

BATCO

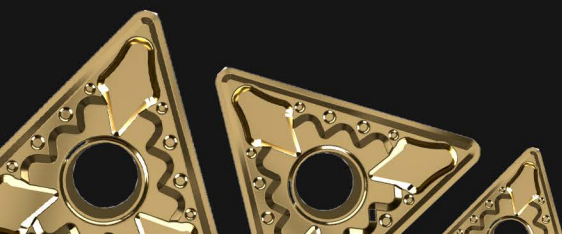
تامین ابزار باوند



تهران، خیابان امام خمینی
روبروی وزارت امور خارجه



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فکس: ۰۲۱-۵۵۳۹ ۳۰۷۸





Cutting Tool Solutions

2020 Product Catalog Supplement



osgtool.com

Introduction

1-7

Web & Social Media2
Catalog Guide.....3

Icon Guide.....4-5
Surface Treatments.....6-7



Drills

8-43

Illustrated Index/Application Guide.....8-9
A Brand ADO-TRS10-21
A Brand ADO-MICRO.....22-29

PHOENIX® PDZ30-37
PHOENIX® PLDS38-43



Taps

44-53

Illustrated Index/Application Guide.....44-45
A Brand AT-2.....46-49

A Brand AT-2 R-SPEC50-53
A Brand A-CHT.....54-57



End Mills

58-231

Illustrated Index/Application Guide.....58-63
A Brand AE-VMS-RA.....64-71
A Brand AE-VML.....72-83
A Brand AE-VMFE84-87
A Brand AE-MS-H.....88-99
A Brand AE-ML-H100-103
A Brand AE-BM-H104-111
A Brand AE-BD-H112-117
A Brand AE-LNBD-H.....118-127
A Brand AE-TL-N.....128-135
A Brand AE-VTS-N136-143

A Brand AE-LNBD-N.....144-149
HY-PRO® CARB VGM150-169
EXOCARB® AM-EBT170-175
EXOCARB® AM-CRE.....176-179
EXOCARB® AM-HFC180-185
PHOENIX® PXHF-AM.....186-193
EXOCARB® VU-TBR194-197
PHOENIX® PFB198-203
EXOCARB® WXL-EML.....204-207
PHOENIX® PMD208-215
PHOENIX® PSE216-231



Holders

232-240

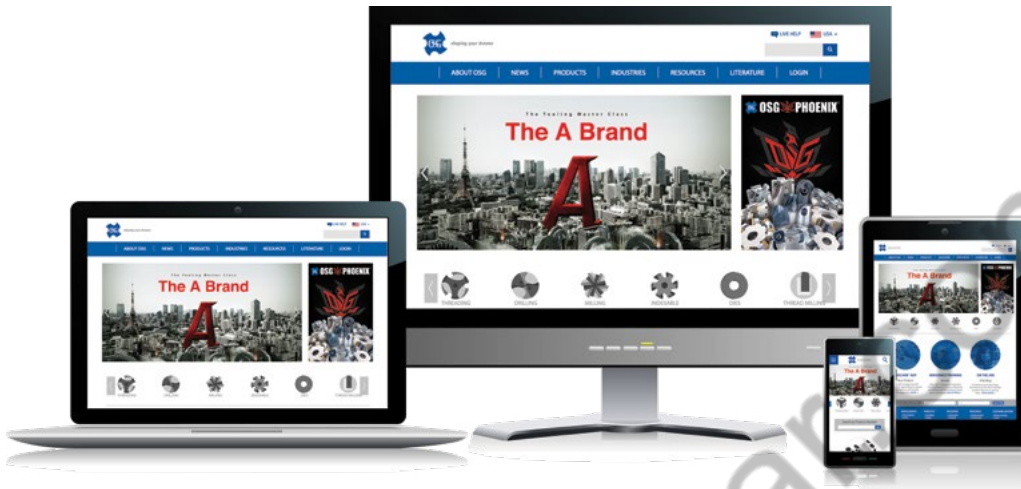
Illustrated Index/Application Guide.....232-233
SynchroMaster Tap Holders.....234-237

SynchroMaster Collet.....238-239
SynchroMaster Accessories240

OSG Online

www.osgtool.com

Our website, osgtool.com, is designed to help you find all your cutting tool solutions. We continuously strive to deliver a website that provides a value added experience by focusing on functionality, usability, and appearance while being responsive across all your devices.



OSG News: *See What's New at OSG*

- Press Releases
- New Products
- Blog

Resources: *Tools to Make it Easier*

- **NEW Digital Catalog**
- Product Search
- Tool Reconditioning
- Find a Distributor
- Competitor Crossover
- Fast Service Taps
- MSDS Download
- Tap-Drill Size Calculator

OSG's Tool Selector: *The Right Tool Right Now*

- With OSG's new tool selector, you are never more than 5 simple steps away from the right tool for your job.

Online Live Chat

- During regular business hours, OSG provides online support for customers looking for an alternative way to get their technical product assistance.

Social Media

Connect with OSG

Follow and interact with OSG on popular social media sites including Facebook, Twitter, LinkedIn, Instagram, and YouTube.

Facebook: facebook.com/osgtool

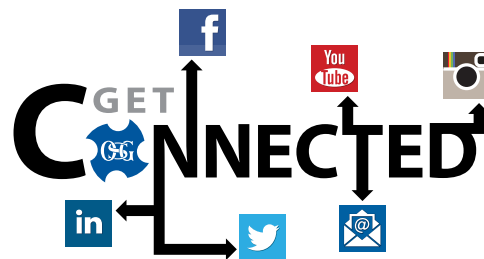
Twitter: twitter.com/OSGTOOL

LinkedIn: linkedin.com/company/osg-usa-inc

Instagram: instagram.com/osgtool/

YouTube: youtube.com/osgtool

OSG E-CLUB: Subscribe: eclub@osgtool.com



CUTTING TOOL SOLUTIONS Digital

www.osgtool.com/DigitalCatalog

OSG's new comprehensive digital catalog. Our newest tool, unlike any of our others, to provide you with solutions at your fingertips!

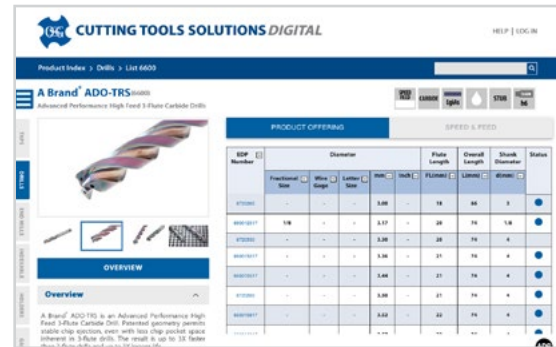


Main Menu Icons:

- **Products:** Quickly navigate to our product index to view our comprehensive product offering.
- **About OSG:** Learn more about how OSG shapes your dreams.
- **Guides:** Access helpful guides that give more detail on our icons and surface treatments
- **Reconditioning:** Review the benefits of OSG's reconditioning service
- **Brand Overview:** View OSG's product solutions by brand

Product Pages:

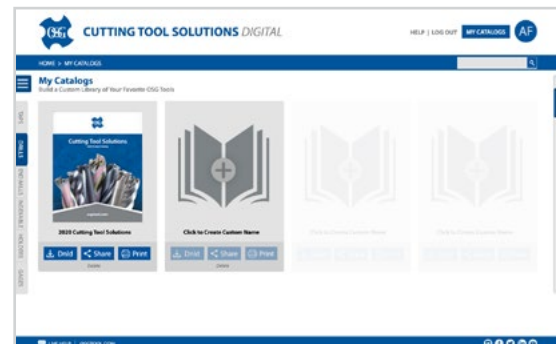
- Product Images and Videos
- Features & Benefits
- Series Lineup & Size offering
- Product Dimensions
- Recommended Work Material Charts
- Speed & Feed Tables/ Cutting Conditions Tool
- You Might Also Like product suggestions
- Cutting Conditions Tool
- Tool Drawing/Model Download files
- Literature-Access to featured product flyer PDFs



Login for Access Additional Features:

Existing OSG web users can use current user name and password for the OSG website to login to the digital catalog.

- **New Users:** Sign up to create an account and access additional features!
- **My Catalogs:** Create customized flyers of selected products to save, download as PDF's, share via email or print on demand.






















Tool Materials

HSS	HSS	HSSE	High Vanadium HSS	HSSE V3	HSSE V3
HSS-Co	HSS Cobalt	HSS-Co5	HSS-Co5	HSS-Co8	HSS-Co8
VC10	Powder Metallurgy HSS	XPM	High Grade Powder Metallurgy HSS	CARBIDE	Tungsten Carbide
CBN	CBN	CERMET	CERMET	PCD	PCD

Surface Treatment

BR	Bright	EXO'	Multi-Layer TiAlN Coating	TiCN	TiCN Coating
CrN	CrN Coating	HR	HR Coating	TiN	TiN Coating
DIA	OSG Patented Diamond Coating	IchAda	IchAda Coating	V	OSG Special Multi-Layer TiCN Coating
DLC-IGUSS	DLC-IGUSS Coating	Ni	Nitride Coating	WD1	WD1 Coating
DLC	DLC Coating	N S/O	Nitride/Steam Oxide Coating	WXL	WXL® Coating
DUARISE	Duarise Coating	S/O	Steam Oxide Coating	WXS	WXS® Coating
DUROREY	DUROREY Coating	SS	Super Smooth		
EgiAs	EgiAs Coating	TiAlN	TiAlN Coating		

Tool Dimensions

 EXTRA LONG	Extra Long Length	 LHS	Left Hand Spiral		Straight Shank
 LONG	Long Length	 STI	Screw Thread Insert		Taper Shank
 JOBBER	Jobbers Length		Center Cutting		Helix Angle
 MED	Medium Length		Non-Center Cutting		Tool Tolerance
 REG	Regular Length		Radius Tolerance		Right Angle
 STUB	Stub Length		Milling Diameter Tolerance		
 LH	Left Hand		Coolant-Through		

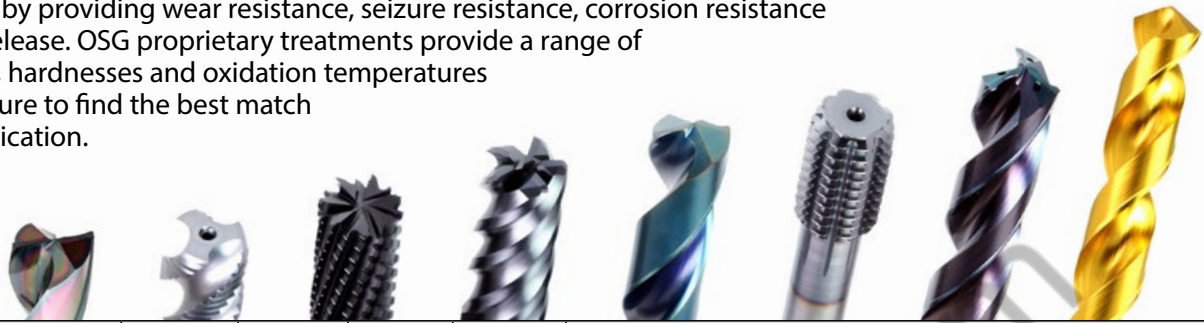
Other Icons
















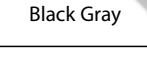


 SPEED FEED	Speeds & Feeds	 SHRINK FIT	Shrink Fit	 NEW	New	 NEW SIZES	New Sizes
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Surface Treatments

OSG Product Treatments

OSG's surface treatments are designed to meet customer needs through comprehensive technology by providing wear resistance, seizure resistance, corrosion resistance and mold release. OSG proprietary treatments provide a range of thicknesses, hardnesses and oxidation temperatures so you are sure to find the best match for any application.













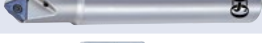


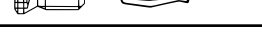


Coating	Coating Color	Type	Thickness (µm)	Hardness (HV)	Oxidation Temp. (°C)	Application
 IchAda	 Black Gray	Cr	1~5	3100	1100	For drilling steel, stainless steel & hardened steel. A PVD coating with excellent surface smoothness and abrasion resistance, high surface hardness and heat resistance for small diameter tools.
 DUARISE	 Black Gray	Cr multilayer	1~5	3100	1100	For milling steel, stainless steel & hardened steel. A PVD coating with excellent surface hardness and wear resistance, excellent heat resistance and low coefficient of friction to reduce material adhesion.
 DUREY	 Black Gray	SiC-containing Nano Layered Periodic	1~5	4180	1300	Ideally suited for Hardened steel > 50 HRC. Also works in: Cast Iron, Carbon Steel, Alloy Steel, Die Steel, Hardened Steel 35-50 HRC. Use in combination with High Speed Machining Techniques to optimize performance.
 WD1	 Iridescent Blue	Cr multilayer	3~5	3300	1100	For drilling steel, stainless steel, cast iron & hardened steel. A PVD coating with excellent surface hardness and wear resistance, excellent heat resistance and low coefficient of friction to reduce material adhesion.
 EgiAs	 Iridescent Red	Nano multilayer	3~5	3200	1100	For drilling steel, stainless steel, cast iron, aluminum & hardened steel. A PVD coating with excellent surface hardness and wear resistance, excellent heat resistance and low coefficient of friction to reduce material adhesion.
 WXS	 Black Gray	SiC	1~5	3500	1300	For drilling, tapping & milling steel, stainless steel & hardened steel. A PVD coating with excellent surface hardness and wear resistance, excellent heat resistance and low coefficient of friction to reduce material adhesion.
 WXL	 Black Gray	Cr	1~5	3100	1100	For drilling & milling steel, stainless steel & hardened steel. A PVD coating with excellent surface hardness and wear resistance, excellent heat resistance and low coefficient of friction to reduce material adhesion.
 EXO	 Black Violet	TiAlN multilayer	3	2800	850	For drilling, tapping & milling steel, stainless steel, cast iron & heat resistant alloys. A PVD coating with high surface hardness and wear resistance, very good heat resistance and low coefficient of friction to reduce material adhesion.
 TiAlN	 Black Violet	TiAlN	3	2800	800	For drilling, tapping & milling steel, stainless steel, cast iron & heat resistant alloys. A PVD coating with high surface hardness and wear resistance, very good heat resistance and low coefficient of friction to reduce material adhesion.

Surface Treatments

Coating	Coating Color	Type	Thickness (µm)	Hardness (HV)	Oxidation Temp. (°C)	Application
 V	 Blue Gray	TiCN multilayer	3	2700	400	For drilling & tapping steel, stainless steel, aluminum & heat resistant alloys. A PVD coating with high surface hardness and wear resistance, good heat resistance and low coefficient of friction to reduce material adhesion.
 TiCN	 Blue Gray	TiCN	3	2700	400	For drilling, tapping & milling steel, stainless steel, aluminum & heat resistant alloys. A PVD coating with high surface hardness and wear resistance, good heat resistance and low coefficient of friction to reduce material adhesion.
 TiN	 Gold	TiN	3	2000	500	For drilling, tapping & milling steel, stainless steel, tool & die steel & aluminum. A PVD coating with good surface hardness and wear resistance, good heat resistance and low coefficient of friction to reduce material adhesion.
 SS	 Black Violet	TiAlN	1	2800	800	For drilling & tapping steel, stainless steel, & heat resistant alloys. A PVD coating with high wear & abrasion resistance, very good heat resistance and high surface smoothness to reduce material adhesion.
 HR	 Silver Gray	Ti	2	2800	700	For tapping stainless steel & heat resistant alloys. A PVD coating with high wear & abrasion resistance, very good heat resistance and high surface smoothness to reduce material adhesion.
 S/O	 Black	Steam-Oxide	-	-	-	For tapping steel, stainless steel, tool & die steel & nickel-alloys. The oxidized surface layer is porous and increases lubricity by retaining cutting fluid on the working area of the tool.
 Ni	 Silver Gray	Nitride	30~50	1000	-	For tapping cast iron, cast aluminum, & plastic. The case-hardened surface layer increases wear resistance in abrasive and tough materials.
 CrN	 Silver Gray	CrN	3	1800	700	For tapping non-ferrous materials. A PVD coating with high surface lubricity to reduce material adhesion applied over a case-hardened surface layer with increased wear resistance.
 DIA	 Black	DIA	20, 12	9000	600	For drilling, tapping & milling non-ferrous & composite materials. A CVD coating with superior surface hardness and wear resistance, outstanding durability, and excellent smoothness to reduce material adhesion.
 DLC	 Iridescent Green	DLC	0.2	6000	550	For milling non-ferrous materials. A PVD coating with excellent surface hardness and wear resistance, and very low coefficient of friction to reduce material adhesion.
 BR	-	-	-	-	-	For general machining of all materials. The uncoated substrate provides good wear resistance and durability in general machining applications.

