



Indexable Flat Drill

PDZ

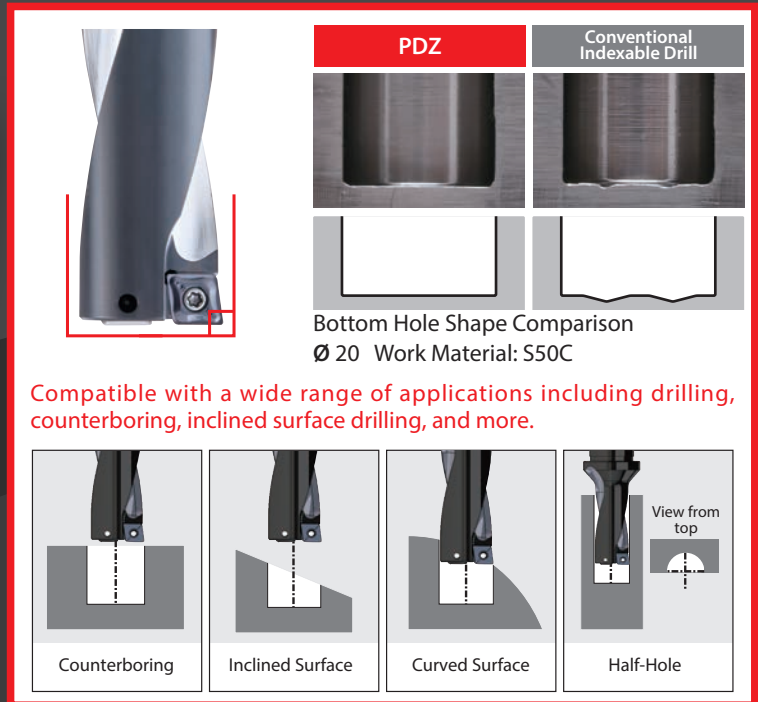
Volume 1.1



KEY FEATURES: PDZ

Achieves stable flat-bottom hole machining

1 Flat bottom cutting edge configuration



2 High precision finishing on flute improves rigidity, chip ejection and reduces cutting force!

3 Superior chip breaking capability during drilling, counterboring, and turning



- 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*



$\varnothing 20$ hole processing (non-step drilling)
Work Material: S50C
Cutting conditions: $V_c=150/\text{min}$, $f=0,1\text{mm/rev}$

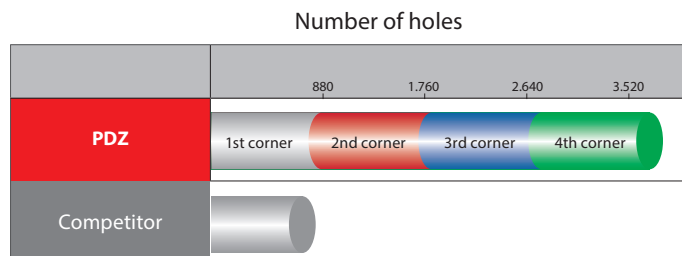
PROCESSING DATA

Drilling | Indexable | Processing data

Higher cost performance compared to exchangeable head drills

The number of holes machined per insert corner by the PDZ versus per exchangeable head by a competitor.

Tool	PDZ1600FS20M05-2D (Ø16)	Competitor Exchangeable Head Drill
Insert (Grade)	ZPNT050204EN (XP8030)	-
Work Material	S50C	
Cutting Speed	150m/min (2.984min ⁻¹)	100m/min (1.989min ⁻¹)
Feed	298mm/min (0,1mm/rev)	198mm/min (0,1mm/rev)
Depth of Hole	24mm (Blind)	
Coolant	Water soluble (Internal)	
Machine	Horizontal Machining Center (BT50)	



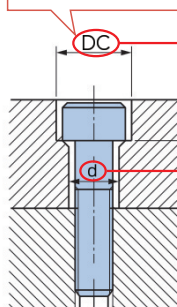
Broad size lineup

Size lineup corresponding to the cap bolt's counterbore hole size (corresponds to bolt screw sizes M10 to M27)



