High-quality and high efficiency top solid indexable Drill

# TPDB Plus Drill

KORLOY TECH-NEWS


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

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High-quality and high efficiency 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 highquality and high-efficiency indexable Drill that enhances machining quality and production efficiency.

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

The **TPDBP-H** insert with unique lowcutting resistance cutting edge improves centering and provides excellent machining quality even in vibrationprone machining environments byreducing 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.

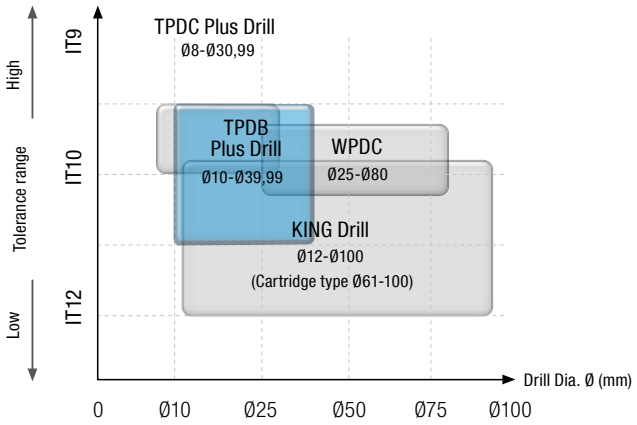
**TPDB-DS** is a Drill designed for machining medium/large diameter workpieces, applying a strong clamping structure. The specially designed clamping system and screw clamping method enablestable machining in high cutting load machining environments.

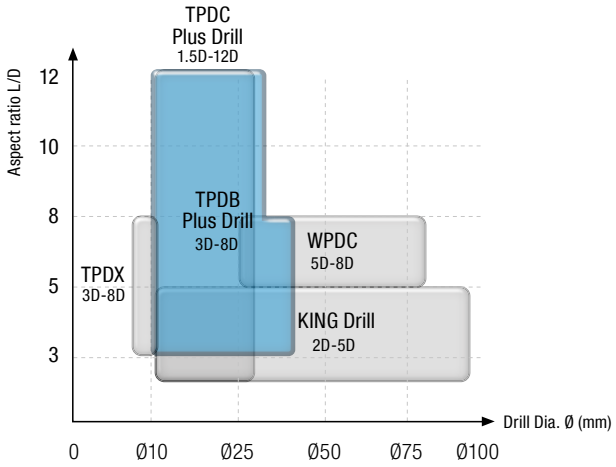
Additionally, the double-margin design provides excellent hole surface finish and precision. Highly precise and efficient top solid indexable Drill Excellent machinability.

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

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

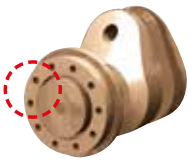
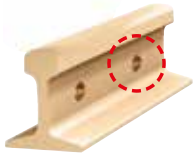
# Application range



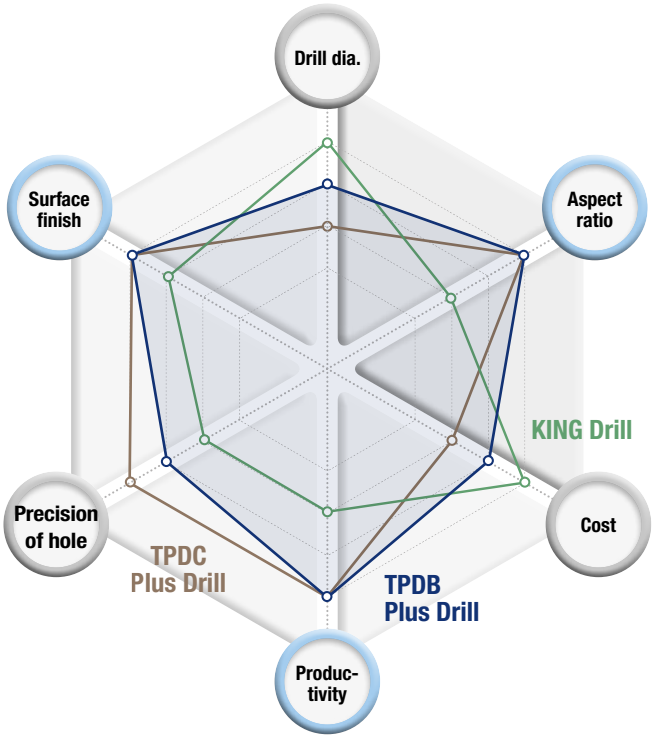




| Tool | | Application range | | | | | |
|---|---|---|---|---|---|---|---|
| | | Drill (Ø) | Tolerance of hole | Surface finish (Ra) | Aspect ratio (Aspect ratio) | Tolerance of Drill dia. | Workpiece material |
| TPDB Plus Drill | TPDB Plus | 10,0 - 32,99 | 0 - +0.1 | ≤ 2.0㎛ | 3, 5, 8, 10, 12 | h7 | P K |
| | TPDB-DS | 33,0 - 39,99 | 0 - +0.2 | ≤ 2.5㎛ | 3, 5, 8 | | P K |
| | TPDBP-H | 14,0 - 32,99 | 0 - +0.1 | ≤ 2.5㎛ | 3, 5, 8 | | P |

# Applicable industries

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

# Indexable Drill selection guide




### TPDB Plus Drill new

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

### TPDC Plus Drill

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

### KING Drill

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

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

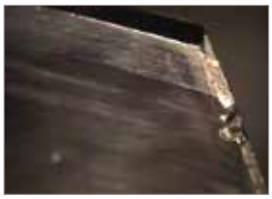
# TPDB Plus - types of damage to Drill and solutions

| Scratches on the margin | | |
|---|---|---|
|  | **Factor** | • Lack of coolant lubrication<br>• Lack of coolant in deep Drilling due to MQL system<br>• Bend of Drill due to improperly placed holder or using a long holder<br>• Low rigidity or large concentricity |
| | **Solution** | • Use more coolant<br>• Place workpiece tightly and check the concentricity<br>• Check the precision of installment of Drill (below 0.03 mm)<br>• Reduce the cutting speed |

| Wear on the margin | | |
|---|---|---|
|  | **Factor** | • Due to machining pure metal or heat resisting alloy<br>• Less back taper due to using a holder for a long time<br>• Unstable machining at the end of hole due to interruption<br>• Lack of coolant lubrication on the peripheral section of holder contacting workpiece |
| | **Solution** | • Set up proper tool life and manage its usage<br>• Check the shape of machining part<br>• Check the kind and concentration of coolant |

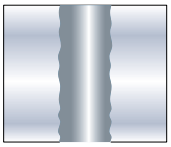
| Chipping on the corner | | |
|---|---|---|
|  | **Factor** | • Interrupted machining (end of hole is inclined or curved shape, junction hole the middle of hole.)<br>• Chattering in Drilling due to unstable clamping, low rigidity of machine or bending of Drill<br>• Chattering due to unstable clamping of Drill |
| | **Solution** | • Check the part of machining<br>• Machine in lower cutting speed<br>• Place workpiece tightly<br>• Check the performance of the machine<br>• Check the precision of installment of Drill (below 0.03 mm) |

| Wear on the rake face | | |
|---|---|---|
|  | **Factor** | • Low cutting speed<br>• Machining free-cutting Steel<br>• Erosion of chip and flute<br>• Lack of coolant lubrication |
| | **Solution** | • Increase cutting speed<br>• Set a lower thinning angle<br>• Reduce the honing<br>• Use more coolant |

| Chipping on the rake face | | |
|---|---|---|
|  | **Factor** | • Fracture on the cutting edge partially due to pre-treatment on the center of hole<br>• Unstable chip evacuation due to step Drilling and external coolant<br>• Chattering in Drilling and low precision of holder installment |
| | **Solution** | • Check if there is pre-machining or not<br>• It is recommended to use internal coolant in step Drilling<br>• Check the state of clamping workpiece and the precision of Drill installment (below 0.03 mm) |

# TPDB Plus - Types of damage to workpiece and check points

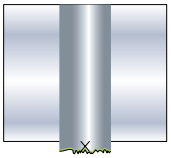
## Poor surface finish (rough, scratch, etc.)



**Factor**
- 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

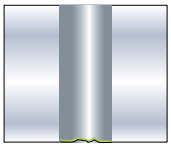
## Remained lots of burr at the end of the Drilled hole



**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

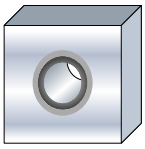
## Flaking the end of the Drilled hole



**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) and use a new Drill
- Reduce honing on the cutting edge

## Thermal deformation and oxidation of the end of the Drilled hole



**Factor**
- Rapid feed and lack of coolant
- Excessive cutting load, exceeded cutting tool's tool life (too much wear and chipping)

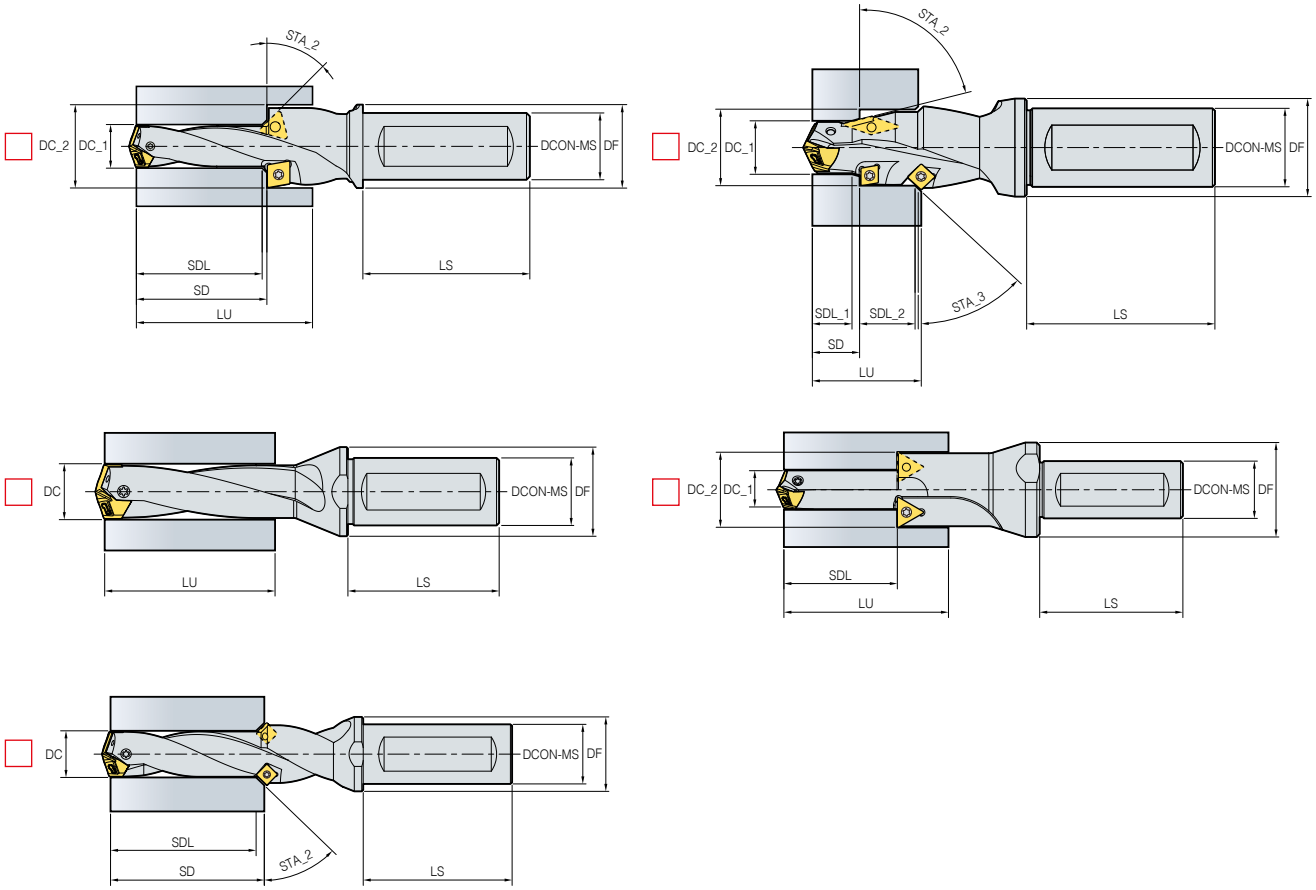
**Solution**
- Reduce the feed and honing on the cutting edge
- Use more coolant and use a new Drill