Illustrated Index

List	Item	Brand	Inch/ Metric	Material	Coating	Size Range	Features	Overview/ Cutting Data	Product Page	Tech Page
6600		A Brand ADO-TRS	Inch/ Metric	Carbide	EgiAs	1/8"-3/4" 3mm - 20mm	3D, Coolant-Through, 3 Flutes	10-11	12-15	20-21
6610		A Brand ADO-TRS	Inch/ Metric	Carbide	EgiAs	1/8"-3/4" 3mm - 20mm	5D, Coolant-Through, 3 Flutes	10-11	16-19	20-21
6501		A Brand ADO-MICRO	Metric	Carbide	IchAda	0.7mm-2mm	ADO-MICRO, 2D, Coolant-Through	22-23	24	28
6502		A Brand ADO-MICRO	Metric	Carbide	IchAda	0.7mm-2mm	ADO-MICRO, 5D, Coolant-Through	22-23	25	28
6503		A Brand ADO-MICRO	Metric	Carbide	IchAda	1mm-2mm	ADO-MICRO, 12D, Coolant-Through	22-23	26	29
6504		A Brand ADO-MICRO	Metric	Carbide	IchAda	1mm-2mm	ADO-MICRO, 20D, Coolant-Through	22-23	26	29
6505		A Brand ADO-MICRO	Metric	Carbide	IchAda	1mm-2mm	ADO-MICRO, 30D, Coolant-Through	22-23	27	29
52513		PHOENIX® PDZ	Inch	Steel	-	0.6875"- 1.5000"	Indexable Flat Drill, 2D	30-31	32	36-37
78537		PHOENIX® PDZ	Metric	Steel	-	16mm - 43mm	Indexable Flat Drill, 2D	30-31	33	36-37
78PZAG		PHOENIX® PDZ Inserts	-	Carbide	-	-	PDZ Inserts	30-31	34	36-37
7808H		PHOENIX® PDZ Accessories	-	-	-	-	PDZ Accessories	30-31	35	-
52512		PHOENIX® PLDS	Inch	Steel	-	0.567" - 0.681"	Indexable Centering & Chamfering Cutter, SA	38-39	40	43
78034		PHOENIX® PLDS	Metric	Steel	-	14.4mm - 17.3mm	Indexable Centering & Chamfering Cutter, SS	38-39	40	43
78134		PHOENIX® PLDS SF	Metric	Steel	-	14.4mm - 17.3mm	Indexable Centering & Chamfering Cutter, SF	38-39	41	43
78PLDS		PHOENIX® PLDS Inserts	-	Carbide	-	-	PLDS Inserts	38-39	42	43
7808H		PHOENIX® PLDS Accessories	-	-	-	-	PLDS Accessories	38-39	42	-

Application Guide

List No.	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels 4140 4340	Die Steels	Stainless Steels			Cast Iron	Aluminum		Nickel Alloy Inconel	Titanium 6Al4V (30 HRC)	Hardened Steels			
	Low 1010 1018	Med. 1035 1045	High 1065			300	400	17-4 PH		6061 7075	Casting			~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
6600	⊙	⊙	⊙	⊙	⊙		⊙	○	⊙		○		○	○			
6610	⊙	⊙	⊙	⊙	⊙		⊙	○	⊙		○		○	○			
6501	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	⊙	○		
6502	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	⊙	○		
6503	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	⊙	○		
6504	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	⊙	○		
6505	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	⊙	○		
52513	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	○	○	○	
78537	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	○	○	○	
78PZAG	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	○	○	○	○	○	
7808H																	
52512	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	⊙	⊙	⊙	⊙	⊙	
78034	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	⊙	⊙	⊙	⊙	⊙	
78134	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	⊙	⊙	⊙	⊙	⊙	
78PLDS	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	○	○	⊙	⊙	⊙	⊙	⊙	
7808H																	

○ good ⊙ best



A Brand ADO-TRS

Overview



A Brand ADO-TRS

The A Brand ADO-TRS drill with its advanced performance 3-flute geometry, allows for reduced vibration, higher feed rates, improved chip evacuation, decreased work hardening, and stable drilling. The end result is up to 3X faster than 2-flute drills and up to 3X longer life.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/ado-trs



List Numbers

6600 - A Brand ADO-TRS (3D)
6610 - A Brand ADO-TRS (5D)

Size Range

3mm-20mm, 1/8"-3/4"
3mm-20mm, 1/8"-3/4"

Primary Applications

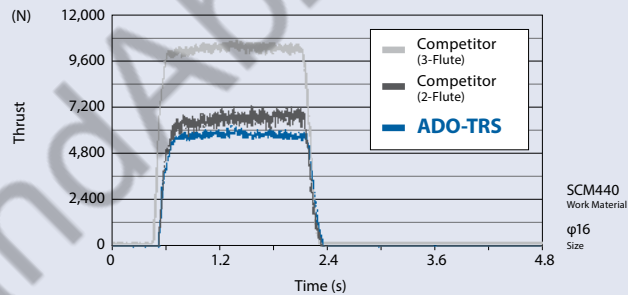
- Carbon Steels, Alloy Steel, Die Steel, Cast Iron, Stainless Steel (400 series)
- Any application where currently using a 2-flute coolant-fed drill.

Features & Product Solutions

30% Lower Thrust Force

R Gash Geometry

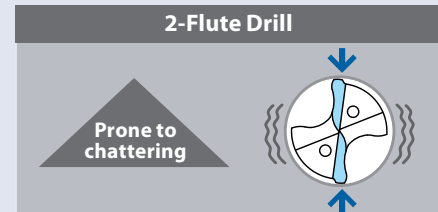
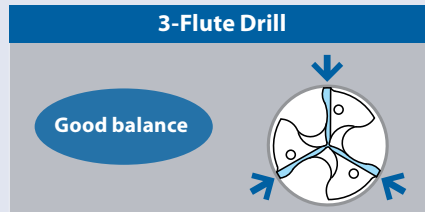
The ADO-TRS's unique geometry reduces thrust force by over 30% against the competitor's 3-flute drill, while also producing lower thrust force than even the competitor's 2-flute drill.



High Precision & Hole Quality

120-degree Equal Spacing Margins

The 120° equal spacing margins of the 3-flute design allows for more stable, vibration-free hole processing, thereby increasing hole quality and tolerance.



Outstanding Chip Management

Patented Flute Geometry

ADO-TRS produces small, consistent chips that can be easily evacuated, while the competitor's 3-flute & 2-flute drills' chips are elongated, which is the most common cause of chip evacuation difficulty.

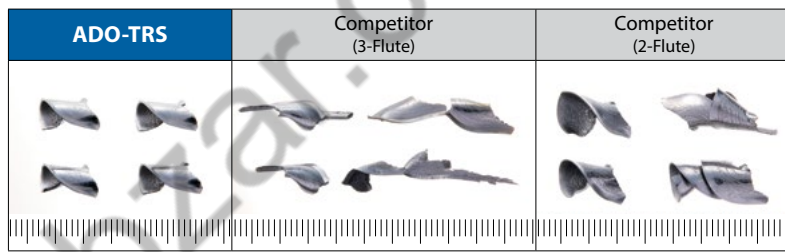
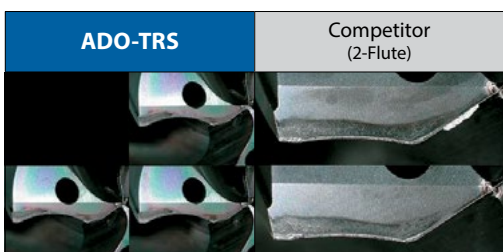
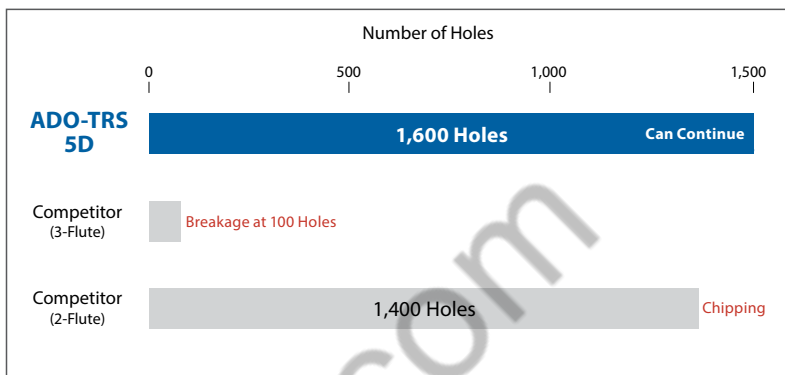


Tool Life in Carbon Steel

1050 Carbon Steel

Outstanding cutting chip breakage and consistent chip form.

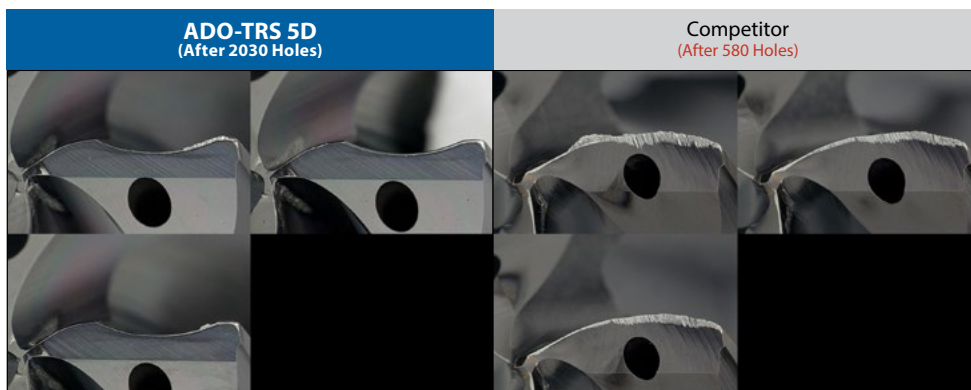
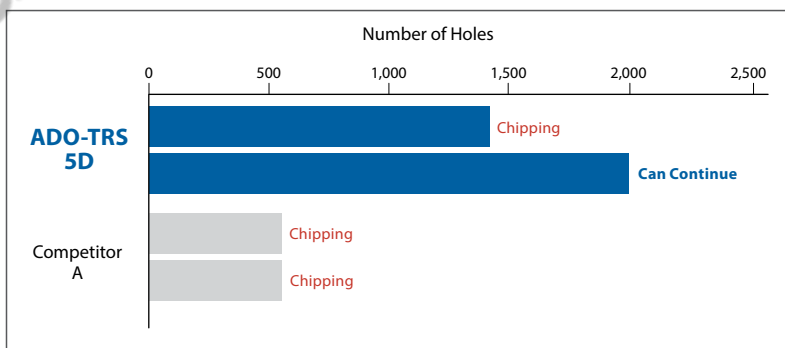
Tool	ADO-TRS 5D	Competitor (3-Flute)	Competitor (2-Flute)
Drill Size	Ø14		
Work Material	1050 Carbon Steel		
Cutting Speed	330 SFM (2,275 RPM)		
Feed Rate	53.7 IPM (0.024 in/rev)	38.0 IPM (0.015 in/rev)	
Depth of Hole	2.756" (Blind)		
Coolant	Water-Soluble		
Machine	Horizontal Machining Center		



Tool Life in Cast Iron

Gray Cast Iron

Tool	ADO-TRS 5D	Competitor A
Drill Size	Ø8.5mm	
Work Material	Gray Cast Iron	
Cutting Speed	230 SFM (2,625 RPM)	
Feed Rate	44.6 IPM (0.017 IPR)	
Depth of Hole	43 mm	
Coolant	Water Soluble	
Machine	Vertical Machining Center	

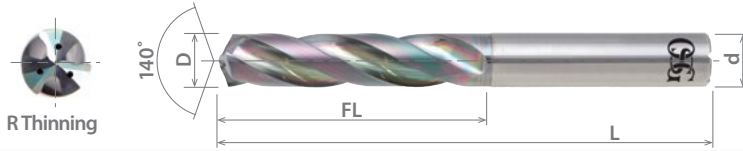


A Brand[®] ADO-TRS

Advanced Performance High Feed 3-Flute Carbide Drills

List 6600

ADO-TRS-3D, 3 Flute, Coolant-Through



NEW SIZES	SPEED FEED P20-21	CARBIDE	EgiAs		30°	SHANK h6
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Cutting Diameter Tolerance (h8)		
Size	mm	inch
4≤D≤6	+0 / -0.018	+0 / -0.0007
6<D≤10	+0 / -0.022	+0 / -0.0009
10<D≤18	+0 / -0.027	+0 / -0.0011
18<D≤20	+0 / -0.033	+0 / -0.0013

EDP Number	Diameter					Flute Length FL	Overall Length L	Shank Diameter d	Status
	Fractional Size	Wire Gage	Letter Size	mm	Inch				
8720300	-	-	-	3.000	0.11811	18	66	3	●
660012517	1/8	-	-	3.175	0.12500	20	74	1/8	●
8720330	-	-	-	3.300	0.12992	20		●	
660013217	-	-	-	3.360	0.13228	21		●	
660013517	-	-	-	3.440	0.13543			●	
8720350	-	-	-	3.500	0.13780	22		4	●
660013817	-	-	-	3.520	0.13858			●	
660014017	-	-	-	3.570	0.14055			●	
8720366	-	-	-	3.660	0.14409	23		●	
660014817	-	-	-	3.770	0.14843			●	
8720386	-	-	-	3.860	0.15197	24		●	
660015617	5/32	-	-	3.969	0.15625		5/32	●	
8720400	-	-	-	4.000	0.15748	25	4	●	
660015917	-	-	-	4.050	0.15945		6	●	
660016117	-	20	-	4.089	0.16100			●	
8720410	-	-	-	4.100	0.16142		80	6	●
660016317	-	-	-	4.160	0.16378			●	
8720420	-	-	-	4.200	0.16535		26	●	
660016817	-	-	-	4.270	0.16811			●	
8720430	-	-	-	4.300	0.16929		27	3/16	●
660017217	11/64	-	-	4.366	0.17188			●	
8720440	-	-	-	4.400	0.17323		28	6	●
660017517	-	-	-	4.460	0.17559	●			
8720450	-	-	-	4.500	0.17717	29	3/16	●	
8720460	-	-	-	4.600	0.18110			●	
660018317	-	-	-	4.660	0.18346	30	6	●	
8720470	-	-	-	4.700	0.18504			●	
660018717	3/16	-	-	4.763	0.18750	25	6	●	
8720480	-	-	-	4.800	0.18898			●	
8720490	-	-	-	4.900	0.19291	26	1/4	●	
8720500	-	-	-	5.000	0.19685			●	
8720510	-	-	-	5.100	0.20079	27	6	●	
660020317	13/64	-	-	5.159	0.20313			●	
8720520	-	-	-	5.200	0.20472	28	1/4	●	
8720530	-	-	-	5.300	0.20866			●	
8720540	-	-	-	5.400	0.21260	29	6	●	
660021317	-	3	-	5.410	0.21300			●	
8720550	-	-	-	5.500	0.21654	30	1/4	●	
660021817	7/32	-	-	5.556	0.21875			●	
8720560	-	-	-	5.600	0.22047	31	6	●	
8720570	-	-	-	5.700	0.22441			●	
8720580	-	-	-	5.800	0.22835	32	1/4	●	
8720590	-	-	-	5.900	0.23228			●	
660023417	15/64	-	-	5.953	0.23438	33	8	●	
8720600	-	-	-	6.000	0.23622			●	
8720610	-	-	-	6.100	0.24016	34	8	●	
8720620	-	-	-	6.200	0.24409			●	
8720630	-	-	-	6.300	0.24803	88	1/4	●	
660025017	1/4	-	E	6.350	0.25000			●	
8720640	-	-	-	6.400	0.25197	33	8	●	
8720650	-	-	-	6.500	0.25591			●	
660025717	-	-	F	6.528	0.25700	34	8	●	
8720660	-	-	-	6.600	0.25984			●	
8720670	-	-	-	6.700	0.26378	34	8	●	

Packed: 1 pc. Available EgiAs Coating Only.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 6600 (Continued)