Cannot be used as a face milling cutter

DC' represents the drill diameter



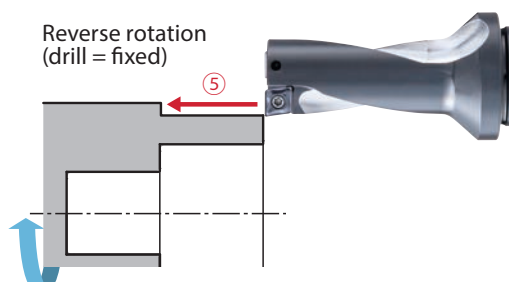
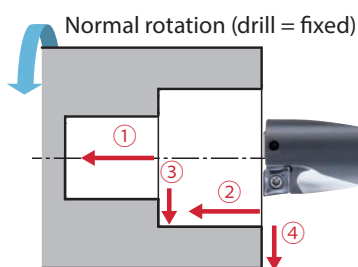
Dimensions of counterbore and bolt hole with hexagon socket head bolt

Thread size	M10	M12	M14	M16	M18	M20	M22	M24	M27
DC	17,5	20	23	26	29	32	35	39	43
H	10,8	13	15,2	17,5	19,5	21,5	23,5	25,5	29
d	11	14	16	18	20	22	24	26	30

Unit:mm

Enables tool consolidation on lathes

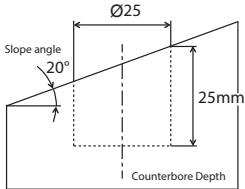
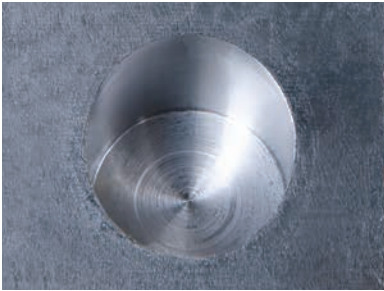
- ① Drilling from solid
- ② Internal turning
- ③ Facing
- ④ Facing
- ⑤ Outer turning



1 tool for 5 types of machining method

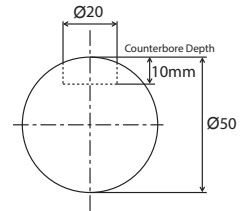
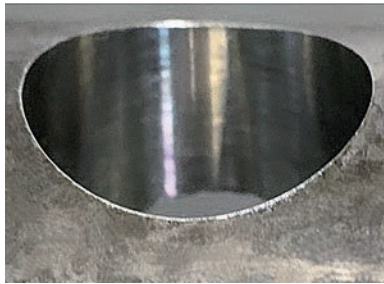
Counterboring in Inclined Surfaces

Tool	PDZ2500FS25M07-2D (Ø25)
Insert Grade	ZPNT070304EN (XP8030)
Work Material	S50C
Cutting Speed	60m/min (764min ⁻¹)
Feed	46mm/min (0,06mm/rev)
Counterbore Depth	Counterboring: 25mm Slope angle: 20°
Coolant	Dry
Machine	Horizontal Machining Center (BT50)



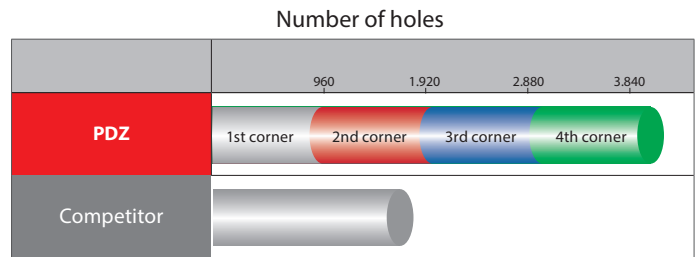
Counterboring in Curved Surfaces

Tool	PDZ2000FS25M06-2D (Ø25)
Insert Grade	ZPNT060204EN (XP8030)
Work Material	SCM420
Cutting Speed	50m/min (800min ⁻¹)
Feed	80mm/min (0,1mm/rev)
Counterbore Depth	Counterboring: 10mm
Coolant	Water-Soluble (Internal)
Machine	Multifunction Lathe (HSK-A63)



