28.0 - 28.4	32.0	42.00	76.5	56.0	60.0	136.5	TPD280B-F ~ 284B-F
	285-32-1.5-F		28.5 - 28.9	32.0	42.75	77.5	57.0	60.0	137.5	TPD285B-F ~ 289B-F
	290-32-1.5-F		29.0 - 29.4	32.0	43.50	78.5	58.0	60.0	138.5	TPD290B-F ~ 294B-F
	295-32-1.5-F		29.5 - 29.9	32.0	44.25	79.5	59.0	60.0	139.5	TPD295B-F ~ 299B-F
	300-32-1.5-F		30.0 - 30.4	32.0	45.00	80.5	60.0	60.0	140.5	TPD300B-F ~ 304B-F
	305-32-1.5-F		30.5 - 30.9	32.0	45.75	81.5	61.0	60.0	141.5	TPD305B-F ~ 309B-F

●: Stock item

TPDB-H New

Code system

Insert

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

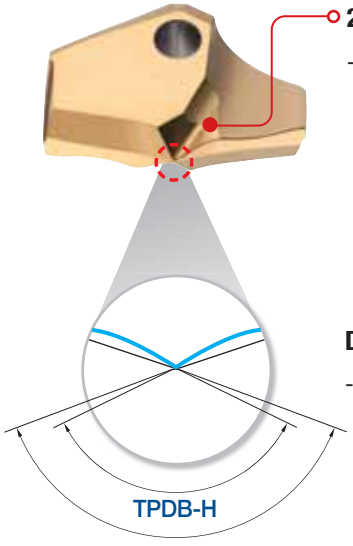
Holder

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

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

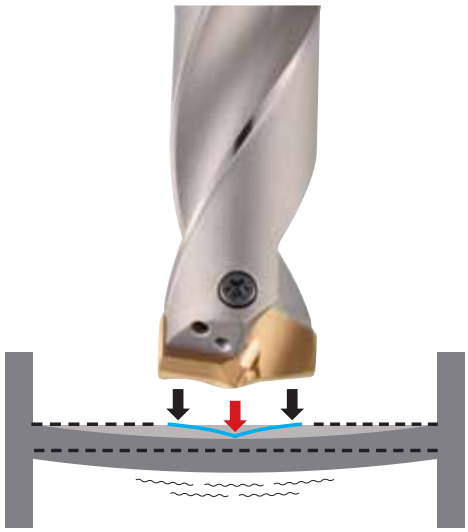


2-step thinning shape

- Good chip control

Double R point cutting edge

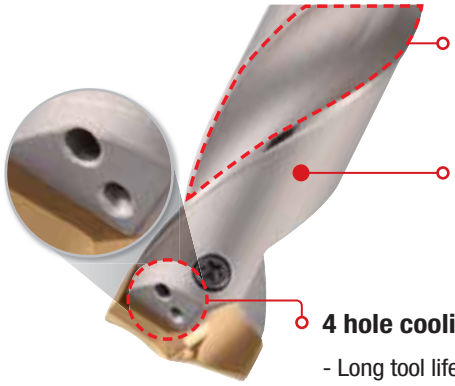
- Stable centering and machinability



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.

Holder features



High helix angle

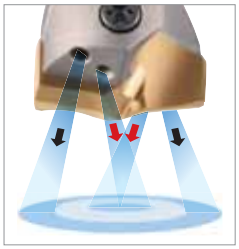
- Good chip evacuation and machinability

Special surface treatment

- Good holder durability

4 hole cooling system

- Long tool life

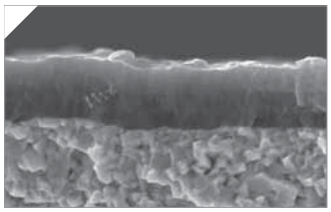


[TPDB-H]

[Competitor]

Concentrated coolant injection on delicate cutting edge increases tool life.