# Solutions for troubles

↑ Increase ↓ Decrease ○ Use

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

# TPDB Plus - Special Drill order form




| Hole type | |
|---|---|
| ☐ Blind hole | ☐ Through hole |

| Coolant type | |
|---|---|
| ☐ Internal | ☐ External |

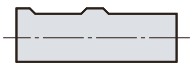
**Special note**

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

**Shank type**

☐  Plain

☐  Flat

☐  Weldon

☐  Whistle Notch

# TPDB Plus - Code system

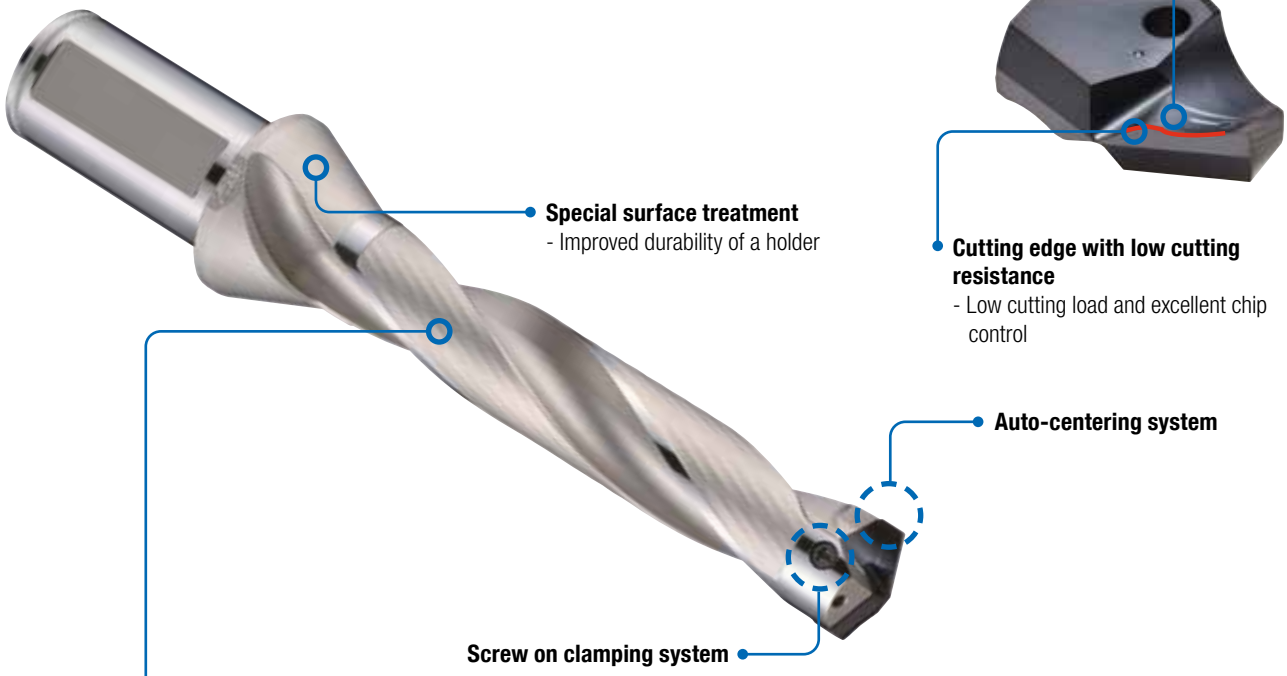
## Insert

| TPD | 150 | B | PC5300 |
|---|---|---|---|
| **Top Solid Piercing Drill** | **Drill dia. Ø**<br>150: Ø15.0 mm | **Insert type**<br>B: Blade type | **Grade**<br>PC5300 |

## Holder

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

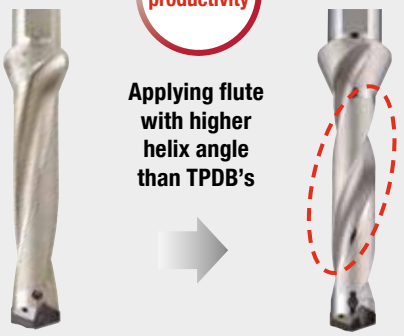
## Features




### High helix angle

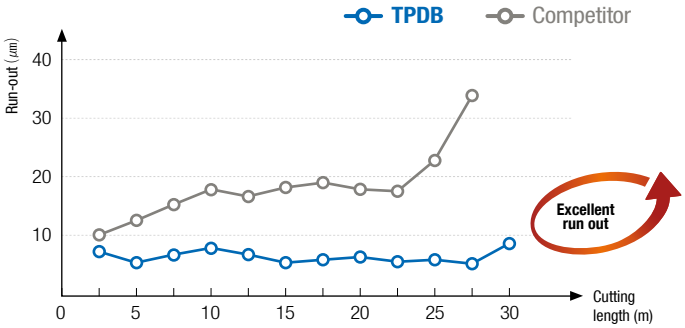
**High productivity**
- Stable chip evacuation realizes stable machinability
- Decreased cycle time by applying improved cutting conditions

**Improvement in machining quality**
- Good surface finish and regular size of the hole



# TPDB Plus - Run-out

| | |
|---|---|
| **Workpiece** | Alloy steel (42CrMo4, HRC22) |
| **Cutting condition** | vc = 90 m/min · fn = 0,25 mm/rev |
| | ap = 120 mm · wett · 20 bar |
| **Tool** | Insert TPD250B (PC5300) |
| | Holder TPDB250-32-5-P (Drill dia. Ø = 25 mm) |




# How to clamp an insert

**Clamping an insert to a holder**


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

**Changing the used insert to a new one**



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

# Empfohlene Cutting condition

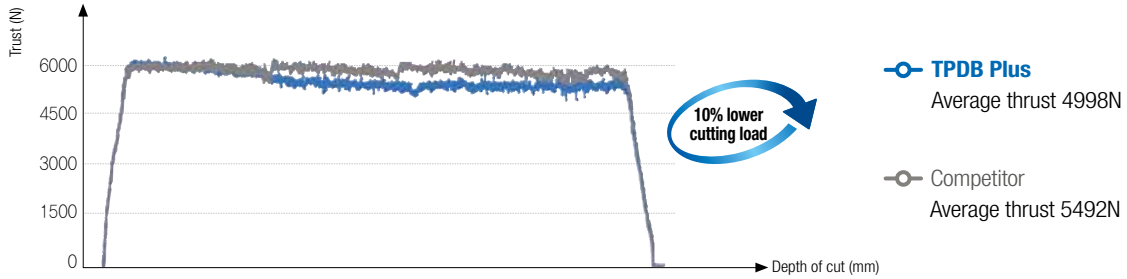
| Workpiece | | | | | Specific cutting force (N/mm²) | Brinell Hardness (HB) | Grade | vc (m/min) | Aspect ratio = 3D, 5D | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | fn (mm/rev) | | |
| ISO | Workpiece material | | KS | ISO | | | | | Ø10-Ø16.9 | Ø17-Ø26.9 | Ø27-Ø32.9 |
| 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 |
| | | 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.

# TPDB Plus - Performance evaluation

## Cutting load

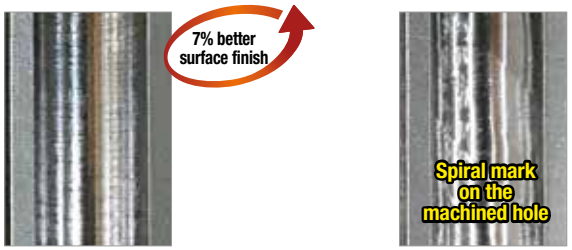
| | |
|---|---|
| **Workpiece** | Alloy steel (42CrMo4, HRC22) |
| **Cutting condition** | vc = 120 m/min · fn = 0.25 mm/rev · ap = 120 mm · wet (20 bar) |
| **Tool** | **Insert** TPD250B (PC5300) **Holder** TPDB250-32-5-P (Drill Dia. Ø = 25 mm) |




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

## Surface finish

| | |
|---|---|
| **Workpiece** | Alloy steel (42CrMo4, HRC22) |
| **Cutting condition** | vc = 120 m/min · fn = 0.35 mm/rev · ap = 120 mm · wet (20 bar) |
| **Tool** | **Insert** TPD250B (PC5300) **Holder** TPDB250-32-5-P (Drill Dia. Ø = 25 mm) |



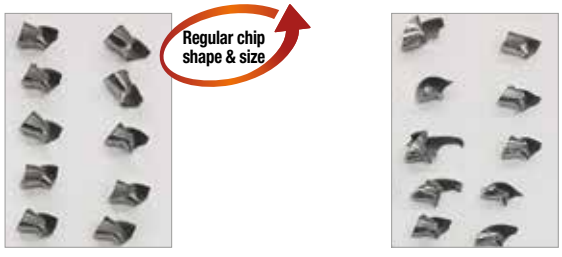

**[ TPDB Plus ]**
Ra = 0.54㎛

[ Competitor ]
Ra = 0.57㎛

» Hohe Surface finish durch stabile Spanform und Spanabfuhr

## Chip control

| | |
|---|---|
| **Workpiece** | Alloy steel (42CrMo4, HRC22) |
| **Cutting condition** | vc = 120 m/min · fn = 0.35 mm/rev · ap = 120 mm · wet (20 bar) |
| **Tool** | **Insert** TPD250B (PC5300) **Holder** TPDB250-32-5-P (Drill Dia. Ø = 25 mm) |




**[ TPDB Plus ]**

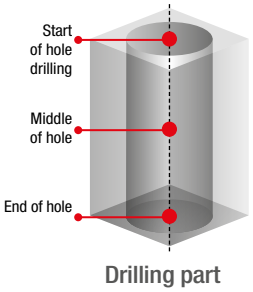
[ Competitor ]

