Vol 6

High Performance Indexable Tooling for Various Applications

OSG PHOENIX®

OSG PHOENIX®

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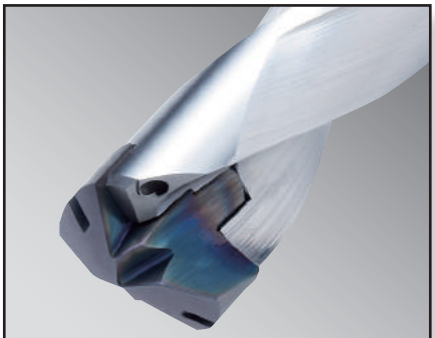
Drilling



PXD
Exchangeable head drill series for efficient, precise hole processing.
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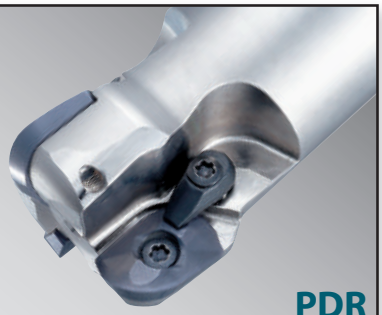

PDR
Deep feed radius end mills and facemills for deeper depths of cut versus conventional high feed cutters.
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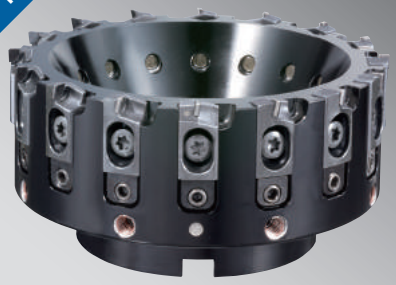
NEW



PFAL
Finishing cutter for Aluminum.
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NEW SIZES

PFB
High precision indexable finish ballnose end mills for superior surface finish and tool life.
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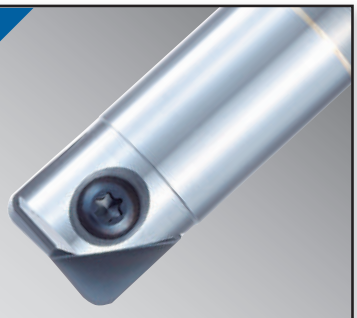
NEW SIZES



PFR
High precision indexable finish radius end mills for superior surface finish and tool life.
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NEW SIZES

SF
Modular indexable end mills for a variety of applications.
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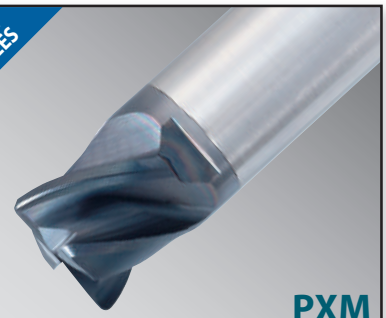
NEW SIZES



PXM
Exchangeable head end mill series for superior surface finish and precision in a variety of applications.
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	List	Product	Designation	Page	Tool Features
DRILLING	52400 78310 78PXD 7808H		PXD	13-24	OSG PHOENIX® Exchangeable Head Drill, 3D & 5D
	52502 78031 52503 78032 52504 78033 52505 78027 78P5D 7808H		PD	25-52	OSG PHOENIX® Indexable Drill, 2D, 3D, 4D & 5D
	78001 78PHP 7808H		PHP	53-58	OSG PHOENIX® High Performance Drill, 3D
MILLING	52700 78020 78PAS 7808H		PAS	59-64	OSG PHOENIX® 45° Face Mill, Square Insert
	52800 78120 78PAO 7808H		PAO	65-72	OSG PHOENIX® 45° Face Mill, Octagon Insert
	78013 78011 78012 78010 52601 78016 78PSE 7808H		PSE	73-86	OSG PHOENIX® 90° Shoulder Cutter
	53000 78029 53001 78028 78PSE 7808H		PSEL	87-94	OSG PHOENIX® 90° Roughing Cutter
	52900 78030 52901 78130 78PSF 7808H		PSF	95-102	OSG PHOENIX® 90° Shoulder Cutter, Square insert
	53100 78131 78PSTW 7808H		PSTW	103-110	OSG PHOENIX® 90° Shoulder Cutter, Triangle insert
	78005 78003 78004 78002 52602 78017 78PRC 7808H		PRC	111-122	OSG PHOENIX® Radius Cutter

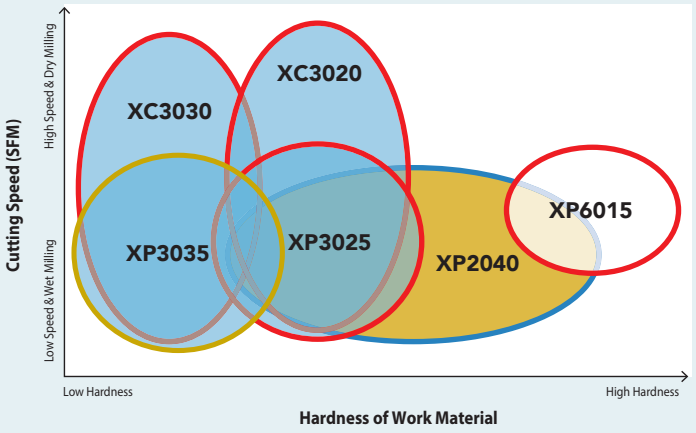
	List	Product	Designation	Page	Tool Features
MILLING	78009 78007 78008 78006 52603 78015 78PHC 7808H		**PHC**	123-138	**OSG PHOENIX®** High Feed Radius Cutter
	6420 6450 78PDR 7808H		**PDR**	139-144	**OSG PHOENIX®** Deep Feed Radius Cutter
	78036 78PFAL 7808H		**PFAL**	145-152	**OSG PHOENIX®** Finishing Cutter for Aluminum
	52100 78014 52604 78114 78PFB 7808H		**PFB**	153-166	**OSG PHOENIX®** Finishing Ball End Mill
	52200 78320 52605 78220 78PFR 7808H		**PFR**	167-180	**OSG PHOENIX®** Finishing Radius End Mill
	52601 78016 52602 78017 52603 78015 52604 78014 52605 78220 52600 78019 78025 78125		**SF**	181-192	**OSG PHOENIX®** Screw Fit Cutter
	52300 78018 78PXSE 78PXVC 78PXSM 78PXNL 78PXNH 78PXRE 78PXDR 78PXBE 78PXBM 7808H		**PXM**	193-214	**OSG PHOENIX®** Exchangeable Head End Mill

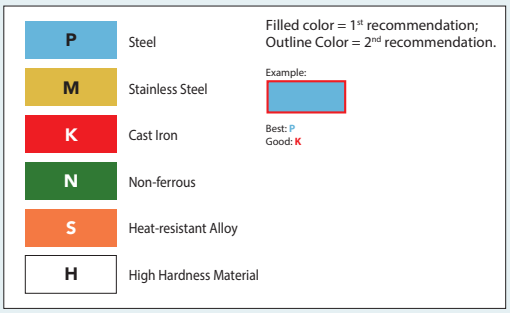
Type of Insert

Material Class	Grade	Coating Method	Hardness (HRA)	Surface Treament		Features
				Main Component	Coating Thickness	
P	XC3020	CVD	90.5	TiCN + Al_2O_3	10 µm	**For Machining Steel and Cast Iron** Composed of a tough, high-strength carbide material with a chipping-resistant and wear-resistance coating.
	XP3025	PVD	90.5	TiAlN	5 µm	**For Machining Steel and Cast Iron** Composed of a tough, high-strength carbide material with a chipping-resistant and wear-resistance coating.
	XC3025	CVD	90.8	TiCN + TiN + Al_2O_3	4 µm	**For Machining Steel, Stainless Steel and Cast Iron** Composed of a tough, high-strength carbide material with a chipping-resistant and wear-resistant coating.
	XC3030	CVD	89.5	TiCN + Al_2O_3	10 µm	**For Machining Steel and Cast Iron** Composed of a tough, high-strength carbide material with a chipping-resistant and wear-resistant coating.
	XP3035	PVD	89.6	TiAlN	5 µm	**For Machining Steel, Stainless Steel and Cast Iron** A grade for general purpose milling. Composed of a tough, high-strength carbide material with a chipping-resistant and wear-resistant coating.
	XP3225	PVD	91.5	Cr	3 µm	**For Machining Steel, Stainless Steel and Cast Iron** Composed of a tough carbide material with an excellent general purpose coating.
	XP3310	PVD	92.5	SiC Silicon-based heat-resistant coating	3 µm	**For Machining Steel and Cast Iron** Composed of a tough, high-strength carbide material with a chipping-resistant and wear-resistant coating.
	XP3320	PVD	91.5	SiC Silicon-based heat-resistant coating	3 µm	**For Machining Steel, Stainless Steel and Cast Iron** Composed of a tough carbide material with a heat-resistant and wear-resistant coating.
	XP3425	PVD	91.8	Cr Composite multilayer	7 µm	**For Machining Steel** A grade for hole drilling. Composed of a tough, high strength carbide material with a wear-resistant thick film coating.
	XP3930	PVD	90.8	TiAlN	3 µm	**For Machining Steel, Stainless Steel and Cast Iron** Excellent balance; can accommodate a wide range of workpiece materials.
	XP9020	PVD	91.9	TiAlN	3 µm	**For Steel, Stainless Steel, Cast Iron and Non-Ferrous Materials** A grade for hole drilling. Composed of a tough carbide material with an anti-chipping and wear-resistant grade.
	XP9040	PVD	91.9	TiAlN	3 µm	**For Machining Steel and Stainless Steel** A grade for hole drilling. Composed of a tough carbide material with an anti-chipping and wear-resistant coating.
M	XP2025	PVD	91.0	TiAlN	5 µm	**For Machining Steel and Stainless Steel** Composed of a tough, high-strength carbide material with an anti-chipping and wear resistant coating.
	XP2040	PVD	89.6	TiAlN	5 µm	**For Machining Steel and Stainless Steel** A grade for genera purpose milling. Composed of a tough, high-strength carbide material with an anti-chipping and wear-resistant coating.

Material Class	Grade	Coating Method	Hardness (HRA)	Surface Treament		Features
				Main Component	Coating Thickness	
K	XC1015	CVD	92.0	TiCN + Al_2O_3	10 µm	**For Machining Cast Iron** Composed of a tough, high-strength carbide material with an anti-chipping and wear-resistant coating.
	XP1010	PVD	91.4	TiAlN	6 µm	**For Machining Cast Iron** Composed of a tough, high-strength carbide material with highly rigid cutting edge and wear resistant coating.
	XP1020	PVD	91.5	TiAlN	5 µm	**For Machining Cast Iron** Composed of a tough, high-strength carbide material with an anti-chipping and wear-resistant coating.
	XP1425	PVD	91.8	Cr Composite multilayer	7 µm	**For Machining Cast Iron** A grade for hole drilling. Composed of a tough, high strength carbide material with a wear-resistant thick film coating.
	XC9025	CVD	90.8	TiCN + Al_2O_3	6 µm	**For Machining Cast Iron** A grade for hole drilling in cast iron. Composed of a tough, high-strength carbide with an anti-chipping and wear-resistant coating.
N	CK010	–	92.0	–	–	**For Machining Non-Ferrous Materials** Composed of a non-coated carbide material with an anti-chipping and wear-resistant properties.
	CK110	-	92.2	-	-	**For Machining Non-Ferrous Materials** A grade for hole drilling. Composed of a non-coated carbide material with a sharp cutting edge and polished surface.
	CF225	-	91.8	-	-	**For Machining Non-Ferrous Materials** A grade for hole drilling. Composed of a non-coated carbide material with an anti-chipping and wear-resistant properties.
	XC4505	CVD	92.0	DIA	12 µm	**For Machining Non-Ferrous Materials** Micro crystal diamond provides a coating layer with excellent strength.
S	XC5035	CVD	89.3	TiN + Ti(CN) + Al_2O_3 + Ti(BN)	6 µm	**For Machining Heat-Resistant Alloy and Stainless Steel** Composed of a tough carbide material with an oxidation-resistant and high-lubricity coating.
	XC5040	CVD	89.3	TiN + TiB_2	4 µm	**For Machining Heat-Resistant Alloy and Stainless Steel** Can be used for wet machining. Composed of a tough carbide material with an oxidation-resistant and high-lubricity coating.
H	XP6015	PVD	92.2	TiAlN	4 µm	**For Machining High Hardness Materials** Composed of a tough, high-strength carbide material with a wear-resistant coating.
	XP6305	PVD	93.0	SiC Silicon-based heat-resistant coating	3 µm	**For Machining High Hardness Materials** Composed of a tough, high-strength carbide material with excellent thermal conductivity.

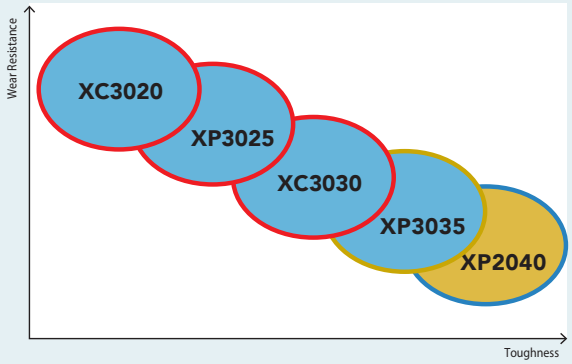
Insert Application Chart



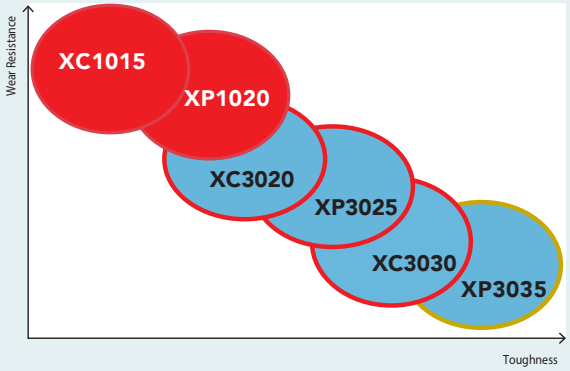


Application Chart of Insert Material

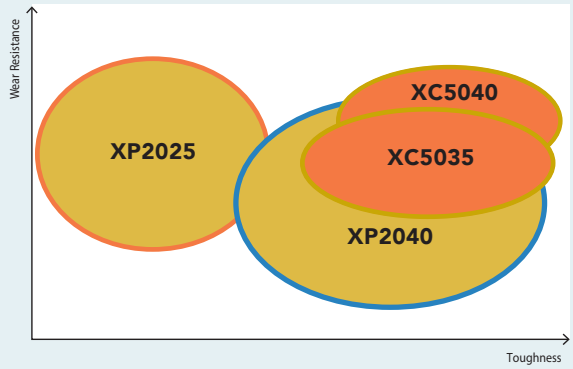
Steel-based Work Material
(Mild Steel, Steel, Hardened Steel)

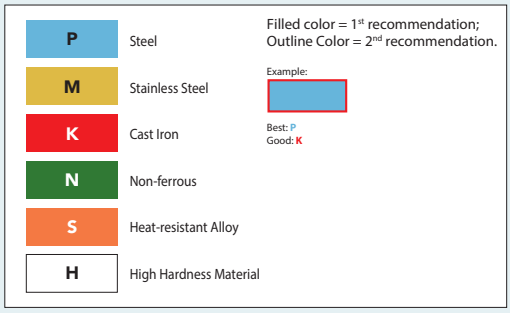


Cast Iron & Ductile Iron

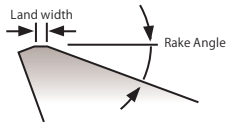
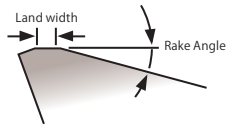
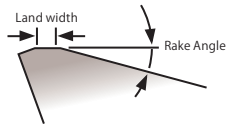
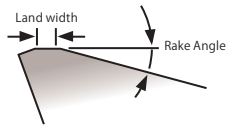
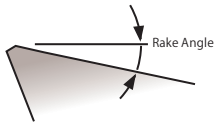
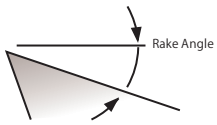
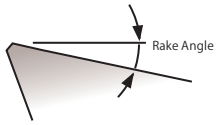
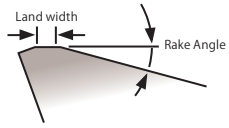
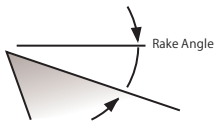


Stainless Steel





Type of Chip Breaker

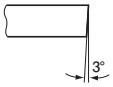
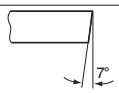
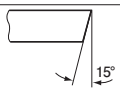
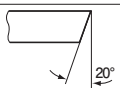
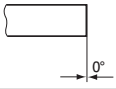
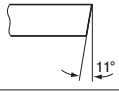
Machining Method	Chip Breaker	Cutting Edge Cross-Section (Approximate)	Rake Angle	Application
Milling	GL		25°	For milling stainless steel: a breaker with a large rake angle and a small flat land to reduce cutting force.
	GM		15° 35° (PAS) 25° (PSTW)	For milling various materials from steel to cast iron: a breaker with a superior balance of rake angle and flat land.
	GR		7° 35° (PAS) 2° (PSTW)	For milling various materials from steel to cast iron: a highly rigid breaker with large rake angle and flat and to provide a sharp cutting edge and enable efficient milling.
	HR		3°	For milling high hardened steel: a breaker with sharpness and excellent rigidity.
	SM		15° 25° (PSTW)	For milling difficult materials: a breaker with a sharp cutting edge to reduce cutting force and provide smooth chip evacuation.
	NM		30°	For milling non-ferrous materials: a breaker with a sharp cutting edge and a large rake angle to suppress welding, improve the milling surface and prevent burrs.
Drilling	DM		10°	For drilling various materials from steel to cast iron: a general purpose breaker with an ideal rake angle.
	DR		9°	For drilling cast iron: a highly rigid breaker with an optimal land width and rake angle.
	DN		10°	For drilling non-ferrous materials: a breaker with a sharp cutting edge and polish treatment for excellent chip evacuation.

Z	D	K	T
①	②	③	④

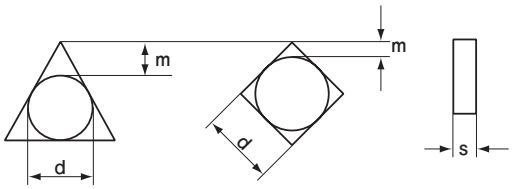
Shape of Insert

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	

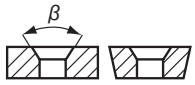
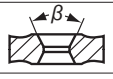
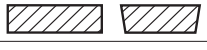
Tolerance



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

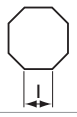
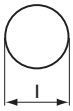
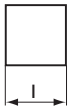
*Sintered insert shown on the side

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	

15	05	08	S	R	-	GM
⑤	⑥	⑦	⑧	⑨	-	⑩

Length of the Cutting Edge

O	
R	
S	
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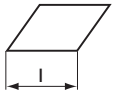
Z	

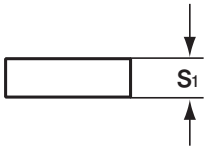
Corner Radius Symbol

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

Abbreviation

Example:
PHC =
Phoenix High Feed Cutter

Insert Size

Example:
12 = 12 mm

Cutting Direction

R = Right Hand

L = Left Hand

Cutter Diameter

Example:
150 = 1.50"
080 = 80 mm

Mounting Diameter

Example:
125 = 1.25"
32 = 32 mm

Mounting Type

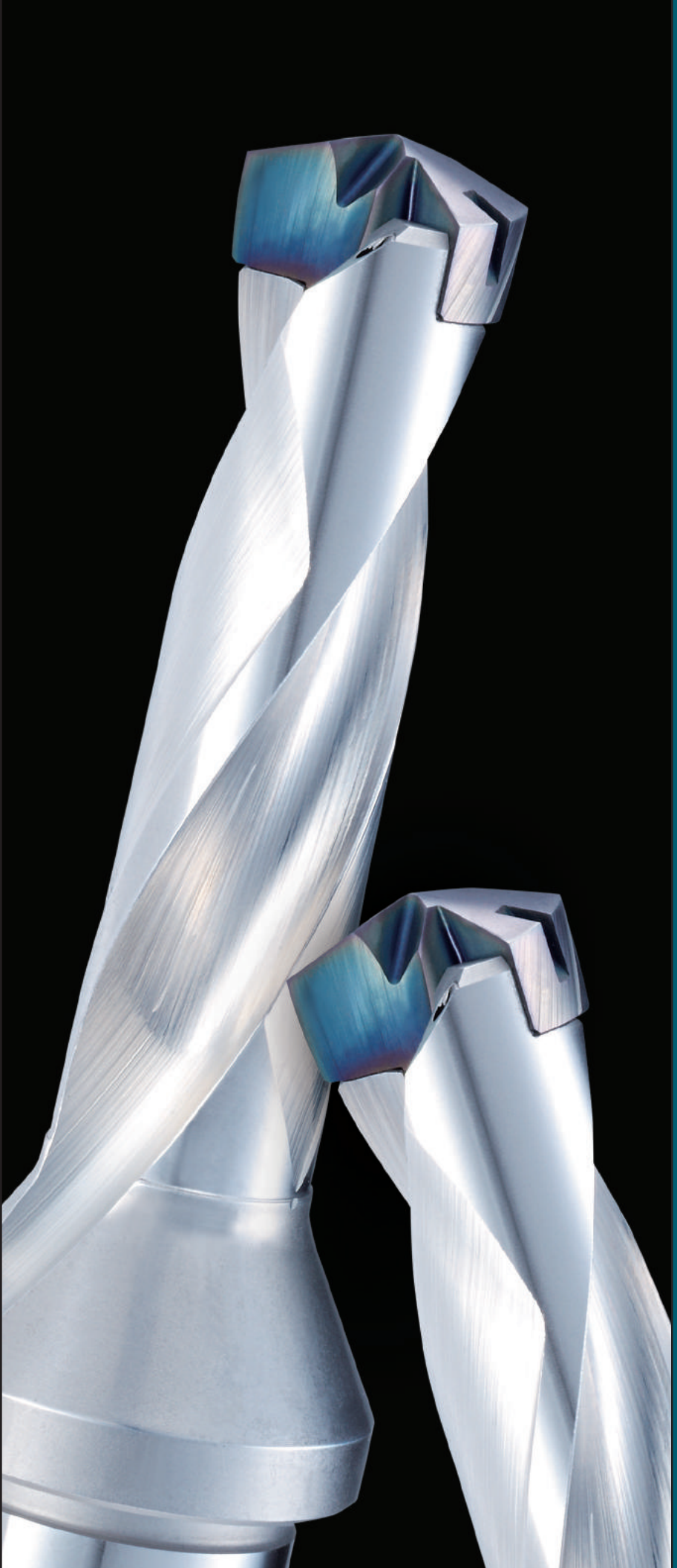
A	Bore Type (Inch)
M	Bore Type (Metric)
SA	Straight Shank (Inch)
FA	Weldon Shank (Inch)
SS	Straight Shank (Metric)
MT	Morse Taper Shank
ASF	Screw Fit Type (Inch)
SF	Screw Fit Type (Metric)
FS	Flat Shank

Number of Flutes

Example:
3 = 3-Flute

Shank Type

S	Short
L	Long
LL	Extra Long



OSG PHOENIX® PXD

Exchangeable Head Drill Series

An exchangeable head drill series designed for efficient, precise holemaking. It is ideal for 3XD and 5XD holes in carbon and alloy steel, cast iron, and non-ferrous materials.

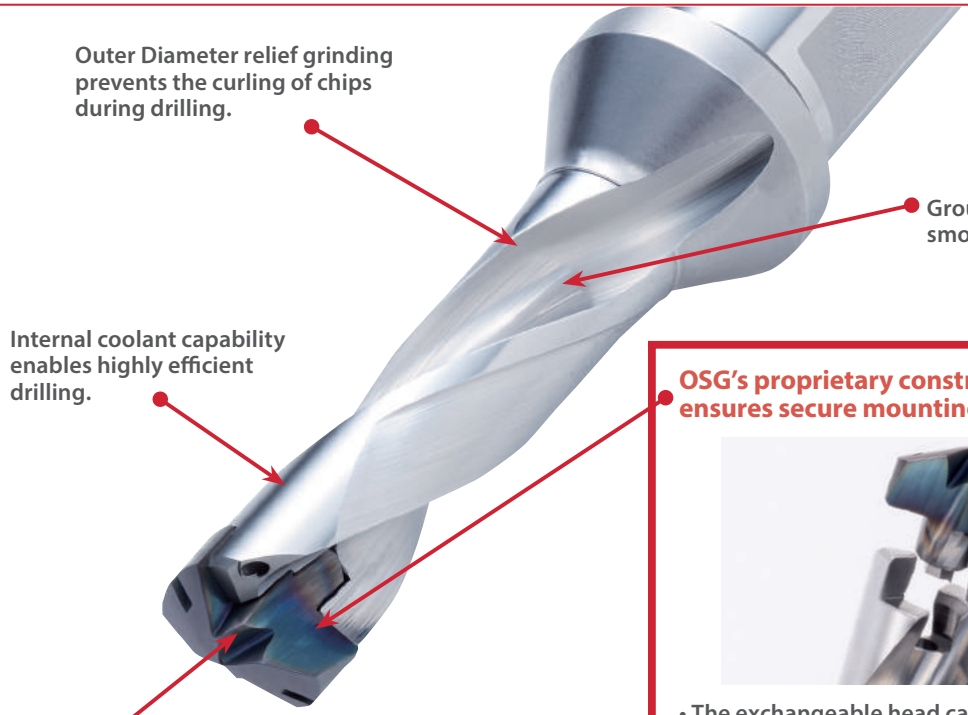
List 52400
PXD 3D & 5D (Inch)

List 78310
PXD 3D & 5D (Metric)

List 78PXD
PXD Exchangeable Heads (Inch & Metric)

List 7808H
PXD Accessories

Features & Benefits



OSG's proprietary construction ensures secure mounting. PAT.P.

- The exchangeable head can be securely mounted without the use of screws.
- Eliminates loose screw problems.
- Easy attachment and removal system.

OSG's Proprietary WD1 Coating Engineered Exclusively for PXD

The WD1 coating on the PXD prevents margin wear, thereby enabling high speed drilling and prolonging tool life.

Coating	Coating Structure	Thickness (µm)	Surface Hardness (HV)	Oxidation Temperature (˚C)
WD1 exclusive for PXD	Multiple Layer	7	3,300	1,100
TiAlN	Dual Layer	4	2,700	800

Key Benefits

- **Efficiency:** Equivalent to carbide drills.
- **Versatility:** For accurately drilling large diameter holes as well as pilot holes for forming taps.
- **Ease of Use:** Screwless, simple and firm-fastening.
- **Cost Performance:** Greater than that of carbide drills.
- **Variety of Sizes:** A single drill body is applicable for multiple drilling diameters.

PXD Specials Capability

Custom tooling with features such as counterboring and chamfering are available upon request. Please contact your local OSG sales representative for details.

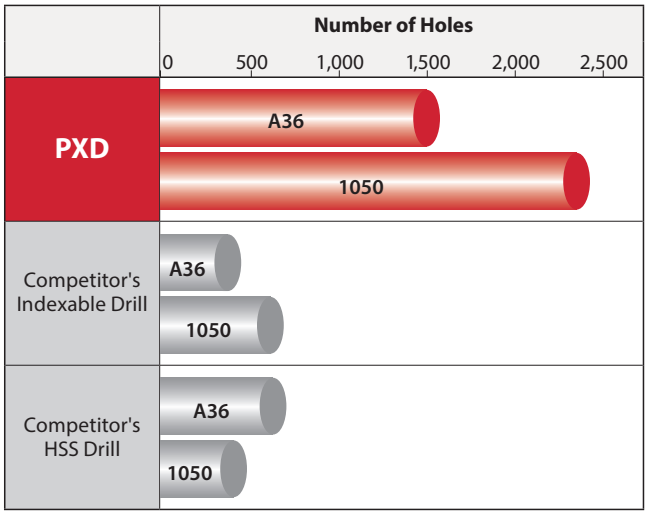

Special PXD with Counterboring Step


Special PXD with Chamfering Step

Processing Data

» Greater Tool Life and Efficiency while Significantly Lowering Cost - 1050 & A36 Steels

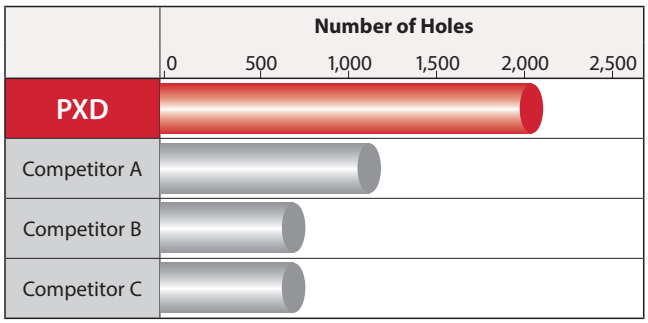
Work Material	1050 Steel		A36 Steel	
	Cutting Speed (SFM)	Feed (in/rev)	Cutting Speed (SFM)	Feed (in/rev)
PXD	328	0.012	328	0.012
Competitor's Indexable Drill	525	0.004	656	0.004
Competitor's HSS Drill	98	0.012	328	0.012
Depth of Hole	1.968 in			
Coolant	Water Soluble			
Machine	Horizontal Machining Center			



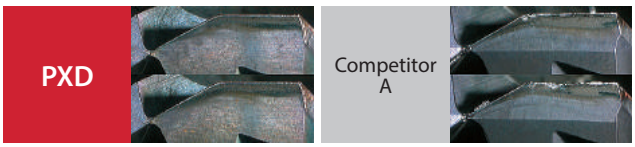
» Highly Efficient Drilling in Steel - 1050 Steel

At ø16, the PXD was able to perform at the same level of efficiency as a carbide drill. Moreover, it was approximately 1.7 times the durability versus the competitor.

Tool	PXDZ160-3D-123.5-20
Head (Grade)	PXDH1600-PC (XP3425)
Work Material	1050 Steel
Cutting Speed	328 SFM (1990 RPM)
Feed	23.5 IPM (0.012 in/rev)
Depth of Hole	1.772 in (Through)
Coolant	Water Soluble
Machine	Horizontal Machining Center



Wear comparison after drilling 1,300 holes

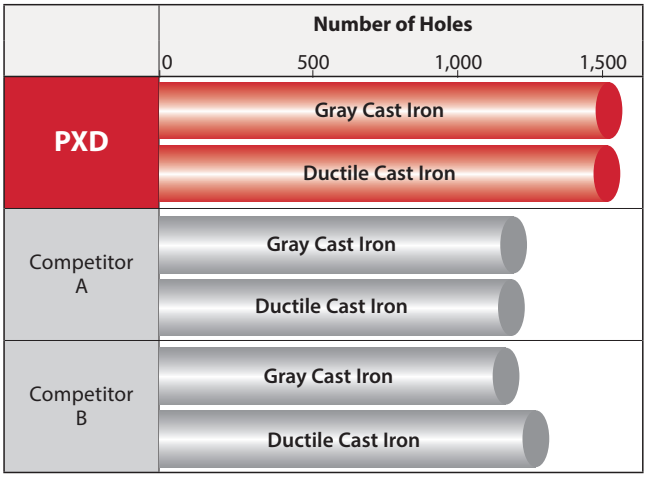


Processing Data

Long Tool Life in Cast Iron - Gray Cast Iron & Ductile Cast Iron

This exchangeable head is designed for cast iron and can maintain long tool life in both Gray Cast Iron and Ductile Cast Iron.

Tool	PXDZ160-3D-123.5-20	
Head (Grade)	PXDH1600-KC (XP1425)	
Work Material	Gray Cast Iron	Ductile Cast Iron
Cutting Speed	328 SFM (1990 RPM)	262 SFM (1600 RPM)
Feed	31.34 IPM (0.016 in/rev)	18.90 IPM (0.012 in/rev)
Depth of Hole	1.772 in (Through)	
Coolant	Water Soluble	
Machine	Horizontal Machining Center	

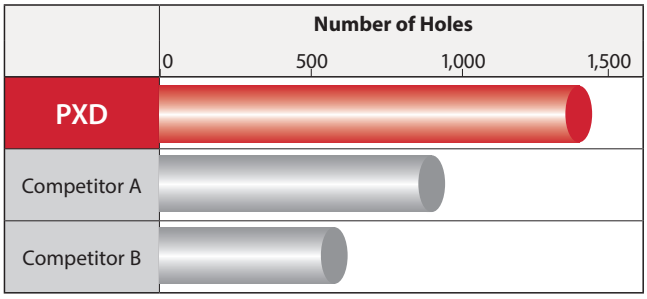


Wear comparison after drilling 1,280 holes		Wear comparison after drilling 1,600 holes	
Gray Cast Iron		Ductile Cast Iron	

Long Tool Life in Steel - A36 Steel

When drilling in A36, OSG's proprietary WD1 coating minimized tool wear, permitting 1.8 times the tool life versus the competition.

Tool	PXDZ160-3D-123.5-20
Head (Grade)	PXDH1600-PC (XP3425)
Work Material	A36 Steel
Cutting Speed	328 SFM (1990 RPM)
Feed	23.5 IPM (0.012 in/rev)
Depth of Hole	1.772 in (Through)
Coolant	Water Soluble
Machine	Horizontal Machining Center



Wear comparison after drilling 900 holes

Tap Drill Size Chart

OSG PHOENIX® PXD Fractional Tap Drill Sizes

Thread Size	Minor Diameter (2B) Min	Minor Diameter (2B) Max	Cut Tap					Form Tap			
			Recommended Tap Drill Dia.		Recommended PXD Head	Recommended A-SFT Tap	Recommended A-POT Tap	Recommended Tap Drill Dia.		Recommended PXD Head	Recommended XPF Tap
			mm	inch				mm	inch		
5/8 - 11	0.5270	0.5460	14.00	0.5512	PXDH1400…	1650504008	1651504008	14.80	0.5827	PXDH1480…	1625058110
5/8 - 18	0.5650	0.5780	14.50	0.5709	PXDH1450…	1650504208	1651504208	15.25	0.6004	PDXH1525…	1625058180
5/8 - 24	0.5800	0.5900	14.80	0.5827	PXDH1480…	1650506308	1651506708	15.40	0.6063	PXDH1540…	-
3/4 - 10	0.6420	0.6630	16.67	0.6563	PXDH6563…	1650504408	1651504408	18.00	0.7087	PXDH1800…	1625034100
3/4 - 16	0.6820	0.6960	17.50	0.6890	PXDH1750…	1650504608	1651504608	18.26	0.7188	PXDH7188…	1625034160
3/4 - 20	0.6960	0.7070	17.80	0.7008	PXDH1780…	1650506508	1651506908	18.50	0.7283	PXDH1850…	-
7/8 - 9	0.7550	0.7780	19.50	0.7677	PXDH1950…	1650504808	1651504808	21.00	0.8268	PXDH2100…	1625078901
7/8 - 14	0.7980	0.8140	20.50	0.8071	PXDH2050…	1650505008	1651505008	21.43	0.8438	PXDH8438…	1625078141
7/8 - 20	0.8210	0.8320	21.00	0.8268	PXDH2100…	1650506708	1651507108	21.70	0.8543	PXDH2170…	-
1 - 8	0.8650	0.8900	22.23	0.8750	PXDH8750…	1650505208	1651505208	24.00	0.9449	PXDH2400…	1625001081
1 - 12	0.9100	0.9280	23.50	0.9252	PXDH2350...	1650505408	1651505408	24.50	0.9646	PXDH2450…	1625001121
1 - 20	0.9460	0.9570	24.20	0.9527	PXDH2420…	1650506908	1651507308	24.80	0.9764	PXDH2480…	-
1-1/8 - 7	0.9700	0.9980	25.00	0.9843	PXDH2500…	1650507108	-	-	-	-	1625011878
1-1/8 - 8	0.9900	1.0150	25.40	1.0000	PXDH2540…	1650507208	-	-	-	-	1625011888

OSG PHOENIX® PXD Metric Tap Drill Sizes

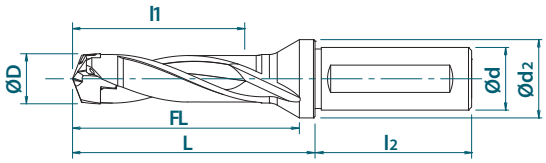
Thread Size	Minor Diameter (6H) Min	Minor Diameter (6H) Max	Cut Tap					Form Tap			
			Recommended Tap Drill Dia.		Recommended PXD Head	Recommended A-SFT Tap	Recommended A-POT Tap	Recommended Tap Drill Dia.		Recommended PXD Head	Recommended XPF Tap
			mm	inch				mm	inch		
M15 x 1	0.5479	0.5572	14.00	0.5512	PXDH1400…	1650005908	1651005908	14.50	0.5709	PXDH1450…	-
M16 x 2	0.5447	0.5594	14.00	0.5512	PXDH1400…	1650002108	1651002108	14.95	0.5886	PXDH1495…	1635016202
M16 x 1.5	0.5660	0.5778	14.50	0.5709	PXDH1450…	1650002008	1651002008	15.25	0.6004	PXDH1525…	1635016151
M16 x 1	0.5873	0.5966	15.00	0.5906	PXDH1500…	1650006108	1651006108	15.50	0.6102	PXDH1550…	-
M17 x 1.5	0.6054	0.6172	15.50	0.6102	PXDH1550…	1650006208	1651006308	16.40	0.6457	PXDH1640…	-
M17 x 1	0.6267	0.6359	16.00	0.6299	PXDH1600…	1650006308	1651006208	16.60	0.6535	PXDH1660…	-
M18 x 2.5	0.6022	0.6198	15.50	0.6102	PXDH1550…	1650002308	1651002308	16.70	0.6575	PXDH1670…	1635018252
M18 x 2	0.6234	0.6382	16.00	0.6299	PXDH1600…	1650006508	1651006508	17.00	0.6693	PXDH1700…	-
M18 x 1.5	0.6447	0.6565	16.50	0.6496	PXDH1650…	1650002208	1651002208	17.25	0.6791	PXDH1725…	1635018151
M18 x 1	0.6660	0.6753	17.00	0.6693	PXDH1700…	1650006408	1651006408	17.50	0.6890	PXDH1750…	-
M20 x 2.5	0.6809	0.6986	17.50	0.6890	PXDH1750…	1650002508	1651002508	18.70	0.7362	PXDH1870…	1635020252
M20 x 2	0.7022	0.7169	18.00	0.7087	PXDH1800…	1650006708	1651006708	9.05	0.7500	PXDH7500…	-
M20 x 1.5	0.7235	0.7353	18.50	0.7283	PXDH1850…	1650002408	1651002408	19.25	0.7579	PXDH1925…	1635020151
M20 x 1	0.7448	0.7541	19.00	0.7480	PXDH1900…	1650006608	1651006608	19.60	0.7716	PXDH1960…	-
M22 x 2.5	0.7596	0.7773	19.50	0.7677	PXDH1950…	1650002708	1651002708	20.70	0.8150	PXDH2070…	1635022522
M22 x 2	0.7809	0.7957	20.00	0.7874	PXDH2000…	1650006908	1651006908	21.10	0.8307	PXDH2110…	1635022222
M22 x 1.5	0.8022	0.8140	20.50	0.8071	PXDH2050…	1650002608	1651002608	21.25	0.8366	PXDH2125…	1635022121
M22 x 1	0.8235	0.8328	21.00	0.8268	PXDH2100…	1650006808	1651006809	21.50	0.8465	PXDH2150…	-
M24 x 3	0.8170	0.8367	21.00	0.8268	PXDH2100…	1650002908	1651002908	22.40	0.8819	PXDH2240…	1635024325
M24 x 2	0.8596	0.8744	22.00	0.8661	PXDH2200…	1650007108	1651007108	23.10	0.9094	PXDH2310…	1635024223
M24 x 1.5	0.8809	0.8928	22.50	0.8858	PXDH2250…	1650002808	1651002808	23.25	0.9154	PXDH2325…	1635024121
M24 x 1	0.9023	0.9116	23.00	0.9055	PXDH2300…	1650007008	1651007008	23.50	0.9252	PXDH2350…	-
M27 x 3	0.9351	0.9548	24.00	0.9449	PXDH2400…	1650007408	-	25.40	1.0000	PXDH2540…	1635027039
M27 x 1.5	0.9991	1.0109	25.40	1.0000	PXDH2540…	1650007208	-	-	-	-	-

List 52400

PXD 3D (Inch)

SPEED FEED P24

Recommended Materials: p24
Accessories & Inserts: p20-23



EDP No.	Body Type	Designation	Drill Dia. (inch)		Drilling Depth (inch)	Flute Length (inch)	Gage Length (inch)	Shank Length (inch)	Shank Dia. (inch)	Flange Dia. (inch)	Appl. Head
			D Min	D Max	l1	FL	L	l2	d	d2	
52400000	Cylindrical Shank	PXDZ0551-3D-113.5-0625	0.551	0.570	1.693	2.496	2.752	1.890	0.625	0.787	1
52400001		PXDZ0571-3D-115.5-0625	0.571	0.590	1.752	2.579	2.835	1.890	0.625	0.787	2
52400002		PXDZ0591-3D-119.5-0750	0.591	0.629	1.831	2.642	2.898	1.969	0.750	0.984	3
52400003		PXDZ0630-3D-123.5-0750	0.630	0.668	1.949	2.823	3.079	1.969	0.750	0.984	4
52400004		PXDZ0669-3D-128.5-0750	0.669	0.708	2.067	3.024	3.280	1.969	0.750	0.984	5
52400005		PXDZ0709-3D-138.5-1000	0.709	0.747	2.185	3.205	3.461	2.205	1.000	1.260	6
52400006		PXDZ0748-3D-142.5-1000	0.748	0.786	2.303	3.362	3.618	2.205	1.000	1.260	7
52400007		PXDZ0787-3D-146.5-1000	0.787	0.826	2.421	3.547	3.803	2.205	1.000	1.260	8
52400008		PXDZ0827-3D-154.5-1250	0.827	0.865	2.539	3.728	3.984	2.362	1.250	1.654	9
52400009		PXDZ0866-3D-158.5-1250	0.866	0.905	2.657	3.890	4.146	2.362	1.250	1.654	10
52400010		PXDZ0906-3D-162.5-1250	0.906	0.944	2.775	4.071	4.327	2.362	1.250	1.654	11
52400011		PXDZ0945-3D-167.5-1250	0.945	0.983	2.894	4.268	4.524	2.362	1.250	1.654	12
52400012		PXDZ0984-3D-170.5-1250	0.984	1.023	3.012	4.409	4.665	2.362	1.250	1.654	13

Packed: 1 pc.
Note: Driver included with body.

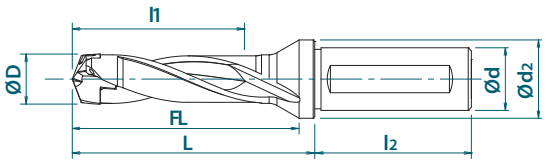
PXT

List 52400

PXD 5D (Inch)

SPEED FEED P24

Recommended Materials: p24
Accessories & Inserts: p20-23



EDP No.	Body Type	Designation	Drill Dia. (inch)		Drilling Depth (inch)	Flute Length (inch)	Gage Length (inch)	Shank Length (inch)	Shank Dia. (inch)	Flange Dia. (inch)	Appl. Head
			D Min	D Max	l1	FL	L	l2	d	d2	
52400100	Cylindrical Shank	PXDZ0551-5D-141.5-0625	0.551	0.570	2.805	3.657	3.854	1.890	0.625	0.787	1
52400101		PXDZ0571-5D-144.5-0625	0.571	0.590	2.903	3.780	3.976	1.890	0.625	0.787	2
52400102		PXDZ0591-5D-149.5-0750	0.591	0.629	3.051	3.823	4.079	1.969	0.750	0.984	3
52400103		PXDZ0630-5D-155.5-0750	0.630	0.668	3.248	4.083	4.339	1.969	0.750	0.984	4
52400104		PXDZ0669-5D-162.5-0750	0.669	0.708	3.445	4.362	4.618	1.969	0.750	0.984	5
52400105		PXDZ0709-5D-174.5-1000	0.709	0.747	3.642	4.622	4.878	2.205	1.000	1.260	6
52400106		PXDZ0748-5D-180.5-1000	0.748	0.786	3.838	4.858	5.114	2.205	1.000	1.260	7
52400107		PXDZ0787-5D-186.5-1000	0.787	0.826	4.035	5.122	5.378	2.205	1.000	1.260	8
52400108		PXDZ0827-5D-196.5-1250	0.827	0.865	4.232	5.382	5.638	2.362	1.250	1.654	9
52400109		PXDZ0866-5D-202.5-1250	0.866	0.905	4.429	5.622	5.878	2.362	1.250	1.654	10
52400110		PXDZ0906-5D-208.5-1250	0.906	0.944	4.626	5.882	6.138	2.362	1.250	1.654	11
52400111		PXDZ0945-5D-215.5-1250	0.945	0.983	4.823	6.157	6.413	2.362	1.250	1.654	12
52400112		PXDZ0984-5D-220.5-1250	0.984	1.023	5.020	6.378	6.634	2.362	1.250	1.654	13

Packed: 1 pc.
Note: Driver included with body.

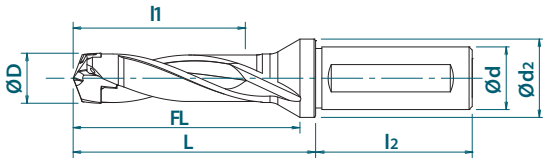
PXT

List 78310

PXD 3D (Metric)

SPEED FEED P24

Recommended Materials: p24
Accessories & Inserts: p20-23



EDP No.	Body Type	Designation	Drill Dia. (mm)		Drilling Depth (mm)	Flute Length (mm)	Gage Length (mm)	Shank Length (mm)	Shank Dia. (mm)	Flange Dia. (mm)	Appl. Head
			D Min	D Max	l1	FL	L	l2	d	d2	
48173001	Cylindrical Shank	PXDZ140-3D-113.5-16	14.00	14.49	43.0	63.4	69.9	48	16	20	1
48173002		PXDZ145-3D-115.5-16	14.50	14.99	44.5	65.5	72.0	48	16	20	2
48173003		PXDZ150-3D-119.5-20	15.00	15.99	46.5	67.1	73.6	50	20	25	3
48173004		PXDZ160-3D-123.5-20	16.00	16.99	49.5	71.7	78.2	50	20	25	4
48173005		PXDZ170-3D-128.5-20	17.00	17.99	52.5	76.8	83.3	50	20	25	5
48173006		PXDZ180-3D-138.5-25	18.00	18.99	55.5	81.4	87.9	56	25	32	6
48173007		PXDZ190-3D-142.5-25	19.00	19.99	58.5	85.4	91.9	56	25	32	7
48173008		PXDZ200-3D-146.5-25	20.00	20.99	61.5	90.1	96.6	56	25	32	8
48173009		PXDZ210-3D-154.5-32	21.00	21.99	64.5	94.7	101.2	60	32	42	9
48173010		PXDZ220-3D-158.5-32	22.00	22.99	67.5	98.8	105.3	60	32	42	10
48173011		PXDZ230-3D-162.5-32	23.00	23.99	70.5	103.4	109.9	60	32	42	11
48173012		PXDZ240-3D-167.5-32	24.00	24.99	73.5	108.4	114.9	60	32	42	12
48173013		PXDZ250-3D-170.5-32	25.00	25.99	76.5	112.0	118.5	60	32	42	13

Packed: 1 pc.
Note: Driver included with body.

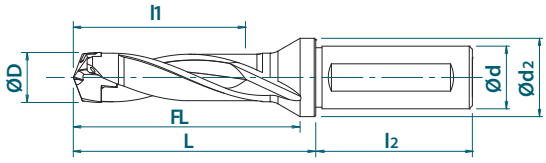
PXT

List 78310

PXD 5D (Metric)

SPEED FEED P24

Recommended Materials: p24
Accessories & Inserts: p20-23



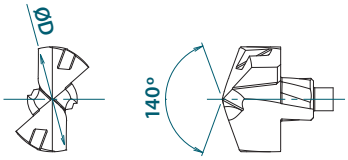
EDP No.	Body Type	Designation	Drill Dia. (mm)		Drilling Depth (mm)	Flute Length (mm)	Gage Length (mm)	Shank Length (mm)	Shank Dia. (mm)	Flange Dia. (mm)	Appl. Head
			D Min	D Max	l1	FL	L	l2	d	d2	
48173014	Cylindrical Shank	PXDZ140-5D-141.5-16	14.00	14.49	71.2	92.9	97.9	48	16	20	1
48173015		PXDZ145-5D-144.5-16	14.50	14.99	73.7	96.0	101.0	48	16	20	2
48173016		PXDZ150-5D-149.5-20	15.00	15.99	77.5	97.1	103.6	50	20	25	3
48173017		PXDZ160-5D-155.5-20	16.00	16.99	82.5	103.7	110.2	50	20	25	4
48173018		PXDZ170-5D-162.5-20	17.00	17.99	87.5	110.8	117.3	50	20	25	5
48173019		PXDZ180-5D-174.5-25	18.00	18.99	92.5	117.4	123.9	56	25	32	6
48173020		PXDZ190-5D-180.5-25	19.00	19.99	97.5	123.4	129.9	56	25	32	7
48173021		PXDZ200-5D-186.5-25	20.00	20.99	102.5	130.1	136.6	56	25	32	8
48173022		PXDZ210-5D-196.5-32	21.00	21.99	107.5	136.7	143.2	60	32	42	9
48173023		PXDZ220-5D-202.5-32	22.00	22.99	112.5	142.8	149.3	60	32	42	10
48173024		PXDZ230-5D-208.5-32	23.00	23.99	117.5	149.4	155.9	60	32	42	11
48173025		PXDZ240-5D-215.5-32	24.00	24.99	122.5	156.4	162.9	60	32	42	12
48173026		PXDZ250-5D-220.5-32	25.00	25.99	127.5	162.0	168.5	60	32	42	13

Packed: 1 pc.
Note: Driver included with body.

PXT

List 78PXD

PXD Exchangeable Heads (Inch & Metric)



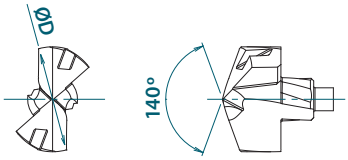
EDP No.	Type	Designation	Head Diameter (D)			Size	Grade
			Fractional	mm	inch		
7831140	PC	PXDH1400-PC	-	14.00	0.5512	1	XP3425
52401000		PXDH5625-PC	9/16	14.29	0.5625		XP3425
7831145		PXDH1450-PC	-	14.50	0.5709	2	XP3425
7831351		PXDH1495-PC	-	14.95	0.5886		XP3425
7831150		PXDH1500-PC	-	15.00	0.5906	3	XP3425
52401001		PXDH5938-PC	19/32	15.08	0.5938		XP3425
7831352		PXDH1525-PC	-	15.25	0.6004		XP3425
7831155		PXDH1550-PC	-	15.50	0.6102		XP3425
52401002		PXDH6250-PC	5/8	15.88	0.6250		XP3425
7831160		PXDH1600-PC	-	16.00	0.6299	4	XP3425
7831165		PXDH1650-PC	-	16.50	0.6496		XP3425
52401003		PXDH6563-PC	21/32	16.67	0.6563		XP3425
7831167		PXDH1670-PC	-	16.70	0.6575		XP3425
7831170		PXDH1700-PC	-	17.00	0.6693	5	XP3425
7831353		PXDH1725-PC	-	17.25	0.6791		XP3425
52401004		PXDH6875-PC	11/16	17.46	0.6875		XP3425
7831175		PXDH1750-PC	-	17.50	0.6890		XP3425
7831180		PXDH1800-PC	-	18.00	0.7087	6	XP3425
52401005		PXDH7188-PC	23/32	18.26	0.7188		XP3425
7831185		PXDH1850-PC	-	18.50	0.7283		XP3425
7831187		PXDH1870-PC	-	18.70	0.7362		XP3425
7831190		PXDH1900-PC	-	19.00	0.7480	7	XP3425
52401006		PXDH7500-PC	3/4	19.05	0.7500		XP3425
7831354		PXDH1925-PC	-	19.25	0.7579		XP3425
7831195		PXDH1950-PC	-	19.50	0.7677		XP3425
52401007		PXDH7813-PC	25/32	19.85	0.7813		XP3425
7831200		PXDH2000-PC	-	20.00	0.7874	8	XP3425
7831205		PXDH2050-PC	-	20.50	0.8071		XP3425
52401008		PXDH8125-PC	13/16	20.64	0.8125		XP3425
7831207		PXDH2070-PC	-	20.70	0.8150		XP3425
7831210		PXDH2100-PC	-	21.00	0.8268	9	XP3425
7831355		PXDH2125-PC	-	21.25	0.8366		XP3425
52401009		PXDH8438-PC	27/32	21.43	0.8438		XP3425
7831215		PXDH2150-PC	-	21.50	0.8465		XP3425
7831220		PXDH2200-PC	-	22.00	0.8661	10	XP3425
52401010		PXDH8750-PC	7/8	22.23	0.8750		XP3425
7831224		PXDH2240-PC	-	22.40	0.8819		XP3425
7831225		PXDH2250-PC	-	22.50	0.8858		XP3425
7831230		PXDH2300-PC	-	23.00	0.9055	11	XP3425
52401011		PXDH9063-PC	29/32	23.02	0.9063		XP3425
7831356		PXDH2325-PC	-	23.25	0.9154		XP3425
7831235		PXDH2350-PC	-	23.50	0.9252		XP3425
52401012		PXDH9375-PC	15/16	23.81	0.9375		XP3425
7831240		PXDH2400-PC	-	24.00	0.9449	12	XP3425
7831245		PXDH2450-PC	-	24.50	0.9646		XP3425
52401013		PXDH9688-PC	31/32	24.61	0.9688		XP3425
7831250		PXDH2500-PC	-	25.00	0.9843	13	XP3425
7831254		PXDH2540-PC	1	25.40	1.0000		XP3425

Packed: 1 pc.

PXI

List 78PXD

PXD Exchangeable Heads (Inch & Metric)



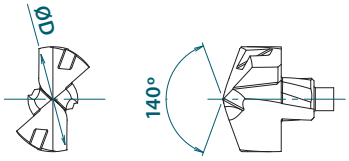
EDP No.	Type	Designation	Head Diameter (D)			Size	Grade
			Fractional	mm	inch		
7831440	KC	PXDH1400-KC	-	14.00	0.5512	1	XP1425
52402000		PXDH5625-KC	9/16	14.29	0.5625		XP1425
7831445		PXDH1450-KC	-	14.50	0.5709	2	XP1425
7831450		PXDH1500-KC	-	15.00	0.5906	3	XP1425
52402001		PXDH5938-KC	19/32	15.08	0.5938		XP1425
7831455		PXDH1550-KC	-	15.50	0.6102		XP1425
52402002		PXDH6250-KC	5/8	15.88	0.6250		XP1425
7831460		PXDH1600-KC	-	16.00	0.6299	4	XP1425
7831465		PXDH1650-KC	-	16.50	0.6496		XP1425
52402003		PXDH6563-KC	21/32	16.67	0.6563		XP1425
7831467		PXDH1670-KC	-	16.70	0.6575		XP1425
7831470		PXDH1700-KC	-	17.00	0.6693	5	XP1425
52402004		PXDH6875-KC	11/16	17.46	0.6875		XP1425
7831475		PXDH1750-KC	-	17.50	0.6890		XP1425
7831480		PXDH1800-KC	-	18.00	0.7087	6	XP1425
52402005		PXDH7188-KC	23/32	18.26	0.7188		XP1425
7831485		PXDH1850-KC	-	18.50	0.7283		XP1425
7831487		PXDH1870-KC	-	18.70	0.7362		XP1425
7831490		PXDH1900-KC	-	19.00	0.7480	7	XP1425
52402006		PXDH7500-KC	3/4	19.05	0.7500		XP1425
7831495		PXDH1950-KC	-	19.50	0.7677		XP1425
52402007		PXDH7813-KC	25/32	19.85	0.7813		XP1425
7831500		PXDH2000-KC	-	20.00	0.7874	8	XP1425
7831505		PXDH2050-KC	-	20.50	0.8071		XP1425
52402008		PXDH8125-KC	13/16	20.64	0.8125		XP1425
7831507		PXDH2070-KC	-	20.70	0.8150		XP1425
7831510		PXDH2100-KC	-	21.00	0.8268	9	XP1425
52402009		PXDH8438-KC	27/32	21.43	0.8438		XP1425
7831515		PXDH2150-KC	-	21.50	0.8465		XP1425
7831520		PXDH2200-KC	-	22.00	0.8661	10	XP1425
52402010		PXDH8750-KC	7/8	22.23	0.8750		XP1425
7831524		PXDH2240-KC	-	22.40	0.8819		XP1425
7831525		PXDH2250-KC	-	22.50	0.8858		XP1425
7831530		PXDH2300-KC	-	23.00	0.9055	11	XP1425
52402011		PXDH9063-KC	29/32	23.02	0.9063		XP1425
7831535		PXDH2350-KC	-	23.50	0.9252		XP1425
52402012		PXDH9375-KC	15/16	23.81	0.9375		XP1425
7831540		PXDH2400-KC	-	24.00	0.9449	12	XP1425
7831545		PXDH2450-KC	-	24.50	0.9646		XP1425
52402013		PXDH9688-KC	31/32	24.61	0.9688		XP1425
7831550		PXDH2500-KC	-	25.00	0.9843	13	XP1425
7831554		PXDH2540-KC	1	25.40	1.0000		XP1425

Packed: 1 pc.

PXI

List 78PXD

PXD Exchangeable Heads (Inch & Metric)



EDP No.	Type	Designation	Head Diameter (D)			Size	Grade
			Fractional	mm	inch		
7831740	NC	PXDH1400-NC	-	14.00	0.5512	1	CF225
52403000		PXDH5625-NC	9/16	14.29	0.5625		CF225
7831745		PXDH1450-NC	-	14.50	0.5709	2	CF225
7831750		PXDH1500-NC	-	15.00	0.5906	3	CF225
52403001		PXDH5938-NC	19/32	15.08	0.5938		CF225
7831755		PXDH1550-NC	-	15.50	0.6102		CF225
52403002		PXDH6250-NC	5/8	15.88	0.6250		CF225
7831760		PXDH1600-NC	-	16.00	0.6299	4	CF225
7831765		PXDH1650-NC	-	16.50	0.6496		CF225
52403003		PXDH6563-NC	21/32	16.67	0.6563		CF225
7831767		PXDH1670-NC	-	16.70	0.6575		CF225
7831770		PXDH1700-NC	-	17.00	0.6693	5	CF225
52403004		PXDH6875-NC	11/16	17.46	0.6875		CF225
7831775		PXDH1750-NC	-	17.50	0.6890		CF225
7831780		PXDH1800-NC	-	18.00	0.7087	6	CF225
52403005		PXDH7188-NC	23/32	18.26	0.7188		CF225
7831785		PXDH1850-NC	-	18.50	0.7283		CF225
7831787		PXDH1870-NC	-	18.70	0.7362		CF225
7831790		PXDH1900-NC	-	19.00	0.7480	7	CF225
52403006		PXDH7500-NC	3/4	19.05	0.7500		CF225
7831795		PXDH1950-NC	-	19.50	0.7677		CF225
52403007		PXDH7813-NC	25/32	19.85	0.7813		CF225
7831800		PXDH2000-NC	-	20.00	0.7874	8	CF225
7831805		PXDH2050-NC	-	20.50	0.8071		CF225
52403008		PXDH8125-NC	13/16	20.64	0.8125		CF225
7831807		PXDH2070-NC	-	20.70	0.8150		CF225
7831810		PXDH2100-NC	-	21.00	0.8268	9	CF225
52403009		PXDH8438-NC	27/32	21.43	0.8438		CF225
7831815		PXDH2150-NC	-	21.50	0.8465		CF225
7831820		PXDH2200-NC	-	22.00	0.8661	10	CF225
52403010		PXDH8750-NC	7/8	22.23	0.8750		CF225
7831824		PXDH2240-NC	-	22.40	0.8819		CF225
7831825		PXDH2250-NC	-	22.50	0.8858		CF225
7831830		PXDH2300-NC	-	23.00	0.9055	11	CF225
52403011		PXDH9063-NC	29/32	23.02	0.9063		CF225
7831835		PXDH2350-NC	-	23.50	0.9252		CF225
52403012		PXDH9375-NC	15/16	23.81	0.9375		CF225
7831840		PXDH2400-NC	-	24.00	0.9449	12	CF225
7831845		PXDH2450-NC	-	24.50	0.9646		CF225
52403013		PXDH9688-NC	31/32	24.61	0.9688		CF225
7831850		PXDH2500-NC	-	25.00	0.9843	13	CF225
7831854		PXDH2540-NC	1	25.40	1.0000		CF225

Packed: 1 pc.

PXI

List 7808H

PXD Accessories

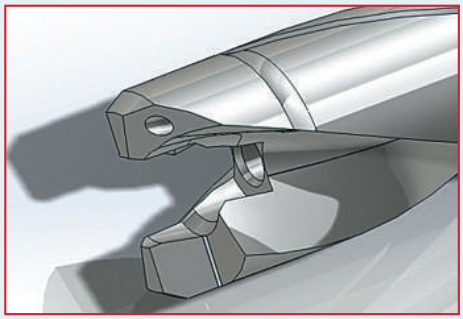
Appearance	EDP No.	Designation	Sheet Thickness (mm)	Applicable Head		
				Size	(inch)	(mm)
 Driver	7808282	PXDP1400-1890	1.5	1-6	Ø0.551-0.744	Ø14.0-18.9
	7808283	PXDP1900-2299	1.8	7-10	Ø0.748-0.901	Ø19.0-22.9
	7808284	PXDP2300-2699	2	11-13	Ø0.905-1.059	Ø23.0-26.9

Packed: 1 pc.

PXT

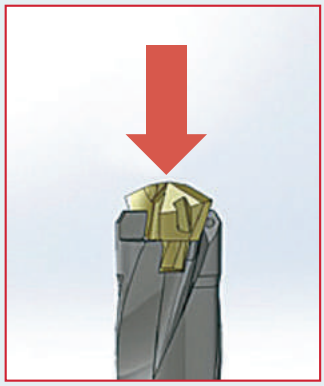
Mounting Procedure

Step 1



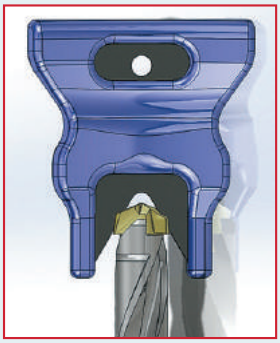
Clean attachment area with an air nozzle.
Any leftover cutting chips may prevent the head from being mounted properly and may cause damage to the tool.

Step 2



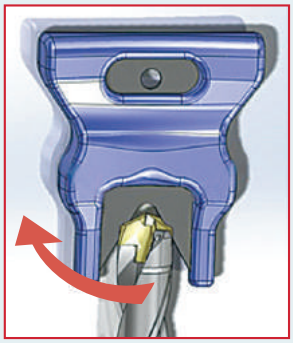
Manually attach the head.

Step 3



Insert the flat metal portion of the designated driver into the groove of the head. Insert the driver firmly into the groove. If the insertion of the designated driver is too shallow, it could damage the flutes.

Step 4



Turn the driver clockwise and mount the head onto the body. Mount it firmly and make sure that there is no gap in the area between the head and the body.

Cutting Conditions

Work Material	Mild Steel Low Carbon Steel		Carbon Steel		Alloy Steel		Cast Iron		Ductile Cast Iron		Aluminum Alloy Casting	
Speed	265 - 395 SFM		265 - 395 SFM		195 - 395 SFM		265 - 395 SFM		195 - 325 SFM		265 - 590 SFM	
Drill Dia. (mm)	Speed (RPM)	Feed (in/rev)	Speed (RPM)	Feed (in/rev)	Speed (RPM)	Feed (in/rev)	Speed (RPM)	Feed (in/rev)	Speed (RPM)	Feed (in/rev)	Speed (RPM)	Feed (in/rev)
14	2300	0.008 - 0.014	2300	0.008 - 0.014	2000	0.008 - 0.014	2300	0.008 - 0.014	1800	0.008 - 0.014	3000	0.011 - 0.016
15	2100	0.009 - 0.015	2100	0.009 - 0.015	1900	0.009 - 0.015	2100	0.009 - 0.015	1700	0.009 - 0.015	2800	0.012 - 0.018
16	2000	0.009 - 0.016	2000	0.009 - 0.016	1800	0.009 - 0.016	2000	0.009 - 0.016	1600	0.009 - 0.016	2600	0.012 - 0.019
17	1900	0.010 - 0.017	1900	0.010 - 0.017	1700	0.010 - 0.017	1900	0.010 - 0.017	1500	0.010 - 0.017	2400	0.013 - 0.020
18	1800	0.010 - 0.018	1800	0.010 - 0.018	1600	0.010 - 0.018	1800	0.010 - 0.018	1400	0.010 - 0.018	2300	0.014 - 0.021
19	1700	0.011 - 0.019	1700	0.011 - 0.019	1500	0.011 - 0.019	1700	0.011 - 0.019	1300	0.011 - 0.019	2200	0.015 - 0.022
20	1600	0.012 - 0.020	1600	0.012 - 0.020	1400	0.012 - 0.020	1600	0.012 - 0.020	1300	0.012 - 0.020	2100	0.016 - 0.024
21	1500	0.012 - 0.021	1500	0.012 - 0.021	1400	0.012 - 0.021	1500	0.012 - 0.021	1200	0.012 - 0.021	2000	0.016 - 0.025
22	1400	0.013 - 0.022	1400	0.013 - 0.022	1300	0.013 - 0.022	1400	0.013 - 0.022	1200	0.013 - 0.022	1900	0.017 - 0.026
23	1400	0.014 - 0.023	1400	0.014 - 0.023	1200	0.014 - 0.023	1400	0.014 - 0.023	1100	0.014 - 0.023	1800	0.018 - 0.027
24	1300	0.014 - 0.024	1300	0.014 - 0.024	1200	0.014 - 0.024	1300	0.014 - 0.024	1100	0.014 - 0.024	1700	0.019 - 0.028
25	1300	0.015 - 0.025	1300	0.015 - 0.025	1100	0.015 - 0.025	1300	0.015 - 0.025	1000	0.015 - 0.025	1700	0.020 - 0.029

Recommended Materials by Application

Insert Grade	Type	Coolant	Carbon Steel	Alloy Steel	Hardened Steel (Up to 35 HRC)	Cast Iron Ductile Cast Iron	Aluminum Alloy Casting	Copper Alloy
XP3425	PC	Yes	◻	▢	▢	▢		
XP1425	KC	Yes	▢	▢	▢	◻		
CF225	NC	Yes					◻	▢

▢ good ◻ best

OSG PHOENIX® PD

Indexable Drill Series

An indexable drill series designed for efficient, stable holemaking up to 5XD. It is an ideal solution for a wide variety of materials such as carbon and alloy steel, stainless steel, cast iron, and non-ferrous materials.

List 52502
P2D (Inch)

List 78031
P2D (Metric)

List 52503
P3D (Inch)

List 78032
P3D (Metric)

List 52504
P4D (Inch)

List 78033
P4D (Metric)

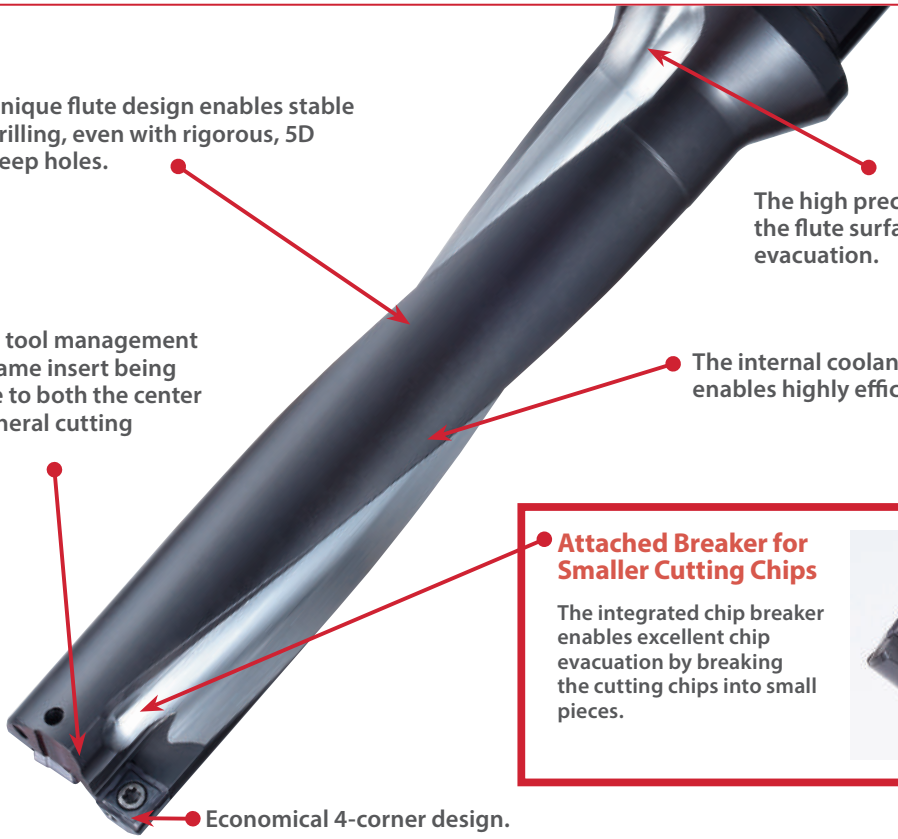
List 52505
P5D (Inch)

List 78027
P5D (Metric)

List 78P5D
PD Inserts

List 7808H
PD Accessories

Features & Benefits



Attached Breaker for Smaller Cutting Chips

The integrated chip breaker enables excellent chip evacuation by breaking the cutting chips into small pieces.

Optimally Designed for Drilling up to 5D Deep

- **Deeper Drilling Made Easier:** OSG's proprietary design facilitates stable drilling of depths up to 5D, a process that was originally difficult to achieve with a double-flute, single-edge indexable drill.

PD Insert Variety

Grade	Chipbreaker	Classification	Coating Method	Hardness (HRA)	Surface Treatment	
					Main Component	Coating Thickness
XP9020	DM (for Steel & Stainless Steel)	P	PVD	91.9	TiAlN	3 µm
XP1010	DR (for Cast Iron)	K	PVD	91.4	TiAlN	6 µm
CK110	DN (for Non-Ferrous)	N	-	92.2	-	-

PD Specials Capability


Special PD with Chamfering Step


Special PD with Counterbore

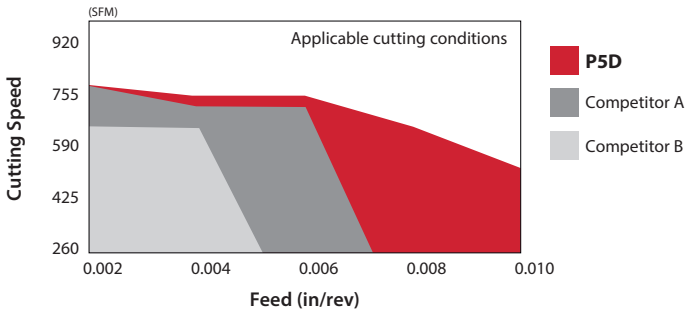

Special PD For Large Diameters (>2.500"/63mm)

Custom tooling with features such are available upon request. Please contact your local OSG sales representative

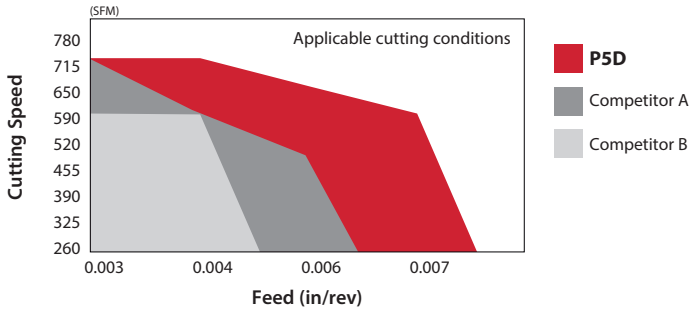
Processing Data

High Efficiency Even When Drilling Deep Holes - 1050 Steel, A36 Steel & 304 Stainless Steel

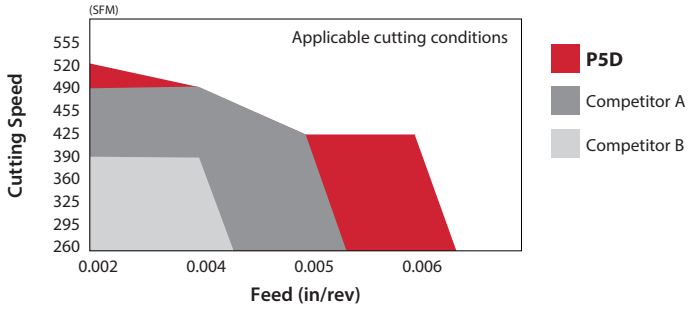
Tool	P5D2500FS32M08
Insert (Grade)	XCMT083508ER-DM (XP9020)
Work Material	1050 Steel
Depth of Hole	4.724 in
Coolant	Water Soluble
Machine	Horizontal Machining Center



Tool	P5D2500FS32M08
Insert (Grade)	XCMT083508ER-DM (XP9020)
Work Material	A36 Steel (30 HRC)
Depth of Hole	4.724 in
Coolant	Water Soluble
Machine	Horizontal Machining Center



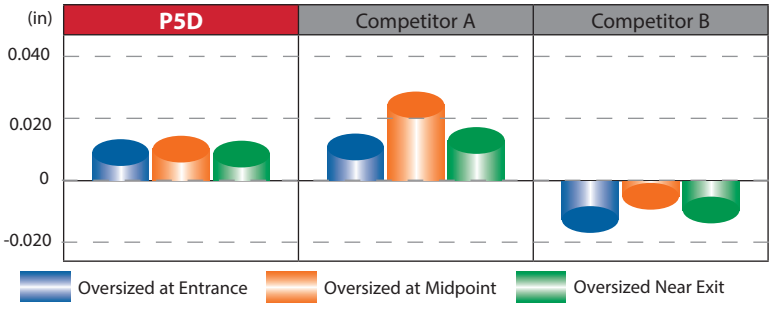
Tool	P5D2500FS32M08
Insert (Grade)	XCMT083508ER-DM (XP9020)
Work Material	304 Stainless Steel
Depth of Hole	4.724 in
Coolant	Water Soluble
Machine	Horizontal Machining Center



Applicable cutting conditions may vary based on actual machining conditions. These graphs are not to guarantee the applicable cutting conditions.

Stable Hole Size From Entrance to Exit - 1050 Steel

Tool	P5D2500FS32M08
Insert (Grade)	XCMT083508ER-DM (XP9020)
Work Material	1050 Steel
Cutting Speed	492 SFM (1900 RPM)
Feed	9.02 IPM (0.005 in/rev)
Depth of Hole	4.921 in (Through)
Coolant	Water Soluble
Machine	Horizontal Machining Center

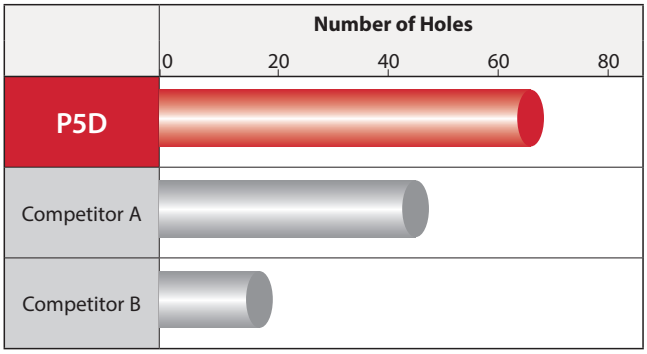


Processing Data

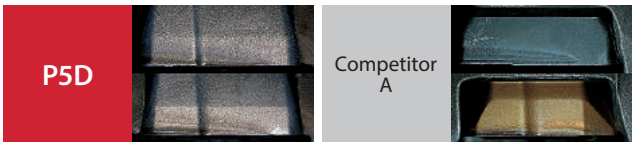
» High Efficiency Drilling in Steel - 1050 Steel

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

Tool	P5D2700FS32M08
Insert (Grade)	XCMT083508ER-DM (XP9020)
Work Material	1050 Steel
Cutting Speed	492 SFM (1800 RPM)
Feed	8.50 IPM (0.005 in/rev)
Depth of Hole	4.724 in (Through)
Coolant	Water Soluble
Machine	Horizontal Machining Center



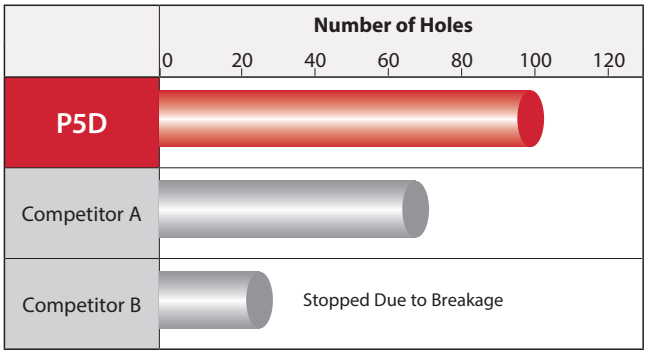
Wear comparison after drilling 40 holes



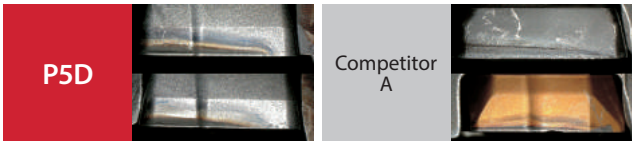
» Stable Performance Even in Stainless Steel - 304 Stainless Steel

The P5D is able to achieve excellent chip evacuation and stable performance even in 304 Stainless Steel, where chip packing is a common problem.

