Indexable Flat Drill

Vol 2

# OSG PHOENIX® PDZ

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# OSG PHOENIX® PDZ

***Indexable Flat Drill***

*An indexable drill series designed for stable flat-bottom holemaking. It is an ideal solution for a wide variety of materials such as carbon and alloy steel, stainless steel, and cast iron.*

**List 52513**
PDZ-2D (Inch)

**List 78537**
PDZ-2D (Metric)

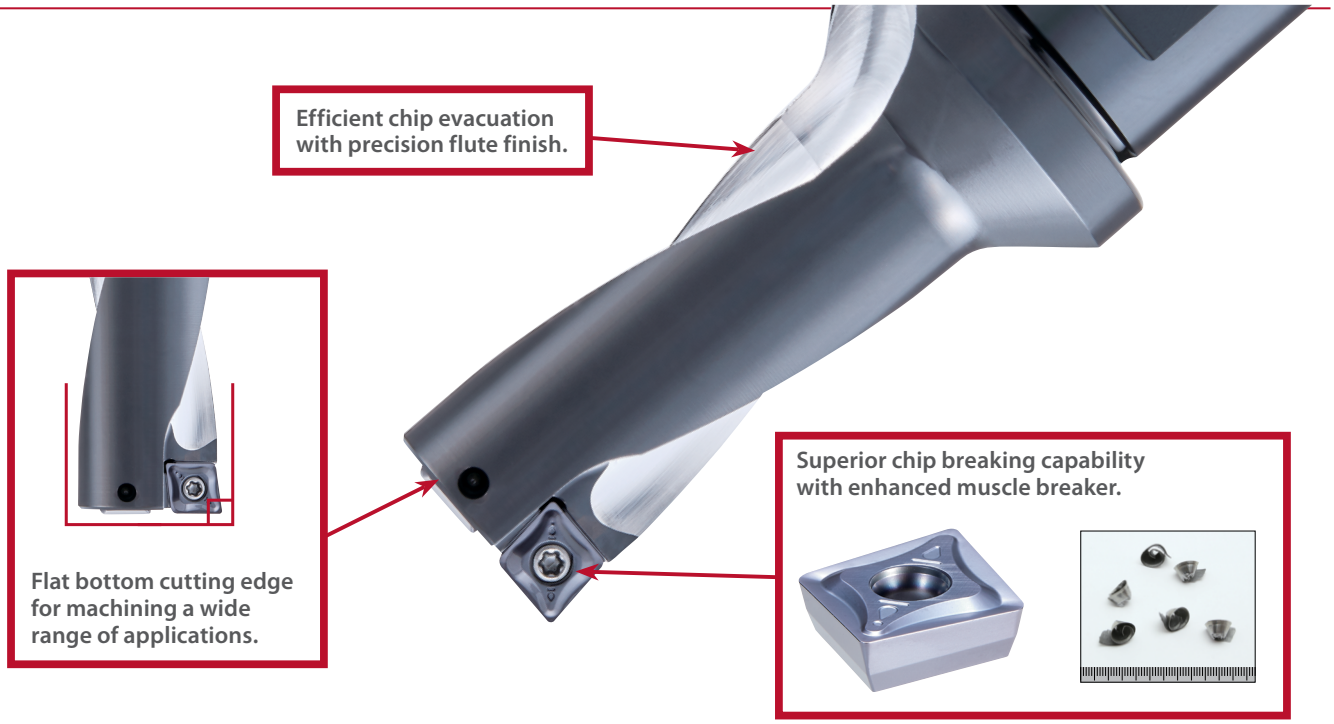
**List 52514**
PDZ-3D (Inch)

**List 78538**
PDZ-3D (Metric)

**List 78PZAG**
PZAG Inserts for PDZ

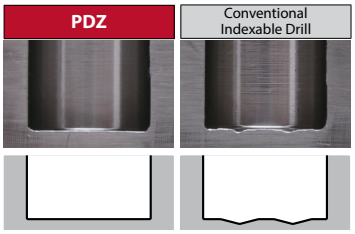
**List 7808H**
PDZ Accessories

# Features & Benefits

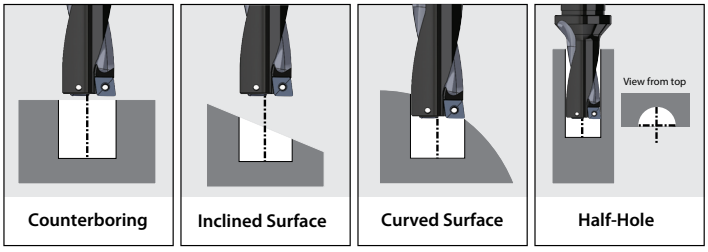



## Flat Bottom Cutting Edge Configuration

The PDZ's flat bottom cutting edge configuration makes it compatible with a wide range of applications including drilling, counterboring, inclined surface drilling and more.




Bottom Hole Shape Comparison
Ø20 • Work Material: 1050 Steel




## Superior Chip Breaking Capability

The PDZ has superior chip breaking capability during drilling, counterboring and turning.

**Excellent chip breaking capability with the enhanced muscle breaker.**

- Uses the same insert as the PZAG counterboring cutter and the PMD multi-function cutter series
- Economical 4-corner insert design maximizes cost efficiency, with the same insert applicable to both peripheral and center cutting edge*

*2 corners for the peripheral cutting edge and 2 corners for the center cutting edge, adding up to a total of 4 corners.

Ø20 hole processing
(non-step drilling)
**Work Material:** 1050 Steel
**Cutting Conditions:**
Vc=492 SFM • f=0.004 in/rev

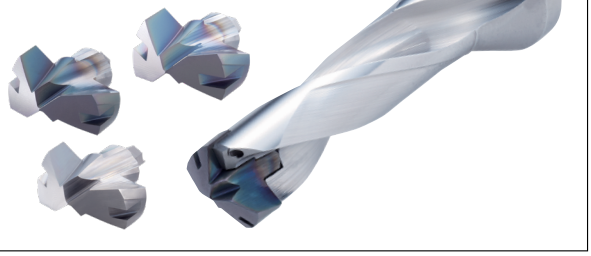
## Efficient Chip Evacuation

High precision finishing on flute improves rigidity, chip evacuation and reduces cutting force.