High cost performance even in SUS304

Tool	PDZ1600FS20M05-2D (Ø16)	Competitor Exchangeable Head Drill
Insert Grade	ZPNT050204EN (XP8030)	-
Work Material	SUS304	
Cutting Speed	80m/min (1.591min ⁻¹)	
Feed	80mm/min (0,05mm/rev)	
Counterbore Depth	24mm	
Coolant	Water-Soluble (Internal)	
Machine	Horizontal Machining Center (BT50)	

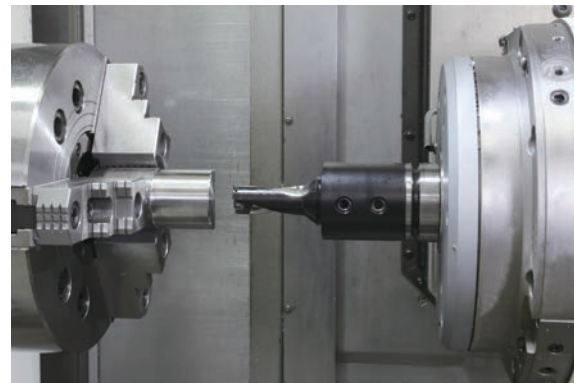


The number of holes machined per insert corner by the PDZ versus per exchangeable head by a competitor.



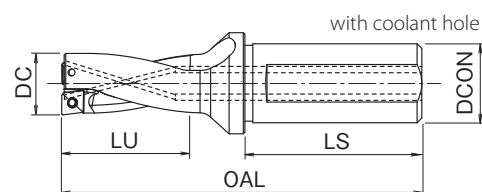
Tool consolidation by turning

Tool	PDZ2500FS25M07-2D (Ø25)	
Insert Grade	ZPNT070304EN (XP8030)	
Work Material	SCM440	
Milling Method	Drilling	Counterboring
Cutting Speed	100m/min (1.273min ⁻¹)	100m/min
Feed	127mm/min (0,1mm/rev)	f=0,12mm/rev ap=2mm x4 pass
Coolant	Air Blow	
Machine	Multifunction Lathe (HSK-A63)	



Workpiece





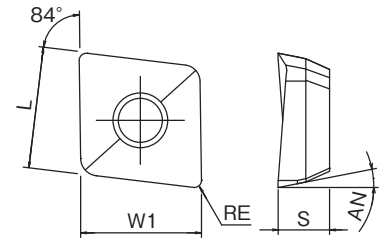
- Indexable Flat drill with internal coolant
- Up to 2xD
- 33 sizes