Tool	P5D2700FS32M08
Insert (Grade)	XCMT083508ER-DM (XP9020)
Work Material	304 Stainless Steel
Cutting Speed	393 SFM (1400 RPM)
Feed	5.51 IPM (0.004 in/rev)
Depth of Hole	4.724 in (Through)
Coolant	Water Soluble
Machine	Horizontal Machining Center



Wear comparison after drilling 100 holes



Tap Drill Size Chart

OSG PHOENIX® PD Fractional Tap Drill Sizes

Thread Size	Minor Diameter (2B) Min	Minor Diameter (2B) Max	Cut Tap				
			Recommended Tap Drill Dia.		Recommended PD Drill	Recommended A-SFT Tap	Recommended A-POT Tap
			mm	in			
5/8 - 11	0.527	0.546	14.00	0.5512	-	1650504008	1651504008
5/8 - 18	0.5650	0.5780	14.50	0.5709	-	1650504208	1651504208
5/8 - 24	0.5800	0.5900	15.00	0.5905	P_D1500…	1650506308	1651506708
3/4 - 10	0.6420	0.6630	16.67	0.6563	P_D0656…	1650504408	1651504408
3/4 - 16	0.6820	0.6960	17.50	0.6890	P_D1750…	1650504608	1651504608
3/4 - 20	0.6960	0.7070	17.86	0.7031	P_D0703…	1650506508	1651506908
7/8 - 9	0.7550	0.7780	19.50	0.7677	P_D1950…	1650504808	1651504808
7/8 - 14	0.7980	0.8140	20.50	0.8071	P_D2050…	1650505008	1651505008
7/8 - 20	0.8210	0.8320	21.00	0.8268	P_D2100…	1650506708	1651507108
1 - 8	0.8650	0.8900	22.23	0.8750	P_D0875…	1650505208	1651505208
1 - 12	0.9100	0.9280	23.50	0.9252	P_D2350…	1650505408	1651505408
1 - 20	0.9460	0.9570	24.00	0.9449	P_D2400…	1650506908	1651507308
1-1/8 - 7	0.9700	0.9980	25.00	0.9842	P_D2500…	1650507108	-
1-1/8 - 8	0.9900	1.0150	25.40	1.0000	P_D1000…	1650507208	-
1-1/8 - 12	1.0350	1.0530	26.50	1.0433	P_D2650…	1650507308	-
1-1/4 - 7	1.0950	1.1230	28.00	1.1024	P_D2800…	1650507408	-
1-1/4 - 8	1.1150	1.1400	28.58	1.1250	P_D1125…	1650507508	-
1-1/4 - 12	1.1600	1.1780	29.50	1.1614	P_D2950…	1650507608	-
1-3/8 - 6	1.1950	1.2250	31.00	1.2205	P_D3100…	1650507708	-
1-3/8 - 8	1.2400	1.2650	31.75	1.2500	P_D1250…	1650507808	-
1-3/8 - 12	1.2850	1.3030	33.00	1.2990	P_D3300…	1650507908	-
1-1/2 - 6	1.3200	1.3500	34.00	1.3386	P_D3400…	1650508008	-
1-1/2 - 8	1.3650	1.3900	34.92	1.3750	P_D1375…	1650508108	-
1-1/2 - 12	1.4100	1.4280	36.00	1.4173	P_D3600…	1650508208	-
1-5/8 - 8	1.4900	1.5150	38.10	1.5000	P_D1500…	1650508308	-
1-3/4 - 5	1.5340	1.5680	39.69	1.5625	P_D1563…	1650508408	-
1-3/4 - 8	1.6150	1.6400	41.28	1.6250	P_D1625…	1650508508	-
1-7/8 - 8	1.7400	1.7650	44.45	1.7500	P_D1750…	1650508608	-
2 - 4.5	1.7590	1.7950	45.25	1.7813	P_D1781…	1650508708	-
2 - 8	1.8650	1.8900	47.63	1.8750	P_D1875…	1650508808	-

continued on next page

Tap Drill Size Chart

OSG PHOENIX® PD Metric Tap Drill Sizes

Thread Size	Minor Diameter (6H) Min	Minor Diameter (6H) Max	Cut Tap				
			Recommended Tap Drill Dia.		Recommended PD Head	Recommended A-SFT Tap	Recommended A-POT Tap
			mm	in			
M15 x 1	0.5479	0.5572	14.00	0.5512	-	1650005908	1651005908
M16 x 2	0.5447	0.5594	14.00	0.5512	-	1650002108	1651002108
M16 x 1.5	0.5660	0.5778	14.50	0.5709	-	1650002008	1651002008
M16 x 1	0.5873	0.5966	15.00	0.5906	P_D1500…	1650006108	1651006108
M17 x 1.5	0.6054	0.6172	15.50	0.6102	P_D1550…	1650006208	1651006308
M17 x 1	0.6267	0.6359	16.00	0.6299	P_D1600...	1650006308	1651006208
M18 x 2.5	0.6022	0.6198	15.50	0.6102	P_D1550…	1650002308	1651002308
M18 x 2	0.6234	0.6382	16.00	0.6299	P_D1600...	1650006508	1651006508
M18 x 1.5	0.6447	0.6565	16.50	0.6496	P_D1650…	1650002208	1651002208
M18 x 1	0.6660	0.6753	17.00	0.6693	P_D1700…	1650006408	1651006408
M20 x 2.5	0.6809	0.6986	17.50	0.6890	P_D1750…	1650002508	1651002508
M20 x 2	0.7022	0.7169	18.00	0.7087	P_D1800…	1650006708	1651006708
M20 x 1.5	0.7235	0.7353	18.50	0.7283	P_D1850…	1650002408	1651002408
M20 x 1	0.7448	0.7541	19.00	0.7480	P_D1900…	1650006608	1651006608
M22 x 2.5	0.7596	0.7773	19.50	0.7677	P_D1950…	1650002708	1651002708
M22 x 2	0.7809	0.7957	20.00	0.7874	P_D2000…	1650006908	1651006908
M22 x 1.5	0.8022	0.8140	20.50	0.8071	P_D2050…	1650002608	1651002608
M22 x 1	0.8235	0.8328	21.00	0.8268	P_D2100…	1650006808	1651006809
M24 x 3	0.8170	0.8367	21.00	0.8268	P_D2100…	1650002908	1651002908
M24 x 2	0.8596	0.8744	22.00	0.8661	P_D2200…	1650007108	1651007108
M24 x 1.5	0.8809	0.8928	22.50	0.8858	P_D2250…	1650002808	1651002808
M24 x 1	0.9023	0.9116	23.00	0.9055	P_D2300…	1650007008	1651007008
M27 x 3	0.9351	0.9548	24.00	0.9449	P_D2400…	1650007408	-
M27 x 1.5	0.9991	1.0109	25.50	1.0039	P_D2550…	1650007208	-
M30 x 3.5	1.0319	1.0540	26.50	1.0433	P_D2650…	1650007708	-
M30 x 3	1.0532	1.0729	27.00	1.0630	P_D2700…	8326615	-
M30 x 1.5	1.1172	1.1290	28.50	1.1220	P_D2850…	1650007508	-
M33 x 3.5	1.1500	1.1721	29.50	1.1615	P_D2950…	1650008008	-
M33 x 3	1.1713	1.1910	30.00	1.1811	P_D3000…	8326625	-
M33 x 1.5	1.2353	1.2471	31.50	1.2402	P_D3150…	1650007808	-
M36 x 4	1.2469	1.2705	32.00	1.2598	P_D3200…	1650008408	-
M36 x 3	1.2895	1.3091	33.00	1.2992	P_D3300…	1650008308	-
M36 x 1.5	1.3534	1.3652	34.50	1.3583	P_D3450…	1650008108	-
M39 x 4	1.3650	1.3886	35.00	1.3780	P_D3500…	1650008508	-
M42 x 4.5	1.4618	1.4881	37.50	1.4764	P_D3750…	1650008908	-
M42 x 3	1.5257	1.5454	39.00	1.5354	P_D3900…	1650008808	-
M42 x 1.5	1.5896	1.6014	40.50	1.5945	P_D4050…	1650008608	-
M45 x 4.5	1.5799	1.6063	40.50	1.5945	P_D4050…	1650009108	-
M48 x 5	1.6767	1.7046	43.00	1.6929	P_D4300…	1650009508	-
M48 x 3	1.7619	1.7816	45.00	1.7717	P_D4500…	1650009408	-
M56 x 5.5	1.9703	1.9998	50.50	1.9882	P_D5050…	1650009608	-

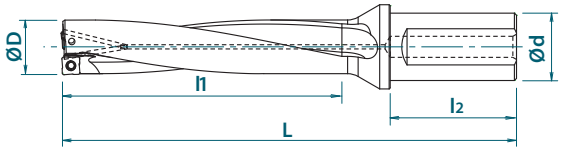
List 52502

P2D (Inch)

NEW SIZES

SPEED FEED P49

Recommended Materials: p51
Accessories & Inserts: p47-48



EDP No.	Body Type	Designation	Drill Dia. (inch)	Drilling Depth (inch)	Overall Length (inch)	Shank Dia. (inch)	Shank Length (Inch)	Applicable Insert
			D	l1	L	d	l2	
52502026	Flat Shank	P2D0594FS075A04	0.5938	1.188	4.063	0.750	1.969	XCMT04…
52502027		P2D0609FS075A04	0.6094	1.219	4.094	0.750	1.969	
52502008		P2D0625FS075A04	0.6250	1.250	4.125	0.750	1.969	
52502028		P2D0641FS075A04	0.6406	1.281	4.156	0.750	1.969	
52502009		P2D0656FS075A04	0.6563	1.313	4.187	0.750	1.969	
52502029		P2D0672FS075A05	0.6719	1.344	4.219	0.750	1.969	XCMT05…
52502010		P2D0688FS075A05	0.6875	1.375	4.250	0.750	1.969	
52502030		P2D0703FS075A05	0.7031	1.406	4.281	0.750	1.969	
52502031		P2D0719FS100A05	0.7188	1.438	4.549	1.000	2.205	
52502032		P2D0734FS100A05	0.7344	1.469	4.580	1.000	2.205	
52502011		P2D0750FS100A06	0.7500	1.500	4.611	1.000	2.205	XCMT06…
52502033		P2D0766FS100A06	0.7656	1.531	4.642	1.000	2.205	
52502034		P2D0781FS100A06	0.7813	1.563	4.674	1.000	2.205	
52502035		P2D0797FS100A06	0.7969	1.594	4.705	1.000	2.205	
52502012		P2D0812FS100A06	0.8125	1.625	4.736	1.000	2.205	
52502036		P2D0828FS100A07	0.8281	1.656	4.767	1.000	2.205	XCMT07…
52502037		P2D0844FS100A07	0.8439	1.688	4.799	1.000	2.205	
52502038		P2D0859FS100A07	0.8594	1.719	4.830	1.000	2.205	
52502000		P2D0875FS100A07	0.8750	1.750	4.861	1.000	2.205	
52502039		P2D0891FS100A07	0.8906	1.781	4.892	1.000	2.205	
52502040		P2D0906FS100A07	0.9063	1.813	4.924	1.000	2.205	
52502041		P2D0922FS100A07	0.9219	1.844	4.955	1.000	2.205	
52502001		P2D0937FS125A07	0.9375	1.875	5.143	1.250	2.362	
52502042		P2D0953FS125A07	0.9531	1.906	5.174	1.250	2.362	
52502043		P2D0969FS125A07	0.9688	1.938	5.206	1.250	2.362	
52502044		P2D0984FS125A08	0.9844	1.969	5.237	1.250	2.362	XCMT08…
52502002		P2D1000FS125A08	1.0000	2.000	5.268	1.250	2.362	
52502045		P2D1031FS125A08	1.0313	2.063	5.331	1.250	2.362	
52502003		P2D1062FS125A08	1.0625	2.125	5.393	1.250	2.362	
52502046		P2D1094FS125A08	1.0938	2.188	5.456	1.250	2.362	
52502004		P2D1125FS125A08	1.1250	2.250	5.518	1.250	2.362	
52502047		P2D1156FS125A09	1.1563	2.313	5.581	1.250	2.362	XCMT09…
52502005		P2D1187FS125A09	1.1875	2.375	5.643	1.250	2.362	
52502048		P2D1219FS125A09	1.2188	2.438	5.706	1.250	2.362	
52502006		P2D1250FS125A09	1.2500	2.500	5.768	1.250	2.362	
52502049		P2D1281FS150A09	1.2813	2.563	6.225	1.500	2.756	
52502007		P2D1312FS150A09	1.3125	2.625	6.287	1.500	2.756	
52502050		P2D1344FS150A10	1.3438	2.688	6.350	1.500	2.756	XCMT10…
52502013		P2D1375FS150A10	1.3750	2.750	6.412	1.500	2.756	
52502051		P2D1406FS150A10	1.4063	2.813	6.475	1.500	2.756	
52502014		P2D1437FS150A10	1.4375	2.875	6.537	1.500	2.756	
52502052		P2D1469FS150A10	1.4688	2.938	6.600	1.500	2.756	
52502015		P2D1500FS150A10	1.5000	3.000	6.662	1.500	2.756	
52502053		P2D1531FS150A10	1.5313	3.063	6.725	1.500	2.756	
52502016		P2D1563FS150A12	1.5625	3.125	6.787	1.500	2.756	XCMT12…
52502054		P2D1594FS150A12	1.5938	3.188	6.850	1.500	2.756	
52502017		P2D1625FS150A12	1.6250	3.250	6.912	1.500	2.756	
52502055		P2D1656FS150A12	1.6563	3.313	6.975	1.500	2.756	
52502018		P2D1688FS150A12	1.6875	3.375	7.037	1.500	2.756	
52502056		P2D1719FS150A12	1.7188	3.438	7.100	1.500	2.756	
52502019		P2D1750FS150A12	1.7500	3.500	7.162	1.500	2.756	

Packed: 1 pc.

continued on next page

PXT

List 52502 (Continued)

P2D (Inch)

NEW SIZES

SPEED FEED P49

Recommended Materials: p51
Accessories & Inserts: p47-48

EDP No.	Body Type	Designation	Drill Dia. (inch)	Drilling Depth (inch)	Overall Length (inch)	Shank Dia. (inch)	Shank Length (Inch)	Applicable Insert
			D	l1	L	d	l2	
52502057	Flat Shank	P2D1781FS150A13	1.7813	3.563	7.225	1.500	2.756	XCMT13…
52502058		P2D1813FS150A13	1.8125	3.625	7.287	1.500	2.756	
52502059		P2D1844FS150A13	1.8438	3.688	7.350	1.500	2.756	
52502020		P2D1875FS150A13	1.8750	3.750	7.412	1.500	2.756	
52502060		P2D1906FS150A13	1.9063	3.813	7.475	1.500	2.756	
52502061		P2D1938FS150A13	1.9375	3.875	7.537	1.500	2.756	
52502062		P2D1969FS150A14	1.9688	3.938	7.600	1.500	2.756	XCMT14…
52502021		P2D2000FS150A14	2.0000	4.000	7.664	1.500	2.756	
52502022		P2D2125FS150A14	2.1250	4.250	7.912	1.500	2.756	
52502023		P2D2250FS150A16	2.2500	4.500	8.162	1.500	2.756	XCMT16…
52502024		P2D2375FS150A16	2.3750	4.750	8.412	1.500	2.756	
52502025		P2D2500FS150A16	2.5000	5.000	8.662	1.500	2.756	

Packed: 1 pc.

PXT

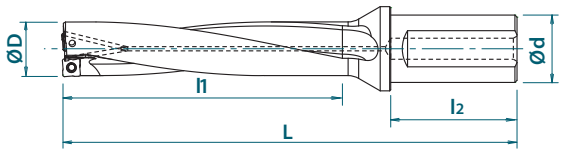
List 78031

P2D (Metric)

NEW SIZES

SPEED FEED P49

Recommended Materials: p51
Accessories & Inserts: p47-48



EDP No.	Body Type	Designation	Drill Dia. (mm) D	Drilling Depth (mm) l1	Overall Length (mm) L	Shank Dia. (mm) d	Shank Length (mm) l2	Applicable Insert
7803117	Flat Shank	P2D1500FS20M04	15.0	30	95	20	50	XCMT04…
7803118		P2D1550FS20M04	15.5	31	96	20	50	
7803119		P2D1600FS20M04	16.0	32	97	20	50	
7803120		P2D1650FS20M04	16.5	33	98	20	50	
7803121		P2D1700FS20M05	17.0	34	102	20	50	XCMT05…
7803122		P2D1750FS20M05	17.5	35	103	20	50	
7803190		P2D1750FS25M05	17.5	35	109	25	56	
7803123		P2D1800FS25M05	18.0	36	110	25	56	
7803124		P2D1850FS25M05	18.5	37	111	25	56	
7803125		P2D1900FS25M06	19.0	38	112	25	56	XCMT06…
7803126		P2D1950FS25M06	19.5	39	113	25	56	
7803127		P2D2000FS25M06	20.0	40	114	25	56	
7803128		P2D2050FS25M06	20.5	41	115	25	56	
7803129		P2D2100FS25M07	21.0	42	121	25	56	XCMT07…
7803130		P2D2150FS25M07	21.5	43	122	25	56	
7803131		P2D2200FS25M07	22.0	44	123	25	56	
7803132		P2D2250FS25M07	22.5	45	124	25	56	
7803133		P2D2300FS25M07	23.0	46	125	25	56	
7803191		P2D2350FS25M07	23.5	47	126	25	56	
7803134		P2D2350FS32M07	23.5	47	130	32	60	
7803192		P2D2400FS25M07	24.0	48	127	25	56	
7803135		P2D2400FS32M07	24.0	48	131	32	60	
7803193		P2D2450FS25M07	24.5	49	128	25	56	
7803136		P2D2450FS32M07	24.5	49	132	32	60	
7803194		P2D2500FS25M08	25.0	50	129	25	56	
7803137		P2D2500FS32M08	25.0	50	133	32	60	XCMT08…
7803195		P2D2550FS25M08	25.5	51	130	25	56	
7803138		P2D2550FS32M08	25.5	51	134	32	60	
7803139		P2D2600FS32M08	26.0	52	135	32	60	
7803140		P2D2650FS32M08	26.5	53	136	32	60	
7803141		P2D2700FS32M08	27.0	54	137	32	60	
7803142		P2D2800FS32M08	28.0	56	139	32	60	
7803143		P2D2850FS32M08	28.5	57	140	32	60	
7803144		P2D2900FS32M09	29.0	58	141	32	60	XCMT09…
7803145		P2D3000FS32M09	30.0	60	143	32	60	
7803146		P2D3100FS32M09	31.0	62	145	32	60	
7803196		P2D3100FS40M09	31.0	62	155	40	70	
7803147		P2D3200FS32M09	32.0	64	147	32	60	
7803197		P2D3200FS40M09	32.0	64	157	40	70	
7803148		P2D3300FS40M09	33.0	66	159	40	70	
7803149		P2D3350FS40M09	33.5	67	160	40	70	
7803150		P2D3400FS40M10	34.0	68	161	40	70	XCMT10…
7803151		P2D3500FS40M10	35.0	70	163	40	70	
7803152		P2D3600FS40M10	36.0	72	165	40	70	
7803153		P2D3700FS40M10	37.0	74	167	40	70	
7803154		P2D3800FS40M10	38.0	76	169	40	70	
7803155		P2D3900FS40M12	39.0	78	178	40	70	XCMT12…
7803156		P2D4000FS40M12	40.0	80	180	40	70	
7803157		P2D4100FS40M12	41.0	82	182	40	70	
7803158		P2D4200FS40M12	42.0	84	184	40	70	
7803159		P2D4300FS40M12	43.0	86	186	40	70	
7803160		P2D4400FS40M12	44.0	88	188	40	70	

Packed: 1 pc.

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PXT

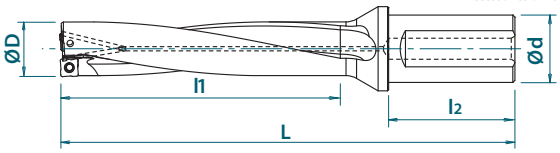
List 78031 (Continued)

NEW SIZES

SPEED FEED P49

Recommended Materials: p51
Accessories & Inserts: p47-48

P2D (Metric)



EDP No.	Body Type	Designation	Drill Dia. (mm)	Drilling Depth (mm)	Overall Length (mm)	Shank Dia. (mm)	Shank Length (mm)	Applicable Insert
			D	l1	L	d	l2	
7803161	Flat Shank	P2D4500FS40M13	45.0	90	190	40	70	XCMT13…
7803162		P2D4600FS40M13	46.0	92	192	40	70	
7803163		P2D4700FS40M13	47.0	94	194	40	70	
7803164		P2D4800FS40M13	48.0	96	196	40	70	
7803165		P2D4900FS40M13	49.0	98	198	40	70	
7803166		P2D5000FS40M14	50.0	100	200	40	70	XCMT14…
7803167		P2D5100FS40M14	51.0	102	202	40	70	
7803168		P2D5200FS40M14	52.0	104	204	40	70	
7803169		P2D5300FS40M14	53.0	106	206	40	70	
7803170		P2D5400FS40M14	54.0	108	208	40	70	
7803171		P2D5500FS40M14	55.0	110	210	40	70	
7803172		P2D5600FS40M14	56.0	112	212	40	70	
7803173		P2D5700FS40M16	57.0	114	214	40	70	XCMT16…
7803174		P2D5800FS40M16	58.0	116	216	40	70	
7803175		P2D5900FS40M16	59.0	118	218	40	70	
7803176		P2D6000FS40M16	60.0	120	220	40	70	
7803177		P2D6100FS40M16	61.0	122	222	40	70	
7803178		P2D6200FS40M16	62.0	124	224	40	70	
7803179		P2D6300FS40M16	63.0	126	226	40	70	

Packed: 1 pc.

PXT

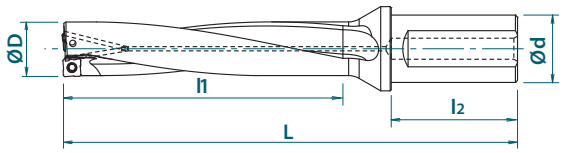
List 52503

P3D (Inch)

NEW SIZES

SPEED FEED P49

Recommended Materials: p51
Accessories & Inserts: p47-48



EDP No.	Body Type	Designation	Drill Dia. (inch) D	Drilling Depth (inch) l1	Overall Length (inch) L	Shank Dia. (inch) d	Shank Length (Inch) l2	Applicable Insert
52503026	Flat Shank	P3D0594FS075A04	0.5938	1.781	4.656	0.750	1.969	XCMT04…
52503027		P3D0609FS075A04	0.6094	1.828	4.703	0.750	1.969	
52503008		P3D0625FS075A04	0.6250	1.875	4.750	0.750	1.969	
52503028		P3D0641FS075A04	0.6406	1.922	4.797	0.750	1.969	
52503009		P3D0656FS075A04	0.6563	1.969	4.843	0.750	1.969	
52503029		P3D0672FS075A05	0.6719	2.016	4.891	0.750	1.969	XCMT05…
52503010		P3D0688FS075A05	0.6875	2.063	4.937	0.750	1.969	
52503030		P3D0703FS075A05	0.7031	2.109	4.984	0.750	1.969	
52503031		P3D0719FS100A05	0.7188	2.156	5.267	1.000	2.205	
52503032		P3D0734FS100A05	0.7344	2.203	5.314	1.000	2.205	
52503011		P3D0750FS100A06	0.7500	2.250	5.361	1.000	2.205	XCMT06…
52503033		P3D0766FS100A06	0.7656	2.297	5.408	1.000	2.205	
52503034		P3D0781FS100A06	0.7813	2.344	5.455	1.000	2.205	
52503035		P3D0797FS100A06	0.7969	2.391	5.502	1.000	2.205	
52503012		P3D0812FS100A06	0.8125	2.438	5.548	1.000	2.205	
52503036		P3D0828FS100A07	0.8281	2.484	5.595	1.000	2.205	XCMT07…
52503037		P3D0844FS100A07	0.8438	2.531	5.642	1.000	2.205	
52503038		P3D0859FS100A07	0.8594	2.578	5.689	1.000	2.205	
52503000		P3D0875FS100A07	0.8750	2.625	5.736	1.000	2.205	
52503039		P3D0891FS100A07	0.8906	2.672	5.783	1.000	2.205	
52503040		P3D0906FS100A07	0.9063	2.719	5.830	1.000	2.205	
52503041		P3D0922FS100A07	0.9219	2.766	5.877	1.000	2.205	
52503001		P3D0937FS125A07	0.9375	2.813	6.080	1.250	2.362	
52503042		P3D0953FS125A07	0.9531	2.859	6.127	1.250	2.362	
52503043		P3D0969FS125A07	0.9688	2.906	6.174	1.250	2.362	
52503044		P3D0984FS125A08	0.9844	2.953	6.221	1.250	2.362	XCMT08…
52503002		P3D1000FS125A08	1.0000	3.000	6.268	1.250	2.362	
52503045		P3D1031FS125A08	1.0313	3.094	6.362	1.250	2.362	
52503003		P3D1062FS125A08	1.0625	3.188	6.455	1.250	2.362	
52503046		P3D1094FS125A08	1.0938	3.281	6.549	1.250	2.362	
52503004		P3D1125FS125A08	1.1250	3.375	6.643	1.250	2.362	
52503047		P3D1156FS125A09	1.1563	3.469	6.737	1.250	2.362	XCMT09…
52503005		P3D1187FS125A09	1.1875	3.563	6.830	1.250	2.362	
52503048		P3D1219FS125A09	1.2188	3.656	6.924	1.250	2.362	
52503006		P3D1250FS125A09	1.2500	3.750	7.018	1.250	2.362	
52503049		P3D1281FS150A09	1.2813	3.844	7.506	1.500	2.756	
52503007		P3D1312FS150A09	1.3125	3.938	7.599	1.500	2.756	
52503050		P3D1344FS150A10	1.3438	4.031	7.693	1.500	2.756	XCMT10…
52503013		P3D1375FS150A10	1.3750	4.125	7.787	1.500	2.756	
52503051		P3D1406FS150A10	1.4063	4.219	7.881	1.500	2.756	
52503014		P3D1437FS150A10	1.4375	4.313	7.974	1.500	2.756	
52503052		P3D1469FS150A10	1.4688	4.406	8.068	1.500	2.756	
52503015		P3D1500FS150A10	1.5000	4.500	8.162	1.500	2.756	
52503053		P3D1531FS150A10	1.5313	4.594	8.256	1.500	2.756	
52503016		P3D1563FS150A12	1.5625	4.688	8.349	1.500	2.756	XCMT12…
52503054		P3D1594FS150A12	1.5938	4.781	8.443	1.500	2.756	
52503017		P3D1625FS150A12	1.6250	4.875	8.537	1.500	2.756	
52503055		P3D1656FS150A12	1.6563	4.969	8.631	1.500	2.756	
52503018		P3D1688FS150A12	1.6875	5.063	8.724	1.500	2.756	
52503056		P3D1719FS150A12	1.7188	5.156	8.818	1.500	2.756	
52503019		P3D1750FS150A12	1.7500	5.250	8.912	1.500	2.756	

Packed: 1 pc.

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PXT

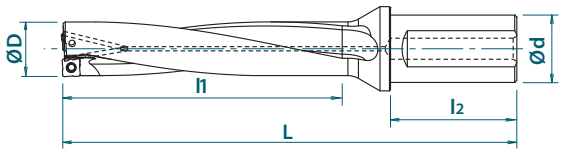
List 52503 (Continued)

NEW SIZES

SPEED FEED P49

Recommended Materials: p51
Accessories & Inserts: p47-48

P3D (Inch)



EDP No.	Body Type	Designation	Drill Dia. (inch)	Drilling Depth (inch)	Overall Length (inch)	Shank Dia. (inch)	Shank Length (Inch)	Applicable Insert
			D	l1	L	d	l2	
52503057	Flat Shank	P3D1781FS150A13	1.7813	5.344	9.006	1.500	2.756	XCMT13…
52503058		P3D1813FS150A13	1.8125	5.438	9.100	1.500	2.756	
52503059		P3D1844FS150A13	1.8438	5.531	9.193	1.500	2.756	
52503020		P3D1875FS150A13	1.8750	5.625	9.287	1.500	2.756	
52503060		P3D1906FS150A13	1.9063	5.719	9.381	1.500	2.756	
52503061		P3D1938FS150A13	1.9375	5.813	9.475	1.500	2.756	
52503062		P3D1969FS150A14	1.9688	5.906	9.568	1.500	2.756	XCMT14…
52503021		P3D2000FS150A14	2.0000	6.000	9.662	1.500	2.756	
52503022		P3D2125FS150A14	2.1250	6.375	10.037	1.500	2.756	
52503023		P3D2250FS150A16	2.2500	6.750	10.412	1.500	2.756	XCMT16…
52503024		P3D2375FS150A16	2.3750	7.125	10.787	1.500	2.756	
52503025		P3D2500FS150A16	2.5000	7.500	11.162	1.500	2.756	

Packed: 1 pc.

PXT

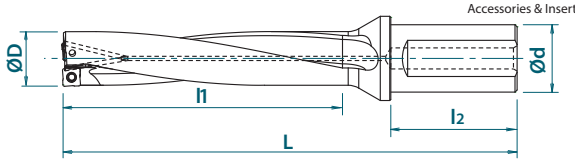
List 78032

P3D (Metric)

NEW SIZES

SPEED FEED P49

Recommended Materials: p51
Accessories & Inserts: p47-48



EDP No.	Body Type	Designation	Drill Dia. (mm) D	Drilling Depth (mm) l1	Overall Length (mm) L	Shank Dia. (mm) d	Shank Length (mm) l2	Applicable Insert
7803217	Flat Shank	P3D1500FS20M04	15.0	45	110	20	50	XCMT04…
7803218		P3D1550FS20M04	15.5	47	112	20	50	
7803219		P3D1600FS20M04	16.0	48	113	20	50	
7803220		P3D1650FS20M04	16.5	50	115	20	50	
7803221		P3D1700FS20M05	17.0	51	119	20	50	XCMT05…
7803222		P3D1750FS20M05	17.5	53	121	20	50	
7803290		P3D1750FS25M05	17.5	53	127	25	56	
7803223		P3D1800FS25M05	18.0	54	128	25	56	
7803224		P3D1850FS25M05	18.5	56	130	25	56	
7803225		P3D1900FS25M06	19.0	57	131	25	56	XCMT06…
7803226		P3D1950FS25M06	19.5	59	133	25	56	
7803227		P3D2000FS25M06	20.0	60	134	25	56	
7803228		P3D2050FS25M06	20.5	62	136	25	56	
7803229		P3D2100FS25M07	21.0	63	142	25	56	XCMT07…
7803230		P3D2150FS25M07	21.5	65	144	25	56	
7803231		P3D2200FS25M07	22.0	66	145	25	56	
7803232		P3D2250FS25M07	22.5	68	147	25	56	
7803233		P3D2300FS25M07	23.0	69	148	25	56	
7803291		P3D2350FS25M07	23.5	71	150	25	56	
7803234		P3D2350FS32M07	23.5	71	154	32	60	
7803292		P3D2400FS25M07	24.0	72	151	25	56	
7803235		P3D2400FS32M07	24.0	72	155	32	60	
7803293		P3D2450FS25M07	24.5	74	153	25	56	
7803236		P3D2450FS32M07	24.5	74	157	32	60	
7803294		P3D2500FS25M08	25.0	75	154	25	56	XCMT08…
7803237		P3D2500FS32M08	25.0	75	158	32	60	
7803295		P3D2550FS25M08	25.5	77	156	25	56	
7803238		P3D2550FS32M08	25.5	77	160	32	60	
7803239		P3D2600FS32M08	26.0	78	161	32	60	
7803240		P3D2650FS32M08	26.5	80	163	32	60	
7803241		P3D2700FS32M08	27.0	81	164	32	60	
7803300		P3D2750FS32M08	27.5	83	166	32	60	
7803242		P3D2800FS32M08	28.0	84	167	32	60	
7803243		P3D2850FS32M08	28.5	86	169	32	60	
7803244		P3D2900FS32M09	29.0	87	170	32	60	XCMT09…
7803301		P3D2950FS32M09	29.5	89	172	32	60	
7803245		P3D3000FS32M09	30.0	90	173	32	60	
7803302		P3D3050FS32M09	30.5	92	175	32	60	
7803246		P3D3100FS32M09	31.0	93	176	32	60	
7803296		P3D3100FS40M09	31.0	93	186	40	70	
7803303		P3D3150FS32M09	31.5	95	178	32	60	
7803247		P3D3200FS32M09	32.0	96	179	32	60	
7803297		P3D3200FS40M09	32.0	96	189	40	70	
7803304		P3D3250FS40M09	32.5	98	191	40	70	
7803248		P3D3300FS40M09	33.0	99	192	40	70	
7803249		P3D3350FS40M09	33.5	101	194	40	70	
7803250		P3D3400FS40M10	34.0	102	195	40	70	XCMT10…
7803305		P3D3450FS40M10	34.5	104	197	40	70	
7803251		P3D3500FS40M10	35.0	105	198	40	70	
7803306		P3D3550FS40M10	35.5	107	200	40	70	
7803252		P3D3600FS40M10	36.0	108	201	40	70	
7803253		P3D3700FS40M10	37.0	111	204	40	70	
7803307		P3D3750FS40M10	37.5	113	206	40	70	
7803254		P3D3800FS40M10	38.0	114	207	40	70	

Packed: 1 pc.

continued on next page PXT

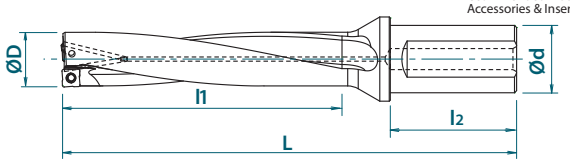
List 78032 (Continued)

NEW SIZES

SPEED FEED P49

Recommended Materials: p51
Accessories & Inserts: p47-48

P3D (Metric)



EDP No.	Body Type	Designation	Drill Dia. (mm)	Drilling Depth (mm)	Overall Length (mm)	Shank Dia. (mm)	Shank Length (mm)	Applicable Insert
			D	l1	L	d	l2	
7803255	Flat Shank	P3D3900FS40M12	39.0	117	217	40	70	XCMT12…
7803256		P3D4000FS40M12	40.0	120	220	40	70	
7803308		P3D4050FS40M12	40.5	122	222	40	70	
7803257		P3D4100FS40M12	41.0	123	223	40	70	
7803258		P3D4200FS40M12	42.0	126	226	40	70	
7803259		P3D4300FS40M12	43.0	129	229	40	70	
7803260		P3D4400FS40M12	44.0	132	232	40	70	
7803261		P3D4500FS40M13	45.0	135	235	40	70	XCMT13…
7803262		P3D4600FS40M13	46.0	138	238	40	70	
7803263		P3D4700FS40M13	47.0	141	241	40	70	
7803264		P3D4800FS40M13	48.0	144	244	40	70	
7803265		P3D4900FS40M13	49.0	147	247	40	70	
7803266		P3D5000FS40M14	50.0	150	250	40	70	XCMT14…
7803309		P3D5050FS40M14	50.5	152	252	40	70	
7803267		P3D5100FS40M14	51.0	153	253	40	70	
7803268		P3D5200FS40M14	52.0	156	256	40	70	
7803269		P3D5300FS40M14	53.0	159	259	40	70	
7803270		P3D5400FS40M14	54.0	162	262	40	70	
7803271		P3D5500FS40M14	55.0	165	265	40	70	
7803272		P3D5600FS40M14	56.0	168	268	40	70	
7803273		P3D5700FS40M16	57.0	171	271	40	70	XCMT16…
7803274		P3D5800FS40M16	58.0	174	274	40	70	
7803275		P3D5900FS40M16	59.0	177	277	40	70	
7803276		P3D6000FS40M16	60.0	180	280	40	70	
7803277		P3D6100FS40M16	61.0	183	283	40	70	
7803278		P3D6200FS40M16	62.0	186	286	40	70	
7803279		P3D6300FS40M16	63.0	189	289	40	70	

Packed: 1 pc.

PXT

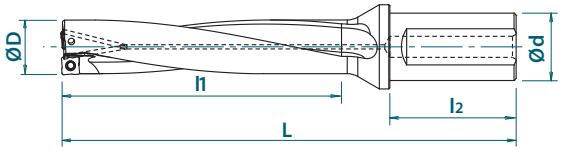
List 52504

P4D (Inch)

NEW SIZES

SPEED FEED P50

Recommended Materials: p51
Accessories & Inserts: p47-48



EDP No.	Body Type	Designation	Drill Dia. (inch) D	Drilling Depth (inch) l1	Overall Length (inch) L	Shank Dia. (inch) d	Shank Length (Inch) l2	Applicable Insert
52504026	Flat Shank	P4D0594FS075A04	0.5938	2.375	5.250	0.750	1.969	XCMT04…
52504027		P4D0609FS075A04	0.6094	2.438	5.313	0.750	1.969	
52504008		P4D0625FS075A04	0.6250	2.500	5.375	0.750	1.969	
52504028		P4D0641FS075A04	0.6406	2.563	5.438	0.750	1.969	
52504009		P4D0656FS075A04	0.6563	2.625	5.500	0.750	1.969	
52504029		P4D0672FS075A05	0.6719	2.688	5.563	0.750	1.969	XCMT05…
52504010		P4D0688FS075A05	0.6875	2.750	5.625	0.750	1.969	
52504030		P4D0703FS075A05	0.7031	2.813	5.688	0.750	1.969	
52504031		P4D0719FS100A05	0.7188	2.875	5.986	1.000	2.205	
52504032		P4D0734FS100A05	0.7344	2.938	6.049	1.000	2.205	
52504011		P4D0750FS100A06	0.7500	3.000	6.111	1.000	2.205	XCMT06…
52504033		P4D0766FS100A06	0.7656	3.063	6.174	1.000	2.205	
52504034		P4D0781FS100A06	0.7813	3.125	6.236	1.000	2.205	
52504035		P4D0797FS100A06	0.7969	3.188	6.299	1.000	2.205	
52504012		P4D0812FS100A06	0.8125	3.250	6.361	1.000	2.205	
52504036		P4D0828FS100A07	0.8281	3.313	6.424	1.000	2.205	XCMT07…
52504037		P4D0844FS100A07	0.8438	3.375	6.486	1.000	2.205	
52504038		P4D0859FS100A07	0.8594	3.438	6.549	1.000	2.205	
52504000		P4D0875FS100A07	0.8750	3.500	6.611	1.000	2.205	
52504039		P4D0891FS100A07	0.8906	3.563	6.674	1.000	2.205	
52504040		P4D0906FS100A07	0.9063	3.625	6.736	1.000	2.205	
52504041		P4D0922FS100A07	0.9219	3.688	6.799	1.000	2.205	
52504001		P4D0937FS125A07	0.9375	3.750	7.018	1.250	2.362	
52504042		P4D0953FS125A07	0.9531	3.813	7.081	1.250	2.362	
52504043		P4D0969FS125A07	0.9688	3.875	7.143	1.250	2.362	
52504044		P4D0984FS125A08	0.9844	3.938	7.206	1.250	2.362	XCMT08…
52504002		P4D1000FS125A08	1.0000	4.000	7.268	1.250	2.362	
52504045		P4D1031FS125A08	1.0313	4.125	7.393	1.250	2.362	
52504003		P4D1062FS125A08	1.0625	4.250	7.518	1.250	2.362	
52504046		P4D1094FS125A08	1.0938	4.375	7.643	1.250	2.362	
52504004		P4D1125FS125A08	1.1250	4.500	7.768	1.250	2.362	
52504047		P4D1156FS125A09	1.1563	4.625	7.893	1.250	2.362	XCMT09…
52504005		P4D1187FS125A09	1.1875	4.750	8.018	1.250	2.362	
52504048		P4D1219FS125A09	1.2188	4.875	8.143	1.250	2.362	
52504006		P4D1250FS125A09	1.2500	5.000	8.268	1.250	2.362	
52504049		P4D1281FS150A09	1.2813	5.125	8.787	1.500	2.756	
52504007		P4D1312FS150A09	1.3125	5.250	8.912	1.500	2.756	
52504050		P4D1344FS150A10	1.3438	5.375	9.037	1.500	2.756	XCMT10…
52504013		P4D1375FS150A10	1.3750	5.500	9.162	1.500	2.756	
52504051		P4D1406FS150A10	1.4063	5.625	9.287	1.500	2.756	
52504014		P4D1437FS150A10	1.4375	5.750	9.412	1.500	2.756	
52504052		P4D1469FS150A10	1.4688	5.875	9.537	1.500	2.756	
52504015		P4D1500FS150A10	1.5000	6.000	9.662	1.500	2.756	
52504053		P4D1531FS150A10	1.5313	6.125	9.787	1.500	2.756	
52504016		P4D1563FS150A12	1.5625	6.250	9.912	1.500	2.756	XCMT12…
52504054		P4D1594FS150A12	1.5938	6.375	10.037	1.500	2.756	
52504017		P4D1625FS150A12	1.6250	6.500	10.162	1.500	2.756	
52504055		P4D1656FS150A12	1.6563	6.625	10.287	1.500	2.756	
52504018		P4D1688FS150A12	1.6875	6.750	10.412	1.500	2.756	
52504056		P4D1719FS150A12	1.7188	6.875	10.537	1.500	2.756	
52504019		P4D1750FS150A12	1.7500	7.000	10.662	1.500	2.756	

Packed: 1 pc.

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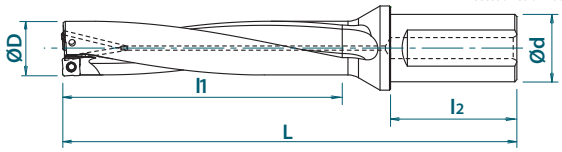
PXT

List 52504 (Continued)

NEW SIZES | SPEED FEED P50

Recommended Materials: p51
Accessories & Inserts: p47-48

P4D (Inch)



EDP No.	Body Type	Designation	Drill Dia. (inch)	Drilling Depth (inch)	Overall Length (inch)	Shank Dia. (inch)	Shank Length (Inch)	Applicable Insert
			D	l1	L	d	l2	
52504057	Flat Shank	P4D1781FS150A13	1.7813	7.125	10.787	1.500	2.756	XCMT13…
52504058		P4D1813FS150A13	1.8125	7.250	10.912	1.500	2.756	
52504059		P4D1844FS150A13	1.8438	7.375	11.037	1.500	2.756	
52504020		P4D1875FS150A13	1.8750	7.500	11.162	1.500	2.756	
52504060		P4D1906FS150A13	1.9063	7.625	11.287	1.500	2.756	
52504061		P4D1938FS150A13	1.9375	7.750	11.412	1.500	2.756	
52504062		P4D1969FS150A14	1.9688	7.875	11.537	1.500	2.756	XCMT14…
52504021		P4D2000FS150A14	2.0000	8.000	11.662	1.500	2.756	
52504022		P4D2125FS150A14	2.1250	8.500	12.162	1.500	2.756	
52504023		P4D2250FS150A16	2.2500	9.000	12.662	1.500	2.756	XCMT16…
52504024		P4D2375FS150A16	2.3750	9.500	13.162	1.500	2.756	
52504025		P4D2500FS150A16	2.5000	10.000	13.662	1.500	2.756	

Packed: 1 pc.

PXT

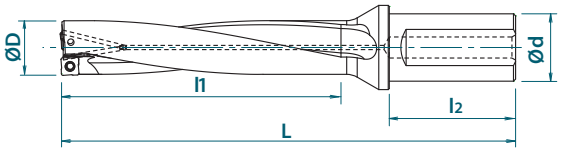
List 78033

P4D (Metric)

NEW SIZES

SPEED FEED P50

Recommended Materials: p51
Accessories & Inserts: p47-48



EDP No.	Body Type	Designation	Drill Dia. (mm) D	Drilling Depth (mm) l1	Overall Length (mm) L	Shank Dia. (mm) d	Shank Length (mm) l2	Applicable Insert
7803317	Flat Shank	P4D1500FS20M04	15.0	60	135	20	50	XCMT04…
7803318		P4D1550FS20M04	15.5	62	127	20	50	
7803319		P4D1600FS20M04	16.0	64	129	20	50	
7803320		P4D1650FS20M04	16.5	66	131	20	50	
7803321		P4D1700FS20M05	17.0	68	136	20	50	XCMT05…
7803322		P4D1750FS20M05	17.5	70	138	20	50	
7803390		P4D1750FS25M05	17.5	70	144	25	56	
7803323		P4D1800FS25M05	18.0	72	146	25	56	
7803324		P4D1850FS25M05	18.5	74	148	25	56	
7803325		P4D1900FS25M06	19.0	76	150	25	56	XCMT06…
7803326		P4D1950FS25M06	19.5	78	152	25	56	
7803327		P4D2000FS25M06	20.0	80	154	25	56	
7803328		P4D2050FS25M06	20.5	82	156	25	56	
7803329		P4D2100FS25M07	21.0	84	163	25	56	XCMT07…
7803330		P4D2150FS25M07	21.5	86	165	25	56	
7803331		P4D2200FS25M07	22.0	88	167	25	56	
7803332		P4D2250FS25M07	22.5	90	169	25	56	
7803333		P4D2300FS25M07	23.0	92	171	25	56	
7803391		P4D2350FS25M07	23.5	94	173	25	56	
7803334		P4D2350FS32M07	23.5	94	177	32	60	
7803392		P4D2400FS25M07	24.0	96	175	25	56	
7803335		P4D2400FS32M07	24.0	96	179	32	60	
7803393		P4D2450FS25M07	24.5	98	177	25	56	
7803336		P4D2450FS32M07	24.5	98	181	32	60	
7803394		P4D2500FS25M08	25.0	100	179	25	56	
7803337		P4D2500FS32M08	25.0	100	183	32	60	XCMT08…
7803395		P4D2550FS25M08	25.5	102	181	25	56	
7803338		P4D2550FS32M08	25.5	102	185	32	60	
7803339		P4D2600FS32M08	26.0	104	187	32	60	
7803340		P4D2650FS32M08	26.5	106	189	32	60	
7803341		P4D2700FS32M08	27.0	108	191	32	60	
7803342		P4D2800FS32M08	28.0	112	195	32	60	
7803343		P4D2850FS32M08	28.5	114	197	32	60	
7803344		P4D2900FS32M09	29.0	116	199	32	60	XCMT09…
7803345		P4D3000FS32M09	30.0	120	203	32	60	
7803346		P4D3100FS32M09	31.0	124	207	32	60	
7803396		P4D3100FS40M09	31.0	124	217	40	70	
7803347		P4D3200FS32M09	32.0	128	211	32	60	
7803397		P4D3200FS40M09	32.0	128	221	40	70	
7803348		P4D3300FS40M09	33.0	132	225	40	70	
7803349		P4D3350FS40M09	33.5	134	227	40	70	
7803350		P4D3400FS40M10	34.0	136	229	40	70	XCMT10…
7803351		P4D3500FS40M10	35.0	140	233	40	70	
7803352		P4D3600FS40M10	36.0	144	237	40	70	
7803353		P4D3700FS40M10	37.0	148	241	40	70	
7803354		P4D3800FS40M10	38.0	152	245	40	70	
7803355		P4D3900FS40M12	39.0	156	256	40	70	XCMT12…
7803356		P4D4000FS40M12	40.0	160	260	40	70	
7803357		P4D4100FS40M12	41.0	164	264	40	70	
7803358		P4D4200FS40M12	42.0	168	268	40	70	
7803359		P4D4300FS40M12	43.0	172	272	40	70	
7803360		P4D4400FS40M12	44.0	176	276	40	70	

Packed: 1 pc.

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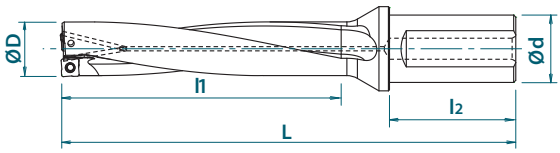
PXT

List 78033 (Continued)

P4D (Metric)

NEW SIZES | SPEED FEED P50

Recommended Materials: p51
Accessories & Inserts: p47-48



EDP No.	Body Type	Designation	Drill Dia. (mm) D	Drilling Depth (mm) l1	Overall Length (mm) L	Shank Dia. (mm) d	Shank Length (mm) l2	Applicable Insert
7803361	Flat Shank	P4D4500FS40M13	45.0	180	280	40	70	XCMT13…
7803362		P4D4600FS40M13	46.0	184	284	40	70	
7803363		P4D4700FS40M13	47.0	188	288	40	70	
7803364		P4D4800FS40M13	48.0	192	292	40	70	
7803365		P4D4900FS40M13	49.0	196	296	40	70	
7803366		P4D5000FS40M14	50.0	200	300	40	70	XCMT14…
7803367		P4D5100FS40M14	51.0	204	304	40	70	
7803368		P4D5200FS40M14	52.0	208	308	40	70	
7803369		P4D5300FS40M14	53.0	212	312	40	70	
7803370		P4D5400FS40M14	54.0	216	316	40	70	
7803371		P4D5500FS40M14	55.0	220	320	40	70	
7803372		P4D5600FS40M14	56.0	224	324	40	70	
7803373		P4D5700FS40M16	57.0	228	328	40	70	XCMT16…
7803374		P4D5800FS40M16	58.0	232	332	40	70	
7803375		P4D5900FS40M16	59.0	236	336	40	70	
7803376		P4D6000FS40M16	60.0	240	340	40	70	
7803377		P4D6100FS40M16	61.0	244	344	40	70	
7803378		P4D6200FS40M16	62.0	248	348	40	70	
7803379		P4D6300FS40M16	63.0	252	352	40	70	

Packed: 1 pc.

PXT

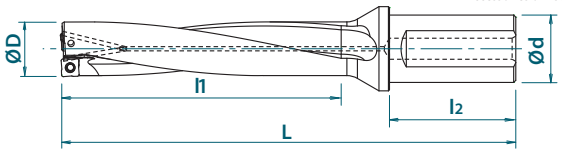
List 52505

P5D (Inch)

NEW SIZES

SPEED FEED P51

Recommended Materials: p51
Accessories & Inserts: p47-48



EDP No.	Body Type	Designation	Drill Dia. (inch) D	Drilling Depth (inch) l1	Overall Length (inch) L	Shank Dia. (inch) d	Shank Length (Inch) l2	Applicable Insert
52505026	Flat Shank	P5D0594FS075A04	0.5938	2.969	5.844	0.750	1.969	XCMT04…
52505027		P5D0609FS075A04	0.6094	3.047	5.922	0.750	1.969	
52505008		P5D0625FS075A04	0.6250	3.125	6.000	0.750	1.969	
52505028		P5D0641FS075A04	0.6406	3.203	6.078	0.750	1.969	
52505009		P5D0656FS075A04	0.6563	3.281	6.156	0.750	1.969	
52505029		P5D0672FS075A05	0.6719	3.359	6.234	0.750	1.969	XCMT05…
52505010		P5D0688FS075A05	0.6875	3.438	6.312	0.750	1.969	
52505030		P5D0703FS075A05	0.7031	3.516	6.391	0.750	1.969	
52505031		P5D0719FS100A05	0.7188	3.594	6.705	1.000	2.205	
52505032		P5D0734FS100A05	0.7344	3.672	6.783	1.000	2.205	
52505011		P5D0750FS100A06	0.7500	3.750	6.861	1.000	2.205	XCMT06…
52505033		P5D0766FS100A06	0.7656	3.828	6.939	1.000	2.205	
52505034		P5D0781FS100A06	0.7813	3.906	7.017	1.000	2.205	
52505035		P5D0797FS100A06	0.7969	3.984	7.095	1.000	2.205	
52505012		P5D0812FS100A06	0.8125	4.063	7.173	1.000	2.205	
52505036		P5D0828FS100A07	0.8281	4.141	7.252	1.000	2.205	XCMT07…
52505037		P5D0844FS100A07	0.8438	4.219	7.330	1.000	2.205	
52505038		P5D0859FS100A07	0.8594	4.297	7.408	1.000	2.205	
52505000		P5D0875FS100A07	0.8750	4.375	7.485	1.000	2.205	
52505039		P5D0891FS100A07	0.8906	4.453	7.564	1.000	2.205	
52505040		P5D0906FS100A07	0.9063	4.531	7.642	1.000	2.205	
52505041		P5D0922FS100A07	0.9219	4.609	7.720	1.000	2.205	
52505001		P5D0937FS125A07	0.9375	4.688	7.955	1.250	2.362	
52505042		P5D0953FS125A07	0.9531	4.766	8.034	1.250	2.362	
52505043		P5D0969FS125A07	0.9688	4.844	8.112	1.250	2.362	
52505044		P5D0984FS125A08	0.9844	4.922	8.190	1.250	2.362	XCMT08…
52505002		P5D1000FS125A08	1.0000	5.000	8.268	1.250	2.362	
52505045		P5D1031FS125A08	1.0313	5.156	8.424	1.250	2.362	
52505003		P5D1062FS125A08	1.0625	5.313	8.580	1.250	2.362	
52505046		P5D1094FS125A08	1.0938	5.469	8.737	1.250	2.362	
52505004		P5D1125FS125A08	1.1250	5.625	8.893	1.250	2.362	
52505047		P5D1156FS125A09	1.1563	5.781	9.049	1.250	2.362	XCMT09…
52505005		P5D1187FS125A09	1.1875	5.938	9.205	1.250	2.362	
52505048		P5D1219FS125A09	1.2188	6.094	9.362	1.250	2.362	
52505006		P5D1250FS125A09	1.2500	6.250	9.518	1.250	2.362	
52505049		P5D1281FS150A09	1.2813	6.406	10.068	1.500	2.756	
52505007		P5D1312FS150A09	1.3125	6.563	10.224	1.500	2.756	
52505050		P5D1344FS150A10	1.3438	6.719	10.381	1.500	2.756	XCMT10…
52505013		P5D1375FS150A10	1.3750	6.875	10.537	1.500	2.756	
52505051		P5D1406FS150A10	1.4063	7.031	10.693	1.500	2.756	
52505014		P5D1437FS150A10	1.4375	7.188	10.849	1.500	2.756	
52505052		P5D1469FS150A10	1.4688	7.344	11.006	1.500	2.756	
52505015		P5D1500FS150A10	1.5000	7.500	11.162	1.500	2.756	
52505053		P5D1531FS150A10	1.5313	7.656	11.318	1.500	2.756	
52505016		P5D1563FS150A12	1.5625	7.813	11.474	1.500	2.756	XCMT12…
52505054		P5D1594FS150A12	1.5938	7.969	11.631	1.500	2.756	
52505017		P5D1625FS150A12	1.6250	8.125	11.787	1.500	2.756	
52505055		P5D1656FS150A12	1.6563	8.281	11.943	1.500	2.756	
52505018		P5D1688FS150A12	1.6875	8.438	12.099	1.500	2.756	
52505056		P5D1719FS150A12	1.7188	8.594	12.256	1.500	2.756	
52505019		P5D1750FS150A12	1.7500	8.750	12.412	1.500	2.756	

Packed: 1 pc.

continued on next page PXT

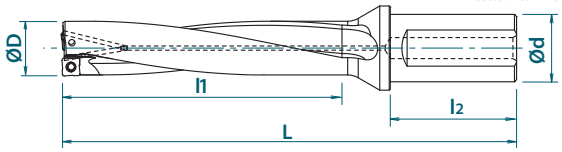
List 52505 (Continued)

NEW SIZES

SPEED FEED P51

Recommended Materials: p51
Accessories & Inserts: p47-48

P5D (Inch)



EDP No.	Body Type	Designation	Drill Dia. (inch)	Drilling Depth (inch)	Overall Length (inch)	Shank Dia. (inch)	Shank Length (Inch)	Applicable Insert
			D	l1	L	d	l2	
52505057	Flat Shank	P5D1781FS150A13	1.7813	8.906	12.568	1.500	2.756	XCMT13…
52505058		P5D1813FS150A13	1.8125	9.063	12.725	1.500	2.756	
52505059		P5D1844FS150A13	1.8438	9.219	12.881	1.500	2.756	
52505020		P5D1875FS150A13	1.8750	9.375	13.037	1.500	2.756	
52505060		P5D1906FS150A13	1.9063	9.531	13.193	1.500	2.756	
52505061		P5D1938FS150A13	1.9375	9.688	13.350	1.500	2.756	
52505062		P5D1969FS150A14	1.9688	9.844	13.506	1.500	2.756	XCMT14…
52505021		P5D2000FS150A14	2.0000	10.000	13.662	1.500	2.756	
52505022		P5D2125FS150A14	2.1250	10.625	14.287	1.500	2.756	
52505023		P5D2250FS150A16	2.2500	11.250	14.912	1.500	2.756	XCMT16…
52505024		P5D2375FS150A16	2.3750	11.875	15.537	1.500	2.756	
52505025		P5D2500FS150A16	2.5000	12.500	16.162	1.500	2.756	

Packed: 1 pc.

PXT

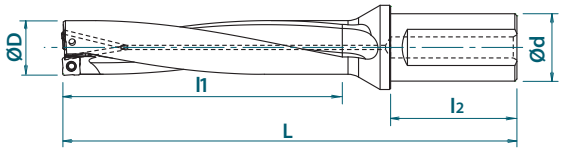
List 78027

P5D (Metric)

NEW SIZES

SPEED FEED P51

Recommended Materials: p51
Accessories & Inserts: p47-48



EDP No.	Body Type	Designation	Drill Dia. (mm) D	Drilling Depth (mm) l1	Overall Length (mm) L	Shank Dia. (mm) d	Shank Length (mm) l2	Applicable Insert
7802717	Flat Shank	P5D1500FS20M04	15.0	75	140	20	50	XCMT04…
7802718		P5D1550FS20M04	15.5	78	143	20	50	
7802719		P5D1600FS20M04	16.0	80	145	20	50	
7802720		P5D1650FS20M04	16.5	83	148	20	50	
7802721		P5D1700FS20M05	17.0	85	153	20	50	XCMT05…
7802722		P5D1750FS20M05	17.5	88	156	20	50	
7802790		P5D1750FS25M05	17.5	88	162	25	56	
7802723		P5D1800FS25M05	18.0	90	164	25	56	
7802724		P5D1850FS25M05	18.5	93	167	25	56	
7802725		P5D1900FS25M06	19.0	95	169	25	56	XCMT06…
7802726		P5D1950FS25M06	19.5	98	172	25	56	
7802727		P5D2000FS25M06	20.0	100	174	25	56	
7802728		P5D2050FS25M06	20.5	103	177	25	56	
7802729		P5D2100FS25M07	21.0	105	184	25	56	XCMT07…
7802730		P5D2150FS25M07	21.5	108	187	25	56	
7802731		P5D2200FS25M07	22.0	110	189	25	56	
7802732		P5D2250FS25M07	22.5	113	192	25	56	
7802733		P5D2300FS25M07	23.0	115	194	25	56	
7802791		P5D2350FS25M07	23.5	118	197	25	56	
7802734		P5D2350FS32M07	23.5	118	201	32	60	
7802792		P5D2400FS25M07	24.0	120	199	25	56	
7802735		P5D2400FS32M07	24.0	120	203	32	60	
7802793		P5D2450FS25M07	24.5	123	202	25	56	
7802736		P5D2450FS32M07	24.5	123	206	32	60	
7802794		P5D2500FS25M08	25.0	125	204	25	56	
7802737		P5D2500FS32M08	25.0	125	208	32	60	XCMT08…
7802795		P5D2550FS25M08	25.5	128	207	25	56	
7802738		P5D2550FS32M08	25.5	128	211	32	60	
7802739		P5D2600FS32M08	26.0	130	213	32	60	
7802740		P5D2650FS32M08	26.5	133	216	32	60	
7802741		P5D2700FS32M08	27.0	135	218	32	60	
7802742		P5D2800FS32M08	28.0	140	223	32	60	
7802743		P5D2850FS32M08	28.5	143	226	32	60	
7802744		P5D2900FS32M09	29.0	145	228	32	60	XCMT09…
7802745		P5D3000FS32M09	30.0	150	233	32	60	
7802746		P5D3100FS32M09	31.0	155	238	32	60	
7802796		P5D3100FS40M09	31.0	155	248	40	70	
7802747		P5D3200FS32M09	32.0	160	243	32	60	
7802797		P5D3200FS40M09	32.0	160	253	40	70	
7802748		P5D3300FS40M09	33.0	165	258	40	70	
7802749		P5D3350FS40M09	33.5	168	261	40	70	
7802750		P5D3400FS40M10	34.0	170	263	40	70	XCMT10…
7802751		P5D3500FS40M10	35.0	175	268	40	70	
7802752		P5D3600FS40M10	36.0	180	273	40	70	
7802753		P5D3700FS40M10	37.0	185	278	40	70	
7802754		P5D3800FS40M10	38.0	190	283	40	70	
7802755		P5D3900FS40M12	39.0	195	295	40	70	XCMT12…
7802756		P5D4000FS40M12	40.0	200	300	40	70	
7802757		P5D4100FS40M12	41.0	205	305	40	70	
7802758		P5D4200FS40M12	42.0	210	310	40	70	
7802759		P5D4300FS40M12	43.0	215	315	40	70	
7802760		P5D4400FS40M12	44.0	220	320	40	70	

Packed: 1 pc.

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PXT

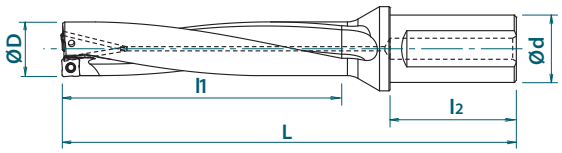
List 78027 (Continued)

NEW SIZES

SPEED FEED P51

Recommended Materials: p51
Accessories & Inserts: p47-48

P5D (Metric)



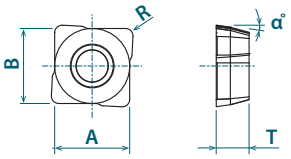
EDP No.	Body Type	Designation	Drill Dia. (mm)	Drilling Depth (mm)	Overall Length (mm)	Shank Dia. (mm)	Shank Length (mm)	Applicable Insert
			D	l1	L	d	l2	
7802761	Flat Shank	P5D4500FS40M13	45.0	225	325	40	70	XCMT13…
7802762		P5D4600FS40M13	46.0	230	330	40	70	
7802763		P5D4700FS40M13	47.0	235	335	40	70	
7802764		P5D4800FS40M13	48.0	240	340	40	70	
7802765		P5D4900FS40M13	49.0	245	345	40	70	
7802766		P5D5000FS40M14	50.0	250	350	40	70	XCMT14…
7802767		P5D5100FS40M14	51.0	255	355	40	70	
7802768		P5D5200FS40M14	52.0	260	360	40	70	
7802769		P5D5300FS40M14	53.0	265	365	40	70	
7802770		P5D5400FS40M14	54.0	270	370	40	70	
7802771		P5D5500FS40M14	55.0	275	375	40	70	
7802772		P5D5600FS40M14	56.0	280	380	40	70	
7802773		P5D5700FS40M16	57.0	285	385	40	70	XCMT16…
7802774		P5D5800FS40M16	58.0	290	390	40	70	
7802775		P5D5900FS40M16	59.0	295	395	40	70	
7802776		P5D6000FS40M16	60.0	300	400	40	70	
7802777		P5D6100FS40M16	61.0	305	405	40	70	
7802778		P5D6200FS40M16	62.0	310	410	40	70	
7802779		P5D6300FS40M16	63.0	315	415	40	70	

Packed: 1 pc.

PXT

List 78P5D

PD Inserts



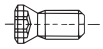
Designation	No. of Cutting Edges	Insert Size				EDP Number		
		A x B (mm)	T (mm)	α	R (mm)	XP9020	XP1010	CK110
XCMT042204ER-DM	4	5 x 5	2.2	8°	0.4	7823064	-	-
XCMT042204ER-DR						-	7823164	-
XCMT042204ER-DN						-	-	7823264
XCMT052404ER-DM		5.83 x 5.83	2.4			7823065	-	-
XCMT052404ER-DR						-	7823165	-
XCMT052404ER-DN						-	-	7823265
XCMT062706ER-DM		6.46 x 6.46	2.7		0.6	7823066	-	-
XCMT062706ER-DR						-	7823166	-
XCMT062706ER-DN						-	-	7823266
XCMT073106ER-DM		7.42 x 7.42	3.1			7823067	-	-
XCMT073106ER-DR						-	7823167	-
XCMT073106ER-DN						-	-	7823267
XCMT083508ER-DM		8.71 x 8.71	3.5		0.8	7823068	-	-
XCMT083508ER-DR						-	7823168	-
XCMT083508ER-DN						-	-	7823268
XCMT094008ER-DM		10.04 x 10.04	4.0			7823069	-	-
XCMT094008ER-DR						-	7823169	-
XCMT094008ER-DN						-	-	7823269
XCMT104608ER-DM		10.89 x 10.89	4.6			7823097	-	-
XCMT104608ER-DR						-	7823197	-
XCMT104608ER-DN						-	-	7823297
XCMT125010ER-DM		12.57 x 12.57	5.0		1.0	7823071	-	-
XCMT125010ER-DR						-	7823171	-
XCMT125010ER-DN						-	-	7823271
XCMT135212ER-DM		14.05 x 14.05	5.2		1.2	7823072	-	-
XCMT135212ER-DR						-	7823172	-
XCMT135212ER-DN						-	-	7823272
XCMT145612ER-DM		15.58 x 15.58	5.6			7823073	-	-
XCMT145612ER-DR						-	7823173	-
XCMT145612ER-DN						-	-	7823273
XCMT165912ER-DM		17.28 x 17.28	5.8			7823075	-	-
XCMT165912ER-DR						-	7823175	-
XCMT165912ER-DN						-	-	7823275

Packed: 10 pcs.

PXI

List 7808H

PD Accessories

Appearance	EDP Number	Designation	Applicable Insert	Recommended Tightening Torque
 Clamping Screw	7808139	FS20543P (Torx 6IP)	XCMT04…	0.7 Nm
			XCMT05…	
	7808138	FS22550P (Torx 7IP)	XCMT06…	1.0 Nm
	7808136	FS25560P (Torx 8IP)	XCMT07…	1.6 Nm
	7808135	FS30570P (Torx 9IP)	XCMT08…	2.2 Nm
			XCMT09…	
	7808137	FS35586P (Torx 15IP)	XCMT10…	3.2 Nm
			XCMT12…	
	7808114	FS45510P (Torx 20IP)	XCMT13…	5.0 Nm
			XCMT14…	
			XCMT16…	
 Wrench	7808223	6IP-D (Torx 6IP)	XCMT04…	
			XCMT05…	
	7808224	7IP-D (Torx 7IP)	XCMT06…	
	7808225	8IP-D (Torx 8IP)	XCMT07…	
	7808226	9IP-D (Torx 9IP)	XCMT08…	
			XCMT09…	
	7808228	15IP-D (Torx 15IP)	XCMT10…	
			XCMT12…	
	7808229	20IP-D (Torx 20IP)	XCMT13…	
			XCMT14…	
			XCMT16…	

Packed: Clamping Screws = 10 pcs.; Wrench = 1 pc.
Note: Wrench sold separately.

PXT

Cutting Conditions (2D & 3D)

Work Material		Tensile Strength – Hardness	Drilling Speed Vc (SFM)	Feed Rate, f (in/rev)						
				Drilling Depth 2D, 3D						
				Ø0.591-0.650 (15-16.5mm)	Ø0.669-0.728 (17-18.5mm)	Ø0.748-0.807 (19-20.5mm)	Ø0.827-0.965 (21-24.5mm)	Ø0.984-1.122 (25-28.5mm)	Ø1.142-1.319 (29-33.5mm)	Ø1.339-2.500 (34-63mm)
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	650 (500 - 800)	0.003 (0.0015 - 0.0055)	0.0035 (0.0015 - 0.0063)	0.0039 (0.0015 - 0.007)	0.0055 (0.0015 - 0.008)	0.007 (0.0024 - 0.010)	0.008 (0.003 - 0.012)	0.008 (0.003 - 0.014)
	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	500 (330 - 720)	0.003 (0.0015 - 0.0055)	0.0035 (0.0015 - 0.0063)	0.0039 (0.0015 - 0.007)	0.0055 (0.0015 - 0.0075)	0.007 (0.0024 - 0.010)	0.008 (0.003 - 0.012)	0.008 (0.003 - 0.014)
	Die Steels (H13, D2)	~280 HB	330 (260 - 500)	0.0024 (0.0015 - 0.004)	0.0027 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)	0.0045 (0.0015 - 0.006)	0.0055 (0.0024 - 0.008)	0.007 (0.003 - 0.010)	0.007 (0.003 - 0.010)
M	Stainless Steels (304, 420)	~250 HB	430 (260 - 600)	0.0027 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)	0.0035 (0.0015 - 0.0045)	0.004 (0.0015 - 0.006)	0.005 (0.0024 - 0.008)	0.0063 (0.003 - 0.010)	0.006 (0.003 - 0.010)
K	Cast Iron (No. 35 B)	~350 N/mm²	650 (500 - 920)	0.003 (0.0015 - 0.0055)	0.0039 (0.0015 - 0.0063)	0.0045 (0.0015 - 0.008)	0.0063 (0.003 - 0.010)	0.008 (0.0024 - 0.012)	0.008 (0.003 - 0.012)	0.008 (0.003 - 0.014)
	Ductile Cast Iron (60-40-18)	~800 N/mm²	530 (330 - 720)	0.003 (0.0015 - 0.0045)	0.0035 (0.0015 - 0.0055)	0.0039 (0.0015 - 0.007)	0.0055 (0.0015 - 0.008)	0.007 (0.0024 - 0.010)	0.007 (0.003 - 0.010)	0.007 (0.003 - 0.010)
N	Aluminum Alloys (6061, 7075)	~13% Si	650 (330 - 2600)	0.003 (0.0015 - 0.0045)	0.004 (0.0015 - 0.0063)	0.0045 (0.0015 - 0.008)	0.0063 (0.0015 - 0.010)	0.008 (0.0024 - 0.012)	0.008 (0.003 - 0.012)	0.008 (0.003 - 0.012)
S	Heat Resistant Alloys (Inconel 718)	-	100 (50 - 160)	0.0015 (0.0008 - 0.0024)	0.002 (0.0012 - 0.0024)	0.002 (0.0012 - 0.0024)	0.0023 (0.0015 - 0.0032)	0.003 (0.0024 - 0.004)	0.004 (0.0024 - 0.0045)	0.004 (0.0024 - 0.0045)
	Titanium Alloy (Ti-6Al-4V)	-	200 (100 - 330)	0.002 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0032 (0.0015 - 0.006)	0.004 (0.0024 - 0.008)	0.0055 (0.003 - 0.008)	0.0055 (0.003 - 0.008)
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HrC	330 (200 - 400)	0.0024 (0.0016 - 0.004)	0.0024 (0.0016 - 0.0047)	0.0027 (0.0016 - 0.0047)	0.003 (0.0016 - 0.0047)	0.004 (0.0024 - 0.006)	0.004 (0.0024 - 0.006)	0.004 (0.0024 - 0.006)
	Die Cast Steels (A2, S7)	43 - 48 HrC	260 (165 - 330)	0.002 (0.0015 - 0.003)	0.002 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)
	Hardened Steels (D2)	50 - 55 HrC	200 (130 - 260)	0.002 (0.0015 - 0.003)	0.002 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)

Cutting Conditions (4D)

Work Material		Tensile Strength – Hardness	Drilling Speed Vc (SFM)	Feed Rate, f (in/rev)						
				Drilling Depth 4D						
				Ø0.591-0.650 (15-16.5mm)	Ø0.669-0.728 (17-18.5mm)	Ø0.748-0.807 (19-20.5mm)	Ø0.827-0.965 (21-24.5mm)	Ø0.984-1.122 (25-28.5mm)	Ø1.142-1.319 (29-33.5mm)	Ø1.339-2.500 (34-63mm)
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	650 (500 - 800)	0.003 (0.0015 - 0.0055)	0.003 (0.0015 - 0.0063)	0.0035 (0.0015 - 0.007)	0.0045 (0.0015 - 0.006)	0.007 (0.0024 - 0.010)	0.008 (0.003 - 0.010)	0.008 (0.003 - 0.012)
	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	500 (330 - 720)	0.003 (0.0015 - 0.0055)	0.003 (0.0015 - 0.0063)	0.0035 (0.0015 - 0.007)	0.0045 (0.0015 - 0.006)	0.007 (0.0024 - 0.010)	0.008 (0.003 - 0.010)	0.008 (0.003 - 0.012)
	Die Steels (H13, D2)	~280 HB	330 (260 - 500)	0.0024 (0.0015 - 0.004)	0.0027 (0.0015 - 0.004)	0.003 (0.0015 - 0.0045)	0.004 (0.0015 - 0.0052)	0.0055 (0.0024 - 0.008)	0.007 (0.003 - 0.010)	0.007 (0.003 - 0.010)
M	Stainless Steels (304, 420)	~250 HB	430 (260 - 600)	0.0024 (0.0015 - 0.003)	0.0027 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)	0.0052 (0.0024 - 0.008)	0.0063 (0.003 - 0.008)	0.0063 (0.003 - 0.008)
K	Cast Iron (No. 35 B)	~350 N/mm²	650 (500 - 920)	0.003 (0.0015 - 0.0055)	0.0035 (0.0015 - 0.0063)	0.004 (0.0015 - 0.008)	0.0045 (0.0015 - 0.006)	0.008 (0.0024 - 0.012)	0.008 (0.003 - 0.012)	0.008 (0.003 - 0.012)
	Ductile Cast Iron (60-40-18)	~800 N/mm²	530 (330 - 720)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.0045)	0.0035 (0.0015 - 0.006)	0.0045 (0.0015 - 0.006)	0.006 (0.0024 - 0.010)	0.007 (0.003 - 0.010)	0.007 (0.003 - 0.010)
N	Aluminum Alloys (6061, 7075)	~13% Si	650 (330 - 2600)	0.0027 (0.0015 - 0.0045)	0.0035 (0.0015 - 0.0045)	0.0045 (0.0015 - 0.008)	0.0055 (0.0015 - 0.008)	0.008 (0.0024 - 0.012)	0.008 (0.003 - 0.012)	0.008 (0.003 - 0.012)
S	Heat Resistant Alloys (Inconel 718)	-	100 (50 - 160)	0.0015 (0.0008 - 0.0024)	0.0015 (0.0008 - 0.0024)	0.0015 (0.0008 - 0.0024)	0.002 (0.0015 - 0.0032)	0.0027 (0.0024 - 0.004)	0.003 (0.0024 - 0.0045)	0.003 (0.0024 - 0.0045)
	Titanium Alloy (Ti-6Al-4V)	-	200 (100 - 330)	0.002 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.003 (0.0015 - 0.004)	0.004 (0.0024 - 0.008)	0.005 (0.003 - 0.008)	0.005 (0.003 - 0.008)
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HrC	330 (200 - 400)	0.0024 (0.0016 - 0.004)	0.0024 (0.0016 - 0.004)	0.0024 (0.0016 - 0.004)	0.003 (0.0016 - 0.0047)	0.003 (0.0024 - 0.0047)	0.004 (0.0024 - 0.0051)	0.004 (0.0024 - 0.0051)
	Die Cast Steels (A2, S7)	43 - 48 HrC	260 (165 - 330)	0.002 (0.0015 - 0.003)	0.002 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)
	Hardened Steels (D2)	50 - 55 HrC	200 (130 - 260)	0.002 (0.0015 - 0.003)	0.002 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)

Cutting Conditions (5D)

Work Material		Tensile Strength – Hardness	Drilling Speed Vc (SFM)	Feed Rate, f (in/rev) Drilling Depth 5D						
				Ø0.591-0.650 (15-16.5mm)	Ø0.669-0.728 (17-18.5mm)	Ø0.748-0.807 (19-20.5mm)	Ø0.827-0.965 (21-24.5mm)	Ø0.984-1.122 (25-28.5mm)	Ø1.142-1.319 (29-33.5mm)	Ø1.339-2.500 (34-63mm)
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	650 (500 - 800)	0.0024 (0.0015 - 0.0035)	0.003 (0.0015 - 0.0045)	0.003 (0.0015 - 0.0055)	0.0045 (0.0015 - 0.006)	0.006 (0.0024 - 0.008)	0.007 (0.003 - 0.008)	0.007 (0.003 - 0.010)
	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	500 (330 - 720)	0.0024 (0.0015 - 0.0035)	0.003 (0.0015 - 0.0045)	0.003 (0.0015 - 0.0055)	0.0045 (0.0015 - 0.006)	0.006 (0.0024 - 0.008)	0.007 (0.003 - 0.008)	0.007 (0.003 - 0.010)
	Die Steels (H13, D2)	~280 HB	330 (260 - 500)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0027 (0.0015 - 0.004)	0.004 (0.0015 - 0.0052)	0.0045 (0.0024 - 0.006)	0.006 (0.003 - 0.007)	0.0063 (0.003 - 0.0087)
M	Stainless Steels (304, 420)	~250 HB	430 (260 - 600)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0027 (0.0015 - 0.0035)	0.003 (0.0015 - 0.004)	0.004 (0.0024 - 0.006)	0.0045 (0.003 - 0.007)	0.0045 (0.003 - 0.008)
K	Cast Iron (No. 35 B)	~350 N/mm²	650 (500 - 920)	0.0024 (0.0015 - 0.004)	0.003 (0.0015 - 0.0045)	0.003 (0.0015 - 0.005)	0.005 (0.0015 - 0.006)	0.006 (0.0024 - 0.006)	0.007 (0.003 - 0.008)	0.007 (0.003 - 0.010)
	Ductile Cast Iron (60-40-18)	~800 N/mm²	530 (330 - 720)	0.0024 (0.0015 - 0.0035)	0.003 (0.0015 - 0.0045)	0.003 (0.0015 - 0.0045)	0.004 (0.0015 - 0.0052)	0.005 (0.0024 - 0.006)	0.006 (0.003 - 0.007)	0.007 (0.003 - 0.010)
N	Aluminum Alloys (6061, 7075)	~13% Si	650 (330 - 2600)	0.0024 (0.0015 - 0.004)	0.0035 (0.0015 - 0.0045)	0.004 (0.0015 - 0.006)	0.005 (0.0015 - 0.006)	0.006 (0.0024 - 0.010)	0.008 (0.003 - 0.012)	0.006 (0.003 - 0.007)
S	Heat Resistant Alloys (Inconel 718)	-	100 (50 - 160)	0.0015 (0.0008 - 0.0024)	0.0015 (0.0008 - 0.0024)	0.0015 (0.0008 - 0.0024)	0.0015 (0.0008 - 0.0024)	0.0027 (0.0024 - 0.003)	0.0027 (0.0024 - 0.003)	0.0027 (0.0024 - 0.003)
	Titanium Alloy (Ti-6Al-4V)	-	200 (100 - 330)	0.002 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.004)	0.004 (0.0024 - 0.006)	0.004 (0.003 - 0.006)	0.004 (0.003 - 0.006)
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HrC	330 (200 - 400)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.0024 (0.0015 - 0.003)	0.003 (0.0015 - 0.004)	0.003 (0.0024 - 0.0047)	0.004 (0.0024 - 0.0047)	0.004 (0.0024 - 0.0047)
	Die Cast Steels (A2, S7)	43 - 48 HrC	260 (165 - 330)	0.002 (0.0015 - 0.0027)	0.002 (0.0015 - 0.0027)	0.0024 (0.0015 - 0.0027)	0.0024 (0.0015 - 0.003)	0.0027 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)
	Hardened Steels (D2)	50 - 55 HrC	200 (130 - 260)	0.002 (0.0015 - 0.0027)	0.002 (0.0015 - 0.0027)	0.0024 (0.0015 - 0.0027)	0.0024 (0.0015 - 0.003)	0.0027 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)	0.003 (0.0015 - 0.004)

Recommended Materials by Application

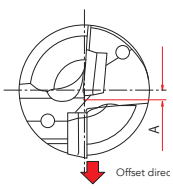
Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
XP9020	DM	Yes	◎	◎	○	○	○	○
XP1010	DR	Yes	○		◎			
CK110	DN	Yes				◎		

DM: Steel & Stainless Steel DR: Cast Iron DN: Non-Ferrous

○ good ◎ best

Maximum Offset for Drilling on Lathe

Drill Diameter (Inch)	Maximum Offset (Inch)	Max Diameter (Inch)
0.5938	0.0157	0.6252
0.6094	0.0118	0.6330
0.6250	0.0078	0.6406
0.6406	0.0078	0.6562
0.6563	0.0078	0.6719
0.6719	0.0196	0.7111
0.6875	0.0157	0.7189
0.7031	0.0157	0.7345
0.7188	0.0157	0.7502
0.7344	0.0118	0.7580
0.7500	0.0196	0.7892
0.7656	0.0157	0.7970
0.7813	0.0157	0.8127
0.7969	0.0118	0.8205
0.8125	0.0118	0.8361
0.8281	0.0393	0.9067
0.8438	0.0354	0.9146
0.8594	0.0314	0.9222
0.8750	0.0275	0.9300
0.8906	0.0236	0.9378
0.9063	0.0196	0.9455
0.9219	0.0157	0.9533
0.9375	0.0118	0.9611
0.9531	0.0078	0.9687
0.9688	0.0039	0.9766
0.9844	0.0393	1.0630
1.0000	0.0354	1.0708
1.0313	0.0275	1.0863
1.0625	0.0196	1.1017
1.0938	0.0118	1.1174
1.1250	0.0039	1.1328
1.1563	0.0472	1.2507
1.1875	0.0393	1.2661
1.2188	0.0314	1.2816
1.2500	0.0236	1.2972
1.2813	0.0157	1.3127
1.3125	0.0078	1.3281
1.3438	0.0393	1.4224
1.3750	0.0315	1.4380
1.4063	0.0236	1.4535
1.4375	0.0275	1.4925
1.4688	0.0196	1.5080
1.5000	0.0118	1.5236
1.5313	0.0039	1.5391
1.5625	0.0315	1.6255
1.5938	0.0275	1.6488
1.6250	0.0275	1.6800
1.6563	0.0236	1.7035
1.6875	0.0157	1.7189
1.7188	0.0118	1.7424
1.7500	0.0078	1.7656
1.7813	0.0314	1.8441
1.8125	0.0275	1.8675
1.8438	0.0196	1.8830
1.8750	0.0196	1.9142
1.9063	0.0157	1.9377
1.9375	0.0078	1.9531
1.9688	0.0433	2.0554
2.0000	0.0354	2.0708
2.1250	0.0157	2.1564
2.2500	0.0433	2.3366
2.3750	0.0275	2.4300
2.5000	0	2.5000



Maximum Offset Amount, A, for Drilling on a lathe.