Grade features



PC340Q

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

Performance evaluation

Chip control

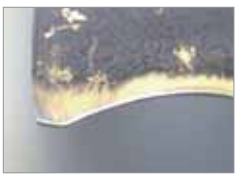
Workpiece	Carbon steel (SS275, SM355A)
Cutting condition	vc (m/min) = 80, fn (mm/rev) = 0.2,
	ap (mm) = 30, wet
Tool	Insert TPD270B-H (PC340Q)
	Holder TPDB270-32-4-H (Drill dia. = Ø27 mm)

[SS275]

[SM355A]

Wear resistance

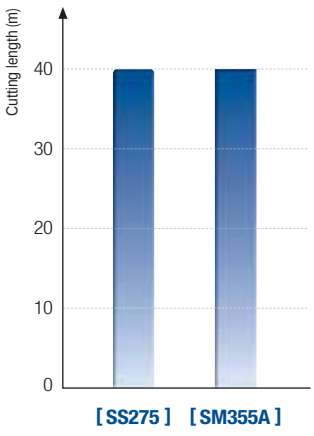
Workpiece	Carbon steel (SS275)
Cutting condition	vc (m/min) = 65, fn (mm/rev) = 0.25,
	ap (mm) = 30, wet
Tool	Insert TPD220B-H (PC340Q)
	Holder TPDB220-25-4-H (Drill dia. = Ø22 mm)



[SS275]

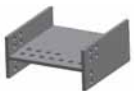
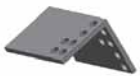
Workpiece	Carbon steel (SM355A)
Cutting condition	vc (m/min) = 70, fn (mm/rev) = 0.25,
	ap (mm) = 30, wet
Tool	Insert TPD270B-H (PC340Q)
	Holder TPDB270-32-4-H (Drill dia. = Ø27 mm)

[SM355A]



» Normal wear and still usable

Workpiece and recommended cutting conditions

Workpiece					Yield Strength (Mpa, min)	Brinell hardness (HB)	Grade	vc (m/min)	Aspect ratio (L/D) = 3D, 4D, 8D fn (mm/rev)	
ISO	Workpiece material		KS	AISI					Ø14 ~ Ø21.9	Ø22 ~ Ø30.9
P	H-Beam		SS275 (SS400*) SM355 (SM490*) SHN355 (SHN490*)	A36 A572	275 355 355 (t≤16)	-	PC340Q	60 ~ 75	0.25 ~ 0.2	0.3 ~ 0.2
	Angle						PC340Q	60 ~ 75	0.25 ~ 0.2	0.3 ~ 0.2
	Plate						PC340Q	60 ~ 75	0.25 ~ 0.2	0.3 ~ 0.2
	Plate (Stacked)						PC340Q	55 ~ 65	0.25 ~ 0.15	0.25 ~ 0.15

⁎: Old symbol

Precaution in Drilling

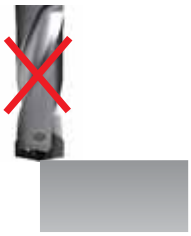
Angled surface Drilling

- 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.

Stacked plates Drilling

- 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.

Performance evaluation

Carbon steel (SM355)

Cutting condition	vc (m/min) = 60, fn (mm/rev) = 0.25, ap (mm) = 50, wet
Tool	Insert TPD240B-H (PC340Q)
	Holder TPDB240-32-3-H (Drill dia. = Ø24 mm)
Tool life	60m (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 (m/min) = 70, fn (mm/rev) = 0.25, ap (mm) = 24, wet
Tool	Insert TPD270B-H (PC340Q)
	Holder TPDB270-32-3-H (Drill dia. = Ø27 mm)
Tool life	40m (Normal wear)

» High speed and high feed machining saves machining hours.