## OSG Product Lineup for Indexable Holemaking

### PXD Exchangeable Head Drill for 3D, 5D

- OSG's proprietary construction ensures secure mounting
- Internal coolant capability enables highly efficient drilling
- Smooth chip evacuation

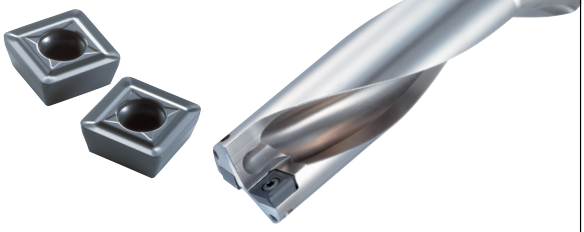


### PD Indexable Drill

- The same insert is used for both the peripheral and center cutting edge
- Supports 2 x D up to 5 x D
- Extensive lineup

### PHP Indexable Drill for 3D

- Unique design supports many types of drilling
  ☑ Inclined plane ☑ Cast surface ☑ Stacked plates
- High rigidity of body



### PDZ Indexable Flat Drill

- Flat bottom cutting edge configuration
- Efficient chip evacuation
- Superior chip breaking capability during drilling, counterboring, and turning

## OSG Product Lineup for Flat-Bottom Holemaking

| | PDZ | PZAG | PMD |
|---|---|---|---|
| |  |  |  |
| **Shape** | Indexable Flat Drill | Counterboring Cutter | Multi-Function Cutter |
| **Bottom Hole Shape** | Flat | Flat | Flat |
| **Drilling Efficiency** | ○ | ◎ | Δ |
| **Requires a Pilot Hole when Drilling** | No | Yes | No |
| **Horizontal Milling** | No | No | Yes |
| **Insert designation** | ZPNT… | ZPNT… | ZPNT... (center)<br>ZDKT... (peripheral) |

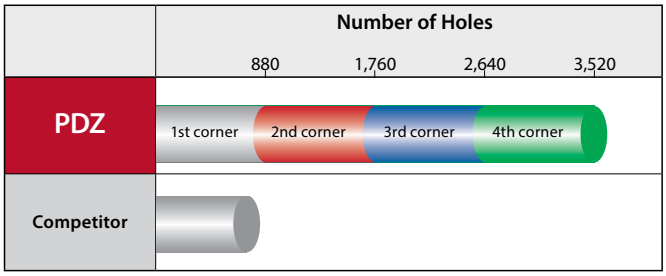
○ good ◎ best

# Processing Data

## » Higher Cost Performance than Exchangeable Head Drills - 1050 Carbon Steel

PDZ was able to process over 3,500 holes per insert with 1.5 times the efficiency, compared to 880 holes by the competitor's exchangeable head drill.

| Tool | PDZ1600FS20M05-2D | Competitor Exchangeable Head Drill |
|---|---|---|
| Insert (grade) | ZPNT050204EN (XP8030) | - |
| Work Material | 1050 Carbon Steel | |
| Cutting Speed | 2984 RPM (492 SFM) | 1989 RPM (328 SFM) |
| Feed | 11.7 IPM (0.004 in/rev) | 7.8 IPM (0.004 in/rev) |
| Depth of Hole | 0.945 in (Through) | |
| Coolant | Water-soluble | |
| Machine | HMC | |

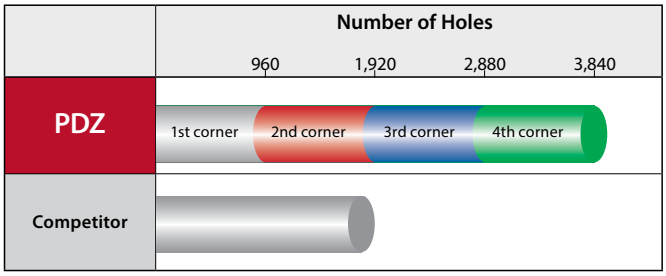




## » Higher Cost Performance than Exchangeable Head Drills - 304 Stainless Steel

PDZ was able to process over 3,800 holes per insert, compared to 1,900 holes by the competitor's exchangeable head drill.

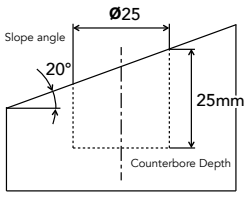
| Tool | PDZ1600FS20M05-2D | Competitor Exchangeable Head Drill |
|---|---|---|
| Insert (grade) | ZPNT050204EN (XP8030) | - |
| Work Material | 304 Stainless Steel | |
| Cutting Speed | 1591 RPM (262 SFM) | |
| Feed | 3.1 IPM (0.002 in/rev) | |
| Depth of Hole | 0.945 in (Through) | |
| Coolant | Water-soluble | |
| Machine | HMC | |




# Processing Data

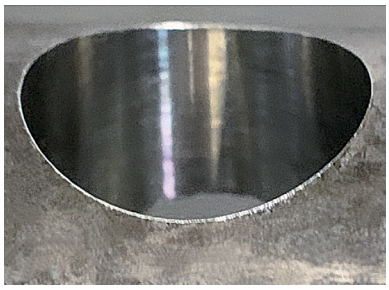
## » Efficient Drilling on Angled Surfaces - 1050 Carbon Steel

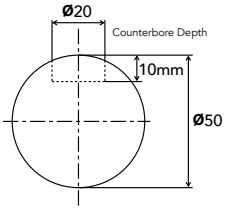
| Tool | PDZ2500FS25M07-2D |
|---|---|
| Insert (grade) | ZPNT070304EN (XP8030) |
| Work Material | 1050 Carbon Steel |
| Cutting Speed | 764 RPM (196 SFM) |
| Feed | 1.8 IPM (0.002 in/rev) |
| Depth of Hole | 0.984 in (20° incline) |
| Coolant | Air |
| Machine | HMC |




## » Efficient Drilling on Curved Surfaces - 4118 Alloy Steel

| Tool | PDZ2000FS25M06-2D |
|---|---|
| Insert (grade) | ZPNT060204EN (XP8030) |
| Work Material | 4118 Alloy Steel |
| Cutting Speed | 800 RPM (164 SFM) |
| Feed | 3.1 IPM (0.004 in/rev) |
| Depth of Hole | 0.394 in |
| Coolant | Water-Soluble |
| Machine | Multifunction Lathe |

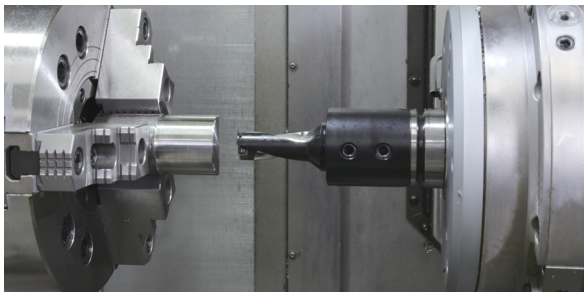




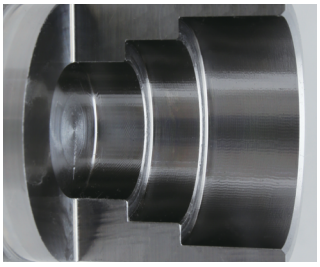
# Processing Data

## Multiple Operations by Turning - 4140 Alloy Steel

| Tool | PDZ2500FS25M07-2D | |
|---|---|---|
| Insert (grade) | ZPNT070304EN (XP8030) | |
| Work Material | 4140 Alloy Steel | |
| Operation | Drilling | Contouring |
| Cutting Speed | 1273 RPM (328 SFM) | 328 SFM |
| Feed | 5.0 IPM (0.004 in/rev) | 0.0047 in/rev<br>Aa = 0.079 (4 passes) |
| Coolant | Air | |
| Machine | Multifunction Lathe | |



**Workpiece**

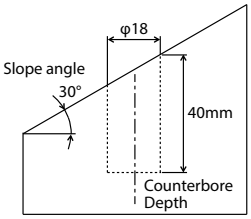


## Counterboring in Inclined Surfaces - Carbon Steel

Good hole shape and stable hole quality were obtained in the counterboring of inclined surface.