Drill Diameter (mm)	Maximum Offset (mm)	Max Diameter (mm)
15.0	0.4	15.8
15.5	0.3	16.1
16.0	0.3	16.6
16.5	0.3	17.1
17.0	0.6	18.2
17.5	0.5	18.5
18.0	0.5	19.0
18.5	0.4	19.3
19.0	0.6	20.2
19.5	0.5	20.5
20.0	0.4	20.8
20.5	0.4	21.3
21.0	1.0	23.0
21.5	0.9	23.3
22.0	0.8	23.6
22.5	0.7	23.9
23.0	0.5	24.0
23.5	0.4	24.3
24.0	0.3	24.6
24.5	0.2	24.9
25.0	1.1	27.2
25.5	0.9	27.3
26.0	0.8	27.6
26.5	0.7	27.9
27.0	0.6	28.2
27.5	0.4	28.3
28.0	0.3	28.6
28.5	0.2	28.9
29.0	1.3	31.6
29.5	1.2	31.9
30.0	1.1	32.2
30.5	1.0	32.5
31.0	0.8	32.6
31.5	0.7	32.9
32.0	0.6	33.2
32.5	0.4	33.3
33.0	0.3	33.6
33.5	0.2	33.9
34.0	1.1	36.2
34.5	0.9	36.3
35.0	0.8	36.6
35.5	0.7	36.9
36.0	0.8	37.6
37.0	0.6	38.2
37.5	0.4	38.3
38.0	0.3	38.6
39.0	1.0	41.0
40.0	0.9	41.8
40.5	0.8	42.1
41.0	0.8	42.6
42.0	0.6	43.2
43.0	0.5	44.0
44.0	0.3	44.6
45.0	0.9	46.8
46.0	0.8	47.6
47.0	0.7	48.4
48.0	0.5	49.0
49.0	0.3	49.6
50.0	1.1	52.2
50.5	1.0	52.5
51.0	1.0	53.0
52.0	0.8	53.6
53.0	0.7	54.4
54.0	0.6	55.2
55.0	0.4	55.8
56.0	0.1	56.2
57.0	1.1	59.2
58.0	1.0	60.0
59.0	0.9	60.8
60.0	0.8	61.6
61.0	0.6	62.2
62.0	0.4	62.8
63.0	0.2	63.4

OSG PHOENIX® PHP

High Performance Drill

A high performance 3XD indexable drill. It is capable efficient drilling, even in difficult applications.

List 78001
PHP (Metric)

List 78PHP
PHP Inserts

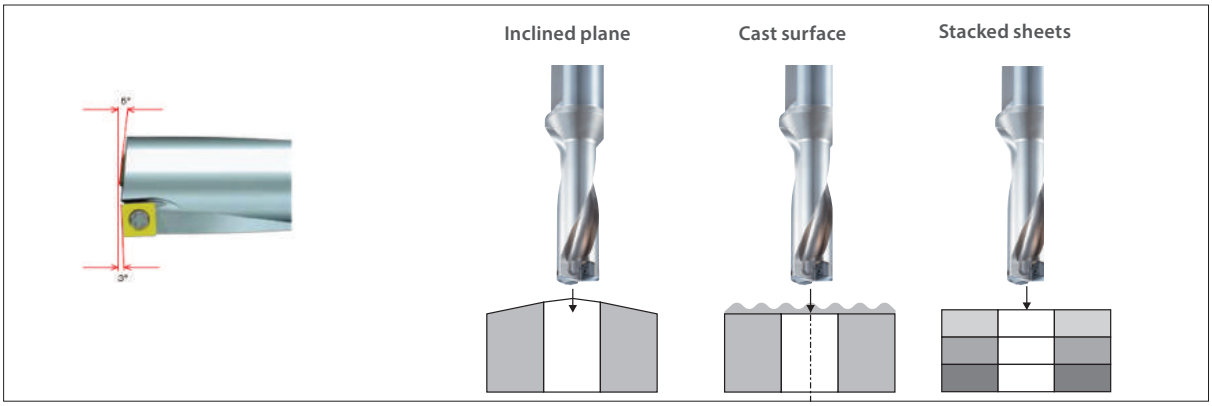
List 7808H
PHP Accessories

Features & Benefits

Simplified Insert Management

The center and peripheral cutting edges use the same insert, simplifying insert management.

» Unique PHP Design Supports a Variety of Drilling Operations

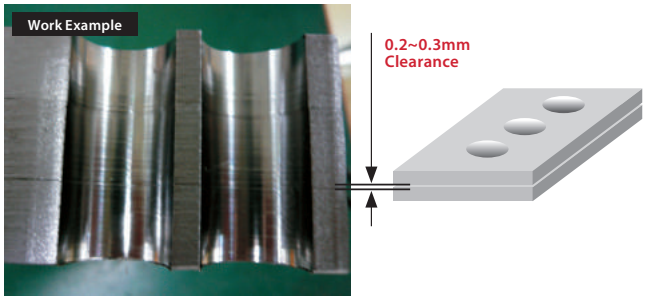


Processing Data

Stacked Plate Drilling - A36 Steel

Stacked drilling consisted of 20mm × 10mm sheets. Tests using competitor indexable drills resulted in the frequent breakage of inserts and bodies. However, the chip of the PHP is shaped with an angle, and thus suppresses the creation of discs. This allows the PHP to drill in a stable manner even with externally fed coolant.

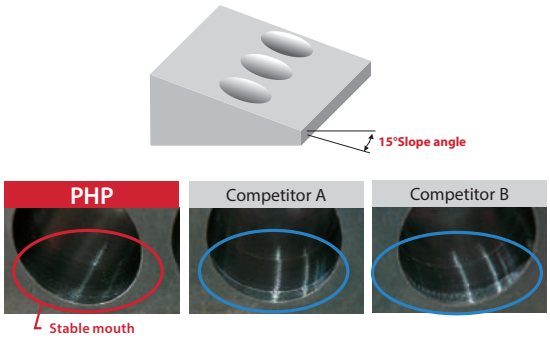
Tool	PHP260FS32M08-3D	Competitor
Insert (Grade)	SCMT083608-DM (XP9040)	HSS Drill
Work Material	A36 Steel	
Cutting Speed	262 SFM (980 RPM)	65 SFM (245 RPM)
Feed	4.65 IPM (0.005 in/rev)	0.98 IPM (0.004 in/rev)
Depth of Hole	1.181 in (0.787 in + 0.394 in, Through)	
Coolant	Water Soluble (External)	
Machine	Vertical Machining Center	



Inclined Surface Drilling - 1050 Steel

When drilling a 15° inclined surface, the competitors' drills wobbled at entry and enlarged the entry point. Because the PHP has the rigidity to withstand intermittent drilling, it inhibits the enlargement of the entry point (Refer to photos below).

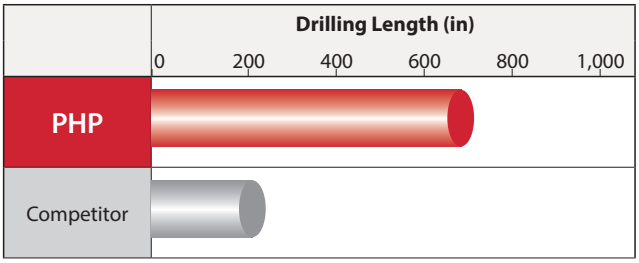
Tool	PHP210FS25M07-3D	Competitors A & B
Insert (Grade)	SCMT073206-DM (XP9040)	Coated Carbide Chip
Work Material	1050 Steel	
Cutting Speed	656 SFM (3033 RPM)	
Feed	14.33 IPM (0.005 in/rev)	
Depth of Hole	1.772 in	
Coolant	Water Soluble	
Machine	Horizontal Machining Center	



Stable Performance & Durability - 304 Stainless Steel

The competitor's tool could not provide stable durability due to chipping. The PHP, however, breaks up chips into small pieces and evacuates them properly, which results in double the durability.

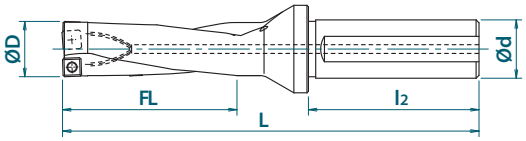
Tool	PHP210FS25M07-3D	Competitor
Insert (Grade)	SCMT073206-DM (XP9040)	Coated Carbide Chip
Work Material	304 Stainless Steel	
Cutting Speed	492 SFM (2275 RPM)	
Feed	10.71 IPM (0.005 in/rev)	
Depth of Hole	1.968 in	
Coolant	Water Soluble	
Machine	Horizontal Machining Center	



List 78001

PHP (Metric)

SPEED FEED P58
Recommended Materials: p58
Accessories & Inserts: p57



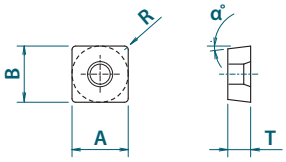
EDP No.	Body Type	Designation	Drill Dia. (mm)	Flute Length (mm)	Overall Length (mm)	Shank Dia. (mm)	Shank Length (mm)	Applicable Insert
			D	FL	L	d	l2	
7800100	Flat Shank	PHP140FS20M04-3D	14.0	42	116	20	50	SCMT04…
7800101		PHP145FS20M04-3D	14.5	45	119	20	50	
7800102		PHP150FS20M04-3D	15.0	45	119	20	50	
7800103		PHP155FS20M04-3D	15.5	48	122	20	50	
7800104		PHP160FS20M04-3D	16.0	48	122	20	50	
7800105		PHP165FS20M05-3D	16.5	51	125	20	50	SCMT05…
7800106		PHP170FS20M05-3D	17.0	51	125	20	50	
7800107		PHP175FS25M05-3D	17.5	54	134	25	56	
7800108		PHP180FS25M05-3D	18.0	54	134	25	56	
7800109		PHP185FS25M06-3D	18.5	57	137	25	56	SCMT06…
7800110		PHP190FS25M06-3D	19.0	57	137	25	56	
7800111		PHP195FS25M06-3D	19.5	60	140	25	56	
7800112		PHP200FS25M06-3D	20.0	60	140	25	56	
7800113		PHP205FS25M06-3D	20.5	63	143	25	56	
7800114		PHP210FS25M06-3D	21.0	63	143	25	56	SCMT07…
7800115		PHP215FS25M07-3D	21.5	66	146	25	56	
7800116		PHP220FS25M07-3D	22.0	66	146	25	56	
7800117		PHP225FS25M07-3D	22.5	69	149	25	56	
7800118		PHP230FS25M07-3D	23.0	69	149	25	56	
7800119		PHP235FS32M07-3D	23.5	72	156	32	60	
7800120		PHP240FS32M07-3D	24.0	72	156	32	60	
7800121		PHP245FS32M08-3D	24.5	75	159	32	60	SCMT08…
7800122		PHP250FS32M08-3D	25.0	75	159	32	60	
7800123		PHP255FS32M08-3D	25.5	78	162	32	60	
7800124		PHP260FS32M08-3D	26.0	78	162	32	60	
7800125		PHP265FS32M08-3D	26.5	81	165	32	60	
7800126		PHP270FS32M08-3D	27.0	81	165	32	60	
7800127		PHP280FS32M08-3D	28.0	84	168	32	60	
7800128		PHP290FS32M10-3D	29.0	87	171	32	60	SCMT10…
7800130		PHP300FS32M10-3D	30.0	90	179	32	60	
7800131		PHP310FS32M10-3D	31.0	93	182	32	60	
7800132		PHP320FS32M10-3D	32.0	96	185	32	60	
7800133		PHP330FS40M10-3D	33.0	99	196	40	68	
7800134		PHP340FS40M12-3D	34.0	102	199	40	68	SCMT12…
7800135		PHP350FS40M12-3D	35.0	105	202	40	68	
7800136		PHP360FS40M12-3D	36.0	108	205	40	68	
7800137		PHP370FS40M12-3D	37.0	111	218	40	68	
7800138		PHP380FS40M12-3D	38.0	114	221	40	68	
7800139		PHP390FS40M12-3D	39.0	117	224	40	68	
7800140		PHP400FS40M12-3D	40.0	120	227	40	68	

Packed: 1 pc.
Note: **This item is stocked overseas. Please contact OSG for availability and delivery.**

PXT

List 78PHP

PHP Inserts



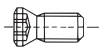
Designation	No. of Cutting Edges	Insert Size				EDP Number	
		A x B (mm)	T (mm)	α	R (mm)	XP9040	XC9025
SCMT042204-DM	4	4.8 x 4.8	2.2	7°	0.4	7818001	7817001
SCMT052404-DM		5.4 x 5.4	2.4			7818002	7817002
SCMT062806-DM		6.2 x 6.2	2.8		0.6	7818003	7817003
SCMT073206-DM		7.2 x 7.2	3.2			7818004	7817004
SCMT083608-DM		8.6 x 8.6	3.6		0.8	7818005	7817005
SCMT104208-DM		10.0 x 10.0	4.2			7818006	7817006
SCMT125008-DM		12.3 x 12.3	5.0			7818007	7817007

Packed: 10 pcs.
This item is stocked overseas. Please contact OSG for availability and delivery.

PXI

List 7808H

PHP Accessories

Appearance	EDP No.	Designation	Applicable Insert	Recommended Tightening Torque
 Clamping Screw	7808100	FS18538 (Torx 6)	SCMT04…	0.7 Nm
	7808102	FS20540 (Torx 6)	SCMT05…	0.7 Nm
	7808104	FS22550 (Torx 7)	SCMT06…	1.0 Nm
	7808108	FS25560 (Torx 8)	SCMT07…	1.6 Nm
	7808110	FS30573 (Torx 8)	SCMT08…	1.6 Nm
	7808111	FS35572 (Torx 15)	SCMT10…	3.2 Nm
	7808113	FS45510 (Torx 20)	SCMT12…	5.0 Nm
 Wrench	7808203	T6-D (Torx 6)	SCMT04…	
			SCMT05…	
	7808204	T7-D (Torx 7)	SCMT06…	
	7808205	T8-D (Torx 8)	SCMT07…	
			SCMT08…	
	7808208	T15-D (Torx 15)	SCMT10…	
	7808209	T20-D (Torx 20)	SCMT12…	

Packed: Clamping Screws = 10 pcs.; Wrench = 1 pc.
Note: Wrench sold separately.
This item is stocked overseas. Please contact OSG for availability and delivery.

PXT

Cutting Conditions

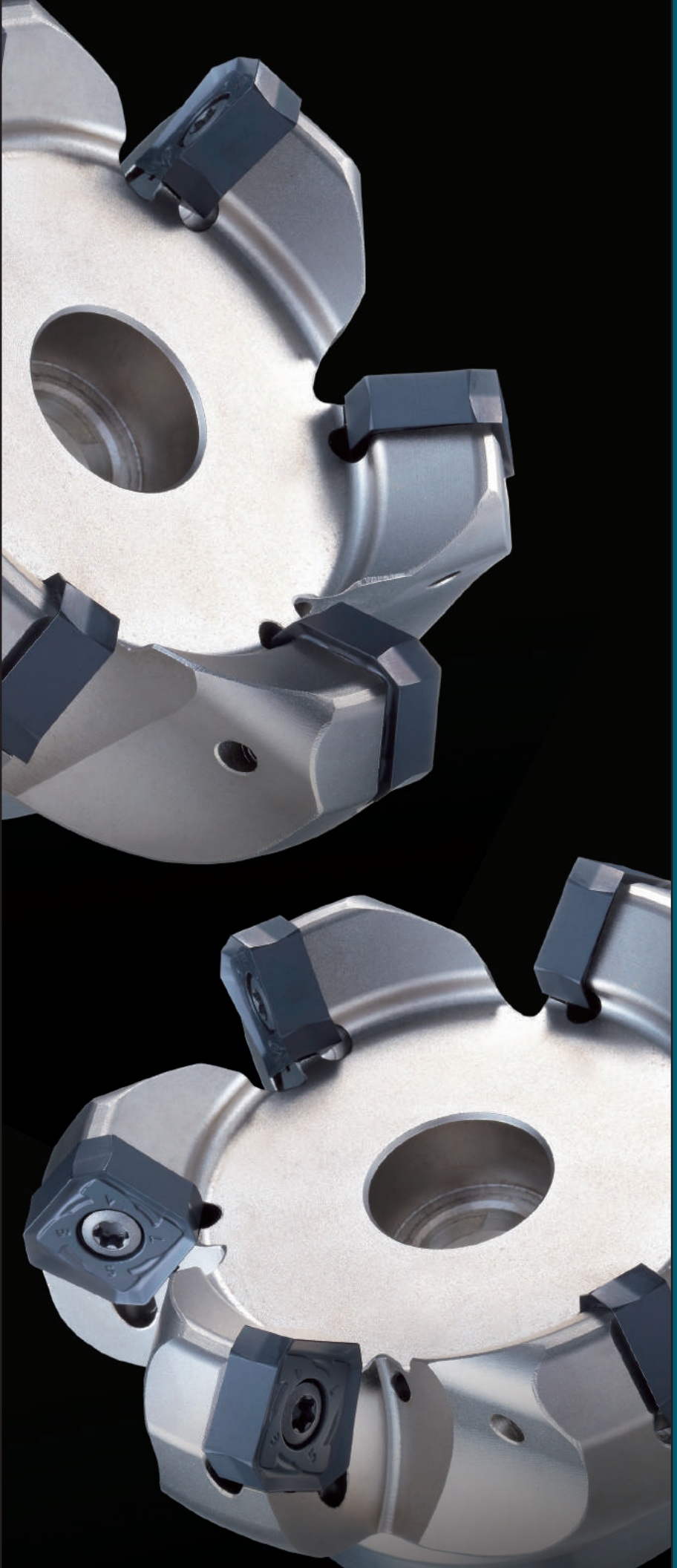
Work Material		Tensile Strength – Hardness	Drilling Speed Vc (SFM)	Feed Rate f (in/rev)			
				Ø14-20.5mm	Ø21-28mm	Ø29-34mm	Ø35-40mm
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	655 (495 - 820)	0.004 (0.002 - 0.005)	0.005 (0.004 - 0.007)	0.007 (0.005 - 0.008)	0.010 (0.008 - 0.011)
	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	525 (330 - 720)	0.004 (0.002 - 0.005)	0.005 (0.004 - 0.007)	0.007 (0.005 - 0.008)	0.010 (0.008 - 0.011)
	Die Steels (H13, D2)	~280 HB	460 (265 - 590)	0.003 (0.002 - 0.005)	0.005 (0.002 - 0.006)	0.006 (0.004 - 0.007)	0.006 (0.004 - 0.008)
M	Stainless Steels (304, 420)	~250 HB	495 (330 - 590)	0.003 (0.002 - 0.005)	0.004 (0.002 - 0.005)	0.006 (0.004 - 0.007)	0.007 (0.006 - 0.008)
K	Cast Iron (No. 35 B)	~350 N/mm²	495 (330 - 590)	0.004 (0.002 - 0.005)	0.005 (0.004 - 0.007)	0.007 (0.005 - 0.008)	0.010 (0.008 - 0.011)
	Ductile Cast Iron (60-40-18)	~800 N/mm²	425 (265 - 495)	0.004 (0.002 - 0.005)	0.005 (0.003 - 0.006)	0.006 (0.004 - 0.008)	0.008 (0.006 - 0.010)
N	Aluminum Alloys (6061, 7075)	~13% Si	720 (330 - 2625)	0.004 (0.002 - 0.008)	0.005 (0.004 - 0.010)	0.007 (0.005 - 0.012)	0.010 (0.008 - 0.014)
S	Heat Resistant Alloys (Inconel 718)	-	100 (50 - 165)	0.002 (0.001 - 0.003)	0.002 (0.001 - 0.004)	0.003 (0.002 - 0.005)	0.004 (0.002 - 0.006)
	Titanium Alloy (Ti-6Al-4V)	-	195 (100 - 330)	0.002 (0.002 - 0.003)	0.003 (0.002 - 0.005)	0.004 (0.003 - 0.006)	0.005 (0.004 - 0.006)

Recommended Materials by Application

Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
XP9040	DM	Yes	◎	◎		◎	○	
XC9025	DM	Yes	○	○	◎	○		

DM: Center Cutting Drill

○ good ◎ best



OSG PHOENIX® PAS

45° Face Milling Cutter

A series of 45° indexable facemills. Utilizing a 2-sided square insert, stable and economical rough and finish machining is possible in a wide range of materials.

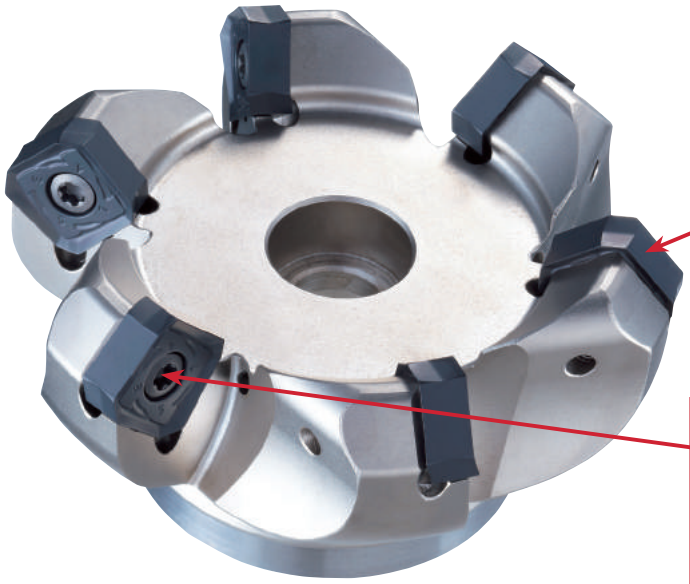
List 52700
PAS Bore (Inch)

List 78020
PAS Bore (Metric)

List 78PAS
PAS Inserts

List 7808H
PAS Accessories

Features & Benefits

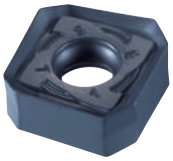


Robust 2-sided square insert has 4 cutting edges per side (8 corners total) and is capable of 0.256" maximum axial depth of cut.

Applicable in a wide range of machining processes from rough milling to finishing.

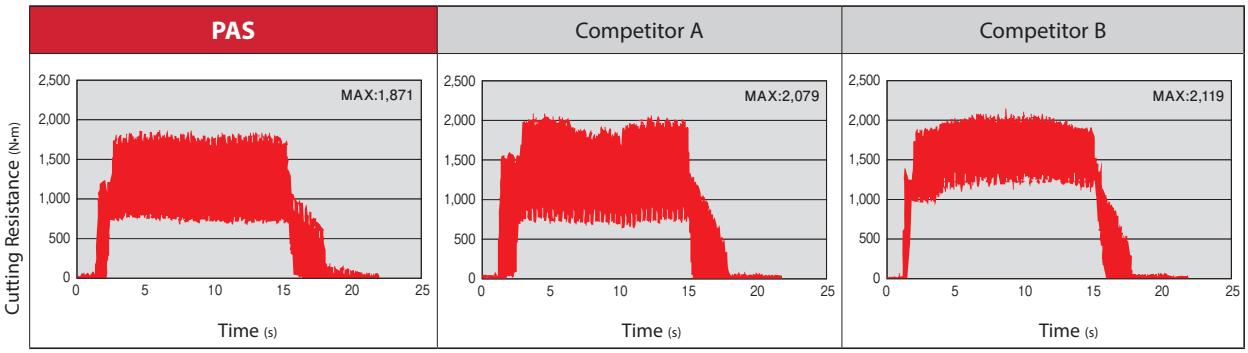
Positive Breaker Greatly Reduces Cutting Resistance

The combination of a positive breaker and the negative rake angle greatly reduces cutting resistance and improves rigidity.



» Low Resistance Machining - Ductile Cast Iron

Tool	PAS15R080M25.4-6
Insert (Grade)	SNKU1505AZER-GR (XC1015)
Work Material	Ductile Cast Iron
Cutting Speed	590 SFM (716 RPM)
Feed	33.86 IPM (0.008 ipt)
Depth of Cut	Aa = 0.118 in, Ar = 1.968 in
Coolant	Air
Machine	Vertical Machining Center

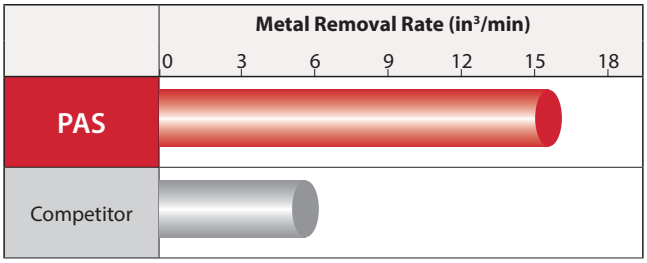


Processing Data

» Die Mold Surface, Rough Milling - Ductile Cast Iron

In the past, due to the limited depth of cut, competitor's high feed cutters would often leave a large amount of work material uncut, creating a need for aircut. This challenge has been overcome with the introduction of the PAS. The PAS is capable of milling difficult-to-reach areas, thus eliminating 2.5 times more work material than competitor's high feed cutters and decreasing machining time by 60%.

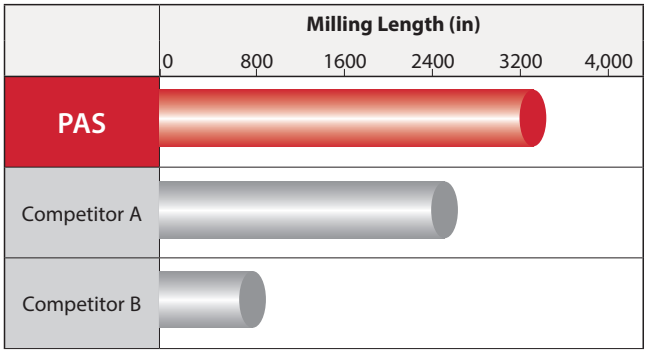
Tool	PAS15R100M31.7-7	Competitor
Insert (Grade)	SNKU1505AZER-GR (XC1015)	Coated Carbide Chip
Work Material	Ductile Cast Iron	
Cutting Speed	656 SFM (637 RPM)	393 SFM (600 RPM)
Feed	59.05 IPM (0.014 ipt)	106.30 IPM (0.035 ipt)
Depth of Cut	0.118 in	0.039 in
Width of Cut	2.362 in MAX	1.575 in MAX
Coolant	Air	
Machine	Gantry Machining Center	



» Rough Milling of Parts - 1050 Steel

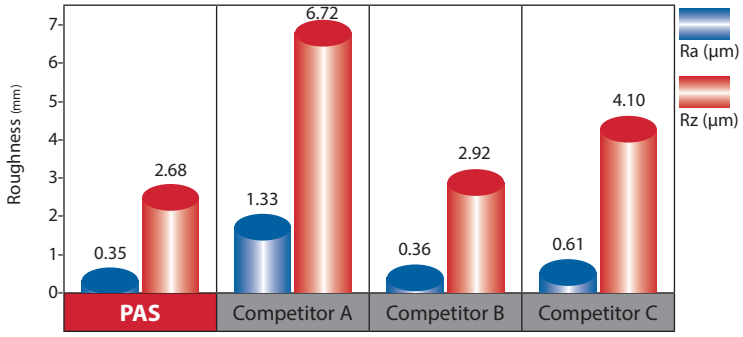
Competitors' products and the PAS were compared in the rough milling stage under identical conditions. The competitors' tools had large chipping and wore out at early stages. The PAS, in contrast, showed normal cutting wear and attained more than 1.4 times the durability.

Tool	PAS15R080M25.4-6	Competitor A & B
Insert (Grade)	SNKU1505AZER-GR (XP3035)	Coated Carbide Chip
Work Material	1050 Steel	
Cutting Speed	656 SFM (796 RPM)	
Feed	37.60 IPM (0.008 ipt)	
Depth of Cut	Aa = 0.079 in, Ar = 1.968 in	
Coolant	Air	
Machine	Vertical Machining Center	



» High Precision Surface Finishing - Ductile Cast Iron

Tool	PAS15R080M25.4-6
Insert (Grade)	SNKU1505AZER-GR (XC1015)
Work Material	Ductile Cast Iron
Cutting Speed	820 SFM (995 RPM)
Feed	11.69 IPM (0.004 ipt)
Depth of Cut	Aa = 0.008 in, Ar = 1.968 in
Coolant	Air
Machine	Vertical Machining Center



List 52700

SPEED FEED P64

Recommended Materials: p64
Accessories & Inserts: p63

PAS Bore (Inch)

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch)	Effective Dia. (inch)	No. of Teeth	Tool Height (inch)	Flange Dia. (inch)	Bore Dia. (inch)	Keyway Width (inch)	Keyway Depth (inch)	Applicable Insert
					D	D1		H	D2	d3	a	b	
52700000	Bore	Normal	PAS15R200A075-4	1	2.590	2.000	4	1.772	1.772	0.750	0.315	0.197	SNKU15…
52700001			PAS15R250A075-5	1	3.090	2.500	5	1.772	1.968	0.750	0.315	0.197	
52700002			PAS15R300A100-6	1	3.590	3.000	6	1.968	2.362	1.000	0.375	0.236	
52700003			PAS15R400A125-7	2	4.590	4.000	7	1.968	2.756	1.250	0.500	0.315	
52700004			PAS15R500A150-8	2	5.590	5.000	8	2.480	3.543	1.500	0.625	0.394	
52700005			PAS15R600A150-9	2	6.590	6.000	9	2.480	3.740	1.500	0.625	0.394	

Packed: 1 pc.

PXT

List 78020

SPEED FEED P64

Recommended Materials: p64
Accessories & Inserts: p63

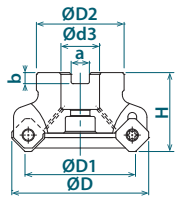
PAS Bore (Metric)

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm)	Effective Dia. (mm)	No. of Teeth	Tool Height (mm)	Flange Dia. (mm)	Bore Dia. (mm)	Keyway Width (mm)	Keyway Depth (mm)	Applicable Insert
					D	D1		H	D2	d3	a	b	
7802000	Bore	Normal	PAS15R050M22-4	1	65	50	4	45	45	22	10.4	6.3	SNKU15…
7802001			PAS15R063M22-5	1	78	63	5	45	50	22	10.4	6.3	
7802002			PAS15R080M25.4-6	1	95	80	6	50	60	25.4	9.5	6	
7802003			PAS15R100M31.7-7	2	115	100	7	50	70	31.75	12.7	8	
7802004			PAS15R125M38.1-8	2	140	125	8	63	90	38.1	15.9	10	

Packed: 1 pc.
Note: **This item is stocked overseas. Please contact OSG for availability and delivery.**

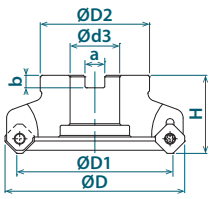
PXT

Type 1



With coolant hole.

Type 2

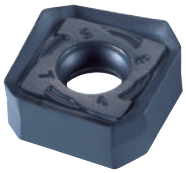


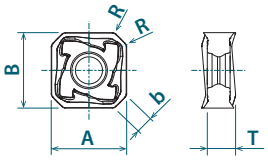
Without coolant hole.

List 78PAS

NEW SIZES

PAS Inserts





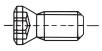
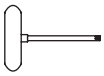
Designation	No. of Cutting Edges	Insert Size				EDP Number				
		AxB (mm)	T (mm)	R (mm)	b (mm)	XP3035	XC3025	XP2040	XC1015	XC5040
SNKU1505AZER-GM	8	15.88 x 15.88	7.18	1.0	3.65	7814061	7819061	7813061	-	-
SNKU1505AZER-GR						-	-	-	7812060	-
SNKU1505AZER-SM						-	-	-	-	52700006

Packed: 10 pcs.

PXI

List 7808H

PAS Accessories

Appearance	EDP No.	Designation	Applicable Cutter		Recommended Tightening Torque
			(mm)	(inch)	
 Clamping Screw	7808131	FS45513P (Torx 20IP)	PAS BORE Ø50-125	PAS BORE Ø2-6"	5.0 Nm
 Wrench	7808000	20IP-T (Torx 20IP)	PAS BORE Ø50-125	PAS BORE Ø2-6"	

Packed: Clamping Screws = 10 pcs.; Wrench = 1 pc.
Note: Wrench sold separately.

PXT

Cutting Conditions

Work Material		Tensile Strength – Hardness	Insert Size SNKU15… Face Milling		
			Milling Speed Vc (SFM)	Feed Per Tooth fz(in/t)	Depth of Cut Aa (in)
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	590 (330 - 820)	0.007 (0.006 - 0.014)	0.120
P	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	590 (330 - 820)	0.007 (0.006 - 0.014)	0.120
P	Die Steels (H13, D2)	~280 HB	495 (260 - 655)	0.006 (0.004 - 0.012)	0.120
M	Stainless Steels (304, 420)	~250 HB	395 (260 - 590)	0.005 (0.003 - 0.010)	0.120
K	Cast Iron (No. 35 B)	~300 N/mm²	590 (330 - 1150)	0.008 (0.006 - 0.014)	0.160
K	Ductile Cast Iron (60-40-18)	~600 N/mm²	590 (330 - 885)	0.008 (0.004 - 0.012)	0.120
S	Heat Resistant Alloys (Inconel 718)	-	115 (85 - 200)	0.004 (0.002 - 0.006)	0.040
S	Titanium Alloy (Ti-6Al-4V)	-	130 (100 - 400)	0.005 (0.003 - 0.008)	0.060
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HRC	330 (195 - 495)	0.005 (0.003 - 0.008)	0.060
H	Die Cast Steels (A2, S7)	43 - 48 HRC	260 (130 - 395)	0.004 (0.002 - 0.006)	0.020
H	Hardened Steels (D2)	50 - 55 HRC	195 (130 - 295)	0.003 (0.002 - 0.006)	0.020

Recommended Materials by Application

Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
XP3035	GM	–	◎	○	○			
XC3025	GM	–	◎		○			
XP2040	GM	–	○	○				○
		Yes	○	◎			○	
XC1015	GR	–			◎			
XC5040	SM	Yes		○			◎	

GM: Medium Cutting GR: Rough Cutting SM: Heat Resistant Alloy

○ good ◎ best

OSG PHOENIX® PAO

45° Face Milling Cutter

A series of 45° indexable facemills. Utilizing a 2-sided octagon insert, stable and economical rough and finish machining is possible in a wide range of materials.

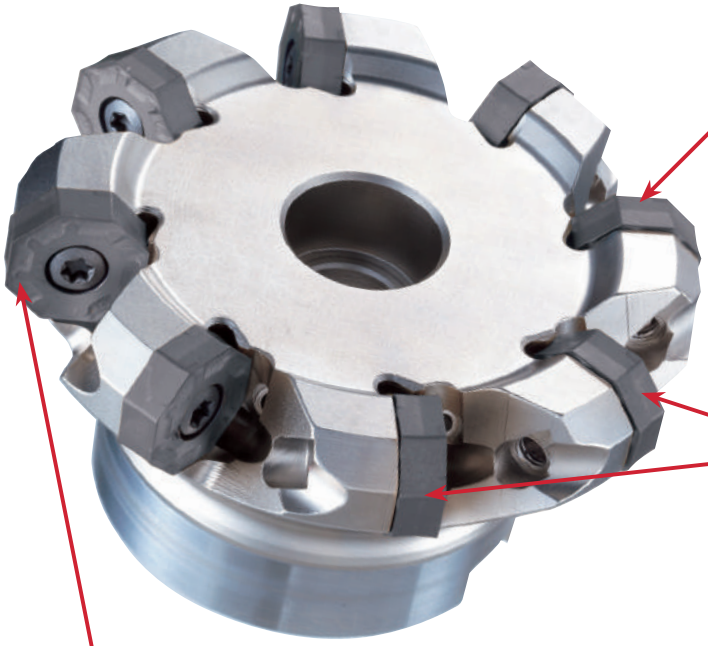
List 52800
PAO Bore (Inch)

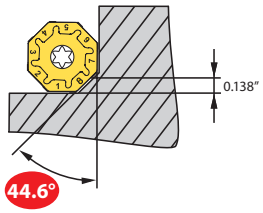
List 78120
PAO Bore (Metric)

List 78PAO
PAO Inserts

List 7808H
PAO Accessories

Features & Benefits

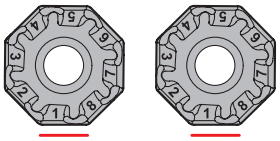




An economical 8 corners per side (16 corners in total) specifications with 0.138" maximum depth of cut.

Easy Insert Setup

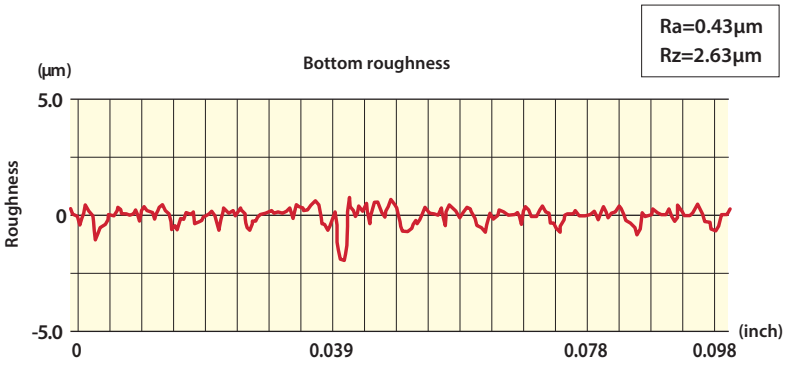
The slot of each insert is individually numbered. By matching the correct insert during setup, confusion can be minimized.



The new cutting edge geometry of the wiper edge further improves surface roughness. Wiper edge length is 2 mm.

» High Precision Surface Finishing with Wiper Insert - FCD500

Tool	PAO06R160M50.8W-20
Insert (Grade)	OZKU060508SR-GM (XC1015) XAHT060525SR-GM (XP3035) Wiper
Work Material	FCD500
Cutting Speed	820 SFM (500 RPM)
Feed	59.05 IPM (0.006 ipt)
Depth of Cut	Aa = 0.008 in, Ar = 4.724 in
Coolant	Air
Machine	Vertical Machining Center



Processing Data

» Rough Milling of Hydraulic Parts - FCD600

The workpiece, which had multiple holes, required interrupted machining. However, the PAO enabled stable machining under the high speed condition and better durability per cutting edge, which will contribute to cost reduction.

Tool	PAO06R160M50.8W-20	Competitor
Insert (Grade)	OZKU060508SR-GM (XC1015)	Coated Carbide Chip
Work Material	FCD600	
Cutting Speed	820 SFM (500 RPM)	
Feed	118.11 IPM (0.012 ipt)	
Depth of Cut	Aa = 0.118 in, Ar = 4.724 in	
Coolant	Air	
Machine	Vertical Machining Center	

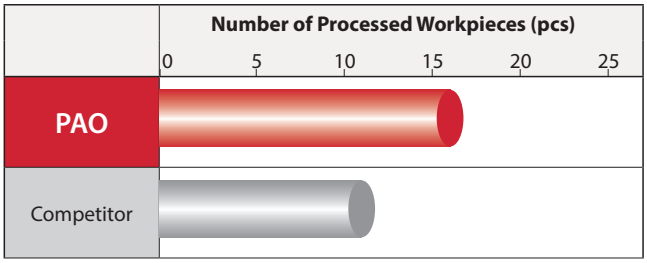
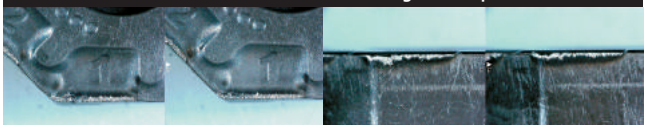


Photo of PHOENIX® PAO after milling 16 workpieces



» Long Tool Life in Heat Resistant Super Alloys - Inconel 718

PAO demonstrated excellent wear resistance and achieved four times the durability versus the competitor.

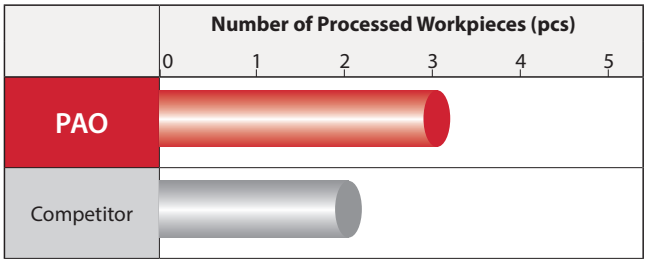
Tool	PAO06R125M38.1-12	Competitor
Insert (Grade)	OZKU060508SR-GM (XC5040)	Coated Carbide Chip
Work Material	Inconel 718	
Cutting Speed	131 SFM (100 RPM)	
Feed	4.72 IPM (0.004 ipt)	
Depth of Cut	Aa = 0.059 in, Ar = 1.968 in	
Coolant	Water Soluble	
Machine	Vertical Machining Center	

After 2 meters of milling

» Rough Milling of Cast Iron - FC250

By reducing cutting resistance, efficiency can be increased by 1.8 times and tool life can be prolonged 1.5 times.

Tool	PAO06R125M38.1-12	Competitor
Insert (Grade)	OZKU060508SR-GM (XC1015)	Coated Carbide Chip
Work Material	FC250	
Cutting Speed	656 SFM (500 RPM)	515 SFM (400 RPM)
Feed	70.87 IPM (0.012 ipt)	39.37 IPM (0.012 ipt)
Depth of Cut	Aa = 0.079 in, Ar = 3.543 in	
Coolant	Air	
Machine	Gantry Machining Center	



List 52800

PAO Bore (Inch)

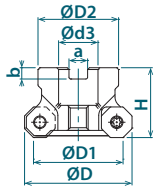
SPEED FEED P72
Recommended Materials: p72
Accessories & Inserts: p70-71

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch)	Effective Dia. (inch)	No. of Teeth	Tool Height (inch)	Flange Dia. (inch)	Bore Dia. (inch)	Keyway Width (inch)	Keyway Depth (inch)	Applicable Insert
					D	D1		H	D2	d3	a	b	
52800000	Bore	Normal	PAO06R200A075-5	1	2.401	2.000	5	1.575	1.772	0.750	0.315	0.197	OZKU06... / XAHT06…
52800001			PAO06R250A075-7	2	2.901	2.500	7	1.575	1.968	0.750	0.315	0.197	
52800002			PAO06R300A100-8	2	3.401	3.000	8	1.968	2.362	1.000	0.375	0.236	
52800003			PAO06R400A125-10	3	4.401	4.000	10	1.968	2.756	1.250	0.500	0.315	
52800004			PAO06R500A150-12	3	5.401	5.000	12	2.480	3.543	1.500	0.625	0.394	
52800005			PAO06R600A150-13	3	6.401	6.000	13	2.480	3.740	1.500	0.625	0.394	
52800006		Close	PAO06R400A125W-14	4	4.401	4.000	14	1.968	2.756	1.250	0.500	0.315	
52800007			PAO06R500A150W-17	4	5.401	5.000	17	2.480	3.543	1.500	0.625	0.394	
52800008			PAO06R600A150W-20	4	6.401	6.000	20	2.480	3.740	1.500	0.625	0.394	
52800009			PAO06R800A250W-25	5	8.401	8.000	25	2.480	5.118	2.500	1.000	0.551	

Packed: 1 pc.

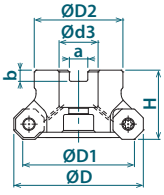
PXT

Type 1



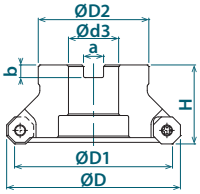
With coolant hole.

Type 2



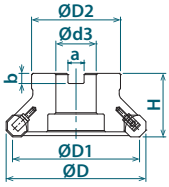
With coolant hole.

Type 3



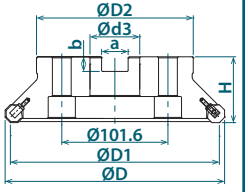
Without coolant hole.

Type 4



Without coolant hole.

Type 5



Without coolant hole.

List 78120

PAO Bore (Metric)

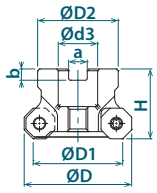
SPEED FEED P72
Recommended Materials: p72
Accessories & Inserts: p70-71

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	Effective Dia. (mm) D1	No. of Teeth	Tool Height (mm) H	Flange Dia. (mm) D2	Bore Dia. (mm) d3	Keyway Width (mm) a	Keyway Depth (mm) b	Applicable Insert
7802020	Bore	Normal	PAO06R050M22-5	1	60.2	50	5	40	45	22.000	10.4	6.3	OZKU06... / XAHT06…
7802021			PAO06R063M22-7	2	73.2	63	7	40	50	22.000	10.4	6.3	
7802022			PAO06R080M25.4-8	2	90.2	80	8	50	60	25.400	9.5	6.0	
7802023			PAO06R100M31.7-10	3	110.2	100	10	50	70	31.750	12.7	8.0	
7802024			PAO06R125M38.1-12	3	135.2	125	12	63	90	38.100	15.9	10.0	
7802089			PAO06R100M31.7W-14	4	110.2	100	14	50	70	31.750	12.7	8.0	
7802091		Close	PAO06R125M38.1W-17	4	135.2	125	17	63	90	38.100	15.9	10.0	
7802093			PAO06R160M50.8W-20	4	170.2	160	20	63	100	50.800	19.0	11.0	
7802095			PAO06R200M47.6W-25	5	210.2	200	25	63	150	47.625	25.4	14.0	

Packed: 1 pc.
Note: **This item is stocked overseas. Please contact OSG for availability and delivery.**

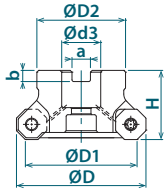
PXT

Type 1



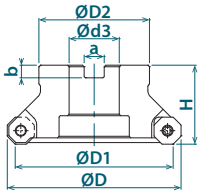
With coolant hole.

Type 2



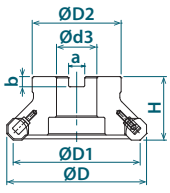
With coolant hole.

Type 3



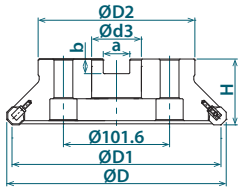
Without coolant hole.

Type 4



Without coolant hole.

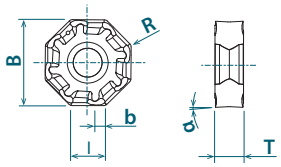
Type 5

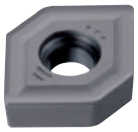


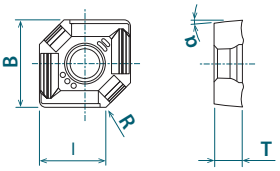
Without coolant hole.

List 78PAO

PAO Inserts





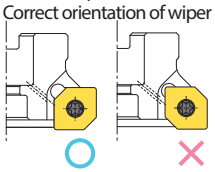


Designation	No. of Cutting Edges	Insert Size						EDP Number						
		B (mm)	T (mm)	l (mm)	α	R (mm)	b (mm)	XP3035	XC3030	XP2040	XP2025	XC1015	XP1020	XC5040
OZKU060508SR-GM	16	17.1	5.66	6	3°	0.8	2	7814062	7825062	7813062	7826062	7812062	7821062	-
OZKU060508SR-GR								-	-	-	-	7812086	-	-
OZKU060508ER-SM								-	-	-	-	-	-	7816085
XAHT060525SR-GM	2			10		2.5	-	7814064	-	-	-	7812064	-	-

Packed: 10 pcs.

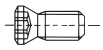
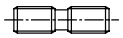
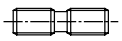
PXI

Correct orientation of wiper insert:



List 7808H

PAO Accessories

Appearance	EDP No.	Designation	Applicable Cutter		Recommended Tightening Torque
			(mm)	(inch)	
 Clamping Screw	7808130	FS50614 (Torx 20)	PAO BORE Ø50-125	PAO BORE Ø2-6"	5.0 Nm
 Power Screw	7808151	PS1031 (M10x31)	PAO BORE Ø50	PAO BORE Ø2"	20.0 Nm
 Wedge	7808141	W12F-06N (M6)	PAO BORE(W) Ø100-200	PAO BORE(W) Ø4-8"	
 Wedge Clamping Screw	7808140	WS0621T (M6x21)	PAO BORE(W) Ø100-200	PAO BORE(W) Ø4-8"	4.0 Nm
 Wrench	7808208	T15-D (Torx 15)	PAO BORE(W) Ø100-200	PAO BORE(W) Ø4-8"	
	7808209	T20-D (Torx 20)	PAO BORE Ø50-125	PAO BORE Ø2-6"	

Packed: Clamping Screws = 10 pcs.; Power Screw = 1 pc.; Wedge = 10 pcs.; Wedge Clamping Screw = 10 pcs.; Wrench = 1 pc.
Note: Wrench sold separately.

PXT

Cutting Conditions

Work Material		Tensile Strength – Hardness	Insert Size OZKU06… / XAHT06… Face Milling		
			Milling Speed Vc (SFM)	Feed Per Tooth fz (in/t)	Depth of Cut Aa (in)
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	590 (330 - 820)	0.010 (0.008 - 0.020)	0.080
P	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	590 (330 - 820)	0.010 (0.008 - 0.020)	0.080
P	Die Steels (H13, D2)	~280 HB	495 (260 - 655)	0.010 (0.006 - 0.016)	0.080
M	Stainless Steels (304, 420)	~250 HB	395 (260 - 590)	0.008 (0.006 - 0.016)	0.080
K	Cast Iron (No. 35 B)	~300 N/mm²	655 (330 - 1150)	0.012 (0.008 - 0.020)	0.080
K	Ductile Cast Iron (60-40-18)	~600 N/mm²	590 (330 - 885)	0.011 (0.006 - 0.016)	0.080
S	Heat Resistant Alloys (718 Inconel)	-	115 (85 - 200)	0.005 (0.002 - 0.008)	0.040
S	Titanium Alloy (Ti-6Al-4V)	-	130 (100 - 400)	0.006 (0.004 - 0.010)	0.060
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HRC	330 (195 - 495)	0.006 (0.004 - 0.010)	0.060
H	Die Cast Steels (A2, S7)	43 - 48 HRC	260 (130 - 395)	0.005 (0.002 - 0.008)	0.020
H	Hardened Steels (D2)	50 - 55 HRC	195 (130 - 295)	0.004 (0.002 - 0.008)	0.020

Recommended Materials by Application

Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
XP3035	GM	–	◎	○	○			
XC3030	GM	–	◎		○			
XP2040	GM	–	○	○				○
		Yes	○	◎			○	
XP2025	GM	Yes	○	◎			○	
XC1015	GM/GR	–			◎*			
XP1020	GM	–			◎**			
XC5040	SM	Yes		○			◎	

GM: Medium Cutting GR: Rough Cutting SM: Heat Resistant Alloy

○ good ◎ best

*: XC1015 best recommended for grey cast iron.

**: XP1020 best recommended for ductile cast iron.

OSG PHOENIX® PSE

90° Shoulder Cutter

A versatile series of 90° end mills and facemills, ideal for a wide variety of rough and finish milling applications including facing, side milling, slotting, ramping and helical milling.

List 78013
PSE SA/FA (Inch)

List 78011
PSE SS (Metric)

List 78012
PSE Bore (Inch)

List 78010
PSE Bore (Metric)

List 52601
PSE ASF (Inch)

List 78016
PSE SF (Metric)

List 78PSE
PSE/PSEL Inserts

List 7808H
PSE Accessories

Features & Benefits

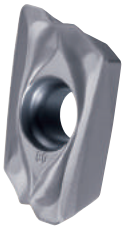
Margin

The margin on the side cutting edge of the PSE insert acts like a wiper and enables superior surface finishes in side milling applications.

Bottom Notch

The notch on the bottom cutting edge of the PSE insert breaks chips into small pieces, which prevents the jamming or wrapping of chips and enables the tool to perform ramping and helical milling efficiently.

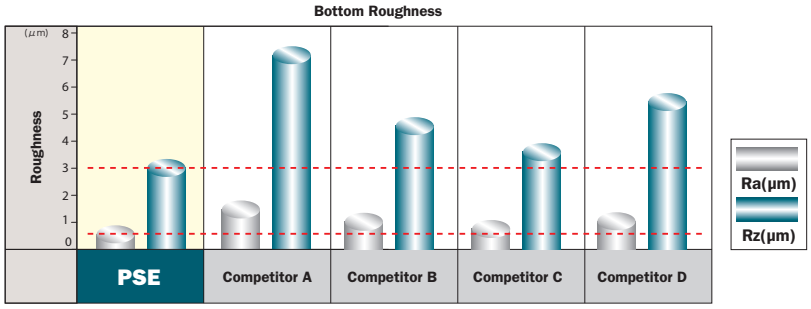
PSE Insert Variety

Grade	CK010	XP3035 XC3030 XP2040 XP2025	XC5035 XC5040	XP3035 XC3030 XP2040 XP2025 XC1015	XP3035 XC3030 XP2040 XC1015	XP6015
Chip Breaker	NM	GL	SM	GM	GR	HR
Rake Angle	30°	25°	15°	15°	7°	3°
Application	Aluminum Alloy & Non-Ferrous Metal Machining	Low-Resistance Machining	Superalloy & Difficult-to-Cut Material Machining	Multi-Purpose Machining	Interrupted Machining & Long Overhang Machining	High-Hardened Material
						

Processing Data

High Precision Insert - Bottom Roughness

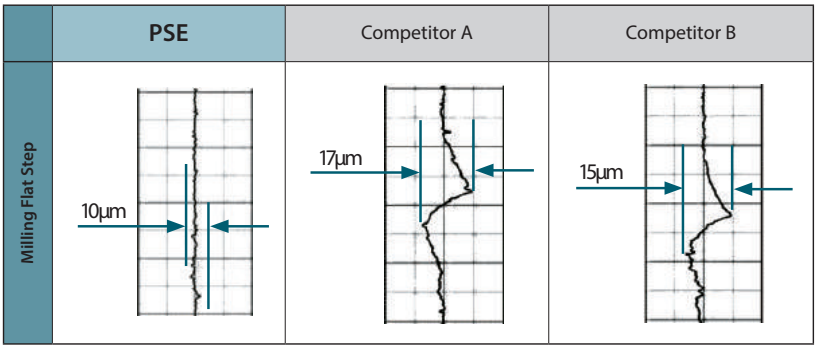
Tool	PSE11R032SS32-5S
Insert (Grade)	ZDKT11T304SR-GM (XP3035)
Work Material	1050 Steel
Cutting Speed	590 SFM (1790 RPM)
Feed	35.25 IPM (0.004 ipt)
Depth of Cut	Aa = 0.004 in, Ar = 1.008 in



The PSE showed an improvement at the bottom flat surface finish Rz 4μm and under.

High Precision Insert - Side Milling Offset

Tool	PSE15R032SS32-3S
Insert (Grade)	ZDKT150508SR-GM (XP3035)
Work Material	1050 Steel
Cutting Speed	590 SFM (1790 RPM)
Feed	35.25 IPM (0.004 ipt)
Depth of Cut	Aa = 0.004 in, Ar = 1.008 in



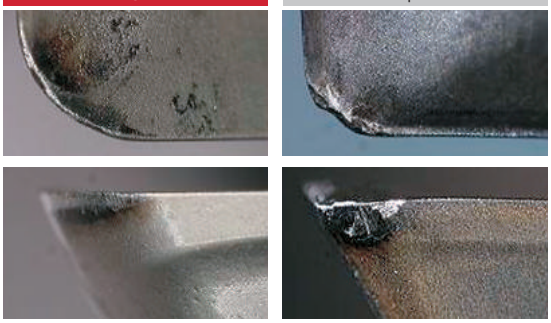
PSE showed an improvement at side step machining as (measured) step was 10μm.

Long Tool Life in Heat Resistant Super Alloys - Inconel 718 (45 HRC)

OSG PHOENIX® PSE was able to mill at conditions that were 50% higher than those for conventional tools. It provided double the durability, wore normally and was able to continue milling.

Tool	PSE11R032SS32-5S	Competitor
Insert (Grade)	ZDKT11T308ER-SM (XC5040)	Coated Carbide Chip
Work Material	Inconel 718 (45 HRC)	
Cutting Speed	98 SFM (298 RPM)	82 SFM (248 RPM)
Feed	4.72 IPM (0.003 ipt)	3.15 IPM (0.003 ipt)
Depth of Cut	Aa = 0.039 in, Ar = 0.787 in	
Coolant	Water Soluble	
Machine	Vertical Machining Center	

Photo of tool after milling 1.5m

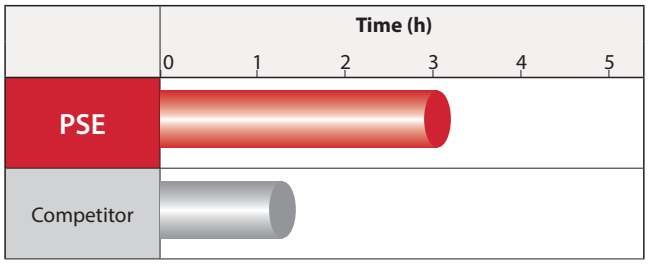


Processing Data

» Long Tool Life in Mold Steel - NAK80 (40HRC)

The competitor tool chipped. The PSE, on the other hand, did not exhibit any chipping, performed stably and provided approximately double the durability under the same conditions.

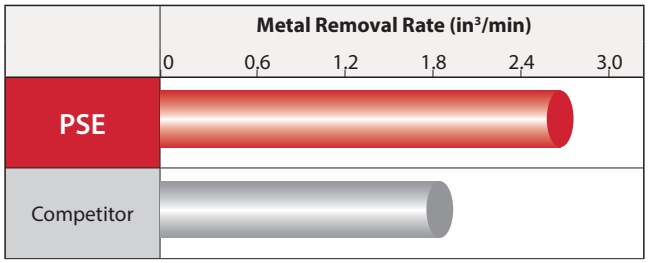
Tool	PSE11R020SS20-3S	Competitor
Insert (Grade)	ZDKT11T308SR-GL (XP2040)	Coated Carbide Chip
Work Material	NAK80 (40 HRC)	
Cutting Speed	426 SFM (2070 RPM)	
Feed	55.12 IPM (0.009 ipt)	
Depth of Cut	Aa = 0.012 in, Ar = 0.394 in	
Coolant	Air	
Machine	Vertical Machining Center	



» Increased Machining Efficiency in Stainless Steel - 304 Stainless Steel

This process consisted of intermittent face milling a surface with multiple holes, and the PSE was able to mill with 1.4 times the efficiency versus the competitor. It also reduced heat generation, reducing the distortion of the workpiece as well as the effects passed on to the subsequent process.

Tool	PSE15R100M31.7-10	Competitor
Insert (Grade)	ZDKT150508SR-GM (XP2040)	Coated Carbide Chip
Work Material	304 Stainless Steel	
Cutting Speed	492 SFM (478 RPM)	
Feed	28.35 IPM (0.006 ipt)	19.68 IPM (0.006 ipt)
Depth of Cut	Aa = 0.039 in, Ar = 2.362 in	
Coolant	Water Soluble	
Machine	Horizontal Machining Center	

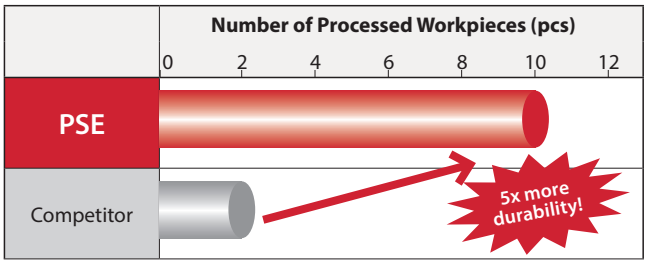


Processing Data

» Excellent Chip Evacuation in Stainless Steel - 630 Stainless Steel

This process consisted of groove milling in stainless steel. The competitor's tool caused the chips to jam, resulting in premature breakage of the tool. The PSE, in contrast, evacuated chips in a stable manner and could mill 10 workpieces, a significant improvement.

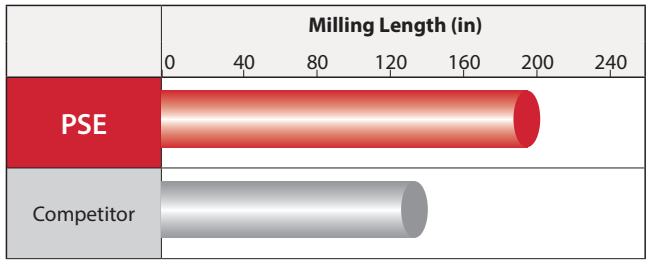
Tool	PSE11R020SS20-3S	Competitor
Insert (Grade)	ZDKT11T308ER-SM (XC5040)	Coated Carbide Chip
Work Material	630 Stainless Steel	
Cutting Speed	524 SFM (2548 RPM)	
Feed	20.08 IPM (0.003 ipt)	
Depth of Cut	Aa = 0.079 in, Ar = 0.787 in	
Coolant	Water Soluble	
Machine	Compound Machine	

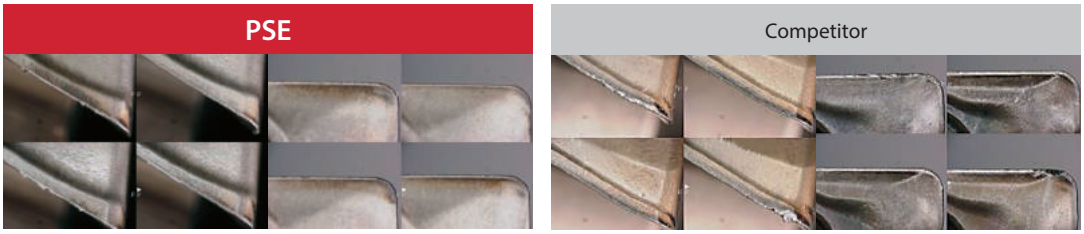


» Wear & Chipping Resistance in Heat Resistant Super Alloys - Titanium-β Alloy

A competitor's product and the PSE were compared in the rough milling of aircraft parts under identical conditions. The competitor's product chipped, but the PSE wore normally and attained 1.5 times the durability.

Tool	PSE11R025SS25-4S	Competitor
Insert (Grade)	ZDKT11T308ER-SM (XC5040)	Coated Carbide Chip
Work Material	Titanium-β Alloy	
Cutting Speed	131 SFM (510 RPM)	
Feed	6.30 IPM (0.003 ipt)	
Depth of Cut	Aa = 0.197 in, Ar = 0.394 in	
Coolant	Water Soluble	
Machine	Horizontal Machining Center	





List 78013

PSE SA/FA (Inch)

SPEED FEED P85

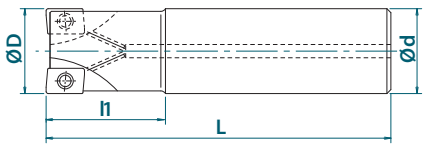
Recommended Materials: p85
Accessories & Inserts: p84
Maximum Ramping Angle: p86

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch) D	No. of Teeth	Shank Dia. (inch) d	Overall Length (inch) L	Neck Length (inch) L1	Applicable Insert
7801300	Cylindrical Shank Short	Normal	PSE11R063SA063-2S	1	0.625	2	0.625	3.543	0.984	ZD_T11...
7801301			PSE11R075SA075-3S	1	0.750	3	0.750	3.937	1.181	
7801302			PSE11R100SA100-3S	1	1.000	3	1.000	4.724	1.378	
7801303			PSE11R125SA125-3S	1	1.250	3	1.250	5.118	1.772	
7801304		Close	PSE11R100SA100-4S	1	1.000	4	1.000	4.724	1.378	
7801305			PSE11R125SA125-5S	1	1.250	5	1.250	5.118	1.772	
7801306		Normal	PSE15R100SA100-2S	1	1.000	2	1.000	4.724	1.378	ZDKT15...
7801307			PSE15R125SA125-2S	1	1.250	2	1.250	5.118	1.772	
7801308			PSE15R150SA125-3S	2	1.500	3	1.250	5.512	1.969	
7801309		Close	PSE15R125SA125-3S	1	1.250	3	1.250	5.118	1.772	
7801310			PSE15R150SA125-4S	2	1.500	4	1.250	5.512	1.969	
7801336	Cylindrical Shank Long	Normal	PSE11R063SA063-2L	1	0.625	2	0.625	5.906	1.969	ZD_T11...
7801337			PSE11R075SA075-3L	1	0.750	3	0.750	6.299	2.362	
7801338			PSE11R100SA100-3L	1	1.000	3	1.000	6.693	2.756	
7801339			PSE11R125SA125-3L	1	1.250	3	1.250	7.480	3.543	
7801340		Close	PSE11R100SA100-4L	1	1.000	4	1.000	6.693	2.756	
7801341			PSE11R125SA125-5L	1	1.250	5	1.250	7.480	3.543	
7801342		Normal	PSE15R100SA100-2L	1	1.000	2	1.000	6.693	2.756	ZDKT15...
7801343			PSE15R125SA125-2L	1	1.250	2	1.250	7.480	3.543	
7801344			PSE15R150SA125-3L	2	1.500	3	1.250	7.480	1.969	
7801345		Close	PSE15R125SA125-3L	1	1.250	3	1.250	7.480	3.543	
7801346			PSE15R150SA125-4L	2	1.500	4	1.250	7.480	1.969	
7801320	Weldon Shank Short	Normal	PSE11R063FA063-2S	1	0.625	2	0.625	3.205	1.299	ZD_T11...
7801321			PSE11R075FA075-3S	1	0.750	3	0.750	3.583	1.551	
7801323			PSE11R100FA100-3S	1	1.000	3	1.000	3.831	1.551	
7801324		Close	PSE11R100FA100-4S	1	1.000	4	1.000	3.831	1.551	
7801325			PSE11R125FA125-5S	1	1.250	5	1.250	4.378	2.098	
7801330		Normal	PSE15R100FA100-2S	1	1.000	2	1.000	3.830	1.550	ZDKT15...
7801332			PSE15R125FA125-2S	1	1.250	2	1.250	4.380	2.100	
7801333		Close	PSE15R125FA125-3S	1	1.250	3	1.250	4.380	2.100	
7801334		Normal	PSE15R150FA125-3S	2	1.500	3	1.250	4.380	2.100	
7801335		Close	PSE15R150FA125-4S	2	1.500	4	1.250	4.380	2.100	
7801347	Weldon Shank Long	Normal	PSE11R063FA063-2L	1	0.625	2	0.625	3.874	1.969	ZD_T11...
7801348			PSE11R075FA075-3L	1	0.750	3	0.750	4.394	2.362	
7801349			PSE11R100FA100-3L	1	1.000	3	1.000	5.035	2.756	
7801350		Close	PSE11R100FA100-4L	1	1.000	4	1.000	5.035	2.756	
7801351			PSE11R125FA125-5L	1	1.250	5	1.250	5.823	3.543	
7801352		Normal	PSE15R100FA100-2L	1	1.000	2	1.000	5.035	2.756	ZDKT15...
7801353			PSE15R125FA125-2L	1	1.250	2	1.250	5.823	3.543	
7801354		Close	PSE15R125FA125-3L	1	1.250	3	1.250	5.823	3.543	
7801355		Normal	PSE15R150FA125-3L	2	1.500	3	1.250	5.823	2.100	
7801356		Close	PSE15R150FA125-4L	2	1.500	4	1.250	5.823	2.100	

Packed: 1 pc.
Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).

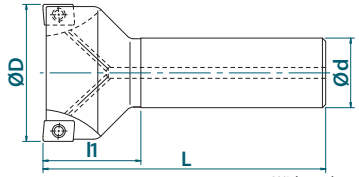
PXT

Type 1



With coolant hole.

Type 2



With coolant hole.

List 78011

PSE SS (Metric)

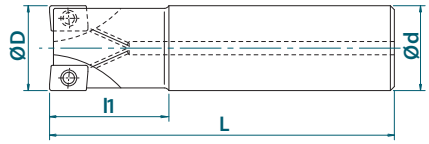
Recommended Materials: p85
Accessories & Inserts: p84
Maximum Ramping Angle: p86

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	No. of Teeth	Shank Dia. (mm) d	Overall Length (mm) L	Neck Length (mm) L1	Applicable Insert
7801101	Cylindrical Shank Short	Normal	PSE11R020SS20-2S	1	20	2	20	100	30	ZD_T11...
7801102			PSE11R025SS25-3S	1	25	3	25	120	35	
7801103			PSE11R032SS32-3S	1	32	3	32	130	45	
7801100		Close	PSE11R016SS16-2S	1	16	2	16	90	25	
7801116			PSE11R018SS16-2S	2	18	2	16	90	25	
7801115			PSE11R020SS20-3S	1	20	3	20	100	30	
7801117			PSE11R022SS20-3S	2	22	3	20	110	30	
7801104			PSE11R025SS25-4S	1	25	4	25	120	35	
7801118			PSE11R028SS25-4S	2	28	4	25	120	35	
7801119			PSE11R030SS32-4S	1	30	4	32	130	45	
7801105			PSE11R032SS32-5S	1	32	5	32	125	40	
7801120			PSE11R035SS32-5S	2	35	5	32	130	35	
7801121	Cylindrical Shank Long	Close	PSE11R016SS16-2L	1	16	2	16	150	50	
7801139			PSE11R017SS16-2L	2	17	2	16	150	25	
7801122			PSE11R018SS16-2L	2	18	2	16	150	25	
7801123			PSE11R020SS20-3L	1	20	3	20	160	60	
7801140			PSE11R021SS20-3L	2	21	3	20	160	30	
7801124			PSE11R022SS20-3L	2	22	3	20	160	30	
7801125		Normal	PSE11R025SS25-3L	1	25	3	25	170	70	
7801141			PSE11R026SS25-3L	2	26	3	25	170	35	
7801126			PSE11R028SS25-3L	2	28	3	25	170	35	
7801127			PSE11R030SS32-3L	1	30	3	32	190	90	
7801128			PSE11R032SS32-3L	1	32	3	32	190	90	
7801142			PSE11R033SS32-3L	2	33	3	32	190	35	
7801129			PSE11R035SS32-3L	2	35	3	32	190	35	
7801107	Cylindrical Shank Short	Normal	PSE15R032SS32-2S	1	32	2	32	130	45	ZDKT15...
7801108			PSE15R040SS32-3S	2	40	3	32	140	50	
7801109			PSE15R050SS32-3S	2	50	3	32	130	45	
7801110			PSE15R063SS32-4S	2	63	4	32	130	45	
7801106		Close	PSE15R025SS25-2S	1	25	2	25	120	35	
7801130			PSE15R028SS25-2S	2	28	2	25	120	35	
7801131			PSE15R030SS32-3S	1	30	3	32	130	45	
7801111			PSE15R032SS32-3S	1	32	3	32	130	45	
7801132			PSE15R035SS32-3S	2	35	3	32	130	35	
7801112			PSE15R040SS32-4S	2	40	4	32	140	50	
7801113			PSE15R050SS32-5S	2	50	5	32	130	45	
7801114			PSE15R063SS32-6S	2	63	6	32	130	45	
7801133	Cylindrical Shank Long	Close	PSE15R025SS25-2L	1	25	2	25	170	70	
7801143			PSE15R026SS25-2L	2	26	2	25	170	35	
7801134			PSE15R028SS25-2L	2	28	2	25	170	35	
7801135			PSE15R030SS32-3L	1	30	3	32	190	90	
7801136			PSE15R032SS32-3L	1	32	3	32	190	90	
7801144			PSE15R033SS32-3L	2	33	3	32	190	45	
7801137			PSE15R035SS32-3L	2	35	3	32	190	45	
7801138		Normal	PSE15R040SS32-3L	2	40	3	32	190	45	

Packed: 1 pc.
Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).
This item is stocked overseas. Please contact OSG for availability and delivery.

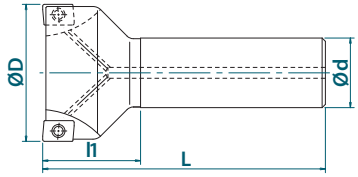
PXT

Type 1



With coolant hole.

Type 2



With coolant hole.

List 78012

PSE Bore (Inch)

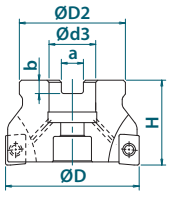
Recommended Materials: p85
Accessories & Inserts: p84
Maximum Ramping Angle: p86

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch) D	No. of Teeth	Tool Height (inch) H	Flange Dia. (inch) D2	Bore Hole Dia. (inch) d3	Keyway Width (inch) a	Keyway Depth (inch) b	Applicable Insert
7801200	Bore	Normal	PSE11R200A075-5	2	2.000	5	1.575	1.772	0.750	0.315	0.197	ZD_T11...
7801201			PSE11R250A075-6	2	2.500	6	1.575	1.968	0.750	0.315	0.197	
7801202			PSE11R300A100-7	2	3.000	7	1.968	2.362	1.000	0.375	0.236	
7801203		Close	PSE11R200A075-7	2	2.000	7	1.575	1.772	0.750	0.315	0.197	
7801204			PSE11R250A075-8	2	2.500	8	1.575	1.968	0.750	0.315	0.197	
7801205			PSE11R300A100-10	2	3.000	10	1.968	2.362	1.000	0.375	0.236	
7801206		Normal	PSE15R200A075-3	2	2.000	3	1.575	1.772	0.750	0.315	0.197	ZDKT15...
7801207			PSE15R250A075-4	2	2.500	4	1.575	1.968	0.750	0.315	0.197	
7801208			PSE15R300A100-5	2	3.000	5	1.968	2.362	1.000	0.375	0.236	
7801209			PSE15R400A150-7	3	4.000	7	1.968	2.756	1.500	0.625	0.394	
7801210			PSE15R500A150-8	3	5.000	8	2.480	3.543	1.500	0.625	0.394	
7801216			PSE15R600A150-10	3	6.000	10	2.480	3.740	1.500	0.625	0.394	
7801211		Close	PSE15R200A075-5	2	2.000	5	1.575	1.772	0.750	0.315	0.197	
7801212			PSE15R250A075-6	2	2.500	6	1.575	1.968	0.750	0.315	0.197	
7801213			PSE15R300A100-8	2	3.000	8	1.968	2.362	1.000	0.375	0.236	
7801214			PSE15R400A150-10	3	4.000	10	1.968	2.756	1.500	0.625	0.394	
7801215			PSE15R500A150-11	3	5.000	11	2.480	3.543	1.500	0.625	0.394	
7801217			PSE15R600A150-12	3	6.000	12	2.480	3.740	1.500	0.625	0.394	

Packed: 1 pc.
Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).

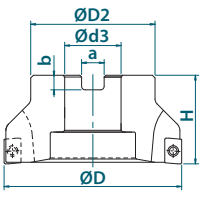
PXT

Type 2



With coolant hole.

Type 3



Without coolant hole.

List 78010

PSE Bore (Metric)

SPEED FEED P85

Recommended Materials: p85
Accessories & Inserts: p84
Maximum Ramping Angle: p86

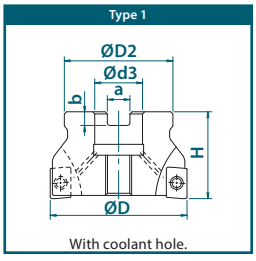
EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	No. of Teeth	Tool Height (mm) H	Flange Dia. (mm) D2	Bore Hole Dia. (mm) d3	Keyway Width (mm) a	Keyway Depth (mm) b	Applicable Insert
7801000	Bore	Normal	PSE11R040M16-4	1	40	4	40	38	16.00	8.4	5.6	ZD_T11...
7801001			PSE11R050M22-5	1	50	5	40	45	22.00	10.4	6.3	
7801002			PSE11R063M22-6	2	63	6	40	50	22.00	10.4	6.3	
7801003			PSE11R080M27-7	2	80	7	50	60	27.00	12.4	7.0	
7801020			PSE11R080M25.4-7	2	80	7	50	60	25.40	9.5	6.0	
7801004		Close	PSE11R040M16-6	1	40	6	40	38	16.00	8.4	5.6	
7801005			PSE11R050M22-7	1	50	7	40	45	22.00	10.4	6.3	
7801006			PSE11R063M22-8	2	63	8	40	50	22.00	10.4	6.3	
7801007			PSE11R080M27-10	2	80	10	50	60	27.00	12.4	7.0	
7801021			PSE11R080M25.4-10	2	80	10	50	60	25.40	9.5	6.0	
7801008		Normal	PSE15R040M16-3	1	40	3	40	38	16.00	8.4	5.6	ZDKT15...
7801009			PSE15R050M22-3	1	50	3	40	45	22.00	10.4	6.3	
7801010			PSE15R063M22-4	2	63	4	40	50	22.00	10.4	6.3	
7801011			PSE15R080M27-5	2	80	5	50	60	27.00	12.4	7.0	
7801022			PSE15R080M25.4-5	2	80	5	50	60	25.40	9.5	6.0	
7801012			PSE15R100M32-7	2	100	7	50	70	32.00	14.4	8.0	
7801023			PSE15R100M31.7-7	3	100	7	50	70	31.75	12.7	8.0	
7801024			PSE15R125M38.1-8	3	125	8	63	90	38.10	15.9	10.0	
7801014		Close	PSE15R040M16-4	1	40	4	40	38	16.00	8.4	5.6	
7801015			PSE15R050M22-5	1	50	5	40	45	22.00	10.4	6.3	
7801016			PSE15R063M22-6	2	63	6	40	50	22.00	10.4	6.3	
7801017			PSE15R080M27-8	2	80	8	50	60	27.00	12.4	7.0	
7801025			PSE15R080M25.4-8	2	80	8	50	60	25.40	9.5	6.0	
7801018			PSE15R100M32-10	2	100	10	50	70	32.00	14.4	8.0	
7801026			PSE15R100M31.7-10	3	100	10	50	70	31.75	12.7	8.0	
7801027			PSE15R125M38.1-11	3	125	11	63	90	38.10	15.9	10.0	

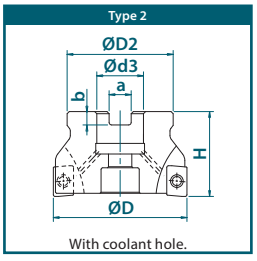
Packed: 1 pc.

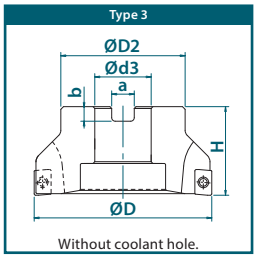
Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).

This item is stocked overseas. Please contact OSG for availability and delivery.

PXT





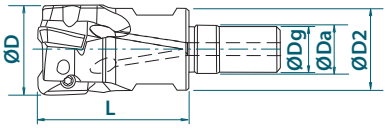


List 52601

PSE ASF (Inch)

SPEED FEED P85

Recommended Materials: p85
Accessories & Inserts: p84
Maximum Ramping Angle: p86
SF Arbors: p189



EDP No.	Body Type	Designation	Tool Dia. (inch) D	No. of Teeth	Pilot Dia. (inch) Da	Thread Dia. (mm) Dg	Overall Length (inch) L	Flange Dia. (inch) D2	Wrench Size	Applicable Insert
52601000	Screw Fit Head	PSE11R063ASF8-2	0.625	2	0.335	M8	1.063	0.571	10	ZD_T11…
52601001		PSE11R075ASF10-3	0.750	3	0.413	M10	1.299	0.709	14	
52601002		PSE11R100ASF12-3	1.000	3	0.492	M12	1.378	0.905	17	
52601003		PSE11R125ASF16-3	1.250	3	0.669	M16	1.575	1.102	22	
52601004		PSE15R100ASF12-2	1.000	2	0.492	M12	1.378	0.905	17	ZDKT15…
52601005		PSE15R125ASF16-3	1.250	3	0.669	M16	1.575	1.102	22	
52601006		PSE15R150ASF16-4	1.500	4	0.669	M16	1.575	1.102	22	

Packed: 1 pc.
Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).