ADO-TRS-3D, 3 Flute, Coolant-Through

NEW SIZES	SPEED FEED P20-21	CARBIDE	EgiAs		30°	SHANK h6
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EDP Number	Diameter					Flute Length	Overall Length	Shank Diameter	Status
	Fractional Size	Wire Gage	Letter Size	mm	Inch				
660026517	17/64	-	-	6.747	0.26563	34	88	5/16	●
8720680	-	-	-	6.800	0.26772	35		8	●
8720690	-	-	-	6.900	0.27165				●
8720700	-	-	-	7.000	0.27559	36	5/16	●	
8720710	-	-	-	7.100	0.27953			●	
660028117	9/32	-	-	7.144	0.28125	37	8	●	
8720720	-	-	-	7.200	0.28346			●	
8720730	-	-	-	7.300	0.28740	38	94	●	
8720738	-	-	-	7.380	0.29055			●	
8720740	-	-	-	7.400	0.29134	39	8	●	
8720750	-	-	-	7.500	0.29528			●	
660029617	19/64	-	-	7.541	0.29688	40	5/16	●	
8720760	-	-	-	7.600	0.29921			●	
8720770	-	-	-	7.700	0.30315	41	10	●	
8720780	-	-	-	7.800	0.30709			●	
8720790	-	-	-	7.900	0.31102	42	3/8	●	
660031217	5/16	-	-	7.938	0.31250			●	
8720800	-	-	-	8.000	0.31496	43	101	8	●
8720810	-	-	-	8.100	0.31890			●	
8720820	-	-	-	8.200	0.32283	44	10	10	●
8720830	-	-	-	8.300	0.32677			●	
660032817	21/64	-	-	8.334	0.32813	45	3/8	3/8	●
8720840	-	-	-	8.400	0.33071			●	
660033217	-	-	Q	8.433	0.33200	46	106	10	●
8720850	-	-	-	8.500	0.33465				●
8720860	-	-	-	8.600	0.33858	47	10	10	●
8720870	-	-	-	8.700	0.34252			●	
660034317	11/32	-	-	8.731	0.34375	48	106	3/8	●
8720880	-	-	-	8.800	0.34646			●	
8720890	-	-	-	8.900	0.35039	49	10	10	●
8720900	-	-	-	9.000	0.35433			●	
8720910	-	-	-	9.100	0.35827	50	7/16	7/16	●
660035917	23/64	-	-	9.128	0.35938			●	
8720920	-	-	-	9.200	0.36220	51	113	10	●
8720925	-	-	-	9.250	0.36417			●	
8720930	-	-	-	9.300	0.36614	52	113	12	●
8720938	-	-	-	9.380	0.36929			●	
8720940	-	-	-	9.400	0.37008	51	113	12	●
8720950	-	-	-	9.500	0.37402			●	
660037517	3/8	-	-	9.525	0.37500	52	113	7/16	●
8720960	-	-	-	9.600	0.37795			●	
8720970	-	-	-	9.700	0.38189	51	113	12	●
8720980	-	-	-	9.800	0.38583			●	
8720990	-	-	-	9.900	0.38976	52	113	7/16	●
660039017	25/64	-	-	9.922	0.39063			●	
8721000	-	-	-	10.000	0.39370	51	113	12	●
8721010	-	-	-	10.100	0.39764			●	
8721020	-	-	-	10.200	0.40157	52	113	7/16	●
8721030	-	-	-	10.300	0.40551			●	
660040617	13/32	-	-	10.319	0.40625	52	7/16	●	

Packed: 1 pc. Available EgiAs Coating Only.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.

▶ continued on next page ▶



List No.	Work Material																	
	P					M			K	N		S		H				
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels				
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
6600	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ good ⊗ best



A Brand ADO-MICRO

Overview

A Brand ADO-MICRO

ADO-MICRO's unique oil holes and flute geometry enable stable and high efficiency processing in small diameter deep-hole applications. Large oil holes and the hollow shank design allows greater coolant flow volume for smooth chip evacuation. The extended flute enables chips to be discharged from the tip of the flute to the extended flute with enhanced evacuation capability.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/ado-micro

List Numbers

6501 - A Brand ADO-MICRO (2D)
6502 - A Brand ADO-MICRO (5D)
6503 - A Brand ADO-MICRO (12D)
6504 - A Brand ADO-MICRO (20D)
6505 - A Brand ADO-MICRO (30D)

Size Range

0.7mm-2mm
0.7mm-2mm
1mm-2mm
1mm-2mm
1mm-2mm

Primary Applications

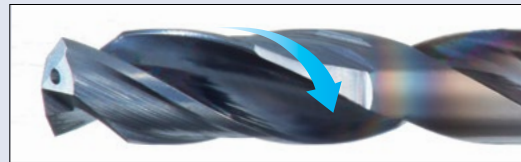
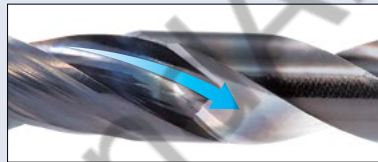
- Small Diameter Drilling in Difficult to Machine Materials Where Coolant is Necessary
- Small Diameter Deep Hole Applications with High Accuracy
- Hole Diameters from 0.7-2.0mm

Features & Product Solutions

Outstanding Chip Evacuation

Unique Flute Structure

The flute design provides stable performance even in difficult small diameter deep-hole applications.



Extended Flute

Chips are discharged from the tip of the flute to the extended flute with enhanced evacuation capability.

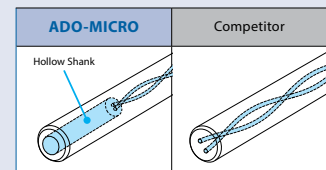
Removed End of Margin

Capability to smoothly discharge "micro sludges" that can be easily accumulated around the outer periphery of the tool, which is a key cause of abrupt tool breakage.

Greater Coolant Flow Volume

Large Oil Holes and Hollow Shank Design

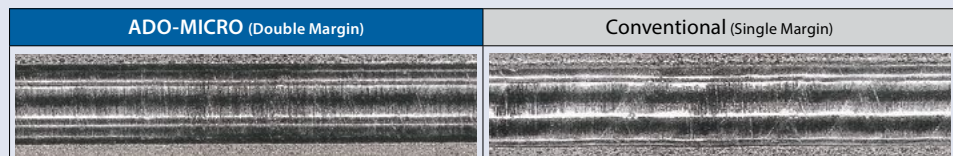
The hollow shank design allows greater coolant flow volume which enables smooth chip evacuation.



Stable Performance

Double Margin Configuration

The double margin enhances the drill's stability while drilling, improving performance, hole accuracy, and surface finish.



Tool: ADO-MICRO 20D Ø2 | Work Material: 304 Stainless | Depth of Hole: 40mm

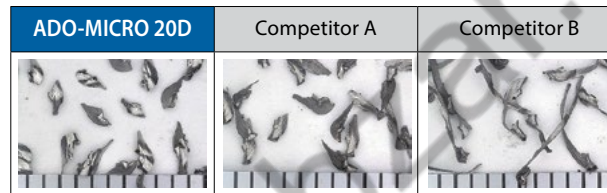


Unique Flute Geometry

4140 Alloy Steel

The ADO-MICRO's unique flute geometry provides stable drilling and results in longer tool life.

Tool	ADO-MICRO 20D	Competitor A	Competitor B
Tool Size	Ø2		
Work Material	4140 Alloy Steel		
Cutting Speed	164 SFM (7,960 RPM)		
Feed Rate	30 IPM (0.003 IPR)		
Depth of Hole	38 mm (Blind with Pilot Hole)		
Coolant	Water-Soluble (Internal)		
Coolant Pressure	3MPa		
Machine	Vertical Machining Center		

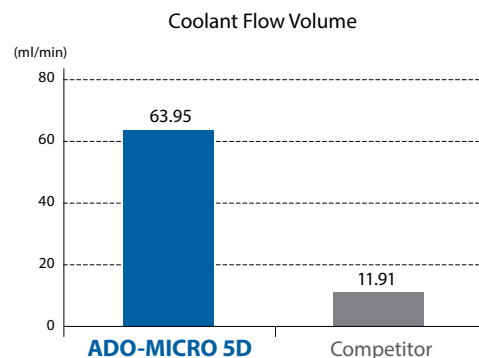
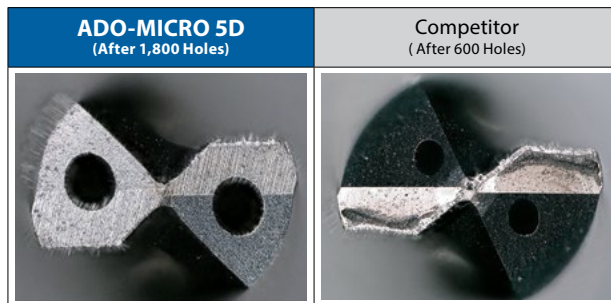
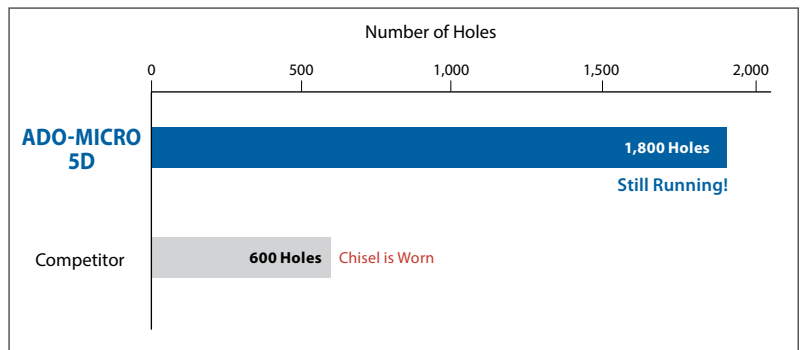


Enlarged Oil Holes

304 Stainless Steel

The ADO-MICRO's large coolant holes increase the coolant flow volume resulting in stable drilling.

Tool	ADO-MICRO 5D	Competitor
Tool Size	Ø0.7	
Work Material	304 Stainless Steel	
Cutting Speed	99 SFM (13,640 RPM)	
Feed Rate	5.35 IPM (0.0004 IPR)	
Depth of Hole	3.5 mm (Blind)	
Coolant	Water-Soluble (Internal)	
Coolant Pressure	3MPa	
Machine	Vertical Machining Center	

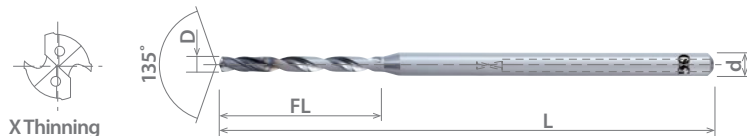


List 6502

ADO-MICRO-5D, Coolant-Through

NEW	SPEED FEED P28	CARBIDE				SHRINK FIT
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Cutting Diameter Tolerance		
Size	mm	inch
0.7 ≤ D ≤ 2	+0 / -0.009	+0 / -0.0004



EDP Number	Diameter (D)					Flute Length FL (mm)	Overall Length L (mm)	Shank Diameter d (mm)	Status
	Fractional Size	Wire Gage	Letter Size	mm	inch				
8732018	-	-	-	0.700	0.02756	7	47	3	●
8732019	-	-	-	0.750	0.02953	7.5			
8732020	-	-	-	0.800	0.03150	8			
8732021	-	-	-	0.850	0.03346	8.5	50	3	●
8732022	-	-	-	0.900	0.03543	9			
8732023	-	-	-	0.950	0.03740	9.5			
8732024	-	-	-	1.000	0.03937	10	55	3	●
8732025	-	-	-	1.100	0.04331	11			
8732026	-	-	-	1.200	0.04724	12			
8732027	-	-	-	1.300	0.05118	13	60	3	●
8732028	-	-	-	1.400	0.05512	14			
8732029	-	-	-	1.500	0.05906	15			
8732030	-	-	-	1.600	0.06299	16	65	3	●
8732031	-	-	-	1.700	0.06693	17			
8732032	-	-	-	1.800	0.07087	18			
8732033	-	-	-	1.900	0.07480	19	65	3	●
8732034	-	-	-	2.000	0.07874	20			

Packed: 1 pc. Available IchAda coating only.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



Watch it in Action!

List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels 4140 4340	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy Inconel	Titanium 6Al4V (30 HRC)	Hardened Steels			
Low 1010 1018	Med. 1035 1045	High 1065	300			400	17-4 PH	6061 7075		Casting	~35 HRC			35-45 HRC	45-50 HRC	50-70 HRC	
6502	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

○ good ○ best

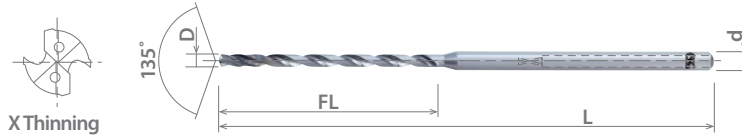


A Brand ADO-MICRO

Advanced Performance Carbide Micro Drills

List 6503

ADO-MICRO-12D, Coolant-Through



NEW	SPEED FEED P29	CARBIDE		IchAda	 0~-0.009	 ~30°	SHRINK FIT
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Cutting Diameter Tolerance		
Size	mm	inch
0.7≤D≤2	+0 / -0.009	+0 / -0.0004

EDP Number	Diameter (D)					Flute Length FL (mm)	Overall Length L (mm)	Shank Diameter d (mm)	Status
	Fractional Size	Wire Gage	Letter Size	mm	inch				
8732035	-	-	-	1.000	0.03937	17	60	3	●
8732036	-	-	-	1.100	0.04331	18.7	65		●
8732037	-	-	-	1.200	0.04724	20.4			●
8732038	-	-	-	1.300	0.05118	22.1	70		●
8732039	-	-	-	1.400	0.05512	23.8			●
8732040	-	-	-	1.500	0.05906	25.5	73		●
8732041	-	-	-	1.600	0.06299	27.2			●
8732042	-	-	-	1.700	0.06693	28.9	77		●
8732043	-	-	-	1.800	0.07087	30.6			●
8732044	-	-	-	1.900	0.07480	32.3	●		
8732045	-	-	-	2.000	0.07874	34	●		

Packed: 1 pc. Available IchAda coating only. ADO-MICRO 2D is the recommended pilot hole drill.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 6504

ADO-MICRO-20D, Coolant-Through



NEW	SPEED FEED P29	CARBIDE		IchAda	 0~-0.009	 ~30°	SHRINK FIT
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Cutting Diameter Tolerance		
Size	mm	inch
0.7≤D≤2	+0 / -0.009	+0 / -0.0004

EDP Number	Diameter (D)					Flute Length FL (mm)	Overall Length L (mm)	Shank Diameter d (mm)	Status
	Fractional Size	Wire Gage	Letter Size	mm	inch				
8732046	-	-	-	1.000	0.03937	24	68	3	●
8732047	-	-	-	1.100	0.04331	26.4	75		●
8732048	-	-	-	1.200	0.04724	28.8			●
8732049	-	-	-	1.300	0.05118	31.2	81		●
8732050	-	-	-	1.400	0.05512	33.6			●
8732051	-	-	-	1.500	0.05906	36	88		●
8732052	-	-	-	1.600	0.06299	38.4			●
8732053	-	-	-	1.700	0.06693	40.8	95		●
8732054	-	-	-	1.800	0.07087	43.2			●
8732055	-	-	-	1.900	0.07480	45.6	●		
8732056	-	-	-	2.000	0.07874	48	●		

Packed: 1 pc. Available IchAda coating only. ADO-MICRO 2D is the recommended pilot hole drill.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels 4140 4340	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low 1010 1018	Med. 1035 1045	High 1065			300	400	17-4 PH		6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
6503	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
6504	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

○ good ○ best



A Brand ADO-MICRO

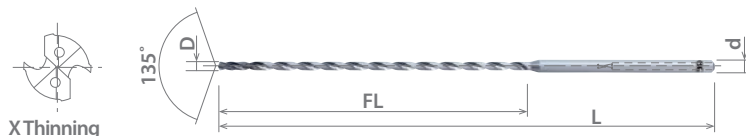
Advanced Performance Carbide Micro Drills

List 6505

ADO-MICRO-30D, Coolant-Through

NEW	SPEED FEED P29	CARBIDE		IchAda	 0~-0.009	 ~30°	SHRINK FIT
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Cutting Diameter Tolerance		
Size	mm	inch
0.7 ≤ D ≤ 2	+0 / -0.009	+0 / -0.0004



EDP Number	Diameter (D)					Flute Length FL (mm)	Overall Length L (mm)	Shank Diameter d (mm)	Status
	Fractional Size	Wire Gage	Letter Size	mm	inch				
8732057	-	-	-	1.000	0.03937	34	77	3	●
8732058	-	-	-	1.100	0.04331	37.4	86		●
8732059	-	-	-	1.200	0.04724	40.8			●
8732060	-	-	-	1.300	0.05118	44.2	95		●
8732061	-	-	-	1.400	0.05512	47.6			●
8732062	-	-	-	1.500	0.05906	51	101		●
8732063	-	-	-	1.600	0.06299	54.4			●
8732064	-	-	-	1.700	0.06693	57.8	107		●
8732065	-	-	-	1.800	0.07087	61.2			●
8732066	-	-	-	1.900	0.07480	64.6	112		●
8732067	-	-	-	2.000	0.07874	68			●

Packed: 1 pc. Available IchAda coating only. ADO-MICRO 2D is the recommended pilot hole drill.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzar.com

Watch it in Action!