» Regular chip shape

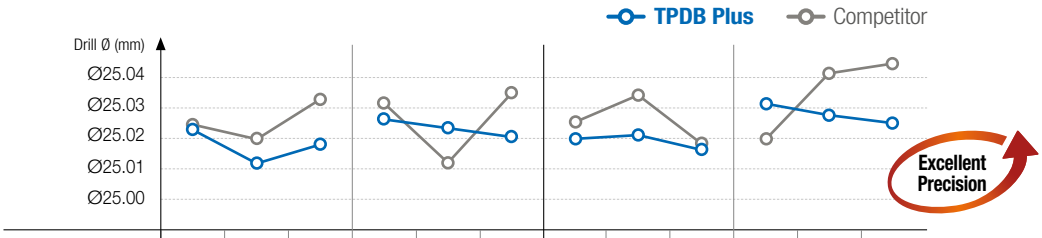
# TPDB Plus - Performance evaluation

## Machining precision

| | |
|---|---|
| **Workpiece** | Alloy steel (42CrMo4, HRC22) |
| **Cutting condition** | vc = 90/120 m/min · fn = 0.25/0.35 mm/rev · ap = 120 mm · wet (20 bar) |
| **Tool** | **Insert** TPD250B (PC5300) **Holder** TPDB250-32-5-P (Drill Dia. Ø = 25 mm) |




Drilling part



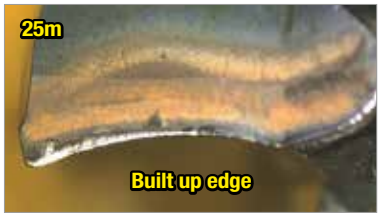

| Drill | Start | Middle | End | Start | Middle | End | Start | Middle | End | Start | Middle | End |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| fn (mm/rev) | 0.25 | | | 0.35 | | | 0.25 | | | 0.35 | | |
| vc (m/min) | 90 | | | | | | 120 | | | | | |

» High precision cutting due to stable chip evacuation

## Wear resistance

| | |
|---|---|
| **Workpiece** | Alloy steel (42CrMo4, HRC22) |
| **Cutting condition** | vc = 100 m/min · fn = 0.3 mm/rev · ap = 100 mm · wet (30 bar) |
| **Tool** | **Insert** TPD250B (PC5300) **Holder** TPDB250-32-5-P (Drill Dia. Ø = 25 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.

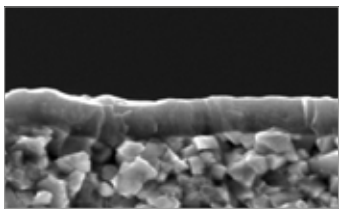
| | |
|---|---|
| **Workpiece** | Carbon steel (C45, HRC18) |
| **Cutting condition** | vc = 100 m/min · fn = 0.3 mm/rev · ap = 100 mm · wet (30 bar) |
| **Tool** | **Insert** TPD250B (PC5335) **Holder** TPDB250-32-5-P (Drill Dia. Ø = 25 mm) |


[ TPDB Plus ]


[ Competitor ]

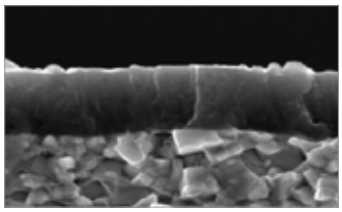
» Sharper cutting edge than competitor's improves built up edge resistance and tool life.

## TPDB Plus - Grade features



### PC5300

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

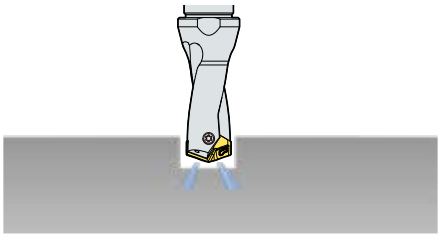


### PC5335

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

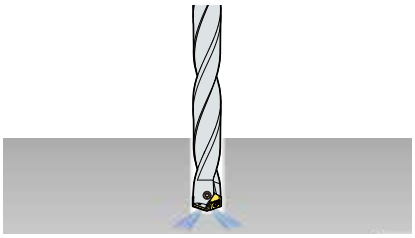
## Recommended Drilling method (10D, 12D)

### Machine a pilot hole 1.5xD

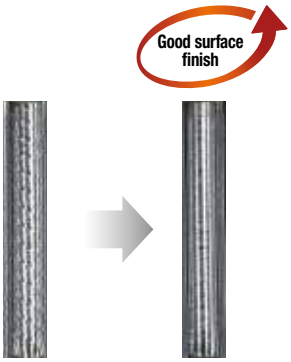


- Machine a pilot hole with the depth of cut as 0.5D and at 30% lower speed using a 1.5D or 3D Drill.

### Start drilling



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




Result of general Drilling

Result of recommended Drilling

## Precaution in Drilling

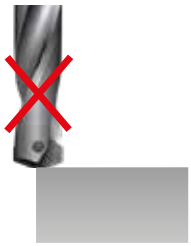
### Angled surface

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

### Stacked plates

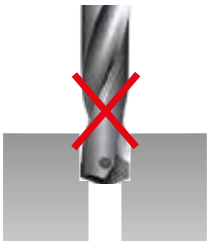
Gap between the plates could make wrong chip evacuation causing fracture of the Drill. Place stacked plates without any gap between each.

### Plunging



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

### Boring



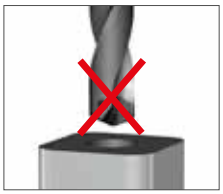
Boring is not recommended due to wear and chipping in the corner of the insert.

## Checklist for the Drilling

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

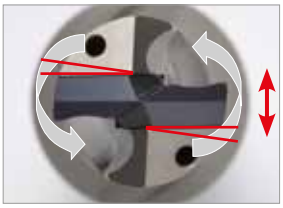
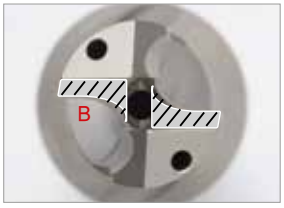
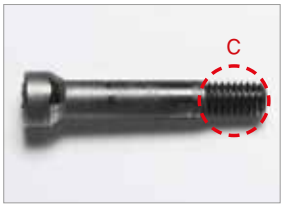
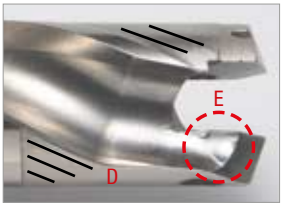
## Coolant application system

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

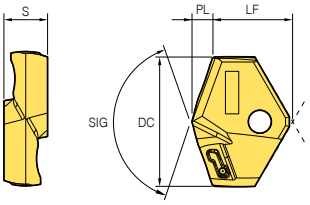


dry

## Replacement of holders and screws

| Worn part | How to check | Description |
|---|---|---|
| Pic. 1<br>  | Pic. 2<br>Check the gap<br>  | • In case of Drilling for a long time as shown in the [ Pic. 1 ] the 'A' part is torn and twisted due to torque.<br>• 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<br>  | Pic. 4<br>Check moving<br>  | • 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 ].<br>• 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<br>  | Check moving<br>  | • 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.<br>• Spreading the grease on the screw makes it last longer. |
| Pic. 6<br>① Check the 'D' and 'E' parts as shown in the [ Pic. 6 ].<br>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.<br>• The excessive wear of the part 'E' as shown in the [ Pic. 6 ] relating to chip curling might cause long chips. |

# TPDB Plus - Holder

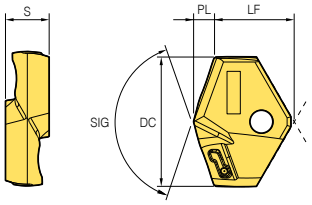



| Designation | | Grade | | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | PC5300 | PC5335 | DC | LF | PL | SIG | S |
| TPD | 100B | ▲ | | 10.0 | 6.0 | 1.58 | 140 | 3.5 |
| | 101B | ▲ | | 10.1 | 6.0 | 1.59 | 140 | 3.5 |
| | 102B | ▲ | | 10.2 | 6.0 | 1.61 | 140 | 3.5 |
| | 103B |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

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

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

# TPDB Plus - Holder

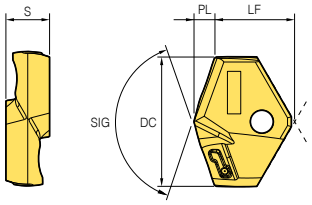



| Designation | | Grade | | Dimension (mm) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | PC5300 | PC5335 | DC | LF | PL | SIG | S |
| TPD | 172B | ▲ | | 17.2 | 9.6 | 2.96 | 140 | 5.5 |
| | 173B | ● | | 17.3 | 9.6 | 2.98 | 140 | 5.5 |
| | 174B | ▲ | | 17.4 | 9.6 | 3.00 | 140 | 5.5 |
| | 175B | ▲ | ● | 17.5 | 9.6 | 3.01 | 140 | 5.5 |
| | 176B | ▲ | | 17.6 | 9.6 | 3.03 | 140 | 5.5 |
| | 177B | ▲ | | 17.7 | 9.6 | 3.05 | 140 | 5.5 |
| | 178B | ▲ | | 17.8 | 9.5 | 3.06 | 140 | 5.5 |
| | 180B | ▲ | ▲ | 18.0 | 10.5 | 3.10 | 140 | 6.0 |
| | 181B | ▲ | | 18.1 | 10.5 | 3.12 | 140 | 6.0 |
| | 182B | ▲ | | 18.2 | 10.5 | 3.13 | 140 | 6.0 |
| | 185B | ▲ | ● | 18.5 | 10.4 | 3.19 | 140 | 6.0 |
| | 186B | ▲ | ● | 18.6 | 10.4 | 3.20 | 140 | 6.0 |
| | 187B | ▲ | | 18.7 | 10.4 | 3.22 | 140 | 6.0 |
| | 190B | ▲ | ▲ | 19.0 | 10.8 | 3.27 | 140 | 6.0 |
| | 191B | ▲ | | 19.1 | 10.8 | 3.29 | 140 | 6.0 |
| | 192B | ▲ | | 19.2 | 10.8 | 3.31 | 140 | 6.0 |
| | 193B | ▲ | | 19.3 | 10.8 | 3.32 | 140 | 6.0 |
| | 195B | ▲ | | 19.5 | 10.7 | 3.36 | 140 | 6.0 |
| | 196B | ▲ | | 19.6 | 10.7 | 3.37 | 140 | 6.0 |
| | 197B | ▲ | | 19.7 | 10.7 | 3.39 | 140 | 6.0 |
| | 198B | ▲ | | 19.8 | 10.7 | 3.41 | 140 | 6.0 |
| | 199B | ▲ | | 19.9 | 10.7 | 3.43 | 140 | 6.0 |
| | 200B | ▲ | ▲ | 20.0 | 11.7 | 3.44 | 140 | 6.5 |
| | 201B | ▲ | | 20.1 | 11.6 | 3.46 | 140 | 6.5 |
| | 202B | ▲ | | 20.2 | 11.6 | 3.48 | 140 | 6.5 |
| | 204B | ▲ | | 20.4 | 11.6 | 3.51 | 140 | 6.5 |
| | 205B | ▲ | | 20.5 | 11.6 | 3.53 | 140 | 6.5 |
| | 206B | ▲ | | 20.6 | 11.6 | 3.55 | 140 | 6.5 |
| | 210B | ▲ | ▲ | 21.0 | 12.0 | 3.62 | 140 | 6.5 |
| | 211B | ▲ | | 21.1 | 12.0 | 3.63 | 140 | 6.5 |
| | 212B | ▲ | | 21.2 | 12.0 | 3.65 | 140 | 6.5 |
| | 213B | ▲ | | 21.3 | 11.9 | 3.67 | 140 | 6.5 |
| | 215B | ▲ | | 21.5 | 11.9 | 3.70 | 140 | 6.5 |
| | 217B | ▲ | | 21.7 | 11.9 | 3.74 | 140 | 6.5 |
| | 219B | ▲ | | 21.9 | 11.8 | 3.77 | 140 | 6.5 |
| | 220B | ▲ | ▲ | 22.0 | 12.3 | 3.79 | 140 | 7.0 |
| | 222B | ▲ | | 22.2 | 12.3 | 3.82 | 140 | 7.0 |
| | 223B | ▲ | | 22.3 | 12.3 | 3.84 | 140 | 7.0 |
| | 225B | ▲ | | 22.5 | 12.2 | 3.87 | 140 | 7.0 |
| | 227B | ▲ | | 22.7 | 12.2 | 3.91 | 140 | 7.0 |
| | 230B | ▲ | | 23.0 | 12.6 | 3.96 | 140 | 7.0 |
| | 235B | ▲ | | 23.5 | 12.6 | 4.05 | 140 | 7.0 |
| | 237B | ▲ | | 23.7 | 12.5 | 4.08 | 140 | 7.0 |
| | 240B | ▲ | ▲ | 24.0 | 13.0 | 4.13 | 140 | 7.5 |
| | 242B | ▲ | | 24.2 | 12.9 | 4.17 | 140 | 7.5 |
| | 244B | ▲ | | 24.4 | 12.9 | 4.20 | 140 | 7.5 |
| | 245B | ▲ | | 24.5 | 12.9 | 4.22 | 140 | 7.5 |