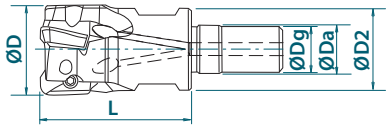
PXT

List 78016

PSE SF (Metric)

SPEED FEED P85

Recommended Materials: p85
Accessories & Inserts: p84
Maximum Ramping Angle: p86
SF Arbors: p190



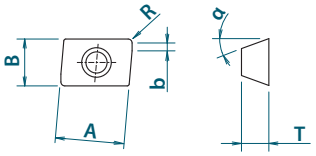
EDP No.	Body Type	Designation	Tool Dia. (mm) D	No. of Teeth	Pilot Dia. (mm) Da	Thread Dia. (mm) Dg	Tool Height (mm) L	Flange Dia. (mm) D2	Wrench Size	Applicable Insert
7801600	Screw Fit Head	PSE11R016SF8-2	16	2	8.5	M8	27	14.5	10	ZD_T11…
7801612		PSE11R017SF8-2	17	2	8.5	M8	27	14.5	10	
7801613		PSE11R018SF8-2	18	2	8.5	M8	27	14.5	10	
7801601		PSE11R020SF10-3	20	3	10.5	M10	33	18.0	14	
7801614		PSE11R021SF10-3	21	3	10.5	M10	33	18.0	14	
7801615		PSE11R022SF10-3	22	3	10.5	M10	33	18.0	14	
7801602		PSE11R025SF12-4	25	4	12.5	M12	35	23.0	17	
7801616		PSE11R026SF12-3	26	3	12.5	M12	35	23.0	17	
7801603		PSE11R028SF12-4	28	4	12.5	M12	35	23.0	17	
7801604		PSE11R032SF16-5	32	5	17.0	M16	40	28.0	22	
7801617		PSE11R033SF16-3	33	3	17.0	M16	40	28.0	22	
7801605		PSE11R035SF16-5	35	5	17.0	M16	40	28.0	22	
7801606		PSE11R040SF16-6	40	6	17.0	M16	40	28.0	22	
7801607		PSE15R025SF12-2	25	2	12.5	M12	35	23.0	17	ZDKT15…
7801618		PSE15R026SF12-2	26	2	12.5	M12	35	23.0	17	
7801608		PSE15R028SF12-2	28	2	12.5	M12	35	23.0	17	
7801609		PSE15R032SF16-3	32	3	17.0	M16	40	28.0	22	
7801619		PSE15R033SF16-3	33	3	17.0	M16	40	28.0	22	
7801610		PSE15R035SF16-3	35	3	17.0	M16	40	28.0	22	
7801611		PSE15R040SF16-4	40	4	17.0	M16	40	28.0	22	

Packed: 1 pc.
Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).
This item is stocked overseas. Please contact OSG for availability and delivery.

PXT

List 78PSE

PSE/PSEL Inserts



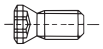
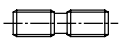
Designation	No. of Cutting Edges	Insert Size					EDP Number								
		AxB (mm)	T (mm)	α	R (mm)	b (mm)	CK010	XP3035	XC3030	XP2040	XP2025	XC1015	XC5035	XC5040	XP6015
ZDKT11T308SR-GL	2	10×6.8	3.8	15°	0.8	1.4	-	7814026	7825026	7813026	7826026	-	-	-	-
ZDKT11T304SR-GM					0.4	1.8	-	7814025	7825025	7813025	7826025	7812025	-	-	-
ZDKT11T308SR-GM					0.8	1.4	-	7814032	7825032	7813032	7826032	-	-	-	-
ZDKT11T312SR-GM					1.2	1.0	-	7814053	-	-	-	-	-	-	-
ZDKT11T320SR-GM					2.0	2.1	-	7814038	-	-	-	-	-	-	-
ZDKT11T330SR-GM					3.0	1.5	-	7814054	-	-	-	-	-	-	-
ZDKT11T340SR-GM					4.0	-	-	7814055	-	-	-	-	-	-	-
ZDKT11T308SR-GR					0.8	1.4	-	7814033	7825033	7813033	-	7812033	-	-	-
ZDKT11T304ER-SM					0.4	1.8	-	-	-	-	-	-	-	7816034	-
ZDKT11T308ER-SM					0.8	1.4	-	-	-	-	-	-	7815031	7816031	-
ZDKT11T316ER-SM					1.6	0.8	-	-	-	-	-	-	7815027	7816027	-
ZDKT11T308SR-HR					0.8	1.4	-	-	-	-	-	-	-	-	7824035
ZDKT11T302FR-NM					0.2	2.0	7811048	-	-	-	-	-	-	-	-
ZDKT11T304FR-NM					0.4	1.8	7811049	-	-	-	-	-	-	-	-
ZDHT11T304FR-NM			3.5		0.4	1.8	7811024	-	-	-	-	-	-	-	-
ZDKT150508SR-GL	2	14×9.3	5.56	15°	0.8	1.6	-	7814057	7825057	7813057	7826057	-	-	-	-
ZDKT150508SR-GM					0.8	1.6	-	7814029	7825029	7813028	7826029	7812029	-	-	-
ZDKT150512SR-GM					1.2	1.2	-	7814077	-	-	-	-	-	-	-
ZDKT150516SR-GM					1.6	0.8	-	7814078	-	-	-	-	-	-	-
ZDKT150520SR-GM					2.0	2.1	-	7814079	-	-	-	-	-	-	-
ZDKT150530SR-GM					3.0	1.9	-	7814080	-	-	-	-	-	-	-
ZDKT150540SR-GM					4.0	1.1	-	7814081	-	-	-	-	-	-	-
ZDKT150550SR-GM					5.0	0.7	-	7814082	-	-	-	-	-	-	-
ZDKT150508SR-GR					0.8	1.6	-	7814058	7825058	7813058	-	7812058	-	-	-
ZDKT150508ER-SM					0.8	1.6	-	-	-	-	-	-	7815056	7816056	-
ZDKT150508SR-HR					0.8	1.6	-	-	-	-	-	-	-	-	7824036
ZDKT150508FR-NM					0.8	1.6	7811046	-	-	-	-	-	-	-	-

Packed: 10 pcs.

PXI

List 7808H

PSE Accessories

Appearance	EDP No.	Designation	Applicable Insert	Applicable Cutter		Recommended Tightening Torque
				(mm)	(inch)	
 Clamping Screw	7808107	FS25656P (Torx 8IP)	ZD_T11...	PSE SS/SF Ø16-35	PSE11 SA/FA/ASF Ø.625-1.25"	1.6 Nm
	7808109	FS25673P (Torx 8IP)		PSE BORE Ø40-80	PSE11 BORE Ø2-3"	1.6 Nm
	7808115	FS35686P (Torx 15IP)	ZDKT15...	PSE SS/SF Ø25-63 PSE BORE Ø40-125	PSE SA/FA/ASF Ø1-1.5" PSE15 BORE Ø2-6"	3.2 Nm
 Power Screw	7808150	PS0830 (M8×30)	ZD_T11... ZDKT15...	PSE BORE Ø40	n/a	15.0 Nm
	7808151	PS1031 (M10×31)	ZD_T11... ZDKT15...	PSE BORE Ø50	n/a	20.0 Nm
 Wrench	7808225	8IP-D (Torx 8IP)	ZD_T11...	PSE SS/SF Ø16-35 PSE BORE Ø40-80	PSE11 SA/FA/ASF Ø.625-1.25" PSE11 BORE Ø2-3"	
	7808228	15IP-D (Torx 15IP)	ZDKT15...	PSE SS/SF Ø25-63 PSE BORE Ø40-125	PSE15 SA/FA/ASF Ø1-1.5" PSE15 BORE Ø2-6"	

Packed: Clamping Screws = 10 pcs.; Power Screw = 1 pc.; Wrench = 1 pc.
Note: Wrench sold separately.

PXT

Cutting Conditions

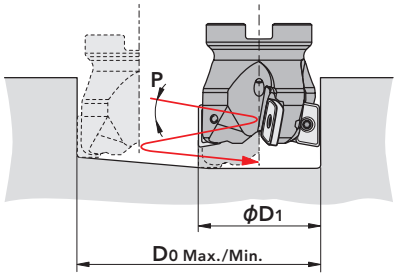
Work Material		Tensile Strength – Hardness	Insert Size							
			ZD_T11...				ZDKT15...			
			Side Milling Aa: 0.394" • Ar: 0.2D		Face Milling Aa: 0.118" • Ar: 1.0D		Side Milling Aa: 0.551" • Ar: 0.2D		Face Milling Aa: 0.197" • Ar: 1.0D	
			Milling Speed Vc (SFM)	Feed Per Tooth fz(in/t)	Milling Speed Vc (SFM)	Feed Per Tooth fz(in/t)	Milling Speed Vc (SFM)	Feed Per Tooth fz(in/t)	Milling Speed Vc (SFM)	Feed Per Tooth fz(in/t)
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	590 (330 - 820)	0.010 (0.008 - 0.020)	590 (330 - 820)	0.005 (0.002 - 0.008)	590 (330 - 820)	0.012 (0.008 - 0.024)	590 (330 - 820)	0.006 (0.002 - 0.010)
	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	590 (330 - 820)	0.008 (0.006 - 0.016)	590 (330 - 820)	0.004 (0.002 - 0.008)	590 (330 - 820)	0.010 (0.006 - 0.020)	590 (330 - 820)	.005 (.002 - .008)
	Die Steels (H13, D2)	~280 HB	495 (260 - 655)	0.008 (0.006 - 0.016)	495 (260 - 655)	0.004 (0.002 - 0.007)	495 (260 - 655)	0.010 (0.006 - 0.020)	495 (260 - 655)	.005 (.002 - .008)
M	Stainless Steels(Dry) (304SS, 420SS)	~250 HB	495 (260 - 655)	0.007 (0.006 - 0.016)	495 (260 - 655)	0.004 (0.004 - 0.007)	495 (260 - 655)	0.008 (0.006 - 0.018)	495 (260 - 655)	0.005 (0.004 - 0.008)
	Stainless Steels(Wet) (304SS, 420SS)	~250 HB	260 (195 - 395)	0.007 (0.006 - 0.016)	260 (195 - 395)	0.004 (0.004 - 0.007)	260 (195 - 395)	0.008 (0.006 - 0.018)	260 (195 - 395)	0.005 (0.004 - 0.008)
K	Cast Iron (FC250)	~350 N/mm²	590 (330 - 985)	0.010 (0.006 - 0.020)	590 (330 - 985)	0.005 (0.002 - 0.008)	590 (330 - 985)	0.012 (0.008 - 0.024)	590 (330 - 985)	0.006 (0.002 - 0.010)
	Ductile Cast Iron (60-40-18)	~800 N/mm²	590 (330 - 820)	0.006 (0.004 - 0.016)	590 (330 - 820)	0.005 (0.002 - 0.008)	590 (330 - 820)	0.008 (0.006 - 0.020)	590 (330 - 820)	0.006 (0.002 - 0.010)
N	Aluminum Alloys (6061, 7075)	~13% Si	985 (655 - 4920)	0.012 (0.008 - 0.020)	985 (655 - 4920)	0.006 (0.004 - 0.010)	985 (655 - 4920)	0.014 (0.008 - 0.024)	985 (655 - 4920)	0.007 (0.004 - 0.012)
S	Heat Resistant Alloys (Inconel 718)	-	115 (85 - 195)	0.006 (0.004 - 0.012)	115 (85 - 195)	0.004 (0.002 - 0.006)	115 (85 - 195)	0.008 (0.004 - 0.012)	115 (85 - 195)	0.004 (0.002 - 0.006)
	Titanium Alloy (Ti-6Al-4V)	-	130 (100 - 395)	0.007 (0.004 - 0.014)	130 (100 - 395)	0.004 (0.004 - 0.010)	130 (100 - 395)	0.009 (0.004 - 0.014)	130 (100 - 395)	0.004 (0.004 - 0.010)
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HRC	330 (130 - 495)	0.007 (0.004 - 0.012)	330 (130 - 495)	0.004 (0.003 - 0.008)	330 (130 - 495)	0.008 (0.004 - 0.014)	330 (130 - 495)	0.005 (0.003 - 0.010)
	Die Cast Steels (A2, S7)	43 - 48 HRC	260 (130 - 395)	0.005 (0.003 - 0.008)	260 (130 - 395)	0.003 (0.002 - 0.006)	260 (130 - 395)	0.006 (0.003 - 0.010)	260 (130 - 395)	0.004 (0.002 - 0.008)
	Hardened Steels (D2)	50 - 55 HRC	195 (130 - 295)	0.004 (0.002 - 0.008)	195 (130 - 295)	0.002 (0.002 - 0.004)	195 (130 - 295)	0.005 (0.002 - 0.008)	195 (130 - 295)	0.003 (0.002 - 0.005)

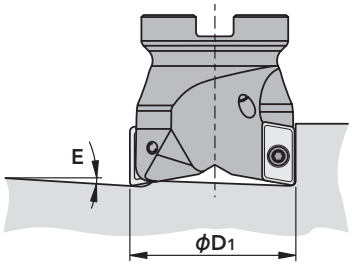
Recommended Materials by Application

Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
CK010	NM	Yes				◎		
XP3035	GL/GM/GR	–	◎	○	○			
XC3030	GL/GM/GR	–	◎		○			
XP2040	GL/GM/GR	–	○	○				○
		Yes	○	◎			○	
XP2025	GL/GM	Yes	○	◎			○	
XC1015	GM/GR	–			◎			
XC5035	SM	–		◎				
		Yes		○			○	
XC5040	SM	Yes		○			◎	
XP6015	HR	–	○		○			◎

GL:Light Cutting GM:Medium Cutting GR: Rough Cutting NM:Aluminum SM:Heat Resistant Alloy HR: Hardened Steel ○ good ◎ best

Maximum Ramping Angle (E) & Helical Angle (P)





Insert Size	ZD_T11...				ZDKT15...			
Diameter (inch)	Ramping Angle	Helical Milling(inch)		Helical Angle	Ramping Angle	Helical Milling (inch)		Helical Angle
D1	E	D_0 Min.	D_0 Max.	P	E	D_0 Min.	D_0 Max.	P
0.625	10.8°	0.935	1.187	9.5°	-	-	-	-
0.750	9.8°	1.185	1.437	7.0°	-	-	-	-
1.000	7.4°	1.685	1.927	4.4°	9.5°	1.488	1.921	7.4°
1.250	4.8°	2.158	2.437	3.2°	6.8°	1.988	2.421	5.0°
1.500	2.9°	2.685	2.937	2.2°	5.1°	2.488	2.921	3.2°
2.000	2.1°	3.685	3.937	1.6°	2.4°	3.488	3.921	2.4°
2.500	1.8°	4.685	4.937	1.4°	2.3°	4.488	4.921	1.4°
3.000	1.4°	5.685	5.937	1.0°	2.0°	5.488	5.921	1.3°
4.000	-	-	-	-	1.4°	7.488	7.921	1.0°
5.000	-	-	-	-	0.8°	9.488	9.921	0.8°
6.000	-	-	-	-	0.7°	11.488	11.921	0.6°

OSG PHOENIX® PSEL

Rough Milling Cutter

A series of 90° indexable roughing end mills and facemills. Stable and efficient milling with reduced cutting forces is possible in a wide range of materials.

List 53000
PSEL SA/FA (Inch)

List 78029
PSEL SS (Metric)

List 53001
PSEL Bore (Inch)

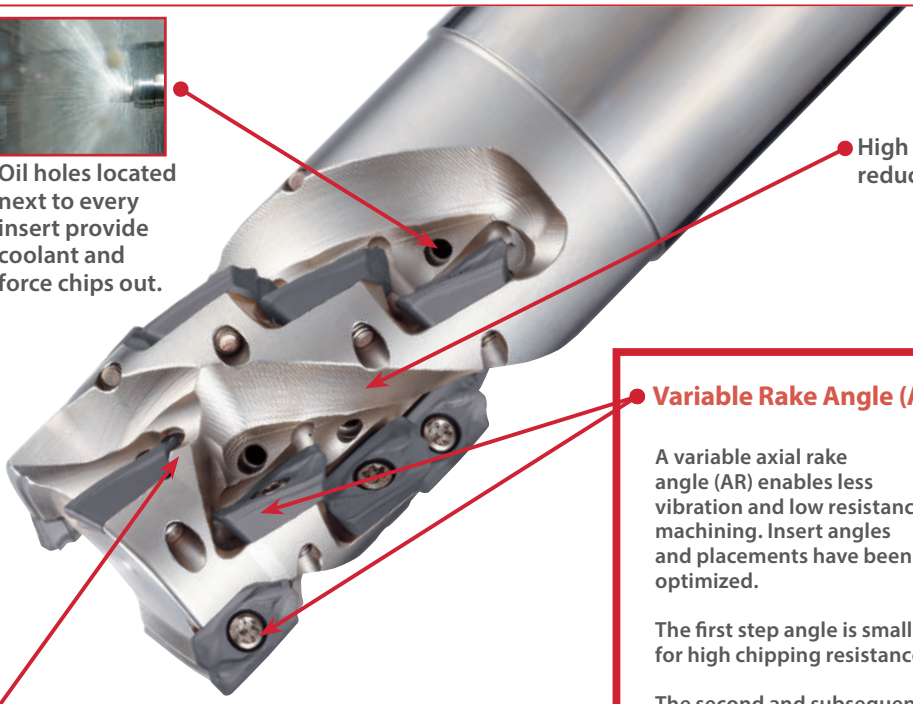
List 78028
PSEL Bore (Metric)

List 78PSE
PSE/PSEL Inserts

List 7808H
PSEL Accessories

Features & Benefits

Oil holes located next to every insert provide coolant and force chips out.



High helix lead groove creates reduced cutting forces.

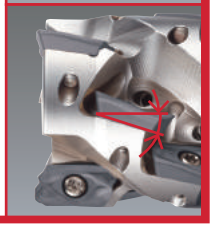
The inserts along the tip are securely clamped in and supported for stable machining with less chipping.

Variable Rake Angle (AR)

A variable axial rake angle (AR) enables less vibration and low resistance machining. Insert angles and placements have been optimized.

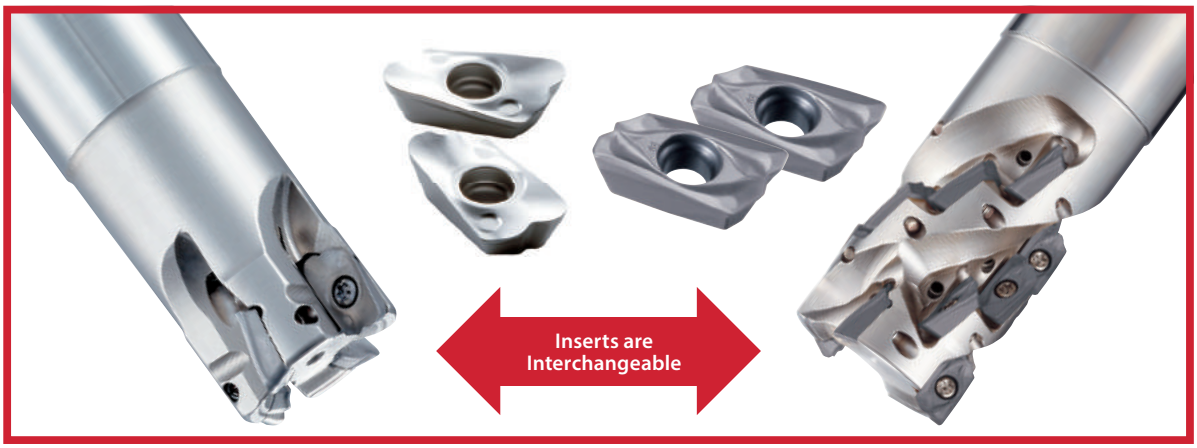
The first step angle is small for high chipping resistance.

The second and subsequent steps are larger for increased sharpness.



» Inserts for the PSEL and PSE are Interchangeable to Simplify Tool Management

The PSEL and PSE use the same style inserts, making it easy to go between the two tools. Choose from a wide variety of inserts to cover all types of machining needs.

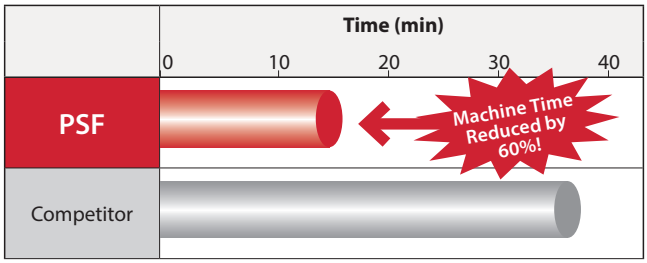


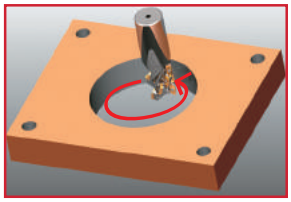
Processing Data

» Increased Productivity in Cast Iron - FCD450

The PSEL's design allowed for stable machining, reduced noise, minimal wear, and ***a reduction of the overall machine time by 60%*** compared to that of the competitor's machine time! After machining 30 pieces an inspection showed chipping on the competitor's tool but minimum wear on the PSEL.

Tool	PSEL11R032SS32-2-45	Competitor
Insert (Grade)	ZDKT11T308SR-GR (XP3035)	Coated Carbide Chip
Work Material	FCD450	
Cutting Speed	328 SFM (995 RPM)	262 SFM (795 RPM)
Feed	23.62 IPM (0.008 ipt)	9.45 IPM (0.006 ipt)
Depth of Cut	Aa = 1.299 in, Ar = 0.197 in	
Coolant	Water Soluble	
Overall Length	7.874 in	
Machine	Vertical Machining Center	

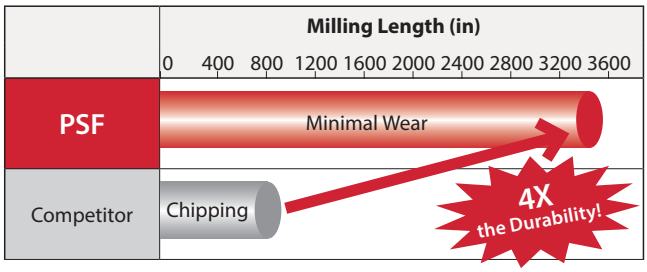


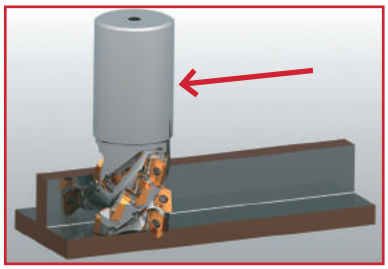


» Long Tool Life in Pre-Hardened Steel - NAK80 (45HRC)

In addition to a ***47% faster machining time*** compared to that of the competitor's time (PSEL: 10min. 8sec. per workpiece; the competitor's product: 19 min. per workpiece), the tool life was increased approximately 4 times! While the competitor's tool revealed chipping, the PSEL showed minimal wear.

Tool	PSEL11R040SS42-3-37	Competitor
Insert (Grade)	ZDKT11T308SR-GR (XP2040)	Coated Carbide Chip
Work Material	NAK80 (45 HRC)	
Cutting Speed	492 SFM (1200 RPM)	
Feed	17.72 IPM (0.005 ipt)	9.45 IPM (0.004 ipt)
Depth of Cut	Aa = 0.984 in, Ar = 0.197 in	
Coolant	Water Soluble	
Overall Length	7.087 in	
Machine	Horizontal Machining Center	



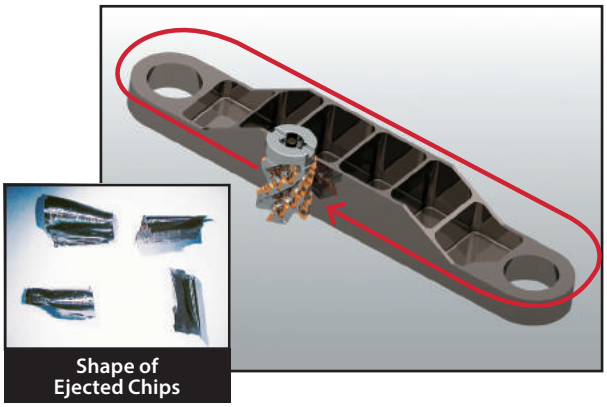


Processing Data

» Long Tool Life in Titanium Alloy - Ti-6Al-4V (35HRC)

PSEL achieved 3 times longer tool life (PSEL: 3 workpieces and welding wear after 276 min.; the competitor's product: 1 workpiece and chipping after 92 min.). Sudden chipping, which occurred in the competitor's product, was unlikely to happen, and the shape of the ejected chips was favorable.

Tool	PSEL15R063M27-3-50	Competitor
Insert (Grade)	ZDKT150508ER-SM (XC5040)	Coated Carbide Chip
Work Material	Ti-6Al-4V (35 HRC)	
Cutting Speed	164 SFM (250 RPM)	
Feed	5.91 IPM (0.008 ipt)	5.91 IPM (0.006 ipt)
Depth of Cut	Aa = 1.102-1.772 in, Ar = 0.394-0.787 in	
Coolant	Water Soluble	
Overall Length	11.811 in	
Machine	Horizontal Machining Center	



Shape of Ejected Chips

List 53000

PSEL SA/FA (Inch)

SPEED FEED P94
Recommended Materials: p94
Accessories & Inserts: p93

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch) D	No. of Teeth	No. of Inserts per Tooth	Total No. of Inserts	Length of Cut (inch) Lc	Shank Dia. (inch) d	Overall Length (inch) L	Neck Length (inch) L1	Applicable Insert
53000000	Cylindrical Shank Short	Normal	PSEL11R100SA100-2-27	1	1.000	2	3	6	1.063	1.000	4.921	1.968	ZD_T11…
53000001			PSEL11R125SA125-2-37	1	1.250	2	4	8	1.457	1.250	5.512	2.362	
53000002			PSEL11R125SA125-3-45	1	1.250	3	5	15	1.791	1.250	5.512	2.362	
53000003			PSEL11R150SA125-3-37	2	1.500	3	4	12	1.457	1.250	5.512	2.362	
53000004			PSEL11R150SA125-4-45	2	1.500	4	5	20	1.791	1.250	5.512	2.362	
53000005			PSEL15R150SA125-2-38	2	1.500	2	3	6	1.496	1.250	5.512	2.362	ZDKT15…
53000006	Weldon Shank Short	Normal	PSEL11R100FA100-2-27	1	1.000	2	3	6	1.063	1.000	4.248	1.968	ZD_T11…
53000007			PSEL11R125FA125-2-37	1	1.250	2	4	8	1.457	1.250	4.642	2.362	
53000008			PSEL11R125FA125-3-45	1	1.250	3	5	15	1.791	1.250	4.642	2.362	
53000009			PSEL11R150FA125-3-37	2	1.500	3	4	12	1.457	1.250	4.642	2.362	
53000010			PSEL11R150FA125-4-45	2	1.500	4	5	20	1.791	1.250	4.642	2.362	
53000011			PSEL15R150FA125-2-38	2	1.500	2	3	6	1.496	1.250	4.642	2.362	ZDKT15…

Packed: 1 pc.
Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).

PXT

List 78029

PSEL SS (Metric)

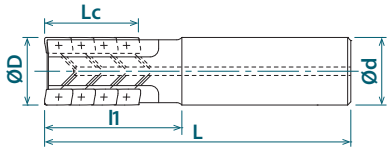
SPEED FEED P94
Recommended Materials: p94
Accessories & Inserts: p93

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	No. of Teeth	No. of Inserts per Tooth	Total No. of Inserts	Length of Cut (mm) Lc	Shank Dia. (mm) d	Overall Length (mm) L	Neck Length (mm) L1	Applicable Insert
7802900	Cylindrical Shank	Normal	PSEL11R025SS25-2-27	1	25	2	3	6	27.0	25	125	50	ZD_T11…
7802901			PSEL11R032SS32-2-37	1	32	2	4	8	37.0	32	140	60	
7802902			PSEL11R032SS32-3-45	1	32	3	5	15	45.5	32	140	60	
7802903			PSEL11R040SS42-3-37	1	40	3	4	12	37.0	42	140	60	
7802904			PSEL11R040SS42-4-45	1	40	4	5	20	45.5	42	140	60	
7802905			PSEL15R040SS42-2-38	1	40	2	3	6	38.0	42	140	60	ZDKT15…
7802906			PSEL15R050SS42-3-50	2	50	3	4	12	50.5	42	144	64	

Packed: 1 pc.
Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).
This item is stocked overseas. Please contact OSG for availability and delivery.

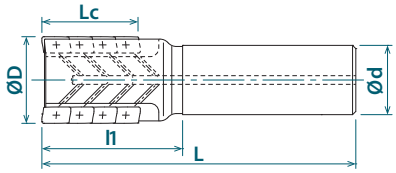
PXT

Type 1



With coolant hole.

Type 2



With coolant hole.

List 53001

PSEL Bore (Inch)

SPEED FEED P94
Recommended Materials: p94
Accessories & Inserts: p93

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch) D	No. of Teeth	No. of Inserts per Tooth	Total No. of Inserts	Length of Cut (inch) Lc	Tool Height (inch) H	Flange Dia. (inch) D2	Bore Hole Dia. (inch) d3	Keyway Width (inch) a	Keyway Depth (inch) b	Applicable Insert
53001000	Bore	Normal	PSEL15R200A075-3-50	1	2.000	3	4	12	1.988	2.913	1.772	0.750	0.315	0.197	ZDKT15…
53001001			PSEL15R250A100-4-50	1	2.500	4	4	16	1.988	2.913	2.362	1.000	0.375	0.236	
53001002			PSEL15R300A100-4-63	1	3.000	4	5	20	2.480	3.464	2.362	1.000	0.375	0.236	

Packed: 1 pc.
Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).

PXT

List 78028

PSEL Bore (Metric)

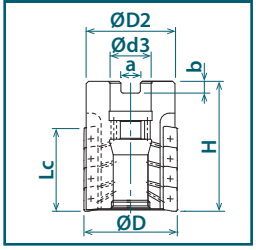
SPEED FEED P94
Recommended Materials: p94
Accessories & Inserts: p93

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	No. of Teeth	No. of Inserts per Tooth	Total No. of Inserts	Length of Cut (mm) Lc	Tool Height (mm) H	Flange Dia. (mm) D2	Bore Hole Dia. (mm) d3	Keyway Width (mm) a	Keyway Depth (mm) b	Applicable Insert
7802850	Bore	Normal	PSEL15R050M22-3-50	1	50	3	4	12	50.5	74	45	22	10.4	6.3	ZDKT15…
7802851			PSEL15R063M27-3-50	1	63	3	4	12	50.5	74	60	27	12.4	7.0	
7802852			PSEL15R080M32-4-63	1	80	4	5	20	63.0	88	76	32	14.4	8.0	

Packed: 1 pc.
Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).
This item is stocked overseas. Please contact OSG for availability and delivery.

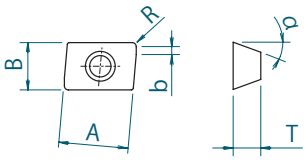
PXT

Type 1



List 78PSE

PSE/PSEL Inserts



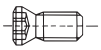
Designation	No. of Cutting Edges	Insert Size					EDP Number								
		AxB (mm)	T (mm)	α	R (mm)	b (mm)	CK010	XP3035	XC3030	XP2040	XP2025	XC1015	XC5035	XC5040	XP6015
ZDKT11T308SR-GL	2	10×6.8	3.8	15°	0.8	1.4	-	7814026	7825026	7813026	7826026	-	-	-	-
ZDKT11T304SR-GM					0.4	1.8	-	7814025	7825025	7813025	7826025	7812025	-	-	-
ZDKT11T308SR-GM					0.8	1.4	-	7814032	7825032	7813032	7826032	-	-	-	-
ZDKT11T312SR-GM					1.2	1.0	-	7814053	-	-	-	-	-	-	-
ZDKT11T320SR-GM					2.0	2.1	-	7814038	-	-	-	-	-	-	-
ZDKT11T330SR-GM					3.0	1.5	-	7814054	-	-	-	-	-	-	-
ZDKT11T340SR-GM					4.0	-	-	7814055	-	-	-	-	-	-	-
ZDKT11T308SR-GR					0.8	1.4	-	7814033	7825033	7813033	-	7812033	-	-	-
ZDKT11T304ER-SM					0.4	1.8	-	-	-	-	-	-	-	7816034	-
ZDKT11T308ER-SM					0.8	1.4	-	-	-	-	-	-	7815031	7816031	-
ZDKT11T316ER-SM					1.6	0.8	-	-	-	-	-	-	7815027	7816027	-
ZDKT11T308SR-HR					0.8	1.4	-	-	-	-	-	-	-	-	7824035
ZDKT11T302FR-NM					0.2	2.0	7811048	-	-	-	-	-	-	-	-
ZDKT11T304FR-NM					0.4	1.8	7811049	-	-	-	-	-	-	-	-
ZDHT11T304FR-NM			3.5		0.4	1.8	7811024	-	-	-	-	-	-	-	-
ZDKT150508SR-GL		14×9.3	5.56		0.8	1.6	-	7814057	7825057	7813057	7826057	-	-	-	-
ZDKT150508SR-GM					0.8	1.6	-	7814029	7825029	7813028	7826029	7812029	-	-	-
ZDKT150512SR-GM					1.2	1.2	-	7814077	-	-	-	-	-	-	-
ZDKT150516SR-GM					1.6	0.8	-	7814078	-	-	-	-	-	-	-
ZDKT150520SR-GM					2.0	2.1	-	7814079	-	-	-	-	-	-	-
ZDKT150530SR-GM					3.0	1.9	-	7814080	-	-	-	-	-	-	-
ZDKT150540SR-GM					4.0	1.1	-	7814081	-	-	-	-	-	-	-
ZDKT150550SR-GM					5.0	0.7	-	7814082	-	-	-	-	-	-	-
ZDKT150508SR-GR					0.8	1.6	-	7814058	7825058	7813058	-	7812058	-	-	-
ZDKT150508ER-SM					0.8	1.6	-	-	-	-	-	-	7815056	7816056	-
ZDKT150508SR-HR					0.8	1.6	-	-	-	-	-	-	-	-	7824036
ZDKT150508FR-NM					0.8	1.6	7811046	-	-	-	-	-	-	-	-

Packed: 10 pcs.
Note: For the 2nd and subsequent steps, use an insert with R0.8 or smaller.

PXI

List 7808H

PSEL Accessories

Appearance	EDP No.	Designation	Applicable Insert	Applicable Cutter		Recommended Tightening Torque
				(mm)	(inch)	
 Clamping Screw	7808107	FS25656P (Torx 8IP)	ZD_T11…	PSEL SS Ø25	PSEL11 SA/FA Ø1"	1.6 Nm
	7808109	FS25673P (Torx 8IP)		PSEL SS Ø32-40	PSEL11 SA/FA Ø1.25-1.5"	1.6 Nm
	7808115	FS35686P (Torx 15IP)	ZDKT15…	PSEL SS Ø40-50 PSEL BORE Ø50-80	PSEL15 SA/FA Ø1.5" PSEL BORE Ø2-3"	3.2 Nm
 Coolant Cap Bolt	7808132	OCB-M20-08		PSEL BORE Ø50	PSEL BORE Ø2"	
	7808133	OCB-M24-10		PSEL BORE Ø63	PSEL BORE Ø2.5"	
	7808134	OCB-M30-14		PSEL BORE Ø80	PSEL BORE Ø3"	
 Wrench	7808225	8IP-D (Torx 8IP)	ZD_T11…	PSEL SS Ø25-40	PSEL11 SA/FA Ø1-1.5"	
	7808228	15IP-D (Torx 15IP)	ZDKT15…	PSEL SS Ø40-50 PSEL BORE Ø50-80	PSEL15 SA/FA Ø1.5" PSEL BORE Ø2-3"	

Packed: Clamping Screws = 10 pcs.; Coolant Cap Bolt = 1 pc.; Wrench = 1 pc.
Note: Wrench sold separately.

PXT

Cutting Conditions

Work Material		Tensile Strength – Hardness	Insert Size			
			ZD_T11…		ZDKT15…	
			Side Milling Aa: 1.1-1.5D • Ar: 0.1D Max		Side Milling Aa: 1.1-1.5D • Ar: 0.1D Max	
			Milling Speed Vc (SFM)	Feed Per Tooth fz(in/t)	Milling Speed Vc (SFM)	Feed Per Tooth fz(in/t)
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	525 (330 - 655)	0.010 (0.008 - 0.016)	525 (330 - 655)	0.012 (0.008 - 0.016)
P	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	495 (330 - 655)	0.008 (0.006 - 0.012)	495 (330 - 655)	0.010 (0.006 - 0.012)
P	Die Steels (H13, D2)	~280 HB	425 (260 - 590)	0.008 (0.006 - 0.012)	425 (260 - 590)	0.010 (0.006 - 0.012)
M	Stainless Steels(Dry) (304SS, 420SS)	~250 HB	495 (330 - 655)	0.005 (0.004 - 0.012)	495 (330 - 655)	0.006 (0.004 - 0.012)
M	Stainless Steels(Wet) (304SS, 420SS)	~250 HB	260 (195 - 395)	0.005 (0.004 - 0.012)	260 (195 - 395)	0.006 (0.004 - 0.012)
K	Cast Iron (FC250)	~350 N/mm²	525 (330 - 985)	0.008 (0.008 - 0.014)	525 (330 - 985)	0.010 (0.008 - 0.014)
K	Ductile Cast Iron (60-40-18)	~800 N/mm²	525 (330 - 820)	0.006 (0.008 - 0.012)	525 (330 - 820)	0.008 (0.008 - 0.012)
N	Aluminum Alloys (6061, 7075)	~13% Si	985 (655 - 3280)	0.010 (0.004 - 0.016)	985 (655 - 3280)	0.012 (0.004 - 0.016)
S	Heat Resistant Alloys (Inconel 718)	-	115 (85 - 195)	0.006 (0.004 - 0.012)	115 (85 - 195)	0.007 (0.004 - 0.012)
S	Titanium Alloy (Ti-6Al-4V)	-	130 (100 - 395)	0.006 (0.004 - 0.012)	130 (100 - 395)	0.007 (0.004 - 0.012)
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HRC	330 (130 - 495)	0.006 (0.004 - 0.012)	330 (130 - 495)	0.007 (0.004 - 0.012)
H	Die Cast Steels (A2, S7)	43 - 48 HRC	195 (130 - 395)	0.005 (0.002 - 0.008)	195 (130 - 395)	0.006 (0.002 - 0.008)

Recommended Materials by Application

Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
CK010	NM	Yes				◎		
XP3035	GL/GM/GR	-	◎	○	○			
XC3030	GL/GM/GR	-	◎		○			
XP2040	GL/GM/GR	-	○	○				○
		Yes	○	◎			○	
XP2025	GL / GM	Yes	○	◎			○	
XC1015	GM/GR	-			◎			
XC5035	SM	-		◎				
		Yes		○			○	
XC5040	SM	Yes		○			◎	
XP6015	HR	-	○		○			◎

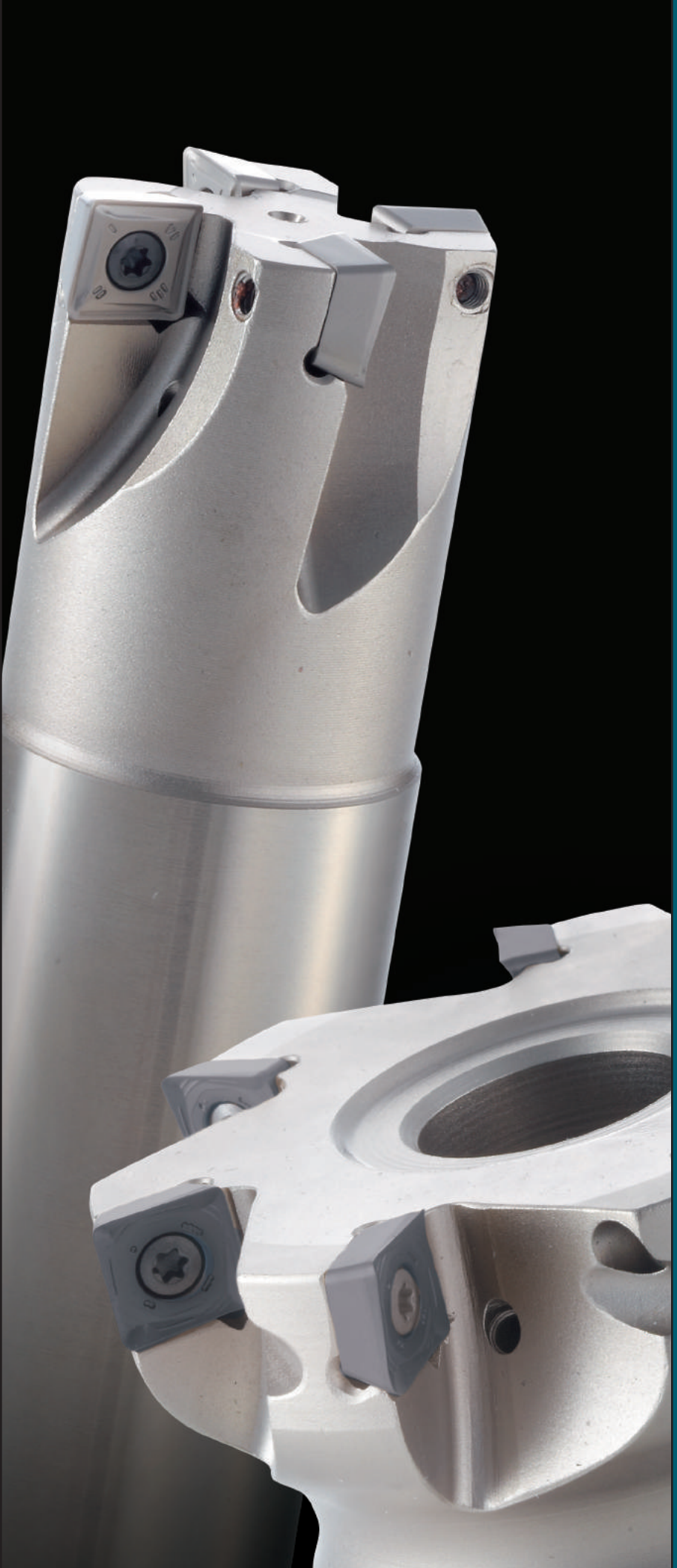
GL:Light Cutting GM:Medium Cutting GR: Rough Cutting
NM:Aluminum SM: Heat Resistant Alloy HR: Hardened Steel

○ good ◎ best

Cutting Conditions Adjustment Ratio

Depth of Cut Aa	Width of Cut Ar Max	Milling Speed Ratio	Feed Rate Ratio
< 0.2D	1D	0.8	0.5
0.25-0.3D	0.7D	0.8	0.6
0.4-0.5D	0.5D	0.9	0.7
0.6-0.7D	0.3D	0.9	0.8
0.8-1.0D	0.2D	1.0	0.9
1.1-1.5D	0.1D	1.0	1.0

Ex: For Ø1.250" PSEL with ZDKT11 inserts, Aa = 1.150", side milling in 1050 carbon steel:
Vc = 492 SFM x 1.0 = 492 SFM
fz = 0.008 in/t x 0.9 = 0.007 in/t
Ar = 0.2 x 1.250" = 0.250" Max



OSG PHOENIX® PSF

90º Shoulder Cutter

A series of 90° indexable shoulder end mills and facemills. Utilizing a 4-cornered insert, highly economical milling is possible in a wide variety of materials.

List 52900
PSF SA/FA (inch)

List 78030
PSF SS (Metric)

List 52901
PSF Bore (Inch)

List 78130
PSF Bore (Metric)

List 78PSF
PSF Inserts

List 7808H
PSF Accessories

Features & Benefits

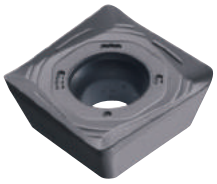
PSF's multiple cutting corners make it optimal for face milling.

- **4 Corners** - Maximum cutting depth of 0.197".
- **2 Corners** - Maximum cutting depth of 0.315".

Long tool life and high-efficiency for low cutting depths (ap=0.118" max.).

Insert Form

- Four-corner, positive square type insert.
- Sharp, three-dimensional breaker insert enables low-resistance milling!
- Compact sized insert for low depth of cut.



Differences From the Phoenix® PSE

Tool		Uses	No. of Corners	Cost	Side Milling Accuracy	Multiple Functions
	PSF	Optimal for face milling	4	◻	Δ	▢
	PSE	Optimal for multiple functions (helical, ramping, etc.)	2	Δ	▢	◻

For details on the Phoenix® PSE (Shoulder Cutters), please refer to P. 53

Δ Not Recommended ▢ Good ◻ Best

PSF Insert Variety

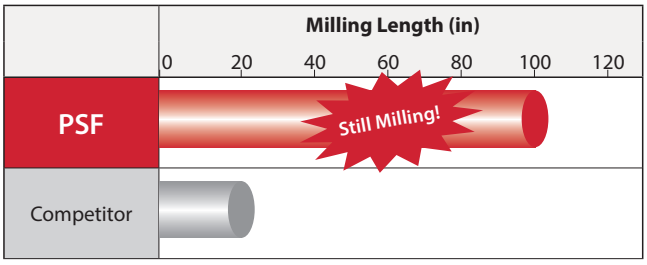
Grade	CK010	XP3035 XP2040 XC5040	XP3035 XP2040	XC1015
Chip Breaker	NM	GL	GM	GR
Rake Angle	30°	25°	15°	7°
Application	Aluminum alloy & Non-ferrous metal machining	Low-resistance machining, Heat-resistant alloy & Difficult-to-cut material machining	Multi-purpose machining & General steel milling	Interrupted machining & Cast iron machining
				

Processing Data

Long Tool Life - Duplex Stainless Steel

The competitor tool chipped early on, however, the PSF's stable milling resulted in a much longer tool life.

Tool	PSF09R025SS25-3S	Competitor
Insert (Grade)	SDKT09T308SR-GL (XC5040)	Coated Carbide Chip
Work Material	Duplex Stainless Steel	
Cutting Speed	262 SFM (800 RPM)	
Feed	11.81 IPM (0.004 ipt)	
Depth of Cut	Aa = 0.079 in, Ar = 0.591 in	
Coolant	Water Soluble	
Machine	Vertical Machining Center	

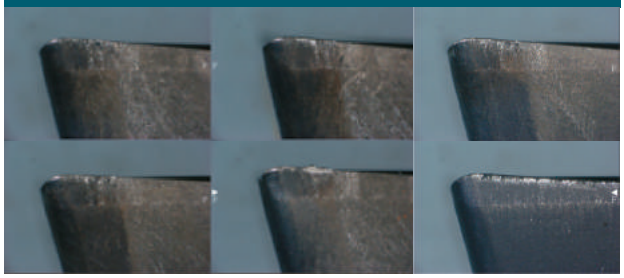


Excellent Wear Resistance & Durability - 304 Stainless Steel

After milling 400 inches, the competitor tool became chipped and could not continue. The PSF showed normal (low) wear and continued milling with 50% more durability.

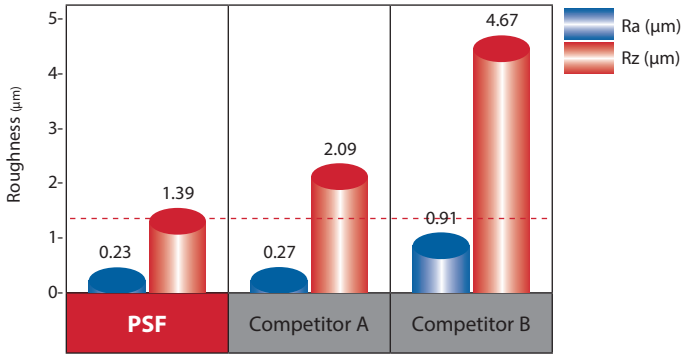
Tool	PSF09R050M22-6	Competitor
Insert (Grade)	SDKT09T308SR-GL (XP2040)	Coated Carbide Chip
Work Material	304 Stainless Steel	
Cutting Speed	524 SFM (1000 RPM)	
Feed	42.24 IPM (0.008 ipt)	
Depth of Cut	Aa = 0.079 in, Ar = 1.181 in	
Coolant	Water Soluble	
Machine	Vertical Machining Center	

After milling 400 inches: average relief wear VB : 0.003"



Superior Milling Surface Roughness - 304 Stainless Steel

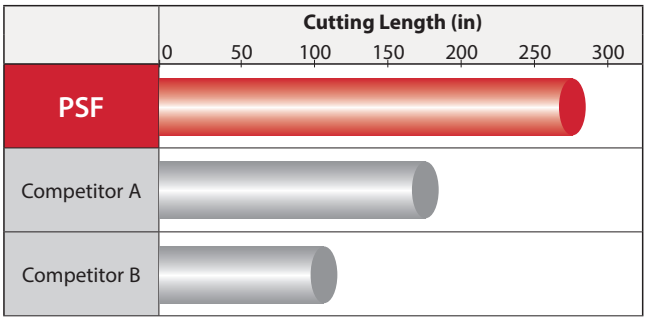
Tool	PSF09R025SS25-3S
Insert (Grade)	SDKT09T308SR-GL (XP2040)
Work Material	304 Stainless Steel
Cutting Speed	492 SFM (955 RPM)
Feed	22.44 IPM (0.004 ipt)
Depth of Cut	Aa = 0.008 in, Ar = 1.260 in
Coolant	Water Soluble
Machine	Horizontal Machining Center



Processing Data

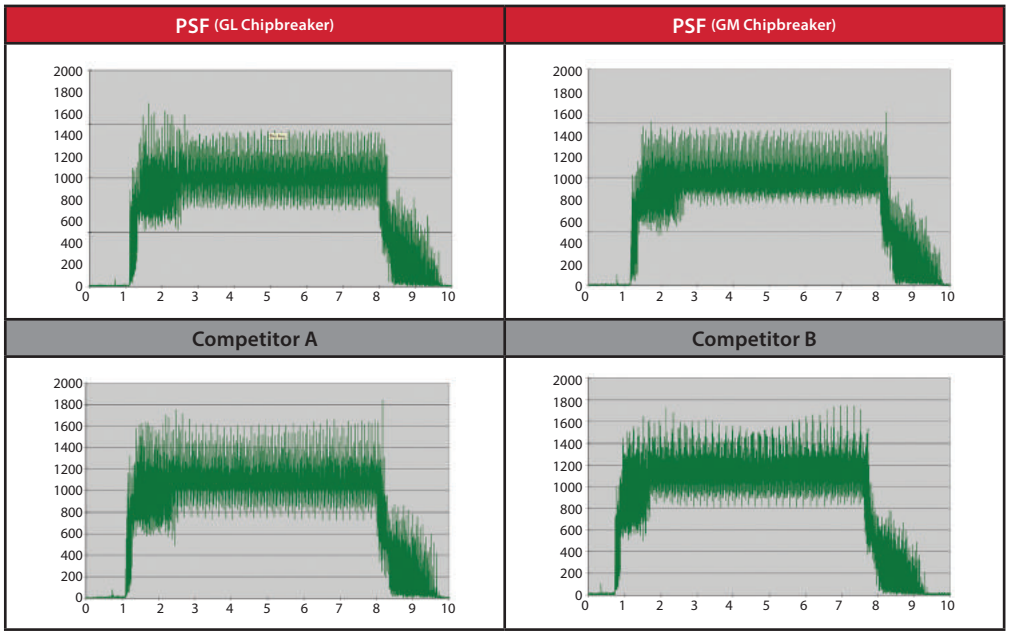
Long Tool Life - 1050 Steel

Tool	PSF09R050M22-6	Competitor
Insert (Grade)	SDKT09T308SR-GM (XP3035)	Coated Carbide Chip
Work Material	1050 Steel	
Cutting Speed	492 SFM (955 RPM)	
Feed	33.86 IPM (0.006 ipt)	
Depth of Cut	Aa = 0.079 in, Ar = 1.575 in	
Coolant	Air	
Machine	Horizontal Machining Center	



Reduced Cutting Forces - 1050 Steel

Tool	PSF09R050M22-6	Competitor
Insert (Grade)	SDKT09T308SR-GL (XP3035) SDKT09T308SR-GM (XP3035)	Coated Carbide Chip
Work Material	1050 Steel	
Cutting Speed	492 SFM (955 RPM)	
Feed	33.86 IPM (0.006 ipt)	
Depth of Cut	Aa = 0.079 in, Ar = 1.575 in	
Coolant	Air	
Machine	Horizontal Machining Center	



List 52900

PSF SA/FA (Inch)

SPEED FEED P102

Recommended Materials: p102
Accessories & Inserts: p101

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch) D	No. of Teeth	Shank Dia. (inch) d	Overall Length (inch) L	Neck Length (inch) L1	Applicable Insert
52900000	Cylindrical Shank Short	Normal	PSF09R100SA100-3S	1	1.000	3	1.000	4.724	1.378	SD_T09…
52900001			PSF09R125SA125-4S	1	1.250	4	1.250	5.118	1.772	
52900002			PSF09R150SA125-5S	2	1.500	5	1.250	5.512	1.969	
52900004	Weldon Shank Short	Normal	PSF09R100FA100-3S	1	1.000	3	1.000	3.831	1.551	
52900005			PSF09R125FA125-4S	1	1.250	4	1.250	4.378	2.098	
52900006			PSF09R150FA125-5S	2	1.500	5	1.250	4.378	2.098	

Packed: 1 pc.

PXT

List 78030

PSF SS (Metric)

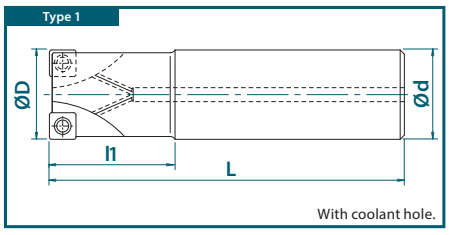
SPEED FEED P102

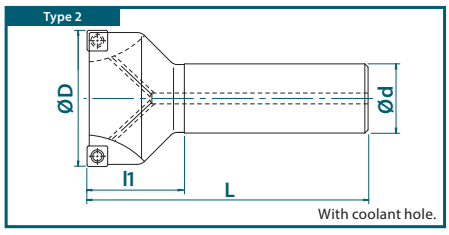
Recommended Materials: p102
Accessories & Inserts: p101

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	No. of Teeth	Shank Dia. (mm) d	Overall Length (mm) L	Neck Length (mm) L1	Applicable Insert
7803001	Cylindrical Shank Short	Normal	PSF09R025SS25-3S	1	25	3	25	120	35	SD_T09…
7803002			PSF09R032SS32-4S	1	32	4	32	130	45	
7803003			PSF09R040SS32-5S	2	40	5	32	140	50	

Packed: 1 pc.
Note: **This item is stocked overseas. Please contact OSG for availability and delivery.**

PXT





List 52901

PSF Bore (Inch)

SPEED FEED P102

Recommended Materials: p102
Accessories & Inserts: p101

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch)	No. of Teeth	Tool Height (inch)	Flange Dia. (inch)	Bore Hole Dia. (inch)	Keyway Width (inch)	Keyway Depth (inch)	Applicable Insert
					D		H	D2	d3	a	b	
52901000	Bore	Normal	PSF09R200A075-6	1	2.000	6	1.575	1.772	0.750	0.315	0.197	SD_T09…
52901001			PSF09R250A075-7	1	2.500	7	1.575	1.968	0.750	0.315	0.197	
52901002			PSF09R300A100-9	1	3.000	9	1.968	2.362	1.000	0.375	0.236	

Packed: 1 pc.

PXT

List 78130

PSF Bore (Metric)

SPEED FEED P102

Recommended Materials: p102
Accessories & Inserts: p101

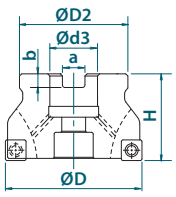
EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm)	No. of Teeth	Tool Height (mm)	Flange Dia. (mm)	Bore Hole Dia. (mm)	Keyway Width (mm)	Keyway Depth (mm)	Applicable Insert
					D		H	D2	d3	a	b	
7803011	Bore	Normal	PSF09R050M22-6	1	50	6	40	45	22.0	10.4	6.3	SD_T09…
7803012			PSF09R063M22-7	1	63	7	40	50	22.0	10.4	6.3	
7803013			PSF09R080M25.4-9	1	80	9	50	60	25.4	9.5	6.0	

Packed: 1 pc.

Note: **This item is stocked overseas. Please contact OSG for availability and delivery.**

PXT

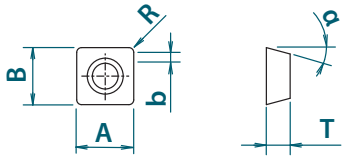
Type 1



With coolant hole.

List 78PSF

PSF Inserts



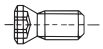
Designation	No. of Cutting Edges	Insert Size					EDP Number				
		AxB (mm)	T (mm)	α	R (mm)	b (mm)	CK010	XP3035	XP2040	XC1015	XC5040
SDKT09T308SR-GL	4	9.07 x 9.07	3.97	15°	0.8	2.5	-	7814073	7813073	-	7816073
SDKT09T308SR-GM							-	7814074	7813074	-	-
SDKT09T308SR-GR							-	-	-	7812075	-
SDHT09T308FR-NM							7811076	-	-	-	-

Packed: 10 pcs.

PXI

List 7808H

PSF Accessories

Appearance	EDP No.	Designation	Applicable Cutter		Recommended Tightening Torque
			(mm)	(inch)	
 Clamping Screw	7808110	FS30573 (Torx 8)	PSF SS Ø25-40 PSF BORE Ø50-80	PSF SA/FA Ø1-1.5″ PSF BORE Ø2-3″	1.6 Nm
 Wrench	7808205	T8-D (Torx 8)	PSF SS Ø25-40 PSF BORE Ø50-80	PSF SA/FA Ø1-1.5″ PSF BORE Ø2-3″	

Packed: Clamping Screws = 10 pcs.; Wrench = 1 pc.
Note: Wrench sold separately.

PXT

Cutting Conditions

Work Material		Tensile Strength – Hardness	Insert Size SD_T09… Face Milling • Side Milling		
			Milling Speed Vc (SFM)	Feed Per Tooth fz(in/t)	Depth of Cut Aa (in)
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	590 (330 - 820)	0.005 (0.002 - 0.008)	0.120
	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	590 (330 - 820)	0.005 (0.002 - 0.008)	0.120
	Die Steels (H13, D2)	~280 HB	495 (260 - 655)	0.004 (0.002 - 0.007)	0.120
M	Stainless Steels(Dry) (304SS, 420SS)	~250 HB	495 (260 - 655)	0.004 (0.002 - 0.007)	0.080
	Stainless Steels(Wet) (304SS, 420SS)	~250 HB	260 (195 - 395)	0.004 (0.002 - 0.007)	0.080
K	Cast Iron (FC250)	~350 N/mm²	590 (330 - 1150)	0.005 (0.002 - 0.008)	0.120
	Ductile Cast Iron (60-40-18)	~800 N/mm²	590 (330 - 885)	0.005 (0.002 - 0.008)	0.120
N	Aluminum Alloys (6061, 7075)	~13% Si	985 (655 - 4920)	0.006 (0.004 - 0.010)	0.120
S	Heat Resistant Alloys (Inconel 718)	-	115 (85 - 195)	0.004 (0.002 - 0.006)	0.060
	Titanium Alloy (Ti-6Al-4V)	-	130 (100 - 395)	0.004 (0.002 - 0.007)	0.060
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HRC	295 (130 - 495)	0.004 (0.003 - 0.008)	0.060
	Die Cast Steels (A2, S7)	43 - 48 HRC	230 (130 - 395)	0.003 (0.002 - 0.006)	0.020
	Hardened Steels (D2)	50 - 55 HRC	165 (130 - 295)	0.002 (0.002 - 0.004)	0.020

Recommended Materials by Application

Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
CK010	NM	Yes				◎		
XP3035	GL/GM	–	◎	○	○			
XP2040	GL/GM	–	○	○				○
		Yes	○	◎			○	
XC1015	GR	–			◎			
XC5040	GL	Yes		○			◎	

GL:Light Cutting GM:Medium Cutting GR: Rough Cutting NM:Aluminum

○ good ◎ best

OSG PHOENIX® PSTW

90° Shoulder Cutter

A series of 90° indexable shoulder facemills with 2-sided triangle inserts.

List 53100
PSTW Bore (Inch)

List 78131
PSTW Bore (Metric)

List 78PSTW
PSTW Inserts

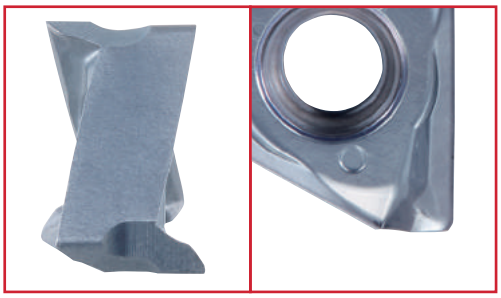
List 7808H
PSTW Accessories

Features & Benefits

Balanced cutter rigidity and cutting edge sharpness enable efficient milling, even with long overhangs.

Robust 2-sided triangle insert has 3 cutting edges per side (6 edges in total) and is capable of 0.472" maximum axial depth of cut.

Large, wide flutes designed for heavy machining enable good chip evacuation.



Strong, sharp insert provides excellent balance of high rigidity and low cutting forces.

Flat, secondary cutting edge enables excellent surface finish.

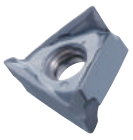
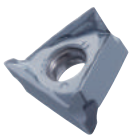
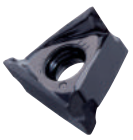
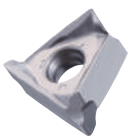
Phoenix 90° Shoulder Milling Lineup

Tool		Uses	No. of Corners	Cost	Accuracy	Productivity	Multiple Functions	Small Machines
	PSTW	Economical face milling with large metal removal rates	6	◎	◎	◎	Δ	Δ
	PSE	Optimal for multiple functions (helical, ramping, etc.)	2	Δ	◎	○	◎	○
	PSF	Optimal for face milling	4	○	○	○	○	◎

For details on the Phoenix® PSE (Shoulder Cutters), please refer to P. 53

Δ Not Recommended ○ Good ◎ Best

PSTW Insert Variety

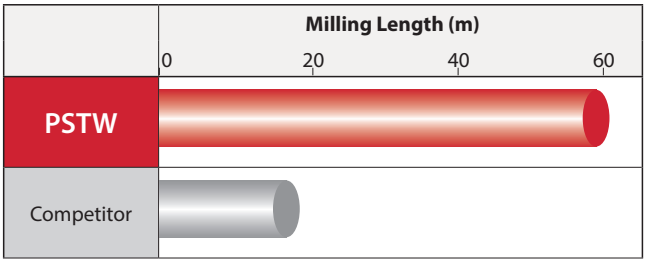
Grade	XP2040	XP3035 XC3030	XC1015 XP1020	XC5040
Chip Breaker	GL	GM	GR	SM
Rake Angle	25°	25°	2°	25°
Application	Low Resistance Machining	Multi-Purpose Machining & General Steel Machining	Interrupted Machining & Cast Iron Machining	Superalloy & Difficult-to-cut Material Machining
				

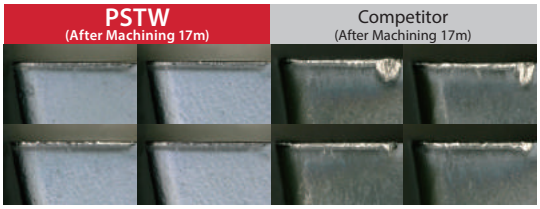
Processing Data

Rough Milling in Ductile Cast Iron - FCD500

The PSTW demonstrated much greater wear resistance and achieved 3.5 times the durability versus the competitor.

Tool	PSTW12R063M22-5	Competitor
Insert (Grade)	TNKU120608ER-GR (XP1020)	Coated Carbide Chip
Work Material	FCD500	
Cutting Speed	590 SFM (910 RPM)	
Feed	39.4 IPM (0.0086 ipt)	
Depth of Cut	Aa = 0.118 in, Ar = 1.772 in	
Coolant	Air	
Machine	Horizontal Machining Center	

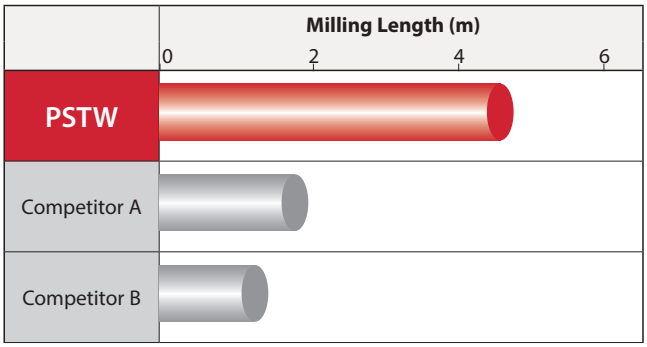


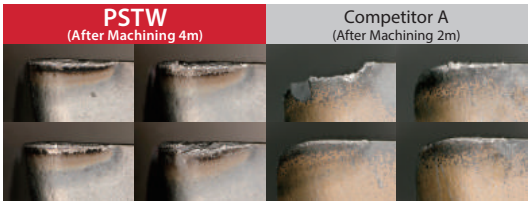


Long Tool Life in Titanium Alloy - Ti-6AL-4V

The PSTW demonstrated better ear resistance and longer durability compared to the competitor, which showed early wear and chipping.

Tool	PSTW12R050M22-4	Competitor
Insert (Grade)	TNKU120608ER-SM (XC5040)	Coated Carbide Chip
Work Material	Ti-6Al-4V	
Cutting Speed	130 SFM (255 RPM)	
Feed	3.23 IPM (0.003 ipt)	
Depth of Cut	Aa = 0.059 in, Ar = 0.787 in	
Coolant	Air	
Machine	Horizontal Machining Center	

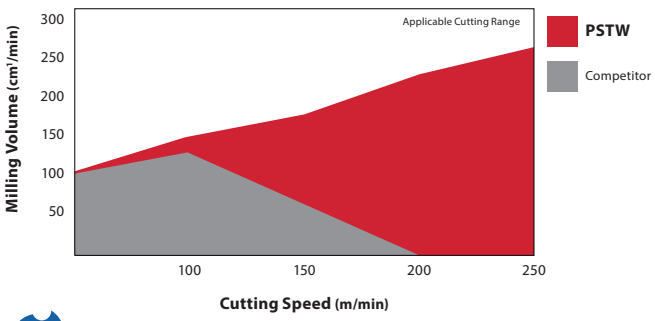




High Efficiency in Long Reach Applications - 1050 Steel

PSTW's increased stability provides high efficiency milling even at long overhang lengths.

Tool	PSTW12R050M22-4	Competitor
Insert (Grade)	TNKU120608ER-SM (XP3035)	Coated Carbide Chip
Work Material	1050 Steel	
Cutting Speed	Slot Milling	
Feed	Aa = 0.118 in, Ar = 1.968 in	
Depth of Cut	7.480 in (3.8xD)	
Coolant	Air	
Machine	Horizontal Machining Center	



List 53100

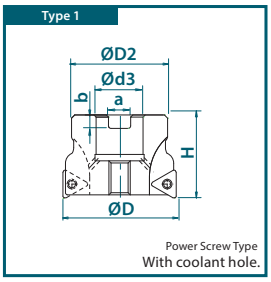
PSTW Bore (Inch)

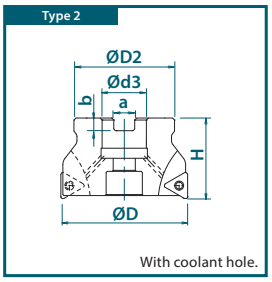
SPEED FEED P109
Recommended Materials: p110
Accessories & Inserts: p108

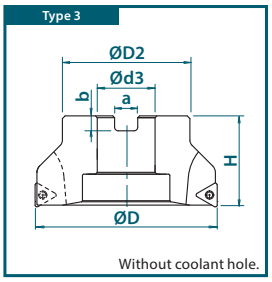
EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch)	No. of Teeth	Tool Height (inch)	Flange Dia. (inch)	Bore Hole Dia. (inch)	Keyway Width (inch)	Keyway Depth (inch)	Applicable Insert
					D		H	D2	d3	a	b	
53100000	Bore	Normal	PSTW12R200A075-3	1	2.000	3	1.575	1.772	0.750	0.315	0.197	TNKU12…
53100001			PSTW12R250A075-3	2	2.500	3	1.575	1.968	0.750	0.315	0.197	
53100002			PSTW12R300A100-5	2	3.000	5	1.968	2.362	1.000	0.375	0.236	
53100003			PSTW12R400A125-5	3	4.000	5	1.968	2.756	1.250	0.500	0.315	
53100004			PSTW12R500A150-7	3	5.000	7	2.480	3.543	1.500	0.625	0.394	
53100005		Close	PSTW12R200A075-4	1	2.000	4	1.575	1.772	0.750	0.315	0.197	
53100006			PSTW12R250A075-5	2	2.500	5	1.575	1.968	0.750	0.315	0.197	
53100007			PSTW12R300A100-6	2	3.000	6	1.968	2.362	1.000	0.375	0.236	
53100008			PSTW12R400A125-7	3	4.000	7	1.968	2.756	1.250	0.500	0.315	
53100009			PSTW12R500A150-9	3	5.000	9	2.480	3.543	1.500	0.625	0.394	

Packed: 1 pc.

PXT







List 78131

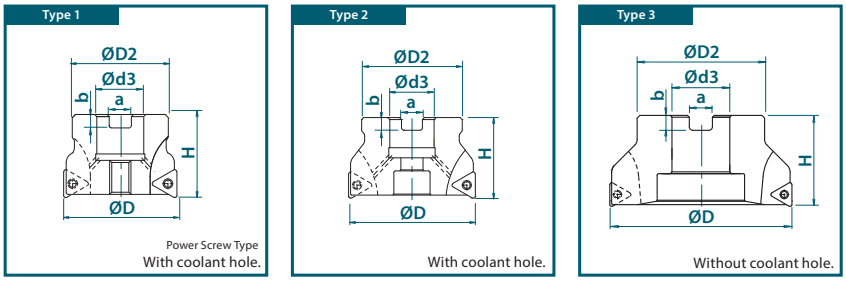
PSTW Bore (Metric)

SPEED FEED P109
Recommended Materials: p110
Accessories & Inserts: p108

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch) D	No. of Teeth	Tool Height (inch) H	Flange Dia. (inch) D2	Bore Hole Dia. (inch) d3	Keyway Width (inch) a	Keyway Depth (inch) b	Applicable Insert
7803100	Bore	Normal	PSTW12R050M22-3	1	50	3	40	45	22	10.4	6.3	TNKU12…
7803102			PSTW12R063M22-3	2	63	3	40	50	22	10.4	6.3	
7803110			PSTW12R080M27-5	2	80	5	50	60	27.0	12.4	7	
7803104			PSTW12R080M25.4-5	2	80	5	50	60	25.4	9.5	6	
7803112			PSTW12R100M32-5	2	100	5	50	70	32.0	14.4	8	
7803106			PSTW12R100M31.7-5	3	100	5	50	70	32	12.7	8	
7803114			PSTW12R125M40-7	2	125	7	63	90	40	16.4	9	
7803108			PSTW12R125M38.1-7	3	125	7	63	90	38.1	15.9	10	
7803101		Close	PSTW12R050M22-4	1	50	4	40	45	22.0	10.4	6.3	
7803103			PSTW12R063M22-5	2	63	5	40	50	22	10.4	6.3	
7803111			PSTW12R080M27-6	2	80	6	50	60	27	12.4	7	
7803105			PSTW12R080M25.4-6	2	80	6	50	60	25.4	9.5	6	
7803113			PSTW12R100M32-7	2	100	7	50	70	32.0	14.4	8	
7803107			PSTW12R100M31.7-7	3	100	7	50	70	31.8	12.7	8	
7803115			PSTW12R125M40-9	2	125	9	63	90	40	16.4	9	
7803109			PSTW12R125M38.1-9	3	125	9	63	90	38.1	15.9	10	

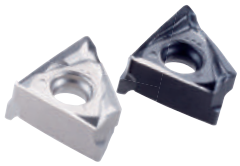
Packed: 1 pc.
Note: **This item is stocked overseas. Please contact OSG for availability and delivery.**

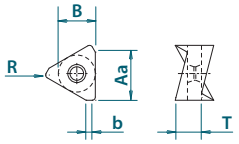
PXT



List 78PSTW

PSTW Inserts





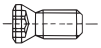
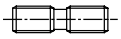
Designation	No. of Cutting Edges	Insert Size					EDP Number					
		B (mm)	T (mm)	R (mm)	b (mm)	Aa (mm)	XP3035	XC3030	XP2040	XC1015	XP1020	XC5040
TNKU120608ER-GL	6	10.8	6.55	0.8	1.5	12	-	-	7813089	-	-	-
TNKU120608ER-GM							7814088	7825088	-	-	-	-
TNKU120608ER-GR							-	-	-	7812090	7821090	-
TNKU120608ER-SM							-	-	-	-	-	7816091

Packed: 10 pcs.

PXI

List 7808H

PSTW Accessories

Appearance	EDP No.	Designation	Applicable Cutter		Recommended Tightening Torque
			(mm)	(inch)	
 Clamping Screw	7808129	FS40511 (Torx 15)	PSTW BORE Ø50-125	PSTW BORE Ø2-5"	5.0 Nm
 Power Screw	7808151	PS1031 (M10x31)	PSTW BORE Ø50	PSTW BORE Ø2"	20.0 Nm
 Wrench	7808208	T15-D (Torx 15)	PSTW BORE Ø50-125	PSTW BORE Ø2-5"	

Packed: Clamping Screws = 10 pcs.; Power Screw = 1 pc.; Wrench = 1 pc.
Note: Wrench sold separately.

PXT

Cutting Conditions

Work Material		Tensile Strength – Hardness	Insert Size TNKU12… Face Milling		
			Milling Speed Vc (SFM)	Feed Per Tooth fz(in/t)	Depth of Cut Aa (in)
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	590 (330 - 820)	0.006 (.002 - .010)	0.120
	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	590 (330 - 820)	0.006 (.002 - .010)	0.120
	Die Steels (H13, D2)	~280 HB	495 (260 - 655)	0.005 (.002 - .008)	0.120
M	Stainless Steels(Dry) (304SS, 420SS)	~250 HB	495 (260 - 655)	0.004 (.002 - .007)	0.080
	Stainless Steels(Wet) (304SS, 420SS)	~250 HB	260 (195 - 395)	0.004 (.002 - .007)	0.080
K	Cast Iron (FC250)	~350 N/mm²	650 (330 - 1150)	0.008 (.004 - .012)	0.120
	Ductile Cast Iron (60-40-18)	~800 N/mm²	590 (330 - 885)	0.006 (.002 - .010)	0.120
S	Heat Resistant Alloys (Inconel 718)	-	115 (85 - 195)	0.003 (.002 - .006)	0.040
	Titanium Alloy (Ti-6Al-4V)	-	130 (100 - 395)	0.003 (.002 - .006)	0.060
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HrC	330 (165 - 495)	0.004 (.003 - .008)	0.060
	Die Cast Steels (A2, S7)	43 - 48 HrC	265 (130 - 395)	0.003 (.002 - .006)	0.040
	Hardened Steels (D2)	50 - 55 HrC	195 (130 - 295)	0.002 (.002 - .004)	0.020

Recommended Materials by Application

Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
XP3035	GM	-	◎	○	○			
XC3030	GM	-	◎		○			
XP2040	GL	-	○	○				○
		Yes	○	◎			○	
XC1015	GR	-			◎*			
XP1020	GR	-			◎**			
XC5040	SM	Yes		○			◎	

GL: Light Cutting GM: Medium Cutting GR: Rough Cutting SM: Heat Resistant Alloy ○ **good** ◎ **best**
*: XC1015 best recommended for grey cast iron
**: XP1020 best recommended for ductile cast iron

OSG PHOENIX® PRC

Radius Cutter

A highly versatile series of button insert end mills and facemills for contour milling applications..

List 78005
PRC SA (Inch)

List 78003
PRC SS (Metric)

List 78004
PRC Bore (Inch)

List 78002
PRC Bore (Metric)

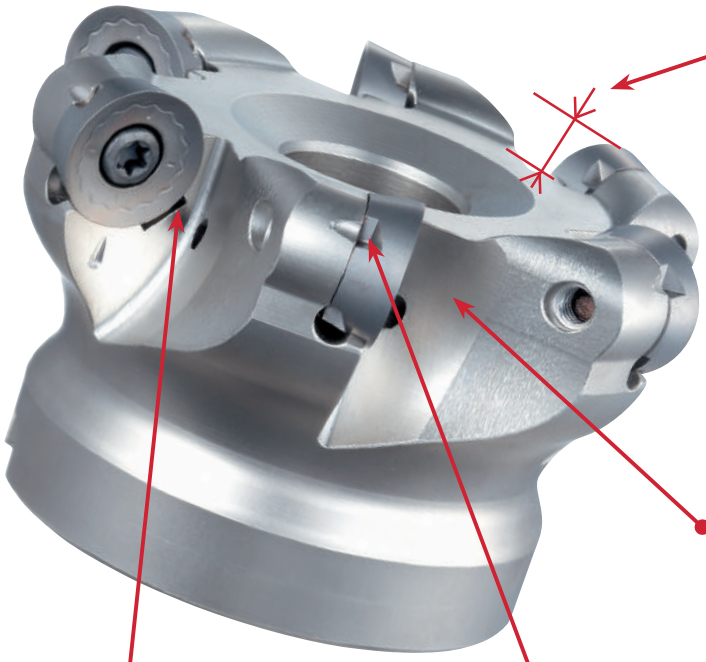
List 52602
PRC ASF (Inch)

List 78017
PRC SF (Metric)

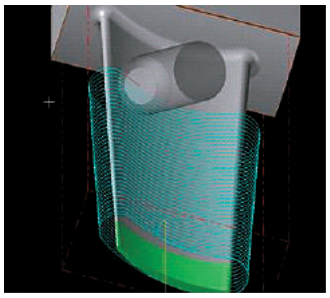
List 78PRC
PRC Inserts

List 7808H
PRC Accessories

Features & Benefits



The PRC's body relief shape supports 3-dimensional machining.

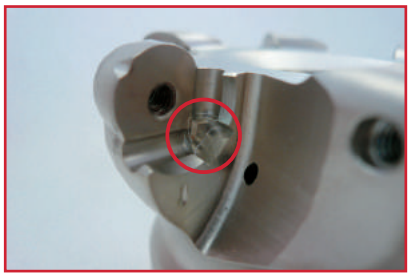


A wide chip pocket for efficient chip evacuation.

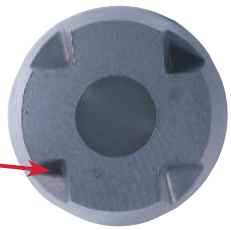
PRC's design eliminates the need for insert clamps, enabling smooth chip evacuation.

Insert Rotation Stopper

Settings to accommodate cutout. The user can select the number of corners to be used by changing the depth of cut setting (4 or 8 corners).



Back of Inserts



Processing Data

Long Tool Life in Nickel Alloys - Inconel 718 (45 HRC)

The competitor tool broke extensively after milling only 80 inches, with damage extending to other corners, making the tool unusable. In contrast, the PRC was able to mill 400 inches - a considerably longer tool life.

