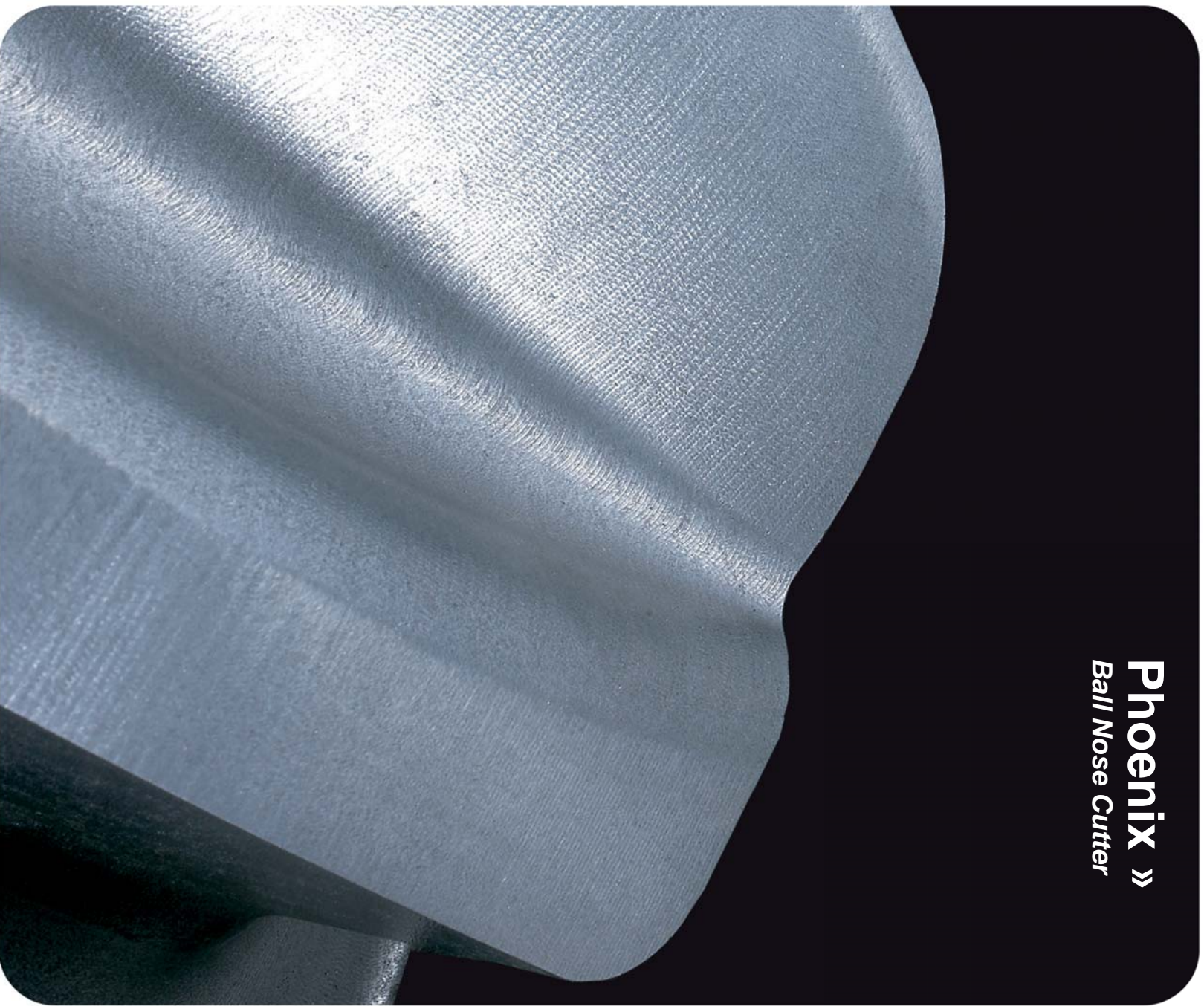




Phoenix Finish Ball Nose Cutter



Phoenix »
Ball Nose Cutter

Phoenix »