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

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

# TPDB Plus - Holder




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

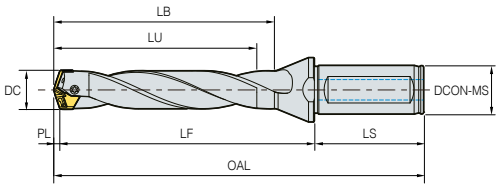
# Parts

| Designation | | Drill Dia. Ø DC (mm) | Screw | Wrench | Torque (N · m) |
|---|---|---|---|---|---|
| TPD | 100B - 129B | 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 |

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

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

# TPDB-P - 3D

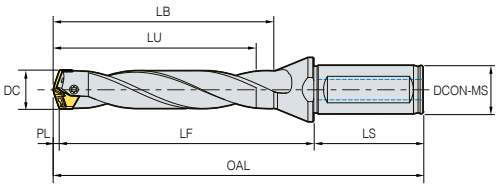



(mm)

| Designation | | Stock | DC | DCON-MS | LU | LF | LB | LS | OAL | PL | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPDB | 100-16-3-P | ▲ | 10.0 - 10.4 | 16.0 | 31.58 | 47.02 | 37.08 | 48.0 | 96.6 | 1.58 | 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 Europe ●: Stock item Korea ○: Production on demand

# TPDB-P - 5D

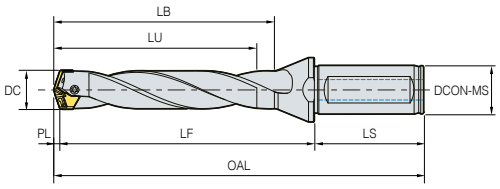



(mm)

| Designation | | Stock | DC | DCON-MS | LU | LF | LB | LS | OAL | PL | 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 Europe ●: Stock item Korea ○: Production on demand

# TPDB-P - 8D

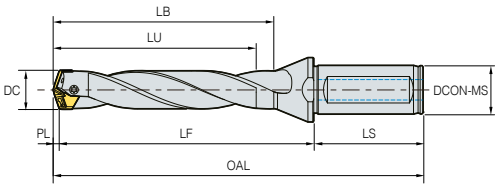



(mm)

| Designation | | Stock | DC | DCON-MS | LU | LF | LB | LS | OAL | PL | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPDB | 100-16-8-P | ▲ | 10.0 - 10.4 | 16.0 | 81.58 | 97.02 | 87.08 | 48.0 | 146.6 | 1.58 | 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 Europe ●: Stock item Korea ○: Production on demand

# TPDB-P - 10D

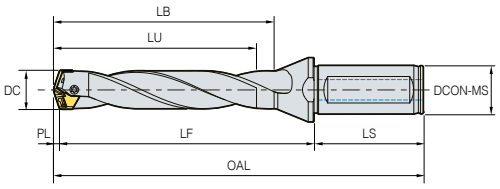



(mm)

| Designation | | Stock | DC | DCON-MS | LU | LF | LB | LS | OAL | PL | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPDB | 100-16-10-P | ● | 10.0 - 10.4 | 16.0 | 101.58 | 117.02 | 107.08 | 48.0 | 166.6 | 1.58 | 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 Europe ●: Stock item Korea ○: Production on demand

# TPDB-P - 12D




(mm)

| Designation | | Stock | DC | DCON-MS | LU | LF | LB | LS | OAL | PL | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPDB | 100-16-12-P | ● | 10.0 - 10.4 | 16.0 | 121.58 | 137.02 | 127.08 | 48.0 | 186.6 | 1.58 | 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 Europe ●: Stock item Korea ○: Production on demand

# TPDB-DS new

## Code system

### Insert

| TPD | 360 | B | DS | PC5300 |
|---|---|---|---|---|
| **Top solid Piercing Drill** | **Drill dia. Ø**<br>360: Ø36.0 mm | **Insert type**<br>B: Blade type | **Margin shape**<br>DS: Double margin shape | **Grade**<br>PC5300 |

### Holder

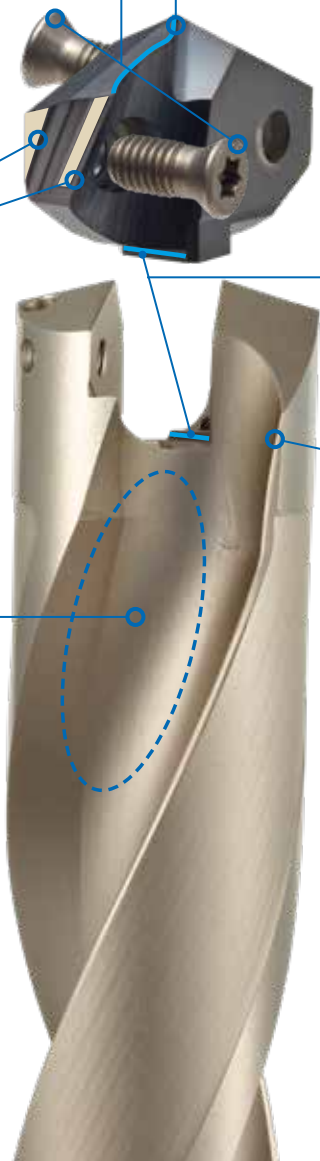
| TPD | B | 360 | 40 | 5 | P |
|---|---|---|---|---|---|
| **Top solid Piercing Drill** | **Holder type**<br>B: Blade type | **Drill dia. Ø**<br>360: Ø36.0 mm | **Shank dia. Ø**<br>40: Ø 40.0 mm | **Aspect ratio L/D**<br>3D, 5D, 8D | **PlusDrill** |

## Features

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

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

**Cutting edge shape for low cutting resistance**
- Less cutting load and better chip control



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

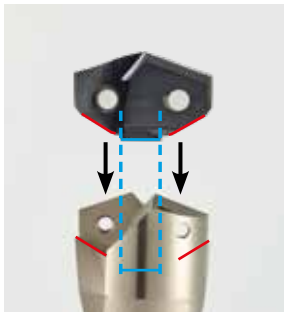
**Applied key preventing insert misalignment**
- High precision of clamping

**Special surface treatment**
- High durability of the holder

**2-stufige Form**
- Sorgt für eine gute Spanabfuhr

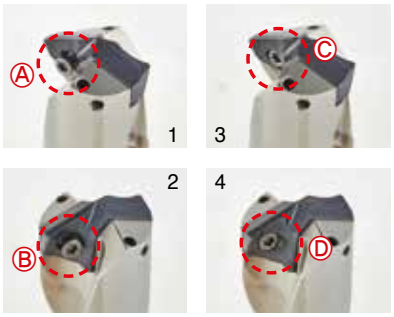
# TPDB-DS - How to clamp an insert

① Clean the tip seat.



② Put an insert in.

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




④ Clamp a screw partially just like in the case of Ⓐ and Ⓑ and prevent it from wobbling.

⑤ Complete the partially the screw in the order of Ⓒ and Ⓓ

## Recommended cutting conditions

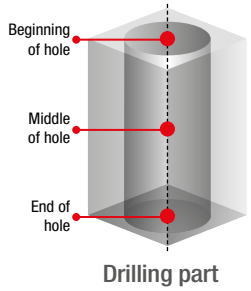
| Workpiece | | | | | Trust ($N/mm^2$) | Brinell Hardness (HB) | Grade | vc (m/min) | Aspect ratio = 3D, 5D |
|---|---|---|---|---|---|---|---|---|---|
| ISO | Workpiece material | | KS | ISO | | | | | fn (mm/rev) |
| P | Carbon steel | C = 0.10 - 0.25% | SM15C<br>SM25C | C15<br>C25 | 1500 | 90 - 200 | PC5300 | 80 - 140 | 0.4 - 0.25 |
| | | C = 0.25 - 0.55% | SM35C<br>SM45C | C35<br>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 |
| | | Tool steel | STD61 | X40CrMoV5-1 | 3000 | 352 | PC5300 | 50 - 90 | 0.35 - 0.2 |
| K | Gray cast iron | | GC250<br>GC350 | 250<br>350 | 900 | 150 - 230 | PC5300 | 80 - 140 | 0.45 - 0.25 |
| | Ductile cast iron | | GCD400<br>GCD500<br>GCD600 | 400-15<br>150-10<br>600-3 | 870 | 160 - 260 | PC5300 | 70 - 130 | 0.45 - 0.25 |

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

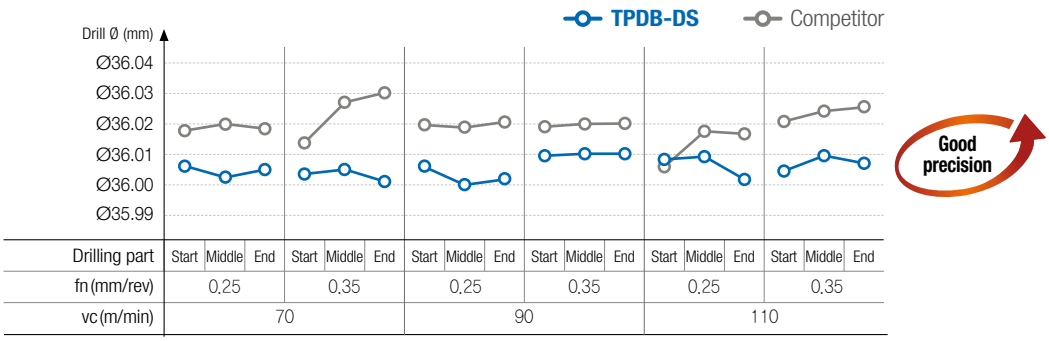
# TPDB-DS - Performance evaluation

## Machining precision

| | |
|---|---|
| **Workpiece** | Alloy steel (42CrMo4, HRC22) |
| **Cutting condition** | vc = 70/90/110 m/min · fn = 0.25/0.35 mm/rev · ap = 150 mm · wet (20 bar) |
| **Tool** | **Insert** TPD360B-DS (PC5300) **Holder** TPDB360-40-5-P (Drill Dia. Ø = 36 mm) |