List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High														
	1010	1035	1065	4140						6061	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
6505	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ good ○ best



List 6501 - A Brand ADO-MICRO: 2D

List 6502 - A Brand ADO-MICRO: 5D

General Drilling Operations

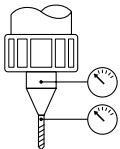
Work Material	Carbon Steels, Mild Steels 1010, 1050, 12L14		Alloy Steels 4140, 4130		300 Series Austenitic Stainless Steels		400 Series Ferritic Stainless Steels Martensitic Stainless Steels		High Heat Material			
	Ti-Alloy, Ti-6Al-4V		Ni-Base Material, Inconel									
Drilling Speed	65-195 SFM		65-195 SFM		65-195 SFM		80-145 SFM		130-195 SFM		15-50 SFM	
Drill Dia. mm	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR
0.7	18,200	0.0003-0.0008	18,200	0.0006-0.0011	13,600	0.0003-0.0008	15,900	0.0003-0.0008	22,700	0.0004-0.0007	4,500	0.0002-0.0006
1	12,700	0.0004-0.0012	12,700	0.0008-0.0016	9,500	0.0004-0.0012	11,100	0.0004-0.0012	15,900	0.0006-0.001	3,200	0.0002-0.0008
1.5	8,500	0.0006-0.0018	8,500	0.0012-0.0024	6,400	0.0006-0.0018	7,400	0.0006-0.0018	10,600	0.001-0.0015	2,100	0.0003-0.0012
2	6,400	0.0008-0.0024	6,400	0.0016-0.0031	4,800	0.0008-0.0024	5,600	0.0008-0.0024	8,000	0.0012-0.002	1,600	0.0004-0.0016

General Drilling Operations

Work Material	Cast Iron		Ductile Cast Iron		Aluminum Alloy 5025,7075		Cast Aluminum		Special Alloy Steels, Hardened Steels			
	26-30 HRC		30-34 HRC									
Drilling Speed	130-195 SFM		100-165 SFM		65-195 SFM		65-195 SFM		100-130 SFM		100-130 SFM	
Drill Dia. mm	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR
0.7	22,700	0.0006-0.0011	18,200	0.0006-0.0011	18,200	0.0003-0.0008	22,700	0.0006-0.0017	15,900	0.0006-0.0011	11,500	0.0006-0.0011
1	15,900	0.0008-0.0016	12,700	0.0008-0.0016	12,700	0.0004-0.0012	15,900	0.0008-0.0024	11,100	0.0008-0.0016	8,000	0.0008-0.0016
1.5	10,600	0.0012-0.0024	8,500	0.0012-0.0024	8,500	0.0006-0.0018	10,600	0.0012-0.0035	7,400	0.0012-0.0024	5,300	0.0012-0.0024
2	8,000	0.0016-0.0031	6,400	0.0016-0.0031	6,400	0.0008-0.0024	8,000	0.0016-0.0047	5,600	0.0016-0.0031	4,000	0.0016-0.0031

Note:

- This cutting condition chart is based on the usage of **water-soluble coolant and internal supply**.
- Please use quality water-soluble coolant with a dilution factor of approximately 20 times, e.g. 5% concentration.
- Please use a precision filter (rating of 3µm to 5µm) to prevent the oil holes from clogging.
- Although the recommended coolant pressure is 3 MPa or more, please adjust accordingly if the level of flow volume is unsatisfactory due to the type and concentration of cutting fluid used.
- For accurate mounting, acceptable deflection of the body cylindrical part at the shank end should be **less than 0.002µm**, as shown in the illustrated figure.
- For work materials with poor chip evacuation, please perform step drilling as required.
- Please always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys. Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.



List 6503 - A Brand ADO-MICRO: 12D

List 6504 - A Brand ADO-MICRO: 20D

List 6505 - A Brand ADO-MICRO: 30D

General Drilling Operations

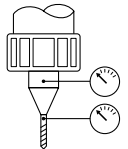
Work Material	Carbon Steels, Mild Steels 1010, 1050, 12L14		Alloy Steels 4140, 4130		300 Series Austenitic Stainless Steels		400 Series Ferritic Stainless Steels Martensitic Stainless Steels		High Heat Material			
	Ti-Alloy, Ti-6Al-4V		Ni-Base Material, Inconel									
Drilling Speed	65-195 SFM		65-195 SFM		65-195 SFM		80-145 SFM		130-195 SFM		15-50 SFM	
Drill Dia. mm	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR
	1	12,700	0.0004-0.0012	12,700	0.0008-0.0016	9,500	0.0004-0.0012	11,100	0.0004-0.0012	15,900	0.0006-0.001	3,200
1.5	8,500	0.0006-0.0018	8,500	0.0012-0.0024	6,400	0.0006-0.0018	7,400	0.0006-0.0018	10,600	0.001-0.0015	2,100	0.0003-0.0012
2	6,400	0.0008-0.0024	6,400	0.0016-0.0031	4,800	0.0008-0.0024	5,600	0.0008-0.0024	8,000	0.0012-0.002	1,600	0.0004-0.0016

General Drilling Operations

Work Material	Cast Iron		Ductile Cast Iron		Aluminum Alloy 5025,7075		Cast Aluminum		Special Alloy Steels, Hardened Steels			
	26-30 HRC		30-34 HRC									
Drilling Speed	130-195 SFM		100-165 SFM		65-195 SFM		100-230 SFM		100-130 SFM		65-100 SFM	
Drill Dia. mm	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR
	1	15,900	0.0008-0.0016	12,700	0.0008-0.0016	12,700	0.0004-0.0012	15,900	0.0008-0.0024	11,100	0.0008-0.0016	8,000
1.5	10,600	0.0012-0.0024	8,500	0.0012-0.0024	8,500	0.0006-0.0018	10,600	0.0012-0.0035	7,400	0.0012-0.0024	5,300	0.0012-0.0024
2	8,000	0.0016-0.0031	6,400	0.0016-0.0031	6,400	0.0008-0.0024	8,000	0.0016-0.0047	5,600	0.0016-0.0031	4,000	0.0016-0.0031

Note:

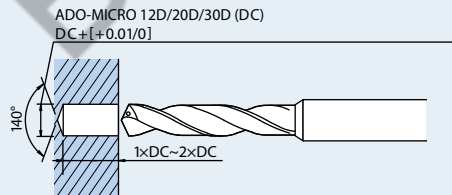
- This cutting condition chart is based on the usage of **water-soluble coolant and internal supply**.
- Please use quality water-soluble coolant with a dilution factor of approximately 20 times, e.g. 5% concentration.
- Please use a precision filter (rating of 3µm to 5µm) to prevent the oil holes from clogging.
- Although the recommended coolant pressure is 3 MPa or more, please adjust accordingly if the level of flow volume is unsatisfactory due to the type and concentration of cutting fluid used.
- For accurate mounting, acceptable deflection of the body cylindrical part at the shank end should be **less than 0.002µm**, as shown in the illustrated figure.
- For work materials with poor chip evacuation, please perform step drilling as required.
- For holes deeper than 12D, please use a 2D type drill to prepare a pilot hole prior to processing.
- Please always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys. Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.



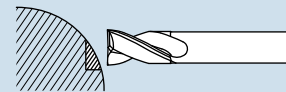
Deep Hold Drilling Procedures ADO-MICRO 12D/20D/30D

1. Make a Pilot Hole with the ADO-MICRO 2D.

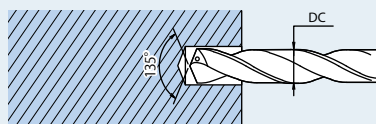
The ADO-MICRO 2D (140° point angle) is the recommended pilot hole drills of the ADO-MICRO 12D/20D/30D



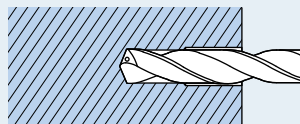
When working on a curved surface, use the ADF (carbide flat drill) to counterbore a flat surface before drilling a pilot hole.



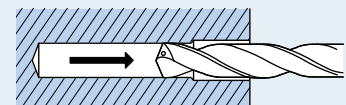
2. Insert the long drill into a pilot hole with a low revolution of 500 to 1,000 RPM.



3. Increase the revolution to the designated speed and start drilling.



4. After drilling, move the drill away from the bottom of the hole; then reduce its speed to 500 to 1,000 RPM while continuing to retract.



PHOENIX® PDZ

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



For more information use your phone to scan the QR code to the right and visit: osgtool.com/PDZ



List Numbers

52513 - PHOENIX® PDZ (2D)
78537 - PHOENIX® PDZ (2D)

Size Range

0.6875"-1.5000"
16mm-43mm

Primary Applications

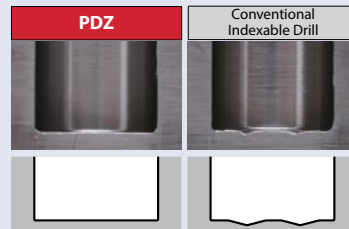
- One-shot processing of flat-bottom holes, is faster than conventional processing with indexable drills & end mills.
- Center-cutting insert configuration doesn't require a pre-existing hole.
- Ideal for a variety of applications: drilling, counterboring, plunging, and inclined & curved surface drilling.

Features & Product Solutions

Capable of Machining a Wide Range of Applications

Flat Bottom Edge Configuration

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



Bottom Hole Shape Comparison
Ø20 • Work Material: 1050 Steel

Superior Chip Breaking Capability

Enhanced Muscle Breaker

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



Excellent chip breaking capability with the enhanced muscle breaker.

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

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



Ø20 hole processing (non-step drilling)

Work Material: 1050 Steel

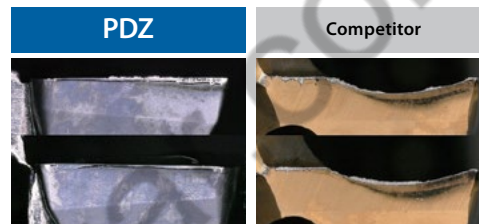
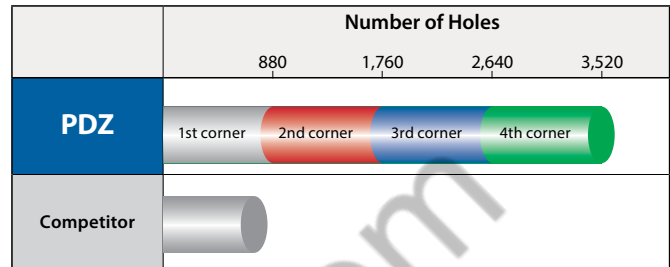
Cutting Conditions:
Vc=492 SFM • f=0.004 in/rev

Higher Cost Performance than Exchangeable Head Drills

1050 Carbon Steel

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

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

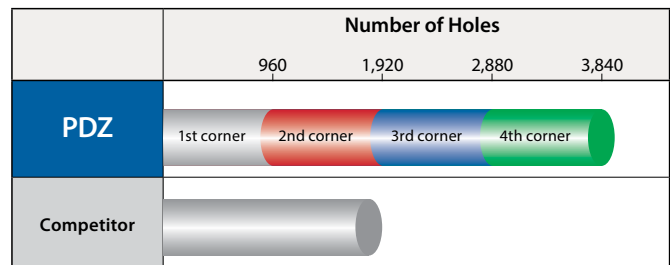


Higher Cost Performance than Exchangeable Head Drills

304 Stainless Steel

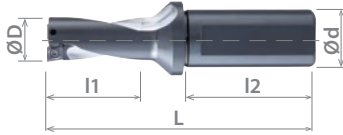
PDZ was able to process over 3,800 holes per insert, compared to 1,900 holes by the competitor's exchangeable head drill.

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



List 52513

PDZ (Inch)



Recommended Materials: p35
Accessories & Inserts: p34-35

EDP No.	Body Type	Designation	Drill Dia. (inch)	Drilling Depth (inch)	Overall Length (inch)	Shank Dia. (inch)	Shank Length (inch)	Applicable Insert	Status
			D	L1	L	d	L2		
52513002	Flat Shank	PDZ0688FS075A05-2D	0.6875	1.375	4.053	0.750	1.969	ZPNT05	●
52513003		PDZ0750FS100A06-2D	0.7500	1.500	4.413	1.000	2.205	ZPNT06	●
52513004		PDZ0812FS100A06-2D	0.8125	1.625	4.537	1.000	2.205		●
52513005		PDZ0875FS100A06-2D	0.8750	1.750	4.860	1.000	2.205	ZPNT07	●
52513006		PDZ0937FS125A07-2D	0.9375	1.875	5.142	1.250	2.362		●
52513007		PDZ1000FS125A07-2D	1.0000	2.000	5.268	1.250	2.362	ZPNT08	●
52513008		PDZ1062FS125A08-2D	1.0625	2.125	5.392	1.250	2.362		●
52513009		PDZ1125FS125A08-2D	1.1250	2.250	5.518	1.250	2.362	ZPNT09	●
52513010		PDZ1187FS125A08-2D	1.1875	2.375	5.642	1.250	2.362		●
52513011		PDZ1250FS125A09-2D	1.2500	2.500	5.768	1.250	2.362	ZPNT10	●
52513012		PDZ1312FS150A09-2D	1.3125	2.625	6.285	1.500	2.756		●
52513013		PDZ1375FS150A09-2D	1.3750	2.750	6.411	1.500	2.756	ZPNT10	●
52513014		PDZ1437FS150A10-2D	1.4375	2.875	6.535	1.500	2.756		●
52513015		PDZ1500FS150A10-2D	1.5000	3.000	6.661	1.500	2.756		●

Packed: 1 pc.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzari.com



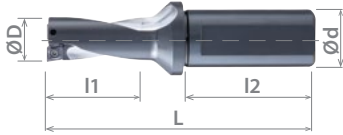
List 78537

PDZ (Metric)

NEW



Recommended Materials: p35
Accessories & Inserts: p34-35



EDP No.	Body Type	Designation	Drill Dia. (mm)	Drilling Depth (mm)	Overall Length (mm)	Shank Dia. (mm)	Shank Length (mm)	Applicable Insert	Status	
			D	L1	L	d	L2			
7803776	Flat Shank	PDZ1600FS20M05-2D	16.0	32	97	20	50	ZPNT05	●	
7803777		PDZ1650FS20M05-2D	16.5	33	98	20	50		●	
7803778		PDZ1700FS20M05-2D	17.0	34	102	20	50		●	
7803779		PDZ1750FS25M05-2D	17.5	35	109	25	56		●	
7803780		PDZ1800FS25M05-2D	18.0	36	110	25	56		●	
7803781		PDZ1850FS25M05-2D	18.5	37	111	25	56	●		
7803782		PDZ1900FS25M06-2D	19.0	38	112	25	56	ZPNT06	●	
7803783		PDZ1950FS25M06-2D	19.5	39	113	25	56		●	
7803784		PDZ2000FS25M06-2D	20.0	40	114	25	56		●	
7803785		PDZ2100FS25M06-2D	21.0	42	121	25	56		●	
7803786		PDZ2200FS25M06-2D	22.0	44	123	25	56		●	
7803787		PDZ2300FS25M07-2D	23.0	46	125	25	56	ZPNT07	●	
7803788		PDZ2400FS25M07-2D	24.0	48	127	25	56		●	
7803790		PDZ2500FS32M07-2D	25.0	50	133	32	60		●	
7803791		PDZ2600FS32M07-2D	26.0	52	135	32	60		●	
7803792		PDZ2700FS32M08-2D	27.0	54	137	32	60		ZPNT08	●
7803793		PDZ2800FS32M08-2D	28.0	56	139	32	60	●		
7803794		PDZ2900FS32M08-2D	29.0	58	141	32	60	●		
7803795		PDZ3000FS32M08-2D	30.0	60	143	32	60	●		
7803796		PDZ3100FS32M08-2D	31.0	62	145	32	60	●		
7803797		PDZ3200FS32M09-2D	32.0	64	147	32	60	ZPNT09	●	
7803798		PDZ3300FS40M09-2D	33.0	66	159	40	70		●	
7803799		PDZ3400FS40M09-2D	34.0	68	161	40	70		●	
7803800		PDZ3500FS40M10-2D	35.0	70	163	40	70		ZPNT10	●
7803801		PDZ3600FS40M10-2D	36.0	72	165	40	70			●
7803802		PDZ3700FS40M10-2D	37.0	74	167	40	70	●		
7803803		PDZ3800FS40M10-2D	38.0	76	169	40	70	●		
7803804		PDZ3900FS40M13-2D	39.0	78	178	40	70	ZPNT13		●
7803805		PDZ4000FS40M13-2D	40.0	80	180	40	70		●	
7803806		PDZ4100FS40M13-2D	41.0	82	182	40	70		●	
7803807		PDZ4200FS40M13-2D	42.0	84	184	40	70		●	
7803808		PDZ4300FS40M13-2D	43.0	86	186	40	70		●	

Packed: 1 pc.