| Tool | PDZ1800FS25M05-3D |
|---|---|
| Insert (grade) | ZPNT050204EN (XP8030) |
| Work Material | Carbon Steel |
| Cutting Speed | 1,062 RPM (197 SFM) |
| Feed | 1.7 IPM (0.0016 in/rev) |
| Counterbore Depth | Counterboring: 1.575 in<br>Slope Angle: 30˚ |
| Coolant | Water-Soluble (Internal) |
| Machine | Vertical Machining Center |

**PDZ**



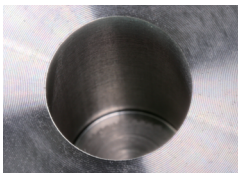
# Processing Data

## » Counterboring on NC Lathe - Medium Carbon Steel

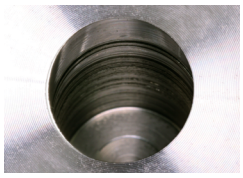
When counterboring on a NC lathe, vibration occurred with the competitor product and the machined surface deteriorated. The PDZ, on the other hand, demonstrated stable machining and achieved good machined surface.

| Tool | PDZ1600FS20M05-3D | Competitor |
|---|---|---|
| Insert (grade) | ZPNT050204EN (XP8030) | Coated Carbide Insert |
| Work Material | Medium Carbon Steel | |
| Cutting Speed | 2,986 RPM (492 SFM) | |
| Feed | 9.4 IPM (0.0031 in/rev) | |
| Counterbore Depth | 1.890 in | |
| Coolant | Water-Soluble (Internal) | |
| Machine | Compound Machine | |

PDZ



Competitor

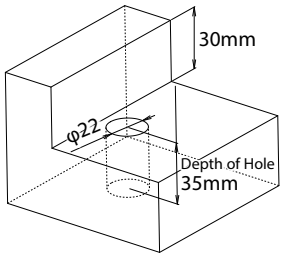


## » 3D Overhang Length Machining with Interference - Cast Iron

Drilling at a depth of 35 mm (1.6D) with interference. The PDZ 3D type was used to avoid interference. Due to the high rigidity of the drill body, it was possible to machine at a more aggressive cutting condition than the competitor's exchangeable head drill..

| Tool | PDZ2200FS25M06-3D | Competitor Exchangeable Head Drill |
|---|---|---|
| Insert (grade) | ZPNT060204EN (XP8030) | – |
| Work Material | Cast Iron | |
| Cutting Speed | 2,170 RPM (492 SFM) | 1,013 RPM (230 SFM) |
| Feed | 10.2 IPM (0.0047 in/rev) | 7.2 IPM (0.0071 in/rev) |
| Counterbore Depth | 1.378 in | |
| Coolant | Water-Soluble (Internal) | |
| Machine | Vertical Machining Center | |

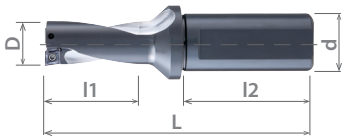
PDZ



# List 52513

NEW | SPEED FEED P18-19 | INSERTS P13 | ACCS. P14 | STEEL | 2 FLUTE | PACKED 1 PIECE

**OSG PHOENIX® PDZ-2D, Flat Shank**




| EDP Number | | Designation | Diameter D (in) | Drilling Depth l1 (in) | Overall Length L (in) | Shank Diameter d (in) | Shank Length l2 (in) | Applicable Insert |
|---|---|---|---|---|---|---|---|---|
| 52513002 | ● | PDZ0688FS075A05-2D | 0.688 | 1.375 | 4.053 | 0.750 | 1.969 | ZPNT05 |
| 52513003 | ● | PDZ0750FS100A06-2D | 0.750 | 1.500 | 4.413 | 1.000 | 2.205 | ZPNT06 |
| 52513004 | ● | PDZ0812FS100A06-2D | 0.813 | 1.625 | 4.537 | 1.000 | 2.205 | ZPNT06 |
| 52513005 | ● | PDZ0875FS100A06-2D | 0.875 | 1.750 | 4.860 | 1.000 | 2.205 | ZPNT06 |
| 52513006 | ● | PDZ0937FS125A07-2D | 0.938 | 1.875 | 5.142 | 1.250 | 2.362 | ZPNT07 |
| 52513007 | ● | PDZ1000FS125A07-2D | 1.000 | 2.000 | 5.268 | 1.250 | 2.362 | ZPNT07 |
| 52513008 | ● | PDZ1062FS125A08-2D | 1.063 | 2.125 | 5.392 | 1.250 | 2.362 | ZPNT08 |
| 52513009 | ● | PDZ1125FS125A08-2D | 1.125 | 2.250 | 5.518 | 1.250 | 2.362 | ZPNT08 |
| 52513010 | ● | PDZ1187FS125A08-2D | 1.188 | 2.375 | 5.642 | 1.250 | 2.362 | ZPNT08 |
| 52513011 | ● | PDZ1250FS125A09-2D | 1.250 | 2.500 | 5.768 | 1.250 | 2.362 | ZPNT09 |
| 52513012 | ● | PDZ1312FS150A09-2D | 1.313 | 2.625 | 6.285 | 1.500 | 2.756 | ZPNT09 |
| 52513013 | ● | PDZ1375FS150A09-2D | 1.375 | 2.750 | 6.411 | 1.500 | 2.756 | ZPNT09 |
| 52513014 | ● | PDZ1437FS150A10-2D | 1.438 | 2.875 | 6.535 | 1.500 | 2.756 | ZPNT10 |
| 52513015 | ● | PDZ1500FS150A10-2D | 1.500 | 3.000 | 6.661 | 1.500 | 2.756 | ZPNT10 |

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

PXT

## DESIGNATION EXPLANATION

**PDZ-0688-FS-075-A-05-2D**

| Series | Diameter | Body Type | Shank Diameter | Units | Insert Size | Drilling Depth |
|---|---|---|---|---|---|---|

See Full Detail on Page 15

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| Steel | Stainless Steel | Cast Iron | Non-Ferrous | HRSA | Hardened Steel |
| ◎ | ◎ | ◎ | ○ | ○ | ○ |

Material recommendation based on inserts compatible with this tool body.