PFB

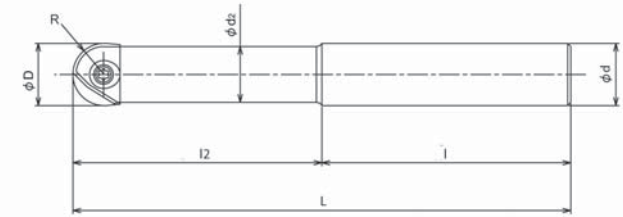
By applying the experiences of WXS in round-shank tools, OSG has engineered indexable ball nose cutter with longer tool life and higher accuracy



Phoenix

Phoenix Finishing Ball Nose Cutter PFB

P F B



Specification Chart

HSS Shanks

Unit:mm



EDP No.	Tool Specification	D	R	L			z	d	l	d2	Stock	Price
					l2	L/D						
7801400	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	64	4	2	16	76	14	●	
7801404	PFB-R200SS20-S160	20	10	160	80	4	2	20	80	18	●	
7801405	PFB-R250SS25-S160	25	12,5	160	75	3	2	25	85	22	●	
7801406	PFB-R300SS32-S170	30	15	170	90	3	2	32	80	27	●	

Carbide Shanks

Unit:mm

Unit:mm

EDP No.	Tool Specification	D	R	L			z	d	l	d2	Stock	Price
					l2	L/D						
7801420	PFB-R080SS08-LL140CS	8	4	140	56	7	2	8	84	7	●	
7801421	PFB-R100SS10-LL150CS	10	5	150	70	7	2	10	80	9	●	
7801422	PFB-R120SS12-LL160CS	12	6	160	84	7	2	12	76	11	●	
7801423	PFB-R160SS16-LL200CS	16	8	200	96	6	2	16	104	14	●	
7801424	PFB-R200SS20-LL240CS	20	10	240	120	6	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	●	

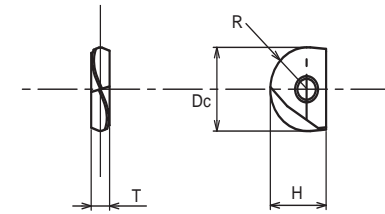
●=Standard stock item.

Please see our company homepage about the machining example.

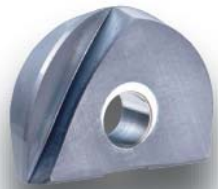
Phoenix

Phoenix Finishing Ball Nose Cutter
PFB

P F B



Applicable Insert



Unit:mm

Designation	Number of Cutting Edges	Insert Size				WXS Coated XP3320	Price
		Dc	R	T	H		
PFB080-SP	2	8	4	2,4	7	7820010	
PFB100-SP	2	10	5	2,6	8,5	7820011	
PFB120-SP	2	12	6	3	10	7820012	
PFB160-SP	2	16	8	4	12	7820013	
PFB200-SP	2	20	10	5	15	7820014	
PFB250-SP	2	25	12,5	6	18,5	7820015	
PFB300-SP	2	30	15	7	22,5	7820016	



Information

Recycled Plastic Cases are used in all OSG Phoenix packaging.
Let's reduce, re-use and re-cycle!

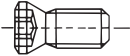


Phoenix


Phoenix Finishing Ball Nose Cutter PFB

P F B

Accessories

	EDP No.	Stock	Designation	Size	Recommended Torque
 <p>Clamping Screw</p>	7808123	●	FS25669RB	φ 8	1Nm
	7808117	●	FS30686RB	φ 10	1,2Nm
	7808118	●	FS35610RB	φ 12	2Nm
	7808119	●	FS40613RB	φ 16	3Nm
	7808120	●	FS50615RB	φ 20	5Nm
	7808121	●	FS60620RB	φ 25	5Nm
	7808122	●	FS80624RB	φ 30	6Nm

Unit:mm

	EDP No.	Stock	Designation	Size
 <p>Wrench</p>	7808204	●	T7-D	φ 8
	7808205	●	T8-D	φ 10
	7808207	●	T10-D	φ 12
	7808208	●	T15-D	φ 16
	7808209	●	T20-D	φ 20, φ 25
	7808212	●	T30-D	φ 30

●=Standard stock item.

