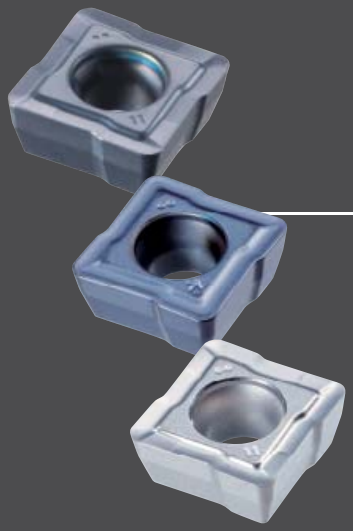
Indexable Drills Series

P2D P3D P4D P5D

Volume 4

KEY FEATURES: PHOENIX P2D P3D P4D P5D



New chipbreakers available for a wide variety of materials

1 Economical 4-corner design

2 Unique flute design enables stable drilling

3 Using same insert to both center and peripheral cutting edge simplify tool management

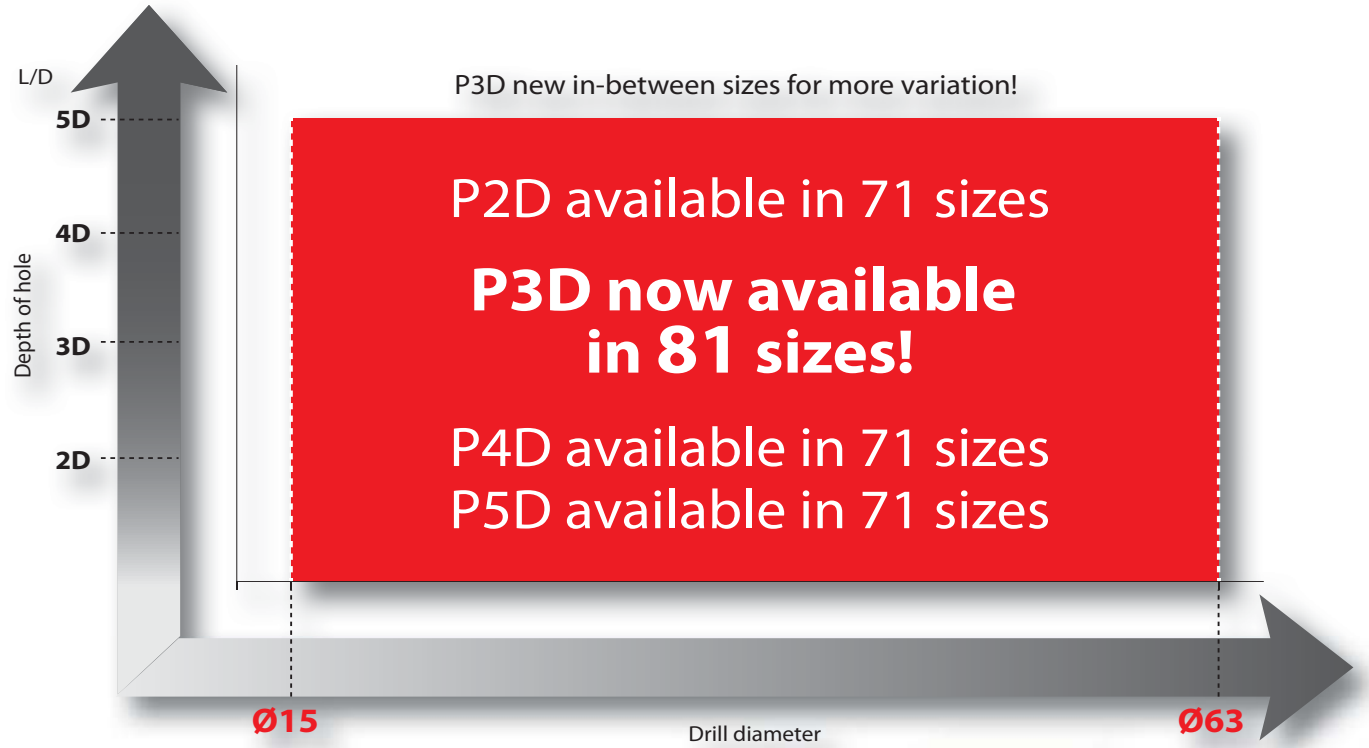
4 High precision finishing of the flute surface improves chip evacuation

5 Internal coolant system

PD SERIES: NEW SIZES AVAILABLE NOW

3 types of chipbreakers for a variety of work material in large size range.

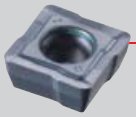
P3D lineup further expanded with 10 additional in-between sizes.



PHOENIX XCMT INSERTS

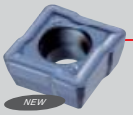
Drilling | Indexable | Inserts

Three types of chipbreakers are available for a wide variety of work material



For Steel and Stainless Steel (DM)

- Well balanced insert with sharpness and rigidity



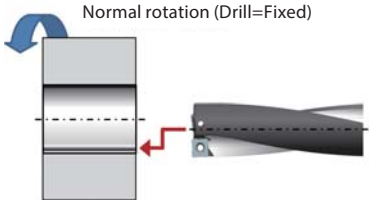
For Cast Iron (DR)

- Strong cutting edge acquired by rake angle and land

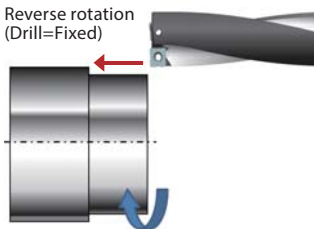
For Aluminum Alloy and Nonferrous Metal (DN)

- Excellent chip evacuation is acquired by sharp cutting edges and polishing treatment

- Turning internal diameter



- Turning outer diameter



Chipbreaker		Work Material	Grades	Coating Method	(HRA) Hardness	Surface Treatment	
						Main Component	Coating Thickness
	DM	P	XP9020	PVD	91.9	TiAlN	3µm
NEW	DR	K	XP1010	PVD	91.4	TiAlN	6µm
NEW	DN	N	CK110	—	92.2	—	—

MATERIAL OVERVIEW

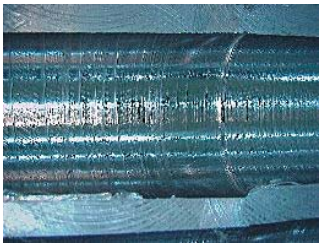
		Work Material	DIN
P	C: ≤0,2%	Low carbon steel	**1.0116** (S235J2G3) **1.0401** (C15)
	C: 0,25-0,45%	Medium carbon steel	**1.0501** (C35)
	C: ≥0,45%	High carbon steel	**1.0535** (C55) **1.0553** (S355J0)
	SCM	Alloy steel	**1.7225** (42CrMo4)
M	INOX	Stainless steel	**1.4301** (X5CrNi18-10)
K	GG	Cast iron	**0.6025** (EN-GJL-250/GG25)
	GGG	Ductile cast iron	**0.7040** (EN-GJS-400-15/GGG-40)
N	Al	Aluminium	**3.0205** (Al99)
	AC, ADC	Cast aluminium alloys	**3.2581** (G-AlSi12)
S	Ti	Titanium	**3.7164** (Ti6Al4V)
	Ni	Nickel alloys	**2.4816** (NiCr15Fe/Inconel® 600)
H	25-35HRC	Hardened steel	
	35-45HRC		
	45-52HRC		
	52-62HRC		

Achieves stable drilling, even when making rigorous 5xD deep holes

Work Material	S50C
Drill Diameter	Ø 25
Depth of hole	125 mm
Cutting Condition	Vc=150m/min f=0,12mm/rev
Coolant	Water soluble
Machine	Horizontal Machining Center (BT50)

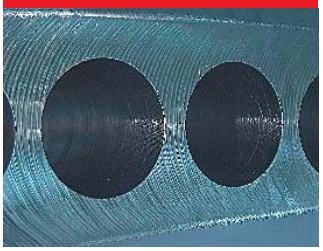
Conventional Indexable drill

Cross-sectional



- 5xD deep hole drilling was an extremely difficult process for conventional indexable drills.
- Since conventional indexable drills are constructed of two flutes and a cutting edge, its load balance is relatively poor especially when drilling deep holes.

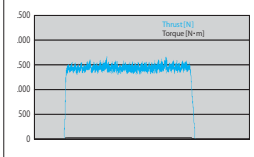
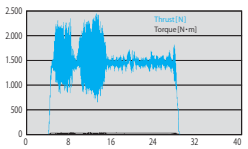
P5D



- Achieves stable drilling with minimal irregularity.
- The P5D is designed specifically for stable drilling of 5xD deep holes

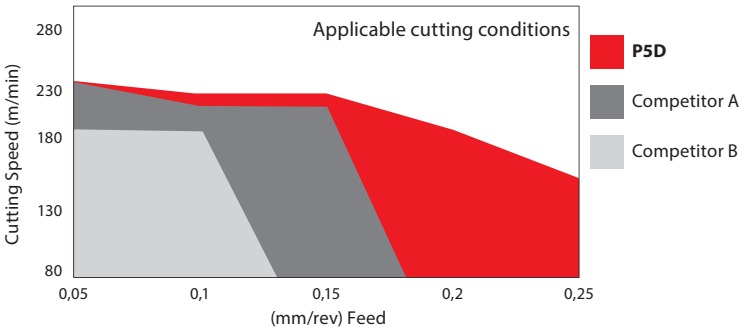
Stable cutting load

Work Material	S50C
Drill Diameter	Ø 21
Depth of hole	50 mm
Cutting Condition	Vc=120m/min f=0,12mm/rev
Coolant	Water soluble
Machine	Horizontal Machining Center (BT50)