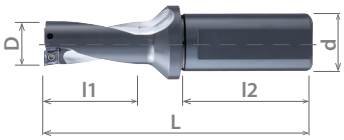
○ Good ◎ Best

# List 78537

NEW

SPEED FEED P18-19 | INSERTS P13 | ACCS. P14 | STEEL | 2 FLUTE | PACKED 1 PIECE

**OSG PHOENIX® PDZ-2D, Flat Shank**




| EDP Number | | Designation | Diameter D (mm) | Drilling Depth l1 (mm) | Overall Length L (mm) | Shank Diameter d (mm) | Shank Length l2 (mm) | Applicable Insert |
|---|---|---|---|---|---|---|---|---|
| 7803776 | ● | PDZ1600FS20M05-2D | 16.00 | 32.00 | 97.00 | 20.00 | 50.00 | ZPNT05 |
| 7803777 | ● | PDZ1650FS20M05-2D | 16.50 | 33.00 | 98.00 | 20.00 | 50.00 | ZPNT05 |
| 7803778 | ● | PDZ1700FS20M05-2D | 17.00 | 34.00 | 102.00 | 20.00 | 50.00 | ZPNT05 |
| 7803779 | ● | PDZ1750FS25M05-2D | 17.50 | 35.00 | 109.00 | 25.00 | 56.00 | ZPNT05 |
| 7803780 | ● | PDZ1800FS25M05-2D | 18.00 | 36.00 | 110.00 | 25.00 | 56.00 | ZPNT05 |
| 7803781 | ● | PDZ1850FS25M05-2D | 18.50 | 37.00 | 111.00 | 25.00 | 56.00 | ZPNT05 |
| 7803782 | ● | PDZ1900FS25M06-2D | 19.00 | 38.00 | 112.00 | 25.00 | 56.00 | ZPNT06 |
| 7803783 | ● | PDZ1950FS25M06-2D | 19.50 | 39.00 | 113.00 | 25.00 | 56.00 | ZPNT06 |
| 7803784 | ● | PDZ2000FS25M06-2D | 20.00 | 40.00 | 114.00 | 25.00 | 56.00 | ZPNT06 |
| 7803785 | ● | PDZ2100FS25M06-2D | 21.00 | 42.00 | 121.00 | 25.00 | 56.00 | ZPNT06 |
| 7803786 | ● | PDZ2200FS25M06-2D | 22.00 | 44.00 | 123.00 | 25.00 | 56.00 | ZPNT06 |
| 7803787 | ● | PDZ2300FS25M07-2D | 23.00 | 46.00 | 125.00 | 25.00 | 56.00 | ZPNT07 |
| 7803788 | ● | PDZ2400FS25M07-2D | 24.00 | 48.00 | 127.00 | 25.00 | 56.00 | ZPNT07 |
| 7803790 | ● | PDZ2500FS32M07-2D | 25.00 | 50.00 | 133.00 | 32.00 | 60.00 | ZPNT07 |
| 7803791 | ● | PDZ2600FS32M07-2D | 26.00 | 52.00 | 135.00 | 32.00 | 60.00 | ZPNT07 |
| 7803792 | ● | PDZ2700FS32M08-2D | 27.00 | 54.00 | 137.00 | 32.00 | 60.00 | ZPNT08 |
| 7803793 | ● | PDZ2800FS32M08-2D | 28.00 | 56.00 | 139.00 | 32.00 | 60.00 | ZPNT08 |
| 7803794 | ● | PDZ2900FS32M08-2D | 29.00 | 58.00 | 141.00 | 32.00 | 60.00 | ZPNT08 |
| 7803795 | ● | PDZ3000FS32M08-2D | 30.00 | 60.00 | 143.00 | 32.00 | 60.00 | ZPNT08 |
| 7803796 | ● | PDZ3100FS32M08-2D | 31.00 | 62.00 | 145.00 | 32.00 | 60.00 | ZPNT08 |
| 7803797 | ● | PDZ3200FS32M09-2D | 32.00 | 64.00 | 147.00 | 32.00 | 60.00 | ZPNT09 |
| 7803798 | ● | PDZ3300FS40M09-2D | 33.00 | 66.00 | 159.00 | 40.00 | 70.00 | ZPNT09 |
| 7803799 | ● | PDZ3400FS40M09-2D | 34.00 | 68.00 | 161.00 | 40.00 | 70.00 | ZPNT09 |
| 7803800 | ● | PDZ3500FS40M10-2D | 35.00 | 70.00 | 163.00 | 40.00 | 70.00 | ZPNT10 |
| 7803801 | ● | PDZ3600FS40M10-2D | 36.00 | 72.00 | 165.00 | 40.00 | 70.00 | ZPNT10 |
| 7803802 | ● | PDZ3700FS40M10-2D | 37.00 | 74.00 | 167.00 | 40.00 | 70.00 | ZPNT10 |
| 7803803 | ● | PDZ3800FS40M10-2D | 38.00 | 76.00 | 169.00 | 40.00 | 70.00 | ZPNT10 |
| 7803804 | ● | PDZ3900FS40M13-2D | 39.00 | 78.00 | 178.00 | 40.00 | 70.00 | ZPNT13 |
| 7803805 | ● | PDZ4000FS40M13-2D | 40.00 | 80.00 | 180.00 | 40.00 | 70.00 | ZPNT13 |
| 7803806 | ● | PDZ4100FS40M13-2D | 41.00 | 82.00 | 182.00 | 40.00 | 70.00 | ZPNT13 |
| 7803807 | ● | PDZ4200FS40M13-2D | 42.00 | 84.00 | 184.00 | 40.00 | 70.00 | ZPNT13 |
| 7803808 | ● | PDZ4300FS40M13-2D | 43.00 | 86.00 | 186.00 | 40.00 | 70.00 | ZPNT13 |

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

PXT

## DESIGNATION EXPLANATION

**PDZ-1600-FS-20-M-05-2D**

Series | Diameter | Body Type | Shank Diameter | Units | Insert Size | Drilling Depth

See Full Detail on Page 15

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| Steel | Stainless Steel | Cast Iron | Non-Ferrous | HRSA | Hardened Steel |
| ◎ | ◎ | ◎ | ○ | ○ | ○ |

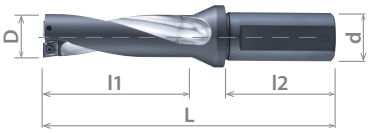
Material recommendation based on inserts compatible with this tool body.

○ Good ◎ Best

# List 52514

NEW | SPEED FEED P18-19 | INSERTS P13 | ACCS. P14 | STEEL | 2 FLUTE | PACKED 1 PIECE

OSG PHOENIX® PDZ-3D, Flat Shank




| EDP Number | | Designation | Diameter D (in) | Drilling Depth l1 (in) | Overall Length L (in) | Shank Diameter d (in) | Shank Length l2 (in) | Applicable Insert |
|---|---|---|---|---|---|---|---|---|
| 52514002 | ● | PDZ0688FS075A05-3D | 0.688 | 2.063 | 4.741 | 0.750 | 1.969 | ZPNT05 |
| 52514003 | ● | PDZ0750FS100A06-3D | 0.750 | 2.250 | 5.163 | 1.000 | 2.205 | ZPNT06 |
| 52514004 | ● | PDZ0812FS100A06-3D | 0.813 | 2.438 | 5.350 | 1.000 | 2.205 | ZPNT06 |
| 52514005 | ● | PDZ0875FS100A06-3D | 0.875 | 2.625 | 5.735 | 1.000 | 2.205 | ZPNT06 |
| 52514006 | ● | PDZ0937FS125A07-3D | 0.938 | 2.813 | 6.080 | 1.250 | 2.362 | ZPNT07 |
| 52514007 | ● | PDZ1000FS125A07-3D | 1.000 | 3.000 | 6.268 | 1.250 | 2.362 | ZPNT07 |
| 52514008 | ● | PDZ1062FS125A08-3D | 1.063 | 3.188 | 6.455 | 1.250 | 2.362 | ZPNT08 |
| 52514009 | ● | PDZ1125FS125A08-3D | 1.125 | 3.375 | 6.643 | 1.250 | 2.362 | ZPNT08 |
| 52514010 | ● | PDZ1187FS125A08-3D | 1.188 | 3.563 | 6.830 | 1.250 | 2.362 | ZPNT08 |
| 52514011 | ● | PDZ1250FS125A09-3D | 1.250 | 3.750 | 7.018 | 1.250 | 2.362 | ZPNT09 |
| 52514012 | ● | PDZ1312FS150A09-3D | 1.313 | 3.938 | 7.598 | 1.500 | 2.756 | ZPNT09 |
| 52514013 | ● | PDZ1375FS150A09-3D | 1.375 | 4.125 | 7.786 | 1.500 | 2.756 | ZPNT09 |
| 52514014 | ● | PDZ1437FS150A10-3D | 1.438 | 4.313 | 7.973 | 1.500 | 2.756 | ZPNT10 |
| 52514015 | ● | PDZ1500FS150A10-3D | 1.500 | 4.500 | 8.161 | 1.500 | 2.756 | ZPNT10 |