Tool	PRC12R050M22-5	Competitor
Insert (Grade)	RPHT1204M0EN-SM (XC5035)	Coated Carbide Chip
Work Material	Inconel 718 (45 HRC)	
Cutting Speed	131 SFM (255 RPM)	196 SFM (382 RPM)
Feed	10.63 IPM (0.008 ipt)	10.63 IPM (0.005 ipt)
Depth of Cut	Aa = 0.020 in, Ar = 1.181 in	
Coolant	Water Soluble	
Machine	Horizontal Machining Center	
Durability	400 inches	80 inches

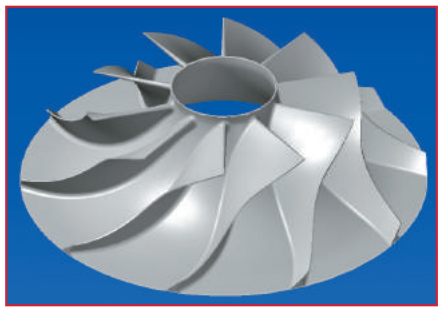
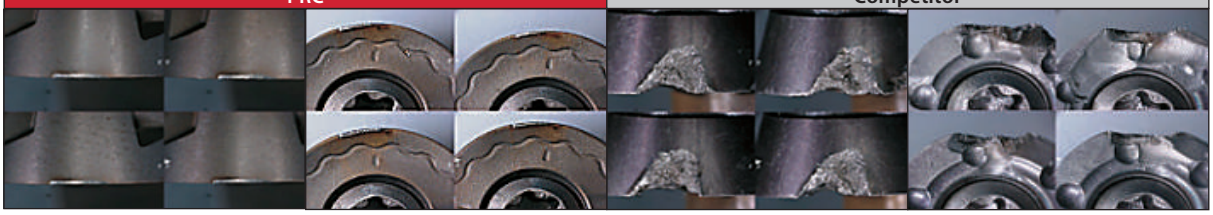


Photo of Inserts After Milling 80 Inches

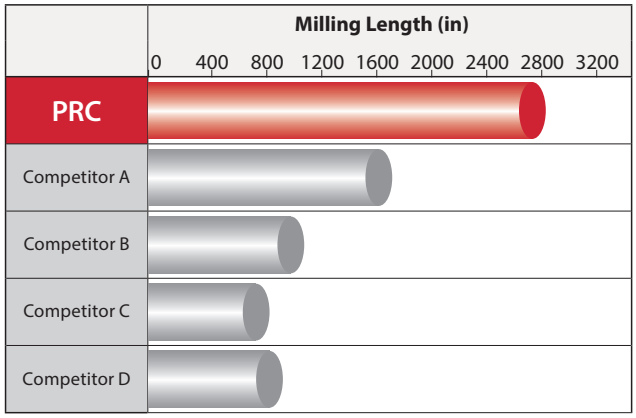


Durability & Wear Resistance in Stainless Steel - 304 Stainless Steel

Under identical rough milling conditions, the competitors' tools resulted in premature chipping and breakage, however the ***PRC showed normal wear with 1.7 times the durability!***

Tool	PRC12R050M22-5	Competitor A, B, C, D
Insert (Grade)	RPHT1204M0EN-GL (XP2040)	Coated Carbide Chip
Work Material	304 Stainless Steel	
Cutting Speed	328 SFM (637 RPM)	
Feed	31.50 IPM (0.010 ipt)	
Depth of Cut	Aa = 0.039 in, Ar = 0.984 in	
Coolant	Water Soluble	
Machine	Horizontal Machining Center	

PRC Inserts After Milling 2800 Inches

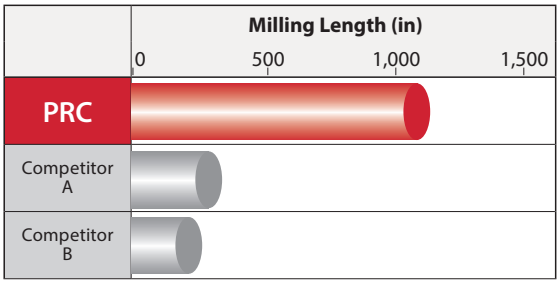


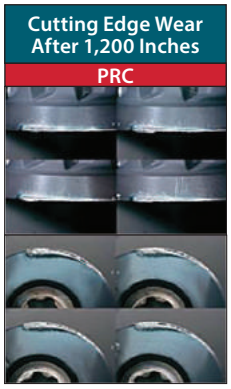
Processing Data

» Long Tool Life in Cast Iron - FC250

PRC's greater rigidity and wear resistance resulted in ***3 times the tool life*** compared to the competitors in grey cast iron.

Tool	ø40mm PRC12R0405532-3S
Insert (Grade)	RPHW1204M0SN (XC1015)
Work Material	FC250 Grey Cast Iron
Cutting Speed	1435 RPM
Feed	90.5 IPM
Depth of Cut	Aa = 0.118 in, Ar = 0.984 in
Coolant	Air
Machine	Horizontal Machining Center

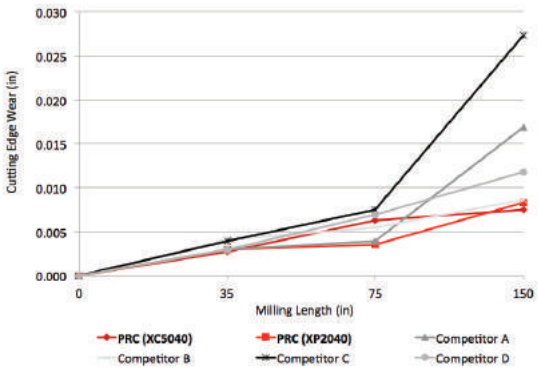




» Excellent Wear Resistance in Titanium - Ti-6Al-4V

In Titanium Alloys, both PRC grades consistently exhibited the least cutting edge wear at any milling length, providing excellent wear resistance and ensuring longer, more stable tool life.

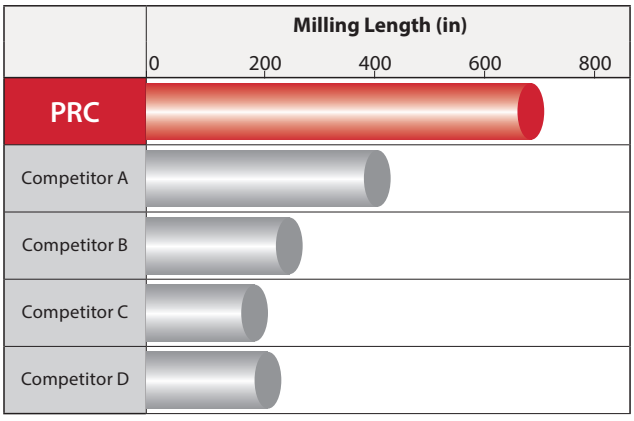
Tool	ø50mm PRC12R050M22-5
Insert (Grade)	RPHT1204M8EN-SM (XC5040) RPHT1204M0EN-GL (XP2040)
Work Material	Ti-6Al-4V
Cutting Speed	385 RPM
Feed	9.1 IPM
Depth of Cut	Aa = 0.079 in, Ar = 0.984 in
Coolant	Water Soluble
Machine	Horizontal Machining Center



» Long Tool Life in Mold & Die Steel - H13 (43-48 HRC)

Under identical rough milling conditions, PRC's stability and wear resistance resulted in the longest tool life compared to all competitors.

Tool	ø40mm PRC12R0405S32-3S
Insert (Grade)	RPHT1204M0EN-GL (XP2040)
Work Material	H13 (43-48 HRC)
Cutting Speed	480 RPM
Feed	39.4 IPM
Depth of Cut	Aa = 0.020 in, Ar = 0.787 in
Coolant	Water Soluble
Machine	Horizontal Machining Center



List 78005

SPEED FEED P121

Recommended Materials: p121
Accessories & Inserts: p120
Maximum Ramping Angle: p122

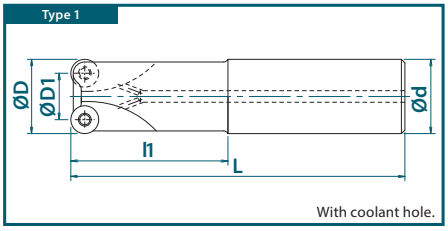
PRC SA (Inch)

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch) D	Effective Dia. (inch) D1	No. of Teeth	Shank Dia. (inch) d	Overall Length (inch) L	Neck Length (inch) L1	Applicable Insert
7800500	Cylindrical Shank Short	Normal	PRC10R100SA100-3S	1	1.000	0.606	3	1.000	5.512	2.362	RPH_10...
7800501			PRC10R125SA125-4S	1	1.250	0.856	4	1.250	5.905	2.756	
7800502			PRC12R125SA125-2S	1	1.250	0.778	2	1.250	5.905	2.756	RPH_12...
7800503			PRC12R150SA125-3S	2	1.500	1.028	3	1.250	5.905	1.968	
7800504			PRC16R150SA125-2S	2	1.500	0.870	2	1.250	5.905	1.968	RPH_16...
7800505	Cylindrical Shank Long		PRC10R100SA100-3L	1	1.000	0.606	3	1.000	7.874	4.724	RPH_10...
7800506			PRC10R125SA125-4L	1	1.250	0.856	4	1.250	7.874	4.724	
7800507			PRC12R125SA125-2L	1	1.250	0.778	2	1.250	7.874	4.724	RPH_12...
7800508			PRC12R150SA125-3L	2	1.500	1.028	3	1.250	9.842	1.968	
7800509			PRC16R150SA125-2L	2	1.500	0.087	2	1.250	9.842	1.968	RPH_16...

Packed: 1 pc.

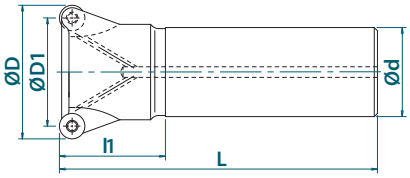
PXT

Type 1



With coolant hole.

Type 2



With coolant hole.

List 78003

PRC SS (Metric)

SPEED FEED P121

Recommended Materials: p121
Accessories & Inserts: p120
Maximum Ramping Angle: p122

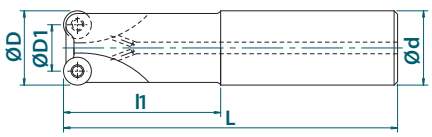
EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	Effective Dia. (mm) D1	No. of Teeth	Shank Dia. (mm) d	Overall Length (mm) L	Neck Length (mm) L1	Applicable Insert
7800300	Cylindrical Shank Short	Normal	PRC10R020SS20-2S	1	20	10	2	20	130	50	RPH_10…
7800301			PRC10R025SS25-3S	1	25	15	3	25	140	60	
7800302			PRC10R032SS32-4S	1	32	22	4	32	150	70	
7800303	Cylindrical Shank Long		PRC10R020SS20-2L	1	20	10	2	20	180	80	
7800304			PRC10R025SS25-3L	1	25	15	3	25	200	120	
7800305			PRC10R032SS32-4L	1	32	22	4	32	200	120	
7800322	Cylindrical Shank Short		PRC12R024SS25-2S	1	24	12	2	25	140	60	RPH_12…
7800318			PRC12R030SS32-2S	1	30	18	2	32	150	70	
7800306			PRC12R032S032-2S	1	32	20	2	32	150	70	
7800320			PRC12R032SS32-3S	1	32	20	3	32	150	70	
7800307			PRC12R040SS32-3S	2	40	28	3	32	150	50	
7800308			PRC12R050SS42-4S	2	50	38	4	42	150	50	
7800323	Cylindrical Shank Long		PRC12R024SS25-2L	1	24	12	2	25	180	100	
7800319			PRC12R030SS32-2L	1	30	18	2	32	200	120	
7800309			PRC12R032SS32-2L	1	32	20	2	32	200	120	
7800321			PRC12R032SS32-3L	1	32	20	3	32	200	120	
7800310			PRC12R040SS32-3L	2	40	28	3	32	250	50	
7800311			PRC12R050SS42-4L	2	50	38	4	42	250	50	
7800324	Cylindrical Shank Short		PRC16R033SS32-2S	1	32	16	2	32	150	70	RPH_16…
7800312			PRC16R040SS32-2S	2	40	24	2	32	150	50	
7800313			PRC16R050SS42-3S	2	50	34	3	42	150	50	
7800314			PRC16R063SS042-4S	2	63	47	4	42	150	50	
7800325	Cylindrical Shank Long		PRC16R033SS32-2L	1	32	16	2	32	200	120	
7800315			PRC16R040SS32-2L	2	40	24	2	32	250	50	
7800316			PRC16R050SS42-3L	2	50	34	3	42	250	50	
7800317			PRC16R063SS42-4L	2	63	47	4	42	250	50	

Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

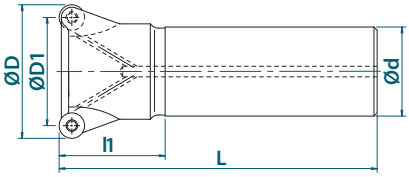
PXT

Type 1



With coolant hole.

Type 2



With coolant hole.

List 78004

PRC Bore (Inch)

SPEED FEED P121

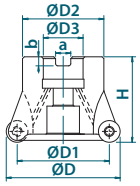
Recommended Materials: p121
Accessories & Inserts: p120
Maximum Ramping Angle: p122

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch)	Effective Dia. (inch)	No. of Teeth	Tool Height (inch)	Flange Dia. (inch)	Bore Dia. (inch)	Keyway Width (inch)	Keyway Depth (inch)	Applicable Insert
					D	D1		H	D2	d3	a	b	
7800412	Bore	Normal	PRC10R200A075-5	2	2.000	1.606	5	1.575	1.772	0.750	0.315	0.197	RPH_10…
7800413			PRC10R250A075-6	2	2.500	2.106	6	1.575	1.968	0.750	0.315	0.197	
7800400			PRC12R200A075-4	2	2.000	1.528	4	1.575	1.772	0.750	0.315	0.197	RPH_12...
7800401			PRC12R250A075-4	2	2.500	2.028	4	1.575	1.968	0.750	0.315	0.197	
7800402			PRC12R300A100-5	2	3.000	2.528	5	1.968	2.362	1.000	0.375	0.236	
7800403			PRC12R400A150-6	3	4.000	3.528	6	1.968	2.756	1.500	0.625	0.394	
7800404		Close	PRC12R200A075-5	2	2.000	1.528	5	1.575	1.772	0.750	0.315	0.197	
7800405			PRC12R250A075-6	2	2.500	2.028	6	1.575	1.968	0.750	0.315	0.197	
7800406			PRC12R300A100-8	2	3.000	2.528	8	1.968	2.362	1.000	0.375	0.236	
7800407			PRC12R400A150-10	3	4.000	3.528	10	1.968	2.756	1.500	0.625	0.394	
7800414			PRC12R500A150-12	3	5.000	4.528	12	2.480	3.543	1.500	0.625	0.394	
7800408		Normal	PRC16R200A075-3	2	2.000	1.370	3	1.575	1.772	0.750	0.315	0.197	RPH_16...
7800409			PRC16R250A075-5	2	2.500	1.870	5	1.575	1.968	0.750	0.315	0.197	
7800410			PRC16R300A100-6	2	3.000	2.370	6	1.968	2.362	1.000	0.375	0.236	
7800411			PRC16R400A150-7	3	4.000	3.370	7	1.968	2.756	1.500	0.625	0.394	
7800415			PRC16R500A150-8	3	5.000	4.370	8	2.480	3.543	1.500	0.625	0.394	
7800416			PRC16R600A150-10	3	6.000	5.370	10	2.480	3.740	1.500	0.625	0.394	

Packed: 1 pc.

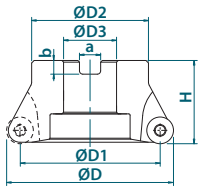
PXT

Type 2



With coolant hole.

Type 3



Without coolant hole.

List 78002

PRC Bore (Metric)

SPEED FEED P121

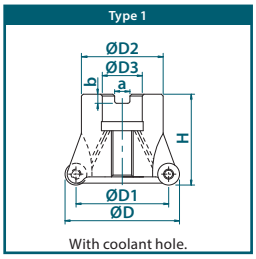
Recommended Materials: p121
Accessories & Inserts: p120
Maximum Ramping Angle: p122

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	Effective Dia. (mm) D1	No. of Teeth	Tool Height (mm) H	Flange Dia. (mm) D2	Bore Dia. (mm) d3	Keyway Width (mm) a	Keyway Depth (mm) b	Applicable Insert
7800200	Bore	Normal	PRC12R050M22-4	2	50	38	4	40	45	22.00	10.4	6.3	RPH_12...
7800201			PRC12R063M22-4	2	63	51	4	40	50	22.00	10.4	6.3	
7800202			PRC12R080M27-5	2	80	68	5	50	60	27.00	12.4	7.0	
7800209			PRC12R080M25.4-5	2	80	68	5	50	60	25.40	9.5	6.0	
7800203			PRC12R100M32-6	2	100	88	6	50	70	32.00	14.4	8.0	
7800210			PRC12R100M31.7-6	3	100	88	6	50	70	31.75	12.7	8.0	
7800204		Close	PRC12R050M22-5	2	50	38	5	40	45	22.00	10.4	6.3	
7800206			PRC12R063M22-6	2	63	51	6	40	50	22.00	10.4	6.3	
7800207			PRC12R080M27-8	2	80	38	8	50	60	27.00	12.4	7.0	
7800211			PRC12R080M25.4-8	2	80	38	8	50	60	25.40	9.5	6.0	
7800208			PRC12R100M32-10	2	100	88	10	50	70	32.00	14.4	8.0	
7800212			PRC12R100M31.7-10	3	100	88	10	50	70	31.75	12.7	8.0	
7800213		Normal	PRC16R050M22-3	1	50	34	3	40	45	22.00	10.4	6.3	RPH_16...
7800214			PRC16R063M22-5	2	63	47	5	40	50	22.00	10.4	6.3	
7800216			PRC16R080M27-6	2	80	64	6	50	60	27.00	12.4	7.0	
7800218			PRC16R080M25.4-6	2	80	64	6	50	60	25.40	9.5	6.0	
7800217			PRC16R100M32-7	2	100	84	7	50	70	32.00	14.4	8.0	
7800219			PRC16R0100M31.7-7	3	100	84	7	50	70	31.75	12.7	8.0	

Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

PXT

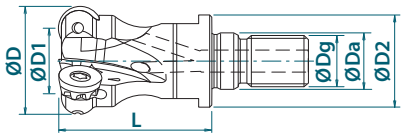


List 52602

PRC ASF (Inch)

SPEED FEED P121

Recommended Materials: p121
Accessories & Inserts: p120
Maximum Ramping Angle: p122
SF Arbors: p189



EDP No.	Body Type	Designation	Tool Dia. (inch)	Effective Dia. (inch)	No. of Teeth	Pilot Dia. (inch)	Thread Dia. (mm)	Overall Length (inch)	Flange Dia. (inch)	Wrench Size	Applicable Insert
			D	D1		Da	Dg	L	D2		
52602000	Screw Fit Head	PRC10R100ASF12-3	1.000	0.606	3	0.492	M12	1.378	0.905	17	RPH_10…
52602001		PRC10R125ASF16-4	1.250	0.856	4	0.669	M16	1.575	1.102	22	
52602002		PRC12R125ASF16-2	1.250	0.778	2	0.669	M16	1.575	1.102	22	RPH_12…
52602003		PRC12R150ASF16-3	1.500	1.028	3	0.669	M16	1.575	1.102	22	
52602004		PRC16R150ASF16-2	1.500	0.870	2	0.669	M16	1.575	1.102	22	RPH_16…

Packed: 1 pc.

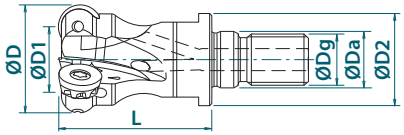
PXT

List 78017

PRC SF (Metric)

SPEED FEED P121

Recommended Materials: p121
Accessories & Inserts: p120
Maximum Ramping Angle: p122
SF Arbors: p190



EDP No.	Body Type	Designation	Tool Dia. (mm)	Effective Dia. (mm)	No. of Teeth	Pilot Dia. (mm)	Thread Dia. (mm)	Overall Length (mm)	Flange Dia. (mm)	Wrench Size	Applicable Insert
			D	D1		Da	Dg	L	D2		
7801700	Screw Fit Head	PRC10R020SF10-2	20	10	2	10.5	M10	33	18	14	RPH_10…
7801701		PRC10R025SF12-3	25	15	3	12.5	M12	35	23	17	
7801702		PRC10R030SF16-3	30	20	3	17.0	M16	40	28	22	
7801703		PRC10R032SF16-4	32	22	4	17.0	M16	40	28	22	
7801704		PRC10R040SF16-4	40	30	4	17.0	M16	40	28	22	
7801705		PRC12R030SF16-2	30	18	2	17.0	M16	40	28	22	RPH_12…
7801706		PRC12R032SF16-3	32	20	3	17.0	M16	40	28	22	
7801707		PRC12R040SF16-3	40	28	3	17.0	M16	40	28	22	

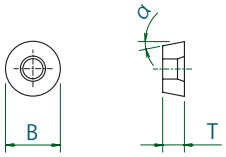
Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

PXT

List 78PRC

PRC Inserts



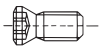
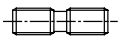
Designation	No. of Cutting Edges	Insert Size			EDP Number								
		B (mm)	T (mm)	α	CK010	XP3035	XC3030	XP2040	XP2025	XC1015	XC5035	XC5040	XP6015
RPHW10T3MOSN	8	10	3.97	11°	-	7814030	7825017	-	-	-	-	-	-
RPHW10T3MOEN	8				-	-	-	-	-	7812017	-	-	-
RPHT10T3MOEN-GL	8				-	-	-	7813008	7826008	-	-	-	-
RPHT10T3MOEN-SM	4				-	-	-	-	-	-	7815010	-	-
RPHT10T3M8EN-SM	8				-	-	-	-	-	-	7815050	7816050	-
RPHT10T3MOFN-NM	8				7811009	-	-	-	-	-	-	-	-
RPMT10T3M8EN-HR	8				-	-	-	-	-	-	-	-	7824083
RPHW1204MOSN	8	12	4.76		-	-	-	-	-	7812018	-	-	-
RPHW1204MOSN	8				-	7814018	7825018	-	-	-	-	-	-
RPHT1204MOEN-GL	8				-	-	-	7813011	7826011	-	-	-	-
RPHT1204MOEN-SM	4				-	-	-	-	-	-	7815012	-	-
RPHT1204M8EN-SM	8				-	-	-	-	-	-	7815051	7816051	-
RPHT1204MOFN-NM	8				7811013	-	-	-	-	-	-	-	-
RPMT1204M8EN-HR	8				-	-	-	-	-	-	-	-	7824084
RPHW1605MOSN	8	16	5.56		-	-	-	-	-	7812019	-	-	-
RPHW1605MOSN	8				-	7814019	7825019	-	-	-	-	-	-
RPHT1605MOEN-GL	8				-	-	-	7813014	7826014	-	-	-	-
RPHT1605MOEN-SM	4				-	-	-	-	-	-	7815015	-	-
RPHT1605M8EN-SM	8				-	-	-	-	-	-	7815052	7816052	-
RPHT1605MOFN-NM	8				7811016	-	-	-	-	-	-	-	-

Packed: 10 pcs.

PXI

List 7808H

PRC Accessories

Appearance	EDP No.	Designation	Applicable Insert	Applicable Cutter		Recommended Tightening Torque
				(mm)	(inch)	
 Clamping Screw	7808116	FS30573A (Torx 10)	RPH_10...	PRC SS/SF Ø20-32	PRC10 SA/ASF Ø1-1.25″ PRC10 BORE Ø2-2.5″	2.0 Nm
	7808112	FS35586 (Torx 15)	RPH_12...	PRC SS/SF Ø32-50 PRC BORE Ø32-63	PRC12 SA/ASF Ø1.25-1.5″ PRC12 BORE Ø2-4″	3.2 Nm
	7808113	FS45510 (Torx 20)	RPH_16...	PRC SS/SF Ø40-63 PRC BORE Ø50-100	PRC16 SA/ASF Ø1.5″ PRC16 BORE Ø2-6″	5.0 Nm
 Power Screw	7808151	PS1031 (M10×31)	RPH_16...	PRC BORE Ø50	n/a	20.0 Nm
 Wrench	7808207	T10-D (Torx 10)	RPH_10...	PRC SS/SF Ø20-32	PRC10 SA/ASF Ø1-1.25″ PRC10 BORE Ø2-2.5″	
	7808208	T15-D (Torx 15)	RPH_12...	PRC SS/SF Ø32-50 PRC BORE Ø32-63	PRC12 SA/ASF Ø1.25-1.5″ PRC12 BORE Ø2-4″	
	7808209	T20-D (Torx 20)	RPH_16...	PRC SS/SF Ø40-63 PRC BORE Ø50-100	PRC16 SA/ASF Ø1.5″ PRC16 BORE Ø2-6″	

Packed: Clamping Screws = 10 pcs.; Power Screw = 1 pc.; Wrench = 1 pc.
Note: Wrench sold separately.

PXT

Cutting Conditions

Work Material		Tensile Strength – Hardness	Milling Speed Vc (SFM)	Insert Size					
				RPH_10…		RPH_12…		RPH_16…	
				Face Milling		Face Milling		Face Milling	
				Feed Per Tooth fz (in/t)	Depth of Cut Aa (in)	Feed Per Tooth fz (in/t)	Depth of Cut Aa (in)	Feed Per Tooth fz (in/t)	Depth of Cut Aa (in)
P	Mild Steels, Carbon Steels (1010, 1018)	~180HB	655 (330-985)	0.010 (0.004 - 0.014)	0.078	0.012 (0.004 - 0.016)	0.093	0.014 (0.004 - 0.020)	0.125
	Carbon Steels, Alloy Steels (1050, 4140)	~280HB	590 (330-820)	0.008 (0.004 - 0.012)	0.078	0.010 (0.004 - 0.014)	0.093	0.012 (0.004 - 0.018)	0.125
	Die Steels (H13, D2)	~280HB	495 (260-655)	0.008 (0.004 - 0.012)	0.078	0.010 (0.004 - 0.014)	0.093	0.012 (0.004 - 0.018)	0.125
M	Stainless Steels (Dry) (304SS, 420SS)	~250HB	525 (265 - 655)	0.010 (0.004 - 0.014)	0.078	0.012 (0.004 - 0.016)	0.093	0.014 (0.004 - 0.020)	0.125
	Stainless Steels (Wet) (304SS, 420SS)	~250HB	395 (200 - 590))	0.010 (0.004 - 0.014)	0.078	0.012 (0.004 - 0.016)	0.093	0.014 (0.004 - 0.020)	0.125
K	Cast Iron (FC250)	~350N/mm²	720 (330-1150)	0.010 (0.002 - 0.016)	0.078	0.012 (0.004 - 0.020)	0.093	0.014 (0.004 - 0.023)	0.125
	Ductile Cast Iron (60-40-18)	~800N/mm²	495 (330-720)	0.008 (0.004 - 0.012)	0.078	0.010 (0.004 - 0.014)	0.093	0.012 (0.004 - 0.018)	0.125
N	Aluminum Alloys (6061, 7075)	~13%Si	1970 (985-4920)	0.016 (0.008 - 0.031)	0.078	0.023 (0.008 - 0.039)	0.093	0.031 (0.012 - 0.059)	0.125
S	Heat Resistant Alloys (Inconel 718)	-	130 (85-195)	0.006 (0.002 - 0.010)	0.078	0.010 (0.002 - 0.012)	0.093	0.010 (0.002 - 0.016)	0.125
	Titanium Alloy (Ti-6Al-4V)	-	260 (165-395)	0.008 (0.004 - 0.012)	0.078	0.010 (0.004 - 0.014)	0.093	0.012 (0.004 - 0.018)	0.125
H	Pre-hardened Steel (P20, Stavax)	40-43 HRC	395 (130-495)	0.006 (0.002 - 0.010)	0.059	0.010 (0.002 - 0.012)	0.059	0.010 (0.002 - 0.016)	0.059
	Die Cast Steels (A2, S7)	43-48HRC	260 (130-395)	0.006 (0.002 - 0.010)	0.039	0.010 (0.002 - 0.012)	0.039	0.010 (0.002 - 0.016)	0.039
	Hardened Steels (D2)	50-55HRC	195 (100-295)	0.006 (0.002 - 0.010)	0.020	0.010 (0.002 - 0.012)	0.020	0.010 (0.002 - 0.016)	0.020

Recommended Materials by Application

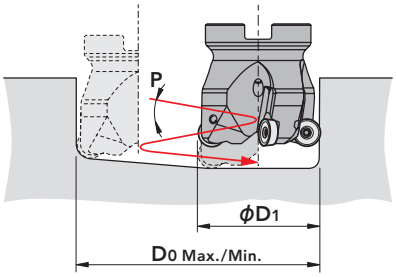
Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
CK010	NM	Yes				◎		
XP3035	-	-	◎	○	○			
XC3030	-	-	◎		○			
XP2040	GL	-	○	○				○
		Yes	○	◎			○	
XP2025	GL	Yes	○	◎			○	
XC1015	-	-			◎			
XC5035	SM	-		◎				
		Yes		○			○	
XC5040	SM	Yes		○			◎	
XP6015	HR	-	○		○			◎

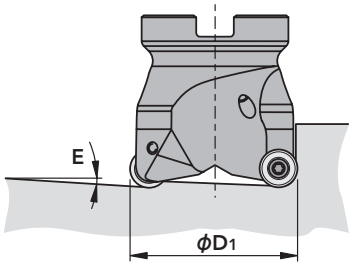
GL:Light Cutting NM:Aluminum SM: Heat Resistant Alloy HR: Hardened Steel

○ good ◎ best

Maximum Ramping Angle (E) & Helical Angle (P)

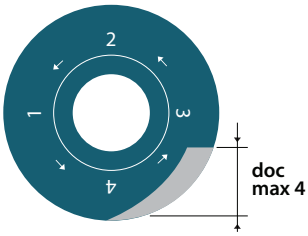
Insert Size	RPH_10...				RPH_12...				RPH_16...			
Diameter (inch)	Ramping Angle	Helical Milling (inch)		Helical Angle	Ramping Angle	Helical Milling (inch)		Helical Angle	Ramping Angle	Helical Milling (inch)		Helical Angle
D1	E	D0 Min	D0 Max	P	E	D0 Min	D0 Max	P	E	D0 Min	D0 Max	P
1.000	2.0°	1.488	1.606	1.8°	-	-	-	-	-	-	-	-
1.250	3.0°	1.988	2.106	1.5°	4.0°	1.752	2.028	1.7°	-	-	-	-
1.500	3.3°	2.488	2.606	1.1°	2.8°	2.252	2.528	1.4°	3.0°	2.016	2.370	2.0°
2.000	2.3°	3.488	3.606	0.9°	2.5°	3.252	3.528	1.1°	4.0°	3.016	3.370	1.5°
2.500	2.2°	4.488	4.606	0.7°	1.8°	4.252	4.528	0.9°	2.8°	4.016	4.370	1.1°
3.000	-	-	-	-	1.3°	5.252	5.528	0.7°	2.0°	5.016	5.370	0.9°
4.000	-	-	-	-	0.9°	7.252	7.528	0.5°	1.5°	7.016	7.370	0.7°
5.000	-	-	-	-	1.0°	9.252	9.528	0.4°	1.1°	9.016	9.370	0.45°
6.000	-	-	-	-	-	-	-	-	1.0°	11.016	11.370	0.4°

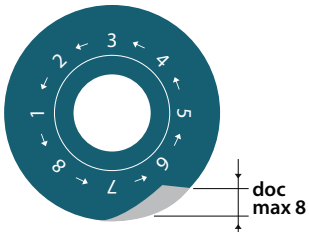




Maximum Depth of Cut (Aa)

Insert Size	Maximum Depth of Cut (Aa)	
	4 Indexes Per Insert	8 Indexes Per Insert
	(in)	(in)
RPH_10...	0.177	0.055
RPH_12...	0.217	0.067
RPH_16...	0.295	0.091





OSG PHOENIX® PHC

High Feed Radius Cutter

A series of high feed end mills and facemills for maximum metal removal rates in a variety of milling applications.

List 78009
PHC SA/FA (Inch)

List 78007
PHC SS (Metric)

List 78008
PHC Bore (Inch)

List 78006
PHC Bore (Metric)

List 52603
PHC ASF (Inch)

List 78015
PHC SF (Metric)

List 78PHC
PHC Inserts

List 7808H
PHC Accessories

Features & Benefits

Specially designed cutting edge suppresses the cutting force.

Tooling options for reducing cutting force:

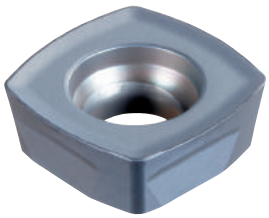
PHC 09 - Multiple cutters for highly efficient milling

PHC 12 - For milling intermittently or with a long tool projection.

The PHC's design reduces the load and vibrations imparted on the machine, thus resulting in highly efficient machining.

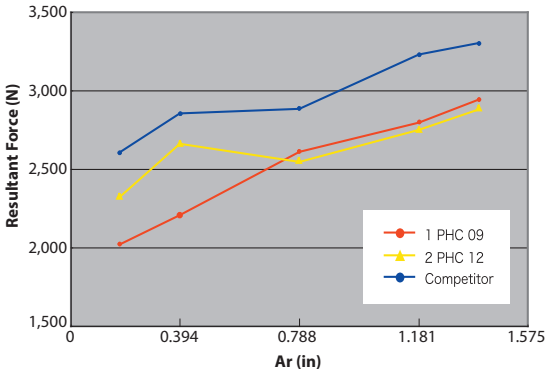
Inserts Ideally Configured for Rough Milling

An economical four-corner design and a breaker shape that enhances cutting performance while ensuring the rigidity of the cutter.



Cutting Force is Reduced by Changing the Width of Cut (Ar)

Tool	PHC09R050M22-5	PHC12R050M22-4	Competitor
Insert (Grade)	SDMT09T308SR-GM (XP3035)	SXMT1204010SR-GM (XP3035)	Coated Carbide Chip
Work Material	1050 Steel		
Cutting Speed	590 SFM (1150 RPM)		
Feed	196.85 IPM		
Depth of Cut	Aa = 0.039 in Ar = 0.197, 0.394, 0.787, 1.181, 1.378 in		
Coolant	Dry		
Machine	Vertical Machining Center		



Number of Flutes Making Simultaneous Contact at Various Widths of Cut (Ar)

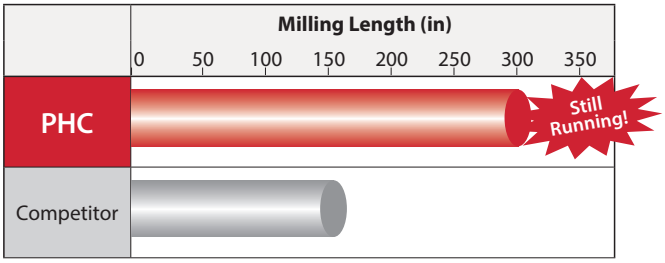
Ar (in)	0.197	0.394	0.788	1.181	1.378
PHC 09	1	2	3	3	4
PHC 12	1	2	2	3	3

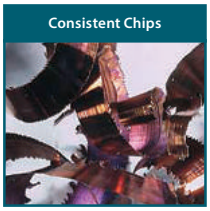
Processing Data

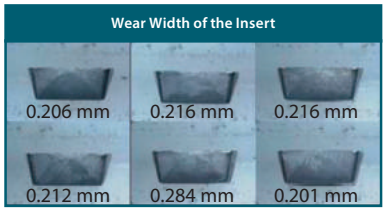
Long Tool Life in Die-Casting Steel - DAC55 (48 HRC)

The OSG PHOENIX® PHC was able to ***double the efficiency and durability*** when compared to the competitor. Due to its low-resistance construction, it minimizes heat generation, resulting in a stable discharge of brownish chips.

Tool	PHC09R063M22-6	Competitor
Insert (Grade)	SDMT09T308SR-GM (XP2040)	Coated Carbide Chip
Work Material	DAC55 (48 HRC)	
Cutting Speed	246 SFM (379 RPM)	387 SFM (596 RPM)
Feed	49.21 IPM (0.022 ipt)	23.62 IPM (0.010 ipt)
Depth of Cut	Aa = 0.027 in, Ar = 1.004 in	
Coolant	Air	
Length of Tool	5.709 in	
Machine	Vertical Machining Center	



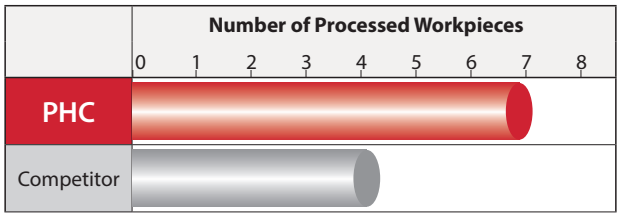


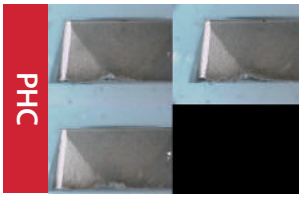


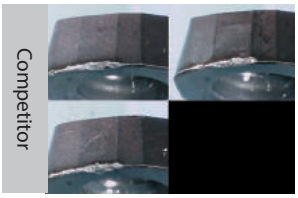
Durability in Stainless Steel - 630 Stainless Steel

When rough milling under identical conditions, ***the PHC provided 1.75 times the durability*** compared to the competitor tool.

Tool	PHC09R032SS32-3S	Competitor
Insert (Grade)	SDMT09T308ER-SM (XC5040)	Coated Carbide Chip
Work Material	630 Stainless Steel	
Cutting Speed	262 SFM (796 RPM)	
Feed	31.50 IPM (0.013ipt)	
Depth of Cut	Aa = 0.020 in, Ar = 1.260 in	
Coolant	Water Soluble	
Machine	Vertical Machining Center	





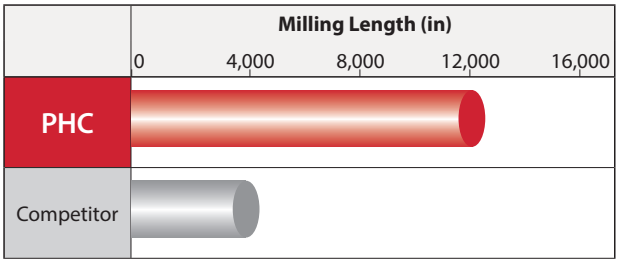


Processing Data

» Wear Resistance in Die-Casting Steel - HPM7 (33 HRC)

The competitor tool chipped prematurely, but the PHC exhibited minimum resistance, inhibiting chipping and allowing it to mill ***three times the distance*** under the same conditions.

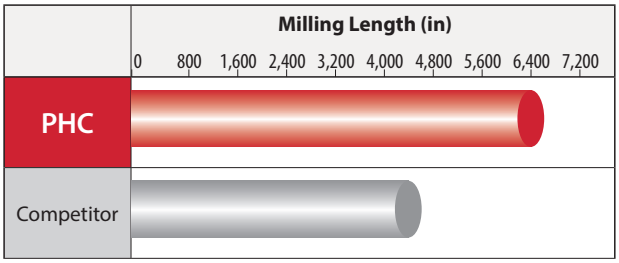
Tool	PHC12R063M22-5	Competitor
Insert (Grade)	SXMT120410SR-GM (XP2040)	Coated Carbide Chip
Work Material	HPM7 (33 HRC)	
Cutting Speed	328 SFM (505 RPM)	
Feed	98.43 IPM (0.039 ipt)	
Depth of Cut	Aa = 0.059 in, Ar = 1.575 in	
Coolant	Air	
Machine	Vertical Machining Center	



» Reduced Cutting Forces in Die Casting Steel - SKD61 (48 HRC)

Due to its low-resistance edge form, this product was able to mill at 1.7 times the efficiency of the competitor's tool and achieved 1.4 times the durability. Additionally, the heat generated by the competitor's tool created a distortion in the workpiece, while the PHC was able to improve the process by suppressing the generation of heat.

Tool	PHC09R050M22-5	Competitor
Insert (Grade)	SDMT09T308SR-GM (XP2040)	Coated Carbide Chip
Work Material	SKD61 (48 HRC)	
Cutting Speed	262 SFM (510 RPM)	360 SFM (700 RPM)
Feed	53.54 IPM (0.021 ipt)	31.50 IPM (0.011 ipt)
Depth of Cut	Aa = 0.020 in, Ar = 0.984 in	
Coolant	Air	
Machine	Horizontal Machining Center	

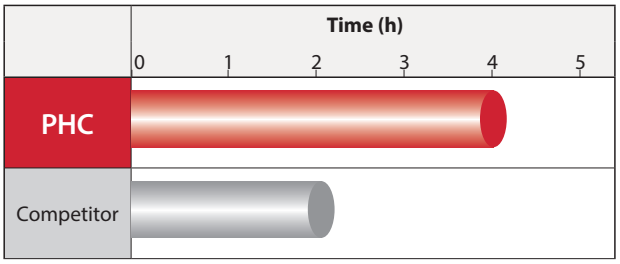


Processing Data

Long Tool Life in Mold Steel - PX5 (30 HRC)

While rough milling a die using identical machining conditions, the ***PHOENIX® PHC had double the tool life compared to that of the competitor's tool.***

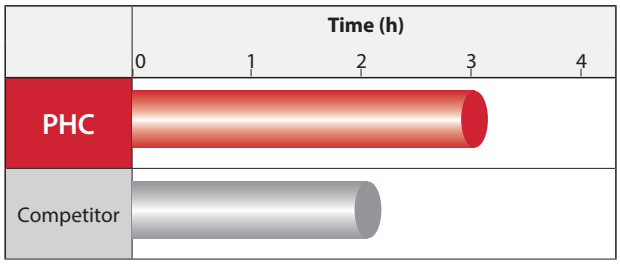
Tool	PHC12R050M22-4	Competitor
Insert (Grade)	SXMT120410SR-GM (XP2040)	Coated Carbide Chip
Work Material	PX5 (30 HRC)	
Cutting Speed	515 SFM (1000 RPM)	
Feed	118.11 IPM (0.030 ipt)	
Depth of Cut	Aa = 0.030 in, Ar = 0.984 in	
Coolant	Water Soluble	
Machine	Vertical Machining Center	



Stable Machining in Tool Steel - SKD11 Equivalent

While rough-milling steel for a press die, the competitor's product could not increase the feed rate due to chipping. However, the PHOENIX® PHC was able to mill with stability, ***increasing the feed rate by 20% and still providing 1.5 times the durability.***

Tool	PHC12R050M22-4	Competitor
Insert (Grade)	SXMT120410SR-GM (XP2040)	Coated Carbide Chip
Work Material	SKD11 Equivalent	
Cutting Speed	367 SFM (713 RPM)	
Feed	94.49 IPM (0.033 ipt)	78.74 IPM (0.027 ipt)
Depth of Cut	Aa = 0.049 in, Ar = 1.268 in	
Coolant	Air	
Machine	Gantry Machining Center	



List 78009

PHC SA/FA (Inch)

NEW SIZES

SPEED FEED P136

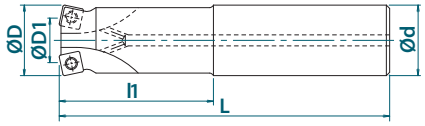
Recommended Materials: p137
Accessories & Inserts: p135
Maximum Ramping Angle: p138

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch) D	Effective Dia. (inch) D1	No. of Teeth	Shank Dia. (inch) d	Overall Length (inch) L	Neck Length (inch) L1	Applicable Insert
7800905	Cylindrical Shank Short	Normal	PHC07R063SA063-2S	1	0.625	0.286	2	0.625	3.937	1.181	SPMT07…
7800906			PHC07R075SA075-3S	1	0.750	0.411	3	0.750	5.118	1.968	
7800907			PHC07R100SA100-4S	1	1.000	0.661	4	1.000	5.512	2.362	
7800908			PHC07R125SA125-5S	1	1.250	0.911	5	1.250	5.905	2.756	
7800900		Normal	PHC09R100SA100-2S	1	1.000	0.535	2	1.000	5.512	2.362	SDMT09...
7800901		Close	PHC09R100SA100-3S	1	1.000	0.535	3	1.000	5.512	2.362	
7800902		Normal	PHC09R125SA125-3S	1	1.250	0.785	3	1.250	5.906	2.756	
7800903			PHC12R125SA125-2S	1	1.250	0.596	2	1.250	5.906	2.756	SXMT12...
7800904			PHC12R150SA125-3S	2	1.500	0.846	3	1.250	5.906	1.969	
7800909	Cylindrical Shank Long	Normal	PHC07R063SA063-2L	1	0.625	0.286	2	0.625	5.905	1.968	SPMT07…
7800913			PHC07R075SA075-3L	1	0.750	0.411	3	0.750	6.299	3.150	
7800914			PHC07R100SA100-4L	1	1.000	0.661	4	1.000	7.874	3.937	
7800915			PHC07R125SA125-5L	1	1.250	0.911	5	1.250	7.874	4.724	
7800922		Normal	PHC09R100SA100-2L	1	1.000	0.535	2	1.000	7.874	4.724	SDMT09...
7800923		Close	PHC09R100SA100-3L	1	1.000	0.535	3	1.000	7.874	4.724	
7800924		Normal	PHC09R125SA125-3L	1	1.250	0.785	3	1.250	7.874	4.724	
7800925			PHC12R125SA125-2L	1	1.250	0.596	2	1.250	7.874	4.724	SXMT12...
7800926			PHC12R150SA125-3L	2	1.500	0.846	3	1.250	9.843	2.756	
7800927	Cylindrical Shank Extra-Long	Normal	PHC09R100SA100-2LL	1	1.000	0.535	2	1.000	11.811	7.087	SDMT09...
7800928		Close	PHC09R100SA100-3LL	1	1.000	0.535	3	1.000	11.811	7.087	
7800929		Normal	PHC09R125SA125-3LL	1	1.250	0.785	3	1.250	11.811	7.087	
7800930			PHC12R125SA125-2LL	1	1.250	0.596	2	1.250	11.811	7.087	SXMT12...
7800931			PHC12R150SA125-3LL	2	1.500	0.846	3	1.250	11.811	2.756	
7800916	Weldon Shank Short	Normal	PHC07R063FA063-2S	1	0.625	0.286	2	0.625	3.937	1.181	SPMT07…
7800917			PHC07R075FA075-3S	1	0.750	0.411	3	0.750	5.118	1.968	
7800918			PHC07R100FA100-4S	1	1.000	0.661	4	1.000	5.512	2.362	
7800919			PHC07R125FA125-5S	1	1.250	0.911	5	1.250	5.905	2.756	
7800910		Normal	PHC09R100FA100-2S	1	1.000	0.535	2	1.000	3.831	1.551	SDMT09...
7800911		Close	PHC09R100FA100-3S	1	1.000	0.535	3	1.000	3.831	1.551	
7800912		Normal	PHC09R125FA125-3S	1	1.250	0.785	3	1.250	4.378	2.098	
7800920			PHC12R125FA125-2S	1	1.250	0.596	2	1.250	4.378	2.098	SXMT12...
7800921			PHC12R150FA125-3S	2	1.500	0.846	3	1.250	4.378	2.098	
7800942	Weldon Shank Long	Normal	PHC07R063FA063-2L	1	0.625	0.286	2	0.625	5.905	1.968	SPMT07…
7800943			PHC07R075FA075-3L	1	0.750	0.411	3	0.750	6.299	3.150	
7800944			PHC07R100FA100-4L	1	1.000	0.661	4	1.000	7.874	3.937	
7800945			PHC07R125FA125-5L	1	1.250	0.911	5	1.250	7.874	4.724	
7800932		Normal	PHC09R100FA100-2L	1	1.000	0.535	2	1.000	7.004	4.724	SDMT09...
7800933		Close	PHC09R100FA100-3L	1	1.000	0.535	3	1.000	7.004	4.724	
7800934		Normal	PHC09R125FA125-3L	1	1.250	0.785	3	1.250	7.004	4.724	
7800935			PHC12R125FA125-2L	1	1.250	0.596	2	1.250	7.004	4.724	SXMT12...
7800936			PHC12R150FA125-3L	2	1.500	0.846	3	1.250	7.004	4.724	
7800937	Weldon Shank Extra-Long	Normal	PHC09R100FA100-2LL	1	1.000	0.535	2	1.000	9.366	7.087	SDMT09...
7800938		Close	PHC09R100FA100-3LL	1	1.000	0.535	3	1.000	9.366	7.087	
7800939		Normal	PHC09R125FA125-3LL	1	1.250	0.785	3	1.250	9.366	7.087	
7800940			PHC12R125FA125-2LL	1	1.250	0.596	2	1.250	9.366	7.087	SXMT12...
7800941			PHC12R150FA125-3LL	2	1.500	0.846	3	1.250	9.366	7.087	

Packed: 1 pc.

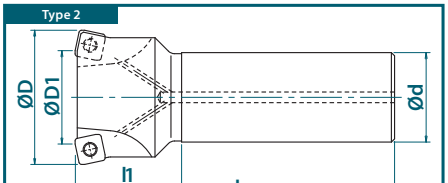
PXT

Type 1



With coolant hole.

Type 2



With coolant hole.

List 78007

PHC SS (Metric)

NEW SIZES

SPEED FEED P136

Recommended Materials: p137
Accessories & Inserts: p135
Maximum Ramping Angle: p138

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	Effective Dia. (mm) D1	No. of Teeth	Shank Dia. (mm) d	Overall Length (mm) L	Neck Length (mm) L1	Applicable Insert
7800750	Cylindrical Shank Short	Normal	PHC07R016SS16-2S	1	16	7.4	2	16	100	30	SPMT07…
7800751			PHC07R020SS20-3S	1	20	11.4	3	20	130	50	
7800752			PHC07R025SS25-4S	1	25	16.4	4	25	140	60	
7800753			PHC07R030SS32-4S	1	30	21.4	4	32	150	70	
7800754			PHC07R032SS32-5S	1	32	23.4	5	32	150	70	
7800755	Cylindrical Shank Long	Normal	PHC07R016SS16-2L	1	16	7.4	2	16	150	50	
7800756			PHC07R017SS16-2L	2	17	8.4	2	16	150	25	
7800757			PHC07R018SS16-2L	2	18	9.4	2	16	150	25	
7800758			PHC07R020SS20-3L	1	20	11.4	3	20	160	80	
7800759			PHC07R021SS20-3L	2	21	12.4	3	20	160	30	
7800760			PHC07R022SS20-3L	2	22	13.4	3	20	160	30	
7800761			PHC07R025SS25-4L	1	25	16.4	4	25	200	100	
7800762			PHC07R026SS25-4L	2	26	17.4	4	25	200	40	
7800763			PHC07R028SS25-4L	2	28	19.4	4	25	200	40	
7800764			PHC07R030SS32-4L	1	30	21.4	4	32	200	120	
7800765			PHC07R032SS32-5L	1	32	23.4	5	32	200	120	
7800766			PHC07R033SS32-5L	2	33	24.4	5	32	200	50	
7800767			PHC07R035SS32-5L	2	35	26.0	5	32	200	50	
7800700	Cylindrical Shank Short	Normal	PHC09R025SS25-2S	1	25	13.2	2	25	140	60	SDMT09…
7800701		Close	PHC09R025SS25-3S	1	25	13.2	3	25	140	60	
7800716		Normal	PHC09R028SS25-3S	2	28	16.2	3	25	140	40	
7800717			PHC09R030SS32-3S	1	30	18.2	3	32	150	70	
7800702			PHC09R032SS32-3S	1	32	20.2	3	32	150	70	
7800718			PHC09R035SS32-3S	2	35	23.2	3	32	150	50	
7800703			PHC09R040SS32-4S	2	40	28.2	4	32	150	50	
7800719			PHC09R040SS42-4S	1	40	28.2	4	42	150	50	
7800704	Cylindrical Shank Long	Normal	PHC09R025SS25-2L	1	25	13.2	2	25	200	120	
7800705		Close	PHC09R025SS25-3L	1	25	13.2	3	25	200	120	
7800740			PHC09R026SS25-3L	2	26	14.2	3	25	200	40	
7800720		Normal	PHC09R028SS25-3L	2	28	16.2	3	25	200	40	
7800721			PHC09R030SS32-3L	1	30	18.2	3	32	200	120	
7800706			PHC09R032SS32-3L	1	32	20.2	3	32	200	120	
7800741			PHC09R033SS32-3L	2	33	21.2	3	32	200	50	
7800722			PHC09R035SS32-3L	2	35	23.2	3	32	200	50	
7800707		Close	PHC09R040SS32-4L	2	40	28.2	4	32	250	50	
7800723		Normal	PHC09R040SS42-3L	1	40	28.2	3	42	250	70	
7800724	Cylindrical Shank Extra-Long	Normal	PHC09R025SS25-2LL	1	25	13.2	2	25	300	180	
7800742			PHC09R026SS25-2LL	2	26	14.2	2	25	300	40	
7800725			PHC09R028SS25-2LL	2	28	16.2	2	25	300	40	
7800726			PHC09R030SS32-2LL	1	30	18.2	2	32	300	180	
7800727			PHC09R032SS32-2LL	1	32	20.2	2	32	300	180	
7800743			PHC09R033SS32-2LL	2	33	21.2	2	32	300	50	
7800728			PHC09R035SS32-2LL	2	35	23.2	2	32	300	50	
7800729			PHC09R040SS42-2LL	1	40	28.2	2	42	300	70	

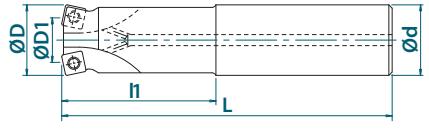
Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

continued on next page

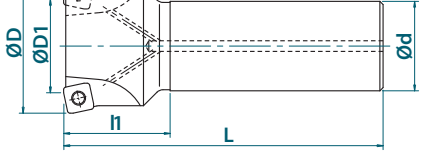
PXT

Type 1



With coolant hole.

Type 2



With coolant hole.

List 78007 (Continued)

PHC SS (Metric)

NEW SIZES

SPEED FEED P136

Recommended Materials: p137
Accessories & Inserts: p135
Maximum Ramping Angle: p138

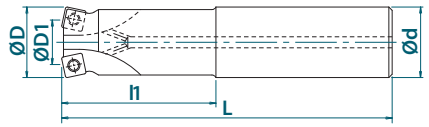
EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	Effective Dia. (mm) D1	No. of Teeth	Shank Dia. (mm) d	Overall Length (mm) L	Neck Length (mm) L1	Applicable Insert
7800730	Cylindrical Shank Short	Normal	PHC12R030SS32-2S	1	30	13.4	2	32	150	70	SXMT12…
7800708			PHC12R032SS32-2S	1	32	15.4	2	32	150	70	
7800731			PHC12R035SS32-3S	2	35	18.4	3	32	150	50	
7800709			PHC12R040SS32-3S	2	40	23.4	3	32	150	50	
7800732			PHC12R040SS42-3S	1	40	23.4	3	42	150	50	
7800710			PHC12R050SS42-4S	2	50	33.4	4	42	150	50	
7800711			PHC12R063SS42-5S	2	63	46.4	5	42	150	50	
7800733	Cylindrical Shank Long	Normal	PHC12R030SS32-2L	1	30	13.4	2	32	200	120	
7800712			PHC12R032SS32-2L	1	32	15.4	2	32	200	120	
7800744			PHC12R033SS32-2L	2	33	16.4	2	32	200	50	
7800734			PHC12R035SS32-3L	2	35	18.4	3	32	200	50	
7800713			PHC12R040SS32-3L	2	40	23.4	3	32	250	50	
7800735			PHC12R040SS42-3L	1	40	23.4	3	42	250	70	
7800714			PHC12R050SS42-4L	2	50	33.4	4	42	250	50	
7800715			PHC12R063SS42-5L	2	63	46.4	5	42	250	50	
7800736	Cylindrical Shank Extra-Long	Normal	PHC12R030SS32-2LL	1	30	13.4	2	32	300	180	
7800737			PHC12R032SS32-2LL	1	32	15.4	2	32	300	180	
7800745			PHC12R033SS32-2LL	2	33	16.4	2	32	300	50	
7800738			PHC12R035SS32-2LL	2	35	18.4	2	32	300	50	
7800739			PHC12R040SS42-2LL	1	40	23.4	2	42	300	70	

Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

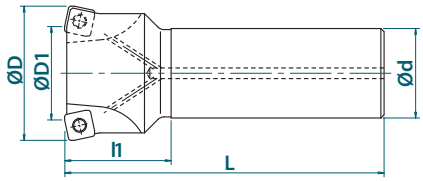
PXT

Type 1



With coolant hole.

Type 2



With coolant hole.

List 78008

PHC Bore (Inch)

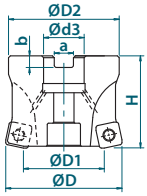
SPEED FEED P136
Recommended Materials: p137
Accessories & Inserts: p135
Maximum Ramping Angle: p138

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (inch) D	Effective Dia. (inch) D1	No. of Teeth	Tool Height (inch) H	Flange Dia. (inch) D2	Bore Dia. (inch) d3	Keyway Width (inch) a	Keyway Depth (inch) b	Applicable Insert
7800800	Bore	Close	PHC09R200A075-5	2	2.000	1.535	5	1.968	1.850	0.750	0.315	0.197	SDMT09…
7800801			PHC09R250A075-6	2	2.500	2.035	6	1.968	2.362	0.750	0.315	0.197	
7800806		Normal	PHC09R300A100-8	2	3.000	2.535	8	2.480	2.835	1.000	0.375	0.236	
7800807		Normal	PHC12R250A075-4	2	2.500	1.846	4	1.968	2.632	0.750	0.315	0.197	SXMT12…
7800808			PHC12R300A100-5	2	3.000	2.346	5	2.480	2.835	1.000	0.375	0.236	
7800809			PHC12R400A150-6	3	4.000	3.346	6	2.480	3.779	1.500	0.625	0.394	
7800802		Close	PHC12R200A075-4	2	2.000	1.346	4	1.968	1.850	0.750	0.315	0.197	
7800803			PHC12R250A075-5	2	2.500	1.846	5	1.968	2.362	0.750	0.315	0.197	
7800804			PHC12R300A100-7	2	3.000	2.346	7	2.480	2.835	1.000	0.375	0.236	
7800805			PHC12R400A150-8	3	4.000	3.346	8	2.480	3.779	1.500	0.625	0.394	
7800810			PHC12R500A150-10	3	5.000	4.346	10	2.480	3.779	1.500	0.625	0.394	
7800811			PHC12R600A150-12	3	6.000	5.346	12	2.480	3.779	1.500	0.625	0.394	

Packed: 1 pc.

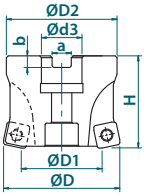
PXT

Type 2



With coolant hole.

Type 3



Without coolant hole.

List 78006

PHC Bore (Metric)

SPEED FEED P136
Recommended Materials: p137
Accessories & Inserts: p135
Maximum Ramping Angle: p138

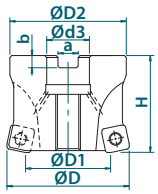
EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	Effective Dia. (mm) D1	No. of Teeth	Tool Height (mm) H	Flange Dia. (mm) D2	Bore Dia. (mm) d3	Keyway Width (mm) a	Keyway Depth (mm) b	Applicable Insert
7800600	Bore	Close	PHC09R040M16-4	1	40	28.2	4	40	38	16.000	8.4	5.6	SDMT09…
7800601			PHC09R050M22-5	2	50	38.2	5	50	47	22.000	10.4	6.3	
7800605			PHC09R050M22.2-5	2	50	38.2	5	50	47	22.225	8.4	5.0	
7800603			PHC09R063M22-6	2	63	51.2	6	50	60	22.000	10.4	6.3	
7800606			PHC09R063M22.2-6	2	63	51.2	6	50	60	22.225	8.4	5.0	
7800607			PHC12R040M16-3	1	40	23.4	3	40	38	16.000	8.4	5.6	SXMT12…
7800608			PHC12R050M22-4	2	50	33.4	4	50	47	22.000	10.4	6.3	
7800614			PHC12R050M22.2-4	2	50	33.4	4	50	47	22.225	8.4	5.0	
7800610			PHC12R063M22-5	2	63	46.4	5	50	60	22.000	10.4	6.3	
7800615			PHC12R063M22.2-5	2	63	46.4	5	50	60	22.225	8.4	5.0	
7800612			PHC12R080M27-7	2	80	63.4	7	50	76	27.000	12.4	7.0	
7800618			PHC12R080M31.7-5	2	80	63.4	5	63	76	31.750	12.7	8.0	
7800616			PHC12R080M31.7-7	2	80	63.4	7	63	76	31.750	12.7	8.0	
7800613			PHC12R100M32-8	2	100	83.4	8	63	96	32.000	14.4	8.0	
7800617			PHC12R100M31.7-8	2	100	83.4	8	63	96	37.750	12.7	8.0	

Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

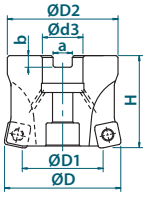
PXT

Type 1



With coolant hole.

Type 2



With coolant hole.

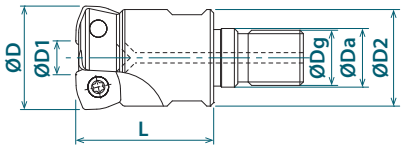
List 52603

PHC ASF (Inch)

NEW SIZES

SPEED FEED P136

Recommended Materials: p137
Accessories & Inserts: p135
Maximum Ramping Angle: p138
SF Arbors: p189



EDP No.	Body Type	Designation	Tool Dia. (inch)	Effective Dia. (inch)	No. of Teeth	Pilot Dia. (inch)	Thread Dia. (mm)	Overall Length (inch)	Flange Dia. (inch)	Wrench Size	Applicable Insert
			D	D1		Da	Dg	L	D2		
52603004	Screw Fit Head	PHC07R063ASF8-2	0.625	0.286	2	0.334	M8	1.063	0.571	10	SPMT07…
52603005		PHC07R075ASF10-3	0.750	0.411	3	0.413	M10	1.300	0.709	14	
52603006		PHC07R100ASF12-4	1.000	0.661	4	0.492	M12	1.378	0.905	17	
52603007		PHC07R125ASF16-5	1.250	0.911	5	0.669	M16	1.575	1.102	22	
52603000		PHC09R100ASF12-2	1.000	0.535	2	0.492	M12	1.378	0.905	17	SDMT09…
52603001		PHC09R125ASF16-3	1.250	0.785	3	0.669	M16	1.575	1.102	22	
52603002		PHC12R125ASF16-2	1.250	0.596	2	0.669	M16	1.575	1.102	22	SXMT12…
52603003		PHC12R150ASF16-3	1.500	0.846	3	0.669	M16	1.575	1.102	22	

Packed: 1 pc.

PXT

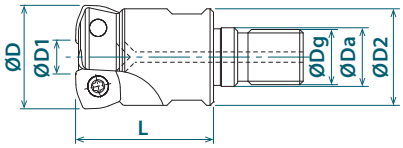
List 78015

PHC SF (Metric)

NEW SIZES

SPEED FEED P136

Recommended Materials: p137
Accessories & Inserts: p135
Maximum Ramping Angle: p138
SF Arbors: p190



EDP No.	Body Type	Designation	Tool Dia. (mm) D	Effective Dia. (mm) D1	No. of Teeth	Pilot Dia. (mm) Da	Thread Dia. (mm) Dg	Overall Length (mm) L	Flange Dia. (mm) D2	Wrench Size	Applicable Insert
7801520	Screw Fit Head	PHC07R016SF8-2	16	7.4	2	8.5	M8	27	14.5	10	SPMT07…
7801521		PHC07R017SF8-2	17	8.4	2	8.5	M8	27	14.5	10	
7801522		PHC07R018SF8-2	18	9.4	2	8.5	M8	27	14.5	10	
7801523		PHC07R020SF10-3	20	11.4	3	10.5	M10	33	18	14	
7801524		PHC07R021SF10-3	21	12.4	3	10.5	M10	33	18	14	
7801525		PHC07R022SF10-3	22	13.4	3	10.5	M10	33	18	14	
7801526		PHC07R025SF12-4	25	16.4	4	12.5	M12	35	23	17	
7801527		PHC07R026SF12-4	26	17.4	4	12.5	M12	35	23	17	
7801528		PHC07R028SF12-4	28	19.4	4	12.5	M12	35	23	17	
7801529		PHC07R030SF16-4	30	21.4	4	17	M16	40	28	22	
7801530		PHC07R032SF16-5	32	23.4	5	17	M16	40	28	22	
7801531		PHC07R033SF16-5	33	24.4	5	17	M16	40	28	22	
7801532		PHC07R035SF16-5	35	26.4	5	17	M16	40	28	22	
7801500		PHC09R025SF12-3	25	13.2	3	12.5	M12	35	23	17	SDMT09…
7801510		PHC09R026SF12-3	26	14.2	3	12.5	M12	35	23	17	
7801501		PHC09R028SF12-3	28	16.2	3	12.5	M12	35	23	17	
7801502		PHC09R030SF16-3	30	18.2	3	17.0	M16	40	28	22	
7801503		PHC09R032SF16-3	32	20.2	3	17.0	M16	40	28	22	
7801511		PHC09R033SF16-3	33	21.2	3	17.0	M16	40	28	22	
7801504		PHC09R035SF16-3	35	23.2	3	17.0	M16	40	28	22	
7801505		PHC09R040SF16-4	40	28.2	4	17.0	M16	40	28	22	
7801506		PHC12R030SF16-2	30	13.4	2	17.0	M16	40	28	22	SDXMT12…
7801507		PHC12R032SF16-2	32	15.4	2	17.0	M16	40	28	22	
7801512		PCH12R033SF16-2	33	16.4	2	17.0	M16	40	28	22	
7801508		PHC12R035SF16-3	35	18.4	3	17.0	M16	40	28	22	
7801509		PHC12R040SF16-3	40	23.4	3	17.0	M16	40	28	22	

Packed: 1 pc.

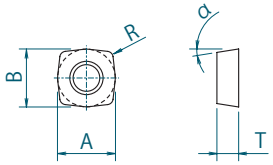
This item is stocked overseas. Please contact OSG for availability and delivery.

PXT

List 78PHC

NEW SIZES

PHC Inserts



Designation	No. of Cutting Edges	Insert Size					EDP Number								
		A x B (mm)	T (mm)	α	R (mm)	Aa Max (mm)	XC3020	XP3025	XP3035	XC3030	XP2040	XP2025	XC1015	XC5035	XC5040
SPMT070305SR-GM	4	7.0 x 7.0	2.75	11°	0.5	0.8	7827092	7828092	7825092	7814092	7826092	7813092	7812092	-	-
SPMT070305ER-SM							-	-	-	-	-	-	-	-	7816093
SDMT09T308SR-GM		9.52 x 9.52	3.97	15°	0.8	1.0	-	-	7814020	7825020	7813020	7826020	7812020	-	-
SDMT09T308ER-SM							-	-	-	-	-	-	-	7815021	7816021
SXMT120410SR-GM		12.7 x 12.7	4.76	9°	1.0	2.0	-	-	7814022	7825022	7813022	7826022	7812022	-	-
SXMT120410ER-SM							-	-	-	-	-	-	-	7815023	7816023

Packed: 10 pcs.

PXI

List 7808H

PHC Accessories

Appearance	EDP No.	Designation	Applicable Insert	Applicable Cutter		Recommended Tightening Torque
				(mm)	(inch)	
Clamping Screw	7808105	FS25550 (Torx 8)	SPMT07…	PHC SS/SF Ø16-35	PHC07 SA/FA/ASF Ø0.625-1.25"	1.6 Nm
	7808111	FS35572 (Torx 15)	SDMT09…	PHC SS/SF Ø25-35	PHC09 SA/FA/ASF Ø1-1.25"	3.2 Nm
	7808112	FS35586 (Torx 15)		PHC SS/SF Ø40 PHC BORE Ø40-63	PHC09 SA/FA/ASF Ø1.5" PHC09 BORE Ø2-3"	3.2 Nm
	7808113	FS45510 (Torx 20)	SXMT12…	PHC SS/SF Ø32-63 PHC BORE Ø40-100	PHC12 SA/FA/ASF Ø1.25-1.5" PHC12 BORE Ø2-6"	5.0 Nm
Power Screw	7808150	PS0830 (M8x30)	SDMT09…	PHC BORE Ø40	n/a	20.0 Nm
			SXMT12…			
Wrench	7808205	T8-D (Torx 8)	SPMT07…	PHC SS/SF Ø16-35	PHC07 SA/FA/ASF Ø0.625-1.25"	
	7808208	T15-D (Torx 15)	SDMT09…	PHC SS/SF Ø25-40 PHC BORE Ø40-63	PHC09 SA/FA/ASF Ø1-1.5" PHC09 BORE Ø2-3"	
	7808209	T20-D (Torx 20)	SXMT12…	PHC SS/SF Ø32-63 PHC BORE Ø40-100	PHC12 SA/FA/ASF Ø1.25-1.5" PHC12 BORE Ø2-6"	

Packed: Clamping Screws = 10 pcs.; Power Screw = 1 pc.; Wrench = 1 pc.
Note: Wrench sold separately.

PXT

Cutting Conditions

Work Material		Tensile Strength – Hardness	Milling Speed Vc (SFM)	Insert Size												
				SDMT07...				SDMT09...				SXMT12...				
				Face Milling				Face Milling				Face Milling				
				Feed Per Tooth fz (in/t)	Depth of Cut Aa (in)			Feed Per Tooth fz (in/t)	Depth of Cut Aa (in)			Feed Per Tooth fz (in/t)	Depth of Cut Aa (in)			
					L/D=2	L/D=3	L/D=4		L/D=2	L/D=3	L/D=4		L/D=2	L/D=3	L/D=4
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	590 (195 - 820)	0.028 (0.012 - 0.060)	0.032	0.024	0.016	0.032 (0.012 - 0.071)	0.040	0.032	0.020	0.050 (0.020 - 0.126)	0.047	0.047	0.040
	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	590 (195 - 820)	0.028 (0.012 - 0.051)	0.032	0.024	0.016	0.032 (0.012 - 0.060)	0.040	0.032	0.020	0.050 (0.020 - 0.118)	0.047	0.047	0.040
	Die Steels (H13, D2)	~280 HB	590 (195 - 820)	0.028 (0.012 - 0.051)	0.024	0.020	0.012	0.032 (0.012 - 0.060)	0.032	0.024	0.016	0.050 (0.020 - 0.118)	0.047	0.047	0.040
M	Stainless Steels (Dry) (304, 420)	~250 HB	525 (265 - 655)	0.016 (0.012 - 0.047)	0.024	0.020	0.012	0.020 (0.012 - 0.060)	0.032	0.024	0.016	0.040 (0.020 - 0.098)	0.047	0.040	0.040
	Stainless Steels (Wet) (304, 420)	~250 HB	395 (200 - 590)	0.016 (0.012 - 0.047)	0.024	0.020	0.012	0.020 (0.012 - 0.060)	0.032	0.024	0.016	0.040 (0.020 - 0.098)	0.047	0.040	0.040
K	Cast Iron (FC250)	~350 N/mm^2	655 (330 - 985)	0.032 (0.016 - 0.060)	0.032	0.024	0.016	0.040 (0.020 - 0.071)	0.040	0.032	0.020	0.060 (0.020 - 0.138)	0.060	0.060	0.040
	Ductile Cast Iron (60-40-18)	~800 N/mm^2	590 (330 - 820)	0.028 (0.012 - 0.051)	0.032	0.024	0.016	0.035 (0.020 - 0.060)	0.040	0.032	0.020	0.053 (0.020 - 0.118)	0.047	0.047	0.035
S	Heat Resistant Alloys (Inconel 718)	-	100 (85 - 195)	0.012 (0.008 - 0.028)	0.016	0.016	0.012	0.016 (0.008 - 0.032)	0.020	0.020	0.016	0.020 (0.008 - 0.040)	0.040	0.040	0.032
	Titanium Alloy (Ti-6Al-4V)	-	260 (165 - 395)	0.016 (0.012 - 0.032)	0.016	0.016	0.012	0.020 (0.012 - 0.040)	0.020	0.020	0.012	0.028 (0.012 - 0.047)	0.032	0.032	0.016
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HRC	395 (130 - 495)	0.016 (0.008 - 0.032)	0.016	0.016	0.012	0.020 (0.008 - 0.040)	0.020	0.020	0.012	0.032 (0.012 - 0.060)	0.040	0.040	0.020
	Die Cast Steels (A2, S7)	43 - 48 HRC	295 (130 - 395)	0.012 (0.008 - 0.024)	0.016	0.016	0.012	0.016 (0.008 - 0.032)	0.020	0.020	0.016	0.028 (0.012 - 0.047)	0.028	0.028	0.024
	Hardened Steels (D2)	50 - 55 HRC	195 (130 - 295)	0.008 (0.008 - 0.020)	0.012	0.012	0.008	0.012 (0.008 - 0.028)	0.012	0.012	0.008	0.020 (0.012 - 0.032)	0.020	0.020	0.016

Recommended Materials by Application

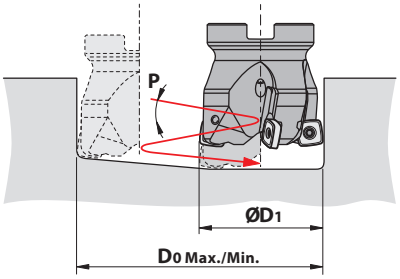
Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
XC3020	GM	-	◎		○			
XP3025	GM	Yes	◎		○			
XP3035	GM	-	◎	○	○			
XC3030	GM	-	◎		○			
XP2040	GM	-	○	○				○
		Yes	○	◎			○	
XP2025	GM	-	○	◎			○	
XC1015	GM	-			◎			
XC5035	SM	-		◎				
		Yes		○			○	
XC5040	SM	Yes		○			◎	

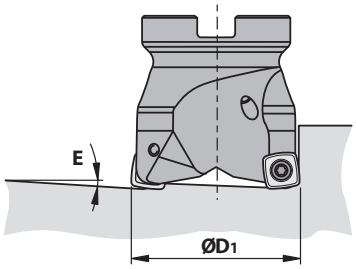
GM: Medium Cutting SM: Heat Resistant Alloy

○ good ◎ best

Maximum Ramping Angle (E) & Helical Angle (P)

Insert Size	SDMT07...				SDMT09...				SDMT12...			
Diameter (inch)	Ramping Angle	Helical Milling (inch)		Helical Angle	Ramping Angle	Helical Milling (inch)		Helical Angle	Ramping Angle	Helical Milling (inch)		Helical Angle
D1	E	D0 Min	D0 Max	P	E	D0 Min	D0 Max	P	E	D0 Min	D0 Max	P
0.625	5.9°	0.857	1.211	4.5°	-	-	-	-	-	-	-	-
0.750	3.2°	1.107	1.461	2.3°	-	-	-	-	-	-	-	-
1.000	2.0°	1.607	1.961	1.2°	3.5°	1.409	1.921	3.0°	-	-	-	-
1.250	1.3°	2.107	2.461	0.9°	1.9°	1.909	2.421	1.7°	7.2°	1.713	2.421	6.1°
1.500	-	-	-	-	1.2°	2.409	2.921	1.0°	2.9°	2.213	2.921	2.5°
2.000	-	-	-	-	0.8°	3.409	3.921	0.7°	1.4°	3.213	3.921	1.2°
2.500	-	-	-	-	0.7°	4.409	4.921	0.7°	1.1°	4.213	4.921	0.9°
3.000	-	-	-	-	0.45°	5.409	5.921	0.4°	1.0°	5.213	5.921	0.8°
4.000	-	-	-	-	-	-	-	-	0.7°	7.213	7.921	0.6°
5.000	-	-	-	-	-	-	-	-	0.5°	9.213	9.921	0.35°
6.000	-	-	-	-	-	-	-	-	0.4°	11.213	11.921	0.3°

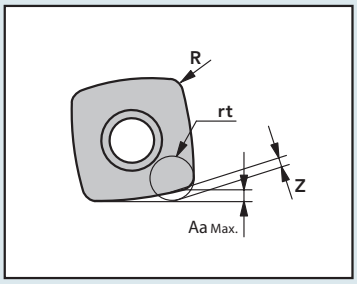


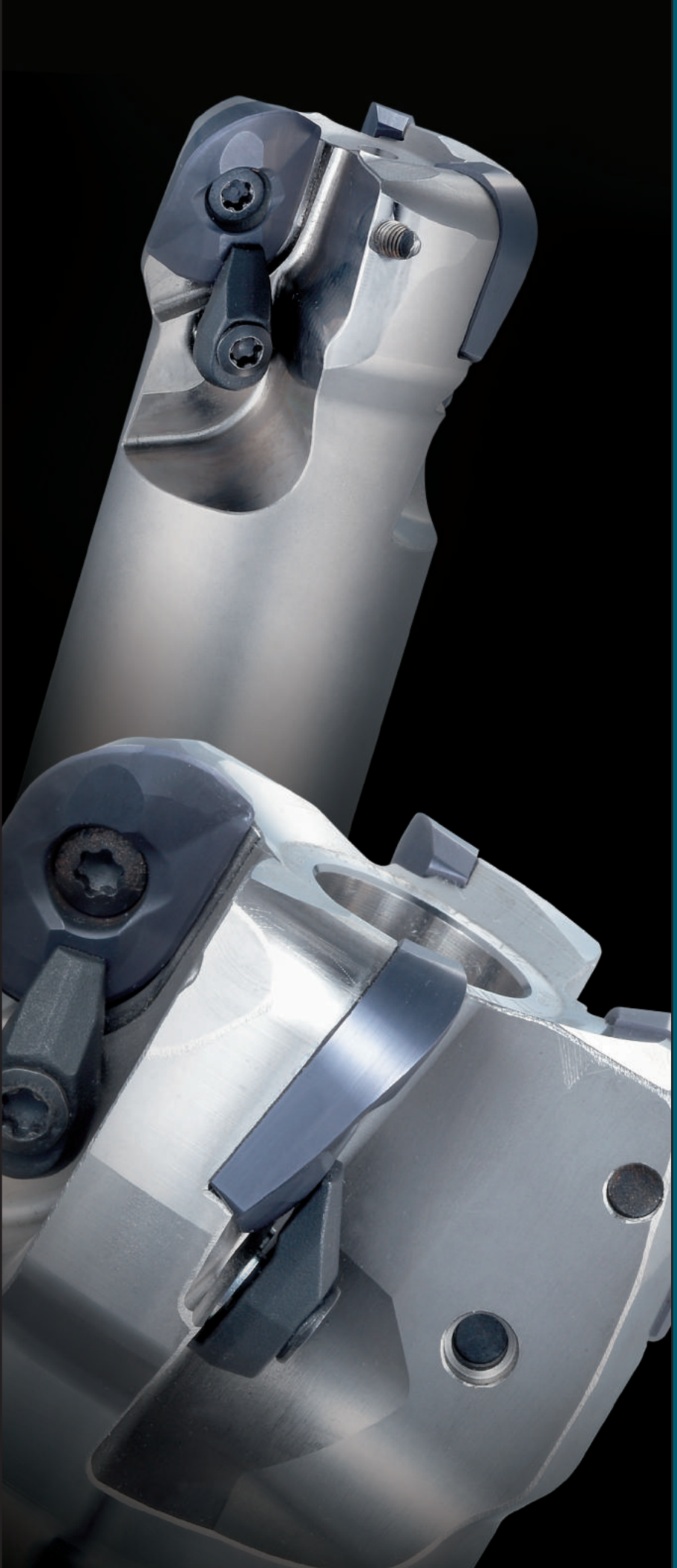


Flute shape definitions for the purpose of creating a program

Insert Size	R (mm)	Aa Max (mm)	rt (mm)	z (mm)
SPMT07…	0.5	0.8	1.2	0.35
SDMT09...	0.8	1	2	0.7
SXMT12...	1	2	3	1.15

For machining purposes, create machining programs for the respective simulated R radius cutters.





OSG PHOENIX® PDR

Deep Feed Radius Cutter

A series of deep feed radius end mills and facemills for deeper depths of cut versus conventional high-feed cutters.