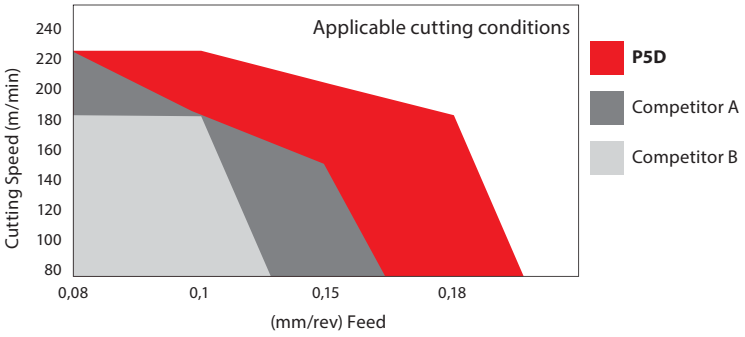
	P5D	Competitor
	 Time	 Time
Average thrust	1,400N	1,500N
Average torque	19N·m	18N·m

High efficiency even when drilling deep holes

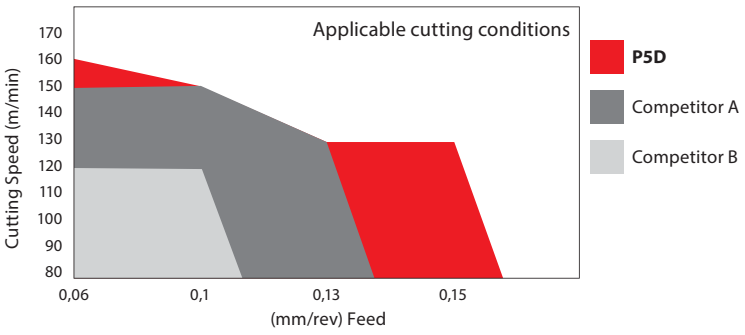
Tool	P5D2500FS32M08 (Ø25)
Insert Grade	XCMT083508ER-DM
Work Material	S50C
Depth of Hole	120 mm
Coolant	Water soluble (Internal)
Machine	BT50 Horizontal Machining Center



Tool	P5D2500FS32M08 (Ø25)
Insert Grade	XCMT083508ER-DM
Work Material	SCM440 (30HRC)
Depth of Hole	120 mm
Coolant	Water soluble (Internal)
Machine	BT50 Horizontal Machining Center



Tool	P5D2500FS32M08 (Ø25)
Insert Grade	XCMT083508ER-DM
Work Material	SUS304
Depth of Hole	120 mm
Coolant	Water soluble (Internal)
Machine	BT50 Horizontal Machining Center

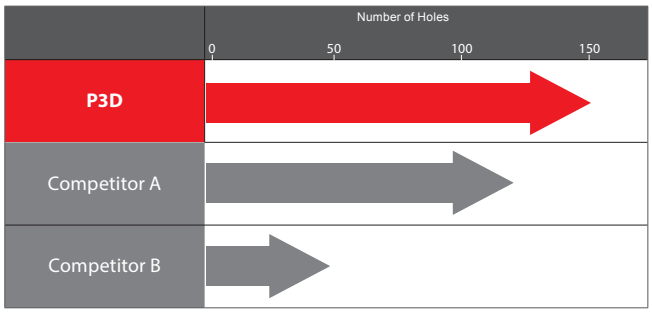


PROCESSING DATA

High efficiency drilling in SUS304 (P3D)

Tool	P3D2500FS32M08 (Ø25)
Insert Grade	XCMT083508ER-DM (XP9020)
Work Material	SUS304
Cutting Speed	160m/min (2.040min^{-1})
Feed	400mm/min (0,2mm/rev)
Depth of Hole	75mm (Blind)
Coolant	Water Soluble
Machine	Horizontal Machining Center

The P3D was able to achieve long tool life by drilling SUS 304.

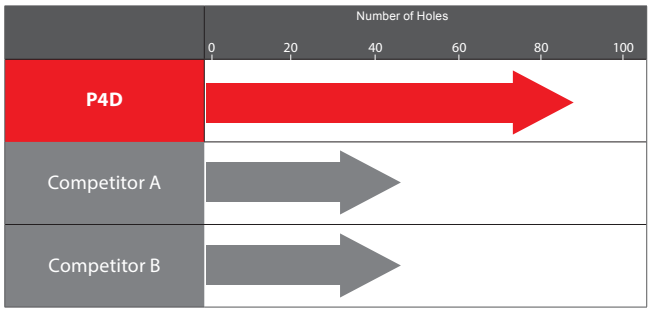


Wear comparison after drilling 48 holes

High efficiency drilling in SUS304 (P4D)

Tool	P4D2500FS32M08 (Ø25)
Insert Grade	XCMT083508ER-DM (XP9020)
Work Material	SUS304
Cutting Speed	160m/min (2.040min^{-1})
Feed	245mm/min (0,12mm/rev)
Depth of Hole	100mm(Blind)
Coolant	Water Soluble
Machine	Horizontal Machining Center

Long tool life was able to achieve by stable drilling.

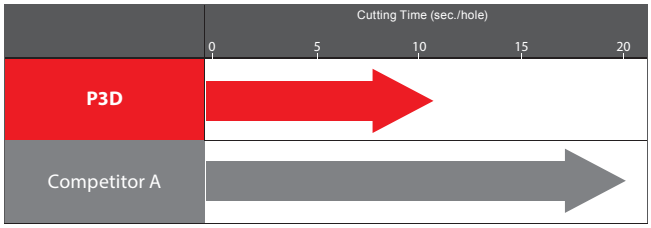


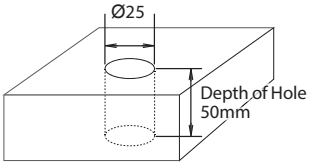
Wear comparison after drilling 45 holes

High efficiency drilling in mold parts (P3D)

Tool	P3D2500FS32M08 (Ø25)	Competitor's Indexable Drill
Insert Grade	XCMT083508ER-DM (XP9020)	Coated Carbide Insert
Work Material	S50C	
Cutting Speed	200m/min (2.550min^{-1})	167m/min (2.100min^{-1})
Feed	300mm/min (0,12mm/rev)	170mm/min (0,08mm/rev)
Depth of Hole	50mm (Through)	
Coolant	Water Soluble (Internal)	
Machine	Vertical Machining Center	

The competitor product exhibited difficulties in the separation of cutting chips, whereas the P3D was able to break chips into small pieces for trouble-free evacuation, reducing processing time significantly.



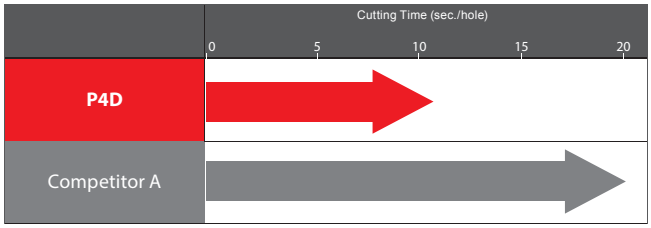


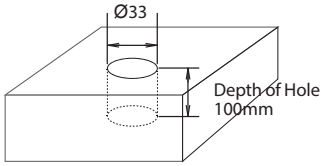
Cutting Chips of P3D

High efficiency drilling of structural parts (P4D)

Tool	P4D3300FS40M09 (Ø33)	Competitor's Indexable Drill
Insert Grade	XCMT094008ER-DM (XP9020)	Coated Carbide Insert
Work Material	SS400	
Cutting Speed	220m/min (2.100min^{-1})	165m/min (1.600min^{-1})
Feed	150mm/min (0,07mm/rev)	110mm/min (0,07mm/rev)
Depth of Hole	100mm (Blind)	
Coolant	Water Soluble (Internal)	
Machine	Horizontal Machining Center	

To prevent chip clogging, 2mm step-drilling was commonly required for applications with a depth of over 70mm. The P4D, however, was able to demonstrate excellent chip evacuation even in deep-hole with no step processing required, improving performance with the reduction of machining time by 45% per hole.

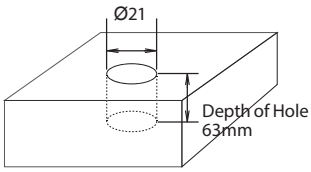


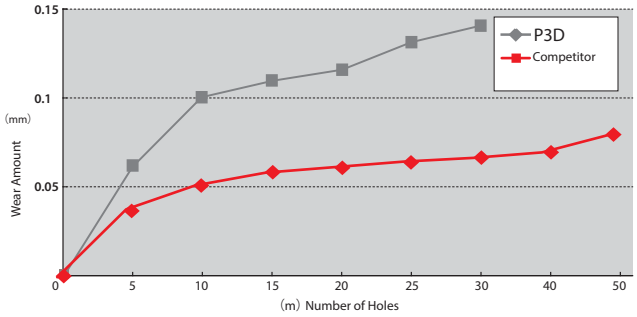


Drilling with long tool life in high-hardened material (P3D)

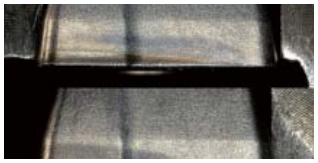
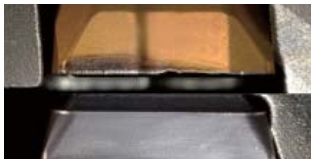
Tool	P3D2100FS25M07 (Ø25)	Competitor's Indexable Drill
Insert Grade	XCMT073106ER-DM (XP9020)	Coated Carbide Insert
Work Material	SKD61 (50HRC)	
Cutting Speed	80m/min (1.200min^{-1})	
Feed	100mm/min (0,08mm/rev)	
Depth of Hole	63mm (Blind)	
Coolant	Water Soluble (Internal)	
Machine	Horizontal Machining Center	

The competitor product exhibited chipping of the center blade after processing 30 holes in a high hardness material of HRC50. The P3D, on the other hand, was able to continue processing even after 50 holes with minimal wear.