Carbon steel (SS275)

Cutting condition	vc (m/min) = 60, fn (mm/rev) = 0.20, ap (mm) = 12, wet
Tool	Insert TPD220B-H (PC340Q)
	Holder TPDB220-32-3-H (Drill dia. = Ø22 mm)
Tool life	35m (Normal wear)

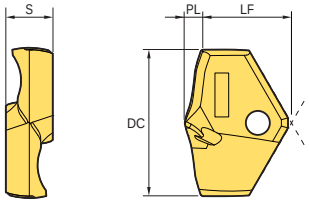
» Stable machinability and long tool life are realized in machining various workpieces such as SM355, SS275, SHN355 etc.

Carbon steel (SM355)

Cutting condition	vc (m/min) = 65, fn (mm/rev) = 0.20, ap (mm) = 22, wet
Tool	Insert TPD240B-H (PC340Q)
	Holder TPDB240-32-3-H (Drill dia. = Ø24 mm)
Tool life	40m (Normal wear)

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

Insert



(mm)

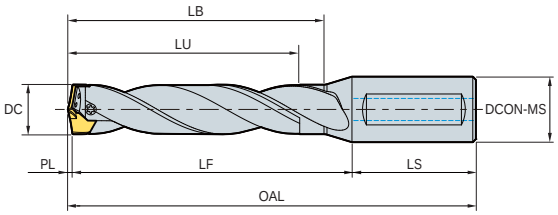
Designation		Coated PC340Q	DC	LF	PL	S
TPD	140B-H		14.0	8.9	1.23	4.0
	145B-H		14.5	8.8	1.28	4.0
	150B-H		15.0	9.3	1.32	4.0
	155B-H		15.5	9.2	1.37	4.0
	160B-H		16.0	10.2	1.41	5.5
	165B-H		16.5	10.1	1.46	5.5
	170B-H		17.0	10.6	1.50	5.5
	175B-H		17.5	10.5	1.55	5.5
	180B-H		18.0	11.5	1.59	6.0
	185B-H		18.5	11.4	1.64	6.0
	190B-H		19.0	11.9	1.68	6.0
	195B-H		19.5	11.8	1.73	6.0
	200B-H		20.0	12.8	1.76	6.5
	205B-H		20.5	12.7	1.81	6.5
	210B-H		21.0	13.3	1.85	6.5
	215B-H		21.5	13.2	1.90	6.5
	220B-H		22.0	13.6	2.04	7.0
	225B-H		22.5	13.5	2.11	7.0
	230B-H		23.0	14.0	2.13	7.0
	235B-H		23.5	13.9	2.18	7.0
	240B-H		24.0	14.4	2.22	7.5
	245B-H		24.5	14.3	2.28	7.5
	250B-H		25.0	14.8	2.32	7.5
	255B-H		25.5	14.7	2.37	7.5
	260B-H		26.0	15.2	2.41	8.5
	265B-H		26.5	15.1	2.48	8.5
	270B-H		27.0	16.1	2.50	8.5
	275B-H		27.5	16.0	2.57	8.5
	280B-H		28.0	17.0	2.59	9.5
	285B-H		28.5	16.9	2.64	9.5
	290B-H		29.0	17.4	2.69	9.5
	295B-H		29.5	17.3	2.74	9.5
	300B-H		30.0	17.8	2.78	10.0
	305B-H		30.5	17.7	2.83	10.0

※ TPD Inserts not list above within the range of Ø14.00 ~ Ø30.99 can be made to order ●: Stock item

Parts

Designation		Drill dia. 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

TPDB-H (3D)

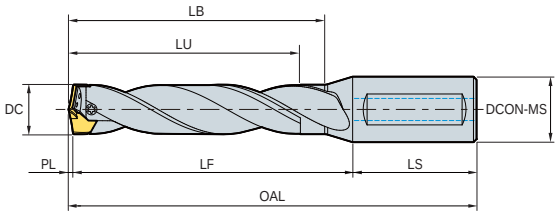


(mm)