EDP	Designation	DC	Applicable inserts type	OAL	LU	DCON	LS	Price
7803776	PDZ1600FS20M05-2D	16	ZPNT050204EN	97	32	20	50	
7803777	PDZ1650FS20M05-2D	16,5	ZPNT050204EN	98	33	20	50	
7803778	PDZ1700FS20M05-2D	17	ZPNT050204EN	102	34	20	50	
7803779	PDZ1750FS25M05-2D	17,5	ZPNT050204EN	109	35	25	56	
7803780	PDZ1800FS25M05-2D	18	ZPNT050204EN	110	36	25	56	
7803781	PDZ1850FS25M05-2D	18,5	ZPNT050204EN	111	37	25	56	
7803782	PDZ1900FS25M06-2D	19	ZPNT060204EN	112	38	25	56	
7803783	PDZ1950FS25M06-2D	19,5	ZPNT060204EN	113	39	25	56	
7803784	PDZ2000FS25M06-2D	20	ZPNT060204EN	114	40	25	56	
7803785	PDZ2100FS25M06-2D	21	ZPNT060204EN	121	42	25	56	
7803786	PDZ2200FS25M06-2D	22	ZPNT060204EN	123	44	25	56	
7803787	PDZ2300FS25M07-2D	23	ZPNT070304EN	125	46	25	56	
7803788	PDZ2400FS25M07-2D	24	ZPNT070304EN	127	48	25	56	
7803789	PDZ2500FS25M07-2D	25	ZPNT070304EN	129	50	25	56	
7803790	PDZ2500FS32M07-2D	25	ZPNT070304EN	133	50	32	60	
7803791	PDZ2600FS32M07-2D	26	ZPNT070304EN	135	52	32	60	
7803792	PDZ2700FS32M08-2D	27	ZPNT080304EN	137	54	32	60	
7803793	PDZ2800FS32M08-2D	28	ZPNT080304EN	139	56	32	60	
7803794	PDZ2900FS32M08-2D	29	ZPNT080304EN	141	58	32	60	
7803795	PDZ3000FS32M08-2D	30	ZPNT080304EN	143	60	32	60	
7803796	PDZ3100FS32M08-2D	31	ZPNT080304EN	145	62	32	60	
7803797	PDZ3200FS32M09-2D	32	ZPNT090404EN	147	64	32	60	
7803798	PDZ3300FS40M09-2D	33	ZPNT090404EN	159	66	40	70	
7803799	PDZ3400FS40M09-2D	34	ZPNT090404EN	161	68	40	70	
7803800	PDZ3500FS40M10-2D	35	ZPNT100408EN	163	70	40	70	
7803801	PDZ3600FS40M10-2D	36	ZPNT100408EN	165	72	40	70	
7803802	PDZ3700FS40M10-2D	37	ZPNT100408EN	167	74	40	70	
7803803	PDZ3800FS40M10-2D	38	ZPNT100408EN	169	76	40	70	
7803804	PDZ3900FS40M13-2D	39	ZPNT130508EN	178	78	40	70	
7803805	PDZ4000FS40M13-2D	40	ZPNT130508EN	180	80	40	70	
7803806	PDZ4100FS40M13-2D	41	ZPNT130508EN	182	82	40	70	
7803807	PDZ4200FS40M13-2D	42	ZPNT130508EN	184	84	40	70	
7803808	PDZ4300FS40M13-2D	43	ZPNT130508EN	186	86	40	70	

Accessories & spare parts

Applicable Cutters Ø	Applicable Inserts	Clamping screw			Wrench	
PDZ SS $\phi 16\sim 18,5$	ZPNT050204EN	7808139	FS20543P (Torx 6IP)	0.7 N-m	7808223	6IP-D (Torx 6IP)
PDZ SS $\phi 19\sim 22$	ZPNT060204EN	7808138	FS22550P (Torx 7IP)	1.0 N-m	7808224	7IP-D (Torx 7IP)
PDZ SS $\phi 23\sim 26$	ZPNT070304EN	7808136	FS25560P (Torx 8IP)	1.6 N-m	7808225	8IP-D (Torx 8IP)
PDZ SS $\phi 27\sim 34$	ZPNT080304EN	7808135	FS30570P (Torx 9IP)	2.2 N-m	7808226	9IP-D (Torx 9IP)
PDZ SS $\phi 27\sim 34$	ZPNT090404EN	7808135	FS30570P (Torx 9IP)	2.2 N-m	7808226	9IP-D (Torx 9IP)
PDZ SS $\phi 35\sim 38$	ZPNT100408EN	7808137	FS35586P (Torx 15IP)	3.2 N-m	7808228	15IP-D (Torx 15IP)
PDZ SS $\phi 39\sim 43$	ZPNT130508EN	7808114	FS45510P (Torx 20IP)	5.0 N-m	7808229	20IP-D (Torx 20IP)



- Applicable inserts for PDZ drill
- Center cutting edge

[illegible]

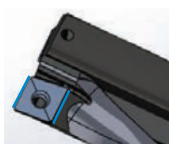
- Applicable inserts for PDZ drill
- Peripheral cutting edge

For machining that requires greater durability, select a designated insert for the peripheral cutting edge.

[illegible]

Precautions when installing the insert

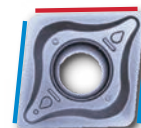
- The insert (XP8030) has a total of 4 working corners
2 corners for the peripheral cutting edge and 2 corners for the center cutting edge.
- Use the peripheral cutting edge corner for the peripheral cutting edge and the center cutting edge corner for the center cutting edge.