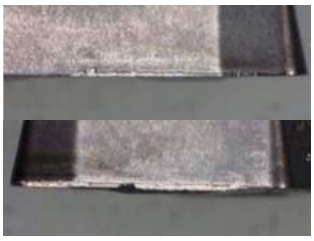
Wear comparison

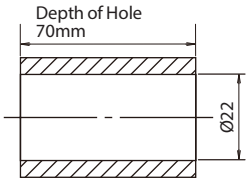
P3D	Competitor
	
after 50 holes of drilling	after 30 holes of drilling

Turning of building component (P4D)

Tool	P4D2200FS25M07 (Ø22)	Competitor's Indexable Drill
Insert Grade	XCMT073106ER-DM (XP9020)	Coated Carbide Insert
Work Material	SCM415	
Cutting Speed	104m/min (1.500min^{-1})	
Feed	300mm/min (0,2mm/rev)	
Depth of Hole	70mm (Through)	
Coolant	Water Soluble (Internal)	
Machine	Horizontal NC Lathe	

The insert of the competitor tool exhibited chipping during the processing of a 70mm deep-hole turning application while the P4D was able to continue processing with minimal wear shown.

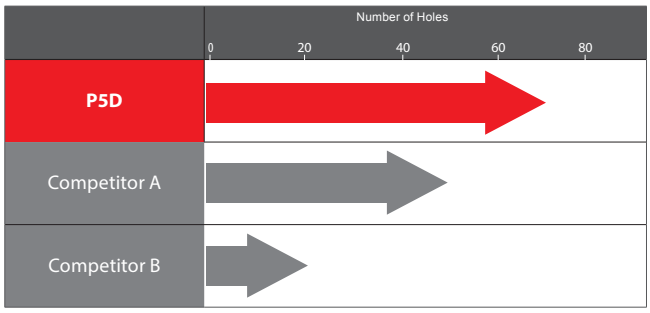
P4D	Competitor
	



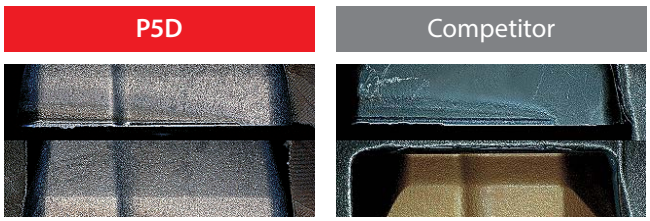
High efficiency drilling in S50C (P5D)

Tool	P5D2700FS32M08 (Ø27)
Insert Grade	XCMT083508ER-DM (XP9020)
Work Material	S50C
Cutting Speed	150m/min (1,800min^{-1})
Feed	216mm/min (0.12mm/rev)
Depth of Hole	120mm (Through)
Coolant	Water Soluble
Machine	Horizontal Machining Center

High efficiency can be achieved even when drilling 5xD deep holes.
With stable performance, tool life can be prolonged.



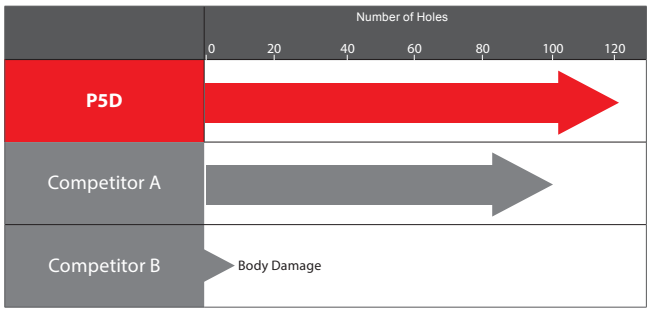
Wear comparison after drilling 40 holes



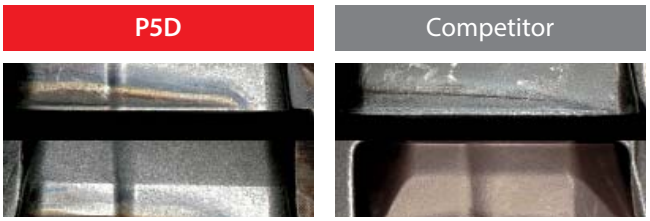
Stable performance even in stainless steel (P5D)

Tool	P5D2700FS32M08 (Ø27)
Insert Grade	XCMT083508ER-DM (XP9020)
Work Material	SUS304
Cutting Speed	120m/min (1.400min^{-1})
Feed	140mm/min (0,1mm/rev)
Depth of Hole	120mm (Through)
Coolant	Water Soluble
Machine	Horizontal Machining Center

The P5D is able to achieve great chip evacuation and stable performance even in SUS304, where chip packing is a common problem.



Wear comparison after drilling 100 holes

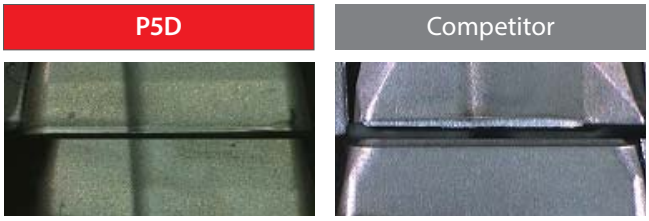


Drilling with long tool life in ADC12 (P5D)

Tool	P5D2500FS32M8 (Ø25)
Insert Grade	XCMT083508ER-DN (CK110)
Work Material	ADC12
Cutting Speed	250m/min (3.185min^{-1})
Feed	320mm/min (0,1mm/rev)
Depth of Hole	100mm (Blind)
Coolant	Water Soluble
Machine	Horizontal Machining Center

Long tool life was achieved in machining ADC12 by using inserts for aluminium alloy and non-ferrous materials.

Wear comparison after drilling 200 holes

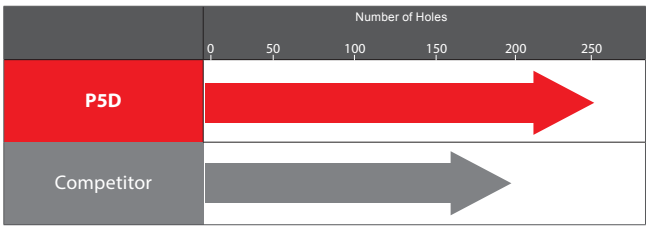


Width of wear 0,117 mm

Width of wear 0,153 mm

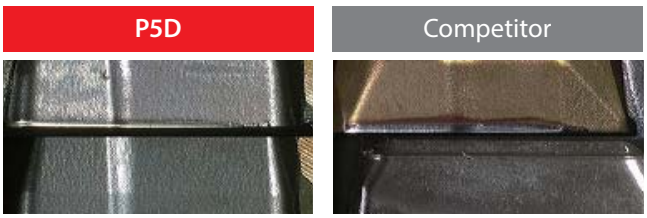
Drilling with long tool life in FC250 (P5D)

Tool	P5D2500FS32M08 (Ø25)
Insert Grade	XCMT083508ER-DR (XP1010)
Work Material	FC250
Cutting Speed	150m/min (1,910min^{-1})
Feed	200mm/min (0.1mm/rev)
Depth of Hole	100mm (Blind)
Coolant	Water Soluble
Machine	Horizontal Machining Center



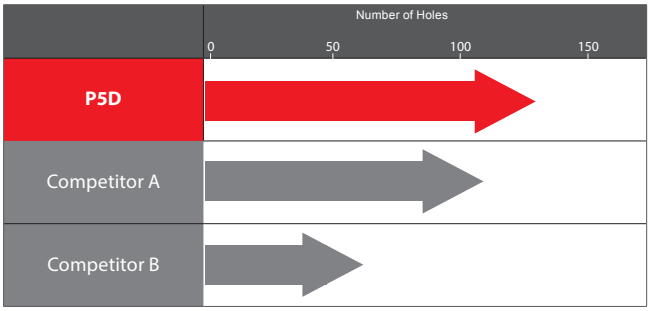
P5D achieved stable drilling of 250holes, which was over 1,3 times, versus the competition.