	Designation	Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Applicable insert
TPDB	140-16-3-H		14.0 - 14.4	16.0	36.23	49.57	43.23	48.0	98.8	1.23	TPD140B-H ~ 144B-H
	145-16-3-H		14.5 - 14.9	16.0	37.52	51.53	44.77	48.0	100.8	1.28	TPD145B-H ~ 149B-H
	150-20-3-H		15.0 - 15.4	20.0	38.82	53.08	46.32	50.0	104.4	1.32	TPD150B-H ~ 154B-H
	155-20-3-H		15.5 - 15.9	20.0	40.11	54.74	47.86	50.0	106.4	1.37	TPD155B-H ~ 159B-H
	160-20-3-H		16.0 - 16.4	20.0	41.41	56.59	49.41	50.0	108.0	1.41	TPD160B-H ~ 164B-H
	165-20-3-H		16.5 - 16.9	20.0	42.70	58.55	50.95	50.0	110.0	1.46	TPD165B-H ~ 169B-H
	170-20-3-H		17.0 - 17.4	20.0	44.00	60.00	52.50	50.0	111.5	1.50	TPD170B-H ~ 174B-H
	175-20-3-H		17.5 - 17.9	20.0	45.29	61.96	54.04	50.0	113.5	1.55	TPD175B-H ~ 179B-H
	180-20-3-H		18.0 - 18.4	20.0	46.59	63.51	55.59	50.0	115.1	1.59	TPD180B-H ~ 184B-H
	185-20-3-H		18.5 - 18.9	20.0	47.88	65.47	57.13	50.0	117.1	1.64	TPD185B-H ~ 189B-H
	190-20-3-H		19.0 - 19.4	20.0	49.18	67.02	58.68	50.0	118.7	1.68	TPD190B-H ~ 194B-H
	195-20-3-H		19.5 - 19.9	20.0	50.47	68.98	60.22	50.0	120.7	1.73	TPD195B-H ~ 199B-H
	200-25-3-H		20.0 - 20.4	25.0	51.76	70.54	61.76	56.0	128.3	1.76	TPD200B-H ~ 204B-H
	205-25-3-H		20.5 - 20.9	25.0	53.05	72.50	63.30	56.0	130.3	1.81	TPD205B-H ~ 209B-H
	210-25-3-H		21.0 - 21.4	25.0	54.35	74.05	64.85	56.0	131.9	1.85	TPD210B-H ~ 214B-H
	215-25-3-H		21.5 - 21.9	25.0	55.64	76.01	66.39	56.0	133.9	1.90	TPD215B-H ~ 219B-H
	220-25-3-H		22.0 - 22.4	25.0	57.04	77.46	68.04	56.0	135.5	2.04	TPD220B-H ~ 224B-H
	225-25-3-H		22.5 - 22.9	25.0	58.33	79.42	69.58	56.0	137.5	2.11	TPD225B-H ~ 229B-H
	230-25-3-H		23.0 - 23.4	25.0	59.63	80.97	71.13	56.0	139.1	2.13	TPD230B-H ~ 234B-H
	235-25-3-H		23.5 - 23.9	25.0	60.92	82.93	72.67	56.0	141.1	2.18	TPD235B-H ~ 239B-H
	240-32-3-H		24.0 - 24.4	32.0	62.22	84.58	74.22	60.0	146.8	2.22	TPD240B-H ~ 244B-H
	245-32-3-H		24.5 - 24.9	32.0	63.51	86.54	75.76	60.0	148.8	2.28	TPD245B-H ~ 249B-H
	250-32-3-H		25.0 - 25.4	32.0	64.82	87.98	77.32	60.0	150.3	2.32	TPD250B-H ~ 254B-H
	255-32-3-H		25.5 - 25.9	32.0	66.11	89.94	78.86	60.0	152.3	2.37	TPD255B-H ~ 259B-H
	260-32-3-H		26.0 - 26.4	32.0	67.41	91.39	80.41	60.0	153.8	2.41	TPD260B-H ~ 264B-H
	265-32-3-H		26.5 - 26.9	32.0	68.70	93.35	81.95	60.0	155.8	2.48	TPD265B-H ~ 269B-H
	270-32-3-H		27.0 - 27.4	32.0	70.00	95.00	83.50	60.0	157.5	2.5	TPD270B-H ~ 274B-H
	275-32-3-H		27.5 - 27.9	32.0	71.29	96.96	85.04	60.0	159.5	2.57	TPD275B-H ~ 279B-H
	280-32-3-H		28.0 - 28.4	32.0	72.59	98.41	86.59	60.0	161.0	2.59	TPD280B-H ~ 284B-H
	285-32-3-H		28.5 - 28.9	32.0	73.88	100.37	88.13	60.0	163.0	2.64	TPD285B-H ~ 289B-H
	290-32-3-H		29.0 - 29.4	32.0	75.19	101.91	89.69	60.0	164.6	2.69	TPD290B-H ~ 294B-H
	295-32-3-H		29.5 - 29.9	32.0	76.48	103.87	91.23	60.0	166.6	2.74	TPD295B-H ~ 299B-H
	300-32-3-H		30.0 - 30.4	32.0	77.78	105.42	92.78	60.0	168.2	2.78	TPD300B-H ~ 309B-H