Attached with peripheral cutting edge



Attached with center cutting edge



- Edges for peripheral cutting

— Edges for center cutting

CUTTING CONDITIONS

Drilling | Indexable | Cutting conditions

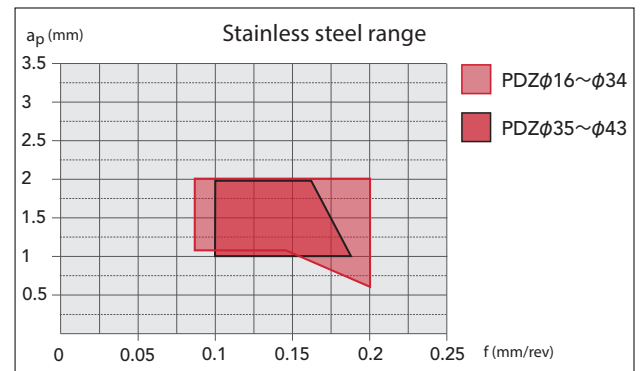
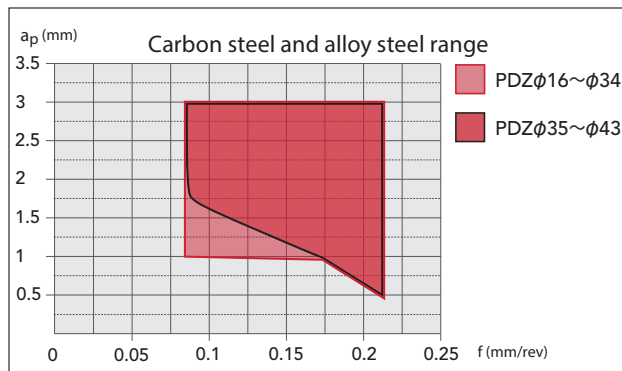
PDZ

Work Material		Tensile Strength/ Hardness	Vc (m/min)	Feed Rate (mm/rev)						
				ø16~ø16,5	ø17~ø18,5	ø19~ø20	ø21~ø24	ø25~ø28	ø29~ø33	ø34~ø43
P	Mild Steel-Carbon Steel (S5400-S10C)	~180HB	200 (150~250)	0,06 (0,04~0,1)	0,06 (0,04~0,1)	0,07 (0,04~0,1)	0,08 (0,04~0,12)	0,08 (0,04~0,12)	0,1 (0,05~0,15)	0,1 (0,05~0,18)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	150 (100~220)	0,08 (0,04~0,14)	0,09 (0,04~0,16)	0,1 (0,04~0,18)	0,14 (0,04~0,2)	0,18 (0,06~0,25)	0,2 (0,08~0,3)	0,2 (0,08~0,35)
	Die Steel (SKD11-SKD61)	~280HB	120 (80~180)	0,06 (0,04~0,1)	0,07 (0,04~0,1)	0,08 (0,04~0,12)	0,12 (0,04~0,15)	0,14 (0,06~0,2)	0,18 (0,08~0,25)	0,18 (0,08~0,25)
M	Stainless Steel (SUS304-SUS420)	~250HB	130 (80~180)	0,07 (0,04~0,1)	0,08 (0,04~0,1)	0,09 (0,04~0,12)	0,1 (0,04~0,15)	0,13 (0,06~0,2)	0,15 (0,08~0,25)	0,15 (0,08~0,25)
K	Cast Iron (FC250)	~350N/mm²	200 (150~280)	0,08 (0,04~0,14)	0,1 (0,04~0,16)	0,12 (0,04~0,2)	0,16 (0,08~0,25)	0,2 (0,06~0,3)	0,2 (0,08~0,3)	0,2 (0,08~0,35)
	Ductile Cast Iron (FCD400)	~800N/mm²	160 (100~220)	0,08 (0,04~0,12)	0,09 (0,04~0,14)	0,1 (0,04~0,18)	0,14 (0,04~0,2)	0,18 (0,06~0,25)	0,18 (0,08~0,25)	0,18 (0,08~0,25)
N	Alluminium Alloy	~13%Si	200 (100~800)	0,08 (0,04~0,12)	0,1 (0,04~0,16)	0,12 (0,04~0,2)	0,16 (0,04~0,25)	0,2 (0,06~0,3)	0,2 (0,08~0,3)	0,2 (0,08~0,3)
S	Heat Resistant Alloy (Wet) (Inconel 718)	—	50 (15~60)	0,04 (0,02~0,06)	0,05 (0,03~0,06)	0,05 (0,03~0,06)	0,06 (0,04~0,08)	0,08 (0,06~0,1)	0,1 (0,06~0,12)	0,1 (0,06~0,12)
	Titanium Alloy (Wet) (Ti-6Al-4V)	—	60 (30~100)	0,05 (0,04~0,08)	0,06 (0,04~0,08)	0,06 (0,04~0,08)	0,08 (0,04~0,15)	0,1 (0,06~0,2)	0,14 (0,08~0,2)	0,14 (0,08~0,2)
H	Pre-hardened Steel NAK80	40~43HRC	100 (60~120)	0,06 (0,04~0,1)	0,06 (0,04~0,12)	0,07 (0,04~0,12)	0,08 (0,04~0,12)	0,1 (0,06~0,15)	0,1 (0,06~0,15)	0,1 (0,06~0,15)
	Hardened Steel SKD11	50~55HRC	60 (40~80)	0,05 (0,04~0,08)	0,05 (0,04~0,08)	0,06 (0,04~0,08)	0,06 (0,04~0,08)	0,08 (0,04~0,1)	0,08 (0,04~0,1)	0,08 (0,04~0,1)