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

PXT

## DESIGNATION EXPLANATION

**PDZ-0688-FS-075-A-05-3D**

- PDZ — Series
- 0688 — Diameter
- FS — Body Type
- 075 — Shank Diameter
- A — Units
- 05 — Insert Size
- 3D — Drilling Depth

See Full Detail on Page 15

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| Steel | Stainless Steel | Cast Iron | Non-Ferrous | HRSA | Hardened Steel |
| ◎ | ◎ | ◎ | ○ | ○ | ○ |

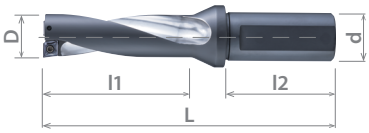
Material recommendation based on inserts compatible with this tool body.

○ Good ◎ Best

# List 78538

NEW | SPEED FEED P18-19 | INSERTS P13 | ACCS. P14 | STEEL | 2 FLUTE | PACKED 1 PIECE

OSG PHOENIX® PDZ-3D, Flat Shank




| EDP Number | | Designation | Diameter D (mm) | Drilling Depth l1 (mm) | Overall Length L (mm) | Shank Diameter d (mm) | Shank Length l2 (mm) | Applicable Insert |
|---|---|---|---|---|---|---|---|---|
| 7803828 | ● | PDZ1600FS20M05-3D | 16.00 | 48.00 | 113.00 | 20.00 | 50.00 | ZPNT05 |
| 7803829 | ● | PDZ1650FS20M05-3D | 16.50 | 50.00 | 115.00 | 20.00 | 50.00 | ZPNT05 |
| 7803830 | ● | PDZ1700FS20M05-3D | 17.00 | 51.00 | 119.00 | 20.00 | 50.00 | ZPNT05 |
| 7803831 | ● | PDZ1750FS25M05-3D | 17.50 | 53.00 | 127.00 | 25.00 | 56.00 | ZPNT05 |
| 7803832 | ● | PDZ1800FS25M05-3D | 18.00 | 54.00 | 128.00 | 25.00 | 56.00 | ZPNT05 |
| 7803833 | ● | PDZ1850FS25M05-3D | 18.50 | 56.00 | 130.00 | 25.00 | 56.00 | ZPNT05 |
| 7803834 | ● | PDZ1900FS25M06-3D | 19.00 | 57.00 | 131.00 | 25.00 | 56.00 | ZPNT05 |
| 7803835 | ● | PDZ1950FS25M06-3D | 19.50 | 59.00 | 133.00 | 25.00 | 56.00 | ZPNT05 |
| 7803836 | ● | PDZ2000FS25M06-3D | 20.00 | 60.00 | 134.00 | 25.00 | 56.00 | ZPNT06 |
| 7803837 | ● | PDZ2100FS25M06-3D | 21.00 | 63.00 | 142.00 | 25.00 | 56.00 | ZPNT06 |
| 7803838 | ● | PDZ2200FS25M06-3D | 22.00 | 66.00 | 145.00 | 25.00 | 56.00 | ZPNT06 |
| 7803839 | ● | PDZ2300FS25M07-3D | 23.00 | 69.00 | 148.00 | 25.00 | 56.00 | ZPNT07 |
| 7803840 | ● | PDZ2400FS25M07-3D | 24.00 | 72.00 | 151.00 | 25.00 | 56.00 | ZPNT07 |
| 7803842 | ● | PDZ2500FS32M07-3D | 25.00 | 75.00 | 158.00 | 32.00 | 60.00 | ZPNT07 |
| 7803843 | ● | PDZ2600FS32M07-3D | 26.00 | 78.00 | 161.00 | 32.00 | 60.00 | ZPNT07 |
| 7803844 | ● | PDZ2700FS32M08-3D | 27.00 | 81.00 | 164.00 | 32.00 | 60.00 | ZPNT08 |
| 7803845 | ● | PDZ2800FS32M08-3D | 28.00 | 84.00 | 167.00 | 32.00 | 60.00 | ZPNT08 |
| 7803846 | ● | PDZ2900FS32M08-3D | 29.00 | 87.00 | 170.00 | 32.00 | 60.00 | ZPNT08 |
| 7803847 | ● | PDZ3000FS32M08-3D | 30.00 | 90.00 | 173.00 | 32.00 | 60.00 | ZPNT08 |
| 7803848 | ● | PDZ3100FS32M08-3D | 31.00 | 93.00 | 176.00 | 32.00 | 60.00 | ZPNT08 |
| 7803849 | ● | PDZ3200FS32M09-3D | 32.00 | 96.00 | 179.00 | 32.00 | 60.00 | ZPNT09 |
| 7803850 | ● | PDZ3300FS40M09-3D | 33.00 | 99.00 | 192.00 | 40.00 | 70.00 | ZPNT09 |
| 7803851 | ● | PDZ3400FS40M09-3D | 34.00 | 102.00 | 195.00 | 40.00 | 70.00 | ZPNT09 |
| 7803852 | ● | PDZ3500FS40M10-3D | 35.00 | 105.00 | 198.00 | 40.00 | 70.00 | ZPNT10 |
| 7803853 | ● | PDZ3600FS40M10-3D | 36.00 | 108.00 | 201.00 | 40.00 | 70.00 | ZPNT10 |
| 7803854 | ● | PDZ3700FS40M10-3D | 37.00 | 111.00 | 204.00 | 40.00 | 70.00 | ZPNT10 |
| 7803855 | ● | PDZ3800FS40M10-3D | 38.00 | 114.00 | 207.00 | 40.00 | 70.00 | ZPNT10 |
| 7803856 | ● | PDZ3900FS40M13-3D | 39.00 | 117.00 | 217.00 | 40.00 | 70.00 | ZPNT13 |
| 7803857 | ● | PDZ4000FS40M13-3D | 40.00 | 120.00 | 220.00 | 40.00 | 70.00 | ZPNT13 |
| 7803858 | ● | PDZ4100FS40M13-3D | 41.00 | 123.00 | 223.00 | 40.00 | 70.00 | ZPNT13 |
| 7803859 | ● | PDZ4200FS40M13-3D | 42.00 | 126.00 | 226.00 | 40.00 | 70.00 | ZPNT13 |
| 7803860 | ● | PDZ4300FS40M13-3D | 43.00 | 129.00 | 229.00 | 40.00 | 70.00 | ZPNT13 |

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

PXT

## DESIGNATION EXPLANATION

**PDZ-0688-FS-075-A-05-3D**

Series | Diameter | Body Type | Shank Diameter | Units | Insert Size | Drilling Depth

See Full Detail on Page 15

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| Steel | Stainless Steel | Cast Iron | Non-Ferrous | HRSA | Hardened Steel |
| ◎ | ◎ | ◎ | ○ | ○ | ○ |

Material recommendation based on inserts compatible with this tool body.