●: Stock item

TPDB-H (4D)

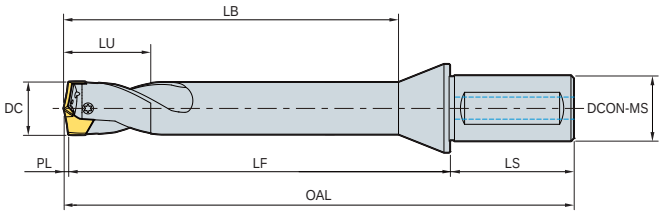


(mm)

Designation		Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Applicable insert
TPDB	140-16-4-H		14.0 - 14.4	16.0	50.23	63.37	57.23	48.0	112.8	1.23	TPD140B-H ~ 144B-H
	145-16-4-H		14.5 - 14.9	16.0	52.02	66.03	59.27	48.0	115.3	1.28	TPD145B-H ~ 149B-H
	150-20-4-H		15.0 - 15.4	20.0	53.82	68.08	61.32	50.0	119.4	1.32	TPD150B-H ~ 154B-H
	155-20-4-H		15.5 - 15.9	20.0	55.61	70.54	63.36	50.0	121.9	1.37	TPD155B-H ~ 159B-H
	160-20-4-H		16.0 - 16.4	20.0	57.41	72.59	65.41	50.0	124.0	1.41	TPD160B-H ~ 164B-H
	165-20-4-H		16.5 - 16.9	20.0	59.20	75.05	67.45	50.0	126.5	1.46	TPD165B-H ~ 169B-H
	170-20-4-H		17.0 - 17.4	20.0	61.00	77.00	69.50	50.0	128.5	1.50	TPD170B-H ~ 174B-H
	175-20-4-H		17.5 - 17.9	20.0	62.79	79.46	71.54	50.0	131.0	1.55	TPD175B-H ~ 179B-H
	180-20-4-H		18.0 - 18.4	20.0	64.59	81.51	73.59	50.0	133.1	1.59	TPD180B-H ~ 184B-H
	185-20-4-H		18.5 - 18.9	20.0	66.38	83.97	75.63	50.0	135.6	1.64	TPD185B-H ~ 189B-H
	190-20-4-H		19.0 - 19.4	20.0	68.18	86.02	77.68	50.0	137.7	1.68	TPD190B-H ~ 194B-H
	195-20-4-H		19.5 - 19.9	20.0	69.97	88.48	79.72	50.0	140.2	1.73	TPD195B-H ~ 199B-H
	200-25-4-H		20.0 - 20.4	25.0	71.76	90.54	81.76	56.0	148.3	1.76	TPD200B-H ~ 204B-H
	205-25-4-H		20.5 - 20.9	25.0	73.55	93.00	83.80	56.0	150.8	1.81	TPD205B-H ~ 209B-H
	210-25-4-H		21.0 - 21.4	25.0	75.35	95.05	85.85	56.0	152.9	1.85	TPD210B-H ~ 214B-H
	215-25-4-H		21.5 - 21.9	25.0	77.14	97.51	87.89	56.0	155.4	1.90	TPD215B-H ~ 219B-H