Phoenix

Phoenix Finishing Ball Nose Cutter PFB

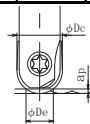
PFB

Recommended Conditions

Depth of Cut and Actual Cutting Diameter

(Unit : mm)

Dc	R	ap															
		(φDe)															
ap		0.1	0.2	0.3	0.4	0.5	0.8	1	1.5	2	2.5	3	3.5	4	4.5	5	
8	4	1.8	2.5	3	3.5	3.9	4.8										
10	5	2	2.8	3.4	3.9	4.4	5.4	6	7.1								
12	6	2.2	3.1	3.7	4.3	4.8	6	6.6	7.9	8.9							
16	8	2.5	3.6	4.3	5	5.6	7	7.7	9.3	10.6	11.6						
20	10	2.8	4	4.9	5.6	6.2	7.8	8.7	10.5	12	13.2	14.3	15.2				
25	12.5	3.2	4.5	5.4	6.3	7	8.8	9.8	11.9	13.6	15	16.2	17.3	18.3			
30	15	3.5	4.9	6	6.9	7.7	9.7	10.8	13.1	15	16.6	18	19.3	20.4	21.4	22.4	



$$De = 2 \sqrt{ap \times (Dc - ap)}$$

Recommended conditions

	Material	hardness	Vc (m/min)	ap (mm)	fz (mm/t)			
					Dc			
					φ 8	φ 10, 12	φ 16, 20	φ 25, 30
P	Mild Steels-Carbon Steels (SS400,S10C)	~180HB	300 (200~400)	0.02Dc	0.1	0.12	0.14	0.18
	Carbon Steels-Alloy Steels (S50C,SCM440)	~280HB	300 (200~400)	0.02Dc	0.07	0.1	0.12	0.14
	Die Steels (SKD11,SKD61)	~280HB	250 (150~350)	0.02Dc	0.07	0.1	0.12	0.14
M	Stainless Steels (SUS304, SUS420)	~250HB	250 (150~350)	0.02Dc	0.07	0.12	0.14	0.17
K	Cast Iron (FC250)	~300N/mm ²	400 (300~500)	0.02Dc	0.12	0.14	0.18	0.22
	Ductile Cast Iron (FCD400)	~600N/mm ²	300 (200~400)	0.02Dc	0.1	0.12	0.14	0.18
N	Aluminium Alloy	~13%Si	500 (400~600)	0.03Dc	0.12	0.14	0.18	0.22
S	Heat Resistant Alloys (Inconel 718)	-	50 (20~80)	0.015Dc	0.04	0.05	0.06	0.06
	Titanium Alloy (Ti-6Al-4V)	-	90 (40~120)	0.02Dc	0.06	0.08	0.11	0.13
H	Pre-hardened Steel (NAK80 · STAVAX)	40~43HRC	200 (100~300)	0.015Dc	0.06	0.07	0.08	0.1
	Steel for Die Casting (DAC55 · DH31)	43~48HRC	180 (90~200)	0.015Dc	0.05	0.06	0.07	0.07
	Hardened Steels (SKD11)	50~60HRC	150 (100~250)	0.01Dc	0.05	0.06	0.07	0.07

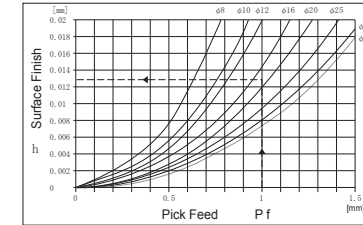
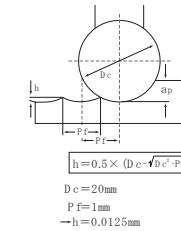
These numbers are typical values shown in the actual cutting speed. Please adjust accordingly to suit process environments.

Recommended Pick Feed and resulting Surface Finish

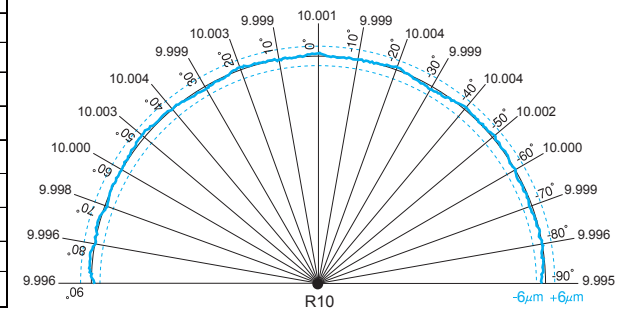
(unit : m m)