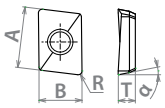
○ Good ◎ Best

# List 78PZAG

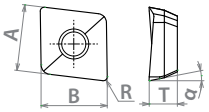
SPEED FEED P18-19 | PACKED 10 PIECE

**OSG PHOENIX® PZAG / PDZ / PMD Inserts**

Type 1




Type 2




| EDP Number | | Designation | Number of Cutting Edges | Insert Size AxB (mm) | Insert Size T (mm) | Insert Size α (°) | Insert Size R (mm) | Type | Grade |
|---|---|---|---|---|---|---|---|---|---|
| 7814101 | ● | ZPNT040104ER | 2 | 6.35 x 4.45 | 1.76 | 11 | 0.4 | 1 | XP8030 |
| 7814102 | ● | ZPNT050204EN | 2 | 5.9 x 5.9 | 2.25 | 11 | 0.4 | 2 | XP8030 |
| 7814103 | ● | ZPNT060204EN | 2 | 6.95 x 6.95 | 2.93 | 11 | 0.4 | 2 | XP8030 |
| 7814104 | ● | ZPNT070304EN | 2 | 7.84 x 7.84 | 3.87 | 11 | 0.4 | 2 | XP8030 |
| 7814105 | ● | ZPNT080304EN | 2 | 8.85 x 8.85 | 3.92 | 11 | 0.4 | 2 | XP8030 |
| 7814106 | ● | ZPNT090404EN | 2 | 9.94 x 9.94 | 4.65 | 11 | 0.4 | 2 | XP8030 |
| 7814108 | ● | ZPNT100408EN | 2 | 10.95 x 10.95 | 4.65 | 11 | 0.8 | 2 | XP8030 |
| 7814109 | ● | ZPNT130504EN | 2 | 13.92 x 13.92 | 5.46 | 11 | 0.4 | 2 | XP8030 |
| 7814110 | ● | ZPNT130508EN | 2 | 13.92 x 13.92 | 5.46 | 11 | 0.8 | 2 | XP8030 |
| 7814111 | ● | ZPNT170608EN | 2 | 17.85 x 17.85 | 6.31 | 11 | 0.8 | 2 | XP8030 |
| 7815101 | ● | ZPNT040104ER | 2 | 6.35 x 4.45 | 1.76 | 11 | 0.4 | 1 | XC8035 |
| 7815102 | ● | ZPNT050204EN | 2 | 5.9 x 5.9 | 2.25 | 11 | 0.4 | 2 | XC8035 |
| 7815103 | ● | ZPNT060204EN | 2 | 6.95 x 6.95 | 2.93 | 11 | 0.4 | 2 | XC8035 |
| 7815104 | ● | ZPNT070304EN | 2 | 7.84 x 7.84 | 3.87 | 11 | 0.4 | 2 | XC8035 |
| 7815105 | ● | ZPNT080304EN | 2 | 8.85 x 8.85 | 3.92 | 11 | 0.4 | 2 | XC8035 |
| 7815106 | ● | ZPNT090404EN | 2 | 9.94 x 9.94 | 4.65 | 11 | 0.4 | 2 | XC8035 |
| 7815108 | ● | ZPNT100408EN | 2 | 10.95 x 10.95 | 4.65 | 11 | 0.8 | 2 | XC8035 |
| 7815109 | ● | ZPNT130504EN | 2 | 13.92 x 13.92 | 5.46 | 11 | 0.4 | 2 | XC8035 |
| 7815110 | ● | ZPNT130508EN | 2 | 13.92 x 13.92 | 5.46 | 11 | 0.8 | 2 | XC8035 |
| 7815111 | ● | ZPNT170608EN | 2 | 17.85 x 17.85 | 6.31 | 11 | 0.8 | 2 | XC8035 |

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked

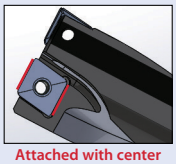
Note: XC8035 recommended for peripheral cutting edge only.

PXI

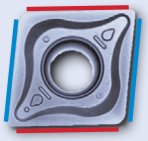
## ⚠ Precautions when installing the insert

- The insert (XP8030) has a total of 4 working corners – 2 corners for the peripheral cutting edge and 2 corners for the center cutting edge.
- Use the peripheral cutting edge corner for the peripheral cutting edge and the center cutting edge corner for the center cutting edge.

Attached with peripheral cutting edge

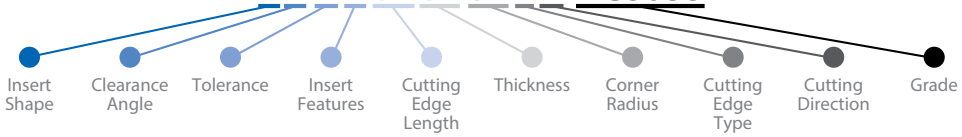


Attached with center cutting edge




## DESIGNATION EXPLANATION

**ZPNT 04 02 04 E R- XC8035**




See Full Detail on Page 16-17

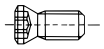
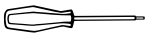
| Insert Grade | Coolant | P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous | S HRSA | H Hardened Steel |
|---|---|---|---|---|---|---|---|
| XC8035 | Yes | ○ | ○ | ◎ | | | |
| XP8030 | Yes | ◎ | ◎ | ○ | ○ | ○ | ○ |

○ Good ◎ Best

# List 7808H

**OSG PHOENIX® PDZ Accessories**

PACKED 1 PIECE | PACKED 10 PIECE

| Appearance | EDP No. | | Designation | Applicable Insert | Recommended Tightening |
|---|---|---|---|---|---|
|  Clamping Screw | 7808139 | ● | FS20543P (M2 x 4.3, Torx 6IP) | ZPNT05 | 0.7 Nm |
| | 7808138 | ● | FS22550P (M2.2 x 5, Torx 7IP) | ZPNT06 | 1.0 Nm |
| | 7808136 | ● | FS25560P (M2.5 x 6, Torx 8IP) | ZPNT07 | 1.6 Nm |
| | 7808135 | ● | FS30570P (M3 x 7, Torx 9IP) | ZPNT08, ZPNT09 | 2.2 Nm |
| | 7808137 | ● | FS35586P (M3.5 x 8.6, Torx 15IP) | ZPNT10 | 3.2 Nm |
| | 7808114 | ● | FS45510P (M4.5 x 10, Torx 20IP) | ZPNT13 | 5.0 Nm |
|  Wrench | 7808223 | ● | 6IP-D (Torx 6IP) | ZPNT05 | |
| | 7808224 | ● | 7IP-D (Torx 7IP) | ZPNT06 | |
| | 7808225 | ● | 8IP-D (Torx 8IP) | ZPNT07 | |
| | 7808226 | ● | 9IP-D (Torx 9IP) | ZPNT08, ZPNT09 | |
| | 7808228 | ● | 15IP-D (Torx 15IP) | ZPNT10 | |
| | 7808229 | ● | 20IP-D (Torx 20IP) | ZPNT13 | |

● Stocked ○ Available Upon Request; MOQ May Apply ▲ Globally Stocked
Note: Wrench sold separately
Packed: Clamping Screws = 10 pcs.; Wrench = 1 pc.