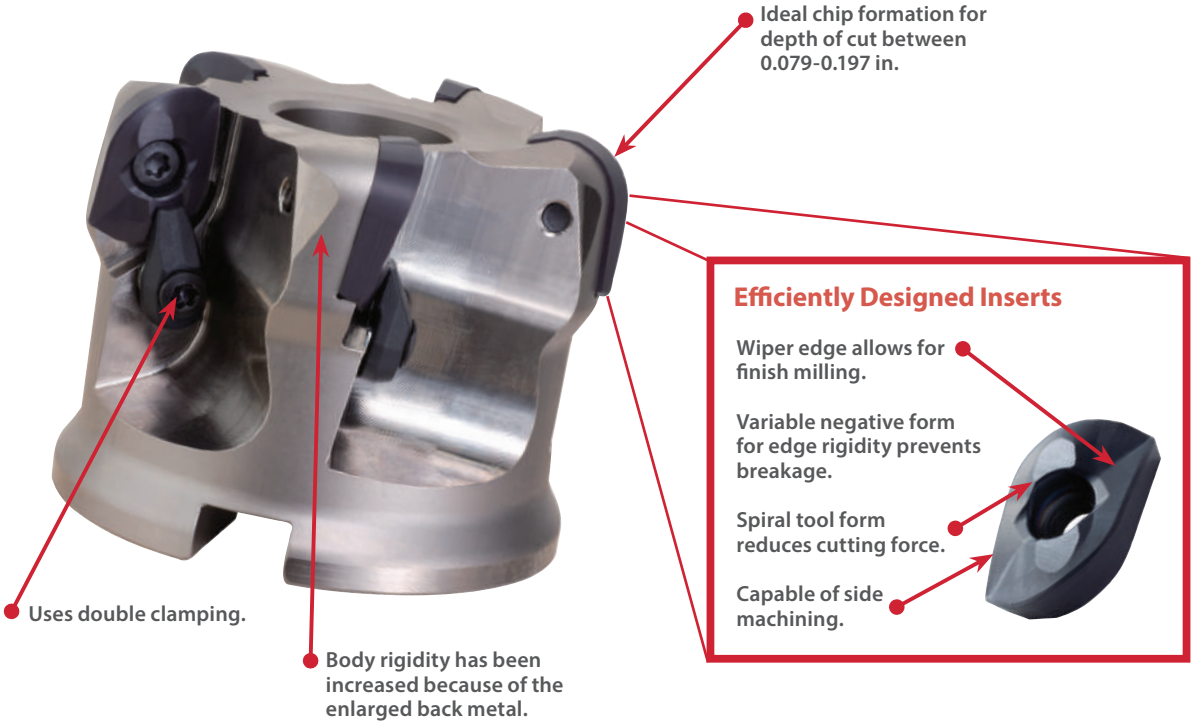
List 6420
PDR SS (Metric)

List 6450
PDR Bore (Metric)

List 78PDR
PDR Inserts

List 7808H
PDR Accessories

Features & Benefits



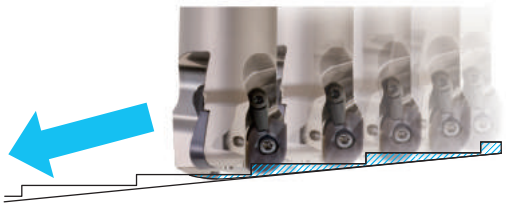
» The PHOENIX® PDR Solves Traditional Machining Problems

Issues with traditional high efficiency cutting tools:

- There is no radius tool that can perform large depths of cut.
- Large variances in removal damage the tool.
- The depth of cut is so small with 3D contours that air cutting is common.

» The PHOENIX® PDR can cut what was once considered the work of only ball end mills.

In heavy roughing (contoured machining), machining steps become larger based on the depth of cut. Usually, the effect on the next cutting tool is great, and as machining processes are added, the overall production time increases. However, the tool form of the OSG PHOENIX® PDR is designed to increase the removal and leave stepovers similar to ball end mills while still maintaining the rigidity of a radius end mill.



Processing Data

» Cutting Edge is Designed for Both Rigidity and Sharpness - FC250

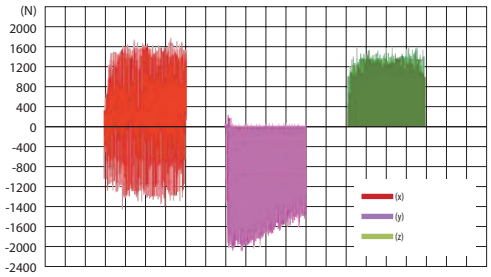
With the strengthened cutting edge, the cutting force is similar to a chip breaker-style insert.

Tool	PDR20R050MT5M16-3L
Insert (Grade)	ADMT2006100PDR-GM (XP3930)
Work Material	FC250
Cutting Speed	492 SFM (955 RPM)
Feed	59.06 IPM (0.020 ipt)
Depth of Cut	Aa = 0.118 in, Ar = 0.984 in
Coolant	Air
Machine	Vertical Machining Center

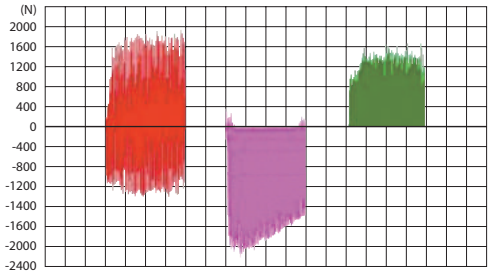
(N)

	F(x) Feed force	F(y) Principal cutting force	F(z) Thrust force	Resultant force
PDR	1651	2082	1433	3019
Competitor (with breaker)	1725	2095	1455	3079

PDR



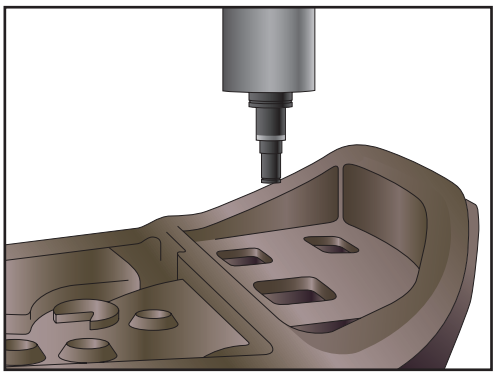
Competitor



» Achieving Efficient Machining and Longer Tool Life - FC250

While efficiency is twice as great as ball end mills, spindle loads are also reduced! The maximum spindle load is 55%.

Tool	PDR20R050MT5M24-3S
Insert (Grade)	ADMT2006100PDR-GM (XP3930)
Work Material	FC250
Cutting Speed	492 SFM (955 RPM)
Feed	78.74 IPM (0.028 ipt)
Depth of Cut	Aa = 0.118 in, Ar = 1.181 in
Coolant	Air
Machine	Gantry Machining Center
Tool Life	4 hrs



List 6420

PDR SS (Metric)

SPEED FEED P144

Recommended Materials: p144
Accessories & Inserts: p143
Maximum Ramping Angle: p144

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	Effective Dia. (mm) D1	No. of Teeth	Shank Dia. (mm) d	Overall Length (mm) L	Neck Length (mm) L1	Neck Dia. (mm) d1	Applicable Insert
7800000	Cylindrical Shank Short	Normal	PDR20R040SS42-2S	1	40	20	2	42	150	50	38.9	ADMT20…
7800004			PDR20R050SS42-3S	1	50	30	3	42	150	50	48.5	
7800009	Cylindrical Shank Long		PDR20R040SS42-2L	1	40	20	2	42	250	150	38.9	
7800013			PDR20R050SS42-3L	1	50	30	3	42	250	150	48.5	

Packed: 1 pc.

PXT

List 6450

PDR Bore (Metric)

SPEED FEED P144

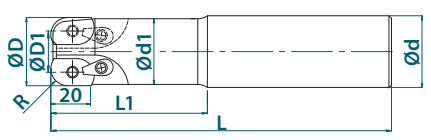
Recommended Materials: p144
Accessories & Inserts: p143
Maximum Ramping Angle: p144

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	Effective Dia. (mm) D1	No. of Teeth	Tool Height (mm) H	Flange Dia. (mm) D2	Bore Dia. (mm) d3	Keyway Width (mm) a	Keyway Depth (mm) b	Applicable Insert
6450001	Bore	Normal	PDR20R063M25.4-3	2	63	43	3	70	60	25.40	8.0	5.0	ADMT20…
6450002			PDR20R063M25.4-4	2	63	43	4	70	60	25.40	8.0	5.0	
7800052			PDR20R080M31.7-4	2	80	60	4	63	76	31.75	12.7	8.0	
7800053			PDR20R080M31.7-5	2	80	60	5	63	76	31.75	12.7	8.0	
7800054			PDR20R100M31.7-5	2	100	80	5	63	90	31.75	12.7	8.0	
7800055			PDR20R100M31.7-6	2	100	80	6	63	90	31.75	12.7	8.0	
7800056			PDR20R125M31.7-6	2	125	105	6	63	100	31.75	12.7	8.0	
7800057			PDR20R063M22-3	2	63	43	3	63	60	22.00	10.4	6.3	
7800058			PDR20R063M22-4	2	63	43	4	63	60	22.00	10.4	6.3	
7800059			PDR20R080M27-4	2	80	60	4	63	76	27.00	12.4	7.0	
7800060			PDR20R080M27-5	2	80	60	5	63	76	27.00	12.4	7.0	
7800061			PDR20R100M32-5	2	100	80	5	63	96	32.00	14.4	8.0	
7800062			PDR20R100M32-6	2	100	80	6	63	96	32.00	14.4	8.0	
7800063			PDR20R125M40-6	2	125	105	6	63	100	40.00	16.4	9.0	

Packed: 1 pc.

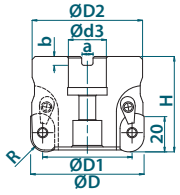
PXT

Type 1



Without coolant hole.

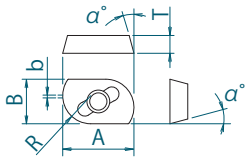
Type 2



Without coolant hole.

List 78PDR

PDR Inserts



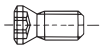
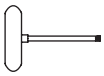
Designation	No. of Cutting Edges	Insert Size					EDP Number
		A x B (mm)	T (mm)	α	R (mm)	b (mm)	XP3930
ADMT2006100PDR-GM	2	24.18 x 16	6.35	15°	10	1	7810000

Packed: 10 pcs.

PXI

List 7808H

PDR Accessories

Appearance	EDP No.	Designation	Recommended Tightening Torque
 Clamping Screw	7808001	CSPB-5 (Torx 20IP)	5.0 Nm
 Wrench	7808000	20IP-T (Torx 20IP)	
Metal Weight Set Washer	7808002	CSY-20	

Packed: Clamping Screws = 10 pcs.; Wrench = 1 pc.; Weight Set = 1 pc.
Note: Wrench sold separately.

PXT

Cutting Conditions

Work Material		Tensile Strength – Hardness	Milling Speed Vc (SFM)	Insert Size							
				PDR SS			PDR BORE				
				Face Milling			Face Milling				
				Feed Per Tooth fz (in/t)	Depth of Cut aa (in)		Feed Per Tooth fz (in/t)	Depth of Cut aa (in)			
					OAL=120	OAL=170		OAL=100	OAL=200	OAL=300	OAL=400
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	590 (295 - 720)	0.027 (0.012 - 0.040)	0.118	0.079	0.024 (0.012 - 0.040)	0.118	0.118	0.079	0.079
	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	590 (295 - 720)	0.027 (0.012 - 0.040)	0.118	0.079	0.024 (0.012 - 0.040)	0.118	0.118	0.079	0.079
	Die Steels (H13, D2)	~280 HB	495 (295 - 590)	0.024 (0.012 - 0.040)	0.118	0.079	0.020 (0.012 - 0.040)	0.118	0.079	0.079	0.079
K	Cast Iron (FC250)	~350 N/mm²	590 (330 - 820)	0.031 (0.012 - 0.059)	0.118	0.118	0.027 (0.012 - 0.059)	0.118	0.118	0.079	0.079
	Ductile Cast Iron (60-40-18)	~800 N/mm²	495 (330 - 820)	0.027 (0.012 - 0.047)	0.118	0.118	0.024 (0.012 - 0.047)	0.118	0.118	0.079	0.079

Recommended Materials by Application

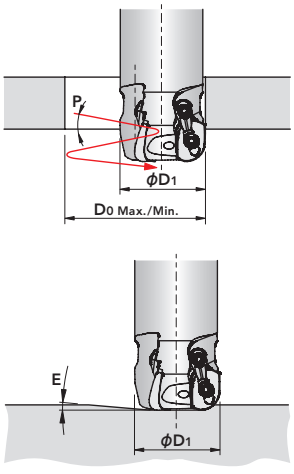
Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
XP3930	GM	-	◻		◻			

GM: Medium Cutting

○ good ◻ best

Maximum Ramping Angle (E)

Insert Size	ADMT20...			
Diameter (mm)	Ramping Angle	Helical Milling (mm)		Plunging (mm)
D1	E	D0 Min	D0 Max	Z
40	5°	50	78	3
50	3°	70	98	3
63	2°	96	124	3
80	1°	130	158	3
100	0.5°	170	198	3
125	0.5°	220	248	3



OSG PHOENIX® PFAL

Finishing Cutter for Aluminum

A finishing cutter designed for excellent surface finish in aluminum applications.

List 78036
PFAL Bore (Metric)

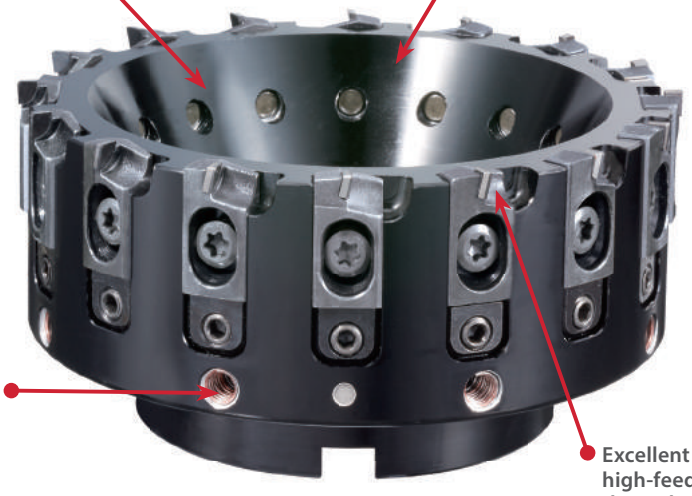
List 78PFAL
PFAL Inserts

List 7808H
PFAL Accessories

Features & Benefits

Cutter (with blades mounted) is balanced to G6.3, enabling high-speed milling.

Lightweight aluminum body and broad size lineup accommodates machining centers from large to small.



High precision balancing can be performed even when the cutter is mounted on the arbor.

Excellent surface finish, even in high-feed milling, through the use of multiple blades and a stanardized wiper.

» Integrated PCD Cartridges

Wiper Blade Indicator

Wiper Blade Position Indicator

Wiper Cartidge:

- Enables superior surface finish.
- One per body, mounted in the designated position.
- Can be reground for maximum cost performance.

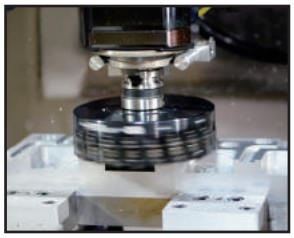
Standard Cartridge:

- Provides stable milling with high efficiency.
- Multiple per body.
- Can be reground for maximum cost performance.

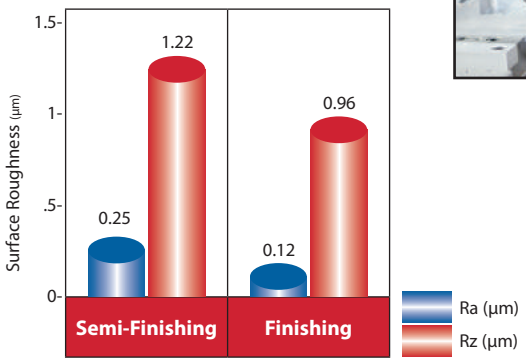
Processing Data

High Efficiency Milling in Die Cast Aluminum on Small Machines - ADC12

The use of a large-diameter PFAL cutter allows for facing of the entire part in one pass with no overlap marks. Stable and high quality surface finish was achieved for semi-finishing and finishing, even on small machining centers.

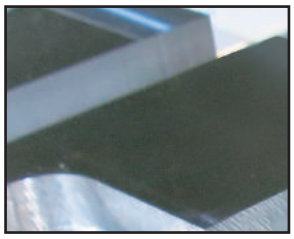


Tool	PFAL04R160M25.4-20	
Insert (Grade)	FR1204 (DP010)	
Application	Semi-Finishing	Finishing
Work Material	ADC12	
Cutting Speed	3280 SFM (2000 RPM)	6560 SFM (4000 RPM)
Feed	126 IPM (0.003 IPT)	252 IPM (0.003 IPT)
Depth of Cut	Aa = 0.079 in, Ar = 3.937 in	Aa = 0.008 in, Ar = 3.937 in
Coolant	Water-Soluble	
Machine	VMC (BT30 taper)	



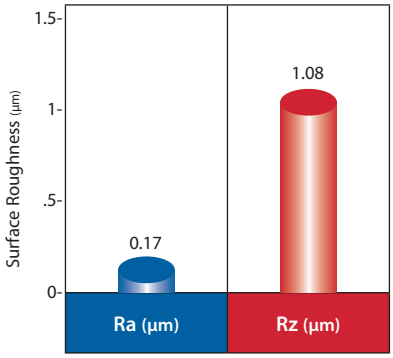
High Precision Milling in Die Cast Aluminum - ADC12

The PFAL cutter had double the milling efficiency with no chatter, producing an excellent surface finish.



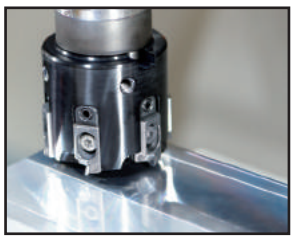
Surface Roughness
Ra=0.17 ~ 0.22µm Rz=1.08 ~ 1.24µm

Tool	PFAL04R080M25.4-10	Competitor
Insert (Grade)	FR1204 (DP010)	PCD
Work Material	ADC12	
Cutting Speed	9842 SFM (12000 RPM)	
Feed	567 IPM (0.005 IPT)	283 IPM (0.004 IPT)
Depth of Cut	Aa = 0.020 in, Ar = 2.087 in	
Coolant	Water Soluble	
Machine	HMC	

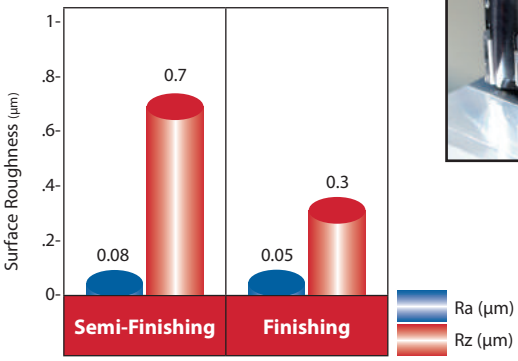


High Efficiency and High Precision Milling in Die Cast Aluminum - ADC12

PFAL was able to meet the required surface roughness in both semi-finishing and finishing. Additionally, the number of machining passes was reduced from 2 to 1 for both processes, resulting in decreased cycle time.



Tool	PSTW12R050M22-4	
Insert (Grade)	FR1204 (DP010)	
Application	Semi-Finishing	Finishing
Work Material	ADC12	
Cutting Speed	3280 SFM (5000 RPM)	4920 SFM (7500 RPM)
Feed	118 IPM (0.004 IPT)	177 IPM (0.004 IPT)
Depth of Cut	Aa = 0.079 in, Ar = 1.338 in	Aa = 0.008 in, Ar = 1.338 in
Coolant	Water-Soluble	
Machine	HMC (BT30 taper)	



List 78036

PFAL Bore (Metric)

NEW

SPEED FEED P152

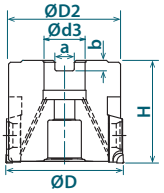
Recommended Materials: p152
Accessories & Inserts: p149

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm) D	No. of Teeth	Tool Height (mm) H	Flange Dia. (mm) D2	Bore Dia. (mm) d3	Keyway Width (mm) a	Keyway Depth (mm) b	Applicable Insert
7803600		Normal	PFAL04R050M16-5	1	50	5	55	40	16	8.4	5.6	
7803601			PFAL04R063M22-6	1	63	6	55	45	22	10.4	6.3	
7803602		Close	PFAL04R063M22-8	1	63	8	55	45	22	10.4	6.3	
7803603		Normal	PFAL04R080M25.4-8	2	80	8	50	70	25.4	9.5	6	
7803604			PFAL04R080M27-8	2	80	8	50	70	27	12.4	7	
7803605		Close	PFAL04R080M25.4-10	2	80	10	50	70	25.4	9.5	6	
7803606			PFAL04R080M27-10	2	80	10	50	70	27	12.4	7	
7803607		Normal	PFAL04R100M25.4-8	2	100	8	50	80	25.4	9.5	6	
7803608			PFAL04R100M27-8	2	100	8	50	80	27	12.4	7	
7803609			PFAL04R100M31.7-8	2	100	8	50	72	31.75	12.7	8	
7803610			PFAL04R100M32-8	2	100	8	50	80	32	14.4	8.2	
7803611		Close	PFAL04R100M25.4-12	2	100	12	50	80	25.4	9.5	6	
7803612			PFAL04R100M27-12	2	100	12	50	80	27	12.4	7	
7803613			PFAL04R100M31.7-12	2	100	12	50	80	31.75	12.7	8	
7803614			PFAL04R100M32-12	2	100	12	50	80	32	14.4	8.2	
7803615		Normal	PFAL04R125M25.4-10	2	125	10	50	80	25.4	9.5	6	FR1204 / FR1206
7803616			PFAL04R125M27-10	2	125	10	50	80	27	12.4	7	
7803617			PFAL04R125M38.1-10	2	125	10	63	80	38.1	15.9	10	
7803618			PFAL04R125M40-10	2	125	10	63	85	40.0	16.4	9.2	
7803619		Close	PFAL04R125M25.4-16	2	125	16	50	80	25.4	9.5	6	
7803620			PFAL04R125M27-16	2	125	16	50	80	27	12.4	7	
7803621			PFAL04R125M38.1-16	2	125	16	63	80	38.1	15.9	10	
7803622			PFAL04R125M40-16	2	125	16	63	85	40	16.4	9.2	
7803623		Normal	PFAL04R160M25.4-12	2	160	12	50	80	25.4	9.5	6	
7803624			PFAL04R160M27-12	2	160	12	50	80	27	12.4	7	
7803625			PFAL04R160M40-12	2	160	12	63	85	40	16.4	9.2	
7803626			PFAL04R160M50.8-12	2	160	12	63	100	50.8	19.1	11	
7803629		Close	PFAL04R160M25.4-20	2	160	20	50	80	40	16.4	9.2	
7803630			PFAL04R160M27-20	2	160	20	50	80	50.8	19.1	11	
7803627			PFAL04R160M40-20	2	160	20	63	85	25.4	9.5	6	
7803628			PFAL04R160M50.8-20	2	160	20	63	100	27	12.4	7	

Packed: 1 pc.
Note: All accessories included with body.
Note: **This item is stocked overseas. Please contact OSG for availability and delivery.**

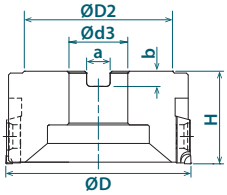
PXT

Type 1



With coolant hole.

Type 2



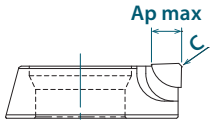
Without coolant hole.

For the use of internal coolant, please use a clamping bolt with coolant holes sold in the market.

List 78PFAL

NEW

PFAL Inserts



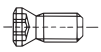
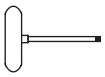
Designation	No. of Cutting Edges	Insert Size		EDP Number
		c (mm)	Aa max (mm)	DP010
FR1204	1	0.4 x 45°	4	7820500
FR1206	1	0.4 x 45°	6	7820502
FR1204-W	1	0.4 x 45°	-	7820501

Packed: 1 pc.
Note: One wiper blade is required per cutter body and should be mounted in the designated position.
Note: The FR1204-W wiper blade can be used with both FR1204 & FR1206 normal blades.

PXI

List 7808H

PFAL Accessories

Appearance	EDP No.	Designation	Applicable Cutter		Recommended Tightening Torque
			(mm)	(inch)	
 Blade Clamping Screw	7808125	FS60620 (Torx 25)	PFAL Ø50-160	-	10.0 Nm
 Wedge	7808143	W12-06	PFAL Ø50-160	-	
 Wedge Clamping Screw	7808142	WS0617	PFAL Ø50-160	-	
 Wrench for Blade	7808211	T25-T (Torx 25)	PFAL Ø50-160	-	
 Wrench for Wedge	7808231	3MM-L	PFAL Ø50-160	-	

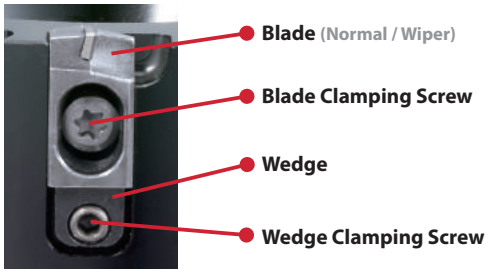
Packed: Clamping Screws = 10 pcs.; Wedge = 10pcs.; Wedge Clamping Screw = 10 pcs.; Wrench for Blade = 1 pc.; Wrench for Wedge = 1 pc.

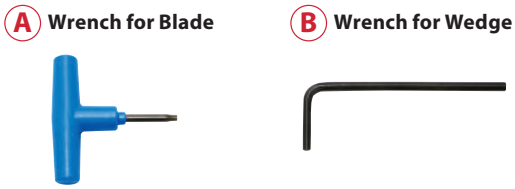
PXT

Technical Data

» Adjusting Cutting Edge Height

Names of Components:



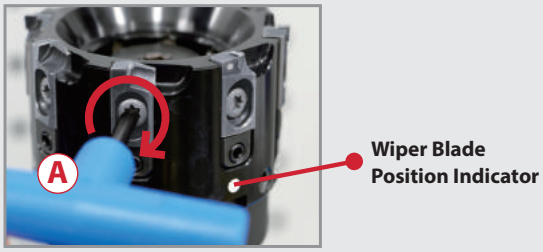


1. Confirm Wedge Position

Check and ensure that all wedges are in the correct position. Make adjustments when necessary.

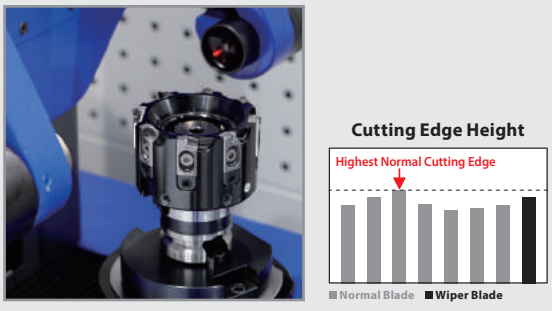
2. Mounting of Blades

Mount one wiper blade (FR1204-W) to the wiper blade position indicator and the normal blades (FR1204 or FR1206) to the remaining positions. Using the T-Wrench (A), tighten the clamp screw completely to 10 Nm.



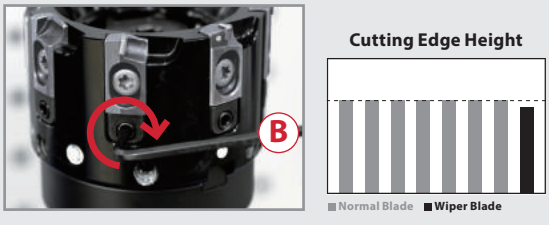
3. Measurement of Cutting Edge Height

Measure all of the cutting edge heights and determine the highest normal cutting edge.



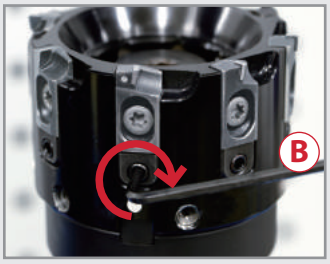
4. Adjustment of Normal Blades

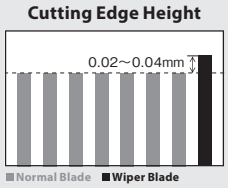
Adjust all other normal cutting edges to match the highest normal cutting edge height. The offset should be within 0.005mm. To lift the wedges, use the L-Wrench (B) to turn the wedge screw clockwise.



5. Adjustment of Wiper Blade

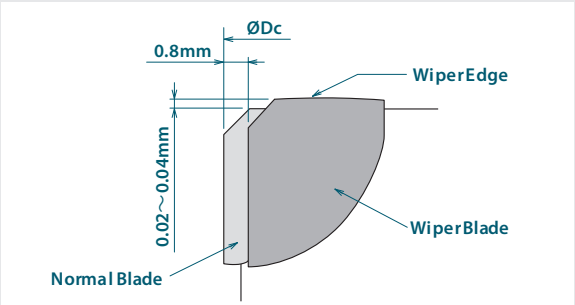
Use the L-Wrench (B) to adjust the wiper blade so that it is 0.02 - 0.04mm higher than the other normal blades.





Cutting Edge Position of the Wiper Blade

The wiper blade is automatically set to be 0.8mm closer to the interior than the normal blade. Based on this design, only the bottom of the wiper edge is used during processing, thus enabling a high quality surface finish even in high depth (Ap) milling.

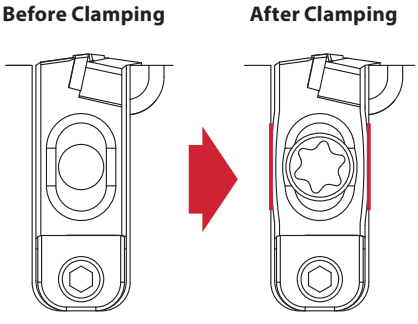


Cautions During Use

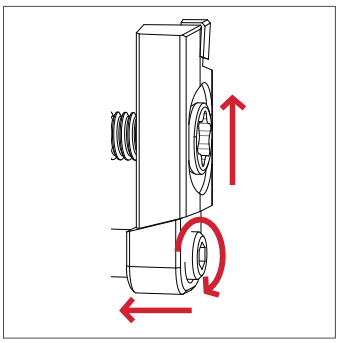
- **Blades can be adjusted by lifting upward only.**
- **Maximum adjustment is 0.6mm.**
- **When the maximum adjustment limit is reached, remove the blade and start over from step (1).**
- **When measuring the edge height using a contact tool presetter with a touch probe, please be cautious to not damage the PCD edge.**

No need for Temporary Tightening

Temporary tightening is not required. Cutting edge height can be adjusted after complete tightening of the clamping screw, making the setup process quick and effortless.



The tightening of the clamping screw pushes sides of the blade outward, locking it tightly in place with the cutter body



After tightening the clamping screw, the blade is locked into position secured by the wedge taper. The wedge assures a fix and unmovable blade position during machining.

Cutting Conditions (Semi-Finishing)

Work Material		Tensile Strength – Hardness	Insert Size: FR12… Face Milling			
			Milling Speed Vc (SFM)		Feed Per Tooth fz (in/t)	Depth of Cut Aa (in)
			CAT30	CAT40, CAT50 HSK-63		
N	Aluminum Alloys (7075, 5052, 2017, ADC12)	~12% Si	3300 (2600-6500)	6500 (3300-16400)	0.003 (0.002-0.004)	0.060 (0.040-0.080)
	Aluminum Alloys (AC9A, AC9B)	~13% Si	2000 (1300-2600)	2000 (1300-2600)	0.0025 (0.002-0.003)	0.060 (0.040-0.080)

Cutting Conditions (Finishing)

Work Material		Tensile Strength – Hardness	Insert Size: FR12… Face Milling			
			Milling Speed Vc (SFM)		Feed Per Tooth fz (in/t)	Depth of Cut Aa (in)
			CAT30	CAT40, CAT50 HSK-63		
N	Aluminum Alloys (7075, 5052, 2017, ADC12)	~12% Si	3300 (2600-6500)	6500 (3300-16400)	0.003 (0.002-0.004)	0.020 (0.012-0.040)
	Aluminum Alloys (AC9A, AC9B)	~13% Si	2000 (1300-2600)	2000 (1300-2600)	0.0025 (0.002-0.003)	0.020 (0.012-0.040)

Recommended Materials by Application

Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
DP010	–	Yes				◻		

○ good ◻ best

OSG PHOENIX® PFB

Finishing Ball End Mill

A series of high precision indexable finish ballnose end mills for superior surface finish and tool life.

List 52100
PFB SA (Inch)

List 78014
PFB SS (Metric)

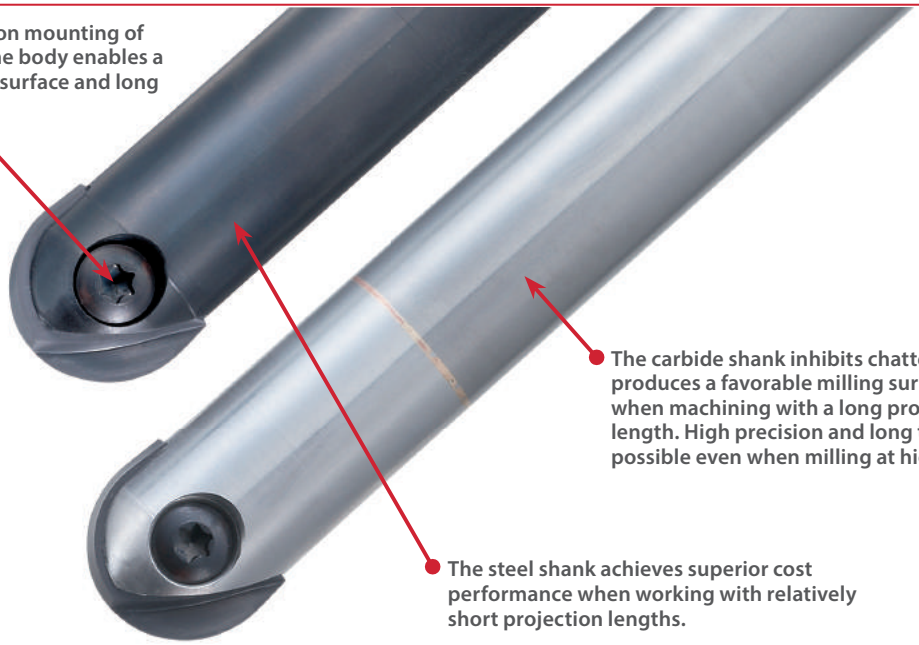
List 52604
PFB ASF (Inch)

List 78114
PFB SF (Metric)

List 78PFB
PFB Inserts (Inch & Metric)

List 7808H
PFB Accessories

Features & Benefits



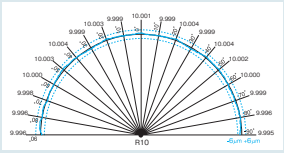
» PFB Insert Variety

PFB-Q

- The effective cutting edge has a 220˚ angle, applicable for undercut milling.
- The 220˚ cutting edge reduces chatter on vertical walls and produces improved surface finishes.
- High insert radius precision (±6µm).

PFB-SP

- Spiral edge form handles a wide range of work materials.
- High insert radius precision (±6µm).



PFB-SH

- Specialized cutting edge shape for cast iron, ductile cast iron, and hardened steel.
- Improved resistance to chipping and breakage by special edge treatment.
- High insert radius precision (±6µm).

PFB-D

- Employs a spiral edge form for outstanding sharpness.
- Amazing durability when machining graphite, copper, aluminum, MMC, and carbon fiber composite material!
- High insert radius precision (±6µm).

XP3225 Grade

- Stable machining is possible in a wide range of cutting conditions.
- Especially good performance in stainless steel and carbon steel.

XP3320 Grade

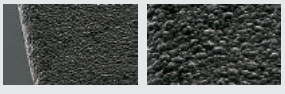
- Utilizes a carbide substrate with a superior balance of wear resistance and anti-chipping properties.
- Oxidation temperature 1300˚C
- Surface hardness 3500 HV
- Capable of long tool life during high speed, high-efficiency machining.

XP3310 Grade

- Highly wear resistant carbide substrate.
- Utilizes a coating with excellent heat resistance and wear resistance.

XC4505 Grade

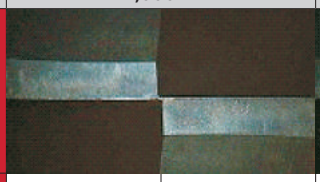
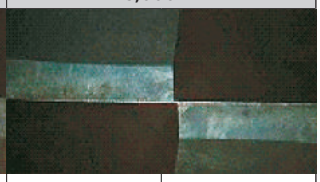
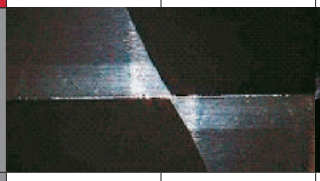
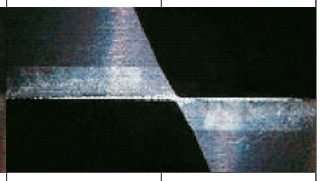
- Utilizes a special carbide substrate for diamond coating.
- A sharp edge is attained through the combination of our high-level grinding techniques and leading diamond coating technology.



Processing Data

Wear Comparison Test - SUH600 Steel

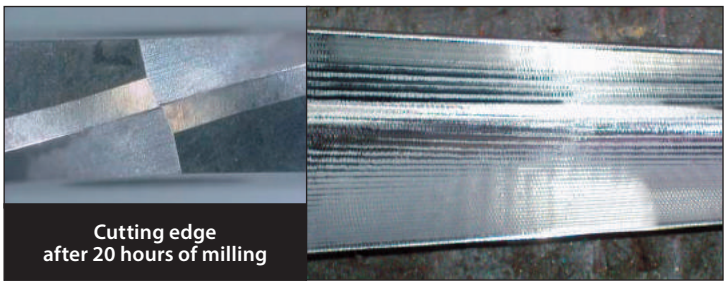
Tool	PFB-R200SS20-S160
Insert (Grade)	PFB200-SP (XP3320)
Workpiece	Blade Sample Model
Work Material	SUH600 Steel
Overall Length	4.331 in
Cutting Speed	308 SFM (1500 RPM)
Feed	78.74 IPM (0.026 ipt)
Milling Method	Profile Milling
Depth of Cut	Aa = 0.008 in, Ar = 0.039 in
Coolant	Water Soluble
Machine	Vertical Machining Center

Time	70 minutes		140 minutes	
Milling Length	4,000 in		8,000 in	
PFB				
Wear Amount (in)	0.0012	0.0011	0.0016	0.0017
Competitor				
Wear Amount (in)	0.0012	0.0013	0.0027	0.0028

Finishing Milling in Stainless Steel - SUS410J1 Equivalent

The amount of flank wear after 20 hours of milling was 0.0008 in. The machined face was smooth and bright during the operation.

Tool	PFB-R120SS12-LL160CS
Insert (Grade)	PFB120-Q (XP3225)
Workpiece	Turbine Blade
Work Material	SUS410J1 Equivalent
Cutting Speed	393 SFM (3185 RPM)
Feed	75.24 IPM (0.012 ipt)
Milling Method	Profile Milling
Depth of Cut	Aa = 0.005 in, Ar = 0.027 in
Coolant	Non-Water Soluble
Machine	Vertical Machining Center



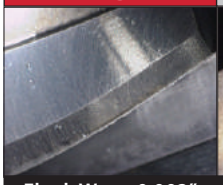
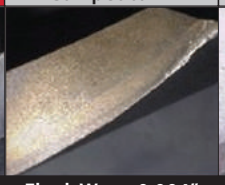
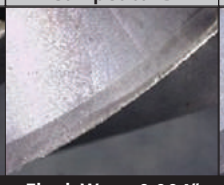
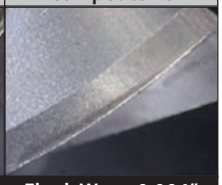
Cutting edge after 20 hours of milling

Long Tool Life in Titanium - Ti-6Al-4V

After machining 300 inches in Titanium Alloy, PFB showed half the flank wear of the competitors' tools.

Tool	ø20mm PFB-R200SS20-S160
Insert (Grade)	ø20mm PFB200-SP (XP3320)
Work Material	Ti-6Al-4V
Cutting Speed	58 SFM (280 RPM)
Feed	1.95 IPM (0.0035 ipt)
Depth of Cut	Aa = 0.012 in, Ar = 0.008 in
Coolant	Water Soluble
Machine	Vertical Machining Center

Cutting Edge Wear After 300 Inches

PFB	Competitor A	Competitor B	Competitor C
			
Flank Wear: 0.002"	Flank Wear: 0.004"	Flank Wear: 0.004"	Flank Wear: 0.004"

Processing Data

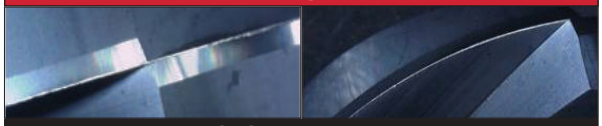
» Long Tool Life in Ductile Cast Iron - GGG70L

After over 50 hours of machining, PFB was able to maintain the required part accuracy and surface finish, and the cutting edge showed normal wear and no chipping.

Tool	ø30mm PFB-R300SS32-S170
Insert (Grade)	ø30mm PFB300-SH (XP3310)
Work Material	GGG70L
Cutting Speed	1,856 SFM (6,000 RPM)
Feed	220.5 IPM (0.018 ipt)
Depth of Cut	Aa = 0.007 in, Ar = 0.020 in
Coolant	Air
Machine	Double Column MC

Cutting Edge Wear After 50 Hours

PFB



Flank Wear: 0.0056"

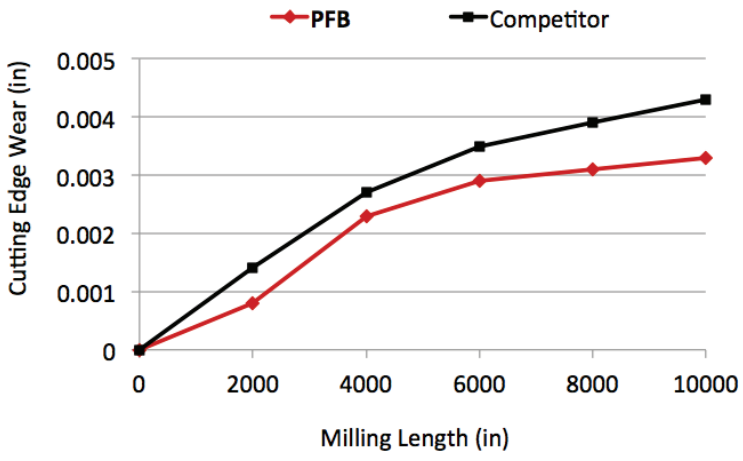
» Long Tool Life in Ductile Cast Iron - GGG70L

After over 50 hours of machining, PFB was able to maintain the required part accuracy and surface finish, and the cutting edge showed normal wear and no chipping.

Tool	ø10mm PFB-R100SS10-S130
Insert (Grade)	ø10mm PFB100-D (XC4505)
Work Material	EX-70
Cutting Speed	619 SFM (6,000 RPM)
Feed	47.2 IPM (0.004 ipt)
Depth of Cut	Aa = 0.197 in, Ar = 0.197 in
Coolant	Air
Machine	Vertical Machining Center

Cutting Edge Wear After 10,000 Inches

PFB	Competitor



List 52100

PFB SA (Inch)

NEW SIZES | SPEED FEED P166

Recommended Materials: p166
Accessories & Inserts: p161-163
Effective Cutting Diameter & Recommended Width of Cut: p164-165

Steel Shank

Carbide Shank

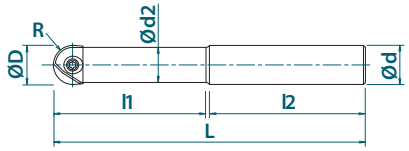
EDP No.	Body Type	Designation	Type	Tool Dia. (inch)	Tool Radius (inch)	Overall Length (inch)	Neck Length (inch)	Taper	L/D Ratio	No. of Teeth	Shank Dia. (inch)	Shank Length (inch)	Neck Dia. (inch)
				D	R	L	l1	α°			d	l2	d2
52100000	Cylindrical Shank Steel	PFB-R0250SA0250-S325	1	0.250	0.1250	3.250	0.625	0	2.5	2	0.250	2.625	0.226
52100026		PFB-R0250SA0250-S375	1	0.250	0.1250	3.750	1.125	0	4.5	2	0.250	2.625	0.226
52100027		PFB-R0250TPA0375-S375	2	0.250	0.1250	3.750	1.125	2	4.5	2	0.375	2.581	0.226
52100028		PFB-R0250TPA0375-S425	2	0.250	0.1250	4.250	1.500	1	6	2	0.375	2.697	0.226
52100029		PFB-R0375SA0375-S400	1	0.375	0.1875	4.000	0.937	0	2.5	2	0.375	3.063	0.336
52100001		PFB-R0375SA0375-S550	1	0.375	0.1875	5.500	1.687	0	4.5	2	0.375	3.813	0.336
52100030		PFB-R0375TPA0500-S500	2	0.375	0.1875	5.000	1.687	2	4.5	2	0.500	3.276	0.336
52100031		PFB-R0375TPA0500-S550	2	0.375	0.1875	5.500	2.250	1	6	2	0.500	3.200	0.336
52100032		PFB-R0500SA0500-S450	1	0.500	0.2500	4.500	1.250	0	2.5	2	0.500	3.250	0.461
52100002		PFB-R0500SA0500-S550	1	0.500	0.2500	5.500	2.250	0	4.5	2	0.500	3.250	0.461
52100033		PFB-R0500TPA0625-S550	2	0.500	0.2500	5.500	2.250	2	4.5	2	0.625	3.229	0.461
52100034		PFB-R0500TPA0625-S650	2	0.500	0.2500	6.500	3.000	1	6	2	0.625	3.461	0.461
52100035		PFB-R0625SA0625-S500	1	0.625	0.3125	5.000	1.562	0	2.5	2	0.625	3.438	0.546
52100003		PFB-R0625SA0625-S550	1	0.625	0.3125	5.500	2.500	0	4	2	0.625	3.000	0.546
52100036		PFB-R0625TPA0750-S600	2	0.625	0.3125	6.000	2.812	2	4.5	2	0.750	3.181	0.546
52100037		PFB-R0625TPA0750-S700	2	0.625	0.3125	7.000	3.750	1	6	2	0.750	3.222	0.546
52100038		PFB-R0750SA0750-S550	1	0.750	0.3750	5.500	1.875	0	2.5	2	0.750	3.625	0.671
52100004		PFB-R0750SA0750-S600	1	0.750	0.3750	6.000	3.000	0	4	2	0.750	3.000	0.671
52100039		PFB-R0750TPA1000-S650	2	0.750	0.3750	6.500	3.375	2	4.5	2	1.000	3.072	0.671
52100040		PFB-R0750TPA1000-S800	2	0.750	0.3750	8.000	4.500	1	6	2	1.000	3.420	0.671
52100005		PFB-R1000SA1000-S650	1	1.000	0.5000	6.500	3.000	0	3	2	1.000	3.500	0.882
52100041		PFB-R1000SA1000-S750	1	1.000	0.5000	7.500	4.000	0	4	2	1.000	3.500	0.882
52100042		PFB-R1000TPA1250-S800	2	1.000	0.5000	8.000	4.500	2	4.5	2	1.250	3.477	0.882
52100043		PFB-R1000TPA1250-S950	2	1.000	0.5000	9.500	6.000	1	6	2	1.250	3.442	0.882
52100016		PFB-R1250SA1250-S700	1	1.250	0.6250	7.000	3.750	0	3	2	1.250	3.250	1.132
52100044		PFB-R1250SA1250-S850	1	1.250	0.6250	8.500	5.000	0	4	2	1.250	3.500	1.132
52100045		PFB-R1250TPA1500-S900	2	1.250	0.6250	9.000	5.625	2	4.5	2	1.500	3.344	1.132
52100046		PFB-R1250TPA1500-S1100	2	1.250	0.6250	11.000	7.500	1	6	2	1.500	3.425	1.132
52100020	Cylindrical Shank Short Carbide	PFB-R0250SA0250-S325CS	1	0.250	0.1250	3.250	0.625	0	2.5	2	0.250	2.625	0.226
52100021		PFB-R0375SA0375-S400CS	1	0.375	0.1875	4.000	0.937	0	2.5	2	0.375	3.063	0.336
52100022		PFB-R0500SA0500-S450CS	1	0.500	0.2500	4.500	1.250	0	2.5	2	0.500	3.250	0.461
52100023		PFB-R0625SA0625-S550CS	1	0.625	0.3125	5.500	1.562	0	2.5	2	0.625	3.938	0.546
52100024		PFB-R0750SA0750-S600CS	1	0.750	0.3750	6.000	1.875	0	2.5	2	0.750	4.125	0.671
52100025		PFB-R1000SA1000-S650CS	1	1.000	0.5000	6.500	2.500	0	2.5	2	1.000	4.000	0.882
52100017		PFB-R1250SA1250-S700CS	1	1.250	0.6250	7.000	3.125	0	2.5	2	1.250	3.875	1.132

Packed: 1 pc.

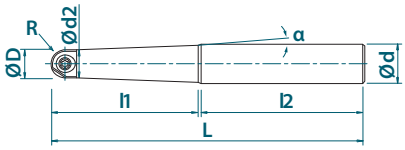
continued on next page

PXT

Type 1



Type 2



List 52100 (Continued)

PFB SA (Inch)

NEW SIZES | SPEED FEED P166

Recommended Materials: p166
Accessories & Inserts: p161-163
Effective Cutting Diameter & Recommended Width of Cut: p164-165

Steel Shank

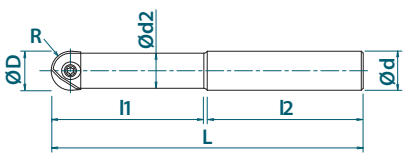
Carbide Shank

EDP No.	Body Type	Designation	Type	Tool Dia. (inch)	Tool Radius (inch)	Overall Length (inch)	Neck Length (inch)	Taper	L/D Ratio	No. of Teeth	Shank Dia. (inch)	Shank Length (inch)	Neck Dia. (inch)
				D	R	L	l1	α°			d	l2	d2
52100047	Cylindrical Shank Long Carbide	PFB-R0250SA0250-L400CS	1	0.250	0.1250	4.000	1.250	0	5	2	0.250	2.750	0.226
52100048		PFB-R0250TPA0375-L425CS	2	0.250	0.1250	4.250	1.500	1	6	2	0.375	2.697	0.226
52100006		PFB-R0375SA0375-L550CS	1	0.375	0.1875	5.500	1.875	0	5	2	0.375	3.625	0.336
52100049		PFB-R0375TPA0500-L550CS	2	0.375	0.1875	5.500	2.250	1	6	2	0.500	3.200	0.336
52100007		PFB-R0500SA0500-L550CS	1	0.500	0.2500	5.500	2.500	0	5	2	0.500	3.000	0.461
52100050		PFB-R0500TPA0625-L650CS	2	0.500	0.2500	6.500	3.000	1	6	2	0.625	3.461	0.461
52100008		PFB-R0625SA0625-L650CS	1	0.625	0.3125	6.500	3.125	0	5	2	0.625	3.375	0.546
52100051		PFB-R0625TPA0750-L700CS	2	0.625	0.3125	7.000	3.750	1	6	2	0.750	3.222	0.546
52100009		PFB-R0750SA0750-L700CS	1	0.750	0.3750	7.000	3.750	0	5	2	0.750	3.250	0.671
52100052		PFB-R0750TPA1000-L800CS	2	0.750	0.3750	8.000	4.500	1	6	2	1.000	3.420	0.671
52100010		PFB-R1000SA1000-L800CS	1	1.000	0.5000	8.000	4.500	0	4.5	2	1.000	3.500	0.882
52100053		PFB-R1000TPA1250-L950CS	2	1.000	0.5000	9.500	6.000	1	6	2	1.250	3.442	0.882
52100018		PFB-R1250SA1250-L900CS	1	1.250	0.6250	9.000	5.625	0	4.5	2	1.250	3.375	1.132
52100054		PFB-R1250TPA1500-L1100CS	2	1.250	0.6250	11.000	7.500	1	6	2	1.500	3.425	1.132
52100055	Cylindrical Shank Extra-Long Carbide	PFB-R0250SA0250-LL450CS	1	0.250	0.1250	4.500	1.750	0	7	2	0.250	2.750	0.226
52100056		PFB-R0250TPA0375-LL475CS	2	0.250	0.1250	4.750	2.000	0.5	8	2	0.375	2.690	0.226
52100011		PFB-R0375SA0375-LL650CS	1	0.375	0.1875	6.500	2.625	0	7	2	0.375	3.875	0.336
52100057		PFB-R0375TPA0500-LL650CS	2	0.375	0.1875	6.500	3.000	0.5	8	2	0.500	3.440	0.336
52100012		PFB-R0500SA0500-LL700CS	1	0.500	0.2500	7.000	3.500	0	7	2	0.500	3.500	0.461
52100058		PFB-R0500TPA0625-LL750CS	2	0.500	0.2500	7.500	4.000	0.5	8	2	0.625	3.448	0.461
52100013		PFB-R0625SA0625-LL750CS	1	0.625	0.3125	7.500	3.750	0	6	2	0.625	3.750	0.546
52100059		PFB-R0625TPA0750-LL825CS	2	0.625	0.3125	8.250	5.000	0.5	8	2	0.750	3.206	0.546
52100014		PFB-R0750SA0750-LL900CS	1	0.750	0.3750	9.000	4.500	0	6	2	0.750	4.500	0.671
52100060		PFB-R0750TPA1000-LL950CS	2	0.750	0.3750	9.500	6.000	0.5	8	2	1.000	3.401	0.671
52100015		PFB-R1000SA1000-LL1050CS	1	1.000	0.5000	10.500	5.500	0	5.5	2	1.000	5.000	0.882
52100061		PFB-R1000TPA1250-LL1150CS	2	1.000	0.5000	11.500	8.000	0.5	8	2	1.250	3.416	0.882
52100019		PFB-R1250SA1250-LL1200CS	1	1.250	0.6250	12.000	6.875	0	5.5	2	1.250	5.125	1.132
52100062		PFB-R1250TPA1500-LL1350CS	2	1.250	0.6250	13.500	10.000	0.5	8	2	1.500	3.392	1.132

Packed: 1 pc.

PXT

Type 1



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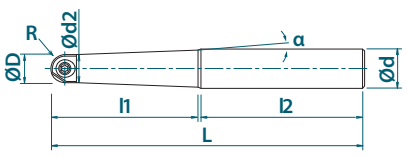


List 78014

PFB SS (Metric)

SPEED FEED P166

Recommended Materials: p166
Accessories & Inserts: p161-163
Effective Cutting Diameter & Recommended Width of Cut: p164-165

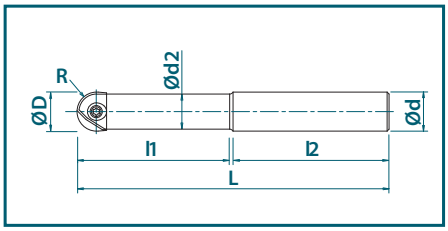
Steel Shank

Carbide Shank

EDP No.	Body Type	Designation	Tool Dia. (mm)	Tool Radius (mm)	Overall Length (mm)	Neck Length (mm)	L/D Ratio	No. of Teeth	Shank Dia. (mm)	Shank Length (mm)	Neck Dia. (mm)
			D	R	L	l1			d	l2	d2
7801400	Cylindrical Shank Steel	PFB-R080SS08-S120	8	4	120	36	4.5	2	8	84	7
7801401		PFB-R100SS10-S130	10	5	130	45	4.5	2	10	85	9
7801402		PFB-R120SS12-S130	12	6	130	54	4.5	2	12	76	11
7801403		PFB-R160SS16-S140	16	8	140	65	4.0	2	16	76	14
7801404		PFB-R200SS20-S160	20	10	160	80	4.0	2	20	80	18
7801405		PFB-R250SS25-S160	25	12.5	160	75	3.0	2	25	85	22
7801406		PFB-R300SS32-S170	30	15	170	90	3.0	2	32	80	27
7801407		PFB-R320SS32-S180	32	16	180	96	3.0	2	32	84	29
7801429	Cylindrical Shank Short Carbide	PFB-R060SS06-S80CS	6	3	80	15	2.5	2	6	65	5.4
7801430		PFB-R080SS08-S100CS	8	4	100	20	2.5	2	8	80	7
7801431		PFB-R100SS10-S100CS	10	5	100	25	2.5	2	10	75	9
7801432		PFB-R120SS12-S110CS	12	6	110	30	2.5	2	12	80	11
7801433		PFB-R160SS16-S140CS	16	8	140	40	2.5	2	16	100	14
7801434		PFB-R200SS20-S160CS	20	10	160	50	2.5	2	20	110	18
7801435		PFB-R250SS25-S160CS	25	12.5	160	62.5	2.5	2	25	97.5	22
7801436		PFB-R300SS32-S170CS	30	15	170	75	2.5	2	32	95	27
7801437		PFB-R320SS32-S180CS	32	16	180	80	2.5	2	32	100	29
7801439	Cylindrical Shank Long Carbide	PFB-R060SS06-L100CS	6	3	100	30	5.0	2	6	70	5.4
7801440		PFB-R080SS08-L120CS	8	4	120	40	5.0	2	8	80	7
7801441		PFB-R100SS10-L130CS	10	5	130	50	5.0	2	10	80	9
7801442		PFB-R120SS12-L140CS	12	6	140	60	5.0	2	12	80	11
7801443		PFB-R160SS16-L160CS	16	8	160	72	4.5	2	16	88	14
7801444		PFB-R200SS20-L180CS	20	10	180	90	4.5	2	20	90	18
7801445		PFB-R250SS25-L200CS	25	12.5	200	100	4.0	2	25	100	22
7801446		PFB-R300SS32-L220CS	30	15	220	120	4.0	2	32	100	27
7801447		PFB-R320SS32-L230CS	32	16	230	128	4.0	2	32	102	29
7801419	Cylindrical Shank Extra-Long Carbide	PFB-R060SS06-LL120CS	6	3	120	42	7.0	2	6	78	5.4
7801420		PFB-R080SS08-LL140CS	8	4	140	56	7.0	2	8	84	7
7801421		PFB-R100SS10-LL150CS	10	5	150	70	7.0	2	10	80	9
7801422		PFB-R120SS12-LL160CS	12	6	160	84	7.0	2	12	76	11
7801423		PFB-R160SS16-LL200CS	16	8	200	96	6.0	2	16	104	14
7801424		PFB-R200SS20-LL240CS	20	10	240	120	6.0	2	20	120	18
7801425		PFB-R250SS25-LL260CS	25	12.5	260	137.5	5.5	2	25	122.5	22
7801426		PFB-R300SS32-LL290CS	30	15	290	165	5.5	2	32	125	27
7801427		PFB-R320SS32-LL300CS	32	16	300	176	5.5	2	32	124	29

Packed: 1 pc.

PXT

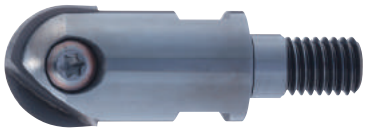


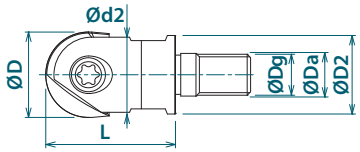
List 52604

PFB ASF (Inch)

SPEED FEED P166

Recommended Materials: p166
Accessories & Inserts: p161-163
Effective Cutting Diameter & Recommended Width of Cut: p164-165
SF Arbors: p189





EDP No.	Body Type	Designation	Tool Dia. (inch) D	No. of Teeth	Pilot Dia. (inch) Da	Thread Dia. (mm) Dg	Overall Length (inch) L	Head Dia. (inch) d2	Flange Dia. (inch) D2	Wrench Size	Applicable Insert
52604000	Screw Fit Head	PFB-R0375ASF6	0.375	2	0.256	M6	1.024	0.354	0.354	7	PFB…
52604001		PFB-R0500ASF6	0.500	2	0.256	M6	1.024	0.433	0.433	7	
52604002		PFB-R0625ASF8	0.625	2	0.335	M8	1.260	0.551	0.571	10	
52604003		PFB-R0750ASF10	0.750	2	0.413	M10	1.496	0.709	0.709	14	
52604004		PFB-R1000ASF12	1.000	2	0.492	M12	1.496	0.866	0.906	17	

Packed: 1 pc.

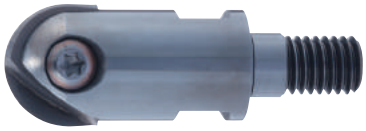
PXT

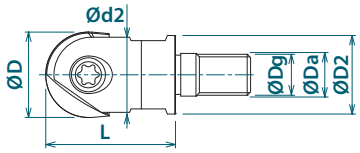
List 78114

PFB SF (Metric)

SPEED FEED P166

Recommended Materials: p166
Accessories & Inserts: p161-163
Effective Cutting Diameter & Recommended Width of Cut: p164-165
SF Arbors: p190





EDP No.	Body Type	Designation	Tool Dia. (mm) D	No. of Teeth	Pilot Dia. (mm) Da	Thread Dia. (mm) Dg	Overall Length (mm) L	Head Dia. (mm) d2	Flange Dia. (mm) D2	Wrench Size	Applicable Insert
7801490	Screw Fit Head	PFB-R100SF6	10	2	6.5	M6	26	9	9.0	7	PFB...
7801491		PFB-R120SF6	12	2	6.5	M6	26	11	11.0	7	
7801492		PFB-R160SF8	16	2	8.5	M8	32	14	14.5	10	
7801493		PFB-R200SF10	20	2	10.5	M10	38	18	18.0	14	
7801494		PFB-R250SF12	25	2	12.5	M12	38	22	23.0	17	
7801495		PFB-R300SF16	30	2	17.0	M16	43	27	28.0	22	

Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

PXT

List 78PFB

NEW SIZES

PFB Inserts (Inch)

Spiral

Spiral (Full Radius)

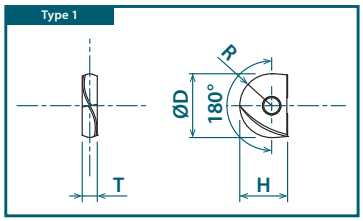
Spiral (Strengthened Edge)

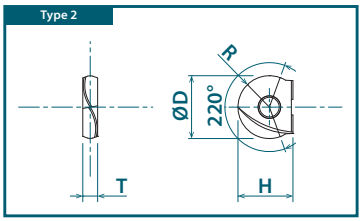
Spiral (Diamond Coated)

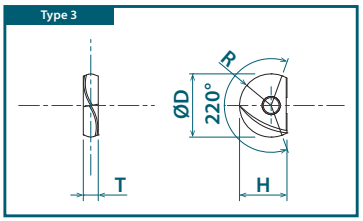
Designation	Type	Specification	No. of Cutting Edges	Range	Insert Size				EDP Number			
					D (inch)	R (inch)	T (mm)	H (mm)	XP3225	XP3310	XP3320	XC4505
PFB0250A-SP	1	Spiral	2	180°	0.250	0.125	2	5.175	52101020	-	52101010	-
PFB0375A-SP					0.375	0.1875	2.6	8.5	52101021	-	52101011	-
PFB0500A-SP					0.500	0.2500	3.0	10.0	52101022	-	52101012	-
PFB0625A-SP					0.625	0.3125	4.0	12.0	52101023	-	52101013	-
PFB0750A-SP					0.750	0.3750	5.0	15.0	52101024	-	52101014	-
PFB1000A-SP					1.000	0.5000	6.0	18.5	52101025	-	52101015	-
PFB1250A-SP					1.250	0.6250	7.0	23.5	52101026	-	52101016	-
PFB0250A-Q	2	Spiral (Full Radius)	2	220°	0.250	0.125	2	5.175	52101040	-	-	-
PFB0375A-Q					0.375	0.1875	2.6	8.5	52101041	-	-	-
PFB0500A-Q					0.500	0.2500	3.0	10.0	52101042	-	-	-
PFB0625A-Q	3				0.625	0.3125	4.0	12.0	52101043	-	-	-
PFB0750A-Q					0.750	0.3750	5.0	15.0	52101044	-	-	-
PFB1000A-Q					1.000	0.5000	6.0	18.5	52101045	-	-	-
PFB1250A-Q					1.250	0.6250	7.0	23.5	52101046	-	-	-
PFB0250A-SH	2	Spiral (Strengthened Edge)	2	220°	0.250	0.125	2	5.175	-	52101030	-	-
PFB0375A-SH	1			180°	0.375	0.1875	2.6	8.5	-	52101031	-	-
PFB0500A-SH					0.500	0.2500	3.0	10.0	-	52101032	-	-
PFB0625A-SH					0.625	0.3125	4.0	12.0	-	52101033	-	-
PFB0750A-SH					0.750	0.3750	5.0	15.0	-	52101034	-	-
PFB1000A-SH					1.000	0.5000	6.0	18.5	-	52101035	-	-
PFB1250A-SH					1.250	0.6250	7.0	23.5	-	52101036	-	-
PFB0250A-D	2	Spiral (Diamond Coated)	2	220°	0.250	1.250	2	5.175	-	-	-	52101000
PFB0375A-D	1			180°	0.375	0.1875	2.6	8.5	-	-	-	52101001
PFB0500A-D					0.500	0.2500	3.0	10.0	-	-	-	52101002
PFB0625A-D					0.625	0.3125	4.0	12.0	-	-	-	52101003
PFB0750A-D					0.750	0.3750	5.0	15.0	-	-	-	52101004
PFB1000A-D					1.000	0.5000	6.0	18.5	-	-	-	52101005
PFB1250A-D					1.250	0.6250	7.0	23.5	-	-	-	52101006

Packed: 1 pc.

PXI







List 78PFB

PFB Inserts (Metric)

Spiral

Spiral (Full Radius)

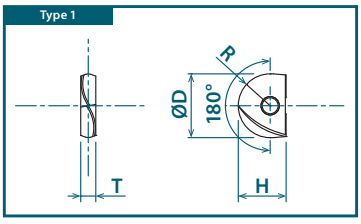
Spiral (Strengthened Edge)

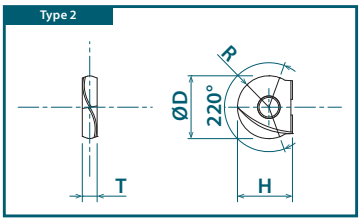
Spiral (Diamond Coated)

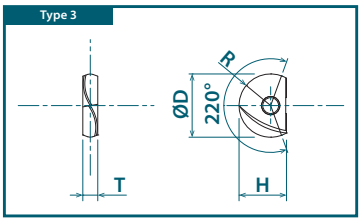
Designation	Type	Specification	No. of Cutting Edges	Range	Insert Size				EDP Number			
					D (mm)	R (mm)	T (mm)	H (mm)	XP3225	XP3310	XP3320	XC4505
PFB080-SP	1	Spiral	2	180°	8	4.0	2.4	7.0	7820030	-	7820010	-
PFB100-SP					10	5.0	2.6	8.5	7820031	-	7820011	-
PFB120-SP					12	6.0	3.0	10.0	7820032	-	7820012	-
PFB160-SP					16	8.0	4.0	12.0	7820033	-	7820013	-
PFB200-SP					20	10.0	5.0	15.0	7820034	-	7820014	-
PFB250-SP					25	12.5	6.0	18.5	7820035	-	7820015	-
PFB300-SP					30	15.0	7.0	22.5	7820036	-	7820016	-
PFB060-Q	2	Spiral (Full Radius)	2	220°	6	3.0	2.0	5.0	7820048	-	-	-
PFB070-Q					7	3.5	2.0	5.5	7820049	-	-	-
PFB080-Q					8	4.0	2.4	7.0	7820050	-	-	-
PFB100-Q					10	5.0	2.6	8.5	7820051	-	-	-
PFB120-Q					12	6.0	3.0	10.0	7820052	-	-	-
PFB160-Q	3				16	8.0	4.0	12.0	7820053	-	-	-
PFB200-Q					20	10.0	5.0	15.0	7820054	-	-	-
PFB250-Q					25	12.5	6.0	18.5	7820055	-	-	-
PFB300-Q					30	15.0	7.0	22.5	7820056	-	-	-
PFB060-SH	2	Spiral (Strengthened Edge)	2	220°	6	3.0	2.0	5.0	-	7820039	-	-
PFB080-SH	1			180°	8	4.0	2.4	7.0	-	7820040	-	-
PFB100-SH					10	5.0	2.6	8.5	-	7820041	-	-
PFB120-SH					12	6.0	3.0	10.0	-	7820042	-	-
PFB160-SH					16	8.0	4.0	12.0	-	7820043	-	-
PFB200-SH					20	10.0	5.0	15.0	-	7820044	-	-
PFB250-SH					25	12.5	6.0	18.5	-	7820045	-	-
PFB300-SH					30	15.0	7.0	22.5	-	7820046	-	-
PFB320-SH					32	16.0	7.0	23.5	-	7820047	-	-
PFB060-D	2	Spiral (Diamond Coated)	2	220°	6	3.0	2.0	5.0	-	-	-	7820018
PFB070-D					7	3.5	2.0	5.5	-	-	-	7820019
PFB080-D	1			180°	8	4.0	2.4	7.0	-	-	-	7820020
PFB100-D					10	5.0	2.6	8.5	-	-	-	7820021
PFB120-D					12	6.0	3.0	10.0	-	-	-	7820022
PFB160-D					16	8.0	4.0	12.0	-	-	-	7820023
PFB200-D					20	10.0	5.0	15.0	-	-	-	7820024
PFB250-D					25	12.5	6.0	18.5	-	-	-	7820025
PFB300-D					30	15.0	7.0	22.5	-	-	-	7820026

Packed: 1 pc.

PXI







List 7808H

PFB Accessories

Appearance	EDP No.	Designation	Applicable Insert		Recommended Tightening Torque
			(inch)	(mm)	
 Clamping Screw	7808124	FS20652RB (Torx 6)	0.250	6-7	0.8 Nm
	7808123	FS25669RB (Torx 7)	-	8	1.0 Nm
	7808117	FS30686RB (Torx 8)	0.375	10	1.2 Nm
	7808118	FS35610RB (Torx 10)	0.500	12	2.0 Nm
	7808119	FS40613RB (Torx 15)	0.625	16	3.0 Nm
	7808120	FS50615RB (Torx 20)	0.750	20	5.0 Nm
	7808121	FS60620RB (Torx 20)	1.000	25	5.0 Nm
	7808122	FS80624RB (Torx 30)	1.250	30-32	6.0 Nm
 Wrench	7808203	T6-D (Torx 6)	0.250	6-7	
	7808204	T7-D (Torx 7)	-	8	
	7808205	T8-D (Torx 8)	0.375	10	
	7808207	T10-D (Torx 10)	0.500	12	
	7808208	T15-D (Torx 15)	0.625	16	
	7808209	T20-D (Torx 20)	0.750-1.000	20-25	
	7808212	T30-T (Torx 30)	1.250	30-32	

Packed: Clamping Screw = 1 pc.; Wrench = 1 pc.
Note: Wrench sold separately.

PXT

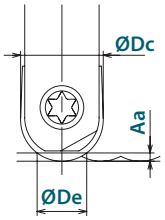
Effective Cutting Diameter

Depth of Cut Aa		Effective Cutting Diameter (ØDe)																			
		ØDc		ØDc		ØDc		ØDc		ØDc		ØDc		ØDc		ØDc		ØDc		ØDc	
(inch)	(mm)	0.250"	6mm	0.275"	7mm	0.315"	8 mm	0.375"	10 mm	0.500"	12 mm	0.625"	16 mm	0.750"	20 mm	1.000"	25 mm	1.181"	30 mm	1.250"	32mm
0.004	0.1	0.063	1.5	0.063	1.6	0.071	1.8	0.077	2.0	0.089	2.2	0.100	2.5	0.109	2.8	0.126	3.2	0.137	3.5	0.142	3.6
0.008	0.2	0.088	2.2	0.091	2.3	0.099	2.5	0.108	2.8	0.125	3.1	0.141	3.6	0.154	4.0	0.178	4.5	0.194	4.9	0.197	5.0
0.012	0.3	0.107	2.6	0.110	2.8	0.121	3.0	0.132	3.4	0.153	3.7	0.172	4.3	0.188	4.9	0.218	5.4	0.237	6.0	0.244	6.2
0.016	0.4	0.122	3.0	0.130	3.3	0.138	3.5	0.152	3.9	0.176	4.3	0.197	5.0	0.217	5.6	0.251	6.3	0.273	6.9	0.280	7.1
0.020	0.5	0.136	3.3	0.142	3.6	0.154	3.9	0.169	4.4	0.196	4.8	0.220	5.6	0.242	6.2	0.280	7.0	0.305	7.7	0.311	7.9
0.031	0.8	0.165	4.1	0.177	4.5	0.188	4.8	0.207	5.4	0.241	6.0	0.271	7.0	0.299	7.8	0.347	8.8	0.378	9.7	0.394	10.0
0.039	1.0	-	-	-	-	-	-	0.229	6.0	0.268	6.6	0.302	7.7	0.333	8.7	0.387	9.8	0.422	10.8	0.437	11.1
0.059	1.5	-	-	-	-	-	-	0.273	7.1	0.323	7.9	0.365	9.3	0.404	10.5	0.471	11.9	0.515	13.1	0.531	13.5
0.079	2.0	-	-	-	-	-	-	-	-	0.365	8.9	0.415	10.6	0.460	12.0	0.539	13.6	0.590	15.0	0.610	15.5
0.098	2.5	-	-	-	-	-	-	-	-	-	-	0.455	11.6	0.506	13.2	0.595	15.0	0.652	16.6	0.677	17.2
0.118	3.0	-	-	-	-	-	-	-	-	-	-	-	-	0.546	14.3	0.645	16.2	0.708	18.0	0.736	18.7
0.138	3.5	-	-	-	-	-	-	-	-	-	-	-	-	0.581	15.2	0.690	17.3	0.759	19.3	0.787	20.0
0.157	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.728	18.3	0.802	20.4	0.835	21.2
0.117	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.706	21.4	0.874	22.2
0.197	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.881	22.3	0.913	23.2

Note: Effective cutting diameter is based on cutting depth (Aa)

How to determine effective cutting diameter:

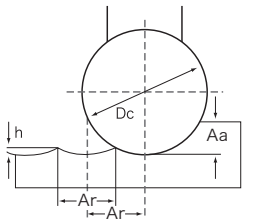
Ex: Dc = 0.500″
Aa = 0.020″
De = 2√0.020(0.500-0.020)
De = 0.196″



$$De=2\sqrt{a_a(D_c-a_a)}$$

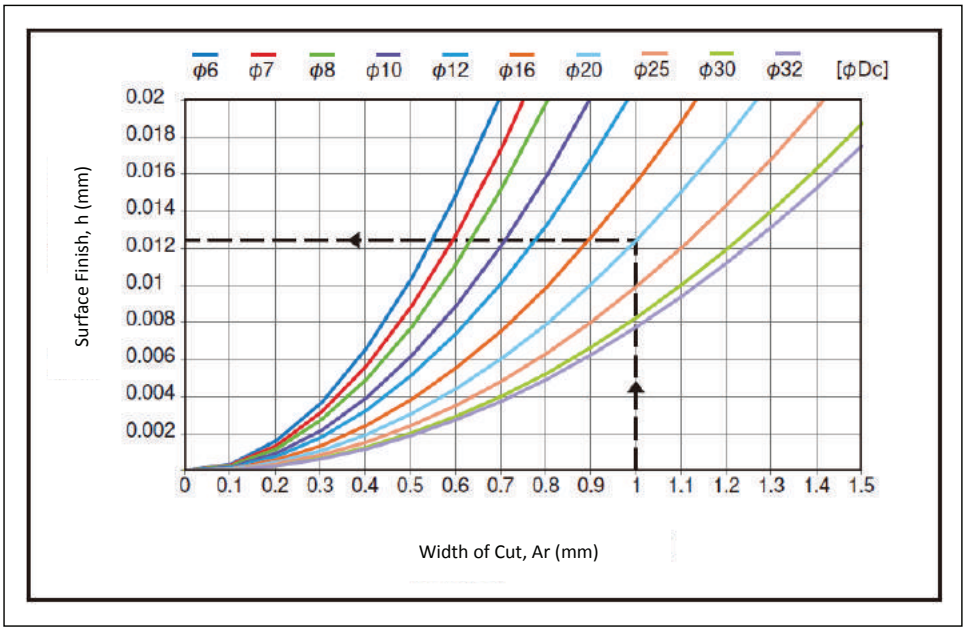
Recommended Width of Cut & Surface Roughness

Tool Dia ØDc		Width of Cut Ar		Surface Finish h	
(inch)	(mm)	(inch)	(mm)	(inch)	(mm)
0.250	6	0.0157	0.4	0.00027	0.007
0.275	7	0.0177	0.45	0.00027	0.007
0.315	8	0.0197	0.5	0.00031	0.008
0.375	10	0.0236	0.6	0.00037	0.009
0.500	12	0.0275	0.7	0.00038	0.010
0.625	16	0.0315	0.8	0.00040	0.010
0.750	20	0.0394	1.0	0.00052	0.012
1.000	25	0.0472	1.2	0.00055	0.014
1.181	30	0.0512	1.3	0.00055	0.014
1.250	32	0.0551	1.4	0.00059	0.015



$h=0.5\ (Dc-\sqrt{Dc^2-Ar^2})$

Dc=20mm
Ar=1mm
->h=0.0125mm



Cutting Conditions

Work Material		Tensile Strength – Hardness	Milling Speed Vc (SFM)	Depth of Cut Aa (in)	Feed Per Tooth fz (in/t)			
					Ø0.236-0.312 (6-8mm)	Ø0.375-0.500 (10-12mm)	Ø0.625-0.750 (16-20mm)	Ø1.000-1.250 (25-32mm)
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	985 (655-1310)	0.02Dc	0.0040	0.0047	0.0055	0.0071
P	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	985 (655-1310)	0.02Dc	0.0028	0.0040	0.0047	0.0055
P	Die Steels (H13, D2)	~280 HB	820 (495-1150)	0.02Dc	0.0028	0.0040	0.0047	0.0055
M	Stainless Steels (304SS, 420SS)	~250 HB	820 (495-1150)	0.02Dc	0.0028	0.0047	0.0055	0.0067
K	Cast Iron (FC250)	~350 N/mm²	1310 (985-1640)	0.02Dc	0.0047	0.0055	0.0071	0.0086
K	Ductile Cast Iron (60-40-18)	~600 N/mm²	985 (655-1310)	0.02Dc	0.0040	0.0047	0.0055	0.0071
N	Aluminum Alloys (6061, 7075)	~13% Si	1640 (1310-1970)	0.03Dc	0.0047	0.0055	0.0071	0.0086
N	Copper Alloys (C1100)	-	985 (655-1310)	0.03Dc	0.0043	0.0051	0.0067	0.0079
N	Graphite	-	1640 (1310-1970)	0.03Dc	0.0055	0.0067	0.0083	0.0098
N	CFRP	-	1310 (985-1640)	0.03Dc	0.0043	0.0051	0.0067	0.0079
S	Heat Resistant Alloys (Inconel 718)	-	165 (65-260)	0.015Dc	0.0016	0.0020	0.0024	0.0024
S	Titanium Alloy (Ti-6Al-4V)	-	295 (130-395)	0.02Dc	0.0024	0.0031	0.0043	0.0051
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HRC	655 (330-985)	0.015Dc	0.0024	0.0028	0.0031	0.0040
H	Die Cast Steels (A2, S7)	43 - 48 HRC	590 (295-655)	0.015Dc	0.0020	0.0024	0.0028	0.0028
H	Hardened Steels (D2)	50 - 55 HRC	490 (330-820)	0.01Dc	0.0020	0.0024	0.0028	0.0028

Recommended Materials by Application

Insert Grade	P	M	K	N	S	H
XP3225	◎	◎		◎*	○	
XP3310			◎			◎
XP3320	○	○	○		◎	○
XC4505				◎**		

*: Best recommended for aluminum & copper alloy applications.
**: Best recommended for graphite & CFRP applications.

○ good ◎ best

OSG PHOENIX® PFR

Finishing Radius End Mill

A series of high precision indexable finish radius end mills for superior surface finish and tool life.