Wear comparison after drilling 150 holes

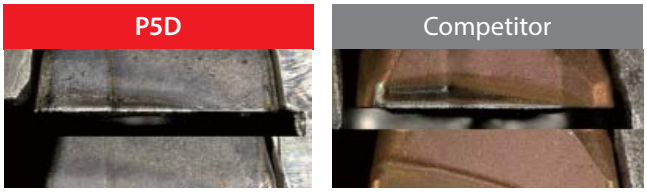


Stable performance even in SUS304 (P5D)

Tool	P5D1500FS20M04 (Ø15)	Competitor A	Competitor B
Insert Grade	XCMT042204ER-DM (XP9020)	Coated Carbide Insert	
Work Material	SUS304		
Cutting Speed	120m/min (2.550min^{-1})		
Feed	150mm/min (0,06mm/rev)		
Depth of Hole	75mm (Blind)		
Coolant	Water Soluble (internal)		
Machine	Horizontal Machining Center		

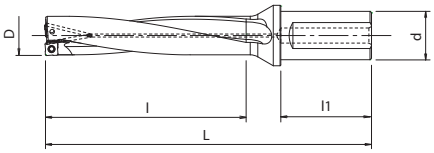


Wear comparison after 9m of drilling

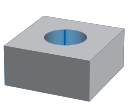


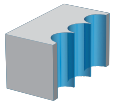
P2D

Drilling | Indexable | Body



- Indexable drill with internal coolant
- Up to 2xD
- 3 different insert grades available
- 71 sizes





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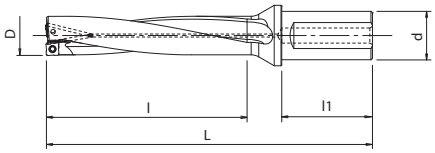
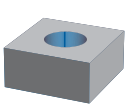
EDP	Designation	D	Applicable inserts type	L	l	l1	d
7803117	P2D1500FS20M04	15	XCMT04…	95	30	50	20
7803118	P2D1550FS20M04	15,5	XCMT04…	96	31	50	20
7803119	P2D1600FS20M04	16	XCMT04…	97	32	50	20
7803120	P2D1650FS20M04	16,5	XCMT04…	98	33	50	20
7803121	P2D1700FS20M05	17	XCMT05…	102	34	50	20
7803122	P2D1750FS20M05	17,5	XCMT05…	103	35	50	20
7803190	P2D1750FS25M05	17,5	XCMT05…	109	35	56	25
7803123	P2D1800FS25M05	18	XCMT05…	110	36	56	25
7803124	P2D1850FS25M05	18,5	XCMT05…	111	37	56	25
7803125	P2D1900FS25M06	19	XCMT06…	112	38	56	25
7803126	P2D1950FS25M06	19,5	XCMT06…	113	39	56	25
7803127	P2D2000FS25M06	20	XCMT06…	114	40	56	25
7803128	P2D2050FS25M06	20,5	XCMT06…	115	41	56	25
7803129	P2D2100FS25M07	21	XCMT07…	121	42	56	25
7803130	P2D2150FS25M07	21,5	XCMT07…	122	43	56	25
7803131	P2D2200FS25M07	22	XCMT07…	123	44	56	25
7803132	P2D2250FS25M07	22,5	XCMT07…	124	45	56	25
7803133	P2D2300FS25M07	23	XCMT07…	125	46	56	25
7803191	P2D2350FS25M07	23,5	XCMT07…	126	47	56	25
7803134	P2D2350FS32M07	23,5	XCMT07…	130	47	60	32
7803192	P2D2400FS25M07	24	XCMT07…	127	48	56	25
7803135	P2D2400FS32M07	24	XCMT07…	131	48	60	32
7803193	P2D2450FS25M07	24,5	XCMT07…	128	49	56	25
7803136	P2D2450FS32M07	24,5	XCMT07…	132	49	60	32
7803194	P2D2500FS25M08	25	XCMT08…	129	50	56	25
7803137	P2D2500FS32M08	25	XCMT08…	133	50	60	32
7803195	P2D2550FS25M08	25,5	XCMT08…	130	51	56	25
7803138	P2D2550FS32M08	25,5	XCMT08…	134	51	60	32
7803139	P2D2600FS32M08	26	XCMT08…	135	52	60	32
7803140	P2D2650FS32M08	26,5	XCMT08…	136	53	60	32
7803141	P2D2700FS32M08	27	XCMT08…	137	54	60	32
7803142	P2D2800FS32M08	28	XCMT08…	139	56	60	32
7803143	P2D2850FS32M08	28,5	XCMT08…	140	57	60	32
7803144	P2D2900FS32M09	29	XCMT09…	141	58	60	32
7803145	P2D3000FS32M09	30	XCMT09…	143	60	60	32
7803146	P2D3100FS32M09	31	XCMT09…	145	62	60	32
7803196	P2D3100FS40M09	31	XCMT09…	155	62	70	40
7803147	P2D3200FS32M09	32	XCMT09…	147	64	60	32
7803197	P2D3200FS40M09	32	XCMT09…	157	64	70	40
7803148	P2D3300FS40M09	33	XCMT09…	159	66	70	40
7803149	P2D3350FS40M09	33,5	XCMT09…	160	67	70	40
7803150	P2D3400FS40M10	34	XCMT10…	161	68	70	40
7803151	P2D3500FS40M10	35	XCMT10…	163	70	70	40
7803152	P2D3600FS40M10	36	XCMT10…	165	72	70	40
7803153	P2D3700FS40M10	37	XCMT10…	167	74	70	40
7803154	P2D3800FS40M10	38	XCMT10…	169	76	70	40
7803155	P2D3900FS40M12	39	XCMT12…	178	78	70	40
7803156	P2D4000FS40M12	40	XCMT12…	180	80	70	40
7803157	P2D4100FS40M12	41	XCMT12…	182	82	70	40
7803158	P2D4200FS40M12	42	XCMT12…	184	84	70	40
7803159	P2D4300FS40M12	43	XCMT12…	186	86	70	40
7803160	P2D4400FS40M12	44	XCMT12…	188	88	70	40
7803161	P2D4500FS40M13	45	XCMT13…	190	90	70	40
7803162	P2D4600FS40M13	46	XCMT13…	192	92	70	40

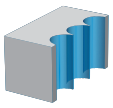
P2D

Drilling | Indexable | Body



- Indexable drill with internal coolant
- Up to 2xD
- 3 different insert grades available
- 71 sizes





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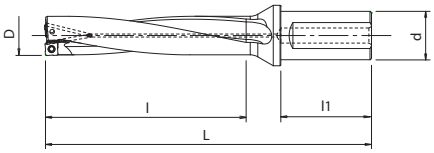
EDP	Designation	D	Applicable inserts type	L	l	l1	d
7803163	P2D4700FS40M13	47	XCMT13…	194	94	70	40
7803164	P2D4800FS40M13	48	XCMT13…	196	96	70	40
7803165	P2D4900FS40M13	49	XCMT13…	198	98	70	40
7803166	P2D5000FS40M14	50	XCMT14…	200	100	70	40
7803167	P2D5100FS40M14	51	XCMT14…	202	102	70	40
7803168	P2D5200FS40M14	52	XCMT14…	204	104	70	40
7803169	P2D5300FS40M14	53	XCMT14…	206	106	70	40
7803170	P2D5400FS40M14	54	XCMT14…	208	108	70	40
7803171	P2D5500FS40M14	55	XCMT14…	210	110	70	40
7803172	P2D5600FS40M14	56	XCMT14…	212	112	70	40
7803173	P2D5700FS40M16	57	XCMT16…	214	114	70	40
7803174	P2D5800FS40M16	58	XCMT16…	216	116	70	40
7803175	P2D5900FS40M16	59	XCMT16…	218	118	70	40
7803176	P2D6000FS40M16	60	XCMT16…	220	120	70	40
7803177	P2D6100FS40M16	61	XCMT16…	222	122	70	40
7803178	P2D6200FS40M16	62	XCMT16…	224	124	70	40
7803179	P2D6300FS40M16	63	XCMT16…	226	126	70	40

Accessories & spare parts

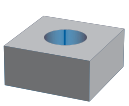
Applicable drill Ø	Clamping screw		Wrench	
Ø 15 - 18,5	7808139	FS20543P	7808223	6IP-D (Torx 6IP)
Ø 19 - 20,5	7808138	FS22550P	7808224	7IP-D (Torx 7IP)
Ø 21 - 24,5	7808136	FS25560P	7808225	8IP-D (Torx 8IP)
Ø 25 - 33,5	7808135	FS30570P	7808226	9IP-D (Torx 9IP)
Ø 34 - 44	7808137	FS35586P	7808228	15IP-D (Torx 15IP)
Ø 45 - 63	7808114	FS45510P	7808229	20IP-D (Torx 20IP)

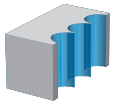
P3D

Drilling | Indexable | Body



- Indexable drill with internal coolant
- Up to 3xD
- 3 different insert grades available
- 81 sizes