1. The indicated speeds and feeds are for using water-soluble oil with inner supply.
2. Suitable cutting fluid is water-soluble in high density (less than 20 times dilution).
3. Using non-water-soluble oil is not recommended.
4. The above cutting conditions are to be used as general guidelines. Adjustments may be necessary depending on actual cutting condition.
5. Inserts should be attached to the holder tightly in a very neat condition.
6. Fasten the work material to reduce the possibility of work deformation, deflection of machined surface, or vibration.
7. A clogged oil hole can lead to a breakage. Make sure that a filter is attached to the oil feeder.

Turning

Cutting Conditions of Internal / External Turning



Also supports small diameter drilling

ADF

Carbide Flat Drill

Lineup

- ADF-2D Ø0,2 ~ Ø20
- ADFO-3D Ø3 ~ Ø20
- ADFLS-2D Ø3 ~ Ø20
- ADF-NC Ø2 ~ Ø12
- ADFO-NC Ø3 ~ Ø10



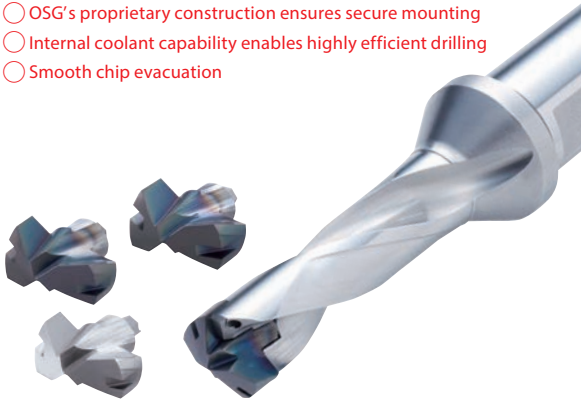
INTRODUCTION OF INDEXABLE DRILLS

Drilling | Indexable | Introduction of indexable drills

A vast drilling lineup with a wide range of diameter sizes

» PXD
Exchangeable Head Drill for 3D, 5D