List 52200
PFR SA (Inch)

List 78320
PFR SS (Metric)

List 52605
PFR ASF (Inch)

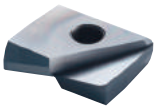
List 78220
PFR SF (Metric)

List 78PFR
PFR Inserts (Inch & Metric)

List 7808H
PFR Accessories

Features & Benefits

Inserts:



High dimensional accuracy enables outstanding machining precision and finished surfaces.

- Corner Radius Precision: ±8µm
- Outer Diameter Tolerance: +0/-20µm
- Wiper on End Cutting Edge
- Compatible with PFB Cutter Body

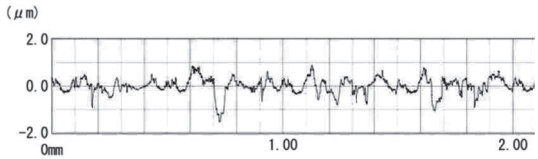
Bodies:

Highly accurate and rigid cutter body for stable milling.

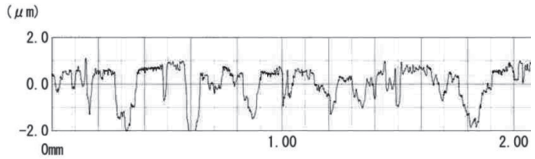
- Suitable for high precision machining.
- Steel & Carbide Shanks

Finished Surface Roughness Curve

PFR



Competitor



PFR Insert Variety

PFR-ST

- Suitable for a wide range of materials from mild steel to HRSA.
- Ideal for milling with long overhangs (L/D≥5).
- Positive rake angle with excellent sharpness & bite.

XP3225 Grade

- For stable milling in a variety of materials.
- Excellent lubricity & wear resistance.

PFR-SH

- For milling cast iron, ductile iron & hardened steel.
- High rigid cutting edge with two-dimensional negative chamfer.
- Suitable for unstable machining conditions.

XP3310 Grade

- Ideal for dry machining of high-hardened steel & cast iron.
- Excellent heat resistance & wear resistance.

PFR-D

- Sharp cutting edge attained through the combination of our high-level grinding techniques and leading diamond coating technology.
- Special carbide substrate for diamond coating.

XP4505 Grade

- For milling non-ferrous materials.
- Optimal diamond coating for milling graphite.

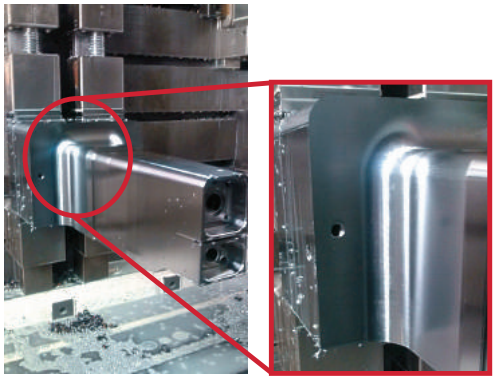
Processing Data

» Side and Bottom Finish in Prehardened Die Steel - PX5D (33 HRC)

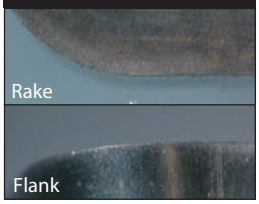
PFR enabled high precision machining as well as a solid carbide tool. With a sharper cutting edge than conventional tools, PFR could machine stably with a deeper depth of cut. As a result, machining time was shortened by reducing the semi-finishing process.

Tool	PFR-R250SS25-LL260CS
Insert (Grade)	PFR250R20-ST (XP3225)
Work Material	PX5D (33 HRC)
Cutting Speed	269 SFM (1050 RPM)
Feed	19.69 IPM (0.009 ipt)
Depth of Cut	Aa = 0.020 in, Ar = 0.020 - 0.040 in
Coolant	Water Soluble
Machine	Horizontal Machining Center

Workpiece: Die Insert



Time: 180 min
Milling Length: 3,500 in

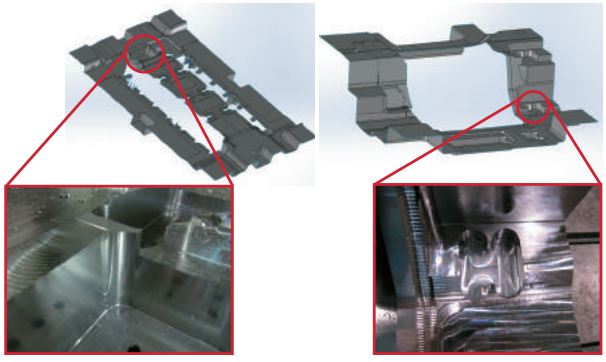


» Side and Bottom Finish for Plastic Mold Steel - SD18 (Enhanced 1055 Steel)

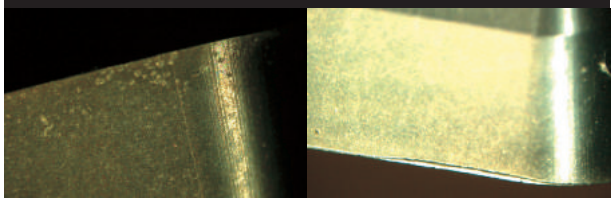
With a conventional tool, one insert for semi-finishing and another insert for finishing were consumed. With PFR, one insert could last until the final finishing process. Furthermore, a better surface finish was achieved.

Tool	PFB-R200SS20-LL240CS (substituted PFB body)	
Insert (Grade)	PFR200R10-ST (XP3225)	
Work Material	SD18 (enhanced 1055 Steel)	
Cutting Speed	Side Finish Section: 1082 SFM (5250 RPM)	Bottom Finish Section: 328 SFM (1600 RPM)
Feed	82.68 IPM (0.008 ipt)	15.75 IPM (0.005 ipt)
Depth of Cut	Aa = 0.060 in, Ar = 0.002 - 0.012 in	Semi-finish: Aa = 0.006 in • Finish: Aa = 0.002 in
Coolant	Air	
Machine	Vertical Machining Center	

Workpiece: Plastic Injection Mold



Edge Wear After 90 min



The edge shows normal wear, and there is no chipping despite the long overhang.

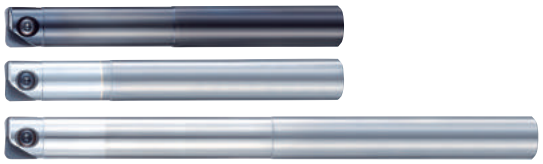
List 52200

NEW SIZES

SPEED FEED P179-180

Recommended Materials: p179-180
Accessories & Inserts: p173-178

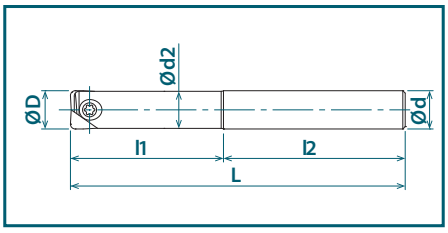
PFR SA (Inch)



EDP No.	Body Type	Designation	Tool Dia. (inch)	Overall Length (inch)	Neck Length (inch)	L/D Ratio	No. of Teeth	Shank Dia. (inch)	Shank Length (inch)	Neck Dia. (inch)
			D	L	l1			d	l2	d2
52200024	Cylindrical Shank Steel	PFR-R0250SA0250-S325	0.250	3.250	0.625	2.5	2	0.250	2.625	0.225
52200025		PFR-R0250SA0250-S375	0.250	3.750	1.125	4.5	2	0.250	2.625	0.225
52200026		PFR-R0375SA0375-S400	0.375	4.000	0.937	2.5	2	0.375	3.063	0.335
52200000		PFR-R0375SA0375-S550	0.375	5.500	1.687	4.5	2	0.375	3.813	0.355
52200027		PFR-R0500SA0500-S450	0.500	4.500	1.250	2.5	2	0.500	3.250	0.480
52200001		PFR-R0500SA0500-S550	0.500	5.500	2.250	4.5	2	0.500	3.250	0.480
52200028		PFR-R0625SA0625-S500	0.625	5.000	1.562	2.5	2	0.625	3.438	0.605
52200002		PFR-R0625SA0625-S550	0.625	5.500	2.500	4	2	0.625	3.000	0.605
52200029		PFR-R0750SA0750-S550	0.750	5.500	1.875	2.5	2	0.750	3.625	0.730
52200003		PFR-R0750SA0750-S600	0.750	6.000	3.000	4	2	0.750	3.000	0.730
52200004		PFR-R1000SA1000-S650	1.000	6.500	3.000	3	2	1.000	3.500	0.980
52200030		PFR-R1000SA1000-S750	1.000	7.500	4.000	4	2	1.000	3.500	0.980
52200015		PFR-R1250SA1250-S700	1.250	7.000	3.750	3	2	1.250	3.250	1.230
52200031		PFR-R1250SA1250-S850	1.250	8.500	5.000	4	2	1.250	3.500	1.230
52200032	Cylindrical Shank Short Carbide	PFR-R0250SA0250-S325CS	0.250	3.250	0.625	2.5	2	0.250	2.625	0.225
52200005		PFR-R0375SA0375-S400CS	0.375	4.000	0.937	2.5	2	0.375	3.063	0.355
52200006		PFR-R0500SA0500-S450CS	0.500	4.500	1.250	2.5	2	0.500	3.250	0.480
52200007		PFR-R0625SA0625-S550CS	0.625	5.500	1.562	2.5	2	0.625	3.938	0.605
52200008		PFR-R0750SA0750-S600CS	0.750	6.000	1.875	2.5	2	0.750	4.125	0.730
52200009		PFR-R1000SA1000-S650CS	1.000	6.500	2.500	2.5	2	1.000	4.000	0.980
52200016		PFR-R1250SA1250-S700CS	1.250	7.000	3.125	2.5	2	1.250	3.875	1.230
52200033	Cylindrical Shank Long Carbide	PFR-R0250SA0250-L400CS	0.250	4.000	1.250	5	2	0.250	2.750	0.225
52200018		PFR-R0375SA0375-L550CS	0.375	5.500	1.875	5	2	0.375	3.625	0.355
52200019		PFR-R0500SA0500-L550CS	0.500	5.500	2.500	5	2	0.500	3.000	0.480
52200020		PFR-R0625SA0625-L650CS	0.625	6.500	3.125	5	2	0.625	3.375	0.605
52200021		PFR-R0750SA0750-L700CS	0.750	7.000	3.750	5	2	0.750	3.250	0.730
52200022		PFR-R1000SA1000-L800CS	1.000	8.000	4.500	4.5	2	1.000	3.500	0.980
52200023		PFR-R1250SA1250-L900CS	1.250	9.000	5.625	4.5	2	1.250	3.375	1.230
52200034	Cylindrical Shank Extra-Long Carbide	PFR-R0250SA0250-LL450CS	0.250	4.500	1.750	7	2	0.250	2.750	0.225
52200010		PFR-R0375SA0375-LL650CS	0.375	6.500	2.625	7	2	0.375	3.875	0.355
52200011		PFR-R0500SA0500-LL700CS	0.500	7.000	3.500	7	2	0.500	3.500	0.480
52200012		PFR-R0625SA0625-LL750CS	0.625	7.500	3.750	6	2	0.625	3.750	0.605
52200013		PFR-R0750SA0750-LL900CS	0.750	9.000	4.500	6	2	0.750	4.500	0.730
52200014		PFR-R1000SA1000-LL1050CS	1.000	10.500	5.500	5.5	2	1.000	5.000	0.980
52200017		PFR-R1250SA1250-LL1200CS	1.250	12.000	6.875	5.5	2	1.250	5.125	1.230

Packed: 1 pc.

PXT

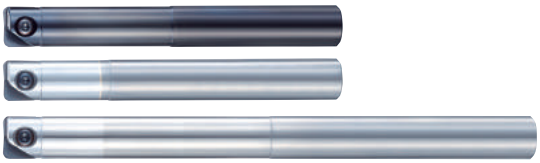


List 78320

SPEED FEED P179-180

Recommended Materials: p179-180
Accessories & Inserts: p173-178

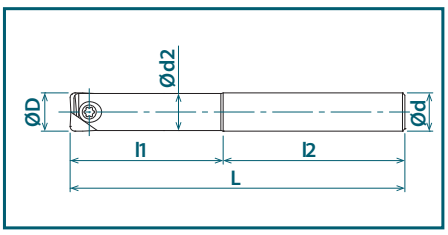
PFR SS (Metric)



EDP No.	Body Type	Designation	Tool Dia. (mm)	Overall Length (mm)	Neck Length (mm)	L/D Ratio	No. of Teeth	Shank Dia. (mm)	Shank Length (mm)	Neck Dia. (mm)
			D	L	l1			d	l2	d2
7832000	Cylindrical Shank Steel	PFR-R080SS08-S120	8	120	36	4.5	2	8	84	7.5
7832001		PFR-R100SS10-S130	10	130	45	4.5	2	10	85	9.5
7832002		PFR-R120SS12-S130	12	130	54	4.5	2	12	76	11.5
7832003		PFR-R160SS16-S140	16	140	64	4.0	2	16	76	15.5
7832004		PFR-R200SS20-S160	20	160	80	4.0	2	20	80	19.5
7832005		PFR-R250SS25-S160	25	160	75	3.0	2	25	85	24.5
7832006		PFR-R300SS32-S170	30	170	90	3.0	2	32	80	29.5
7832007		PFR-R320SS32-S180	32	180	96	3.0	2	32	84	31.5
7832029	Cylindrical Shank Short Carbide	PFR-R060SS06-S80CS	6	80	15	2.5	2	6	65	5.5
7832030		PFR-R080SS08-S100CS	8	100	20	2.5	2	8	80	7.5
7832031		PFR-R100SS10-S100CS	10	100	25	2.5	2	10	75	9.5
7832032		PFR-R120SS12-S110CS	12	110	30	2.5	2	12	80	11.5
7832033		PFR-R160SS16-S140CS	16	140	40	2.5	2	16	100	15.5
7832034		PFR-R200SS20-S160CS	20	160	50	2.5	2	20	110	19.5
7832035		PFR-R250SS25-S160CS	25	160	62.5	2.5	2	25	97.5	24.5
7832036		PFR-R300SS32-S170CS	30	170	75	2.5	2	32	95	29.5
7832037		PFR-R320SS32-S180CS	32	180	80	2.5	2	32	100	31.5
7832039	Cylindrical Shank Long Carbide	PFR-R060SS06-L100CS	6	100	30	5.0	2	6	70	5.5
7832040		PFR-R080SS08-L120CS	8	120	40	5.0	2	8	80	7.5
7832041		PFR-R100SS10-L130CS	10	130	50	5.0	2	10	80	9.5
7832042		PFR-R120SS12-L140CS	12	140	60	5.0	2	12	80	11.5
7832043		PFR-R160SS16-L160CS	16	160	72	4.5	2	16	88	15.5
7832044		PFR-R200SS20-L180CS	20	180	90	4.5	2	20	90	19.5
7832045		PFR-R250SS25-L200CS	25	200	100	4.0	2	25	100	24.5
7832046		PFR-R300SS32-L220CS	30	220	120	4.0	2	32	100	29.5
7832047		PFR-R320SS32-L230CS	32	230	128	4.0	2	32	102	31.5
7832019	Cylindrical Shank Extra-Long Carbide	PFR-R060SS06-LL120CS	6	120	42	7.0	2	6	78	5.5
7832020		PFR-R080SS08-LL140CS	8	140	56	7.0	2	8	84	7.5
7832021		PFR-R100SS10-LL150CS	10	150	70	7.0	2	10	80	9.5
7832022		PFR-R120SS12-LL160CS	12	160	84	7.0	2	12	76	11.5
7832023		PFR-R160SS16-LL200CS	16	200	96	6.0	2	16	104	15.5
7832024		PFR-R200SS20-LL240CS	20	240	120	6.0	2	20	120	19.5
7832025		PFR-R250SS25-LL260CS	25	260	137.5	5.5	2	25	122.5	24.5
7832026		PFR-R300SS32-LL290CS	30	290	165	5.5	2	32	125	29.5
7832027		PFR-R320SS32-LL300CS	32	300	176	5.5	2	32	124	31.5

Packed: 1 pc.

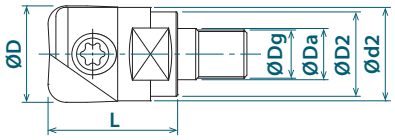
PXT



List 52605

PFR ASF (Inch)

SPEED FEED P179-180
Recommended Materials: p179-180
Accessories & Inserts: p173-178
SF Arbors: p189



EDP No.	Body Type	Designation	Tool Dia. (inch)	No. of Teeth	Pilot Dia. (inch)	Thread Dia. (mm)	Overall Length (inch)	Head Dia. (inch)	Flange Dia. (inch)	Wrench Size	Applicable Insert
			D		Da	Dg	L	d2	D2		
52605000	Screw Fit Head	PFR-R0375ASF6	0.375	2	0.256	M6	1.024	0.374	0.354	7	PFR...
52605001		PFR-R0500ASF6	0.500	2	0.256	M6	1.024	0.453	0.433	7	
52605002		PFR-R0625ASF8	0.625	2	0.335	M8	1.260	0.610	0.571	10	
52605003		PFR-R0750ASF10	0.750	2	0.413	M10	1.496	0.768	0.709	14	
52605004		PFR-R1000ASF12	1.000	2	0.492	M12	1.496	0.965	0.906	17	

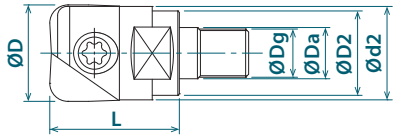
Packed: 1 pc.

PXT

List 78220

PFR SF (Metric)

SPEED FEED P179-180
Recommended Materials: p179-180
Accessories & Inserts: p173-178
SF Arbors: p190



EDP No.	Body Type	Designation	Tool Dia. (mm)	No. of Teeth	Pilot Dia. (mm)	Thread Dia. (mm)	Overall Dia. (mm)	Head Dia. (mm)	Flange Dia. (mm)	Wrench Size	Applicable Insert
			D		Da	Dg	L	d2	D2		
7832090	Screw Fit Head	PFR-R100SF6	10	2	6.5	M6	26	9.5	9.0	7	PFR...
7832091		PFR-R120SF6	12	2	6.5	M6	26	11.5	11.0	7	
7832092		PFR-R160SF8	16	2	8.5	M8	32	15.5	14.5	10	
7832093		PFR-R200SF10	20	2	10.5	M10	38	19.5	18.0	14	
7832094		PFR-R250SF12	25	2	12.5	M12	38	24.5	23.0	17	
7832095		PFR-R300SF16	30	2	17.0	M16	43	29.5	28.0	22	
7832096		PFR-R320SF16	32	2	17.0	M16	43	31.5	28.0	22	

Packed: 1 pc.

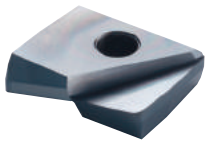
This item is stocked overseas. Please contact OSG for availability and delivery.

PXT

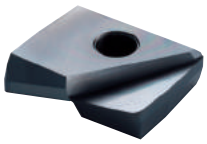
List 78PFR

NEW SIZES

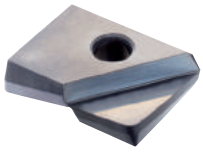
PFR Inserts (Inch)



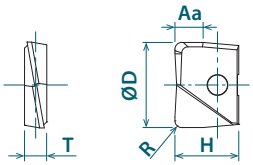
Multi-Purpose



Strengthened Edge



Diamond Coated



Designation	Specification	No. of Cutting Edges	Insert Size					EDP Number		
			D (inch)	R (inch)	Aa (inch)	T (mm)	H (mm)	XP3225	XP3310	XP4505
PFR0250R015A-ST	Multi-Purpose	2	0.250	0.015	0.078	2	5	52201029	-	-
PFR0250R030A-ST				0.030				52201030	-	-
PFR0250R060A-ST				0.060				52201031	-	-
PFR0375R015A-ST			0.375	0.015	0.130	2.6	8.5	52201000	-	-
PFR0375R030A-ST				0.030				52201001	-	-
PFR0375R060A-ST				0.060				52201002	-	-
PFR0375R090A-ST				0.090				52201003	-	-
PFR0500R015A-ST			0.500	0.015	0.157	3.0	10.0	52201004	-	-
PFR0500R030A-ST				0.030				52201005	-	-
PFR0500R060A-ST				0.060				52201006	-	-
PFR0500R090A-ST				0.090				52201007	-	-
PFR0500R120A-ST				0.120				52201008	-	-
PFR0625R015A-ST			0.625	0.015	0.208	4.0	12.0	52201009	-	-
PFR0625R030A-ST				0.030				52201010	-	-
PFR0625R060A-ST				0.060				52201011	-	-
PFR0625R090A-ST				0.090				52201012	-	-
PFR0625R120A-ST				0.120				52201013	-	-
PFR0750R015A-ST			0.750	0.015	0.264	5.0	15.0	52201014	-	-
PFR0750R030A-ST				0.030				52201015	-	-
PFR0750R060A-ST				0.060				52201016	-	-
PFR0750R090A-ST				0.090				52201017	-	-
PFR0750R120A-ST				0.120				52201018	-	-
PFR1000R015A-ST			1.000	0.015	0.327	6.0	18.5	52201019	-	-
PFR1000R030A-ST				0.030				52201020	-	-
PFR1000R060A-ST				0.060				52201021	-	-
PFR1000R090A-ST				0.090				52201022	-	-
PFR1000R120A-ST				0.120				52201023	-	-
PFR1250R015A-ST			1.250	0.015	0.405	7.0	23.5	52201024	-	-
PFR1250R030A-ST				0.030				52201025	-	-
PFR1250R060A-ST				0.060				52201026	-	-
PFR1250R090A-ST				0.090				52201027	-	-
PFR1250R120A-ST				0.120				52201028	-	-

Packed: 1 pc.

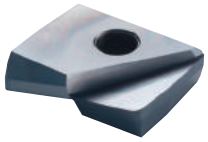
continued on next page

PXI

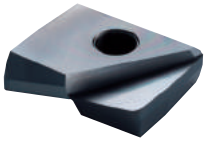
List 78PFR (Continued)

NEW SIZES

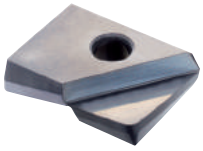
PFR Inserts (Inch)



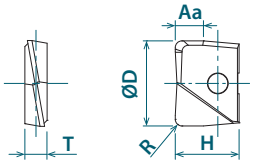
Multi-Purpose



Strengthened Edge



Diamond Coated



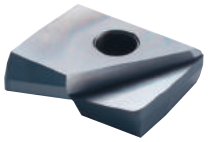
Designation	Specification	No. of Cutting Edges	Insert Size					EDP Number		
			D (inch)	R (inch)	Aa (inch)	T (mm)	H (mm)	XP3225	XP3310	XP4505
PFR0250R015A-SH	Strengthened Edge	2	0.250	0.015	0.078	2	5	-	52201079	-
PFR0250R030A-SH				0.030				-	52201080	-
PFR0250R060A-SH				0.060				-	52201081	-
PFR0375R015A-SH			0.375	0.015	0.130	2.6	8.5	-	52201050	-
PFR0375R030A-SH				0.030				-	52201051	-
PFR0375R060A-SH				0.060				-	52201052	-
PFR0375R090A-SH				0.090				-	52201053	-
PFR0500R015A-SH			0.500	0.015	0.157	3.0	10.0	-	52201054	-
PFR0500R030A-SH				0.030				-	52201055	-
PFR0500R060A-SH				0.060				-	52201056	-
PFR0500R090A-SH				0.090				-	52201057	-
PFR0500R120A-SH				0.120				-	52201058	-
PFR0625R015A-SH			0.625	0.015	0.208	4.0	12.0	-	52201059	-
PFR0625R030A-SH				0.030				-	52201060	-
PFR0625R060A-SH				0.060				-	52201061	-
PFR0625R090A-SH				0.090				-	52201062	-
PFR0625R120A-SH				0.120				-	52201063	-
PFR0750R015A-SH			0.750	0.015	0.264	5.0	15.0	-	52201064	-
PFR0750R030A-SH				0.030				-	52201065	-
PFR0750R060A-SH				0.060				-	52201066	-
PFR0750R090A-SH				0.090				-	52201067	-
PFR0750R120A-SH				0.120				-	52201068	-
PFR1000R015A-SH			1.000	0.015	0.327	6.0	18.5	-	52201069	-
PFR1000R030A-SH				0.030				-	52201070	-
PFR1000R060A-SH				0.060				-	52201071	-
PFR1000R090A-SH				0.090				-	52201072	-
PFR1000R120A-SH				0.120				-	52201073	-
PFR1250R015A-SH			1.250	0.015	0.405	7.0	23.5	-	52201074	-
PFR1250R030A-SH				0.030				-	52201075	-
PFR1250R060A-SH				0.060				-	52201076	-
PFR1250R090A-SH				0.090				-	52201077	-
PFR1250R120A-SH				0.120				-	52201078	-
PFR0250R015A-D	Diamond Coated	2	0.250	0.015	0.078	2	5	-	-	52201114
PFR0250R030A-D				0.030				-	-	52201115
PFR0250R060A-D				0.060				-	-	52201116
PFR0375R015A-D			0.375	0.015	0.130	2.6	8.5	-	-	52201100
PFR0375R030A-D				0.030				-	-	52201101
PFR0375R060A-D				0.060				-	-	52201102
PFR0500R015A-D			0.500	0.015	0.157	3.0	10.0	-	-	52201103
PFR0500R030A-D				0.030				-	-	52201104
PFR0500R060A-D				0.060				-	-	52201105
PFR0625R015A-D			0.625	0.015	0.208	4.0	12.0	-	-	52201106
PFR0625R030A-D				0.030				-	-	52201107
PFR0625R060A-D				0.060				-	-	52201108
PFR0750R015A-D			0.750	0.015	0.264	5.0	15.0	-	-	52201109
PFR0750R030A-D				0.030				-	-	52201110
PFR0750R060A-D				0.060				-	-	52201111
PFR1000R060A-D			1.000	0.060	0.327	6.0	18.5	-	-	52201112
PFR1250R060A-D			1.250	0.060	0.405	7.0	23.5	-	-	52201113

Packed: 1 pc.

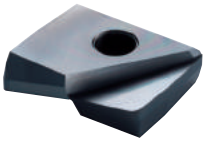
PXI

List 78PFR

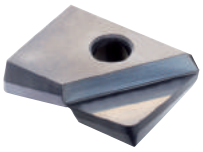
PFR Inserts (Metric)



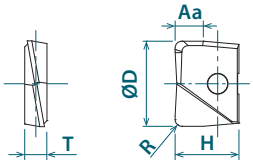
Multi-Purpose



Strengthened Edge



Diamond Coated



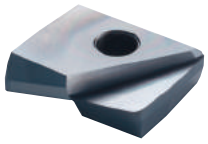
Designation	Specification	No. of Cutting Edges	Insert Size					EDP Number		
			D (mm)	R (mm)	Aa (mm)	T (mm)	H (mm)	XP3225	XP3310	XP4505
PFR060R03-ST	Multi-Purpose	2	6	0.3	2.0	2.0	5.0	7820350	-	-
PFR060R05-ST				0.5				7820351	-	-
PFR060R10-ST				1				7820352	-	-
PFR070R03-ST			7	0.3			5.5	7820353	-	-
PFR070R05-ST				0.5				7820354	-	-
PFR070R10-ST				1				7820355	-	-
PFR080R03-ST			8	0.3	2.7	2.4	7.0	7820200	-	-
PFR080R05-ST				0.5				7820201	-	-
PFR080R10-ST				1				7820202	-	-
PFR080R20-ST				2				7820203	-	-
PFR100R03-ST			10	0.3	3.3	2.6	8.5	7820204	-	-
PFR100R05-ST				0.5				7820205	-	-
PFR100R10-ST				1				7820206	-	-
PFR100R20-ST				2				7820207	-	-
PFR110R03-ST			11	0.3				7820356	-	-
PFR110R05-ST				0.5				7820357	-	-
PFR110R10-ST				1				7820358	-	-
PFR110R20-ST				2				7820359	-	-
PFR120R03-ST			12	0.3	4.0	3.0	10.0	7820208	-	-
PFR120R05-ST				0.5				7820209	-	-
PFR120R10-ST				1				7820210	-	-
PFR120R20-ST				2				7820211	-	-
PFR120R30-ST				3				7820212	-	-
PFR130R03-ST			13	0.3				7820360	-	-
PFR130R05-ST				0.5				7820361	-	-
PFR130R10-ST				1				7820362	-	-
PFR130R20-ST				2				7820363	-	-
PFR160R03-ST			16	0.3	5.3	4.0	12.0	7820213	-	-
PFR160R05-ST				0.5				7820214	-	-
PFR160R10-ST				1				7820215	-	-
PFR160R20-ST				2				7820216	-	-
PFR160R30-ST				3				7820217	-	-
PFR170R03-ST			17	0.3				7820364	-	-
PFR170R05-ST				0.5				7820365	-	-
PFR170R10-ST				1				7820366	-	-
PFR170R20-ST				2				7820367	-	-
PFR200R03-ST			20	0.3	6.7	5.0	15.0	7820218	-	-
PFR200R05-ST				0.5				7820219	-	-
PFR200R10-ST				1				7820220	-	-
PFR200R20-ST				2				7820221	-	-
PFR200R30-ST				3				7820222	-	-
PFR210R03-ST			21	0.3				7820368	-	-
PFR210R05-ST				0.5				7820369	-	-
PFR210R10-ST				1				7820370	-	-
PFR210R20-ST				2				7820371	-	-
PFR250R03-ST			25	0.3	8.3	6.0	18.5	7820223	-	-
PFR250R05-ST				0.5				7820224	-	-
PFR250R10-ST				1				7820225	-	-
PFR250R20-ST				2				7820226	-	-
PFR250R30-ST				3				7820227	-	-

Packed: 1 pc.

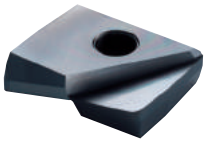
PXI

List 78PFR (Continued)

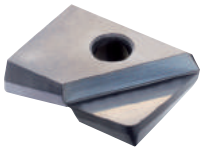
PFR Inserts (Metric)



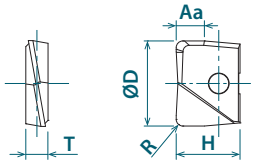
Multi-Purpose



Strengthened Edge



Diamond Coated



Designation	Specification	No. of Cutting Edges	Insert Size					EDP Number		
			D	R	Aa	T	H			
			(mm)	(mm)	(mm)	(mm)	(mm)	XP3225	XP3310	XP4505
PFR260R03-ST	Multi-Purpose	2	26	0.3	8.3	6.0	18.5	7820372	-	-
PFR260R05-ST				0.5				7820373	-	-
PFR260R10-ST				1.0				7820374	-	-
PFR260R20-ST				2.0				7820375	-	-
PFR300R03-ST			30	0.3	10.0	7.0	22.5	7820228	-	-
PFR300R05-ST				0.5				7820229	-	-
PFR300R10-ST				1.0				7820230	-	-
PFR300R20-ST				2.0				7820231	-	-
PFR300R30-ST				3.0				7820232	-	-
PFR320R03-ST			32	0.3	10.3	7.0	23.5	7820233	-	-
PFR320R05-ST				0.5				7820234	-	-
PFR320R10-ST				1.0				7820235	-	-
PFR320R20-ST				2.0				7820236	-	-
PFR320R30-ST				3.0				7820237	-	-
PFR060R03-SH	Strengthened Edge	2	6	0.3	2.0	2.0	5.0	-	7820400	-
PFR060R05-SH				0.5				-	7820401	-
PFR060R10-SH				1.0				-	7820402	-
PFR070R03-SH			7	0.3			5.5	-	7820403	-
PFR070R05-SH				0.5				-	7820404	-
PFR070R10-SH				1.0				-	7820405	-
PFR080R03-SH			8	0.3	2.7	2.4	7.0	-	7820250	-
PFR080R05-SH				0.5				-	7820251	-
PFR080R10-SH				1.0				-	7820252	-
PFR080R20-SH				2.0				-	7820253	-
PFR100R03-SH			10	0.3	3.3	2.6	8.5	-	7820254	-
PFR100R05-SH				0.5				-	7820255	-
PFR100R10-SH				1.0				-	7820256	-
PFR100R20-SH				2.0				-	7820257	-
PFR110R03-SH			11	0.3				-	7820406	-
PFR110R05-SH				0.5				-	7820407	-
PFR110R10-SH				1.0				-	7820408	-
PFR110R20-SH				2.0				-	7820409	-
PFR120R03-SH			12	0.3	4.0	3.0	10.0	-	7820258	-
PFR120R05-SH				0.5				-	7820259	-
PFR120R10-SH				1.0				-	7820260	-
PFR120R20-SH				2.0				-	7820261	-
PFR120R30-SH				3.0				-	7820262	-
PFR130R03-SH			13	0.3				-	7820410	-
PFR130R05-SH				0.5				-	7820411	-
PFR130R10-SH				1.0				-	7820412	-
PFR130R20-SH				2.0				-	7820413	-
PFR160R03-SH			16	0.3	5.3	4.0	12.0	-	7820263	-
PFR160R05-SH				0.5				-	7820264	-
PFR160R10-SH				1.0				-	7820265	-
PFR160R20-SH				2.0				-	7820266	-
PFR160R30-SH				3.0				-	7820267	-
PFR170R03-SH			17	0.3				-	7820414	-
PFR170R05-SH				0.5				-	7820415	-
PFR170R10-SH				1.0				-	7820416	-
PFR170R20-SH				2.0				-	7820417	-

Packed: 1 pc.

PXI

List 78PFR (Continued)

PFR Inserts (Metric)

Designation	Specification	No. of Cutting Edges	Insert Size					EDP Number		
			D (mm)	R (mm)	Aa (mm)	T (mm)	H (mm)	XP3225	XP3310	XP4505
PFR200R03-SH	Strengthened Edge	2	20	0.3	6.7	5.0	15.0	-	7820268	-
PFR200R05-SH				0.5				-	7820269	-
PFR200R10-SH				1.0				-	7820270	-
PFR200R20-SH				2.0				-	7820271	-
PFR200R30-SH				3.0				-	7820272	-
PFR210R03-SH			21	0.3				-	7820418	-
PFR210R05-SH				0.5				-	7820419	-
PFR210R10-SH				1.0				-	7820420	-
PFR210R20-SH				2.0				-	7820421	-
PFR250R03-SH			25	0.3	8.3	6.0	18.5	-	7820273	-
PFR250R05-SH				0.5				-	7820274	-
PFR250R10-SH				1.0				-	7820275	-
PFR250R20-SH				2.0				-	7820276	-
PFR250R30-SH				3.0				-	7820277	-
PFR260R03-SH			26	0.3				-	7820422	-
PFR260R05-SH				0.5				-	7820423	-
PFR260R10-SH				1.0				-	7820424	-
PFR260R20-SH				2.0				-	7820425	-
PFR300R03-SH			30	0.3	10.0	7.0	22.5	-	7820278	-
PFR300R05-SH				0.5				-	7820279	-
PFR300R10-SH				1.0				-	7820280	-
PFR300R20-SH				2.0				-	7820281	-
PFR300R30-SH				3.0				-	7820282	-
PFR320R03-SH			32	0.3	10.3	7.0	23.5	-	7820283	-
PFR320R05-SH				0.5				-	7820284	-
PFR320R10-SH				1.0				-	7820285	-
PFR320R20-SH				2.0				-	7820286	-
PFR320R30-SH				3.0				-	7820287	-
PFR060R03-D	Diamond Coated	2	6	0.3	2.0	2.0	5.0	-	-	7820450
PFR060R05-D				0.5				-	-	7820451
PFR060R10-D				1.0				-	-	7820452
PFR080R03-D			8	0.3	2.7	2.4	7.0	-	-	7820300
PFR080R05-D				0.5				-	-	7820301
PFR080R10-D				1.0				-	-	7820302
PFR100R03-D			10	0.3	3.3	2.6	8.5	-	-	7820303
PFR100R05-D				0.5				-	-	7820304
PFR100R10-D				1.0				-	-	7820305
PFR120R03-D			12	0.3	4.0	3.0	10.0	-	-	7820306
PFR120R05-D				0.5				-	-	7820307
PFR120R10-D				1.0				-	-	7820308
PFR160R03-D			16	0.3	5.3	4.0	12.0	-	-	7820309
PFR160R05-D				0.5				-	-	7820310
PFR160R10-D				1.0				-	-	7820311
PFR200R03-D			20	0.3	6.7	5.0	15.0	-	-	7820312
PFR200R05-D				0.5				-	-	7820313
PFR200R10-D				1.0				-	-	7820314

Packed: 1 pc.

PXI

List 7808H

PFR Accessories

Appearance	EDP No.	Designation	Applicable Insert		Recommended Tightening Torque
			(inch)	(mm)	
 Clamping Screw	7808124	FS20652RB (Torx 6)	0.250	6-7	0.8 Nm
	7808123	FS25669RB (Torx 7)	-	8	1.0 Nm
	7808117	FS30686RB (Torx 8)	0.375	10	1.2 Nm
	7808118	FS35610RB (Torx 10)	0.500	12	2.0 Nm
	7808119	FS40613RB (Torx 15)	0.625	16	3.0 Nm
	7808120	FS50615RB (Torx 20)	0.750	20	5.0 Nm
	7808121	FS60620RB (Torx 20)	1.000	25	5.0 Nm
	7808122	FS80624RB (Torx 30)	1.250	30-32	6.0 Nm
 Wrench	7808203	T6-D (Torx 6)	0.250	6-7	
	7808204	T7-D (Torx 7)	-	8	
	7808205	T8-D (Torx 8)	0.375	10	
	7808207	T10-D (Torx 10)	0.500	12	
	7808208	T15-D (Torx 15)	0.625	16	
	7808209	T20-D (Torx 20)	0.750-1.000	20-25	
	7808212	T30-T (Torx 30)	1.250	30-32	

Packed: Clamping Screw = 1 pc.; Wrench = 1 pc.
Note: Wrench sold separately.

PXT

Cutting Conditions (Standard Milling)

Work Material		Tensile Strength – Hardness	Milling Speed Vc (SFM)			Depth of Cut Aa (in)	Feed Per Tooth fz (in/t)			
			L/D = 2.5	L/D = 5	L/D = 8		Ø0.236-0.275 [6-7mm]	Ø0.312-0.375 [8-10mm]	Ø0.500-0.625 [12-16mm]	Ø0.750-1.250 [20-32mm]
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	655 (490-820)	80%	60%	0.05Dc	0.0047	0.0079	0.0087	0.0098
P	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	590 (495-820)			0.05Dc	0.0059	0.0071	0.0087	0.0098
P	Die Steels (H13, D2)	~280 HB	495 (395-655)			0.05Dc	0.0040	0.0059	0.0071	0.0079
M	Stainless Steels (304SS, 420SS)	~250 HB	495 (330-655)			0.03Dc	0.0031	0.0047	0.0059	0.0071
K	Cast Iron (FC250)	~350 N/mm²	655 (495-820)			0.05Dc	0.0059	0.0079	0.0098	0.0118
K	Ductile Cast Iron (60-40-18)	~600 N/mm²	495 (330-655)			0.05Dc	0.0047	0.0059	0.0079	0.0098
N	Aluminum Alloys (6061, 7075)	~13% Si	985 (655-1310)			0.05Dc	0.0079	0.0098	0.0118	0.0138
N	Graphite	-	825 (500-1150)			0.10Dc	0.0098	0.0157	0.0197	0.0197
N	CFRP	-	650 (500-825)			0.50Dc	0.0020	0.0040	0.0059	0.0079
S	Heat Resistant Alloys (Inconel 718)	-	100 (65-130)			0.02Dc	0.0016	0.0020	0.0031	0.0047
S	Titanium Alloy (Ti-6Al-4V)	-	165 (130-195)			0.02Dc	0.0020	0.0031	0.0040	0.0059
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HRC	395 (330-495)			0.03Dc	0.0031	0.0040	0.0047	0.0071
H	Die Cast Steels (A2, S7)	43 - 48 HRC	260 (165-330)			0.025Dc	0.0020	0.0031	0.0040	0.0059
H	Hardened Steels (D2)	50 - 55 HRC	195 (130-260)			0.02Dc	0.0016	0.0020	0.0031	0.0040

Recommended Materials by Application

Insert Grade	P	M	K	N	S	H
XP3225	◻	◻	▢	◻*	◻	▢
XP3310	▢	▢	◻			◻
XP4505				◻**		

▢ good ◻ best

XP3225: recommended when L/D ≥ 5.
XP3310: recommended for interrupted cutting.
*: Best recommended for aluminum applications.
**: Best recommended for graphite & CFRP applications.

Cutting Conditions (High Speed Light Milling)

Work Material		Tensile Strength – Hardness	Milling Speed Vc (SFM)			Depth of Cut Aa (in)	Feed Per Tooth fz (in/t)			
			Steel Shank	Carbide Shank Short	Carbide Shank Long		Ø0.236-0.312 [6-8mm]	Ø0.375-0.500 [10-12mm]	Ø0.625-0.750 [16-20mm]	Ø1.000-1.250 [25-32mm]
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	1475	1575	1180	0.02Dc	0.0040	0.0047	0.0055	0.0071
P	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	1475	1575	1180	0.02Dc	0.0027	0.0040	0.0047	0.0055
P	Die Steels (H13, D2)	~280 HB	1230	1310	985	0.02Dc	0.0027	0.0040	0.0047	0.0055
M	Stainless Steels (304SS, 420SS)	~250 HB	1230	1310	985	0.02Dc	0.0027	0.0047	0.0055	0.0067
K	Cast Iron (FC250)	~350 N/mm²	1970	2100	1575	0.02Dc	0.0047	0.0055	0.0071	0.0087
K	Ductile Cast Iron (60-40-18)	~600 N/mm²	1475	1575	1180	0.02Dc	0.0040	0.0047	0.0055	0.0071
N	Aluminum Alloys (6061, 7075)	~13% Si	2460	2625	1970	0.03Dc	0.0047	0.0055	0.0071	0.0087
S	Heat Resistant Alloys (Inconel 718)	-	230	260	195	0.015Dc	0.0016	0.0020	0.0024	0.0051
S	Titanium Alloy (Ti-6Al-4V)	-	395	470	360	0.02Dc	0.0024	0.0031	0.0043	0.0040
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HRC	985	1050	790	0.015Dc	0.0024	0.0027	0.0031	0.0040
H	Die Cast Steels (A2, S7)	43 - 48 HRC	885	940	720	0.015Dc	0.0020	0.0024	0.0027	0.0027
H	Hardened Steels (D2)	50 - 55 HRC	720	790	590	0.01Dc	0.0020	0.0024	0.0027	0.0027

Recommended Materials by Application

Insert Grade	P	M	K	N	S	H
XP3225	◎	◎	○	◎*	◎	○
XP3310	○	○	◎			◎
XP4505				◎**		

○ good ◎ best

XP3225: recommended when L/D ≥ 5.
XP3310: recommended for interrupted cutting.
*: Best recommended for aluminum applications.
**: Best recommended for graphite & CFRP applications.

OSG PHOENIX® SF

Screw-Fit End Mills

A series of modular indexable end mills, with PSE, PRC, PHC, PFB and PFR styles for a variety of applications.

List 52601
PSE ASF (Inch)

List 78016
PSE SF (Metric)

List 52602
PRC ASF (Inch)

List 78017
PRC SF (Metric)

List 52603
PHC ASF (Inch)

List 78015
PHC SF (Metric)

List 52604
PFB ASF (Inch)

List 78014
PFB SF (Metric)

List 52605
PFR ASF (Inch)

List 78220
PFR SF (Metric)

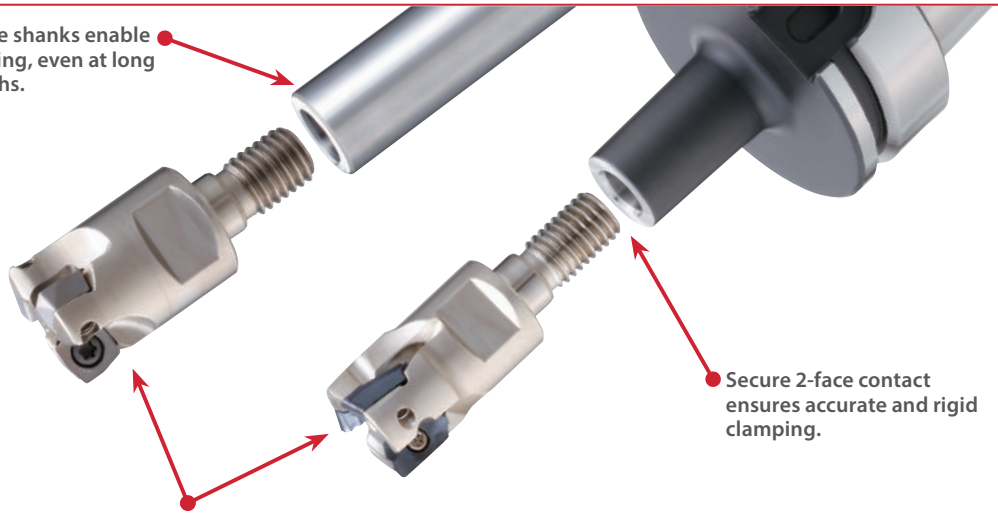
List 52600
SF Arbor SA (Inch)

List 78019
SF Arbor SS (Metric)

List 78025
SF Arbor BT

List 78125
SF Arbor HSK

Features & Benefits



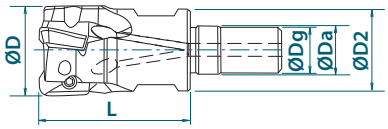
SF Series Overview

				
PSE	**PRC**	**PHC**	**PFB**	**PFR**
Multifunctional 90° indexable shoulder end mills.	Button insert end mills for contour milling applications.	High Feed end mills for maximum metal removal rates in a variety of applications	High precision indexable finish ballnose end mills for superior finish and tool life.	High precision indexable finish radius end mills for superior surface finish and tool life.

List 52601

PSE ASF (Inch)

SPEED FEED P85
Recommended Materials: p85
Accessories & Inserts: p84
Maximum Ramping Angle: p86
SF Arbors: p189



EDP No.	Body Type	Designation	Tool Dia. (inch) D	No. of Teeth	Pilot Dia. (inch) Da	Thread Dia. (mm) Dg	Overall Length (inch) L	Flange Dia. (inch) D2	Wrench Size	Applicable Insert
52601000	Screw Fit Head	PSE11R063ASF8-2	0.625	2	0.335	M8	1.063	0.571	10	ZD_T11…
52601001		PSE11R075ASF10-3	0.750	3	0.413	M10	1.299	0.709	14	
52601002		PSE11R100ASF12-3	1.000	3	0.492	M12	1.378	0.905	17	
52601003		PSE11R125ASF16-3	1.250	3	0.669	M16	1.575	1.102	22	
52601004		PSE15R100ASF12-2	1.000	2	0.492	M12	1.378	0.905	17	ZDKT15…
52601005		PSE15R125ASF16-3	1.250	3	0.669	M16	1.575	1.102	22	
52601006		PSE15R150ASF16-4	1.500	4	0.669	M16	1.575	1.102	22	

Packed: 1 pc.
Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).

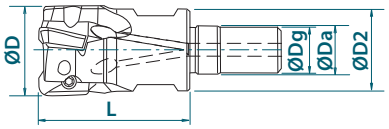
PXT

List 78016

PSE SF (Metric)

SPEED FEED P85

Recommended Materials: p85
Accessories & Inserts: p84
Maximum Ramping Angle: p86
SF Arbors: p190



EDP No.	Body Type	Designation	Tool Dia. (mm) D	No. of Teeth	Pilot Dia. (mm) Da	Thread Dia. (mm) Dg	Tool Height (mm) L	Flange Dia. (mm) D2	Wrench Size	Applicable Insert
7801600	Screw Fit Head	PSE11R016SF8-2	16	2	8.5	M8	27	14.5	10	ZD_T11…
7801612		PSE11R017SF8-2	17	2	8.5	M8	27	14.5	10	
7801613		PSE11R018SF8-2	18	2	8.5	M8	27	14.5	10	
7801601		PSE11R020SF10-3	20	3	10.5	M10	33	18.0	14	
7801614		PSE11R021SF10-3	21	3	10.5	M10	33	18.0	14	
7801615		PSE11R022SF10-3	22	3	10.5	M10	33	18.0	14	
7801602		PSE11R025SF12-4	25	4	12.5	M12	35	23.0	17	
7801616		PSE11R026SF12-3	26	3	12.5	M12	35	23.0	17	
7801603		PSE11R028SF12-4	28	4	12.5	M12	35	23.0	17	
7801604		PSE11R032SF16-5	32	5	17.0	M16	40	28.0	22	
7801617		PSE11R033SF16-3	33	3	17.0	M16	40	28.0	22	
7801605		PSE11R035SF16-5	35	5	17.0	M16	40	28.0	22	
7801606		PSE11R040SF16-6	40	6	17.0	M16	40	28.0	22	
7801607		PSE15R025SF12-2	25	2	12.5	M12	35	23.0	17	ZDKT15…
7801618		PSE15R026SF12-2	26	2	12.5	M12	35	23.0	17	
7801608		PSE15R028SF12-2	28	2	12.5	M12	35	23.0	17	
7801609		PSE15R032SF16-3	32	3	17.0	M16	40	28.0	22	
7801619		PSE15R033SF16-3	33	3	17.0	M16	40	28.0	22	
7801610		PSE15R035SF16-3	35	3	17.0	M16	40	28.0	22	
7801611		PSE15R040SF16-4	40	4	17.0	M16	40	28.0	22	

Packed: 1 pc.

Note: When using an insert with a corner radius of R2 or greater, the corner of the cutter body must be corrected.
The body corner radius should equal insert radius minus one (example: if insert radius is R3, body radius should be R2).

This item is stocked overseas. Please contact OSG for availability and delivery.

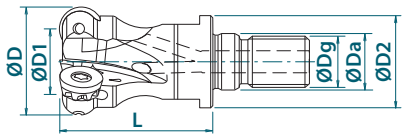
PXT

List 52602

PRC ASF (Inch)

SPEED FEED P121

Recommended Materials: p121
Accessories & Inserts: p120
Maximum Ramping Angle: p122
SF Arbors: p189



EDP No.	Body Type	Designation	Tool Dia. (inch)	Effective Dia. (inch)	No. of Teeth	Pilot Dia. (inch)	Thread Dia. (mm)	Overall Length (inch)	Flange Dia. (inch)	Wrench Size	Applicable Insert
			D	D1		Da	Dg	L	D2		
52602000	Screw Fit Head	PRC10R100ASF12-3	1.000	0.606	3	0.492	M12	1.378	0.905	17	RPH_10…
52602001		PRC10R125ASF16-4	1.250	0.856	4	0.669	M16	1.575	1.102	22	
52602002		PRC12R125ASF16-2	1.250	0.778	2	0.669	M16	1.575	1.102	22	RPH_12…
52602003		PRC12R150ASF16-3	1.500	1.028	3	0.669	M16	1.575	1.102	22	
52602004		PRC16R150ASF16-2	1.500	0.870	2	0.669	M16	1.575	1.102	22	RPH_16…

Packed: 1 pc.

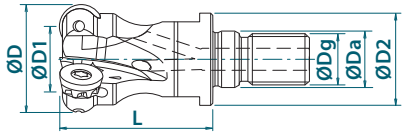
PXT

List 78017

PRC SF (Metric)

SPEED FEED P121

Recommended Materials: p121
Accessories & Inserts: p120
Maximum Ramping Angle: p122
SF Arbors: p190



EDP No.	Body Type	Designation	Tool Dia. (mm)	Effective Dia. (mm)	No. of Teeth	Pilot Dia. (mm)	Thread Dia. (mm)	Overall Length (mm)	Flange Dia. (mm)	Wrench Size	Applicable Insert
			D	D1		Da	Dg	L	D2		
7801700	Screw Fit Head	PRC10R020SF10-2	20	10	2	10.5	M10	33	18	14	RPH_10…
7801701		PRC10R025SF12-3	25	15	3	12.5	M12	35	23	17	
7801702		PRC10R030SF16-3	30	20	3	17.0	M16	40	28	22	
7801703		PRC10R032SF16-4	32	22	4	17.0	M16	40	28	22	
7801704		PRC10R040SF16-4	40	30	4	17.0	M16	40	28	22	
7801705		PRC12R030SF16-2	30	18	2	17.0	M16	40	28	22	RPH_12…
7801706		PRC12R032SF16-3	32	20	3	17.0	M16	40	28	22	
7801707		PRC12R040SF16-3	40	28	3	17.0	M16	40	28	22	

Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

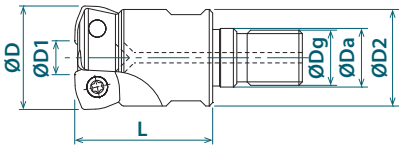
PXT

List 52603

PHC ASF (Inch)

SPEED FEED P136

Recommended Materials: p137
Accessories & Inserts: p135
Maximum Ramping Angle: p138
SF Arbors: p189



EDP No.	Body Type	Designation	Tool Dia. (inch)	Effective Dia. (inch)	No. of Teeth	Pilot Dia. (inch)	Thread Dia. (mm)	Overall Length (inch)	Flange Dia. (inch)	Wrench Size	Applicable Insert
			D	D1		Da	Dg	L	D2		
52603004	Screw Fit Head	PHC07R063ASF8-2	0.625	0.286	2	0.334	M8	1.063	0.571	10	SPMT07…
52603005		PHC07R075ASF10-3	0.750	0.411	3	0.413	M10	1.300	0.709	14	
52603006		PHC07R100ASF12-4	1.000	0.661	4	0.492	M12	1.378	0.905	17	
52603007		PHC07R125ASF16-5	1.250	0.911	5	0.669	M16	1.575	1.102	22	
52603000		PHC09R100ASF12-2	1.000	0.535	2	0.492	M12	1.378	0.905	17	SDMT09…
52603001		PHC09R125ASF16-3	1.250	0.785	3	0.669	M16	1.575	1.102	22	
52603002		PHC12R125ASF16-2	1.250	0.596	2	0.669	M16	1.575	1.102	22	SXMT12…
52603003		PHC12R150ASF16-3	1.500	0.846	3	0.669	M16	1.575	1.102	22	

Packed: 1 pc.

PXT

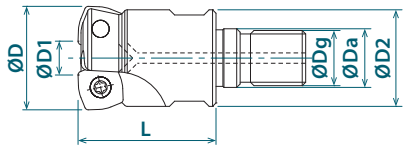
List 78015

PHC SF (Metric)

NEW SIZES

SPEED FEED P136

Recommended Materials: p137
Accessories & Inserts: p135
Maximum Ramping Angle: p138
SF Arbors: p190



EDP No.	Body Type	Designation	Tool Dia. (mm)	Effective Dia. (mm)	No. of Teeth	Pilot Dia. (mm)	Thread Dia. (mm)	Overall Length (mm)	Flange Dia. (mm)	Wrench Size	Applicable Insert
			D	D1		Da	Dg	L	D2		
7801520	Screw Fit Head	PHC07R016SF8-2	16	7.4	2	8.5	M8	27	14.5	10	SPMT07…
7801521		PHC07R017SF8-2	17	8.4	2	8.5	M8	27	14.5	10	
7801522		PHC07R018SF8-2	18	9.4	2	8.5	M8	27	14.5	10	
7801523		PHC07R020SF10-3	20	11.4	3	10.5	M10	33	18	14	
7801524		PHC07R021SF10-3	21	12.4	3	10.5	M10	33	18	14	
7801525		PHC07R022SF10-3	22	13.4	3	10.5	M10	33	18	14	
7801526		PHC07R025SF12-4	25	16.4	4	12.5	M12	35	23	17	
7801527		PHC07R026SF12-4	26	17.4	4	12.5	M12	35	23	17	
7801528		PHC07R028SF12-4	28	19.4	4	12.5	M12	35	23	17	
7801529		PHC07R030SF16-4	30	21.4	4	17	M16	40	28	22	
7801530		PHC07R032SF16-5	32	23.4	5	17	M16	40	28	22	
7801531		PHC07R033SF16-5	33	24.4	5	17	M16	40	28	22	
7801532		PHC07R035SF16-5	35	26.4	5	17	M16	40	28	22	
7801500		PHC09R025SF12-3	25	13.2	3	12.5	M12	35	23	17	SDMT09…
7801510		PHC09R026SF12-3	26	14.2	3	12.5	M12	35	23	17	
7801501		PHC09R028SF12-3	28	16.2	3	12.5	M12	35	23	17	
7801502		PHC09R030SF16-3	30	18.2	3	17.0	M16	40	28	22	
7801503		PHC09R032SF16-3	32	20.2	3	17.0	M16	40	28	22	
7801511		PHC09R033SF16-3	33	21.2	3	17.0	M16	40	28	22	
7801504		PHC09R035SF16-3	35	23.2	3	17.0	M16	40	28	22	
7801505		PHC09R040SF16-4	40	28.2	4	17.0	M16	40	28	22	
7801506		PHC12R030SF16-2	30	13.4	2	17.0	M16	40	28	22	SDXMT12…
7801507		PHC12R032SF16-2	32	15.4	2	17.0	M16	40	28	22	
7801512		PCH12R033SF16-2	33	16.4	2	17.0	M16	40	28	22	
7801508		PHC12R035SF16-3	35	18.4	3	17.0	M16	40	28	22	
7801509		PHC12R040SF16-3	40	23.4	3	17.0	M16	40	28	22	

Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

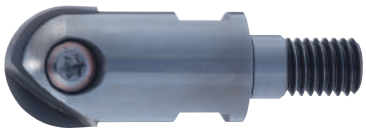
PXT

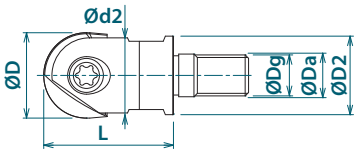
List 52604

SPEED FEED P166

PFB ASF (Inch)

Recommended Materials: p166
Accessories & Inserts: p161-163
Effective Cutting Diameter & Recommended Width of Cut: p164-165
SF Arbors: p189





EDP No.	Body Type	Designation	Tool Dia. (inch)	No. of Teeth	Pilot Dia. (inch)	Thread Dia. (mm)	Overall Length (inch)	Head Dia. (inch)	Flange Dia. (inch)	Wrench Size	Applicable Insert
			D		Da	Dg	L	d2	D2		
52604000	Screw Fit Head	PFB-R0375ASF6	0.375	2	0.256	M6	1.024	0.354	0.354	7	PFB…
52604001		PFB-R0500ASF6	0.500	2	0.256	M6	1.024	0.433	0.433	7	
52604002		PFB-R0625ASF8	0.625	2	0.335	M8	1.260	0.551	0.571	10	
52604003		PFB-R0750ASF10	0.750	2	0.413	M10	1.496	0.709	0.709	14	
52604004		PFB-R1000ASF12	1.000	2	0.492	M12	1.496	0.866	0.906	17	

Packed: 1 pc.

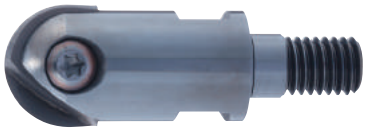
PXT

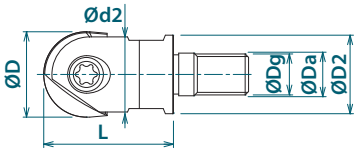
List 78114

SPEED FEED P166

PFB SF (Metric)

Recommended Materials: p166
Accessories & Inserts: p161-163
Effective Cutting Diameter & Recommended Width of Cut: p164-165
SF Arbors: p190





EDP No.	Body Type	Designation	Tool Dia. (mm)	No. of Teeth	Pilot Dia. (mm)	Thread Dia. (mm)	Overall Length (mm)	Head Dia. (mm)	Flange Dia. (mm)	Wrench Size	Applicable Insert
			D		Da	Dg	L	d2	D2		
7801490	Screw Fit Head	PFB-R100SF6	10	2	6.5	M6	26	9	9.0	7	PFB...
7801491		PFB-R120SF6	12	2	6.5	M6	26	11	11.0	7	
7801492		PFB-R160SF8	16	2	8.5	M8	32	14	14.5	10	
7801493		PFB-R200SF10	20	2	10.5	M10	38	18	18.0	14	
7801494		PFB-R250SF12	25	2	12.5	M12	38	22	23.0	17	
7801495		PFB-R300SF16	30	2	17.0	M16	43	27	28.0	22	

Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

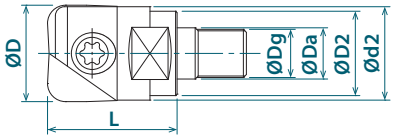
PXT

List 52605

PFR ASF (Inch)

SPEED FEED P179-180

Recommended Materials: p179-180
Accessories & Inserts: p173-178
SF Arbors: p189



EDP No.	Body Type	Designation	Tool Dia. (inch)	No. of Teeth	Pilot Dia. (inch)	Thread Dia. (mm)	Overall Length (inch)	Head Dia. (inch)	Flange Dia. (inch)	Wrench Size	Applicable Insert
			D		Da	Dg	L	d2	D2		
52605000	Screw Fit Head	PFR-R0375ASF6	0.375	2	0.256	M6	1.024	0.374	0.354	7	PFR...
52605001		PFR-R0500ASF6	0.500	2	0.256	M6	1.024	0.453	0.433	7	
52605002		PFR-R0625ASF8	0.625	2	0.335	M8	1.260	0.610	0.571	10	
52605003		PFR-R0750ASF10	0.750	2	0.413	M10	1.496	0.768	0.709	14	
52605004		PFR-R1000ASF12	1.000	2	0.492	M12	1.496	0.965	0.906	17	

Packed: 1 pc.

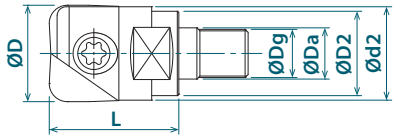
PXT

List 78220

PFR SF (Metric)

SPEED FEED P179-180

Recommended Materials: p179-180
Accessories & Inserts: p173-178
SF Arbors: p190



EDP No.	Body Type	Designation	Tool Dia. (mm)	No. of Teeth	Pilot Dia. (mm)	Thread Dia. (mm)	Overall Dia. (mm)	Head Dia. (mm)	Flange Dia. (mm)	Wrench Size	Applicable Insert
			D		Da	Dg	L	d2	D2		
7832090	Screw Fit Head	PFR-R100SF6	10	2	6.5	M6	26	9.5	9.0	7	PFR...
7832091		PFR-R120SF6	12	2	6.5	M6	26	11.5	11.0	7	
7832092		PFR-R160SF8	16	2	8.5	M8	32	15.5	14.5	10	
7832093		PFR-R200SF10	20	2	10.5	M10	38	19.5	18.0	14	
7832094		PFR-R250SF12	25	2	12.5	M12	38	24.5	23.0	17	
7832095		PFR-R300SF16	30	2	17.0	M16	43	29.5	28.0	22	
7832096		PFR-R320SF16	32	2	17.0	M16	43	31.5	28.0	22	

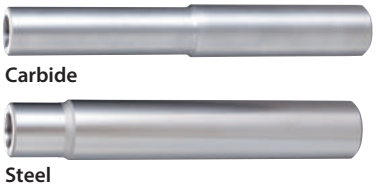
Packed: 1 pc.

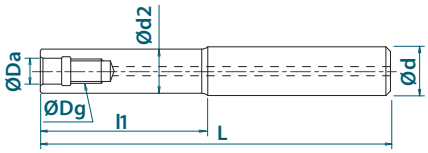
This item is stocked overseas. Please contact OSG for availability and delivery.

PXT

List 52600

SF Arbor SA (Inch)





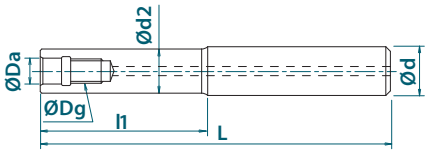
EDP No.	Body Type	Designation	Shank Dia. (inch)	Neck Dia. (inch)	Thread Dia. (mm)	Pilot Dia. (inch)	Overall Length (inch)	Neck Length (inch)
			d	d2	Dg	Da	L	l1
52600000	Cylindrical Shank Steel	SF-M06SA0375-0250	0.375	0.354	M6	0.256	4.000	0.250
52600001		SF-M06SA0500-0500	0.500	0.433	M6	0.256	4.000	0.500
52600002		SF-M08SA0625-0500	0.625	0.571	M8	0.335	4.000	0.500
52600003		SF-M10SA0750-1000	0.750	0.709	M10	0.413	5.000	1.000
52600004		SF-M12SA1000-1250	1.000	0.905	M12	0.492	5.500	1.250
52600005		SF-M16SA1250-1500	1.250	1.102	M16	0.669	6.000	1.500
52600010	Cylindrical Shank Carbide	SF-M06SA0375-1500CS	0.375	0.354	M6	0.256	5.000	1.500
52600011		SF-M06SA0500-2500CS	0.500	0.433	M6	0.256	5.500	2.500
52600012		SF-M08SA0625-2000CS	0.625	0.571	M8	0.335	5.000	2.000
52600013		SF-M08SA0625-3000CS	0.625	0.571	M8	0.335	6.000	3.000
52600014		SF-M10SA0750-3000CS	0.750	0.709	M10	0.413	6.000	3.000
52600015		SF-M10SA0750-4000CS	0.750	0.709	M10	0.413	7.000	4.000
52600016		SF-M12SA1000-4000CS	1.000	0.905	M12	0.492	7.000	4.000
52600017		SF-M12SA1000-5500CS	1.000	0.905	M12	0.492	9.000	5.500
52600018		SF-M16SA1250-5500CS	1.250	1.102	M16	0.669	9.000	5.500
52600019		SF-M16SA1250-8500CS	1.250	1.102	M16	0.669	12.000	8.500

Packed: 1 pc.

PXT

List 78019

SF Arbor SS (Metric)



EDP No.	Body Type	Designation	Shank Dia. (mm)	Neck Dia. (mm)	Thread Dia. (mm)	Pilot Dia. (mm)	Overall Length (mm)	Neck Length (mm)
			d	d2	Dg	Da	L	l1
7801904	Cylindrical Shank Steel	SF-M06SS10-4	10	9.0	M6	6.5	104	4
7801905		SF-M06SS12-10	12	11.0	M6	6.5	104	10
7801900		SF-M08SS16-15	16	14.5	M8	8.5	95	15
7801901		SF-M10SS20-20	20	18.0	M10	10.5	120	20
7801902		SF-M12SS25-35	25	23.0	M12	12.5	135	35
7801903		SF-M16SS32-35	32	28.0	M16	17.0	155	35
7801918	Cylindrical Shank Carbide	SF-M06SS10-24CS	10	9.0	M6	6.5	124	24
7801919		SF-M06SS12-34CS	12	11.0	M6	6.5	134	34
7801910		SF-M08SS16-55CS	16	14.5	M8	8.5	115	55
7801911		SF-M08SS16-85CS	16	14.5	M8	8.5	145	85
7801912		SF-M10SS20-70CS	20	18.0	M10	10.5	140	70
7801913		SF-M10SS20-110CS	20	18.0	M10	10.5	180	110
7801914		SF-M12SS25-90CS	25	23.0	M12	12.5	170	90
7801915		SF-M12SS25-140CS	25	23.0	M12	12.5	220	140
7801916		SF-M16SS32-120CS	32	28.0	M16	17.0	220	120
7801917		SF-M16SSS32-190CS	32	28.0	M16	17.0	290	190

Packed: 1 pc.

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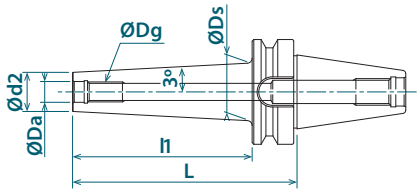
PXT

List 78025

SF Arbor BT



EDP No.	Body Type	Designation	Neck Dia. (mm)	Thread Dia. (mm)	Bore Dia. (mm)	Overall Length (mm)	Neck Length (mm)	Taper Dia. (mm)
			d2	Dg	Da	L	l1	Ds
7802500	BT30 Taper	BT30-SFA8-45	14.5	M8	8.5	45	23	16.0
7802501		BT30-SFA8-85	14.5	M8	8.5	85	63	21.1
7802502		BT30-SFA10-45	18.5	M10	10.5	45	23	20.0
7802503		BT30-SFA10-85	18.5	M10	10.5	85	63	25.1
7802504		BT30-SFA12-45	23.5	M12	12.5	45	23	25.0
7802505		BT30-SFA12-85	23.5	M12	12.5	85	63	30.1
7802506		BT30-SFA16-45	29.0	M16	17.0	45	23	32.0
7802507		BT30-SFA16-85	29.0	M16	17.0	85	63	32.0
7802508	BT40 Taper	BT40-SFA8-45	14.5	M8	8.5	45	18	16.0
7802509		BT40-SFA8-85	14.5	M8	8.5	85	58	20.5
7802510		BT40-SFA10-45	18.5	M10	10.5	45	18	20.0
7802511		BT40-SFA10-85	18.5	M10	10.5	85	58	24.5
7802512		BT40-SFA12-45	23.5	M12	12.5	45	18	25.0
7802513		BT40-SFA12-85	23.5	M12	12.5	85	58	29.5
7802514		BT40-SFA12-135	23.5	M12	12.5	135	108	34.8
7802515		BT40-SFA16-45	29.0	M16	17.0	45	18	32.0
7802516		BT40-SFA16-85	29.0	M16	17.0	85	58	35.0
7802517		BT40-SFA16-135	29.0	M16	17.0	135	108	40.3
7802518	BT50 Taper	BT50-SFA8-85	14.5	M8	8.5	85	47	19.4
7802519		BT50-SFA8-135	14.5	M8	8.5	135	97	23.6
7802520		BT50-SFA10-85	18.5	M10	10.5	85	47	20.0
7802521		BT50-SFA10-135	18.5	M10	10.5	135	97	28.6
7802522		BT50-SFA12-85	23.5	M12	12.5	85	47	25.0
7802523		BT50-SFA12-135	23.5	M12	12.5	135	97	33.6
7802524		BT50-SFA12-185	23.5	M12	12.5	185	147	38.9
7802525		BT50-SFA12-250	23.5	M12	12.5	250	212	45.7
7802526		BT50-SFA12-300	23.5	M12	12.5	300	262	50.9
7802527		BT50-SFA16-800	29.0	M16	17.0	85	47	32.0
7802528		BT50-SFA16-135	29.0	M16	17.0	135	97	39.1
7802529		BT50-SFA16-185	29.0	M16	17.0	185	147	44.4
7802530		BT50-SFA16-250	29.0	M16	17.0	250	212	51.2
7802531		BT50-SFA16-300	29.0	M16	17.0	300	262	56.4

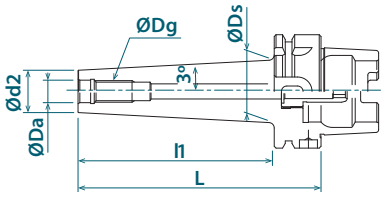
Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

PXT

List 78125

SF Arbor HSK



EDP No.	Body Type	Designation	Neck Dia. (mm)	Thread Dia. (mm)	Bore Dia. (mm)	Overall Length (mm)	Neck Length (mm)	Taper Dia. (mm)
			d2	Dg	Da	L	l1	Ds
7802550	HSK-A63	A63-SFA8-45	14.5	M8	8.5	45	19	16.0
7802551		A63-SFA8-85	14.5	M8	8.5	85	59	20.6
7802552		A63-SFA10-60	18.5	M10	10.5	60	34	20.0
7802553		A63-SFA10-85	18.5	M10	10.5	85	59	24.6
7802554		A63-SFA12-60	23.5	M12	12.5	60	34	25.0
7802555		A63-SFA12-85	23.5	M12	12.5	85	59	39.6
7802556		A63-SFA12-135	23.5	M12	12.5	135	109	34.9
7802557		A63-SFA16-60	29.0	M16	17.0	60	34	32.0
7802558		A63-SFA16-85	29.0	M16	17.0	85	59	32.0
7802559		A63-SFA16-135	29.0	M16	17.0	135	109	40.4
7802560	HSK-A100	A100-SFA8-85	14.5	M8	8.5	85	50	19.7
7802561		A100-SFA8-135	14.5	M8	8.5	135	100	23.9
7802562		A100-SFA10-85	18.5	M10	10.5	85	50	23.7
7802563		A100-SFA10-135	18.5	M10	10.5	135	100	28.9
7802564		A100-SFA12-85	23.5	M12	12.5	85	50	28.7
7802565		A100-SFA12-135	23.5	M12	12.5	135	100	33.9
7802566		A100-SFA12-185	23.5	M12	12.5	185	150	39.2
7802567		A100-SFA12-250	23.5	M12	12.5	250	221	46.6
7802568		A100-SFA12-300	23.5	M12	12.5	300	271	51.9
7802569		A100-SFA16-85	29.0	M16	17.0	85	50	34.2
7802570		A100-SFA16-135	29.0	M16	17.0	135	106	40.1
7802571		A100-SFA16-185	29.0	M16	17.0	185	156	45.3
7802572		A100-SFA16-250	29.0	M16	17.0	250	221	52.1
7802573		A100-SFA16-300	29.0	M16	17.0	300	271	57.4

Packed: 1 pc.

This item is stocked overseas. Please contact OSG for availability and delivery.

PXT

OSG PHOENIX® PXM

Exchangeable Head End Mills

An exchangeable head end mill series for superior surface finish and precision in a variety of applications.

List 78PXSE
PXSE Heads (Inch & Metric)

List 78PXVC
PXVC Heads (Inch & Metric)

List 78PXSM
PXSM Heads (Inch & Metric)

List 78PXNL
PXNL Heads (Inch & Metric)

List 78PXNH
PXNH Heads (Inch & Metric)

List 78PXRE
PXRE Heads (Inch & Metric)

List 78PXDR
PXDR Heads (Inch & Metric)

List 78PXBE
PXBE Heads (Inch & Metric)

List 78PXBM
PXBM Heads (Inch & Metric)

List 52300
PXM SA/TPA (Inch)

List 78018
PXM SS/TP (Metric)

List 7808H
PXM Accessories

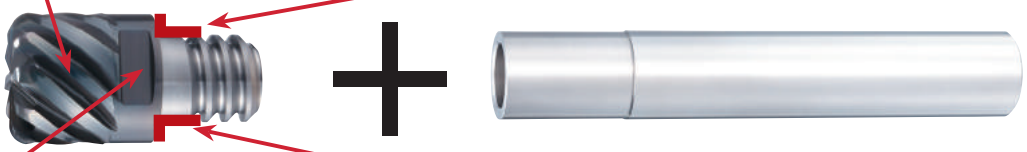
Features & Benefits

Solid Tool Technology

- Features OSG's proven cutting geometries & coatings to achieve excellent performance in a variety of applications & materials.

High Accuracy & Repeatability

- Radial Runout: < 0.0006 in (< 0.015 mm).
- Axial Repeatability: ± 0.0012 in (± 0.030 mm).



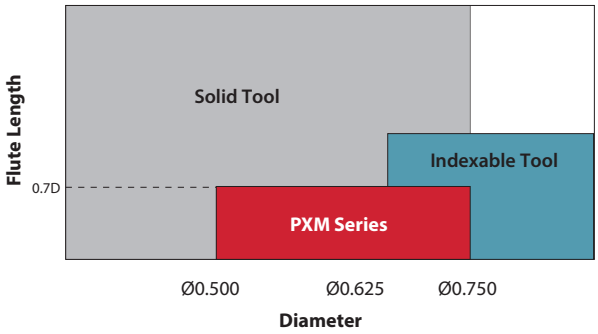
Highly Rigid Clamping

- 2-Face Contact (End Face & Taper).
- Tightening by special spanner wrench (included with body).

Reduced Tool Set-Up Time

- Special buttress thread makes exchanging heads fast & easy.

The Complete Milling Tool Offering



Compared to solid tools	PXM offers similar productivity & precision, increased flexibility and greater cost savings than solid tools at larger diameters.
Compared to indexable tools	PXM offers increased productivity and higher precision than indexable tools at smaller diameters.

PXM Series Overview

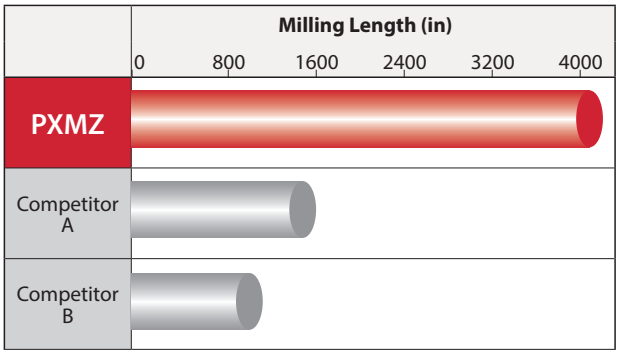
PXSE	Variable index, Four flutes, Square type & Corner Radius type.	All-purpose end mills, suitable for efficient machining in a variety of applications and materials.
PXVC	Variable index & helix, Four flutes, Square type & Corner Radius type.	All-purpose end mills, suitable for efficient & stable machining with long overhangs.
PXSM	Variable index, Multiple flutes, Square type & Corner Radius type	All-purpose end mills, suitable for efficient finish machining in a variety of applications and materials.
PXNL	Variable index & helix, Low Helix, Four flutes, Roughing type	"Silent" Roughing end mills, suitable for rough machining in a wide range of materials with excellent tool life.
PXNH	Variable index & helix, High Helix, Four flutes, Roughing type	"Silent" Roughing end mills, suitable for rough machining in a wide range of materials & cutting conditions.
PXRE	Straight flute, Multiple flutes, Corner Radius type	Corner radius end mills, suitable for efficient machining of high hardness materials.
PXDR-P	Three flutes, Corner Radius type	All-purpose corner radius end mills, suitable for efficient & stable machining with long overhangs.
PXDR-N	Three flutes, Corner Radius type	Heavy-duty corner radius end mills, suitable for profile milling with long tool life.
PXBE-P	Three flutes, Ball type	All-purpose ball nose end mills, suitable for efficient & stable machining with long overhangs.
PXBE-N	Three flutes, Ball type	Heavy-duty ball nose end mills, suitable for profile milling with long tool life.
PXBM	Multiple flutes, Ball Type	Ball nose end mills, suitable for semi-finish and finish machining operations.

Processing Data

Variable Lead Enables Stable Machining and Long Tool Life - 1050 Steel

More than twice the durability of the competitors' products.

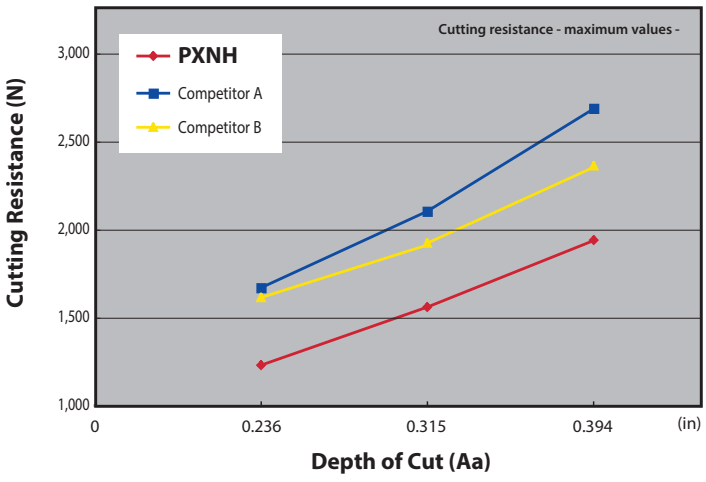
Tool	PXMZ-C20SS20-S120	Competitor
Head (Grade)	PXNL200C20-04C006 (XP3225)	Indexable
Size	Ø20mm (4 Flutes)	Ø20mm (6 Flutes)
Work Material	1050 Steel	
Cutting Speed	393 SFM (1910 RPM)	
Feed	30.08 IPM (0.004 ipt)	30.08 IPM (0.026 ipt)
Milling Method	Side Milling	
Depth of Cut	Aa = 0.394 in, Ar = 0.236 in	
Coolant	Air	
Machine	Vertical Machining Center	



The Variable Lead Enables Low-Resistance Machining - 1050 Steel

Cutting resistance can be reduced by more than 20% from the competitors' products.