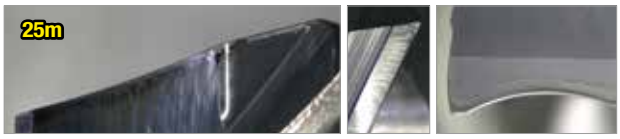

Drilling part




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

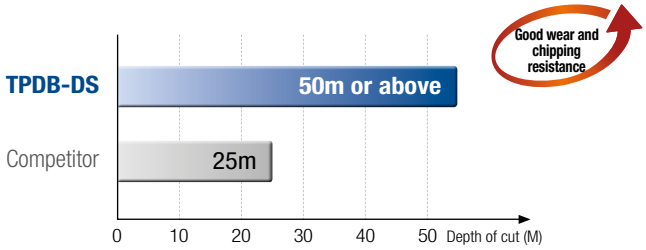
## Wear resistance

| | |
|---|---|
| **Workpiece** | Alloy steel (42CrMo4, HRC22) |
| **Cutting condition** | vc = 90 m/min · fn = 0.3 mm/rev · ap = 150 mm · wet (20 bar) |
| **Tool** | **Insert** TPD360B-DS (PC5300) **Holder** TPDB360-40-5-P (Drill Dia. Ø = 36 mm) |




[ TPDB-DS ]


[ Competitor ]




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

## Cutting surface finish / chip surface finish

| | |
|---|---|
| **Workpiece** | Alloy steel (42CrMo4, HRC22) |
| **Cutting condition** | vc = 90 m/min · fn = 0.35 mm/rev · ap = 150 mm · wet (20 bar) |
| **Tool** | **Insert** TPD360B-DS(PC5300) **Holder** TPDB360-40-5-P (Drill Dia. Ø = 36 mm) |


[ TPDB-DS ]

[ Competitor ]

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

# Precaution in Drilling

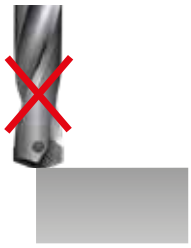
### Angled surface

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

### Stacked plates

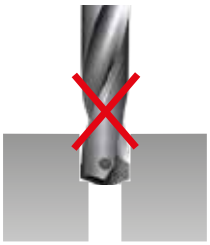
Gap between the plates could make wrong chip evacuation causing fracture of the Drill. Place stacked plates without any gap between each.

### Plunging



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

### Boring



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

## Drilling checklist

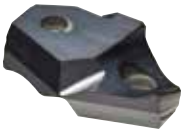
- Workpiece clamping condition
- Rotational state of the main axial in the machining equipment
- Holder condition
- Clamped drill's Run-out : Max. 0.03 mm
- Coolant supply condition (pressure, flow rate, concentration)
- Chip evacuation condition

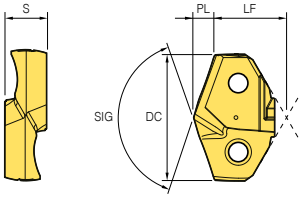
## Coolant application system

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

Dry

# TPDB-DS - Insert






(mm)

| Designation | | Grade | DC | LF | PL | SIG | S |
|---|---|---|---|---|---|---|---|
| | | PC5300 | | | | | |
| TPD | 330B-DS | ▲ | 33,0 | 18,16 | 5,38 | 140 | 10,5 |
| | 335B-DS | ○ | 33,5 | 18,06 | 5,48 | 140 | 10,5 |
| | 340B-DS | ▲ | 34,0 | 18,54 | 5,55 | 140 | 11,0 |
| | 345B-DS | ○ | 34,5 | 18,47 | 5,64 | 140 | 11,0 |
| | 350B-DS | ▲ | 35,0 | 19,47 | 5,71 | 140 | 11,5 |
| | 355B-DS | ○ | 35,5 | 19,38 | 5,80 | 140 | 11,5 |
| | 360B-DS | ▲ | 36,0 | 20,40 | 5,87 | 140 | 11,5 |
| | 365B-DS | ○ | 36,5 | 20,31 | 5,97 | 140 | 11,5 |
| | 370B-DS | ▲ | 37,0 | 20,79 | 6,04 | 140 | 12,0 |
| | 375B-DS | ○ | 37,5 | 20,70 | 6,13 | 140 | 12,0 |
| | 380B-DS | ▲ | 38,0 | 21,62 | 6,20 | 140 | 12,0 |
| | 385B-DS | ○ | 38,5 | 21,53 | 6,29 | 140 | 12,0 |
| | 390B-DS | ▲ | 39,0 | 22,01 | 6,36 | 140 | 12,5 |
| | 395B-DS | ○ | 39,5 | 21,92 | 6,46 | 140 | 12,5 |

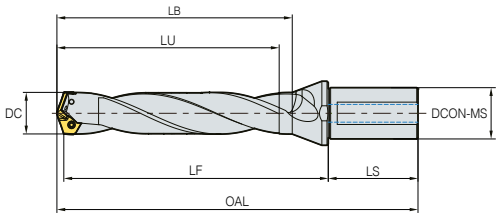
# Parts

| Designation | | Drill Dia. Ø DC (mm) | Screw | Wrench |
|---|---|---|---|---|
| TPD | 330B-DS - 339B-DS | 33,0 - 33,9 | FTKA0410 | TW15S |
| | 340B-DS - 349B-DS | 34,0 - 34,9 | FTKA0410 | TW15S |
| | 350B-DS - 359B-DS | 35,0 - 35,9 | FTKA0410 | TW15S |
| | 360B-DS - 369B-DS | 36,0 - 36,9 | FTNC04511 | TW20S |
| | 370B-DS - 379B-DS | 37,0 - 37,9 | FTNC04511 | TW20S |
| | 380B-DS - 389B-DS | 38,0 - 38,9 | FTNA0511 | TW20S |
| | 390B-DS - 399B-DS | 39,0 - 39,9 | FTNA0511 | TW20S |

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

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

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




(mm)

| | Designation | Stock | DC | DCON-MS | LU | LF | LB | LS | OAL | PL | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPDB | 330-40-3-P | ▲ | 33,0 - 33,9 | 40 | 104,4 | 140,3 | 117,6 | 70 | 215,7 | 5,38 | TPD330B - 339B-DS |
| | 340-40-3-P | ▲ | 34,0 - 34,9 | 40 | 107,5 | 144,4 | 121,1 | 70 | 219,9 | 5,55 | TPD340B - 349B-DS |
| | 350-40-3-P | ▲ | 35,0 - 35,9 | 40 | 110,7 | 148,5 | 124,7 | 70 | 224,2 | 5,71 | TPD350B - 359B-DS |
| | 360-40-3-P | ▲ | 36,0 - 36,9 | 40 | 113,9 | 152,6 | 128,3 | 70 | 228,5 | 5,87 | TPD360B - 369B-DS |
| | 370-40-3-P | ▲ | 37,0 - 37,9 | 40 | 117,0 | 156,7 | 131,8 | 70 | 232,7 | 6,04 | TPD370B - 379B-DS |
| | 380-40-3-P | ▲ | 38,0 - 38,9 | 40 | 120,2 | 160,8 | 135,4 | 70 | 237,0 | 6,20 | TPD380B - 389B-DS |
| | 390-40-3-P | ▲ | 39,0 - 39,9 | 40 | 123,4 | 164,9 | 139,0 | 70 | 241,3 | 6,36 | TPD390B - 399B-DS |
| | 330-40-5-P | ▲ | 33,0 - 33,9 | 40 | 170,4 | 206,3 | 183,6 | 70 | 281,7 | 5,38 | TPD330B - 339B-DS |
| | 340-40-5-P | ▲ | 34,0 - 34,9 | 40 | 175,5 | 212,4 | 189,1 | 70 | 287,9 | 5,55 | TPD340B - 349B-DS |
| | 350-40-5-P | ▲ | 35,0 - 35,9 | 40 | 180,7 | 218,5 | 194,7 | 70 | 294,2 | 5,71 | TPD350B - 359B-DS |
| | 360-40-5-P | ▲ | 36,0 - 36,9 | 40 | 185,9 | 224,6 | 200,3 | 70 | 300,5 | 5,87 | TPD360B - 369B-DS |
| | 370-40-5-P | ▲ | 37,0 - 37,9 | 40 | 191,0 | 230,7 | 205,8 | 70 | 306,7 | 6,04 | TPD370B - 379B-DS |
| | 380-40-5-P | ▲ | 38,0 - 38,9 | 40 | 196,2 | 236,8 | 211,4 | 70 | 313,0 | 6,20 | TPD380B - 389B-DS |
| | 390-40-5-P | ▲ | 39,0 - 39,9 | 40 | 201,4 | 242,9 | 217,0 | 70 | 319,3 | 6,36 | TPD390B - 399B-DS |
| | 330-40-8-P | ○ | 33,0 - 33,9 | 40 | 269,4 | 305,3 | 282,6 | 70 | 380,7 | 5,38 | TPD330B - 339B-DS |
| | 340-40-8-P | ○ | 34,0 - 34,9 | 40 | 277,5 | 314,4 | 291,1 | 70 | 389,9 | 5,55 | TPD340B - 349B-DS |
| | 350-40-8-P | ○ | 35,0 - 35,9 | 40 | 285,7 | 323,5 | 299,7 | 70 | 399,2 | 5,71 | TPD350B - 359B-DS |
| | 360-40-8-P | ○ | 36,0 - 36,9 | 40 | 293,9 | 332,6 | 308,3 | 70 | 408,5 | 5,87 | TPD360B - 369B-DS |
| | 370-40-8-P | ○ | 37,0 - 37,9 | 40 | 302,0 | 341,7 | 316,8 | 70 | 417,7 | 6,04 | TPD370B - 379B-DS |
| | 380-40-8-P | ○ | 38,0 - 38,9 | 40 | 310,2 | 350,8 | 325,4 | 70 | 427,0 | 6,20 | TPD380B - 389B-DS |
| | 390-40-8-P | ○ | 39,0 - 39,9 | 40 | 318,4 | 359,9 | 334,0 | 70 | 436,3 | 6,36 | TPD390B - 399B-DS |

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

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

# TPDB-H new

## Code system

### Insert

| TPD | 200 | B | P | H | PC340UL |
|---|---|---|---|---|---|
| **Top solid Piercing Drill** | **Drill dia. Ø** 200: Ø20.0 mm | **Insert type** B: Blade type | **Workpiece** P: Steel | **H-Beam** | **Grade** PC340UL |