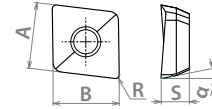
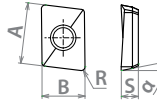
● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 78PZAG

PZAG Inserts for PDZ



Designation	No. of Cutting Edges	Insert Size					EDP Number		Status
		A x B (mm)	S (mm)	α	R (mm)	Type	XP8030	XC8035	
ZPNT050204EN	2	5.9 x 5.9	2.25	11°	0.4	2	7814102	7815102	●
ZPNT060204EN		6.95 x 6.95	2.93		0.4	2	7814103	7815103	●
ZPNT070304EN		7.84 x 7.84	3.87		0.4	2	7814104	7815104	●
ZPNT080304EN		8.85 x 8.85	3.92		0.4	2	7814105	7815105	●
ZPNT090404EN		9.94 x 9.94	4.65		0.4	2	7814106	7815106	●
ZPNT100408EN		10.95 x 10.95	4.65		0.8	2	7814108	7815108	●
ZPNT130508EN		13.92 x 13.92	5.46		0.8	2	7814110	7815110	●

Packed: 10 pcs.

Note: XC8035 recommended for peripheral cutting edge only.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.

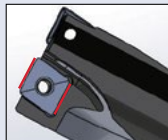


⚠ Precautions when installing the insert

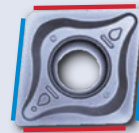
- The insert (XP8030) has a total of 4 working corners – 2 corners for the peripheral cutting edge and 2 corners for the center cutting edge.
- Use the peripheral cutting edge corner for the peripheral cutting edge and the center cutting edge corner for the center cutting edge.



Attached with peripheral cutting edge



Attached with center cutting edge


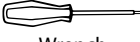


— Edges for peripheral cutting

— Edges for center cutting

List 7808H

PDZ Accessories

Appearance	EDP No.	Designation	Applicable Insert	Applicable Cutter		Recommended Tightening Torque	Status
				(mm)	(inch)		
 Clamping Screw	7808139	FS20543P (M2 x 4.3, Torx 6IP)	ZPNT05...	PDZ Ø16-18.5	PDZ Ø0.687	0.7 Nm	●
	7808138	FS22550P (M2.2 x 5, Torx 7IP)	ZPNT06...	PDZ Ø19-22	PDZ Ø0.750-0.875	1.0 Nm	●
	7808136	FS25560P (M2.5 x 6, Torx 9IP)	ZPNT07...	PDZ Ø23-26	PDZ Ø0.937-1.000	1.6 Nm	●
	7808135	FS30570P (M3 x 7, Torx 9IP)	ZPNT08... ZPNT09...	PDZ Ø27-34	PDZ Ø1.062-1.375	2.2 Nm	●
	7808137	FS35586P (M3.5 x 8.6, Torx 15IP)	ZPNT10...	PDZ Ø35-38	PDZ Ø1.437-1.500	3.2 Nm	●
	7808114	FS45510P (M4.5 x 10.5, Torx 20IP)	ZPNT13...	PDZ Ø39-43	-	5.0 Nm	●
 Wrench	7808223	6IP-D (Torx 6IP)	ZPNT05...	PDZ Ø16-18.5	PDZ Ø0.687	-	●
	7808224	7IP-D (Torx 7IP)	ZPNT06...	PDZ Ø19-22	PDZ Ø0.750-0.875	-	●
	7808225	8IP-D (Torx 8IP)	ZPNT07...	PDZ Ø23-26	PDZ Ø0.937-1.000	-	●
	7808226	9IP-D (Torx 9IP)	ZPNT08... ZPNT09...	PDZ Ø27-34	PDZ Ø1.062-1.375	-	●
	7808228	15IP-D (Torx 15IP)	ZPNT10...	PDZ Ø35-38	PDZ Ø1.437-1.500	-	●
	7808229	20IP-D (Torx 20IP)	ZPNT13...	PDZ Ø39-43	-	-	●

Note: Wrench sold separately.

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

● Stocked ○ Available Upon Request Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



Recommended Materials by Application

Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
XP8030	-	Yes	⊙	⊙	○	○	○	○
XC8035	-	No	○		⊙			
		Yes	○	○				

Note: XC8035 recommended for peripheral cutting edge only.

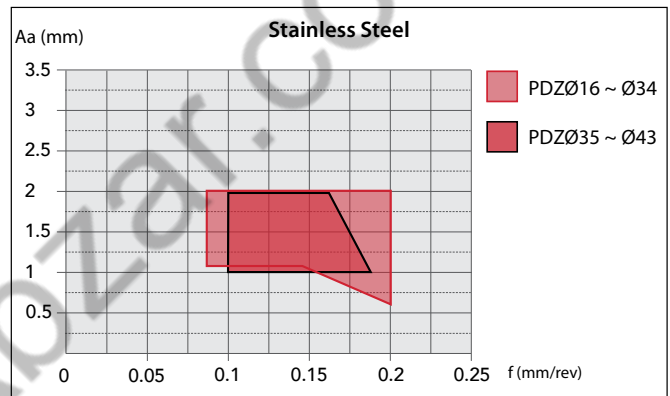
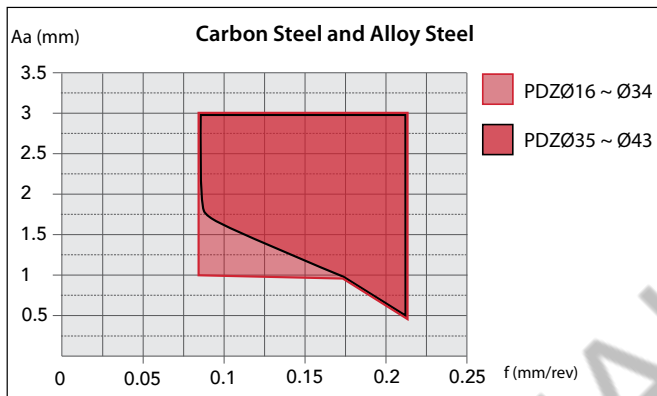
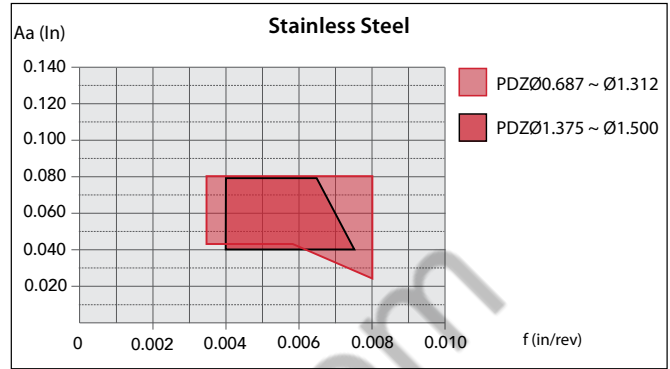
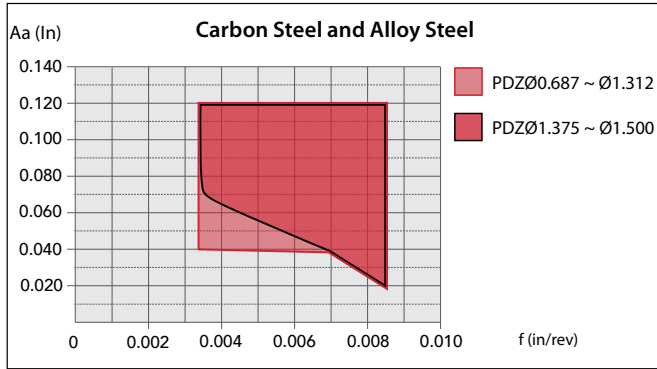
○ good ⊙ best

Cutting Conditions - Drilling

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



Cutting Conditions - Turning



BavandAbzar.com

PHOENIX® PLDS

PHOENIX® PLDS is a versatile series of indexable tools for spot drilling, countersinking & chamfering.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/plds

List Numbers

52512 - PHOENIX® PLDS SA (Inch)
 78034 - PHOENIX® PLDS SS (Metric)
 78134 - PHOENIX® PLDS SF (Metric)
 78PLDS - PHOENIX® PLDS Inserts

Size Range

0.567"-0.618", 90° & 120°
 14.4mm-17.3mm, 90° & 120°
 14.4mm-17.3mm, 90° & 120°

Primary Applications

- Centering, Hole Entry Countersinking, V Slotting, Corner Chamfering

Features & Product Solutions

Economic 3-Corner Insert

Combines Chipping Resistance and Sharpness

High-strength insert grades that can be selected according to the work material.

XP9020 for steel and cast iron

XP2040 for stainless steel and heat resistant alloys

Large rake angle and low cutting resistance.



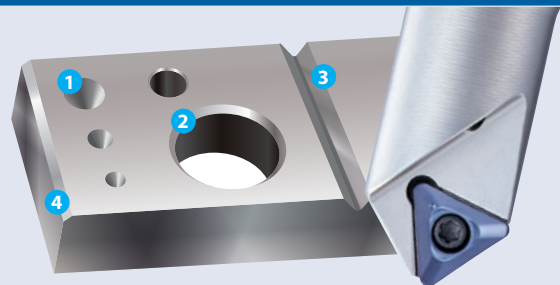
Highly rigid negative chamfer tip enables difficult centering operations.

Cutting edge specification enables optimal chip shape creation.

Efficient Processing in Multiple Operations

Bodies Available: 90° and 120°

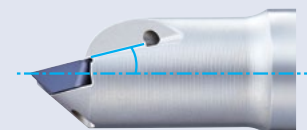
- Centering
- Hole Entry Countersinking
- V Slotting
- Corner Chamfering



Burr Suppression

Negative Axial Rake Angle

The PLDS features a negative axial rake angle that suppresses burrs on the work surface.

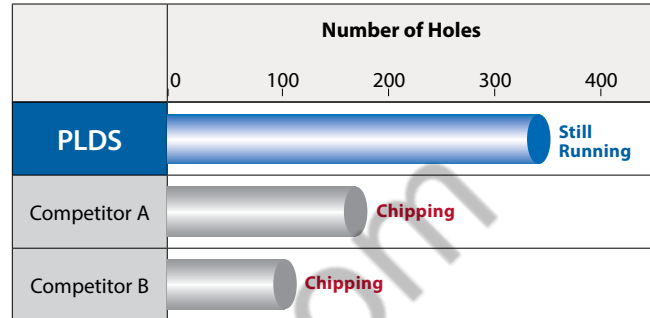


90° Centering in Stainless Steel

304 Stainless Steel

The PLDS exhibits excellent wear resistance, and continues to perform, even after machining more than twice the number of holes as the competitor products.

Tool	PLDS11R002SS16-90
Insert (Grade)	TPKT110308ER-DM (XP2040)
Work Material	304 Stainless Steel
Cutting Speed	206 SFM (2000 RPM)
Feed	3.15 IPM (0.0016 in/rev)
Depth	0.157 in (Ø0.394" Countersink diameter)
Coolant	Water-Soluble
Machine	HMC



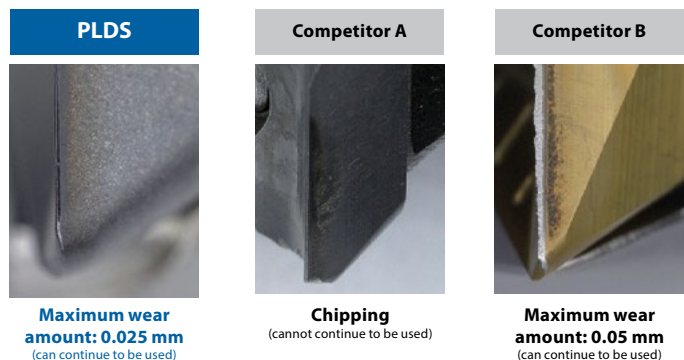
90° Centering in Carbon Steel

1050 Carbon Steel

The PLDS exhibits minimal wear even after machining 700 holes.

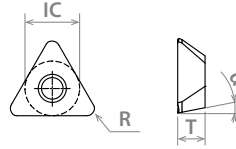
Tool	PLDS11R002SS16-90
Insert (Grade)	TPKT110308ER-DM (XP9020)
Work Material	1050 Carbon Steel
Cutting Speed	308 SFM (3000 RPM)
Feed	7.09 IPM (0.0024 in/rev)
Depth	0.157 in (Ø0.394" Countersink diameter)
Coolant	Water-Soluble
Machine	HMC

Wear Comparison After Machining 700 Holes



List 78PLDS

PLDS Inserts



Designation	No. of Cutting Edges	Insert Size				EDP Number		Status
		IC (mm)	T (mm)	α	R (mm)	XP9020	XP2040	
TPKT110308ER-DM	3	6.35	3.18	11°	0.8	7814205	7813205	●

Packed: 10 pcs.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 7808H

PLDS Accessories

Appearance	EDP No.	Designation	Applicable Insert	Recommended Tightening Torque	Status
 Clamping Screw	7808138	FS22550P (M2.2 x 5, Torx 7IP)	TPKT11...	1.0 Nm	●
 Wrench	7808224	7IP-D (Torx 7IP)	TPKT11...	-	●

Note: Wrench sold separately.

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

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



Cutting Conditions

Work Material	Tensile Strength - Hardness	Cutting Speed Vc (SFM)	Feed Rate f (in/rev)	
			Centering	Countersinking
P Mild Steels, Carbon Steels (1010, 1018) Carbon Steels, Alloy Steels (1050, 4140) Die Steels (H13, D2)	~180 HB	260 (200 - 400)	0.0025 (0.001 - 0.003)	0.003 (0.002 - 0.0045)
	~280 HB	260 (200 - 400)	0.0025 (0.001 - 0.003)	0.003 (0.002 - 0.0045)
	~280 HB	260 (200 - 400)	0.0025 (0.001 - 0.003)	0.003 (0.002 - 0.0045)
M Stainless Steels (304, 420)	~250 HB	260 (200 - 330)	0.0025 (0.001 - 0.003)	0.003 (0.002 - 0.0045)
K Cast Iron (No. 35 B) Ductile Cast Iron (60-40-18)	~350 N/mm ²	330 (200 - 460)	0.0025 (0.001 - 0.003)	0.003 (0.002 - 0.0045)
	~800 N/mm ²	330 (200 - 460)	0.0025 (0.001 - 0.003)	0.003 (0.002 - 0.0045)
N Aluminum Alloys (6061, 7075)	~13% Si	500 (330 - 650)	0.0025 (0.001 - 0.003)	0.003 (0.002 - 0.0045)
S Heat Resistant Alloys (Inconel 718) Titanium Alloy (Ti-6Al-4V)	-	115 (80 - 200) 130 (100 - 330)	0.0015 (0.001 - 0.0025) 0.0025 (0.001 - 0.003)	0.003 (0.002 - 0.0045) 0.003 (0.002 - 0.0045)
	-	200 (165 - 260)	0.0025 (0.001 - 0.003)	0.003 (0.002 - 0.0045)
H Pre-hardened Steel (P20, Stavax) Hardened Steels (D2)	40 - 43 HrC	200 (165 - 260)	0.0025 (0.001 - 0.003)	0.003 (0.002 - 0.0045)
	43 - 48 HrC	165 (130 - 260)	0.0025 (0.001 - 0.003)	0.003 (0.002 - 0.0045)

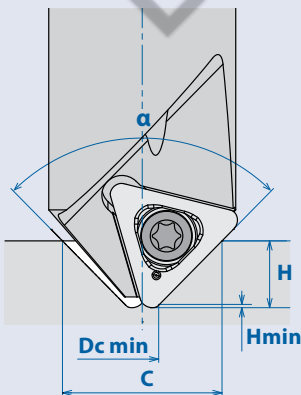
1. For V slotting, use 80% of the Countersinking feed rate shown in the above table.