	220-25-4-H		22.0 - 22.4	25.0	79.04	99.46	90.04	56.0	157.5	2.04	TPD220B-H ~ 224B-H
	225-25-4-H		22.5 - 22.9	25.0	80.83	101.92	92.08	56.0	160.0	2.11	TPD225B-H ~ 229B-H
	230-25-4-H		23.0 - 23.4	25.0	82.63	103.97	94.13	56.0	162.1	2.13	TPD230B-H ~ 234B-H
	235-25-4-H		23.5 - 23.9	25.0	84.42	106.23	96.17	56.0	164.6	2.18	TPD235B-H ~ 239B-H
	240-32-4-H		24.0 - 24.4	32.0	86.22	108.58	98.22	60.0	170.8	2.22	TPD240B-H ~ 244B-H
	245-32-4-H		24.5 - 24.9	32.0	88.01	111.04	100.26	60.0	173.3	2.28	TPD245B-H ~ 249B-H
	250-32-4-H		25.0 - 25.4	32.0	89.82	112.98	102.32	60.0	175.3	2.32	TPD250B-H ~ 254B-H
	255-32-4-H		25.5 - 25.9	32.0	91.61	115.44	104.36	60.0	177.8	2.37	TPD255B-H ~ 259B-H
	260-32-4-H		26.0 - 26.4	32.0	93.41	117.39	106.41	60.0	179.8	2.41	TPD260B-H ~ 264B-H
	265-32-4-H		26.5 - 26.9	32.0	95.20	119.85	108.45	60.0	182.3	2.48	TPD265B-H ~ 269B-H
	270-32-4-H		27.0 - 27.4	32.0	97.00	122.00	110.50	60.0	184.5	2.5	TPD270B-H ~ 274B-H
	275-32-4-H		27.5 - 27.9	32.0	98.79	124.46	112.54	60.0	187.0	2.57	TPD275B-H ~ 279B-H
	280-32-4-H		28.0 - 28.4	32.0	100.59	126.41	114.59	60.0	189.0	2.59	TPD280B-H ~ 284B-H
	285-32-4-H		28.5 - 28.9	32.0	102.38	128.87	116.63	60.0	191.5	2.64	TPD285B-H ~ 289B-H
	290-32-4-H		29.0 - 29.4	32.0	104.19	130.91	118.69	60.0	193.6	2.69	TPD290B-H ~ 294B-H
	295-32-4-H		29.5 - 29.9	32.0	105.98	133.37	120.73	60.0	196.1	2.74	TPD295B-H ~ 299B-H
	300-32-4-H		30.0 - 30.4	32.0	107.78	135.42	122.78	60.0	198.2	2.78	TPD300B-H ~ 309B-H

●: Stock item

TPDB-H (8D)



(mm)