Diameter Dc	Pick Feed Pf	Surface Finish h
8	0.5	0.008
10	0.6	0.009
12	0.7	0.01
16	0.8	0.01
20	1	0.012
25	1.2	0.014
30	1.3	0.014

Theoretical Surface Finish



Indexable Insert has High Accuracy of ± 6 μm



Phoenix

Phoenix Finishing Ball Nose Cutter
PFB

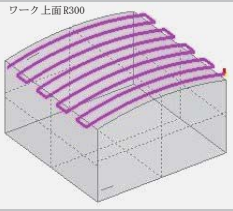
PFB

Cutting Data

PFB has doubled Tool Life

Comparison of tool wear after 200M of machining

Machining Detail		Machining Parameters	
Size	R10	Name of Part	Blade
Overhang	110mm	Material	SUH600
Speed	1,500min ⁻¹	Machining Method	Copy Milling
Feed	2,000mm/min	Machining Type	Vertical Machining Center
ap	0.2mm	Holder Size	BT40
Pf	1mm	Coolant Size	Water Soluble

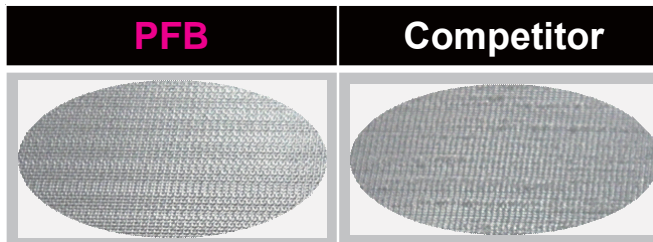


Amount of Wear

	70 minutes		140 minutes	
	Machined Length 100m		Machined Length 200m	
PFB				
Wear (mm)	0.033	0.030	0.041	0.043
Competitor				
Wear (mm)	0.032	0.033	0.070	0.071

PFB has Improved Surface Finish

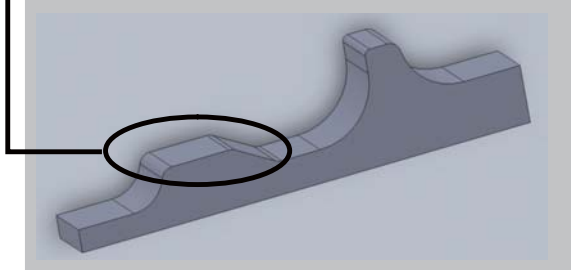
PFB has no tearing on flat surface



Machining Method	Product	2	4	6	8	10 (μm)	RZ (μm)
Copy Milling Flat Surface	PFB						6.171
	A						10.93
	B						6.021
	C						7.798
	D						6.963
Machining Method	Product	0.5	1	1.5	2	2.5 (μm)	RZ (μm)
Copy Milling Slanted Surface	PFB						1.967
	A						2.098
	B						2.083
	C						2.541
	D						1.827
Machining Method	Product	0.5	1	1.5	2	2.5 (μm)	RZ (μm)
Copy Milling Radial Surface	PFB						1.98
	A						1.9
	B						2.183
	C						2
	D						2.508