PXT

# Tool Body Designation

| PDZ | 0688 | FS | 075 | A | 05 | - | 2D |
|---|---|---|---|---|---|---|---|

### Series

| | |
|---|---|
| PDZ | PHOENIX® Indexable Flat Drill |

### Body Type

| | |
|---|---|
| FS | Flat Shank |

### Insert Size

**Example:**
05 = ZPNT05

### Units

| | |
|---|---|
| A | Inch |
| M | Metric |

### Diameter

**Example:**
0688 = Ø0.688″
1600 = Ø16.0mm

### Shank Diameter

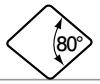
**Example:**
075 = Ø0.750″
20 = Ø20.0mm

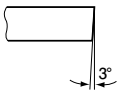
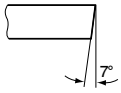
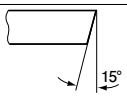
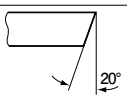
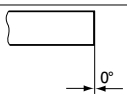
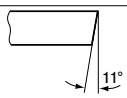
### Drilling Depth

| | |
|---|---|
| 2D | 2xD |
| 3D | 3xD |

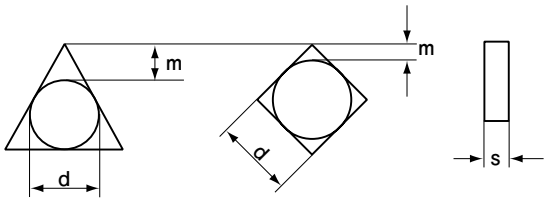
# Insert Designation

| Z | D | K | T |
|---|---|---|---|

| Shape of Insert | | |
|---|---|---|
| C | Diamond Apex 80° |  |
| D | Diamond Apex 55° |  |
| O | Octagon |  |
| R | Round |  |
| S | Square |  |
| T | Triangle |  |
| V | Diamond Apex 35° |  |
| W | Axonometric Hexagon |  |
| Z | Other Shapes | – |

| Clearance Angle | | |
|---|---|---|
| A | 3° |  |
| C | 7° |  |
| D | 15° |  |
| E | 20° |  |
| N | 0° |  |
| P | 11° |  |
| X | Special Dimension | |

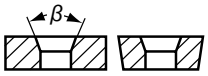
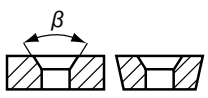
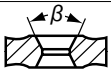
**Tolerance**




| Symbol | Inscribed Circle Tolerance (mm) | Corner Height Tolerance (mm) | Thickness Tolerance (mm) |
|---|---|---|---|
| A | ±0.025 | ±0.005 | ±0.025 |
| C | ±0.025 | ±0.013 | ±0.025 |
| E | ±0.025 | ±0.025 | ±0.025 |
| H | ±0.013 | ±0.013 | ±0.025 |
| K* | ±0.05~±0.15 | ±0.013 | ±0.025 |
| M* | ±0.05~±0.15 | ±0.08~±0.18 | ±0.13 |
| N* | ±0.05~±0.15 | ±0.08~±0.18 | ±0.025 |

*Sintered insert shown on the side

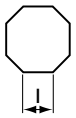
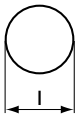
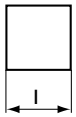
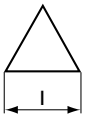
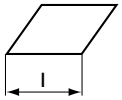
**Special Cutting and Fastening Feature**

| Symbol | Shape of Hole | With or Without Breaker | Insert Cross Section |
|---|---|---|---|
| W | (40°~60°) Partial cylindrical hole | No Breaker |  |
| T | | One Side |  |
| B | (70°~90°) Partial cylindrical hole | No Breaker |  |
| U | (40°~60°) Partial cylindrical hole | Both Sides |  |
| N | – | No Breaker |  |
| R | – | One Side |  |

# Insert Designation (Continued)

| 15 | 05 | 08 | S | R | - | GM |
|---|---|---|---|---|---|---|

## Length of the Cutting Edge

| | |
|---|---|
| O |  |
| R |  |
| S |  |
| T |  |
| Z |  |

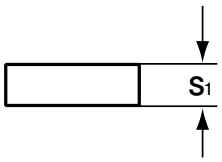
## Corner Radius Symbol

| Symbol | Corner Radius (mm) |
|---|---|
| 02 | R0.2 |
| 04 | R0.4 |
| 08 | R0.8 |
| 12 | R1.2 |
| 16 | R1.6 |
| 24 | R2.4 |

## Cutting Direction

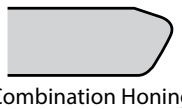
| Symbol | Cutting Direction |
|---|---|
| R | Right Hand |
| L | Left Hand |
| N | Neutral |

## Thickness of Insert




| Symbol | Thickness (mm) |
|---|---|
| 02 | 2.38 |
| 03 | 3.18 |
| T3 | 3.97 |
| 04 | 4.76 |
| 05 | 5.56 |
| 06 | 6.35 |

## Type of Cutting Edge

| Symbol | Appearance |
|---|---|
| F |  Sharp Edge |
| E |  Round Honing |
| T |  Chamfer Honing |
| S |  Combination Honing |

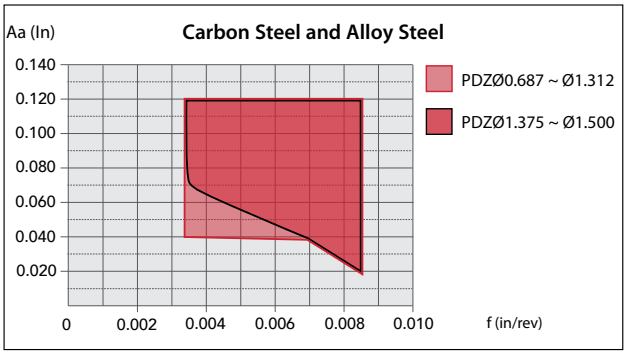
## Type of Chip Breaker

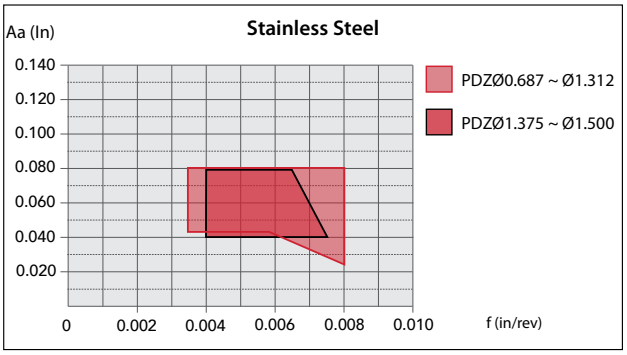
| Symbol | Name |
|---|---|
| GL | GL Breaker |
| GM | GM Breaker |
| GR | GR Breaker |
| HR | HR Breaker |
| NM | NM Breaker |
| SM | SM Breaker |
| DM | DM Breaker |
| DR | DR Breaker |
| DN | DN Breaker |