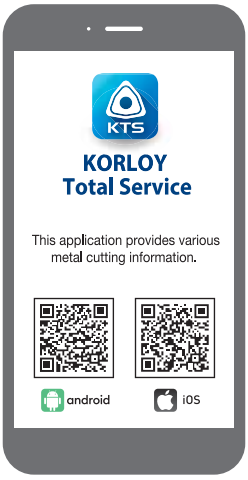
Designation		Stock	DC	DCON-MS	LU	LF	LB	LS	OAL	PL	Applicable insert
TPDB	140-16-8F-H		14.0 - 14.4	16.0	51.23	127.1	113.23	48.0	176.3	1.23	TPD140B-H ~ 144B-H
	145-16-8F-H		14.5 - 14.9	16.0	51.27	131.0	117.27	48.0	180.3	1.28	TPD145B-H ~ 149B-H
	150-20-8F-H		15.0 - 15.4	20.0	51.32	136.1	121.32	50.0	187.4	1.32	TPD150B-H ~ 154B-H
	155-20-8F-H		15.5 - 15.9	20.0	51.36	140.0	125.36	50.0	191.4	1.37	TPD155B-H ~ 159B-H
	160-20-8F-H		16.0 - 16.4	20.0	51.41	145.1	129.41	50.0	196.5	1.41	TPD160B-H ~ 164B-H
	165-20-8F-H		16.5 - 16.9	20.0	51.45	149.1	133.45	50.0	200.5	1.46	TPD165B-H ~ 169B-H
	170-20-8F-H		17.0 - 17.4	20.0	51.50	154.0	137.50	50.0	205.5	1.50	TPD170B-H ~ 174B-H
	175-20-8F-H		17.5 - 17.9	20.0	51.54	158.0	141.54	50.0	209.5	1.55	TPD175B-H ~ 179B-H
	180-20-8F-H		18.0 - 18.4	20.0	51.59	164.0	145.59	50.0	215.6	1.59	TPD180B-H ~ 184B-H
	185-20-8F-H		18.5 - 18.9	20.0	51.63	168.0	149.63	50.0	219.6	1.64	TPD185B-H ~ 189B-H
	190-20-8F-H		19.0 - 19.4	20.0	51.68	172.0	153.68	50.0	223.7	1.68	TPD190B-H ~ 194B-H
	195-20-8F-H		19.5 - 19.9	20.0	51.72	176.0	157.72	50.0	227.7	1.73	TPD195B-H ~ 199B-H
	200-25-8F-H		20.0 - 20.4	25.0	51.76	180.0	161.76	56.0	237.8	1.76	TPD200B-H ~ 204B-H
	205-25-8F-H		20.5 - 20.9	25.0	51.80	184.0	165.80	56.0	241.8	1.81	TPD205B-H ~ 209B-H
	210-25-8F-H		21.0 - 21.4	25.0	51.85	188.1	169.85	56.0	245.9	1.85	TPD210B-H ~ 214B-H
	215-25-8F-H		21.5 - 21.9	25.0	51.89	192.0	173.89	56.0	249.9	1.90	TPD215B-H ~ 219B-H
	220-25-8F-H		22.0 - 22.4	25.0	52.04	196.0	178.04	56.0	254.0	2.04	TPD220B-H ~ 224B-H
	225-25-8F-H		22.5 - 22.9	25.0	52.08	204.9	182.08	56.0	263.0	2.11	TPD225B-H ~ 229B-H
	230-25-8F-H		23.0 - 23.4	25.0	52.13	209.0	186.13	56.0	267.1	2.13	TPD230B-H ~ 234B-H
	235-25-8F-H		23.5 - 23.9	25.0	52.17	212.9	190.17	56.0	271.1	2.18	TPD235B-H ~ 239B-H
	240-32-8F-H		24.0 - 24.4	32.0	52.22	217.1	194.22	60.0	279.3	2.22	TPD240B-H ~ 244B-H
	245-32-8F-H		24.5 - 24.9	32.0	52.26	221.0	198.26	60.0	283.3	2.28	TPD245B-H ~ 249B-H
	250-32-8F-H		25.0 - 25.4	32.0	52.32	225.0	202.32	60.0	287.3	2.32	TPD250B-H ~ 254B-H
	255-32-8F-H		25.5 - 25.9	32.0	52.36	228.9	206.36	60.0	291.3	2.37	TPD255B-H ~ 259B-H
	260-32-8F-H		26.0 - 26.4	32.0	52.41	232.9	210.41	60.0	295.3	2.41	TPD260B-H ~ 264B-H
	265-32-8F-H		26.5 - 26.9	32.0	52.45	236.9	214.45	60.0	299.3	2.48	TPD265B-H ~ 269B-H
	270-32-8F-H		27.0 - 27.4	32.0	52.50	241.0	218.50	60.0	303.5	2.5	TPD270B-H ~ 274B-H
	275-32-8F-H		27.5 - 27.9	32.0	52.54	245.0	222.54	60.0	307.5	2.57	TPD275B-H ~ 279B-H
	280-32-8F-H		28.0 - 28.4	32.0	52.59	250.9	226.59	60.0	313.5	2.59	TPD280B-H ~ 284B-H
	285-32-8F-H		28.5 - 28.9	32.0	52.63	254.9	230.63	60.0	317.5	2.64	TPD285B-H ~ 289B-H
	290-32-8F-H		29.0 - 29.4	32.0	52.69	259.9	234.69	60.0	322.6	2.69	TPD290B-H ~ 294B-H
	295-32-8F-H		29.5 - 29.9	32.0	52.73	263.9	238.73	60.0	326.6	2.74	TPD295B-H ~ 299B-H
	300-32-8F-H		30.0 - 30.4	32.0	52.78	267.9	242.78	60.0	330.7	2.78	TPD300B-H ~ 309B-H