### Holder 3D / 4D

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

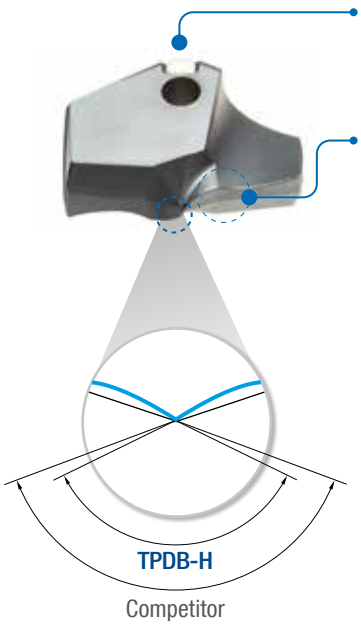
### Holder 5D / 8D

| TPD | BP | 220 | 25 | 545 | 5 | H |
|---|---|---|---|---|---|---|
| **Top solid Piercing Drill** | **Holder type** B: Blade type P: Plus | **Drill dia. Ø** 220: Ø 22,0 mm | **Shank dia. Ø** 25: Ø 25 mm | **Depth of cut** Available cutting depth max: 54.5 mm | **Aspect ratio L/D** 5D, 8D | **H-Beam** |

## Features

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

## Insert features




**Sub screw hole**

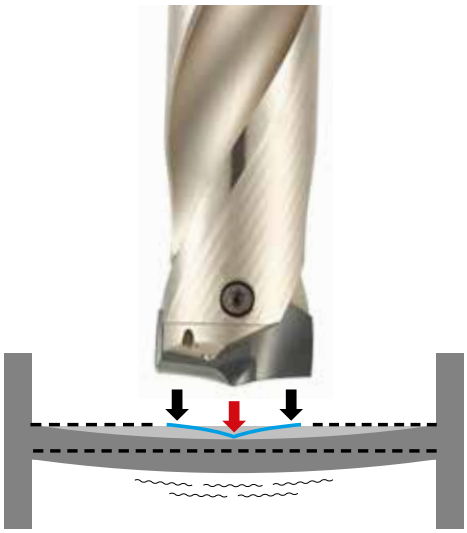
- Increased clamping force and clamping stability

**Applying Webtapper**

- Enhanced chip breaking

**Double R point cutting edge**

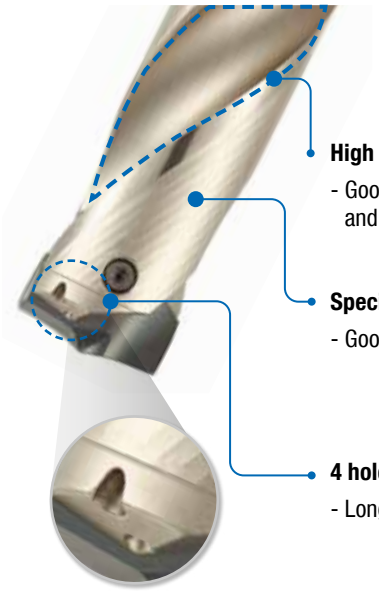
- Stable centering and machinability



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.

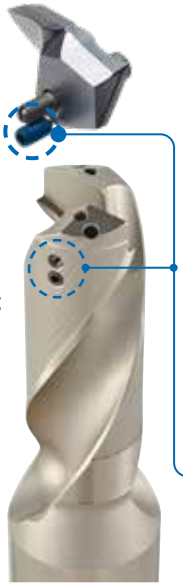
# TPDB-H - Holder features

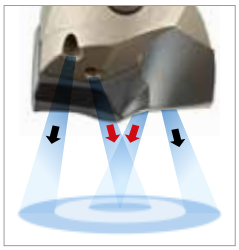


**High helix angle**
- Good chip evacuation and machinability

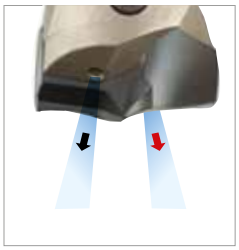
**Special surface treatment**
- Good holder durability

**4 hole cooling system**
- Long tool life





TPDB-H

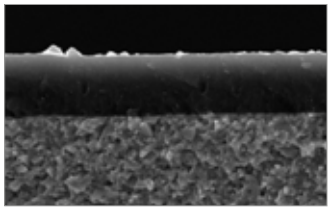


Competitor

Concentrated coolant injection on delicate cutting edge increases tool life.

**Sub screw**
- Increased clamping force and clamping stability

## Grade features



**PC340UL**

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

## Performance evaluation

### Chip control

| | |
|---|---|
| **Workpiece** | Carbon steel (SM355A, HRC20) |
| **Cutting condition** | vc = 80 m/min · fn = 0,20 mm/rev<br>ap = 30 mm · wet |
| **Tool** | Insert TPD240BP-H (PC340UL) |
| | Holder TPDBP240-32S-4-H<br>(Drill dia. Ø = 24 mm) |

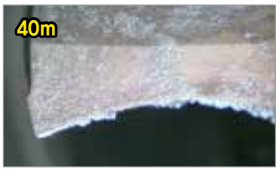

TPDB-H

Competitor

### Wear resistance

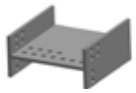
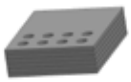
| | |
|---|---|
| **Workpiece** | Carbon steel (SM355A, HRC20) |
| **Cutting condition** | vc = 80 m/min · fn = 0,23 mm/rev<br>ap = 50 mm · wet |
| **Tool** | Insert TPD240BP-H (PC340UL) |
| | Holder TPDBP240-32S-4-H<br>(Drill dia. Ø = 24 mm) |


TPDB-H




Competitor

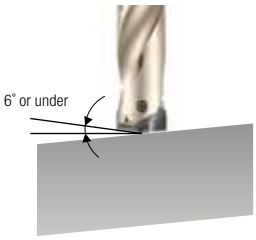
## TPDB-H - Workpiece and recommended cutting conditions

| Workpiece | | | | | Yield Strength (Mpa, min) | Brinell Hardness (HB) | Grade | vc (m/min) | Aspect ratio (L/D) = 3D, 4D, 5D, 8D | |
|---|---|---|---|---|---|---|---|---|---|---|
| ISO | Workpiece material | | KS | AISI | | | | | fn (mm/rev) | |
| | | | | | | | | | Ø14 - Ø21,9 | Ø22 - Ø30,9 |
| P | H-Beam |  | SS275 (SS400*) SM355 (SM490*) SHN355 (SHN490*) | A36 A572 | 275 355 355 (t≤16) | - | PC340UL | 60 - 75 | 0.25 - 0.2 | 0.3 - 0.2 |
| | Angle |  | | | | | PC340UL | 60 - 75 | 0.25 - 0.2 | 0.3 - 0.2 |
| | Plate |  | | | | | PC340UL | 60 - 75 | 0.25 - 0.2 | 0.3 - 0.2 |
| | Plate (Stacked) |  | | | | | PC340UL | 55 - 65 | 0.25 - 0.15 | 0.25 - 0.15 |

* : Old symbol

## Precaution in Drilling

### Angled surface

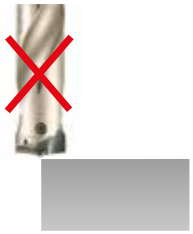



The approach angle between Drill and the workpiece at the beginning and the end should be less than 6°.
Reduce the feed (fn) to 30-50% than general cutting conditions at the beginning and the end of angled surface.

### Stacked plates

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

### Plunging



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

### Boring

Boring is not recommended.

# TPDB-H - Performance evaluation

## Carbon steel (SM355)

| | |
|---|---|
| **Cutting condition** | vc = 47 m/min · fn = 0,24 mm/rev · ap = 50 mm · Wet |
| **Tool** | Insert TPD240BP-H (PC340UL)<br>Holder TPDBP240-32S-4-H (Drill dia. Ø = 24 mm) |
| **Tool life** | 64 m (Normal wear) |

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

## Carbon steel (SM355)

| | |
|---|---|
| **Cutting condition** | vc = 80 m/min · fn = 0,27 mm/rev · ap = 25 mm · Wet |
| **Tool** | Insert TPD220BP-H (PC340UL)<br>Holder TPDBP220-25S-4-H (Drill dia. Ø = 22 mm) |
| **Tool life** | 41 m (Normal wear) |

» High speed and high feed machining saves machining hours.

## Carbon steel (SS275)

| | |
|---|---|
| **Cutting condition** | vc = 70 m/min · fn = 0,23 mm/rev · ap = 30 mm · Wet |
| **Tool** | Insert TPD260BP-H (PC340UL)<br>Holder TPDBP260-32S-4-H (Drill dia. Ø = 26 mm) |
| **Tool life** | 35 m (Normal wear) |

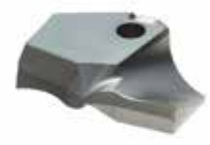
» Stable machinability and long tool life are realized in machining various workpieces such as SM355, SS275, SHN355 etc.

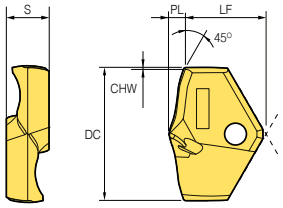
## Carbon steel (SM355)

| | |
|---|---|
| **Cutting condition** | vc = 56 m/min · fn = 0,31 mm/rev · ap = 40 mm · Wet |
| **Tool** | Insert TPD270BP-H (PC340UL)<br>Holder TPDBP270-32S-4-H (Drill dia. Ø = 26 mm) |
| **Tool life** | 47 m (Normal wear) |

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

# TPDB-H - Insert






(mm)

| Designation | | Grade | DC | LF | PL | S | CHW |
|---|---|---|---|---|---|---|---|
| | | PC340UL | | | | | |
| TPD | 140BP-H | ▲ | 14.0 | 9.45 | 1.17 | 4.0 | 0.05 |
| | 150BP-H | ○ | 15.0 | 9.83 | 1.26 | 4.0 | 0.05 |
| | 160BP-H | ▲ | 16.0 | 10.73 | 1.39 | 5.5 | 0.07 |
| | 170BP-H | ○ | 17.0 | 11.14 | 1.48 | 5.5 | 0.07 |
| | 180BP-H | ▲ | 18.0 | 12.15 | 1.51 | 6.0 | 0.07 |
| | 190BP-H | ○ | 19.0 | 12.54 | 1.60 | 6.0 | 0.07 |
| | 200BP-H | ▲ | 20.0 | 13.45 | 1.67 | 6.5 | 0.07 |
| | 210BP-H | ○ | 21.0 | 13.86 | 1.76 | 6.5 | 0.07 |
| | 220BP-H | ▲ | 22.0 | 14.54 | 1.89 | 7.0 | 0.09 |
| | 230BP-H | ○ | 23.0 | 14.70 | 1.94 | 7.0 | 0.09 |
| | 240BP-H | ▲ | 24.0 | 15.56 | 2.02 | 7.5 | 0.09 |
| | 250BP-H | ○ | 25.0 | 15.98 | 2.10 | 7.5 | 0.09 |
| | 260BP-H | ▲ | 26.0 | 16.35 | 2.20 | 8.5 | 0.09 |
| | 270BP-H | ● | 27.0 | 17.43 | 2.28 | 8.5 | 0.11 |
| | 280BP-H | ▲ | 28.0 | 18.26 | 2.32 | 9.5 | 0.11 |
| | 290BP-H | ○ | 29.0 | 18.64 | 2.55 | 9.5 | 0.11 |
| | 300BP-H | ▲ | 30.0 | 19.03 | 2.61 | 10.0 | 0.11 |
| | 310BP-H | ○ | 31.0 | 19.44 | 2.70 | 10.0 | 0.11 |
| | 320BP-H | ▲ | 32.0 | 19.85 | 2.79 | 10.0 | 0.11 |