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



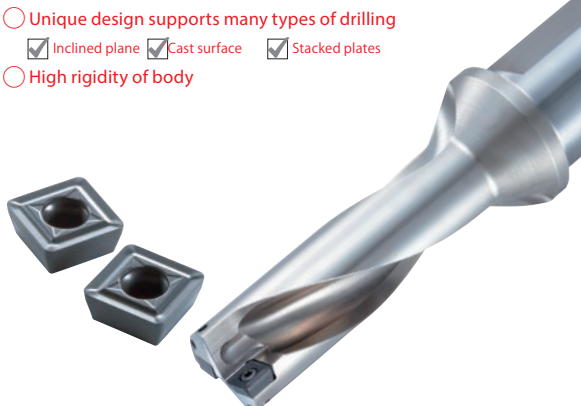
» PD
Indexable Drill

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



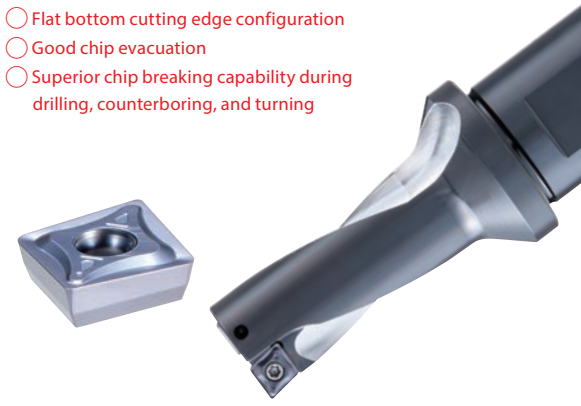
» PHP
Indexable Drill for 3D

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

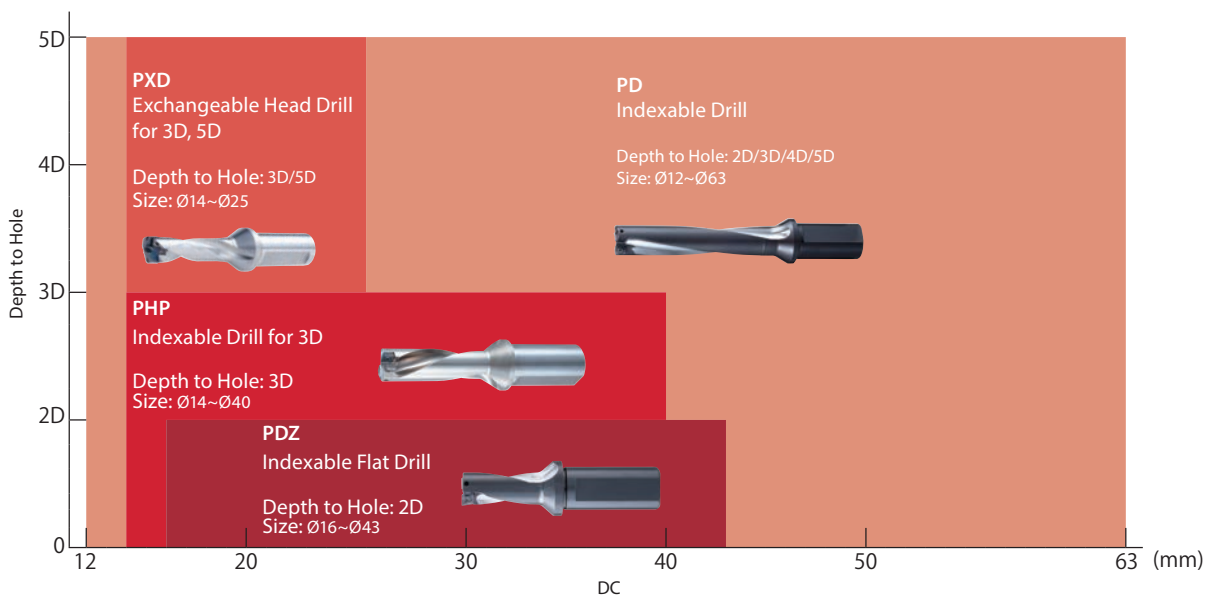


» PDZ
Indexable Flat Drill

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



Drilling depth by product



INTRODUCTION OF PRODUCT LINEUP CAPABLE OF FLAT-BOTTOM HOLE MACHINING

Drilling | Indexable | Introduction of indexable drills

3 product offering to meet your machining needs



Features of each product

	PZAG	PMD	PDZ
Shape	Counterboring Cutter	Multi-function Cutter	Indexable Flat Drill
Bottom hole shape	Flat		
Drilling efficiency	◎	△	○
Requirement of pilot hole when drilling	Required	Not required	Not required
Horizontal Milling	—	○	—
Insert designation	ZPNT...	for Drilling and Plunging Edge : ZPNT... for Peripheral Cutting Edge: ZDKT...	ZPNT...

Simple tool management with interchangeable inserts!

www.osgeurope.com





shaping your dreams

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