※ The maximum length of flute could be LB

●: Stock item

⚠ For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasess 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 threat 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.



KORLOY

Head Office: Holystar B/D, 326, Seocho-daero, Seocho-gu, Seoul, 06633, Republic of Korea
Tel: +82-2-522-3181 Fax: +82-2-522-3184, +82-2-3474-4744 Web: www.korloy.com E-mail: sales.khq@korloy.com

KORLOY AMERICA
620 Maple Avenue, Torrance, CA 90503, USA
Tel: +1-310-782-3800 Toll Free: +1-888-711-0001 Fax: +1-310-782-3885
E-mail: sales.kai@korloy.com

KORLOY INDIA
Plot No. 415, Sector 8, IMT Manesar, Gurgaon 122051, Haryana, India
Tel: +91-124-439-1790 Fax: +91-124-405-0032
E-mail: sales.kip@korloy.com

KORLOY TURKIYE
Serifali Mahallesi, Burhan Sokak NO: 34
Dudullu OSB/Umraniye/Istanbul, 34775, Turkey
Tel: +90-216-415-8874 E-mail: sales.ktl@korloy.com

KORLOY RUSSIA
Premises 1/3, building 3, house 3, per Kapranova, vn.ter.g. municipal district Presnensky, 123242, Moscow, Russia
Tel: +7-495-280-1458 Fax: +7-495-280-1459 E-mail: sales.krc@korloy.com

KORLOY FACTORY INDIA
Plot No. 415, Sector 8, IMT Manesar, Gurgaon 122051, Haryana, India
Tel: +91-124-439-1818 Fax: +91-124-405-0032
E-mail: pro.kim@korloy.com

KORLOY EUROPE
Gablonzer Str. 25-27, 61440 Oberursel, Germany
Tel: +49-6171-27783-0 Fax: +49-6171-27783-59
E-mail: sales.keg@korloy.com

KORLOY BRASIL
Av. Aruana 280, conj.12, WLC, Alphaville, Barueri, CEP06460-010, SP, Brasill
Tel: +55-114-193-3810 Fax: +55-114-193-5837
E-mail: sales.kbl@korloy.com

KORLOY CHILE
Av. Providencia 1650, Office 1009, 7500027
Providencia-Santiago, Chile
Tel: +56-229-295-490 E-mail: sales.kcs@korloy.com

KORLOY MEXICO
Avenida de las Ciencias, No. 3015, Interior 507, Juriquilla Santa Fe, C.P. 76230 Querétaro, Querétaro, Mexico
Tel: +52-442-193-3600 E-mail: sales.kml@korloy.com

PRINTED WITH SOY INK

TN85-EM-02 / 20230910