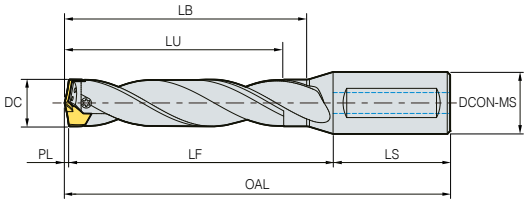
# Parts

| Designation | | Drill dia, Ø DC (mm) | Screw | Wrench | Sub screw | Sub screw wrench |
|---|---|---|---|---|---|---|
| TPD | TPD140BP-H - 159BP-H | Ø14,0-Ø15,9 | FTNB02512-P | TW07S | - | - |
| | TPD160BP-H - 179BP-H | Ø16,0-Ø17,9 | FTNB02514-P | TW07S | KHMA02505 | HW13LB |
| | TPD180BP-H - 199BP-H | Ø18,0-Ø19,9 | FTNB0316-P | TW09S | KHMA02505 | HW13LB |
| | TPD200BP-H - 239BP-H | Ø20,0-Ø23,9 | FTNB0319 | TW09S | KHMA0306 | HW15L |
| | TPD240BP-H - 259BP-H | Ø24,0-Ø25,9 | FTNB03522 | TW15S | KHMA0308 | HW15L |
| | TPD260BP-H - 279BP-H | Ø26,0-Ø27,9 | FTNB03524 | TW15S | KHMA0308 | HW15L |
| | TPD280BP-H - 299BP-H | Ø28,0-Ø29,9 | FTNB0426 | TW15S | KHMA0410 | HW20L |
| | TPD300BP-H - 329BP-H | Ø30,0-Ø32,9 | FTNB0528 | TW20-100 | KHMA0410 | HW20L |

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

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

# TPDB-H - 3D / 4D

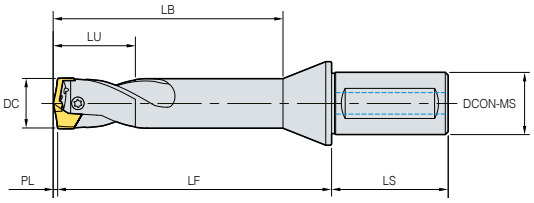



(mm)

| Designation | | Stock | DC | DCON-MS | LU | LF | LB | LS | OAL | PL | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPDBP 3D | 140-16S-3-H | ▲ | 14.0-14.9 | 16.0 | 35.67 | 48.83 | 43.17 | 48.0 | 98.0 | 1.17 | TPD140BP-H-149BP-H |
| | 150-20S-3-H | ○ | 15.0-15.9 | 20.0 | 38.29 | 52.21 | 46.29 | 50.0 | 103.5 | 1.29 | TPD150BP-H-159BP-H |
| | 160-20S-3-H | ▲ | 16.0-16.9 | 20.0 | 40.89 | 55.11 | 49.39 | 50.0 | 106.5 | 1.39 | TPD160BP-H-169BP-H |
| | 170-20S-3-H | ○ | 17.0-17.9 | 20.0 | 43.48 | 58.02 | 52.48 | 50.0 | 109.5 | 1.48 | TPD170BP-H-179BP-H |
| | 180-20S-3-H | ▲ | 18.0-18.9 | 20.0 | 46.01 | 62.49 | 55.51 | 50.0 | 114.0 | 1.51 | TPD180BP-H-189BP-H |
| | 190-20S-3-H | ○ | 19.0-19.9 | 20.0 | 48.60 | 67.40 | 58.60 | 50.0 | 119.0 | 1.60 | TPD190BP-H-199BP-H |
| | 200-25S-3-H | ▲ | 20.0-20.9 | 25.0 | 51.17 | 76.33 | 61.67 | 56.0 | 128.0 | 1.67 | TPD200BP-H-209BP-H |
| | 210-25S-3-H | ○ | 21.0-21.9 | 25.0 | 53.76 | 73.24 | 64.76 | 56.0 | 131.0 | 1.76 | TPD210BP-H-219BP-H |
| | 220-25S-3-H | ▲ | 22.0-22.9 | 25.0 | 56.39 | 76.11 | 67.89 | 56.0 | 134.0 | 1.89 | TPD220BP-H-229BP-H |
| | 230-25S-3-H | ○ | 23.0-23.9 | 25.0 | 58.94 | 79.06 | 70.94 | 56.0 | 137.0 | 1.94 | TPD230BP-H-239BP-H |
| | 240-32S-3-H | ▲ | 24.0-24.9 | 32.0 | 61.52 | 84.78 | 74.02 | 60.0 | 146.8 | 2.02 | TPD240BP-H-249BP-H |
| | 250-32S-3-H | ○ | 25.0-25.9 | 32.0 | 64.10 | 84.90 | 77.10 | 60.0 | 147.0 | 2.10 | TPD250BP-H-259BP-H |
| | 260-32S-3-H | ▲ | 26.0-26.9 | 32.0 | 66.73 | 87.77 | 80.23 | 60.0 | 150.0 | 2.23 | TPD260BP-H-269BP-H |
| | 270-32S-3-H | ● | 27.0-27.9 | 32.0 | 69.28 | 90.72 | 83.28 | 60.0 | 153.0 | 2.28 | TPD270BP-H-279BP-H |
| | 280-32S-3-H | ○ | 28.0-28.9 | 32.0 | 71.82 | 93.68 | 86.32 | 60.0 | 156.0 | 2.32 | TPD280BP-H-289BP-H |
| | 290-32S-3-H | ○ | 29.0-29.9 | 32.0 | 74.55 | 96.45 | 89.55 | 60.0 | 159.0 | 2.55 | TPD290BP-H-299BP-H |
| | 300-32S-3-H | ▲ | 30.0-30.9 | 32.0 | 77.11 | 99.39 | 92.61 | 60.0 | 162.0 | 2.61 | TPD300BP-H-309BP-H |
| | 310-32S-3-H | ○ | 31.0-31.9 | 32.0 | 79.70 | 102.30 | 95.70 | 60.0 | 165.0 | 2.70 | TPD310BP-H-319BP-H |
| | 320-32S-3-H | ▲ | 32.0-32.9 | 32.0 | 82.29 | 105.21 | 98.79 | 60.0 | 168.0 | 2.79 | TPD320BP-H-329BP-H |
| TPDBP 4D | 140-16S-4-H | ○ | 14.0-14.9 | 16.0 | 49.67 | 62.83 | 57.17 | 48.0 | 112.0 | 1.17 | TPD140BP-H-149BP-H |
| | 150-20S-4-H | ○ | 15.0-15.9 | 20.0 | 53.29 | 67.21 | 61.29 | 50.0 | 118.5 | 1.29 | TPD150BP-H-159BP-H |
| | 160-20S-4-H | ○ | 16.0-16.9 | 20.0 | 56.89 | 71.11 | 65.39 | 50.0 | 122.5 | 1.39 | TPD160BP-H-169BP-H |
| | 170-20S-4-H | ○ | 17.0-17.9 | 20.0 | 60.48 | 75.02 | 69.48 | 50.0 | 126.5 | 1.48 | TPD170BP-H-179BP-H |
| | 180-20S-4-H | ○ | 18.0-18.9 | 20.0 | 64.01 | 80.49 | 73.51 | 50.0 | 132.0 | 1.51 | TPD180BP-H-189BP-H |
| | 190-20S-4-H | ○ | 19.0-19.9 | 20.0 | 67.60 | 86.40 | 77.60 | 50.0 | 138.0 | 1.60 | TPD190BP-H-199BP-H |
| | 200-25S-4-H | ○ | 20.0-20.9 | 25.0 | 71.17 | 96.33 | 81.67 | 56.0 | 148.0 | 1.67 | TPD200BP-H-209BP-H |
| | 210-25S-4-H | ○ | 21.0-21.9 | 25.0 | 74.76 | 94.24 | 85.76 | 56.0 | 152.0 | 1.76 | TPD210BP-H-219BP-H |
| | 220-25S-4-H | ● | 22.0-22.9 | 25.0 | 78.39 | 98.11 | 89.89 | 56.0 | 156.0 | 1.89 | TPD220BP-H-229BP-H |
| | 230-25S-4-H | ○ | 23.0-23.9 | 25.0 | 81.94 | 102.06 | 93.94 | 56.0 | 160.0 | 1.94 | TPD230BP-H-239BP-H |
| | 240-32S-4-H | ● | 24.0-24.9 | 32.0 | 85.52 | 108.78 | 98.02 | 60.0 | 170.8 | 2.02 | TPD240BP-H-249BP-H |
| | 250-32S-4-H | ○ | 25.0-25.9 | 32.0 | 89.10 | 109.90 | 102.10 | 60.0 | 172.0 | 2.10 | TPD250BP-H-259BP-H |
| | 260-32S-4-H | ● | 26.0-26.9 | 32.0 | 92.73 | 113.77 | 106.23 | 60.0 | 176.0 | 2.23 | TPD260BP-H-269BP-H |
| | 270-32S-4-H | ● | 27.0-27.9 | 32.0 | 96.28 | 117.72 | 110.28 | 60.0 | 180.0 | 2.28 | TPD270BP-H-279BP-H |
| | 280-32S-4-H | ○ | 28.0-28.9 | 32.0 | 99.82 | 121.68 | 114.32 | 60.0 | 184.0 | 2.32 | TPD280BP-H-289BP-H |
| | 290-32S-4-H | ○ | 29.0-29.9 | 32.0 | 103.55 | 125.45 | 118.55 | 60.0 | 188.0 | 2.55 | TPD290BP-H-299BP-H |
| | 300-32S-4-H | ○ | 30.0-30.9 | 32.0 | 107.11 | 129.39 | 122.61 | 60.0 | 192.0 | 2.61 | TPD300BP-H-309BP-H |
| | 310-32S-4-H | ○ | 31.0-31.9 | 32.0 | 110.70 | 133.30 | 126.70 | 60.0 | 196.0 | 2.70 | TPD310BP-H-319BP-H |
| | 320-32S-4-H | ○ | 32.0-32.9 | 32.0 | 114.29 | 137.21 | 130.79 | 60.0 | 200.0 | 2.79 | TPD320BP-H-329BP-H |