Recommended Materials by Application

Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
XP9020	DM	Yes	⊙	○	⊙	○	○	○
XP2040	DM	-	○	○				
		Yes	○	⊙		○	⊙	⊙

○ good ⊙ best

Standard Centering Depth (H)



When Point Angle (α) = 90°
Min. Centering Depth (H min) = 0.25mm
Min. Drill Hole Diameter (Dc min) = Ø2.5mm

$$H = (C - Dc \text{ min}) \div 2 + Hmin$$

H = Centering Depth (in mm)
 C = Countersink Diameter (in mm)

Ex: If Point Angle (α) = 90° and Countersink Diameter (C) = Ø10mm, Centering Depth (H) = 4mm

When Point Angle (α) = 120°
Min. Centering Depth (H min) = 0.1mm
Min. Drill Hole Diameter (Dc min) = Ø2.4mm

$$H = (C - Dc \text{ min}) \div 3.46 + Hmin$$







H = Centering Depth (in mm)
 C = Countersink Diameter (in mm)

Ex: If Point Angle (α) = 120° and Countersink Diameter (C) = Ø10mm, Centering Depth (H) = 2.3mm

Illustrated Index

List	Item	Brand	Inch/ Metric	Material	Coating	Size Range	Features	Overview/ Cutting Data	Product Page	Tech Page
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A Brand

16640		A Brand AT-2	Metric	Carbide	DUREY	M3-M12	DUREY Coating, End-Cutting Edge, Metric	46-47	48	49
16645		A Brand AT-2	Inch	Carbide	DUREY	#8-1/2"	DUREY Coating, End-Cutting Edge, Inch	46-47	48	49
16647		A Brand AT-2 R-SPEC	Inch	Carbide	DLC- IGUSS	#4-1/2"	Coolant-Through*, End Cut	50-51	52	53
16642		A Brand AT-2 R-SPEC	Metric	Carbide	DLC- IGUSS	M3-M12	Coolant-Through*, End Cut	50-51	52	53
16610		A Brand A-CHT	Metric	Carbide	Bright	M5-M16	Coolant-Through, DIN Overall Length, Bottom (1.5P)	54-55	56	-
16615		A Brand A-CHT	Inch	Carbide	Bright	No. 12- 5/8"	Coolant-Through, DIN Overall Length, Bottom (1.5P)	54-55	57	-

List No.	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
	1010 1018	1035 1045	1065	4140 4340													

A Brand

16640	○	⊙	⊙	⊙	⊙	○	○	⊙	⊙	○	○	○	○	⊙	⊙	⊙	⊙
16645	○	⊙	⊙	⊙	⊙	○	○	⊙	⊙	○	○	○	○	⊙	⊙	⊙	⊙
16647										⊙	⊙						
16642										⊙	⊙						
16610									⊙	⊙	⊙						
16615									⊙	⊙	⊙						

○ good ⊙ best

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A Brand AT-2

Overview

A Brand AT-2

The OSG A Brand AT-2 Thread mills with end-cutting edge for high hardness steels is ideal for highly difficult high hardness steel applications. The risk of sudden tool breakage can be minimized by breaking chips into small and manageable pieces and evacuating them smoothly. Since no pilot hole is required, process integration and the risk of breakage can be avoided.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/at-2

List Numbers

16645 - A Brand AT-2 (Inch)
16640 - A Brand AT-2 (Metric)

Size Range

#8-1/2"
M3-M12

Primary Applications

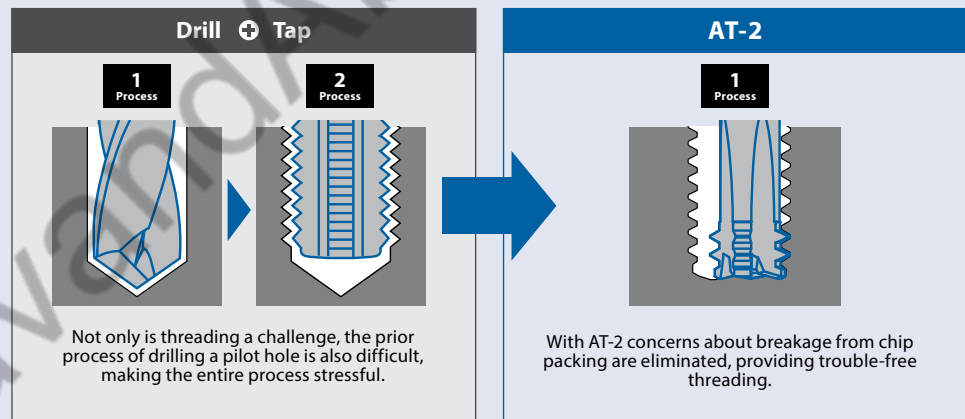
- Customers threading high hardened materials.
- Customers looking for thread processing efficiency.

Features & Product Solutions

2 Processes with 1 Tool

Helical Drilling & Threading Done Simultaneously

Helical drilling and threading are performed simultaneously, which reduces the risk of potential machining problems in the processing of high hardness steels. The risk of sudden tool breakage is minimized as the chips are broken into small, manageable pieces and evacuated smoothly. Since no pilot hole is required, AT-2 integrates two processes while avoiding part scrap.



Superior Heat Resistance and Toughness

DUOREY Coating (PAT. P)

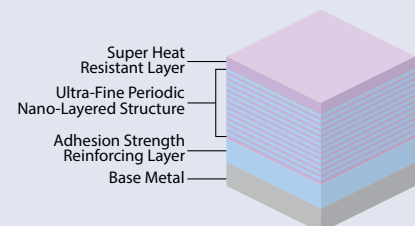
OSG's newly developed DUOREY coating, with its unique coating structure, provides superior heat resistance and toughness for high-hardness steel milling. DUOREY coating also suppresses chipping and achieves longer tool life.

Coating Structure

Coating Color	Coating Structure	Hardness (GPa)	Oxidation Temp. (°C)	Heat Resistance
Black Gray	Ultra-Fine Periodic Nano-Layered	41	1,300	⊙
Adhesion Strength	Surface Roughness	Wear Resistance	Welding Resistance	Toughness
○	Fair	⊙	○	○

DUOREY is a registered trademark of OSG Corporation.

○ good ⊙ best

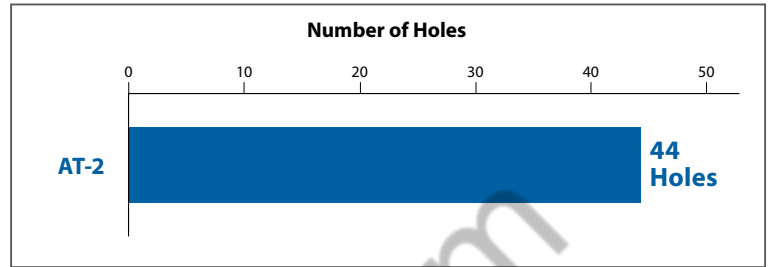


Remarkable Durability in 65 HRC Material

M2 High Speed Steel (65 HRC)

AT-2 demonstrates outstanding durability by cutting with air-blow.

Size	Ø 4 x 10 P0.8
Material	M2 High Speed Steel (65 HRC)
Speed	150 SFM (3581 RPM)
Feed	1.14 IPM (0.0004 IPT)
Thread Size	M5 x 0.8
Depth	8mm (2D)
Coolant	Air blow
Machine	HMC

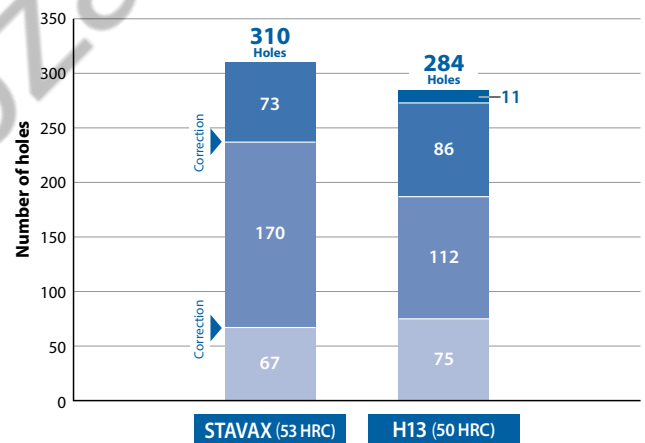


Excellent Durability in STAVAX

STAVAX (53 HRC) and H13 (50 HRC)

Even in difficult stainless steels AT-2 provides excellent tool life.

Size	Ø 7.5 x 20 P1.5	
Material	STAVAX (53 HRC)	H13 (50 HRC)
Speed	180 SFM (2,331 RPM)	
Feed	3.50 IPM (0.0015 IPT)	
Thread Size	M10 x 1.5	
Depth	18mm (1.8D)	
Coolant	Air Blow	
Machine	HMC (BT40)	

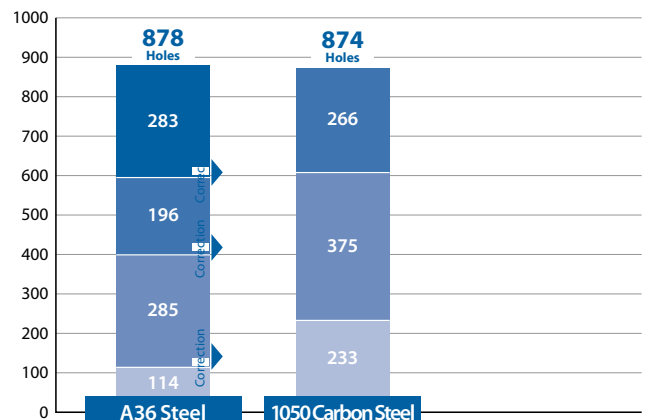


Stable Performance Even in General Steels

STAVAX (53 HRC) and H13 (50 HRC)

Since there is no cutting chip trouble, it is effective for avoiding the risk of tool breakage. Processing consolidation is also made possible.

Size	Ø 3.1 x 8 P0.7	
Material	A36 Steel	1050 Carbon Steel
Speed	150 SFM (3581 RPM)	150 SFM (1910 RPM)
Feed	2.60 IPM (0.0009 IPT)	2.87 IPM (0.0015 IPT)
Thread Size	M4 x 0.7	
Depth	7mm (1.75D)	
Coolant	Water soluble	
Machine	VMC	



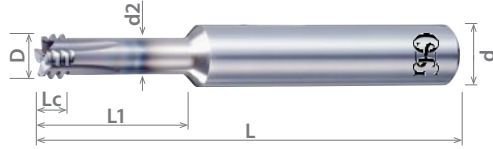
A Brand AT-2

Advanced Performance End-Cutting Thread Mill for High-Hardness Steel

List 16640

AT-2, Coolant-Through*, Straight Flute, End Cut

NEW	SPEED FEED P49	CARBIDE	DUROREY	0°	LH	SHANK h6
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Units: mm

Size	Threads Per Inch	Cutter Diameter	Overall Length	Length of Cut	Neck Diameter	Neck Length	Shank Diameter	Coolant Through	No. of Flutes	EDP Number	Status
		D	L	Lc	d2	L1	d			DUROREY	
M3	0.50	2.40	50.00	1.50	1.82	7.25	6.00	-	4	8331200	●
M4	0.70	3.10	50.00	2.10	2.30	9.75	6.00	-	4	8331201	●
M5	0.80	4.00	50.00	2.40	3.10	12.00	6.00	-	4	8331202	●
M6	1.00	4.60	50.00	3.00	3.48	14.50	6.00	-	4	8331203	●
M8	1.25	6.20	70.00	3.75	4.81	19.13	10.00	-	4	8331204	●
M10	1.50	7.50	70.00	4.50	5.84	23.75	10.00	Yes	4	8331205	●
M12	1.75	9.00	80.00	5.25	7.07	28.38	10.00	Yes	4	8331206	●

Packed: 1 pc. Available DUROREY coating only. For internal threads only.

● Stocked ○ Available Upon Request ▲ Japan Stocked

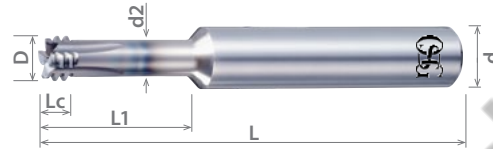
Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 16645

AT-2, Coolant-Through*, Straight Flute, End Cut

NEW	SPEED FEED P49	CARBIDE	DUROREY	0°	LH	SHANK h6
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Units: Inch

Size	Threads Per Inch	Cutter Diameter	Overall Length	Length of Cut	Neck Diameter	Neck Length	Shank Diameter	Coolant Through	No. of Flutes	EDP Number	Status
		D	L	Lc	d2	L1	d			DUROREY	
#8	32	0.122	2.000	0.0938	0.0866	0.4059	1/4	-	4	1664500011	●
#10	24	0.146	3.000	0.1250	0.0988	0.4843	1/4	-	4	1664500111	●
1/4	20	0.179	3.000	0.1500	0.1236	0.6252	1/4	-	4	1664500211	●
1/4	28	0.179	3.000	0.1071	0.1390	0.5894	1/4	-	4	1664500311	●
5/16	18	0.224	3.500	0.1667	0.1626	0.7642	3/8	-	4	1664500411	●
5/16	24	0.224	3.500	0.1250	0.1776	0.7295	3/8	-	4	1664500511	●
3/8	16	0.264	3.500	0.1875	0.1945	0.9063	3/8	-	4	1664500611	●
3/8	24	0.264	3.500	0.1250	0.2169	0.8543	3/8	-	4	1664500711	●
1/2	13	0.362	3.500	0.2308	0.2776	1.1921	3/8	Yes	4	1664500811	●
1/2	20	0.362	3.500	0.1500	0.3067	1.1252	3/8	Yes	4	1664500911	●

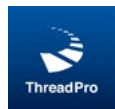
Packed: 1 pc. Available DUROREY coating only. For internal threads only.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



For more information on thread mill applications, including ThreadPro software, visit: www.osgtool.com/ThreadPro.



List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
16640	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
16645	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

○ good ○ best



List 16640 - A Brand AT-2

List 16645 - A Brand AT-2

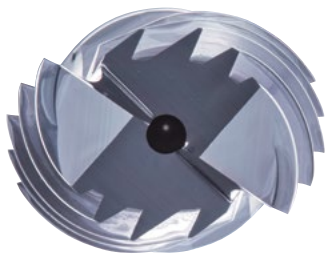
Work Material		Cutting Speed SFM	Feed Rate (in/t)
Low Carbon Steel	~C0.25%	115 - 180	0.0004 - 0.0028
Medium Carbon Steel	C0.25%~0.45%	260 - 525	0.0004 - 0.0028
High Carbon Steel	C0.45%~	260 - 525	0.0004 - 0.0028
Alloy Steel	4140, 4340, 8620	200 - 400	0.0004 - 0.0028
Hardened Steel	25-45 HRC	115 - 250	0.0004 - 0.0028
	45-50 HRC	115 - 215	0.0004 - 0.0028
	50-65 HRC	115 - 180	0.0004 - 0.0028
Stainless Steel	300-Series, 400-Series	115 - 330	0.0004 - 0.0028
Tool Steel	D2, H13, A6	115 - 330	0.0004 - 0.0028
Cast Steel	-	115 - 330	0.0004 - 0.0028
Cast Iron	-	115 - 330	0.0004 - 0.0028
Ductile Cast Iron	-	115 - 330	0.0004 - 0.0028
Copper	-	115 - 330	0.0004 - 0.0028
Brass	B21, B36	115 - 330	0.0004 - 0.0028
Brass Casting	B62	115 - 330	0.0004 - 0.0028
Bronze	B124, B103, B159	115 - 330	0.0004 - 0.0028
Aluminum	6061, 7075, 2014	115 - 330	0.0004 - 0.0028
Aluminum Alloy Casting	-	115 - 330	0.0004 - 0.0028
Magnesium Alloy Casting	-	115 - 330	0.0004 - 0.0028
Zinc Alloy Casting	-	115 - 330	0.0004 - 0.0028
Titanium Alloy*	Ti-6Al-4V	115 - 180	0.0004 - 0.0028
Nickel Alloy*	Inconel	115 - 180	0.0004 - 0.0028
Thermosetting Plastic	-	115 - 330	0.0004 - 0.0028
Thermo Plastic	-	115 - 330	0.0004 - 0.0028

1. The indicated speeds and feeds are for air blow cooling.
2. Please use water soluble coolant when machining aluminum materials.
3. When machining magnesium please refer to the coolant oil manufacturer's specification for recommended oil. Please also properly dispose of the cutting chips to prevent fire hazards.
4. Please adjust the cutting conditions depending on the rigidity of the machine, tool holder, and workpiece clamping.
5. Tool vibration should be kept at a minimum level to ensure highest thread accuracy.
6. Select a higher feed rate for larger diameter tooling and a lower feed rate for smaller diameters.
7. The tool is left-hand cutting - program the spindle for counterclockwise rotation.

*Titanium and Nickel alloy parameters are only to be used for tools with internal coolant running water soluble coolant.