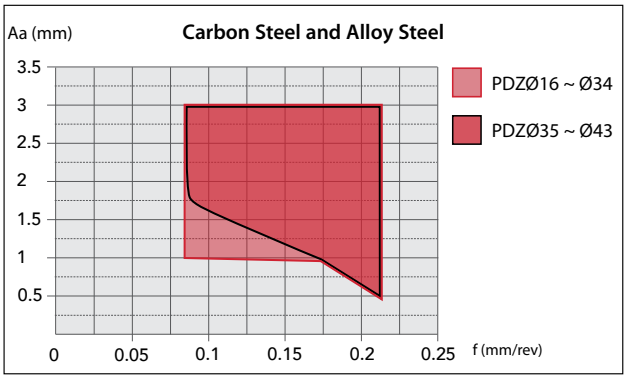
# Cutting Conditions - *Drilling*

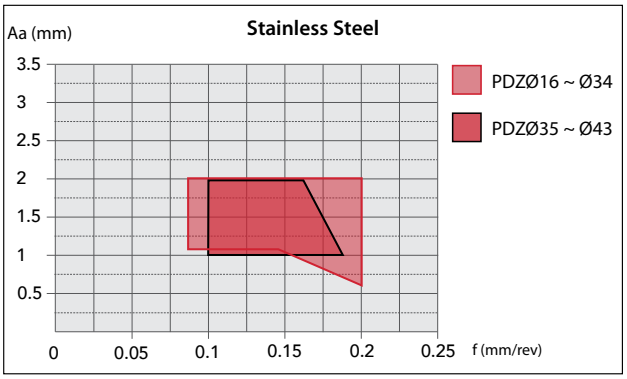
| Work Material | | Tensile Strength - Hardness | Drilling Speed Vc (SFM) | Feed Rate, f (in/rev) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Drilling Depth 2xD | | | | | | |
| | | | | Ø0.630-0.650 (16-16.5mm) | Ø0.669-0.728 (17-18.5mm) | Ø0.748-0.787 (19-20mm) | Ø0.827-0.945 (21-24mm) | Ø0.984-1.102 (25-28mm) | Ø1.142-1.299 (29-33mm) | Ø1.338-1.693 (34-43mm) |
| P | Mild Steels, Carbon Steels (1010, 1018) | ~180 HB | 650 (500 - 800) | .0024 (.0015 - .004) | .0024 (.0015 - .004) | .0027 (.0015 - .004) | .003 (.0015 - .0047) | .003 (.0015 - .0047) | .004 (.002 - .006) | .004 (.002 - .007) |
| | Carbon Steels, Alloy Steels (1050, 4140) | ~280 HB | 500 (330 - 720) | .003 (.0015 - .0055) | .0035 (.0015 - .0063) | .004 (.0015 - .007) | .0055 (.0015 - .008) | .007 (.0024 - .010) | .008 (.003 - .012) | .008 (.003 - .014) |
| | Die Steels (D2, H13) | ~280 HB | 400 (260 - 600) | .0024 (.0015 - .004) | .0027 (.0015 - .004) | .003 (.0015 - .0047) | .0047 (.0015 - .006) | .0055 (.0024 - .008) | .007 (.003 - .010) | .007 (.003 - .010) |
| M | Stainless Steels (304, 420) | ~250 HB | 425 (260 - 600) | .0027 (.0015 - .004) | .003 (.0015 - .004) | .0035 (.0015 - .0047) | .004 (.0015 - .006) | .005 (.0024 - .008) | .006 (.003 - .010) | .006 (.003 - .010) |
| K | Cast Iron (FC250) | ~350 N/mm² | 650 (500 - 920) | .003 (.0015 - .0055) | .004 (.0015 - .0063) | .0047 (.0015 - .008) | .0063 (.003 - .010) | .008 (.0024 - .012) | .008 (.003 - .012) | .008 (.003 - .014) |
| | Ductile Cast Iron (60-40-18) | ~800 N/mm² | 525 (330 - 720) | .003 (.0015 - .0047) | .0035 (.0015 - .0055) | .004 (.0015 - .007) | .0055 (.0015 - .008) | .007 (.0024 - .010) | .007 (.003 - .010) | .007 (.003 - .010) |
| N | Aluminum Alloys (6061, 7075) | ~13% Si | 650 (330 - 2600) | .003 (.0015 - .0047) | .004 (.0015 - .0063) | .0047 (.0015 - .008) | .0063 (.0015 - .010) | .008 (.0024 - .012) | .008 (.003 - .012) | .008 (.003 - .012) |
| S | Heat Resistant Alloys (Inconel 718) | - | 165 (50 - 200) | .0015 (.0008 - .0024) | .002 (.0012 - .0024) | .002 (.0012 - .0024) | .0024 (.0015 - .003) | .003 (.0024 - .004) | .004 (.0024 - .0047) | .004 (.0024 - .0047) |
| | Titanium Alloy (Ti-6Al-4V) | - | 200 (100 - 330) | .002 (.0015 - .003) | .0024 (.0015 - .003) | .0024 (.0015 - .003) | .003 (.0015 - .006) | .004 (.0024 - .008) | .0055 (.003 - .008) | .0055 (.003 - .008) |
| H | Pre-hardened Steel (P20, Stavax) | 40 - 43 HrC | 330 (200 - 400) | .0024 (.0015 - .004) | .0024 (.0015 - .0047) | .0027 (.0015 - .0047) | .003 (.0015 - .0047) | .004 (.0024 - .006) | .004 (.0024 - .006) | .004 (.0024 - .006) |
| | Die Cast Steels (A2, S7) | 43 - 48 HrC | 260 (165 - 330) | .002 (.0015 - .003) | .002 (.0015 - .003) | .0024 (.0015 - .003) | .0024 (.0015 - .003) | .003 (.0015 - .004) | .003 (.0015 - .004) | .003 (.0015 - .004) |
| | Hardened Steels (D2) | 50 - 55 HrC | 200 (130 - 260) | .002 (.0015 - .003) | .002 (.0015 - .003) | .0024 (.0015 - .003) | .0024 (.0015 - .003) | .003 (.0015 - .004) | .003 (.0015 - .004) | .003 (.0015 - .004) |

# Cutting Conditions - *Turning*



shaping your dreams

## ⚠ Safe use of cutting tools

- Use safety cover, safety glasses and safety shoes during operation.
- Do not touch cutting edges with bare hands.
- Do not touch cutting chips with bare hands. Chips will be hot after cutting.
- Stop cutting when the tool becomes dull.
- Stop cutting operation immediately if you hear any abnormal cutting sounds.
- Do not modify tools.
- Please use appropriate tools for the operation. Check dimensions to ensure proper selection.

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