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

# TPDB-H - 5D

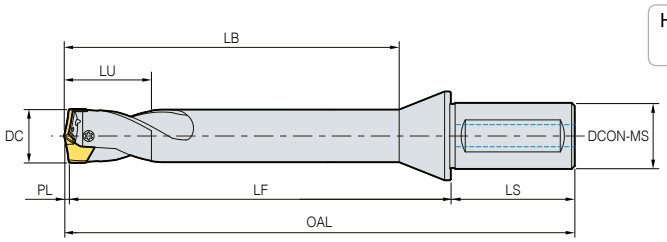



(mm)

| Designation | | Stock | DC | DCON-MS | LU | LF | LB | LS | OAL | PL | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPDBP 5D | **140-16-345-5-H** | ▲ | 14,0-14,9 | 16,0 | 35,67 | 83,83 | 71,17 | 48,0 | 133,0 | 1,17 | TPD140BP-H-149BP-H |
| | **150-20-370-5-H** | ○ | 15,0-15,9 | 20,0 | 38,29 | 90,21 | 76,29 | 50,0 | 141,5 | 1,29 | TPD150BP-H-159BP-H |
| | **160-20-395-5-H** | ▲ | 16,0-16,9 | 20,0 | 40,89 | 95,11 | 81,39 | 50,0 | 146,5 | 1,39 | TPD160BP-H-169BP-H |
| | **170-20-420-5-H** | ○ | 17,0-17,9 | 20,0 | 43,48 | 100,02 | 86,48 | 50,0 | 151,5 | 1,48 | TPD170BP-H-179BP-H |
| | **180-20-445-5-H** | ▲ | 18,0-18,9 | 20,0 | 46,01 | 106,49 | 91,51 | 50,0 | 158,0 | 1,51 | TPD180BP-H-189BP-H |
| | **190-20-470-5-H** | ○ | 19,0-19,9 | 20,0 | 48,60 | 113,40 | 96,60 | 50,0 | 165,0 | 1,60 | TPD190BP-H-199BP-H |
| | **200-25-495-5-H** | ▲ | 20,0-20,9 | 25,0 | 51,17 | 123,33 | 101,67 | 56,0 | 175,0 | 1,67 | TPD200BP-H-209BP-H |
| | **210-25-520-5-H** | ○ | 21,0-21,9 | 25,0 | 53,76 | 122,24 | 106,76 | 56,0 | 180,0 | 1,76 | TPD210BP-H-219BP-H |
| | **220-25-545-5-H** | ▲ | 22,0-22,9 | 25,0 | 56,39 | 127,11 | 111,89 | 56,0 | 185,0 | 1,89 | TPD220BP-H-229BP-H |
| | **230-25-570-5-H** | ○ | 23,0-23,9 | 25,0 | 58,94 | 132,06 | 116,94 | 56,0 | 190,0 | 1,94 | TPD230BP-H-239BP-H |
| | **240-32-595-5-H** | ▲ | 24,0-24,9 | 32,0 | 61,52 | 144,78 | 122,02 | 60,0 | 206,8 | 2,02 | TPD240BP-H-249BP-H |
| | **250-32-620-5-H** | ○ | 25,0-25,9 | 32,0 | 64,10 | 146,90 | 127,10 | 60,0 | 209,0 | 2,10 | TPD250BP-H-259BP-H |
| | **260-32-645-5-H** | ▲ | 26,0-26,9 | 32,0 | 66,73 | 151,77 | 132,23 | 60,0 | 214,0 | 2,23 | TPD260BP-H-269BP-H |
| | **270-32-670-5-H** | ○ | 27,0-27,9 | 32,0 | 69,28 | 156,72 | 137,28 | 60,0 | 219,0 | 2,28 | TPD270BP-H-279BP-H |
| | **280-32-695-5-H** | ○ | 28,0-28,9 | 32,0 | 71,82 | 161,68 | 142,32 | 60,0 | 224,0 | 2,32 | TPD280BP-H-289BP-H |
| | **290-32-720-5-H** | ○ | 29,0-29,9 | 32,0 | 74,55 | 166,45 | 147,55 | 60,0 | 229,0 | 2,55 | TPD290BP-H-299BP-H |
| | **300-32-745-5-H** | ▲ | 30,0-30,9 | 32,0 | 77,11 | 171,39 | 152,61 | 60,0 | 234,0 | 2,61 | TPD300BP-H-309BP-H |
| | **310-32-770-5-H** | ○ | 31,0-31,9 | 32,0 | 79,70 | 176,30 | 157,70 | 60,0 | 239,0 | 2,70 | TPD310BP-H-319BP-H |
| | **320-32-795-5-H** | ▲ | 32,0-32,9 | 32,0 | 82,29 | 181,21 | 162,79 | 60,0 | 244,0 | 2,79 | TPD320BP-H-329BP-H |

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

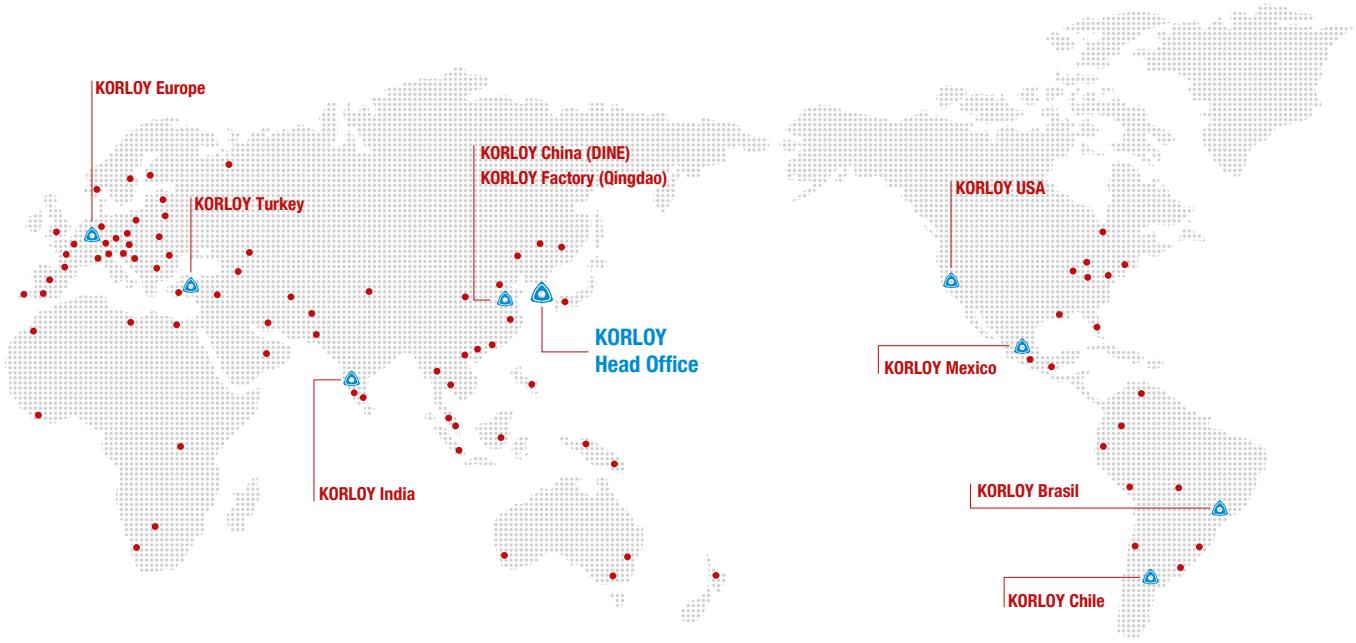
# TPDB-H - 8D




(mm)

| Designation | | Stock | DC | DCON-MS | LU | LF | LB | LS | OAL | PL | Insert |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPDBP 8D | 140-16-345-8-H | ▲ | 14,0-14,9 | 16,0 | 35,67 | 125,83 | 113,17 | 48,0 | 175,0 | 1,17 | TPD140BP-H-149BP-H |
| | 150-20-370-8-H | ○ | 15,0-15,9 | 20,0 | 38,29 | 135,21 | 121,29 | 50,0 | 186,5 | 1,29 | TPD150BP-H-159BP-H |
| | 160-20-395-8-H | ▲ | 16,0-16,9 | 20,0 | 40,89 | 143,11 | 129,39 | 50,0 | 194,5 | 1,39 | TPD160BP-H-169BP-H |
| | 170-20-420-8-H | ○ | 17,0-17,9 | 20,0 | 43,48 | 151,02 | 137,48 | 50,0 | 202,5 | 1,48 | TPD170BP-H-179BP-H |
| | 180-20-445-8-H | ▲ | 18,0-18,9 | 20,0 | 46,01 | 160,49 | 145,51 | 50,0 | 212,0 | 1,51 | TPD180BP-H-189BP-H |
| | 190-20-470-8-H | ○ | 19,0-19,9 | 20,0 | 48,60 | 170,40 | 153,60 | 50,0 | 222,0 | 1,60 | TPD190BP-H-199BP-H |
| | 200-25-495-8-H | ▲ | 20,0-20,9 | 25,0 | 51,17 | 183,33 | 161,67 | 56,0 | 235,0 | 1,67 | TPD200BP-H-209BP-H |
| | 210-25-520-8-H | ○ | 21,0-21,9 | 25,0 | 53,76 | 185,24 | 169,76 | 56,0 | 243,0 | 1,76 | TPD210BP-H-219BP-H |
| | 220-25-545-8-H | ▲ | 22,0-22,9 | 25,0 | 56,39 | 193,11 | 177,89 | 56,0 | 251,0 | 1,89 | TPD220BP-H-229BP-H |
| | 230-25-570-8-H | ○ | 23,0-23,9 | 25,0 | 58,94 | 201,06 | 185,94 | 56,0 | 259,0 | 1,94 | TPD230BP-H-239BP-H |
| | 240-32-595-8-H | ○ | 24,0-24,9 | 32,0 | 61,52 | 216,78 | 194,02 | 60,0 | 278,8 | 2,02 | TPD240BP-H-249BP-H |
| | 250-32-620-8-H | ○ | 25,0-25,9 | 32,0 | 64,10 | 221,90 | 202,10 | 60,0 | 284,0 | 2,10 | TPD250BP-H-259BP-H |
| | 260-32-645-8-H | ○ | 26,0-26,9 | 32,0 | 66,73 | 229,77 | 210,23 | 60,0 | 292,0 | 2,23 | TPD260BP-H-269BP-H |
| | 270-32-670-8-H | ○ | 27,0-27,9 | 32,0 | 69,28 | 237,72 | 218,28 | 60,0 | 300,0 | 2,28 | TPD270BP-H-279BP-H |
| | 280-32-695-8-H | ○ | 28,0-28,9 | 32,0 | 71,82 | 245,68 | 226,32 | 60,0 | 308,0 | 2,32 | TPD280BP-H-289BP-H |
| | 290-32-720-8-H | ○ | 29,0-29,9 | 32,0 | 74,55 | 253,45 | 234,55 | 60,0 | 316,0 | 2,55 | TPD290BP-H-299BP-H |
| | 300-32-745-8-H | ○ | 30,0-30,9 | 32,0 | 77,11 | 261,39 | 242,61 | 60,0 | 324,0 | 2,61 | TPD300BP-H-309BP-H |
| | 310-32-770-8-H | ○ | 31,0-31,9 | 32,0 | 79,70 | 269,30 | 250,70 | 60,0 | 332,0 | 2,70 | TPD310BP-H-319BP-H |
| | 320-32-795-8-H | ○ | 32,0-32,9 | 32,0 | 82,29 | 277,21 | 258,79 | 60,0 | 340,0 | 2,79 | TPD320BP-H-329BP-H |

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

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