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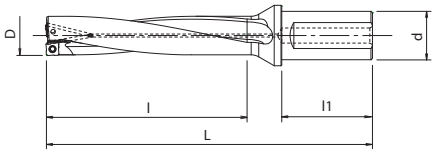
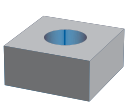
EDP	Designation	D	Applicable inserts type	L	l	l1	d
7803217	P3D1500FS20M04	15	XCMT04…	110	45	50	20
7803218	P3D1550FS20M04	15,5	XCMT04…	112	47	50	20
7803219	P3D1600FS20M04	16	XCMT04…	113	48	50	20
7803220	P3D1650FS20M04	16,5	XCMT04…	115	50	50	20
7803221	P3D1700FS20M05	17	XCMT05…	119	51	50	20
7803222	P3D1750FS20M05	17,5	XCMT05…	121	53	50	20
7803290	P3D1750FS25M05	17,5	XCMT05…	127	53	56	25
7803223	P3D1800FS25M05	18	XCMT05…	128	54	56	25
7803224	P3D1850FS25M05	18,5	XCMT05…	130	56	56	25
7803225	P3D1900FS25M06	19	XCMT06…	131	57	56	25
7803226	P3D1950FS25M06	19,5	XCMT06…	133	59	56	25
7803227	P3D2000FS25M06	20	XCMT06…	134	60	56	25
7803228	P3D2050FS25M06	20,5	XCMT06…	136	62	56	25
7803229	P3D2100FS25M07	21	XCMT07…	142	63	56	25
7803230	P3D2150FS25M07	21,5	XCMT07…	144	65	56	25
7803231	P3D2200FS25M07	22	XCMT07…	145	66	56	25
7803232	P3D2250FS25M07	22,5	XCMT07…	147	68	56	25
7803233	P3D2300FS25M07	23	XCMT07…	148	69	56	25
7803291	P3D2350FS25M07	23,5	XCMT07…	150	71	56	25
7803234	P3D2350FS32M07	23,5	XCMT07…	154	71	60	32
7803292	P3D2400FS25M07	24	XCMT07…	151	72	56	25
7803235	P3D2400FS32M07	24	XCMT07…	155	72	60	32
7803293	P3D2450FS25M07	24,5	XCMT07…	153	74	56	25
7803236	P3D2450FS32M07	24,5	XCMT07…	157	74	60	32
7803294	P3D2500FS25M08	25	XCMT08…	154	75	56	25
7803237	P3D2500FS32M08	25	XCMT08…	158	75	60	32
7803295	P3D2550FS25M08	25,5	XCMT08…	156	77	56	25
7803238	P3D2550FS32M08	25,5	XCMT08…	160	77	60	32
7803239	P3D2600FS32M08	26	XCMT08…	161	78	60	32
7803240	P3D2650FS32M08	26,5	XCMT08…	163	80	60	32
7803241	P3D2700FS32M08	27	XCMT08…	164	81	60	32
7803300	P3D2750FS32M08	27,5 NEW	XCMT08…	166	83	60	32
7803242	P3D2800FS32M08	28	XCMT08…	167	84	60	32
7803243	P3D2850FS32M08	28,5	XCMT08…	169	86	60	32
7803244	P3D2900FS32M09	29	XCMT09…	170	87	60	32
7803301	P3D2950FS32M09	29,5 NEW	XCMT09…	172	89	60	32
7803245	P3D3000FS32M09	30	XCMT09…	173	90	60	32
7803302	P3D3050FS32M09	30,5 NEW	XCMT09…	175	92	60	32
7803246	P3D3100FS32M09	31	XCMT09…	176	93	60	32
7803296	P3D3100FS40M09	31	XCMT09…	186	93	70	40
7803303	P3D3150FS32M09	31,5 NEW	XCMT09…	178	95	60	32
7803247	P3D3200FS32M09	32	XCMT09…	179	96	60	32
7803297	P3D3200FS40M09	32	XCMT09…	189	96	70	40
7803304	P3D3250FS40M09	32,5 NEW	XCMT09…	191	98	70	40
7803248	P3D3300FS40M09	33	XCMT09…	192	99	70	40
7803249	P3D3350FS40M09	33,5	XCMT09…	194	101	70	40
7803250	P3D3400FS40M10	34	XCMT10…	195	102	70	40
7803305	P3D3450FS40M10	34,5 NEW	XCMT10…	197	104	70	40
7803251	P3D3500FS40M10	35	XCMT10…	198	105	70	40
7803306	P3D3550FS40M10	35,5 NEW	XCMT10…	200	107	70	40
7803252	P3D3600FS40M10	36	XCMT10…	201	108	70	40
7803253	P3D3700FS40M10	37	XCMT10…	204	111	70	40
7803307	P3D3750FS40M10	37,5 NEW	XCMT10…	206	113	70	40
7803254	P3D3800FS40M10	38	XCMT10…	207	114	70	40

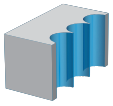
P3D

Drilling | Indexable | Body



- Indexable drill with internal coolant
- Up to 3xD
- 3 different insert grades available
- 81 sizes





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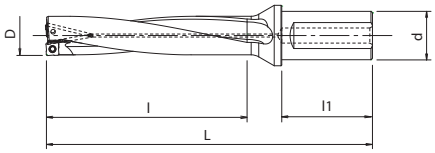
EDP	Designation	D	Applicable inserts type	L	l	l1	d
7803255	P3D3900FS40M12	39	XCMT12…	217	117	70	40
7803256	P3D4000FS40M12	40	XCMT12…	220	120	70	40
7803308	P3D4050FS40M12	40,5 NEW	XCMT12…	222	122	70	40
7803257	P3D4100FS40M12	41	XCMT12…	223	123	70	40
7803258	P3D4200FS40M12	42	XCMT12…	226	126	70	40
7803259	P3D4300FS40M12	43	XCMT12…	229	129	70	40
7803260	P3D4400FS40M12	44	XCMT12…	232	132	70	40
7803261	P3D4500FS40M13	45	XCMT13…	235	135	70	40
7803262	P3D4600FS40M13	46	XCMT13…	238	138	70	40
7803263	P3D4700FS40M13	47	XCMT13…	241	141	70	40
7803264	P3D4800FS40M13	48	XCMT13…	244	144	70	40
7803265	P3D4900FS40M13	49	XCMT13…	247	147	70	40
7803266	P3D5000FS40M14	50	XCMT14…	250	150	70	40
7803309	P3D5050FS40M14	50,5 NEW	XCMT14…	252	152	70	40
7803267	P3D5100FS40M14	51	XCMT14…	253	153	70	40
7803268	P3D5200FS40M14	52	XCMT14…	256	156	70	40
7803269	P3D5300FS40M14	53	XCMT14…	259	159	70	40
7803270	P3D5400FS40M14	54	XCMT14…	262	162	70	40
7803271	P3D5500FS40M14	55	XCMT14…	265	165	70	40
7803272	P3D5600FS40M14	56	XCMT14…	268	168	70	40
7803273	P3D5700FS40M16	57	XCMT16…	271	171	70	40
7803274	P3D5800FS40M16	58	XCMT16…	274	174	70	40
7803275	P3D5900FS40M16	59	XCMT16…	277	177	70	40
7803276	P3D6000FS40M16	60	XCMT16…	280	180	70	40
7803277	P3D6100FS40M16	61	XCMT16…	283	183	70	40
7803278	P3D6200FS40M16	62	XCMT16…	286	186	70	40
7803279	P3D6300FS40M16	63	XCMT16…	289	189	70	40

Accessories & spare parts

Applicable drill Ø	Clamping screw		Wrench	
Ø 15 - 18,5	7808139	FS20543P	7808223	6IP-D (Torx 6IP)
Ø 19 - 20,5	7808138	FS22550P	7808224	7IP-D (Torx 7IP)
Ø 21 - 24,5	7808136	FS25560P	7808225	8IP-D (Torx 8IP)
Ø 25 - 33,5	7808135	FS30570P	7808226	9IP-D (Torx 9IP)
Ø 34 - 44	7808137	FS35586P	7808228	15IP-D (Torx 15IP)
Ø 45 - 63	7808114	FS45510P	7808229	20IP-D (Torx 20IP)

P4D

Drilling | Indexable | Body



- Indexable drill with internal coolant
- Up to 4xD
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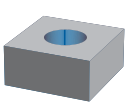
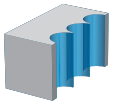
- 71 sizes





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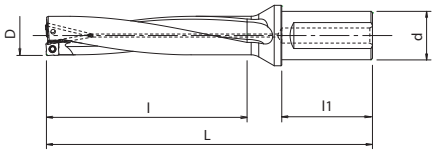
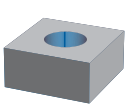
EDP	Designation	D	Applicable inserts type	L	l	l1	d
7803317	P4D1500FS20M04	15	XCMT04…	125	60	50	20
7803318	P4D1550FS20M04	15,5	XCMT04…	127	62	50	20
7803319	P4D1600FS20M04	16	XCMT04…	129	64	50	20
7803320	P4D1650FS20M04	16,5	XCMT04…	131	66	50	20
7803321	P4D1700FS20M05	17	XCMT05…	136	68	50	20
7803322	P4D1750FS20M05	17,5	XCMT05…	138	70	50	20
7803390	P4D1750FS25M05	17,5	XCMT05…	144	70	56	25
7803323	P4D1800FS25M05	18	XCMT05…	146	72	56	25
7803324	P4D1850FS25M05	18,5	XCMT05…	148	74	56	25
7803325	P4D1900FS25M06	19	XCMT06…	150	76	56	25
7803326	P4D1950FS25M06	19,5	XCMT06…	152	78	56	25
7803327	P4D2000FS25M06	20	XCMT06…	154	80	56	25
7803328	P4D2050FS25M06	20,5	XCMT06…	156	82	56	25
7803329	P4D2100FS25M07	21	XCMT07…	163	84	56	25
7803330	P4D2150FS25M07	21,5	XCMT07…	165	86	56	25
7803331	P4D2200FS25M07	22	XCMT07…	167	88	56	25
7803332	P4D2250FS25M07	22,5	XCMT07…	169	90	56	25
7803333	P4D2300FS25M07	23	XCMT07…	171	92	56	25
7803391	P4D2350FS25M07	23,5	XCMT07…	173	94	56	25
7803334	P4D2350FS32M07	23,5	XCMT07…	177	94	60	32
7803392	P4D2400FS25M07	24	XCMT07…	175	96	56	25
7803335	P4D2400FS32M07	24	XCMT07…	179	96	60	32
7803393	P4D2450FS25M07	24,5	XCMT07…	177	98	56	25
7803336	P4D2450FS32M07	24,5	XCMT07…	181	98	60	32
7803394	P4D2500FS25M08	25	XCMT08…	179	100	56	25
7803337	P4D2500FS32M08	25	XCMT08…	183	100	60	32
7803395	P4D2550FS25M08	25,5	XCMT08…	181	102	56	25
7803338	P4D2550FS32M08	25,5	XCMT08…	185	102	60	32
7803339	P4D2600FS32M08	26	XCMT08…	187	104	60	32
7803340	P4D2650FS32M08	26,5	XCMT08…	189	106	60	32
7803341	P4D2700FS32M08	27	XCMT08…	191	108	60	32
7803342	P4D2800FS32M08	28	XCMT08…	195	112	60	32
7803343	P4D2850FS32M08	28,5	XCMT08…	197	114	60	32
7803344	P4D2900FS32M09	29	XCMT09…	199	116	60	32
7803345	P4D3000FS32M09	30	XCMT09…	203	120	60	32
7803346	P4D3100FS32M09	31	XCMT09…	207	124	60	32
7803396	P4D3100FS40M09	31	XCMT09…	217	124	70	40
7803347	P4D3200FS32M09	32	XCMT09…	211	128	60	32
7803397	P4D3200FS40M09	32	XCMT09…	221	128	70	32
7803348	P4D3300FS40M09	33	XCMT09…	225	132	70	40
7803349	P4D3350FS40M09	33,5	XCMT09…	227	134	70	40
7803350	P4D3400FS40M10	34	XCMT10…	229	136	70	40
7803351	P4D3500FS40M10	35	XCMT10…	233	140	70	40
7803352	P4D3600FS40M10	36	XCMT10…	237	144	70	40
7803353	P4D3700FS40M10	37	XCMT10…	241	148	70	40
7803354	P4D3800FS40M10	38	XCMT10…	245	152	70	40
7803355	P4D3900FS40M12	39	XCMT12…	256	156	70	40
7803356	P4D4000FS40M12	40	XCMT12…	260	160	70	40
7803357	P4D4100FS40M12	41	XCMT12…	264	164	70	40
7803358	P4D4200FS40M12	42	XCMT12…	268	168	70	40
7803359	P4D4300FS40M12	43	XCMT12…	272	172	70	40
7803360	P4D4400FS40M12	44	XCMT12…	276	176	70	40
7803361	P4D4500FS40M13	45	XCMT13…	280	180	70	40
7803362	P4D4600FS40M13	46	XCMT13…	284	184	70	40