Tool	PXMZC20SS20-S120	Competitor
Head (Grade)	PXNH200C20-04C006 (XP3225)	Indexable
Size	Ø20mm (4 Flutes)	Ø20mm (6 Flutes)
Work Material	1050 Steel	
Cutting Speed	328 SFM (1590 RPM)	
Feed	17.72 IPM (0.003 ipt)	17.72 IPM (0.002 ipt)
Milling Method	Slotting	
Depth of Cut	Aa = 0.236 in, 0.315 in, 0.394 in	
Coolant	Air	
Machine	Vertical Machining Center	

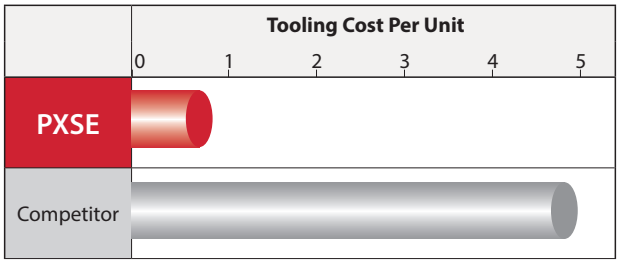


Processing Data

1.6 Times the Durability and 1/5th of the Tooling Cost - 1025 Steel

The tool achieved 1.6 times durability. Tooling cost per unit was reduced to 1/5.

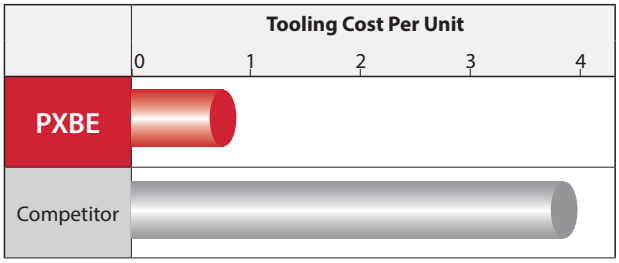
Tool	PXMZ-C20SS20-S120	Competitor
Head (Grade)	PXSE200C20-04R010 (XP3225)	Solid Carbide
Size	Ø20mm x R1mm (4 Flutes)	
Work Material	1025 Steel	
Cutting Speed	196 SFM (1000 RPM)	
Feed	15.75 IPM (0.004 ipt)	
Milling Method	Slotting	
Depth of Cut	Aa = 0.118 in, Ar = 0.787 in	
Coolant	Water Soluble	
Machine	Horizontal Machining Center	
Tool Life	5 parts	3 parts



Reduced Tooling Cost in Die-Casting Steel - SKD11 (60HRC)

Tooling cost per unit was reduced by 75%, while maintaining the same machining efficiency and tool life.

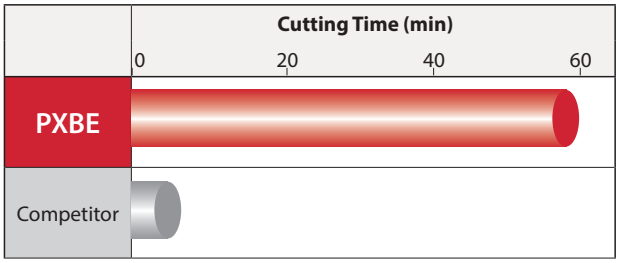
Tool	PXMZ-C16SS16-L130CS	Competitor
Head (Grade)	PXBE160C16-03R080 (XP3320)	Solid Carbide
Size	Ø16mm x R8mm (3 Flutes)	Ø16mm x R8mm (4 Flutes)
Work Material	SKD11 (60 HRC)	
Cutting Speed	295 SFM (1800 RPM)	
Feed	31.89 IPM (0.006 ipt)	31.89 IPM (0.004 ipt)
Milling Method	Pick Milling	
Depth of Cut	Aa = 0.012 in, Ar = 0.031 in	
Coolant	Water Soluble	
Machine	Vertical Machining Center	
Length of Cut	13000 in	13000 in



Machining Efficiency Improved in Welding Parts - SKD61 (52 HRC) + Weld Overlay

PXBE achieved 12 times the durability of the competitor's indexable tool. Machining efficiency was greatly improved, which was partly due to the reduced tool-change time.

Tool	PXMZ-C20SS20-L150CS	Competitor
Head (Grade)	PXBE200C20-03R100 (XP3320)	Indexable
Size	Ø20mm x R10mm (3 Flutes)	Ø20mm x R10mm (2 Flutes)
Work Material	SKD61 (52 HRC) + Weld Overlay	
Cutting Speed	246 SFM (1200 RPM)	
Feed	16.53 IPM (0.005 ipt)	16.53 IPM (0.007 ipt)
Milling Method	Pick Milling	
Depth of Cut	Aa = 0.394 in, Ar = 0.039 in	
Coolant	Air	
Machine	Horizontal Machining Center	

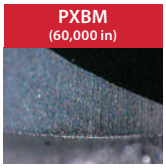


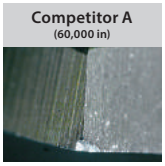
Processing Data

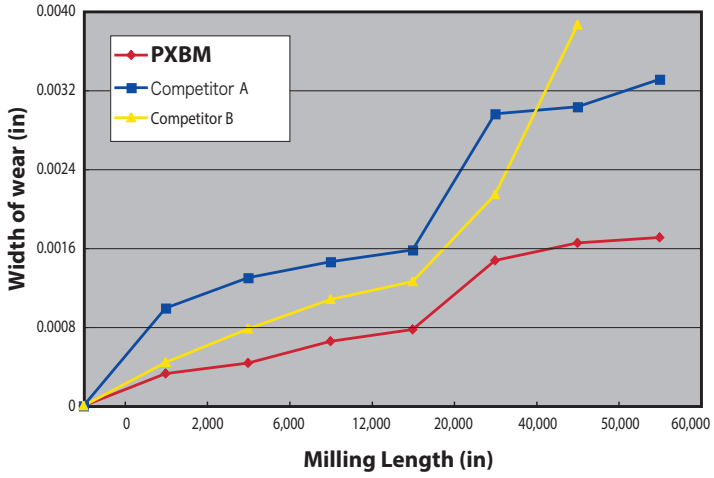
PXM vs. Solid Tools vs. Indexable Tools - NAK80 (40 HRC)

PXBM's additional cutting edges resulted in better productivity, longer tool life and superb durability.

Tool	PXMZ-C16SS16-S100	Competitor A	Competitor B
Head (Grade)	PXBM160C16-06R080 (XP3320)	Solid Carbide	Indexable
Size	Ø16mm (6 Flutes)	Ø16mm (4 Flutes)	Ø16mm (2 Flutes)
Work Material	NAK80 (40 HRC)		
Cutting Speed	656 SFM (3980 RPM)		
Feed	105.71 IPM (0.005 ipt)	75.20 IPM (0.005 ipt)	37.56 IPM (0.005 ipt)
Milling Method	Pick Milling		
Depth of Cut	Aa = 0.013 in, Ar = 0.031 in		
Coolant	Air		
Machine	Horizontal Machining Center		



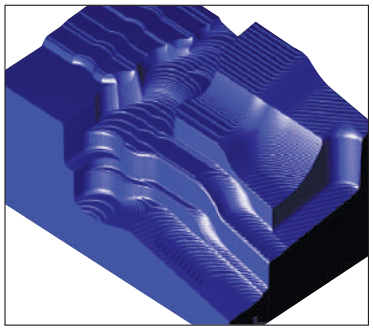




The Multiple Edge Design Increases Efficiency 1.8 Times! - SKD61 (43HRC)

With high feed radius cutters, a simulated R value is inputted in the program during rough milling, resulting in large amounts of uncut areas. In contrast, with the high precision Corner R form PXRE, there are fewer uncut areas, which reduce the load of the next process, thereby increasing tool life and the precision of cut.

Tool	PXMZ-C20SS20-S120	Competitor
Head (Grade)	PXRE200C20-06R030 (XP6305)	Indexable
Size	Ø20mm x R3mm (6 Flutes)	Ø20mm x R3mm (2 Flutes)
Work Material	SKD61 (43 HRC)	
Cutting Speed	755 SFM (3700 RPM)	393 SFM (1900 RPM)
Feed	263.78 IPM (0.012 ipt)	122.05 IPM (0.031 ipt)
Depth of Cut	Aa = 0.016 in	Aa = 0.020 in
Width of Cut	Ar = 0.394 in	
Coolant	Air	
Machine	Horizontal Machining Center	

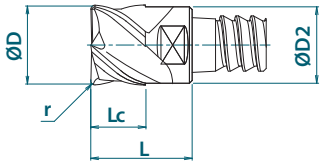


List 78PXSE

SPEED FEED P210

Accessories: p209

PXSE Exchangeable Heads (Inch & Metric) - 4 Flute, Square & Corner Radius



EDP No.	Type	Designation	Head Dia. D		Corner Radius r		Length of Cut Lc		Overall Length L		Flange Dia. D2		Helix Angle	Grade
			(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		
52301000	PXSE	PXSE0500AC12-04R000	-	0.500	-	0.000	-	0.350	-	0.598	-	0.488	38°	XP3225
52301001		PXSE0500AC12-04R015	-	0.500	-	0.015	-	0.350	-	0.598	-	0.488	38°	XP3225
52301002		PXSE0500AC12-04R030	-	0.500	-	0.030	-	0.350	-	0.598	-	0.488	38°	XP3225
52301003		PXSE0500AC12-04R060	-	0.500	-	0.060	-	0.350	-	0.598	-	0.488	38°	XP3225
52301004		PXSE0500AC12-04R090	-	0.500	-	0.090	-	0.350	-	0.598	-	0.488	38°	XP3225
52301005		PXSE0625AC16-04R000	-	0.625	-	0.000	-	0.438	-	0.732	-	0.613	38°	XP3225
52301006		PXSE0625AC16-04R030	-	0.625	-	0.030	-	0.438	-	0.732	-	0.613	38°	XP3225
52301007		PXSE0625AC16-04R060	-	0.625	-	0.060	-	0.438	-	0.732	-	0.613	38°	XP3225
52301008		PXSE0625AC16-04R090	-	0.625	-	0.090	-	0.438	-	0.732	-	0.613	38°	XP3225
52301009		PXSE0625AC16-04R120	-	0.625	-	0.120	-	0.438	-	0.732	-	0.613	38°	XP3225
52301010		PXSE0750AC20-04R000	-	0.750	-	0.000	-	0.525	-	0.807	-	0.736	38°	XP3225
52301011		PXSE0750AC20-04R030	-	0.750	-	0.030	-	0.525	-	0.807	-	0.736	38°	XP3225
52301012		PXSE0750AC20-04R060	-	0.750	-	0.060	-	0.525	-	0.807	-	0.736	38°	XP3225
52301013		PXSE0750AC20-04R090	-	0.750	-	0.090	-	0.525	-	0.807	-	0.736	38°	XP3225
52301014		PXSE0750AC20-04R120	-	0.750	-	0.120	-	0.525	-	0.807	-	0.736	38°	XP3225
52301015		PXSE1000AC25-04R000	-	1.000	-	0.000	-	0.700	-	1.098	-	0.960	38°	XP3225
52301016		PXSE1000AC25-04R030	-	1.000	-	0.030	-	0.700	-	1.098	-	0.960	38°	XP3225
52301017		PXSE1000AC25-04R060	-	1.000	-	0.060	-	0.700	-	1.098	-	0.960	38°	XP3225
52301018		PXSE1000AC25-04R090	-	1.000	-	0.090	-	0.700	-	1.098	-	0.960	38°	XP3225
52301019		PXSE1000AC25-04R120	-	1.000	-	0.120	-	0.700	-	1.098	-	0.960	38°	XP3225
7830004		PXSE120C12-04R000	12	-	0	-	8.4	-	14.4	-	11.7	-	38°	XP3225
7830005		PXSE120C12-04R005	12	-	0.5	-	8.4	-	14.4	-	11.7	-	38°	XP3225
7830006		PXSE120C12-04R010	12	-	1.0	-	8.4	-	14.4	-	11.7	-	38°	XP3225
7830007		PXSE120C12-04R020	12	-	2.0	-	8.4	-	14.4	-	11.7	-	38°	XP3225
7830008		PXSE120C12-04R030	12	-	3.0	-	8.4	-	14.4	-	11.7	-	38°	XP3225
7830009		PXSE160C16-04R000	16	-	0	-	11.2	-	18.7	-	15.7	-	38°	XP3225
7830010		PXSE160C16-04R005	16	-	0.5	-	11.2	-	18.7	-	15.7	-	38°	XP3225
7830011		PXSE160C16-04R010	16	-	1.0	-	11.2	-	18.7	-	15.7	-	38°	XP3225
7830012		PXSE160C16-04R015	16	-	1.5	-	11.2	-	18.7	-	15.7	-	38°	XP3225
7830013		PXSE160C16-04R020	16	-	2.0	-	11.2	-	18.7	-	15.7	-	38°	XP3225
7830014		PXSE160C16-04R030	16	-	3.0	-	11.2	-	18.7	-	15.7	-	38°	XP3225
7830015		PXSE200C20-04R000	20	-	0	-	14.0	-	21.5	-	19.6	-	38°	XP3225
7830016		PXSE200C20-04R005	20	-	0.5	-	14.0	-	21.5	-	19.6	-	38°	XP3225
7830017		PXSE200C20-04R010	20	-	1.0	-	14.0	-	21.5	-	19.6	-	38°	XP3225
7830018		PXSE200C20-04R020	20	-	2.0	-	14.0	-	21.5	-	19.6	-	38°	XP3225
7830019		PXSE200C20-04R030	20	-	3.0	-	14.0	-	21.5	-	19.6	-	38°	XP3225
7830020		PXSE250C25-04R000	25	-	0	-	17.5	-	27.5	-	24.0	-	38°	XP3225
7830021		PXSE250C25-04R010	25	-	1.0	-	17.5	-	27.5	-	24.0	-	38°	XP3225
7830022		PXSE250C25-04R020	25	-	2.0	-	17.5	-	27.5	-	24.0	-	38°	XP3225
7830023		PXSE250C25-04R030	25	-	3.0	-	17.5	-	27.5	-	24.0	-	38°	XP3225

Packed: 1 pc.

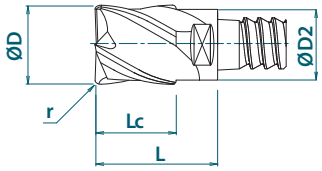
PXI

List 78PXVC

SPEED FEED P211

Accessories: p209

PXVC Exchangeable Heads (Inch & Metric) - 4 Flute, Square & Corner Radius



EDP No.	Type	Designation	Head Dia. D		Corner Radius r		Length of Cut Lc		Overall Length L		Flange Dia. D2		Helix Angle	Grade
			(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		
52308000	PXVC	PXVC0500AC12-04R000	-	0.500	-	0.000	-	0.500	-	0.748	-	0.488	45° / 48°	XP3225
52308001		PXVC0500AC12-04R015	-	0.500	-	0.015	-	0.500	-	0.748	-	0.488	45° / 48°	XP3225
52308002		PXVC0500AC12-04R030	-	0.500	-	0.030	-	0.500	-	0.748	-	0.488	45° / 48°	XP3225
52308003		PXVC0500AC12-04R060	-	0.500	-	0.060	-	0.500	-	0.748	-	0.488	45° / 48°	XP3225
52308004		PXVC0500AC12-04R090	-	0.500	-	0.090	-	0.500	-	0.748	-	0.488	45° / 48°	XP3225
52308005		PXVC0625AC16-04R000	-	0.625	-	0.000	-	0.625	-	0.921	-	0.614	45° / 48°	XP3225
52308006		PXVC0625AC16-04R030	-	0.625	-	0.030	-	0.625	-	0.921	-	0.614	45° / 48°	XP3225
52308007		PXVC0625AC16-04R060	-	0.625	-	0.060	-	0.625	-	0.921	-	0.614	45° / 48°	XP3225
52308008		PXVC0625AC16-04R090	-	0.625	-	0.090	-	0.625	-	0.921	-	0.614	45° / 48°	XP3225
52308009		PXVC0625AC16-04R120	-	0.625	-	0.120	-	0.625	-	0.921	-	0.614	45° / 48°	XP3225
52308010		PXVC0750AC20-04R000	-	0.750	-	0.000	-	0.750	-	1.035	-	0.736	45° / 48°	XP3225
52308011		PXVC0750AC20-04R030	-	0.750	-	0.030	-	0.750	-	1.035	-	0.736	45° / 48°	XP3225
52308012		PXVC0750AC20-04R060	-	0.750	-	0.060	-	0.750	-	1.035	-	0.736	45° / 48°	XP3225
52308013		PXVC0750AC20-04R090	-	0.750	-	0.090	-	0.750	-	1.035	-	0.736	45° / 48°	XP3225
52308014		PXVC0750AC20-04R120	-	0.750	-	0.120	-	0.750	-	1.035	-	0.736	45° / 48°	XP3225
52308015		PXVC1000AC25-04R000	-	1.000	-	0.000	-	1.000	-	1.398	-	0.961	45° / 48°	XP3225
52308016		PXVC1000AC25-04R030	-	1.000	-	0.030	-	1.000	-	1.398	-	0.961	45° / 48°	XP3225
52308017		PXVC1000AC25-04R060	-	1.000	-	0.060	-	1.000	-	1.398	-	0.961	45° / 48°	XP3225
52308018		PXVC1000AC25-04R090	-	1.000	-	0.090	-	1.000	-	1.398	-	0.961	45° / 48°	XP3225
52308019		PXVC1000AC25-04R120	-	1.000	-	0.120	-	1.000	-	1.398	-	0.961	45° / 48°	XP3225
7835004		PXVC120C12-04R000	12	-	0	-	12	-	18	-	12	-	45° / 48°	XP3225
7835005		PXVC120C12-04R005	12	-	0.5	-	12	-	18	-	12	-	45° / 48°	XP3225
7835006		PXVC120C12-04R010	12	-	1.0	-	12	-	18	-	12	-	45° / 48°	XP3225
7835007		PXVC120C12-04R020	12	-	2.0	-	12	-	18	-	12	-	45° / 48°	XP3225
7835008		PXVC120C12-04R030	12	-	3.0	-	12	-	18	-	12	-	45° / 48°	XP3225
7835009		PXVC140C12-04R000	14	-	0	-	14	-	20	-	12	-	45° / 48°	XP3225
7835010		PXVC140C12-04R005	14	-	0.5	-	14	-	20	-	12	-	45° / 48°	XP3225
7835011		PXVC140C12-04R010	14	-	1.0	-	14	-	20	-	12	-	45° / 48°	XP3225
7835012		PXVC140C12-04R020	14	-	2.0	-	14	-	20	-	12	-	45° / 48°	XP3225
7835013		PXVC140C12-04R030	14	-	3.0	-	14	-	20	-	12	-	45° / 48°	XP3225
7835014		PXVC160C16-04R000	16	-	0	-	16	-	24	-	16	-	45° / 48°	XP3225
7835015		PXVC160C16-04R005	16	-	0.5	-	16	-	24	-	16	-	45° / 48°	XP3225
7835016		PXVC160C16-04R010	16	-	1.0	-	16	-	24	-	16	-	45° / 48°	XP3225
7835017		PXVC160C16-04R015	16	-	2.0	-	16	-	24	-	16	-	45° / 48°	XP3225
7835018		PXVC160C16-04R020	16	-	2.0	-	16	-	24	-	16	-	45° / 48°	XP3225
7835019		PXVC160C16-04R030	16	-	3.0	-	16	-	24	-	16	-	45° / 48°	XP3225
7835020		PXVC180C16-04R000	18	-	0	-	18	-	26	-	16	-	45° / 48°	XP3225
7835021		PXVC180C16-04R005	18	-	0.5	-	18	-	26	-	16	-	45° / 48°	XP3225
7835022		PXVC180C16-04R010	18	-	1.0	-	18	-	26	-	16	-	45° / 48°	XP3225
7835023		PXVC180C16-04R020	18	-	2.0	-	18	-	26	-	16	-	45° / 48°	XP3225
7835024		PXVC180C16-04R030	18	-	3.0	-	18	-	26	-	16	-	45° / 48°	XP3225
7835025		PXVC200C20-04R000	20	-	0	-	20	-	28	-	20	-	45° / 48°	XP3225
7835026		PXVC200C20-04R005	20	-	0.5	-	20	-	28	-	20	-	45° / 48°	XP3225
7835027		PXVC200C20-04R010	20	-	1.0	-	20	-	28	-	20	-	45° / 48°	XP3225
7835028		PXVC200C20-04R020	20	-	2.0	-	20	-	28	-	20	-	45° / 48°	XP3225
7835029		PXVC200C20-04R030	20	-	3.0	-	20	-	28	-	20	-	45° / 48°	XP3225
7835030		PXVC220C20-04R000	22	-	0	-	22	-	30	-	20	-	45° / 48°	XP3225
7835038		PXVC220C20-04R005	22	-	0.5	-	22	-	30	-	20	-	45° / 48°	XP3225
7835031		PXVC220C20-04R010	22	-	1.0	-	22	-	30	-	20	-	45° / 48°	XP3225
7835032		PXVC220C20-04R020	22	-	2.0	-	22	-	30	-	20	-	45° / 48°	XP3225
7835033		PXVC220C20-04R030	22	-	3.0	-	22	-	30	-	20	-	45° / 48°	XP3225
7835034		PXVC250C25-04R000	25	-	0	-	25	-	35	-	24	-	45° / 48°	XP3225
7835035		PXVC250C25-04R010	25	-	1.0	-	25	-	35	-	24	-	45° / 48°	XP3225
7835036		PXVC250C25-04R020	25	-	2.0	-	25	-	35	-	24	-	45° / 48°	XP3225
7835037		PXVC250C25-04R030	25	-	3.0	-	25	-	35	-	24	-	45° / 48°	XP3225

Packed: 1 pc.

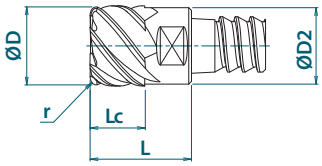
PXI

List 78PXSM

SPEED FEED P212

Accessories: p209

PXSM Exchangeable Heads (Inch & Metric) - Multiple Flute, Square & Corner Radius



EDP No.	Type	Designation	Head Dia. D		Corner Radius r		No. of Flutes	Length of Cut Lc		Overall Length L		Flange Dia. D2		Helix Angle	Grade
			(mm)	(inch)	(mm)	(inch)		(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		
52302000		PXSM0500AC12-06R000	-	0.500	-	0.000	6	-	0.350	-	0.598	-	0.488	38°	XP3225
52302001		PXSM0500AC12-06R015	-	0.500	-	0.015	6	-	0.350	-	0.598	-	0.488	38°	XP3225
52302002		PXSM0500AC12-06R030	-	0.500	-	0.030	6	-	0.350	-	0.598	-	0.488	38°	XP3225
52302003		PXSM0500AC12-06R060	-	0.500	-	0.060	6	-	0.350	-	0.598	-	0.488	38°	XP3225
52302004		PXSM0500AC12-06R090	-	0.500	-	0.090	6	-	0.350	-	0.598	-	0.488	38°	XP3225
52302005		PXSM0625AC16-06R000	-	0.625	-	0.000	6	-	0.438	-	0.732	-	0.613	38°	XP3225
52302006		PXSM0625AC16-06R030	-	0.625	-	0.030	6	-	0.438	-	0.732	-	0.613	38°	XP3225
52302007		PXSM0625AC16-06R060	-	0.625	-	0.060	6	-	0.438	-	0.732	-	0.613	38°	XP3225
52302008		PXSM0625AC16-06R090	-	0.625	-	0.090	6	-	0.438	-	0.732	-	0.613	38°	XP3225
52302009		PXSM0625AC16-06R120	-	0.625	-	0.120	6	-	0.438	-	0.732	-	0.613	38°	XP3225
52302010		PXSM0625AC16-08R000	-	0.625	-	0.000	8	-	0.438	-	0.732	-	0.613	42°	XP3225
52302011		PXSM0625AC16-08R030	-	0.625	-	0.030	8	-	0.438	-	0.732	-	0.613	42°	XP3225
52302012		PXSM0625AC16-08R060	-	0.625	-	0.060	8	-	0.438	-	0.732	-	0.613	42°	XP3225
52302013		PXSM0625AC16-08R090	-	0.625	-	0.090	8	-	0.438	-	0.732	-	0.613	42°	XP3225
52302014		PXSM0625AC16-08R120	-	0.625	-	0.120	8	-	0.438	-	0.732	-	0.613	42°	XP3225
52302015		PXSM0750AC20-10R000	-	0.750	-	0.000	10	-	0.525	-	0.807	-	0.736	42°	XP3225
52302016		PXSM0750AC20-10R030	-	0.750	-	0.030	10	-	0.525	-	0.807	-	0.736	42°	XP3225
52302017		PXSM0750AC20-10R060	-	0.750	-	0.060	10	-	0.525	-	0.807	-	0.736	42°	XP3225
52302018		PXSM0750AC20-10R090	-	0.750	-	0.090	10	-	0.525	-	0.807	-	0.736	42°	XP3225
52302019		PXSM0750AC20-10R120	-	0.750	-	0.120	10	-	0.525	-	0.807	-	0.736	42°	XP3225
52302020		PXSM1000AC25-10R000	-	1.000	-	0.000	10	-	0.700	-	1.098	-	0.960	42°	XP3225
52302021		PXSM1000AC25-10R030	-	1.000	-	0.030	10	-	0.700	-	1.098	-	0.960	42°	XP3225
52302022		PXSM1000AC25-10R060	-	1.000	-	0.060	10	-	0.700	-	1.098	-	0.960	42°	XP3225
52302023		PXSM1000AC25-10R090	-	1.000	-	0.090	10	-	0.700	-	1.098	-	0.960	42°	XP3225
52302024		PXSM1000AC25-10R120	-	1.000	-	0.120	10	-	0.700	-	1.098	-	0.960	42°	XP3225
7830104	PXSM	PXSM120C12-06R000	12	-	0	-	6	8.4	-	14.4	-	11.7	-	38°	XP3225
7830105		PXSM120C12-06R005	12	-	0.5	-	6	8.4	-	14.4	-	11.7	-	38°	XP3225
7830106		PXSM120C12-06R010	12	-	1.0	-	6	8.4	-	14.4	-	11.7	-	38°	XP3225
7830107		PXSM120C12-06R020	12	-	2.0	-	6	8.4	-	14.4	-	11.7	-	38°	XP3225
7830108		PXSM120C12-06R030	12	-	3.0	-	6	8.4	-	14.4	-	11.7	-	38°	XP3225
7830109		PXSM160C16-06R000	16	-	0	-	6	11.2	-	18.7	-	15.7	-	38°	XP3225
7830110		PXSM160C16-06R005	16	-	0.5	-	6	11.2	-	18.7	-	15.7	-	38°	XP3225
7830111		PXSM160C16-06R010	16	-	1.0	-	6	11.2	-	18.7	-	15.7	-	38°	XP3225
7830112		PXSM160C16-06R015	16	-	1.5	-	6	11.2	-	18.7	-	15.7	-	38°	XP3225
7830113		PXSM160C16-06R020	16	-	2.0	-	6	11.2	-	18.7	-	15.7	-	38°	XP3225
7830114		PXSM160C16-06R030	16	-	3.0	-	6	11.2	-	18.7	-	15.7	-	38°	XP3225
7830115		PXSM160C16-08R000	16	-	0	-	8	11.2	-	18.7	-	15.7	-	42°	XP3225
7830116		PXSM160C16-08R005	16	-	0.5	-	8	11.2	-	18.7	-	15.7	-	42°	XP3225
7830117		PXSM160C16-08R010	16	-	1.0	-	8	11.2	-	18.7	-	15.7	-	42°	XP3225
7830118		PXSM160C16-08R015	16	-	1.5	-	8	11.2	-	18.7	-	15.7	-	42°	XP3225
7830119		PXSM160C16-08R020	16	-	2.0	-	8	11.2	-	18.7	-	15.7	-	42°	XP3225
7830120		PXSM160C16-08R030	16	-	3.0	-	8	11.2	-	18.7	-	15.7	-	42°	XP3225
7830121		PXSM200C20-10R000	20	-	0	-	10	14.0	-	21.5	-	19.6	-	42°	XP3225
7830122		PXSM200C20-10R005	20	-	0.5	-	10	14.0	-	21.5	-	19.6	-	42°	XP3225
7830123		PXSM200C20-10R010	20	-	1.0	-	10	14.0	-	21.5	-	19.6	-	42°	XP3225
7830124		PXSM200C20-10R020	20	-	2.0	-	10	14.0	-	21.5	-	19.6	-	42°	XP3225
7830125		PXSM200C20-10R030	20	-	3.0	-	10	14.0	-	21.5	-	19.6	-	42°	XP3225
7830126		PXSM250C25-10R000	25	-	0	-	10	17.5	-	27.5	-	24.0	-	42°	XP3225
7830127		PXSM250C25-10R010	25	-	1.0	-	10	17.5	-	27.5	-	24.0	-	42°	XP3225
7830128		PXSM250C25-10R020	25	-	2.0	-	10	17.5	-	27.5	-	24.0	-	42°	XP3225
7830129		PXSM250C25-10R030	25	-	3.0	-	10	17.5	-	27.5	-	24.0	-	42°	XP3225

Packed: 1 pc.

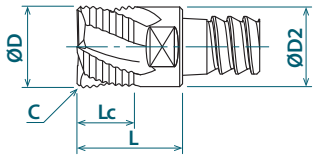
PXI

List 78PXNL

PXNL Exchangeable Heads (inch & metric) - 4 Flute, Roughing, Low Helix

SPEED FEED P212

Accessories: p209



EDP No.	Type	Designation	Head Dia. D		Corner Chamfer C		Length of Cut Lc		Overall Length L		Flange Dia. D2		Helix Angle	Grade
			(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		
52303000	PXNL	PXNL0500AC12-04C020	-	0.500	-	0.020	-	0.350	-	0.598	-	0.488	19° / 21°	XP3225
52303001		PXNL0625AC16-04C025	-	0.625	-	0.025	-	0.438	-	0.732	-	0.613	19° / 21°	XP3225
52303002		PXNL0750AC20-04C025	-	0.750	-	0.025	-	0.525	-	0.807	-	0.736	19° / 21°	XP3225
52303003		PXNL1000AC25-04C025	-	1.000	-	0.025	-	0.700	-	1.098	-	0.960	19° / 21°	XP3225
7830401		PXNL120C12-04C005	12	-	0.5	-	8.4	-	14.4	-	11.7	-	19° / 21°	XP3225
7830402		PXNL160C16-04C006	16	-	0.6	-	11.2	-	18.7	-	15.7	-	19° / 21°	XP3225
7830403		PXNL200C20-04C006	20	-	0.6	-	14.0	-	21.5	-	19.6	-	19° / 21°	XP3225
7830404		PXNL250C25-04C006	25	-	0.6	-	17.5	-	27.5	-	24.0	-	19° / 21°	XP3225

Packed: 1 pc.

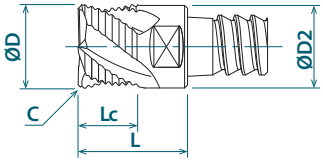
PXI

List 78PXNH

PXNH Exchangeable Heads (inch & metric) - 4 Flute, Roughing, High Helix

SPEED FEED P212

Accessories: p209

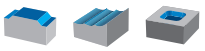


EDP No.	Type	Designation	Head Dia. D		Corner Chamfer C		Length of Cut Lc		Overall Length L		Flange Dia. D2		Helix Angle	Grade
			(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		
52304000	PXNH	PXNH0500AC12-04C020	-	0.500	-	0.020	-	0.350	-	0.598	-	0.488	40° / 42°	XP3225
52304001		PXNH0625AC16-04C025	-	0.625	-	0.025	-	0.438	-	0.732	-	0.613	40° / 42°	XP3225
52304002		PXNH0750AC20-04C025	-	0.750	-	0.025	-	0.525	-	0.807	-	0.736	40° / 42°	XP3225
52304003		PXNH1000AC25-04C025	-	1.000	-	0.025	-	0.700	-	1.098	-	0.960	40° / 42°	XP3225
7830451		PXNH120C12-04C005	12	-	0.5	-	8.4	-	14.4	-	11.7	-	40° / 42°	XP3225
7830452		PXNH160C16-04C006	16	-	0.6	-	11.2	-	18.7	-	15.7	-	40° / 42°	XP3225
7830453		PXNH200C20-04C006	20	-	0.6	-	14.0	-	21.5	-	19.6	-	40° / 42°	XP3225
7830454		PXNH250C25-04C006	25	-	0.6	-	17.5	-	27.5	-	24.0	-	40° / 42°	XP3225

Packed: 1 pc.

PXI

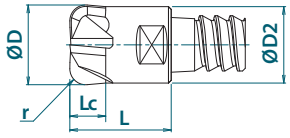
List 78PXRE



SPEED FEED P213

Accessories: p213

PXRE Exchangeable Heads (inch & metric) - Multiple Flute, Straight Flute, Corner Radius



EDP No.	Type	Designation	Head Dia. D		Corner Radius r		No. of Flutes	Length of Cut Lc		Overall Length L		Flange Dia. D2		Helix Angle	Grade
			(mm)	(inch)	(mm)	(inch)		(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		
52305000	PXRE	PXRE0500AC12-04R090	-	0.500	-	0.090	4	-	0.197	-	0.598	-	0.488	-	XP6305
52305001		PXRE0625AC16-06R120	-	0.625	-	0.120	6	-	0.276	-	0.732	-	0.613	-	XP6305
52305002		PXRE0750AC20-06R120	-	0.750	-	0.120	6	-	0.394	-	0.807	-	0.736	-	XP6305
7830201		PXRE120C12-04R020	12	-	2	-	4	5	-	14.4	-	11.7	-	-	XP6305
7830202		PXRE160C16-06R030	16	-	3	-	6	7	-	18.7	-	15.7	-	-	XP6305
7830203		PXRE200C20-06R030	20	-	3	-	6	10	-	21.5	-	19.6	-	-	XP6305

Packed: 1 pc.

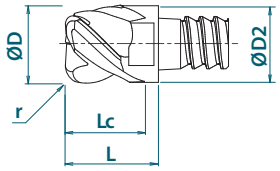
PXI

List 78PXDR

SPEED FEED P213

Accessories: p209

PXDR-P Exchangeable Heads (inch & metric) - 3 Flute, Helical Flute, Corner Radius



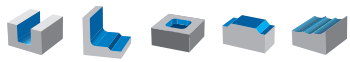
EDP No.	Type	Designation	Head Dia. D		Corner Radius r		Length of Cut Lc		Overall Length L		Flange Dia. D2		Helix Angle	Grade
			(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		
52309000	PXDR-P	PXDR0500AC12-03R060-P	-	0.500	-	0.060	-	0.35	-	0.598	-	0.488	45°	XP3225
52309001		PXDR0500AC12-03R090-P	-	0.500	-	0.090	-	0.35	-	0.598	-	0.488	45°	XP3225
52309002		PXDR0625AC16-03R090-P	-	0.625	-	0.090	-	0.438	-	0.732	-	0.614	45°	XP3225
52309003		PXDR0625AC16-03R120-P	-	0.625	-	0.120	-	0.438	-	0.732	-	0.614	45°	XP3225
52309004		PXDR0750AC20-03R090-P	-	0.750	-	0.090	-	0.525	-	0.807	-	0.736	45°	XP3225
52309005		PXDR0750AC20-03R120-P	-	0.750	-	0.120	-	0.525	-	0.807	-	0.736	45°	XP3225
7830351		PXDR120C12-03R015-P	12	-	1.5	-	8.4	-	14.4	-	11.7	-	45°	XP3225
7830352		PXDR120C12-03R020-P	12	-	2.0	-	8.4	-	14.4	-	11.7	-	45°	XP3225
7830353		PXDR160C16-03R020-P	16	-	2.0	-	11.2	-	18.7	-	15.7	-	45°	XP3225
7830354		PXDR160C16-03R030-P	16	-	3.0	-	11.2	-	18.7	-	15.7	-	45°	XP3225
7830355		PXDR200C20-03R020-P	20	-	2.0	-	14.0	-	21.5	-	19.6	-	45°	XP3225
7830356		PXDR200C20-03R030-P	20	-	3.0	-	14.0	-	21.5	-	19.6	-	45°	XP3225

Packed: 1 pc.

PXI

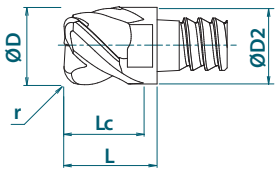
List 78PXDR

PXDR-N Exchangeable Heads (inch & metric) - 3 Flute, Helical Flute, Corner Radius



SPEED FEED P213

Accessories: p209



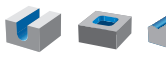
EDP No.	Type	Designation	Head Dia. D		Corner Radius r		Length of Cut Lc		Overall Length L		Flange Dia. D2		Helix Angle	Grade
			(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		
52310000	PXDR-N	PXDR0500AC12-03R060-N	-	0.500	-	0.060	-	0.35	-	0.598	-	0.488	45°	XP6305
52310001		PXDR0500AC12-03R090-N	-	0.500	-	0.090	-	0.35	-	0.598	-	0.488	45°	XP6305
52310002		PXDR0625AC16-03R090-N	-	0.625	-	0.090	-	0.438	-	0.732	-	0.614	45°	XP6305
52310003		PXDR0625AC16-03R120-N	-	0.625	-	0.120	-	0.438	-	0.732	-	0.614	45°	XP6305
52310004		PXDR0750AC20-03R090-N	-	0.750	-	0.090	-	0.525	-	0.807	-	0.736	45°	XP6305
52310005		PXDR0750AC20-03R120-N	-	0.750	-	0.120	-	0.525	-	0.807	-	0.736	45°	XP6305
7830371		PXDR120C12-03R015-N	12	-	1.5	-	8.4	-	14.4	-	11.7	-	45°	XP6305
7830372		PXDR120C12-03R020-N	12	-	2.0	-	8.4	-	14.4	-	11.7	-	45°	XP6305
7830373		PXDR160C16-03R020-N	16	-	2.0	-	11.2	-	18.7	-	15.7	-	45°	XP6305
7830374		PXDR160C16-03R030-N	16	-	3.0	-	11.2	-	18.7	-	15.7	-	45°	XP6305
7830375		PXDR200C20-03R020-N	20	-	2.0	-	14.0	-	21.5	-	19.6	-	45°	XP6305
7830376		PXDR200C20-03R030-N	20	-	30	-	14.0	-	21.5	-	19.6	-	45°	XP6305

Packed: 1 pc.

PXI

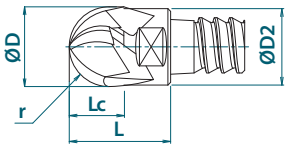
List 78PXBE

PXBE-P Exchangeable Heads (inch & metric) - 3 Flute, Ball End



SPEED FEED P214

Accessories: p209



EDP No.	Type	Designation	Head Dia. D		Head Radius r		Length of Cut Lc		Overall Length L		Flange Dia. D2		Helix Angle	Grade
			(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		
52311000	PXBE-P	PXBE0500AC12-03R250-P	-	0.500	-	0.250	-	0.350	-	0.598	-	0.488	45°	XP3320
52311001		PXBE0625AC16-03R313-P	-	0.625	-	0.3125	-	0.438	-	0.732	-	0.614	45°	XP3320
52311002		PXBE0750AC20-03R375-P	-	0.750	-	0.375	-	0.525	-	0.807	-	0.736	45°	XP3320
7830271		PXBE120C12-03R060-P	12	-	6	-	8.4	-	14.4	-	11.7	-	45°	XP3320
7830272		PXBE160C16-03R080-P	16	-	8	-	11.2	-	18.7	-	15.7	-	45°	XP3320
7830273		PXBE200C20-03R100-P	20	-	10	-	14.0	-	21.5	-	19.6	-	45°	XP3320

Packed: 1 pc.

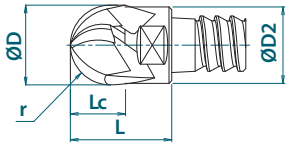
PXI

List 78PXBE

SPEED FEED P214

Accessories: p209

PXBE-N Exchangeable Heads (inch & metric) - 3 Flute, Ball End



EDP No.	Type	Designation	Head Dia. D (mm)	Head Dia. D (inch)	Head Radius R (mm)	Head Radius R (inch)	Length of Cut Lc (mm)	Length of Cut Lc (inch)	Overall Length L (mm)	Overall Length L (inch)	Flange Dia. D2 (mm)	Flange Dia. D2 (inch)	Helix Angle	Grade
52306000	PXBE-N	PXBE0500AC12-03R250-N	-	0.500	-	0.500	-	0.350	-	0.598	-	0.488	45°	XP3320
52306001		PXBE0625AC16-03R313-N	-	0.625	-	0.3125	-	0.438	-	0.732	-	0.613	45°	XP3320
52306002		PXBE0750AC20-03R375-N	-	0.750	-	0.375	-	0.525	-	0.807	-	0.736	45°	XP3320
7830251		PXBE120C12-03R060-N	12	-	6	-	8.4	-	14.4	-	11.7	-	45°	XP3320
7830252		PXBE160C16-03R080-N	16	-	8	-	11.2	-	18.7	-	15.7	-	45°	XP3320
7830253		PXBE200C20-03R100-N	20	-	10	-	14.0	-	21.5	-	19.6	-	45°	XP3320

Packed: 1 pc.

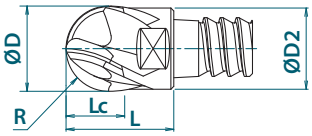
PXI

List 78PXBM

SPEED FEED P214

Accessories: p209

PXBM Exchangeable Heads (inch & metric) - Multiple Flute, Ball End



EDP No.	Type	Designation	Head Dia. D (mm)	Head Dia. D (inch)	Head Radius R (mm)	Head Radius R (inch)	No. of Flutes	Length of Cut Lc (mm)	Length of Cut Lc (inch)	Overall Length L (mm)	Overall Length L (inch)	Flange Dia. D2 (mm)	Flange Dia. D2 (inch)	Helix Angle	Grade
52307000	PXBM	PXBM0500AC12-04R250	-	0.500	-	0.250	4	-	0.350	-	0.598	-	0.488	45°	XP3320
52307001		PXBM0625AC16-06R313	-	0.625	-	0.3125	6	-	0.438	-	0.732	-	0.613	45°	XP3320
52307002		PXBM0750AC20-06R375	-	0.750	-	0.375	6	-	0.525	-	0.807	-	0.736	45°	XP3320
7830301		PXBM120C12-04R060	12	-	6	-	4	8.4	-	14.4	-	11.7	-	45°	XP3320
7830302		PXBM160C16-06R080	16	-	8	-	6	11.2	-	18.7	-	15.7	-	45°	XP3320
7830303		PXBM200C20-06R100	20	-	10	-	6	14.0	-	21.5	-	19.6	-	45°	XP3320

Packed: 1 pc.

PXI

List 52300

PXM SA/TPA (inch)

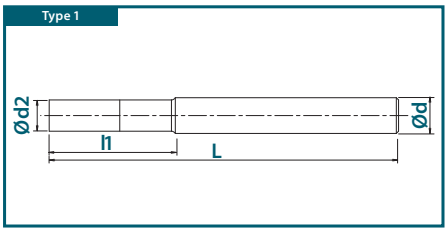
Straight Shank

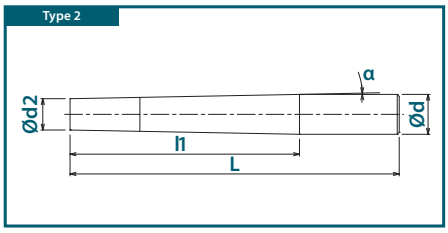
Tapered Shank

EDP No.	Body Type	Designation	Type	Neck Dia. (inch)	Shank Dia. (inch)	Taper	Overall Length (inch)	Neck Length (inch)	Applicable Head (Inch)
				d2	d	α°	L	l1	
52300000	Cylindrical Shank Steel	PXMZ-C12SA0500-S400	1	0.488	0.500	-	4.000	0.750	0.500
52300001		PXMZ-C12TPA0750-S600	2	0.488	0.750	5°	6.000	1.500	
52300002		PXMZ-C16SA0625-S400	1	0.613	0.625	-	4.000	1.000	0.625
52300003		PXMZ-C16TPA1000-S650	2	0.613	1.000	5°	6.500	2.200	
52300004		PXMZ-C20SA0750-S500	1	0.736	0.750	-	5.000	1.250	0.750
52300005		PXMZ-C20TPA1250-S700	2	0.736	1.250	5°	7.000	2.900	
52300006		PXMZ-C25SA1000-S550	1	0.960	1.000	-	5.500	1.500	1.000
52300007	Cylindrical Shank Carbide	PXMZ-C12SA0500-S300CS	1	0.488	0.500	-	3.000	1.000	0.500
52300008		PXMZ-C12SA0500-L400CS	1	0.488	0.500	-	4.000	1.750	
52300009		PXMZ-C12SA0500-L450CS	1	0.488	0.500	-	4.500	2.500	
52300010		PXMZ-C12TPA0625-LL550CS	2	0.488	0.625	1.2°	5.500	3.250	
52300011		PXMZ-C16SA0625-S350CS	1	0.613	0.625	-	3.500	1.500	0.625
52300012		PXMZ-C16SA0625-L550CS	1	0.613	0.625	-	5.500	2.500	
52300013		PXMZ-C16SA0625-L600CS	1	0.613	0.625	-	6.000	3.250	
52300014		PXMZ-C16TPA0750-LL650CS	2	0.613	0.750	1°	6.500	4.500	
52300015		PXMZ-C20SA0750-S350CS	1	0.736	0.750	-	3.500	1.500	0.750
52300016		PXMZ-C20SA0750-L600CS	1	0.736	0.750	-	6.000	3.000	
52300017		PXMZ-C20SA0750-L700CS	1	0.736	0.750	-	7.000	4.250	
52300018		PXMZ-C20TPA1000-LL800CS	2	0.736	1.000	1.5°	8.000	5.500	
52300019		PXMZ-C25SA1000-L800CS	1	0.960	1.000	-	8.000	3.750	1.000

Packed: 1 pc.
Note: Wrench included with body.

PXT





List 78018

PXM SS/TP (Metric)

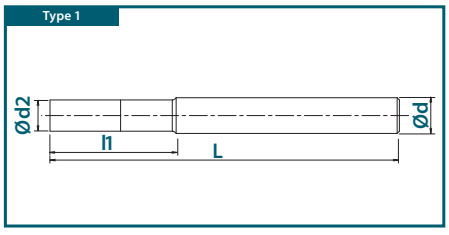
Straight Shank

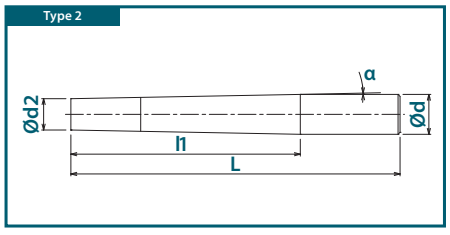
Tapered Shank

EDP No.	Body Type	Designation	Type	Neck Dia. (mm)	Shank Dia. (mm)	Taper	Overall Length (mm)	Neck Length (mm)	Applicable Head (mm)
				d2	d	α°	L	l1	
48174001	Cylindrical Shank Steel	PXMZ-C12SS12-S100	1	11.7	12	-	100	19.0	12
48174002		PXMZ-C12TP20-S145	2	11.7	20	5°	145	47.4	
48174003		PXMZ-C16SS16-S100	1	15.7	16	-	100	23.4	16
48174004		PXMZ-C16TP25-S155	2	15.7	25	5°	155	53.1	
48174005		PXMZ-C20SS20-S120	1	19.6	20	-	120	28.8	20
48174006		PXMZ-C20TP32-S170	2	19.6	32	5°	170	70.8	
48174007		PXMZ-C25SS25-S140	1	24.0	25	-	140	36.0	25
48174008	Cylindrical Shank Carbide	PXMZ-C12SS12-S075CS	1	11.7	12	-	75	25.0	12
48174009		PXMZ-C12SS12-L100CS	1	11.7	12	-	100	46.3	
48174010		PXMZ-C12SS12-L115CS	1	11.7	12	-	115	65.0	
48174011		PXMZ-C12TP16-LL135CS	2	11.7	16	1.5°	135	85.0	
48174012		PXMZ-C16SS16-S090CS	1	15.7	16	-	90	40.0	16
48174013		PXMZ-C16SS16-L130CS	1	15.7	16	-	130	62.0	
48174014		PXMZ-C16SS16-L135CS	1	15.7	16	-	135	85.0	
48174015		PXMZ-C16TP20-LL165CS	2	15.7	20	1.5°	165	115.0	
48174016		PXMZ-C20SS20-S090CS	1	19.6	20	-	90	40.0	20
48174017		PXMZ-C20SS20-L150CS	1	19.6	20	-	150	79.3	
48174018		PXMZ-C20SS20-L180CS	1	19.6	20	-	180	110.0	
48174019		PXMZ-C20TP25-LL200CS	2	19.6	25	1.5°	200	140.0	
48174020		PXMZ-C25SS25-L200CS	1	24.0	25	-	200	98.0	25

Packed: 1 pc.
Note: Wrench included with body.

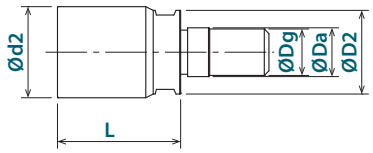
PXT





List 52300

PXM SF Joint (Inch)



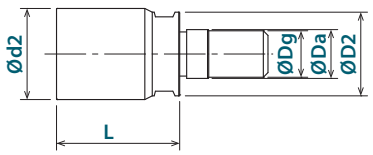
EDP No.	Body Type	Designation	Neck Dia. (Inch)	Pilot Dia. (Inch)	Thread Dia. (mm)	Flange Dia. (Inch)	Overall Length (Inch)	Spanner Wrench	Applicable Head (inch)
			d2	Da	Dg	D2	L		
52300020	PXMJ (Joint)	PXMJ-AC12SF06	0.488	0.256	M6	0.433	0.709	PXMP8-10	0.500
52300021		PXMJ-AC16SF08	0.613	0.335	M8	0.571	0.858	PXMP13-16	0.625
52300022		PXMJ-AC20SF10	0.736	0.413	M10	0.707	1.043	PXMP13-16	0.750
52300023		PXMJ-AC25SF12	0.960	0.492	M12	0.905	1.338	PXMP21	1.000

Packed: 1 pc.
Note: Wrench included with body.
Note: PXM heads can be mounted to PHOENIX® SF Arbors by attaching the PXM SF Joint.

PXT

List 78018

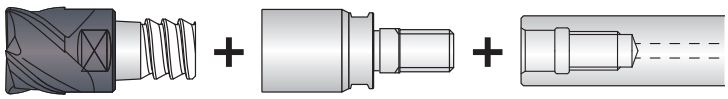
PXM SF Joint (Metric)



EDP No.	Body Type	Designation	Neck Dia. (mm)	Pilot Dia. (mm)	Thread Dia. (mm)	Flange Dia. (mm)	Overall Length (mm)	Spanner Wrench	Applicable Head
			d2	Da	Dg	D2	L		
7801893	PXMJ (Joint)	PXMJ-C12SF06	11.7	6.5	M6	11.0	18.0	PXMP8-10	12
7801894		PXMJ-C16SF08	15.7	8.5	M8	14.5	21.8	PXMP13-16	16
7801895		PXMJ-C20SF10	19.6	10.5	M10	18.0	26.5	PXMP13-16	20
7801896		PXMJ-C25SF12	24.0	12.5	M12	23.0	34.0	PXMP21	25

Packed: 1 pc.
Note: Wrench included with body.
Note: PXM heads can be mounted to PHOENIX® SF Arbors by attaching the PXM SF Joint.

PXT

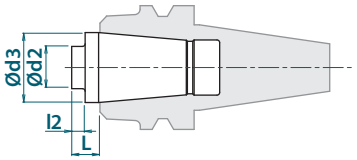


PXM Head **PXM SF Joint** **SF Arbor SS**

List 78340

NEW

PXMC (Metric)



EDP No.	Body Type	Designation	Neck Dia. (mm)	Body Dia. (mm)	Projection Length (mm)	Neck Length (mm)	Applicable Head (mm)
			d2	d3	L	l2	
7834001	Extra-Short	PXMC-C1205	11.7	26	10.5	5	12
7834002		PXMC-C1605	15.7	26	10.5	5	16
7834003		PXMC-C2005	19.6	26	10.5	5	20
7834004		PXMC-C2505	24	26	10.5	5	25
7834011	Short	PXMC-C1230	11.7	26	35.5	30	12
7834012		PXMC-C1630	15.7	26	35.5	30	16
7834013		PXMC-C2030	19.6	26	35.5	30	20
7834014		PXMC-C2530	24	26	35.5	30	25

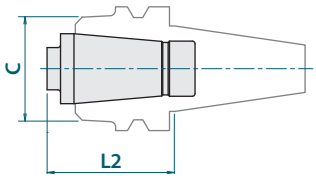
Packed: 1 pc.
Note: The PXMC collet is compatible with the HYPRO Shrink Collet System.
Note: Wrench sold seperately.

PXT

HY-PRO® Shrink

NEW

2 Piece Base Holders



EDP No.	Body Type	Designation	Nose Diameter (mm)	Gage Length (mm)	
			C	L2	
				Extra-Short	Short
9910002	CAT40	CT40-SLK12-45	40.9	45.5	70.5
8910000	BT30	BT30-SLK12-35 - 45 Deg.	38	45.5	70.5
8910001		BT30-SLK12-35 - 60 Deg.	38	45.5	70.5
8910002	BT40	BT40-SLK12-45	38	55.5	80.5
8910003		BT40-SLK12-75	38	85.5	110.5
9910005	HSK-E50	HSK-E50-SLK12-75	38	85.5	110.5
8910005	HSK-A63	HSK-A63-SLK12-75	38	85.5	110.5
8910006		HSK-A63-SLK12-135	38	145.5	170.5

Packed: 1 pc.
Note: For more information, see p1169 of OSG's 2017/18 Cutting Tool Solutions Product Catalog.

List 7808H

PXM Accessories

Appearance	EDP No.	Designation	Applicable Head		Recommended Tightening
			(inch)	(mm)	
 Spanner Wrench	7801890	PXMP8-10	0.500	12	12.0 Nm
	7801891	PXMP13-16	0.625	16	30.0 Nm
			0.750	20	50.0 Nm
	7801892	PXMP21	1.000	25	60.0 Nm

Packed: Wrench = 1 pc.

PXT

Cutting Conditions (PXSE)

Side milling

Hardness			Up to 30 HRC		30-45 HRC		45-55 HRC			
Work Material		Mild Steels Carbon Steels Cast Iron		Alloy Steels Tool Steels		Stainless Steels Hardened Steels		Hardened Steels Titanium Alloys	Heat Resistant Alloys Inconel	
Depth of Cut		Aa=0.5Dc • Ar=0.15Dc				Aa=0.5Dc • Ar=0.1Dc		Aa=0.5Dc • Ar=0.05Dc		
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	3180	29.92	2650	25.20	1700	15.75	1700	13.78	650	3.94
1/2	-	3010	28.29	2450	23.28	1590	14.95	1590	12.72	620	3.78
5/8	-	2410	22.65	1955	18.57	1270	11.94	1270	10.16	495	3.07
-	16	2390	22.44	1950	18.50	1250	11.81	1250	9.84	500	3.15
3/4	-	2000	18.80	1630	15.49	1060	10.39	1060	8.48	410	2.62
-	20	1910	18.11	1550	14.57	1000	9.84	1000	7.87	400	2.56
-	25	1530	14.57	1240	11.81	800	7.87	800	6.30	320	1.97
1	-	1500	14.10	1225	11.64	790	7.74	790	6.25	310	1.89

1. Cutting conditions shown above are for side milling with L/D ≤ 3.5xD.
2. Adjust/reduce the cutting conditions when the overhang length is longer than 3.5xD.

Slotting

Hardness			Up to 30 HRC		30-45 HRC		45-55 HRC			
Work Material		Mild Steels Carbon Steels Cast Iron		Alloy Steels Tool Steels		Stainless Steels Hardened Steels		Hardened Steels Titanium Alloys	Heat Resistant Alloys Inconel	
Depth of Cut		Aa≤0.35Dc				Aa≤0.3Dc		Aa≤0.2Dc	Aa≤0.1Dc	
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	2500	19.69	1550	11.81	1300	9.84	1300	9.84	650	3.94
1/2	-	2350	18.49	1450	11.02	1240	9.42	1240	9.42	620	3.78
5/8	-	1875	14.76	1160	9.98	1010	7.88	1010	7.88	495	3.07
-	16	1850	13.78	1150	9.84	1000	7.87	1000	7.87	500	3.15
3/4	-	1565	12.32	990	8.22	790	6.64	790	6.64	410	2.62
-	20	1500	11.81	950	7.87	750	6.30	750	6.30	400	2.56
-	25	1200	9.45	760	6.30	600	5.12	600	5.12	320	1.97
1	-	1170	9.21	745	6.18	590	5.02	590	5.02	310	1.89

1. Cutting conditions shown above are for slotting with L/D ≤ 3.5xD.
2. Adjust/reduce the cutting conditions when the overhang length is longer than 3.5xD.

Cutting Conditions (PXVC)

Side milling

Hardness			Up to 30 HRC		30-45 HRC		45-55 HRC	
Work Material		Mild Steels Carbon Steels Cast Iron	Alloy Steels Tool Steels		Stainless Steels Hardened Steels		Hardened Steels Titanium Alloys	
Depth of Cut		Aa=0.5Dc • Ar=0.2Dc			Aa=0.5Dc • Ar=0.1Dc		Aa=0.5Dc • Ar=0.05Dc	
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	3980	37.80	3190	30.31	2660	25.20	2130	20.47
1/2	-	3780	35.83	3020	28.63	2520	23.90	2010	19.30
-	14	3420	32.68	2730	25.98	2280	21.65	1820	17.32
5/8	-	3025	28.67	2410	22.85	2015	19.10	1610	15.46
-	16	2990	28.35	2390	22.83	1990	18.90	1600	15.35
-	18	2660	25.20	2130	20.47	1770	16.93	1420	13.78
3/4	-	2520	23.90	2010	19.05	1680	15.93	1340	12.86
-	20	2390	22.83	1910	18.11	1600	15.35	1280	12.20
-	22	2180	20.87	1740	16.54	1450	13.78	1160	11.00
-	25	1910	18.11	1530	14.57	1280	12.20	1020	9.84
1	-	1890	17.92	1510	14.31	1260	11.95	1000	9.60

1. Cutting conditions shown above are for side milling with L/D ≤ 5xD.
2. For side milling with 5xD < L/D ≤ 6xD, reduce Speed and Feed by 10%.
3. For side milling with 6xD < L/D ≤ 7xD, reduce Speed & Feed by 20%.
4. For side milling with PXMC Extra-Short Collet, increase Speed by 30-40% and Feed by 40-80%.
5. For side milling with PXMC Short Collet, increase Speed by 10-20% and Feed by 20-30%.

Slotting

Hardness			Up to 30 HRC		30-45 HRC		45-55 HRC	
Work Material		Mild Steels Carbon Steels Cast Iron	Alloy Steels Tool Steels		Stainless Steels Hardened Steels		Hardened Steels Titanium Alloys	
Depth of Cut		Aa≤0.5Dc	Aa≤0.4Dc		Aa≤0.3Dc			
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	3980	31.50	3180	25.20	2650	20.87	1990	15.75
1/2	-	3760	29.61	3010	23.70	2505	19.72	1870	14.72
-	14	3410	26.77	2730	21.65	2270	17.72	1710	13.38
5/8	-	3010	23.70	2410	18.98	2005	15.79	1500	11.81
-	16	2980	23.62	2390	18.90	1990	15.75	1490	11.81
-	18	2650	20.87	2120	16.53	1770	13.78	1330	10.63
3/4	-	2505	19.72	2010	15.83	1670	13.15	1250	9.84
-	20	2390	18.90	1910	14.96	1590	12.60	1190	9.45
-	22	2170	16.93	1740	13.78	1450	11.42	1090	8.66
-	25	1910	14.96	1530	12.20	1270	9.84	950	7.48
1	-	1880	14.80	1505	11.85	1250	9.70	935	7.36

1. Cutting conditions shown above are for slotting with L/D ≤ 5xD.
2. For slotting with 5xD < L/D ≤ 6xD, reduce Speed and Feed by 20%.
3. For slotting with 6xD < L/D ≤ 7xD, reduce Speed & Feed by 35%.
4. For slotting with PXMC Extra-Short Collet, increase Speed by 10-20% and Feed by 10-50%.
5. For slotting with PXMC Short Collet, increase Speed by 15-30%.

Cutting Conditions (PXSM)

Side milling

Hardness			Up to 30 HRC		30-45 HRC		45-55 HRC			
Work Material		Mild Steels Carbon Steels Cast Iron		Alloy Steels Tool Steels		Stainless Steels Hardened Steels		Hardened Steels Titanium Alloys		Heat Resistant Alloys Inconel	
Depth of Cut		Aa≤0.5Dc • Ar≤0.05Dc				Aa≤0.5Dc • Ar≤0.02Dc		Aa≤0.3Dc • Ar≤0.02Dc			
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	4750	68.90	3950	45.28	3150	37.40	2650	31.50	1550	13.78
1/2	-	4485	65.03	3725	42.84	2980	35.16	2500	29.75	1450	12.91
5/8 (6F)	-	3590	52.06	2970	34.16	2385	28.38	1955	23.66	1160	10.32
5/8 (8F)	-	3590	69.65	2970	45.44	2385	37.92	1955	31.67	1160	13.92
-	16 (6F)	3550	51.57	2950	33.86	2350	27.95	1950	23.62	1150	10.24
-	16 (8F)	3550	68.90	2950	45.28	2350	37.40	1950	31.50	1150	13.78
3/4	-	2990	71.76	2475	47.52	1985	39.10	1630	33.09	995	14.43
-	20	2850	68.90	2350	45.28	1900	37.40	1550	31.50	950	13.78
-	25	2280	55.12	1880	36.22	1520	29.92	1240	25.20	760	11.02
1	-	2240	54.21	1855	35.80	1490	29.35	1220	24.77	745	10.80

1. Cutting conditions shown above are for side milling with L/D ≤ 3.5xD.
2. Adjust/reduce the cutting conditions when the overhang length is longer than 3.5xD.

Cutting Conditions (PXNL & PXNH)

Side milling

Work Material		Cast Iron		Carbon Steels		Alloy Steels		Hardened Steels Pre-hardened Steels		Stainless Steels	
Depth of Cut		Aa=0.5Dc • Ar=0.3Dc				Aa=0.5Dc • Ar=0.2Dc					
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	2390	23.62	3180	27.56	2650	17.32	2390	11.42	2120	9.06
1/2	-	2255	22.32	3000	26.10	2500	16.25	2255	10.82	2000	8.60
5/8	-	1800	24.48	2400	28.56	2000	17.80	1800	11.88	1600	9.44
-	16	1790	24.41	2390	28.35	1990	17.72	1790	11.81	1590	9.45
3/4	-	1500	27.30	2000	31.40	1670	19.87	1500	12.75	1335	10.28
-	20	1430	25.98	1910	29.92	1590	18.90	1430	12.20	1270	9.84
-	25	890	17.72	1270	22.05	1020	13.38	890	8.66	760	6.69
1	-	875	17.41	1250	21.75	1000	13.10	875	8.49	745	6.56

1. Cutting conditions shown above are for side milling with L/D ≤ 3.5xD.
2. Adjust/reduce the cutting conditions when the overhang length is longer than 3.5xD.
3. For side milling with PXMC Extra-Short Collet, increase Speed by 20-80% and Feed by 20-100%.
4. For side milling with PXMC Short Collet, increase Speed by 30-50% and Feed by 10-80%.

Slotting

Work Material		Cast Iron		Carbon Steels		Alloy Steels		Hardened Steels Pre-hardened Steels		Stainless Steels	
Depth of Cut		Aa=0.5Dc									
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	1860	11.81	2650	14.57	2120	8.66	1860	5.51	1590	4.33
1/2	-	1750	11.03	2505	13.78	2000	8.20	1750	5.08	1500	4.05
5/8	-	1400	12.74	2005	15.84	1600	9.44	1400	5.88	1200	4.80
-	16	1390	12.60	1990	15.75	1590	9.45	1390	5.91	1190	4.72
3/4	-	1165	14.91	1670	18.54	1335	11.21	1165	6.99	1000	5.40
-	20	1110	14.17	1590	17.72	1270	10.63	1110	6.69	950	5.12
-	25	760	11.02	1150	14.57	890	8.27	760	5.12	640	3.94
1	-	745	10.80	1130	14.35	875	8.14	745	4.99	630	3.84

1. Cutting conditions shown above are for slotting with L/D ≤ 3.5xD.
2. Adjust/reduce the cutting conditions when the overhang length is longer than 3.5xD.
4. For sloting with PXMC Extra-Short Collet, increase Speed by 20-80% and Feed by 50-250%.
5. For slotting with PXMC Short Collet, increase Speed by 20-50% and Feed by 30-200%.

Cutting Conditions (PXRE)

Contouring

Hardness				Up to 30 HRC		30-45 HRC		45-55 HRC		55-60 HRC	
Work Material		Mild Steels Carbon Steels Cast Iron		Alloy Steels Tool Steels		Hardened Steels Pre-hardened Steels		Hardened Steels		Hardened Steels	
Depth of Cut		Aa=0.1r • Ar=0.3Dc									
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	5800	417.32	4000	255.91	3200	192.91	2700	129.92	2300	86.61
1/2	-	5475	393.65	3780	241.92	3020	182.11	2535	121.93	2170	81.59
5/8	-	4035	472.50	3025	305.53	2415	233.77	2030	155.90	1735	108.44
-	16	4000	468.50	3000	303.15	2400	232.28	2000	153.54	1700	106.30
3/4	-	3360	394.80	2520	268.63	2010	204.02	1690	137.23	1445	89.45
-	20	3200	375.98	2400	255.91	1900	192.91	1600	129.92	1400	86.61

1. Cutting conditions shown above are for contouring with L/D ≤ 3.5xD.
2. Adjust/reduce the cutting conditions when the overhang length is longer than 3.5xD.

Cutting Conditions (PXDR-P)

Contouring

Hardness				Up to 30 HRC		30-45 HRC		45-55 HRC	
Work Material		Mild Steels Carbon Steels Cast Iron		Alloy Steels Tool Steels		Stainless Steels Hardened Steels		Hardened Steels	
Depth of Cut		Aa=0.05r • Ar=0.25Dc						Aa=0.03r • Ar=0.25Dc	
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	3980	117.32	3980	94.10	3980	70.47	3980	46.85
1/2	-	3780	111.60	3780	89.30	3780	66.97	3780	44.65
5/8	-	3025	89.32	3025	74.45	3025	53.59	3025	35.73
-	16	2980	88.19	2980	70.47	2980	52.75	2980	35.43
3/4	-	2520	74.40	2520	59.53	2520	44.65	2520	29.76
-	20	2390	70.47	2390	56.30	2390	42.12	2390	28.35

1. Cutting conditions shown above are for contouring with L/D ≤ 5xD.
2. Adjust/reduce the cutting conditions when the overhang length is longer than 5xD.

Cutting Conditions (PXDR-N)

Contouring

Hardness		Up to 30 HRC		30-45 HRC		45-55 HRC		55-60 HRC	
Work Material		Alloy Steels Tool Steels		Stainless Steels Hardened Steels		Hardened Steels		Hardened Steels	
Depth of Cut		Aa=0.03r • Ar=0.25Dc						Aa=0.02r • Ar=0.2Dc	
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	3980	117.32	3180	75.20	2650	37.40	2650	31.50
1/2	-	3780	111.60	3020	71.34	2520	34.72	2520	29.76
5/8	-	3025	89.32	2415	57.05	2015	28.56	2015	23.80
-	16	2980	88.19	2390	56.30	1990	28.35	1990	23.62
3/4	-	2520	74.40	2010	47.48	1680	23.15	1680	19.84
-	20	2390	70.47	1910	45.27	1590	22.44	1590	18.90

1. Cutting conditions shown above are for contouring with L/D ≤ 5xD.
2. Adjust/reduce the cutting conditions when the overhang length is longer than 5xD.

Cutting Conditions (PXBE-P)

Contouring

Hardness				Up to 30 HRC		30-45 HRC		45-55 HRC	
Work Material		Mild Steels Carbon Steels Cast Iron		Alloy Steels Tool Steels		Stainless Steels Hardened Steels		Hardened Steels Titanium Alloys	
Depth of Cut		Ø0.500: Aa=0.07Dc • Ar=0.15Dc ≥Ø0.625: Aa=0.10Dc • Ar=0.15Dc						Ø0.500: Aa=0.05Dc • Ar=0.1Dc ≥Ø0.625: Aa=0.03Dc • Ar=0.1Dc	
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	3980	70.47	3180	56.30	2650	46.85	2650	31.50
1/2	-	3780	66.97	3020	53.50	2520	44.65	2520	29.76
5/8	-	3025	53.60	2415	42.78	2015	35.70	2015	23.80
-	16	2980	52.75	2390	42.12	1990	35.43	1990	23.62
3/4	-	2520	44.65	2010	35.61	1680	29.76	1680	19.84
-	20	2390	42.12	1910	33.86	1590	28.35	1590	18.90

1. Cutting conditions shown above are for contouring with L/D ≤ 5xD.
2. Adjust/reduce the cutting conditions when the overhang length is longer than 5xD.

Cutting Conditions (PXBE-N)

Contouring

Hardness				Up to 30 HRC		30-45 HRC		45-55 HRC		55-60 HRC	
Work Material		Mild Steels Carbon Steels Cast Iron		Alloy Steels Tool Steels		Hardened Steels Pre-hardened Steels		Hardened Steels		Hardened Steels	
Depth of Cut		Ø0.500: Aa=0.07Dc • Ar=0.15Dc ≥Ø0.625: Aa=0.05Dc • Ar=0.15Dc						Ø0.500: Aa=0.05Dc • Ar=0.1Dc ≥Ø0.625: Aa=0.03Dc • Ar=0.1Dc		Aa=0.03Dc • Ar=0.05Dc	
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	6600	116.14	6600	116.14	5300	74.80	3950	45.27	2600	15.75
1/2	-	6235	109.74	6235	109.74	4970	70.08	3715	42.72	2230	13.38
5/8	-	4990	89.32	4990	89.32	3975	57.24	2970	35.64	1925	11.94
-	16	4950	88.58	4950	88.58	3950	57.09	2950	35.43	1900	11.81
3/4	-	4155	72.30	4155	72.30	3310	47.66	2475	31.19	1680	10.25
-	20	3950	68.90	3950	68.90	3150	45.27	2350	29.53	1600	9.84

1. Cutting conditions shown above are for contouring with L/D ≤ 3.5xD.
2. Adjust/reduce the cutting conditions when the overhang length is longer than 3.5xD.

Cutting Conditions (PXBM)

Contouring

Hardness				Up to 30 HRC		30-45 HRC		45-55 HRC		55-60 HRC	
Work Material		Mild Steels Carbon Steels Cast Iron		Alloy Steels Tool Steels		Hardened Steels Pre-hardened Steels		Hardened Steels		Hardened Steels	
Depth of Cut		Aa=0.02Dc • Ar=0.05Dc									
Mill Dia. (in)	Mill Dia. (mm)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)	Speed (RPM)	Feed (in/min)
-	12	6600	153.54	6600	153.54	5300	98.42	3950	59.05	2600	21.65
1/2	-	6235	145.28	6235	145.28	4970	92.44	3715	55.35	2230	18.51
5/8	-	4990	178.64	4990	178.64	3975	114.88	2970	71.28	1925	23.87
-	16	4950	177.16	4950	177.16	3950	114.17	2950	70.87	1900	23.62
3/4	-	4155	145.01	4155	145.01	3310	95.00	2475	62.12	1680	20.66
-	20	3950	137.79	3950	137.79	3150	90.55	2350	59.05	1600	19.68

1. Cutting conditions shown above are for contouring with L/D ≤ 3.5xD.
2. Adjust/reduce the cutting conditions when the overhang length is longer than 3.5xD.

PXM Head Selector

Roughing Operations

A guide for selecting head type based on application.

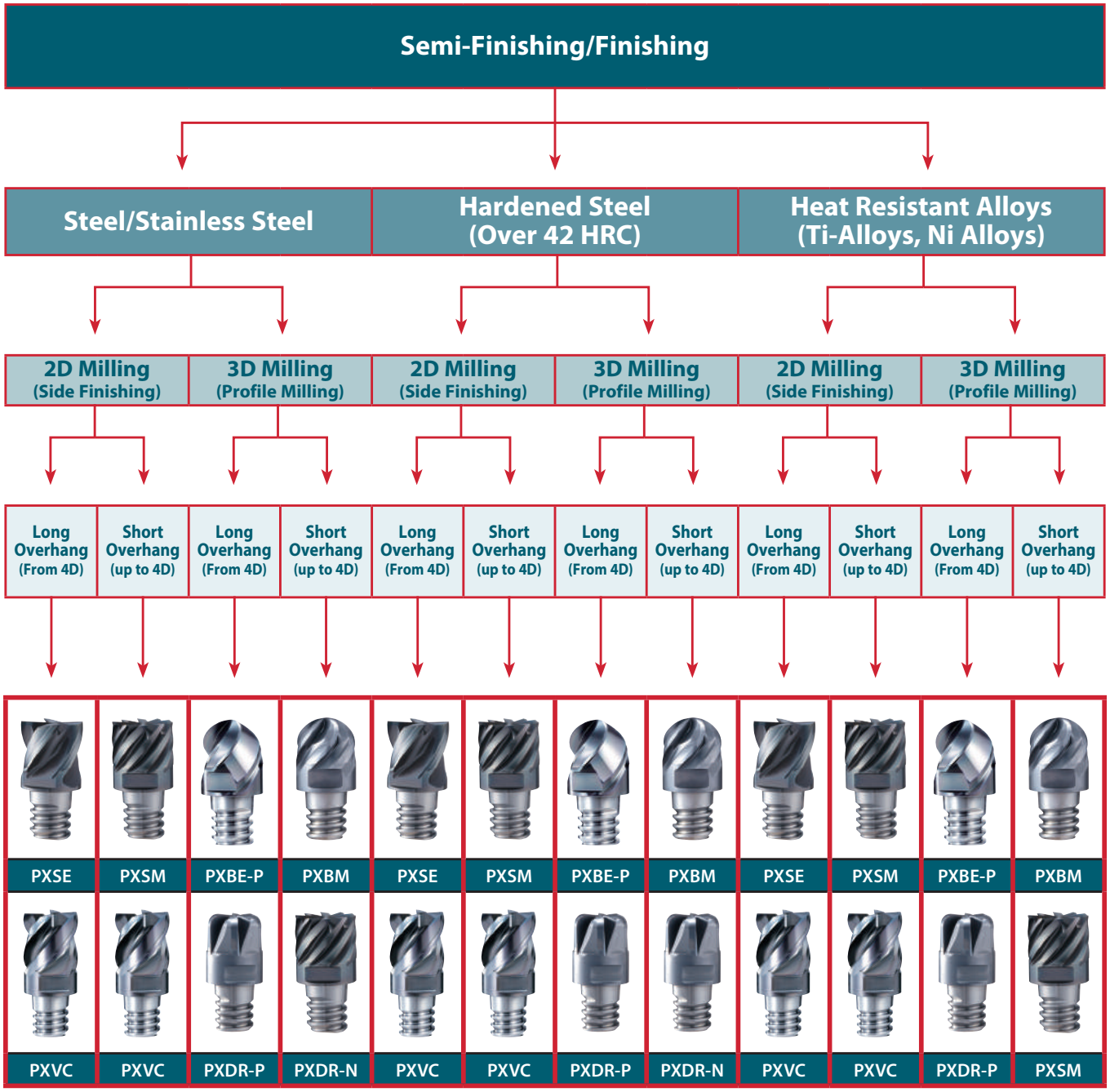
Roughing

Steel/Stainless Steel		Hardened Steel (Over 42 HRC)		Heat Resistant Alloys (Ti-Alloys, Ni Alloys)	
Large Ar (Face Milling)	Small Ar (Side Milling)	Large Ar (Face Milling)	Small Ar (Side Milling)	Large Ar (Face Milling)	Small Ar (Side Milling)
Long Overhang (From 4D)	Short Overhang (up to 4D)	Long Overhang (From 4D)	Short Overhang (up to 4D)	Long Overhang (From 4D)	Short Overhang (up to 4D)	Long Overhang (From 4D)	Short Overhang (up to 4D)	Long Overhang (From 4D)	Short Overhang (up to 4D)	Long Overhang (From 4D)	Short Overhang (up to 4D)
											
PXNL/H PXVC	PXSE	PXNL/H PXVC	PXSM	PXDR-P PXDR-N	PXRE	PXVC	PXSM	PXDR-P	PXRE	PXNL/H PXVC	PXNL/ PXNH
											
PXBE-P	PXBE-N	PXBE-P	PXBM	PXBE-P	PXBE-N	PXBE-P	PXBM	PXBE-P	PXBE-P	PXBE-P	PXBM

PXM Head Selector

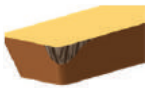
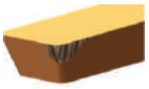
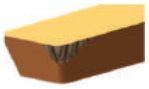
Semi-Finishing/Finishing Operations

A guide for selecting head type based on application.



OSG PHOENIX® Troubleshooting

Take note of the wear marks on your insert's edge and use the following guide to determine the best course of action for optimal results.

Issue	Cause	Solution
 Rapid Flank Wear / Poor Surface Finish	• Cutting speed (Vc) too high. • Poor wear resistance. • Feed/tooth (fz) too low.	• Reduce cutting speed (Vc). • Select a more wear-resistant grade. • Increase feed/tooth (fz).
 Excessive Flank Wear / Short Tool Life	• Vibration. • Re-cutting chips. • Heat generation.	• Increase Feed/tooth (fz). • Use down/climb milling. • Improve chip evacuation. • Check cutting conditions.
 Uneven Flank Wear / Corner Damage	• Tool run-out. • Vibration. • Radial cutting forces too high.	• Adjust run-out less than 0.0008". • Reduce tool overhang length. • Reduce Cutting Speed (Vc). • Reduce Feed/tooth (fz). • Reduce # of teeth in cut. • Reduce Axial DOC (Aa). • Check tool and workpiece clamping.
 Crater Wear / Weakened Edge	• Cutting temperature at rake face too high.	• Change coating. • Select an insert with positive geometry. • Reduce Cutting Speed (Vc). • Reduce Feed/tooth (fz).
 Plastic Deformation	• Cutting temperature too high. • Cutting forces too high.	• Select a more wear-resistant grade. • Reduce Cutting Speed (Vc). • Reduce Feed/tooth (fz).
 Notch Wear	• Work hardening materials. • Surface scale	• Reduce Cutting Speed (Vc). • Select a tougher grade. • Increase Cutting Speed (Vc).
 Chipping	• Chips deflecting against cutting edge.	• Select a tougher grade. • Select an insert with stronger geometry. • Increase Cutting Speed (Vc). • Reduce Feed at entry into cut.
 Frittering	• Insert grade too brittle. • Insert geometry too weak. • Built-up edge.	• Select a tougher grade. • Select an insert with stronger geometry. • Increase Cutting Speed (Vc). • Reduce Feed at entry into cut.
 Thermal Cracking	• Temperature fluctuation from interrupted machining. • Poor coolant supply.	• Select a tougher grade. • Select a more thermal resistant grade. • Increase coolant supply.
 Built-Up Edge (B.U.E.)	• Cutting temperature too low. • "Sticky" material. • Cutting Speed (Vc) too low. • Feed/tooth (fz) too low. • Insert geometry too negative. • Poor coolant supply.	• Increase Cutting Speed (Vc). • Increase Feed/tooth (fz). • Select an insert with positive geometry. • Increase coolant supply.

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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