Machining Environment

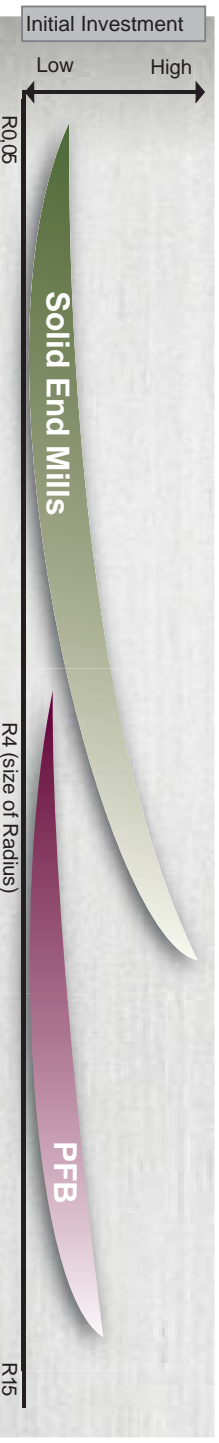
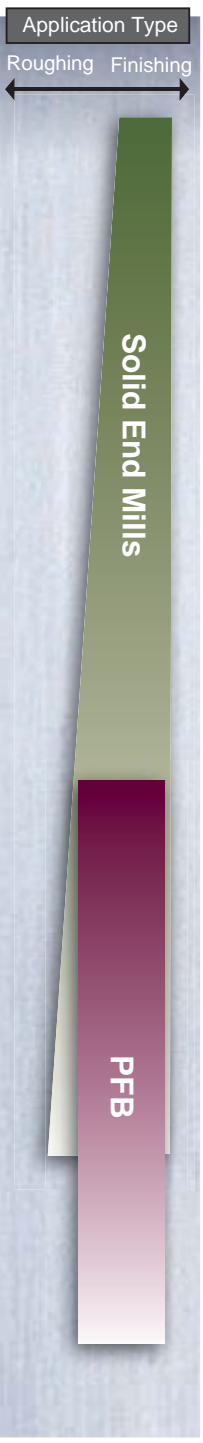
Machining Detail		Machining Parameters	
Size	R10	Name of Part	Blade
Overhang	80mm	Material	S50C
Speed	8,000miri	Machining Method	Copy Milling
Feed	3,200mm/min	Machining Type	Horizontal Machine
ap	0.3mm	Holder Size	BT50
Pf	0.3mm	Coolant Size	Water Soluble



Phoenix

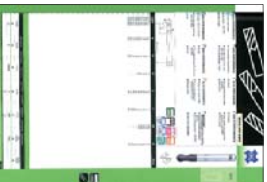
Phoenix Finishing Ball Nose Cutter
PFB

Guidance to Round Shank Tools and Indexable Tools



WXS-EBD / WXS-HS-EBD

- Round Shank Ball End Mill



Catalog Page
371 and 372

EDP No.	R x L2	L	I	d	l2	D1	Stock	Price
3041410	R 0,5 x 2	50	1	4	2	0,95	•	
3041415	R 0,75 x 3	50	1,5	4	3	1,45	•	
3041420	R 1 x 4	50	2	6	4	1,95	•	
3041430	R 1,5 x 6	60	3	6	6	2,85	•	
3041440	R 2 x 8	70	4	6	8	3,85	•	
3041441	R 2 x 8,4	60	4	4	8	3,85	•	
3041450	R 2,5 x 10	80	5	6	10	4,85	•	
3041460	R 3	90	9	6	-	-	•	
3041480	R 4	100	12	8	-	-	•	
3041500	R 5	100	15	10	-	-	•	
3041520	R 6	110	18	12	-	-	•	
3041560	R 8	140	24	16	-	-	•	
3041600	R 10	160	30	20	-	-	•	
3041650	R 12,5	180	38	25	-	-	•	

Unit:mm

OSG EUROPE s.a.

Av. Lavoisier 1
B-1300 Wavre Nord
Belgium

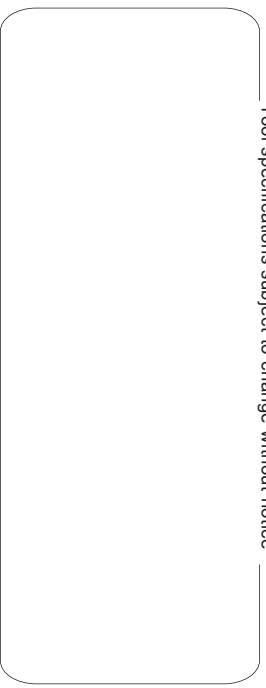
Tel. + 32.10.230508
Fax + 32.10.230531

E-mail: info@osgeurope.com
www.osgeurope.com



TOOL COMMUNICATION
OSG CORPORATION

Tool specifications subject to change without notice



OSG Europe: www.osgeurope.com

All rights reserved. ©OSG Europe 2010.
EURPHOENIX RADIUS CUTTER05R10a

The contents of this catalogue are provided to you for viewing only. They are not intended for reproduction either in part or in whole in this or other medium. They cannot be copied, used to create derivation work or used for any reason, by means without the express, written permission of the copyright owner. If prices are stated, they are netto unit-prices and any eventual tax(es) have to be added. The company is not responsible for any printing error in technical, price and/or any other data.