A Brand[®] AT-2 R-SPEC

Overview



A Brand AT-2 R-SPEC

The OSG A Brand AT-2 R-SPEC high-efficiency thread mill is engineered to dramatically reduce machining time in non-ferrous metal applications such as aluminum alloy by its continuous helical cutting ability, which combines drilling and threading into a single process. The AT-2 R-SPEC is also effective as a countermeasure against cutting position misalignment in cast holes.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/at-2-r-spec



List Numbers

16647 - A Brand AT-2 R-SPEC (Inch)
16642 - A Brand AT-2 R-SPEC (Metric)

Size Range

#4-1/2"
M3-M12

Primary Applications

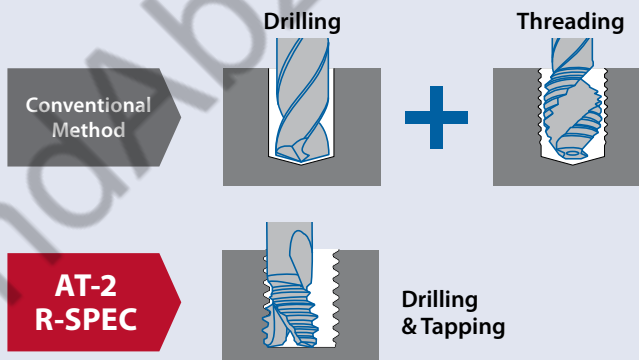
- Customers threading Aluminum material.
- Customers threading into Cast hole.
- Customers looking for thread processing efficiency.

Features & Product Solutions

Cycle Time Reduction

2 Processes with 1 Tool

Achieves drilling and threading by continuous helical cutting with a single tool.

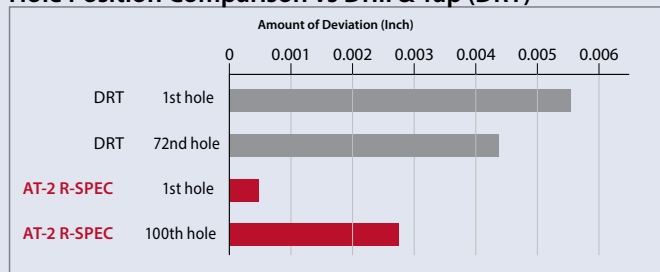


Hole Position Accuracy

Countermeasure Against Misalignment in Cast

Rough position settings and inclined nature of cast holes can cause position shifting in following processes.

Hole Position Comparison vs Drill & Tap (DRT)



Tool: M8x1.25 **Depth:** 0.7087" **Material:** Casting Aluminum
Machining Test Shifter 0.02756" from the pilot hole Ø0.1693"
DRT: SFM = 328, IPR = 0.0492
AT-2 R-SPEC: AFM = 722, IPR = 0.0472



Cycle Time Reduction Against Drill & Tap

ADC12 Aluminum Alloy

Tool	AT-2 R-SPEC	ADO-3D	A-SFT
Size	M6 x 1.0	5.0mm	M6 x 1.0
Material	ADC12 Aluminum Alloy		
Speed	525 SFM	230 SFM	62 SFM
Feed	0.0138 IPT	0.0067 IPR	Tapping
Depth	12mm Threading Depth		
Coolant	Water Soluble		
Machine	BT40 Horizontal		
Total Holes	13 Hole Cycle		
Cycle Time	62.5s	93.3s	



71m/min 0.17 mm/rev
(4,520 min-1 768 mm/min)

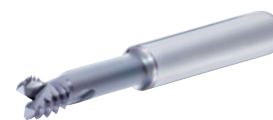


18.8 m/min
(1,000 min-1)

93.3s

Including 1 ATC

**30.8s
Reduction**



160 m/min 0.35 mm/t
(11,072 min-1 1,808 mm/min)

62.5s

Cycle Time Reduction Against Tap

6061 Aluminum Alloy

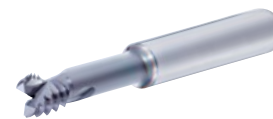
Tool	AT-2 R-SPEC	A-SFT
Size	M6 x 1.0	
Material	6061 Aluminum Alloy	
Speed	720 SFM	89 SFM
Feed	0.0090 IPT	Tapping
Depth	12 mm Threading Depth	
Coolant	Water Soluble	
Machine	HSK50 Vertical	
Cycle Time	2.27s	3.83s



27.2 m/min
(2,000 min-1)

3.83s

**1.56s
Reduction**



220 m/min 0.228 mm/t
(13,840 min-1 1,621 mm/min)

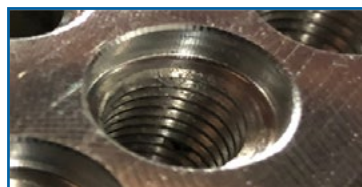
2.27s

Threading in Aluminum with Air Blow

Aluminum Alloy (AlMgSi0.5)

AT-2 R-SPEC can be used with air blow if there is a pre-hole.

	Case 1	Case 2
Thread size	M6 x 1	M8 x 1.25
Thread length	0.3150"	0.5118"
Drill depth	0.1969"	0.2638"
Machine	HSK 63 vertical MC (HERMLE)	
Coolant	Air Blow	
Work material	Aluminum Alloy (AlMgSi0.5)	
Cutting speed	722 SFM	
Feed rate	0.0049 IPT	
Cutting time	3.0 s	6.7 s



AT-2 R-SPEC after 100 Holes

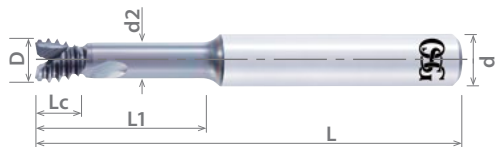
A Brand AT-2 R-SPEC

Advanced Performance End-Cutting Thread Mill for Non-Ferrous Materials

List 16647

AT-2 R-Spec, Coolant-Through*, End Cut

NEW SPEED FEED P53 CARBIDE DLC-IGUSS LH SHANK h6



Units: Inch

Size	Threads Per Inch	Cutter Diameter		Overall Length		Length of Cut		Neck Diameter		Neck Length		Shank Diameter		Coolant Through	No. of Flutes	EDP Number		Status
		D	L	Lc	d2	L1	d	DLC-IGUSS										
#4	40	0.083	2.000	0.125	0.0543	0.311	1/4	-	2	1664700009	●							
#6	32	0.100	2.000	0.156	0.0654	0.385	1/4	-	2	1664700109	●							
#8	32	0.122	2.000	0.156	0.0870	0.437	1/4	-	2	1664700209	●							
#10	24	0.146	3.000	0.208	0.0992	0.526	1/4	-	2	1664700309	●							
#10	32	0.146	3.000	0.156	0.1106	0.489	1/4	-	2	1664700409	●							
1/4	20	0.179	3.000	0.250	0.1236	0.675	1/4	Yes	2	1664700509	●							
1/4	28	0.179	3.000	0.179	0.1390	0.625	1/4	Yes	2	1664700609	●							
5/16	18	0.224	3.500	0.278	0.1630	0.819	3/8	Yes	2	1664700709	●							
5/16	24	0.224	3.500	0.208	0.1780	0.771	3/8	Yes	2	1664700809	●							
3/8	16	0.264	3.500	0.313	0.1949	0.969	3/8	Yes	2	1664700909	●							
3/8	24	0.264	3.500	0.208	0.2173	0.896	3/8	Yes	2	1664701009	●							
1/2	13	0.362	3.500	0.385	0.2776	1.269	3/8	Yes	2	1664701109	●							
1/2	20	0.362	3.500	0.250	0.3067	1.175	3/8	Yes	2	1664701209	●							

Packed: 1 pc. Available DLC-IGUSS coating only. For internal threads only.

● Stocked ○ Available Upon Request ▲ Japan Stocked

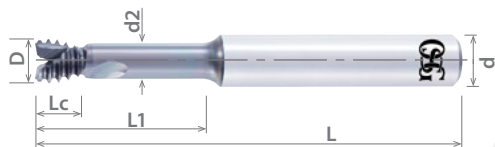
Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 16642

AT-2 R-Spec, Coolant-Through*, End Cut

NEW SPEED FEED P53 CARBIDE DLC-IGUSS LH SHANK h6



Units: mm

Size	Threads Per Inch	Cutter Diameter		Overall Length		Length of Cut		Neck Diameter		Neck Length		Shank Diameter		Coolant Through	No. of Flutes	EDP Number		Status
		D	L	Lc	d2	L1	d	DLC-IGUSS										
M3	0.50	2.40	50	1.50	1.82	7.75	6	-	2	8331220	●							
M4	0.70	3.10	50	2.10	2.30	10.45	6	-	2	8331221	●							
M5	0.80	4.00	50	2.40	3.10	12.80	6	-	2	8331222	●							
M6	1.00	4.60	50	3.00	3.48	15.50	6	Yes	2	8331223	●							
M8	1.25	6.20	70	3.75	4.81	20.38	8	Yes	2	8331224	●							
M10	1.50	7.50	80	4.50	5.84	25.25	10	Yes	2	8331225	●							
M12	1.75	9.00	80	5.25	7.07	30.13	10	Yes	2	8331226	●							
M3	0.50	2.40	50	1.50	1.82	9.25	6	-	2	8331227	●							
M4	0.70	3.10	50	2.10	2.30	12.45	6	-	2	8331228	●							
M5	0.80	4.00	50	2.40	3.10	15.30	6	-	2	8331229	●							
M6	1.00	4.60	50	3.00	3.48	18.50	6	Yes	2	8331230	●							
M8	1.25	6.20	70	3.75	4.81	24.38	8	Yes	2	8331231	●							
M10	1.50	7.50	80	4.50	5.84	30.25	10	Yes	2	8331232	●							
M12	1.75	9.00	80	5.25	7.07	36.13	10	Yes	2	8331233	●							

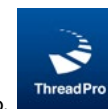
Packed: 1 pc. Available DLC-IGUSS coating only. For internal threads only.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



For more information on thread mill applications, including ThreadPro software, visit: www.osgtool.com/ThreadPro.



List No.	Work Material																		
	P					M			K	N		S		H					
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels					
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
16647										○	○								
16642										○	○								

○ good ○ best



List 16642 - A Brand AT-2 R-SPEC List 16647 - A Brand AT-2 R-SPEC

Work Material		Cutting Speed SFM	Feed Rate (in/t)
Low Carbon Steel	~C0.25%	-	-
Medium Carbon Steel	C0.25%~0.45%	-	-
High Carbon Steel	C0.45%~	-	-
Alloy Steel	4140, 4340, 8620	-	-
Hardened Steel	25-45 HRC	-	-
	45-50 HRC	-	-
	50-65 HRC	-	-
Stainless Steel	300-Series, 400-Series	-	-
Tool Steel	D2, H13, A6	-	-
Cast Steel	-	-	-
Cast Iron	-	-	-
Ductile Cast Iron	-	-	-
Copper	-	330 - 985	0.0118 - 0.0197
Brass	B21, B36	-	-
Brass Casting	B62	-	-
Bronze	B124, B103, B159	-	-
Aluminum	6061, 7075, 2014	330 - 985	0.0118 - 0.0197
Aluminum Alloy Casting	-	330 - 985	0.0118 - 0.0157
Magnesium Alloy Casting	-	330 - 985	0.0118 - 0.0197
Zinc Alloy Casting	-	-	-
Titanium Alloy*	Ti-6Al-4V	-	-
Nickel Alloy*	Inconel	-	-
Thermosetting Plastic	-	-	-
Thermo Plastic	-	-	-

1. This cutting condition table shows the standard values. When machining, it is recommended to use the program created by the NC program creation tool "ThreadPro".
2. Please select "Continuous" as the path type of ThreadPro.
3. Please use water soluble coolant unless there is pre-hole made by casting or drilling.
4. When machining magnesium please refer to the coolant oil manufacturer's specification for recommended oil. Please also properly dispose of the cutting chips to prevent fire hazards.
5. Please adjust the cutting conditions depending on the rigidity of the machine, tool holder, and workpiece clamping.
6. Tool vibration should be kept at a minimum level to ensure highest thread accuracy.
7. Select a higher feed rate for larger diameter tooling and a lower feed rate for smaller diameters.
8. The tool is left-hand cutting - program the spindle for counterclockwise rotation.

Note

Bottom shape of finished hole is as depicted in the right picture. Please make sure that it is acceptable based on the cutting instruction in advance.



A Brand® A-CHT

Overview

A Brand A-CHT

A Brand A-CHT is an Advanced Performance Carbide Coolant-Through Taps for Cast Iron and Aluminum Alloy.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/a-cht



List Numbers

16610 - A Brand A-CHT (Metric)
16615 - A Brand A-CHT (Inch)

Size Range

5mm-12mm
1/4"-1/2"

Primary Applications

- Threading in Cast Aluminum
- Threading in Cast Iron

Features & Product Solutions

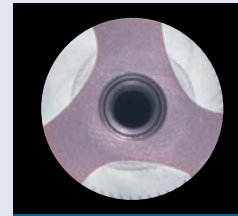
Excellent Coolant Flow

Larger Oil Hole Design

Larger oil hole design provides 1.3 times more coolant flow than conventional designs.



Conventional



A-CSF & A-CHT

Excellent Performance in Non-Ferrous Materials

Bright Finish

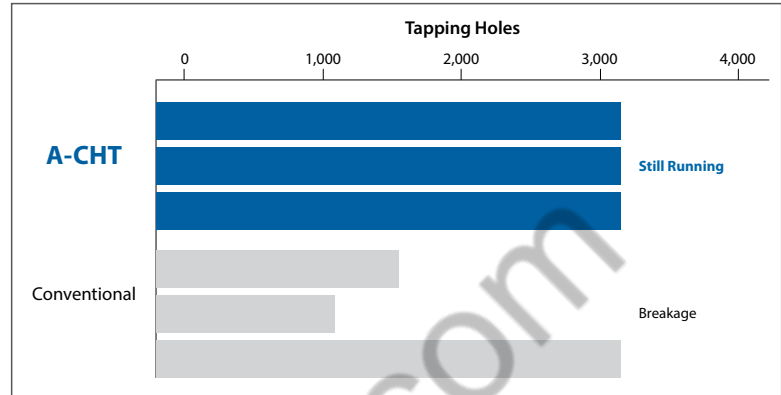
High Wear Resistance and Toughness

Ultra-Fine Grain Carbide

Stable and Consistent Performance

Stable Machining in Ductile Cast Iron

Tool	A-CHT	Conventional
Size	ØM6 x 1	
Drill Hole Size	Ø5mm x 15mm (Blind)	
Work Material	Ductile Cast Iron	
Tapping Depth	12mm (2xD)	
Cutting Speed	100 SFM (1,600 RPM)	
Coolant	Water Soluble Chlorine-Free (10%) (Internal)	
Machine	Horizontal Machining Center (Synchronized)	



BavandAbzar.com

A Brand A-CHT

Advanced Performance Carbide Coolant-Through Taps for Cast Iron and Aluminum Alloy

List 16610

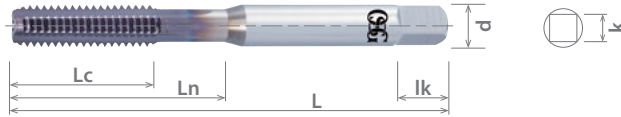
NEW



CARBIDE

BR

A-CHT, Coolant-Through, DIN Overall Length, Bottom (1.5P)



Units: mm

Tap Size	Thread Limit	No. of Flutes	EDP Number	DIN Overall Length	Thread Length	Neck Length	Shank Dia.	Square Width	Square Length	Status
			Bottom (1.5P)							
			Bright							
M5 x 0.8	D4	3	1661000000	70.00	10.00	25.00	4.93	3.86	6.35	●
M6 x 1.0	D5		1661000100	80.00	12.00	31.00	6.48	4.85	7.92	●
M8 x 1.25			1661000200	90.00	15.00	35.00	8.08	6.05	9.52	●
M10 x 1.5	D6	4	1661000300	100.00	18.00	39.00	9.68	7.26	11.11	●
M10 x 1.25	D5		1661000400							●
M12 x 1.75	D6		1661000500	110.00	21.00	9.32	6.98	●		
M12 x 1.5			1661000600	100.00				●		
M12 x 1.25			1661000700	100.00				●		
M14 x 2.0	D7		1661000800	110.00	24.00	10.897	12.70	8.2	●	
M14 x 1.5			1661000900	100.00					●	
M16 x 2.0			1661001000	110.00					●	
M16 x 1.5			1661001100	100.00					●	

Packed: 1 pc. EDP's listed above are stocked standard, other coatings available upon request. Specify treatment at time of order.