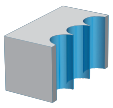
P4D

Drilling | Indexable | Body



- Indexable drill with internal coolant
- Up to 4xD
- 3 different insert grades available
- 71 sizes





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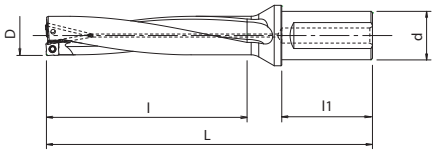
EDP	Designation	D	Applicable inserts type	L	l	l1	d
7803363	P4D4700FS40M13	47	XCMT13…	288	188	70	40
7803364	P4D4800FS40M13	48	XCMT13…	292	192	70	40
7803365	P4D4900FS40M13	49	XCMT13…	296	196	70	40
7803366	P4D5000FS40M14	50	XCMT14…	300	200	70	40
7803367	P4D5100FS40M14	51	XCMT14…	304	204	70	40
7803368	P4D5200FS40M14	52	XCMT14…	308	208	70	40
7803369	P4D5300FS40M14	53	XCMT14…	312	212	70	40
7803370	P4D5400FS40M14	54	XCMT14…	316	216	70	40
7803371	P4D5500FS40M14	55	XCMT14…	320	220	70	40
7803372	P4D5600FS40M14	56	XCMT14…	324	224	70	40
7803373	P4D5700FS40M16	57	XCMT16…	328	228	70	40
7803374	P4D5800FS40M16	58	XCMT16…	332	232	70	40
7803375	P4D5900FS40M16	59	XCMT16…	336	236	70	40
7803376	P4D6000FS40M16	60	XCMT16…	340	240	70	40
7803377	P4D6100FS40M16	61	XCMT16…	344	244	70	40
7803378	P4D6200FS40M16	62	XCMT16…	348	248	70	40
7803379	P4D6300FS40M16	63	XCMT16…	352	252	70	40

Accessories & spare parts

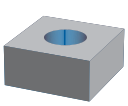
Applicable drill Ø	Clamping screw		Wrench	
Ø 15 - 18,5	7808139	FS20543P	7808223	6IP-D (Torx 6IP)
Ø 19 - 20,5	7808138	FS22550P	7808224	7IP-D (Torx 7IP)
Ø 21 - 24,5	7808136	FS25560P	7808225	8IP-D (Torx 8IP)
Ø 25 - 33,5	7808135	FS30570P	7808226	9IP-D (Torx 9IP)
Ø 34 - 44	7808137	FS35586P	7808228	15IP-D (Torx 15IP)
Ø 45 - 63	7808114	FS45510P	7808229	20IP-D (Torx 20IP)

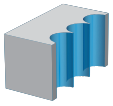
P5D

Drilling | Indexable | Body



- Indexable drill with internal coolant
- Up to 5xD
- 3 different insert grades available
- 71 sizes





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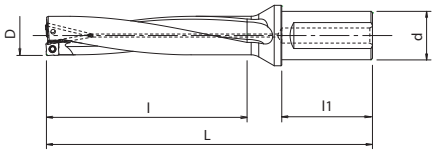
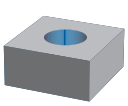
EDP	Designation	D	Applicable inserts type	L	l	l1	d
7802717	P5D1500FS20M04	15	XCMT04…	140	75	50	20
7802718	P5D1550FS20M04	15,5	XCMT04…	143	78	50	20
7802719	P5D1600FS20M04	16	XCMT04…	145	80	50	20
7802720	P5D1650FS20M04	16,5	XCMT04…	148	83	50	20
7802721	P5D1700FS20M05	17	XCMT05…	153	85	50	20
7802722	P5D1750FS20M05	17,5	XCMT05…	156	88	50	20
7802790	P5D1750FS25M05	17,5	XCMT05…	162	88	56	25
7802723	P5D1800FS25M05	18	XCMT05…	164	90	56	25
7802724	P5D1850FS25M05	18,5	XCMT05…	167	93	56	25
7802725	P5D1900FS25M06	19	XCMT06…	169	95	56	25
7802726	P5D1950FS25M06	19,5	XCMT06…	172	98	56	25
7802727	P5D2000FS25M06	20	XCMT06…	174	100	56	25
7802728	P5D2050FS25M06	20,5	XCMT06…	177	103	56	25
7802729	P5D2100FS25M07	21	XCMT07…	184	105	56	25
7802730	P5D2150FS25M07	21,5	XCMT07…	187	108	56	25
7802731	P5D2200FS25M07	22	XCMT07…	189	110	56	25
7802732	P5D2250FS25M07	22,5	XCMT07…	192	113	56	25
7802733	P5D2300FS25M07	23	XCMT07…	194	115	56	25
7802791	P5D2350FS25M07	23,5	XCMT07…	197	118	56	25
7802734	P5D2350FS32M07	23,5	XCMT07…	201	118	60	32
7802792	P5D2400FS25M07	24	XCMT07…	199	120	56	25
7802735	P5D2400FS32M07	24	XCMT07…	203	120	60	32
7802793	P5D2450FS25M07	24,5	XCMT07…	202	123	56	25
7802736	P5D2450FS32M07	24,5	XCMT07…	206	123	60	32
7802794	P5D2500FS25M08	25	XCMT08…	204	125	56	25
7802737	P5D2500FS32M08	25	XCMT08…	208	125	60	32
7802795	P5D2550FS25M08	25,5	XCMT08…	207	128	56	25
7802738	P5D2550FS32M08	25,5	XCMT08…	211	128	60	32
7802739	P5D2600FS32M08	26	XCMT08…	213	130	60	32
7802740	P5D2650FS32M08	26,5	XCMT08…	216	133	60	32
7802741	P5D2700FS32M08	27	XCMT08…	218	135	60	32
7802742	P5D2800FS32M08	28	XCMT08…	223	140	60	32
7802743	P5D2850FS32M08	28,5	XCMT08…	226	143	60	32
7802744	P5D2900FS32M09	29	XCMT09…	228	145	60	32
7802745	P5D3000FS32M09	30	XCMT09…	233	150	60	32
7802746	P5D3100FS32M09	31	XCMT09…	238	155	60	32
7802796	P5D3100FS40M09	31	XCMT09…	248	155	70	40
7802747	P5D3200FS32M09	32	XCMT09…	243	160	60	32
7802797	P5D3200FS40M09	32	XCMT09…	253	160	70	40
7802748	P5D3300FS40M09	33	XCMT09…	258	165	70	40
7802749	P5D3350FS40M09	33,5	XCMT09…	261	168	70	40
7802750	P5D3400FS40M10	34	XCMT10…	263	170	70	40
7802751	P5D3500FS40M10	35	XCMT10…	268	175	70	40
7802752	P5D3600FS40M10	36	XCMT10…	273	180	70	40
7802753	P5D3700FS40M10	37	XCMT10…	278	185	70	40
7802754	P5D3800FS40M10	38	XCMT10…	283	190	70	40
7802755	P5D3900FS40M12	39	XCMT12…	295	195	70	40
7802756	P5D4000FS40M12	40	XCMT12…	300	200	70	40
7802757	P5D4100FS40M12	41	XCMT12…	305	205	70	40
7802758	P5D4200FS40M12	42	XCMT12…	310	210	70	40
7802759	P5D4300FS40M12	43	XCMT12…	315	215	70	40
7802760	P5D4400FS40M12	44	XCMT12…	320	220	70	40
7802761	P5D4500FS40M13	45	XCMT13…	325	225	70	40
7802762	P5D4600FS40M13	46	XCMT13…	330	230	70	40

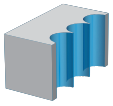
P5D

Drilling | Indexable | Body



- Indexable drill with internal coolant
- Up to 5xD
- 3 different insert grades available
- 71 sizes





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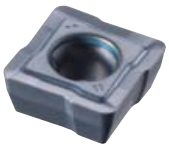
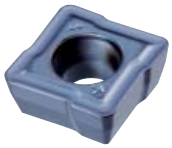
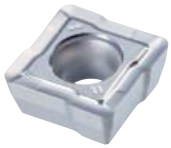
EDP	Designation	D	Applicable inserts type	L	l	l1	d
7802763	P5D4700FS40M13	47	XCMT13…	335	235	70	40
7802764	P5D4800FS40M13	48	XCMT13…	340	240	70	40
7802765	P5D4900FS40M13	49	XCMT13…	345	245	70	40
7802766	P5D5000FS40M14	50	XCMT14…	350	250	70	40
7802767	P5D5100FS40M14	51	XCMT14…	355	255	70	40
7802768	P5D5200FS40M14	52	XCMT14…	360	260	70	40
7802769	P5D5300FS40M14	53	XCMT14…	365	265	70	40
7802770	P5D5400FS40M14	54	XCMT14…	370	270	70	40
7802771	P5D5500FS40M14	55	XCMT14…	375	275	70	40
7802772	P5D5600FS40M14	56	XCMT14…	380	280	70	40
7802773	P5D5700FS40M16	57	XCMT16…	385	285	70	40
7802774	P5D5800FS40M16	58	XCMT16…	390	290	70	40
7802775	P5D5900FS40M16	59	XCMT16…	395	295	70	40
7802776	P5D6000FS40M16	60	XCMT16…	400	300	70	40
7802777	P5D6100FS40M16	61	XCMT16…	405	305	70	40
7802778	P5D6200FS40M16	62	XCMT16…	410	310	70	40
7802779	P5D6300FS40M16	63	XCMT16…	415	315	70	40

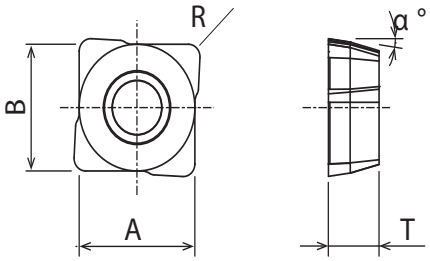
Accessories & spare parts

Applicable drill Ø	Clamping screw		Wrench	
Ø 15 - 18,5	7808139	FS20543P	7808223	6IP-D (Torx 6IP)
Ø 19 - 20,5	7808138	FS22550P	7808224	7IP-D (Torx 7IP)
Ø 21 - 24,5	7808136	FS25560P	7808225	8IP-D (Torx 8IP)
Ø 25 - 33,5	7808135	FS30570P	7808226	9IP-D (Torx 9IP)
Ø 34 - 44	7808137	FS35586P	7808228	15IP-D (Torx 15IP)
Ø 45 - 63	7808114	FS45510P	7808229	20IP-D (Torx 20IP)

P2D • P3D • P4D • P5D INSERTS

Drilling | Indexable | Inserts & Heads



- Applicable inserts for PD drill

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EDP	Designation	z	A x B	T	α	R	Grade	P		M		K		N		S		H		Applicable body Ø
								dry		dry		GG	GGG	dry		dry		dry		
7823064	XCMT042204ER-DM	4	5	2,2	8	0,4	XP9020		●		●	○	○		○		○		○	Ø15 - 16,5
7823065	XCMT052404ER-DM	4	5,83	2,4	8	0,4	XP9020		●		●	○	○		○		○		○	Ø17 - 18,5
7823066	XCMT062706ER-DM	4	6,46	2,7	8	0,6	XP9020		●		●	○	○		○		○		○	Ø19 - 20,5
7823067	XCMT073106ER-DM	4	7,11	3,1	8	0,6	XP9020		●		●	○	○		○		○		○	Ø21 - 24,5
7823068	XCMT083508ER-DM	4	8,36	3,5	8	0,8	XP9020		●		●	○	○		○		○		○	Ø25 - 28,5
7823069	XCMT094008ER-DM	4	9,62	4	8	0,8	XP9020		●		●	○	○		○		○		○	Ø29 - 33,5
7823097	XCMT104608ER-DM	4	10,89	4,6	8	0,8	XP9020		●		●	○	○		○		○		○	Ø34 - 38
7823071	XCMT125010ER-DM	4	12,57	5	8	1	XP9020		●		●	○	○		○		○		○	Ø39 - 44
7823072	XCMT135212ER-DM	4	14,05	5,2	8	1,2	XP9020		●		●	○	○		○		○		○	Ø45 - 49
7823073	XCMT145612ER-DM	4	15,58	5,6	8	1,2	XP9020		●		●	○	○		○		○		○	Ø50 - 56
7823075	XCMT165912ER-DM	4	17,28	5,9	8	1,2	XP9020		●		●	○	○		○		○		○	Ø57 - 63
7823164	XCMT042204ER-DR	4	5	2,2	8	0,4	XP1010		○			●	●							Ø15 - 16,5
7823165	XCMT052404ER-DR	4	5,83	2,4	8	0,4	XP1010		○			●	●							Ø17 - 18,5
7823166	XCMT062706ER-DR	4	6,46	2,7	8	0,6	XP1010		○			●	●							Ø19 - 20,5
7823167	XCMT073106ER-DR	4	7,11	3,1	8	0,6	XP1010		○			●	●							Ø21 - 24,5
7823168	XCMT083508ER-DR	4	8,36	3,5	8	0,8	XP1010		○			●	●							Ø25 - 28,5
7823169	XCMT094008ER-DR	4	9,62	4	8	0,8	XP1010		○			●	●							Ø29 - 33,5
7823197	XCMT104608ER-DR	4	10,89	4,6	8	0,8	XP1010		○			●	●							Ø34 - 38
7823171	XCMT125010ER-DR	4	12,57	5	8	1	XP1010		○			●	●							Ø39 - 44
7823172	XCMT135212ER-DR	4	14,05	5,2	8	1,2	XP1010		○			●	●							Ø45 - 49
7823173	XCMT145612ER-DR	4	15,58	5,6	8	1,2	XP1010		○			●	●							Ø50 - 56
7823175	XCMT165912ER-DR	4	17,28	5,9	8	1,2	XP1010		○			●	●							Ø57 - 63
7823264	XCMT042204ER-DN	4	5	2,2	8	0,4	CK110								●					Ø15 - 16,5
7823265	XCMT052404ER-DN	4	5,83	2,4	8	0,4	CK110								●					Ø17 - 18,5
7823266	XCMT062706ER-DN	4	6,46	2,7	8	0,6	CK110								●					Ø19 - 20,5
7823267	XCMT073106ER-DN	4	7,11	3,1	8	0,6	CK110								●					Ø21 - 24,5
7823268	XCMT083508ER-DN	4	8,36	3,5	8	0,8	CK110								●					Ø25 - 28,5
7823269	XCMT094008ER-DN	4	9,62	4	8	0,8	CK110								●					Ø29 - 33,5
7823297	XCMT104608ER-DN	4	10,89	4,6	8	0,8	CK110								●					Ø34 - 38
7823271	XCMT125010ER-DN	4	12,57	5	8	1	CK110								●					Ø39 - 44
7823272	XCMT135212ER-DN	4	14,05	5,2	8	1,2	CK110								●					Ø45 - 49
7823273	XCMT145612ER-DN	4	15,58	5,6	8	1,2	CK110								●					Ø50 - 56
7823275	XCMT165912ER-DN	4	17,28	5,9	8	1,2	CK110								●					Ø57 - 63

CUTTING CONDITIONS

Drilling | Indexable | Cutting conditions

P2D & P3D

	Work Material	Tensile Strength/ Hardness	Vc (m/min)	Feed Rate (mm/rev)						
				ø15~ø16.5	ø17~ø18.5	ø19~ø20.5	ø21~ø24.5	ø25~ø28.5	ø29~ø33.5	ø34~ø63
P	Mild Steel-Carbon Steel (SS400-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)
P	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)
P	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 (Dry) (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)
K	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)	–	30 (15~50)	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)
S	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)
H	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)

P4D

	Work Material	Tensile Strength/ Hardness	Vc (m/min)	Feed Rate (mm/rev)						
				ø15~ø16.5	ø17~ø18.5	ø19~ø20.5	ø21~ø24.5	ø25~ø28.5	ø29~ø33.5	ø34~ø63
P	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	200 (150~250)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	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)
P	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	150 (100~220)	0.08 (0.04~0.14)	0.08 (0.04~0.16)	0.09 (0.04~0.18)	0.12 (0.04~0.15)	0.18 (0.06~0.25)	0.2 (0.08~0.25)	0.2 (0.08~0.3)
P	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)	0.1 (0.04~0.13)	0.14 (0.06~0.2)	0.18 (0.08~0.25)	0.18 (0.08~0.25)
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	130 (80~180)	0.06 (0.04~0.08)	0.07 (0.04~0.1)	0.08 (0.04~0.1)	0.08 (0.04~0.1)	0.13 (0.06~0.2)	0.15 (0.08~0.2)	0.15 (0.08~0.2)
K	Cast Iron (FC250)	~350N/mm²	200 (150~280)	0.08 (0.04~0.14)	0.09 (0.04~0.16)	0.1 (0.04~0.2)	0.12 (0.04~0.15)	0.2 (0.06~0.3)	0.2 (0.08~0.3)	0.2 (0.08~0.3)
K	Ductile Cast Iron (FCD400)	~800N/mm²	160 (100~220)	0.08 (0.04~0.1)	0.08 (0.04~0.12)	0.09 (0.04~0.15)	0.12 (0.04~0.15)	0.15 (0.06~0.25)	0.18 (0.08~0.25)	0.18 (0.08~0.25)
N	Alluminium Alloy	~13%Si	200 (100~800)	0.07 (0.04~0.12)	0.09 (0.04~0.12)	0.12 (0.04~0.2)	0.14 (0.04~0.2)	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)	–	30 (15~50)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.05 (0.04~0.08)	0.07 (0.06~0.1)	0.08 (0.06~0.12)	0.08 (0.06~0.12)
S	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 (0.04~0.1)	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 (0.04~0.1)	0.06 (0.04~0.1)	0.08 (0.04~0.12)	0.08 (0.06~0.12)	0.1 (0.06~0.13)	0.1 (0.06~0.13)
H	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)

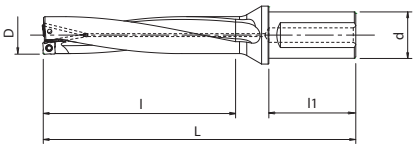
PHP instructions also valid for P2D

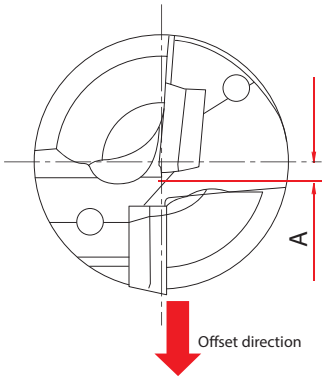
P5D

	Work Material	Tensile Strength/ Hardness	Vc (m/min)	Feed Rate (mm/rev)						
				ø15~ø16.5	ø17~ø18.5	ø19~ø20.5	ø21~ø24.5	ø25~ø28.5	ø29~ø33.5	ø34~ø63
P	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	200 (150~250)	0.05 (0.04~0.08)	0.06 (0.04~0.08)	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)
P	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	150 (100~220)	0.06 (0.04~0.09)	0.08 (0.04~0.12)	0.08 (0.04~0.14)	0.12 (0.04~0.15)	0.15 (0.06~0.2)	0.18 (0.08~0.2)	0.18 (0.08~0.25)
P	Die Steel (SKD11-SKD61)	~280HB	120 (80~180)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.07 (0.04~0.1)	0.1 (0.04~0.13)	0.12 (0.06~0.15)	0.15 (0.08~0.18)	0.16 (0.08~0.22)
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	130 (80~180)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.07 (0.04~0.09)	0.08 (0.04~0.1)	0.1 (0.06~0.15)	0.12 (0.06~0.18)	0.12 (0.06~0.2)
K	Cast Iron (FC250)	~350N/mm²	200 (150~280)	0.06 (0.04~0.1)	0.08 (0.04~0.12)	0.08 (0.04~0.13)	0.12 (0.04~0.15)	0.15 (0.06~0.2)	0.18 (0.08~0.2)	0.18 (0.08~0.25)
K	Ductile Cast Iron (FCD400)	~800N/mm²	160 (100~220)	0.06 (0.04~0.09)	0.08 (0.04~0.12)	0.08 (0.04~0.12)	0.1 (0.04~0.13)	0.12 (0.06~0.15)	0.15 (0.08~0.18)	0.18 (0.08~0.25)
N	Alluminium Alloy	~13%Si	200 (100~800)	0.06 (0.04~0.1)	0.09 (0.04~0.12)	0.1 (0.04~0.15)	0.12 (0.04~0.15)	0.15 (0.06~0.25)	0.2 (0.08~0.3)	0.2 (0.08~0.3)
S	Heat Resistant Alloy (Wet) (Inconel 718)	–	30 (15~50)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.07 (0.06~0.08)	0.07 (0.06~0.08)	0.07 (0.06~0.08)
S	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)	0.06 (0.04~0.1)	0.08 (0.06~0.15)	0.1 (0.08~0.15)	0.1 (0.08~0.15)
H	Pre-hardened Steel NAK80	40~43HRC	100 (60~120)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.08 (0.04~0.1)	0.08 (0.06~0.12)	0.1 (0.06~0.12)	0.1 (0.06~0.12)
H	Hardened Steel SKD11	50~55HRC	60 (40~80)	0.05 (0.04~0.07)	0.05 (0.04~0.07)	0.06 (0.04~0.07)	0.06 (0.04~0.08)	0.07 (0.04~0.1)	0.08 (0.04~0.1)	0.08 (0.04~0.1)

MAXIMUM OFFSET

Maximum offset amount drilling with rotation of work materials





D	D + A offset Amount	D Max.
15	0,4	15,8
15,5	0,3	16,1
16	0,3	16,6
16,5	0,3	17,1
17	0,6	18,2
17,5	0,5	18,5
18	0,5	19
18,5	0,4	19,3
19	0,6	20,2
19,5	0,5	20,5
20	0,4	20,8
20,5	0,4	21,3
21	1	23
21,5	0,9	23,3
22	0,8	23,6
22,5	0,7	23,9
23	0,5	24
23,5	0,4	24,3
24	0,3	24,6
24,5	0,2	24,9
25	1,1	27,2
25,5	0,9	27,3
26	0,8	27,6
26,5	0,7	27,9
27	0,6	28,2
28	0,3	28,6
28,5	0,2	28,9
29	1,3	31,6
30	1,1	32,2
31	0,8	32,6
32	0,6	33,2
33	0,3	33,6
33,5	0,2	33,9
34	1,1	36,2
35	0,8	36,6
36	0,8	37,6
37	0,6	38,2
38	0,3	38,6
39	1,0	41,0
40	0,9	41,8
41	0,8	42,6
42	0,6	43,2
43	0,5	44,0
44	0,3	44,6
45	0,9	46,8
46	0,8	47,6
47	0,7	48,4
48	0,5	49,0
49	0,3	49,6
50	1,1	52,2
51	1,0	53,0
52	0,8	53,6
53	0,7	54,4
54	0,6	55,2
55	0,4	55,8
56	0,1	56,2
57	1,1	59,2
58	1,0	60,0
59	0,9	60,8
60	0,8	61,6
61	0,6	62,2
62	0,4	62,8
63	0,2	63,4

TAP PILOT HOLE SIZE CHART

Drilling | Indexable

Thread Size	Recommended tap drill hole diameter	Min. drill hole dia	Max. drill hole dia.	Applicable Body		Recommended Tap Series	
			6H	P2D	P3D	A-SFT	A-POT
M17×1,5	15,5	15,4	15,67	P2D1550FS20M04	P3D1550FS20M04	-	-
M18×2,5	15,5	15,3	15,74			48139214	48145214
M18×2	16	15,9	16,21	P2D1600FS20M04	P3D1600FS20M04	-	-
M18×1,5	16,5	16,4	16,67	P2D1650FS20M04	P3D1650FS20M04	48139216	48145216
M20×2,5	17,5	17,3	17,74	P2D1750FS20M05	P3D1750FS20M05	48139228	48145228
				P2D1750FS25M05	P3D1750FS25M05		
M20×2	18	17,9	18,21	P2D1800FS25M05	P3D1800FS25M05	48139220	48145220
M20×1,5	18,5	18,4	18,67	P2D1850FS25M05	P3D1850FS25M05	48139230	48145230
M22×2,5	19,5	19,3	19,74	P2D1950FS25M06	P3D1950FS25M06	48139238	48145238
M22×2	20	19,9	20,21	P2D2000FS25M06	P3D2000FS25M06	48139239	48145239
M22×1,5	20,5	20,4	20,67	P2D2050FS20M06	P3D2050FS20M06	48139240	48145240
M24×3	21	20,8	21,25	P2D2100FS25M07	P3D2100FS25M07	48139247	48145247
M24×2	22	21,9	22,21	P2D2200FS25M07	P3D2200FS25M07	48139249	48145249
M24×1,5	22,5	22,4	22,67	P2D2250FS25M07	P3D2250FS25M07	48139250	48145250
M27×3	24	23,8	24,25	P2D2400FS25M07	P3D2400FS25M07	48140262	—
				P2D2400FS32M07	P3D2400FS32M07		
M27×1,5	25,5	25,4	25,67	P2D2550FS25M08	P3D2550FS25M08	-	
				P2D2550FS32M08	P3D2550FS32M08		
M30×3,5	26,5	26,3	26,77	P2D2650FS32M08	P3D2650FS32M08	48140271	
M30×3	27	26,8	27,25	P2D2700FS32M08	P3D2700FS32M08	-	
M30×1,5	28,5	28,4	28,67	P2D2850FS32M08	P3D2850FS32M08	-	
M36×4	32	31,7	32,27	P2D3200FS32M09	P3D3200FS32M09	48140294	
				P2D3200FS40M09	P3D3200FS40M09		
M36×3	33	32,8	33,25	P2D3300FS40M09	P3D3300FS40M09	-	
M39×4	35	34,7	35,27	P2D3500FS40M10	P3D3500FS40M10	48140304	
M42×3	39	38,8	39,25	P2D3900FS40M12	P3D3900FS40M12	-	
M48×5	43	42,6	43,29	P2D4300FS40M12	P3D4300FS40M12	48140325	
M48×3	45	44,8	45,25	P2D4500FS40M13	P3D4500FS40M13	-	

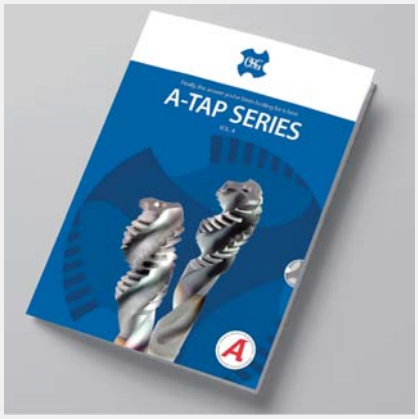
For additional sizes and styles, please refer to the high efficiency, multi-purpose A-Tap series catalog.

Tap recommendation

STANDARD A

Need a thread? Please consider trying our A-Tap (cutting tap) and/or XPF Tap series (forming) after drilling

- A-Tap Series



The new industry standard for stable threading.

- XPF Series

Superior forming taps that stably make threads without creating chips.

shaping your dreams

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