Note: Reduce SFM 50% - 75% while using external coolant.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzar.com

Work Material																		
List No.	P					M			K	N		S		H				
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels				
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC
16610									○	○	○							
SFM									15-50	30-330	30-330							

○ good ○ best



List 16615

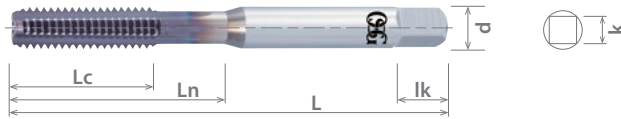
NEW



CARBIDE

BR

A-CHT, Coolant-Through, DIN Overall Length, Bottom (1.5P)



Units: Inch

Tap Size	Thread Limit	No. of Flutes	EDP Number		DIN Overall Length	Thread Length	Neck Length	Shank Dia.	Square Width	Square Length	Status
			Bottom (1.5P)	Bright							
			L	Lc							
12 - 24 UNC	H3	3	1661500200	3.150	L	0.500	0.945	0.220	0.165	0.281	●
12 - 28 UNF			1661500300								●
1/4 - 20 UNC	H5		1661500400	3.543	0.665	1.181	0.255	0.191	0.313	●	
1/4 - 28 UNF	H4		1661500500							●	
5/16 - 18 UNC	H5		1661500600	3.937	0.752	1.378	0.318	0.238	0.375	●	
5/16 - 24 UNF	H4		1661500700							●	
3/8 - 16 UNC	H5	1661500800	3.937	0.858	-	0.381	0.286	0.438	●		
3/8 - 24 UNF	H4	1661500900	3.543						●		
7/16 - 14 UNC	H5	4	1661501000	3.937	0.921	0.323	0.242	0.406	●		
7/16 - 20 UNF			1661501100						●		
1/2 - 13 UNC			1661501200	4.331	0.367	0.275	0.438	●			
1/2 - 20 UNF			1661501300					●			
5/8 - 11 UNC			1661501400	4.331	0.480	0.563	0.360	●			
5/8 - 18 UNF			1661501500					3.937	●		

Packed: 1 pc. EDP's listed above are stocked standard, other coatings available upon request. Specify treatment at time of order.
 Note: Reduce SFM 50% - 75% while using external coolant.

● Stocked ○ Available Upon Request ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.

















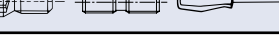
BavandAbzar.com

Work Material																	
List No.	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
16615									○	○	○						
SFM									15-50	30-330	30-330						

○ good ○ best



Illustrated Index

List	Item	Brand	Inch/ Metric	Material	Coating	Size Range	Features	Overview/ Cutting Data	Product Page	Tech Page
53400		PHOENIX® PMD	Inch	Steel	-	1"-1.25"	Indexable Multi-Function Cutter, SA	208-209	210	214-215
78234		PHOENIX® PMD	Metric	Steel	-	20mm - 32mm	Indexable Multi-Function Cutter, SS	208-209	210	214-215
52606		PHOENIX® PMD SF	Inch	Steel	-	1"-1.25"	Indexable Multi-Function Cutter, ASF	208-209	211	214-215
78334		PHOENIX® PMD SF	Metric	Steel	-	20mm - 32mm	Indexable Multi-Function Cutter, SF	208-209	211	214-215
78PZAG		PHOENIX® PMD Inserts	-	Carbide	-	-	PZAG Inserts for PMD	208-209	212	214-215
78PSE		PHOENIX® PMD Inserts	-	Carbide	-	-	PSE Inserts for PMD	208-209	212	214-215
7808H		PHOENIX® PMD Accessories	-	-	-	-	PMD Accessories	-	213	-
78013		PHOENIX® PSE SA/SF	Inch	Steel	-	0.375"-1.5"	Indexable 90° Shoulder Cutter, SA/SF	216-217	218-219	228-231
78011		PHOENIX® PSE SS	Metric	Steel	-	10mm - 63mm	Indexable 90° Shoulder Cutter, SS	216-217	220-221	228-231
78012		PHOENIX® PSE Bore	Inch	Steel	-	2"-6"	Indexable 90° Shoulder Cutter, Bore	216-217	222	228-231
78010		PHOENIX® PSE Bore	Metric	Steel	-	40mm - 125mm	Indexable 90° Shoulder Cutter, Bore	216-217	223	228-231
52601		PHOENIX® PSE SF	Inch	Steel	-	0.375"-1.5"	Indexable 90° Shoulder Cutter, ASF	216-217	224	228-231
78016		PHOENIX® PSE SF	Metric	Steel	-	10mm - 40mm	Indexable 90° Shoulder Cutter, SF	216-217	225	228-231
78PSE		PHOENIX® PSE Inserts	-	Carbide	-	-	PSE Inserts	216-217	226	228-231
7808H		PHOENIX® PSE Accessories	-	-	-	-	PSE Accessories	-	227	-

A Brand[®] AE-VMS-RA & AE-VMSS-RA

Overview

A Brand AE-VMS-RA & AE-VMSS-RA

A Brand AE-VMS-RA is an Advanced Performance Anti-Vibration Carbide End Mill with a Right Angle for milling straight corners.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/ae-vms-ra



List Numbers

- 8225 - A Brand AE-VMS-RA (Metric)
- 8226 - A Brand AE-VMSS-RA (Metric)

Size Range

- 3mm-6mm
- 1mm-6mm

Primary Applications

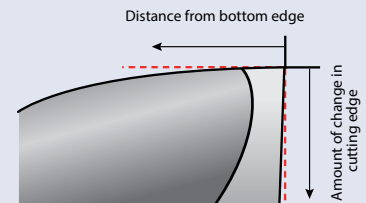
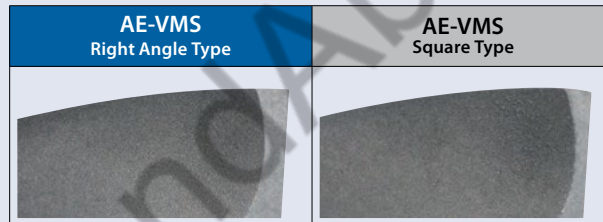
- Side milling and slotting with true 90° shoulder corners.
- Sinker EDM electrodes.
- Scroll compressors.

Features & Product Solutions

Mill Straight Corners

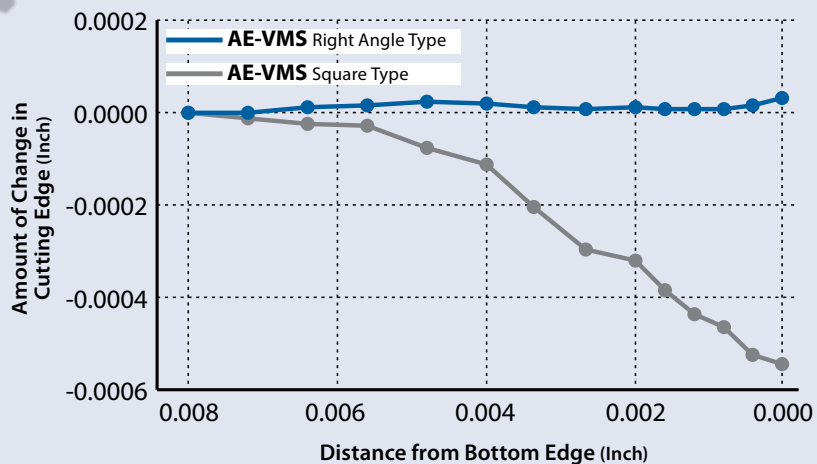
Unique Cutting Edge

Although the right angle type end mill includes a gash land, it is able to mill straight corners due to its unique geometry that maintains a consistent cutting diameter.



Enlarged view of cutting edge

Measured Value of Change in Cutting Edge of φ6 End Mill



* The values measured are internal data. The amount of change in the cutting edge may vary depending on the individual product.

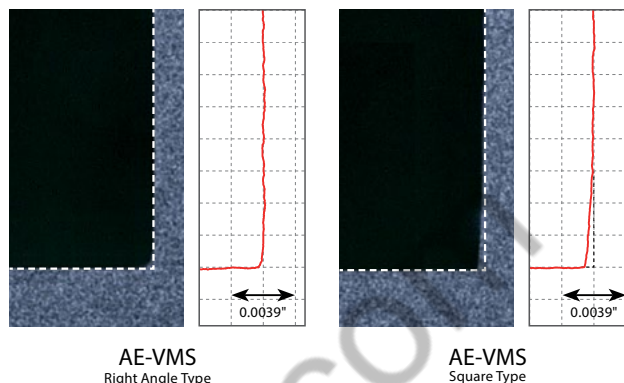


High Milling Quality

Straight Corner Milling

The milling of straight corners with no uncut residue is made possible by a unique cutting edge.

Tool	AE-VMS (Right Angle)
Tool Size	Ø3
Work Material	1050 Carbon Steel
Milling Method	Side Milling
Cutting Speed	298 SFM (9,660 RPM)
Feed	45.7 IPM (0.0012 IPT)
Depth of Cut	Aa= 0.177" / Ar= 0.024" (0.2xD)
Coolant	Air Blow

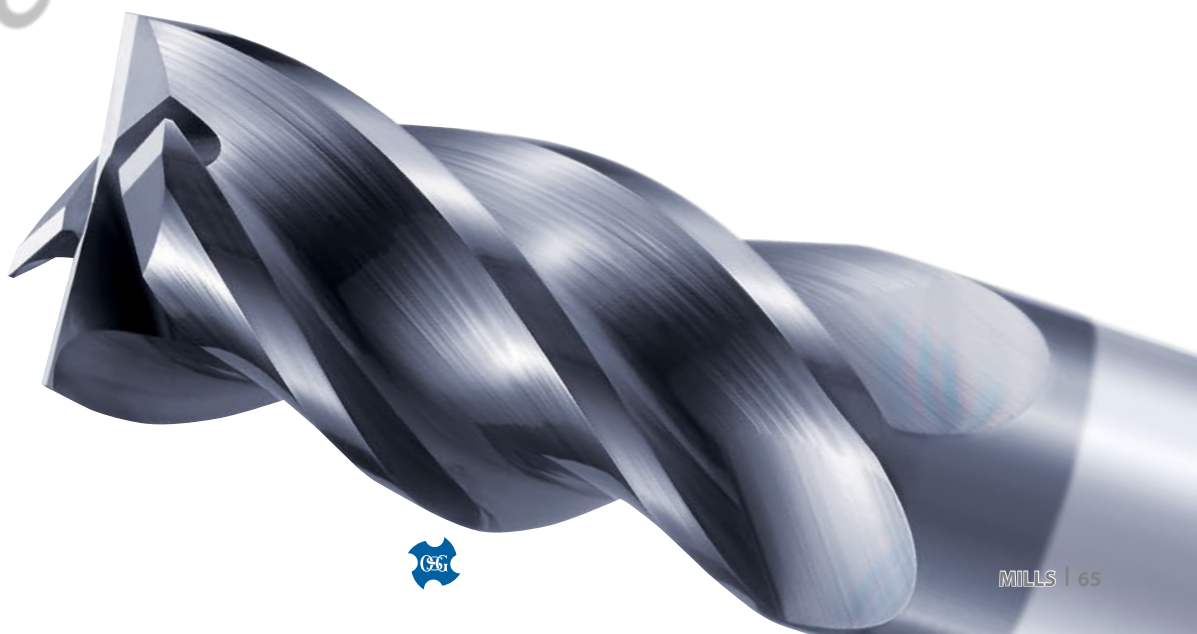
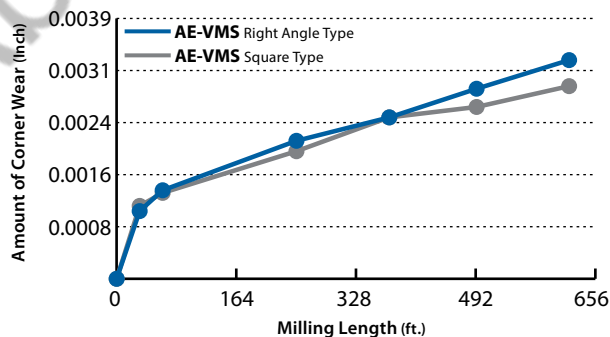


Stable Performance

Cutting Edge Rigidity

Normal progress of wear without chipping due to the gash land.

Tool	AE-VMS (Right Angle)
Tool Size	Ø6
Work Material	1050 Carbon Steel
Milling Method	Side Milling
Cutting Speed	426 SFM (6,900 RPM)
Feed	54.3 IPM (0.002 IPT)
Depth of Cut	Aa= .354" ; Ar= .047" (0.2xD)
Coolant	Air Blow



A Brand AE-VMS-RA

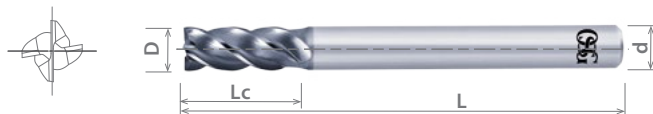
Advanced Performance Anti-Vibration Carbide End Mills

List 8225

AE-VMS-RA, 4 Flute, Regular Length, Right Angle Type

NEW	SPEED FEED P68-69	CARBIDE	DUARISE	Var.°	RA	SHRINK FIT
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Milling Diameter Tolerance	
D ≤ 12mm	0/-0.020mm



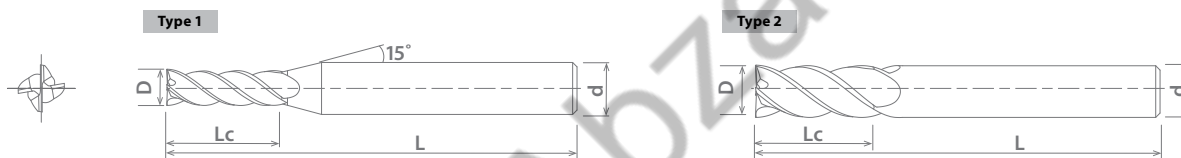
Units: mm

EDP Number	Mill Diameter	OAL	Length of Cut	Shank Diameter	Type	Status
	D	L	Lc	d		
8555730	3	60	8	6	1	▲
8555740	4	60	11	6	1	▲
8555750	5	60	13	6	1	▲
8555760	6	60	13	6	2	▲

Packed: 1 pc. Available Duarise coating only.

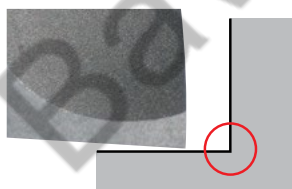
● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



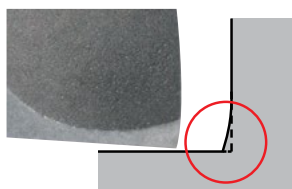
Right Angle Type for Milling Straight Corners

Right Angle Type
AE-VMSS,VMS(-RA)



Straight corners with no uncut residue.

Square Type
AE-VMSS,VMS



Choose the right angle type for milling straight corners!

Choose the square type for high processing efficiency!

See page 6 for details

Work Material

List No.	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
8225	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ good ○ best

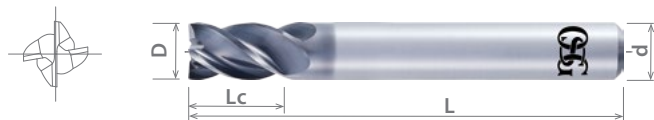


List 8226

AE-VMSS-RA, 4 Flute, Stub Length, Right Angle Type

NEW SPEED FEED P70-71 CARBIDE DUARISE Var.° RA SHRINK FIT

Milling Diameter Tolerance	
D ≤ 12mm	0/-0.020mm



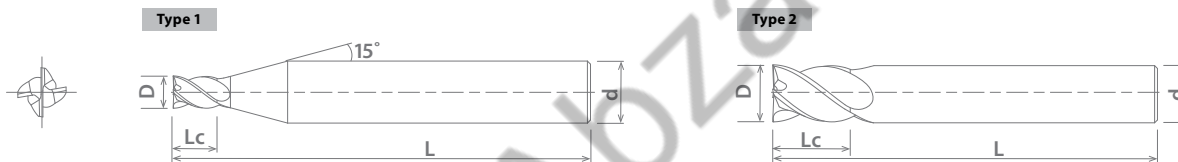
Units: mm

EDP Number	Mill Diameter	OAL	Length of Cut	Shank Diameter	Type	Status
	D	L	Lc	d		
8556550	1	40	1.5	4	1	▲
8556560	2	40	3	4	1	▲
8556570	3	45	4.5	6	1	▲
8556580	4	45	6	6	1	▲
8556590	5	45	7.5	6	1	▲
8556600	6	45	9	6	2	▲

Packed: 1 pc. Available Duarise coating only.

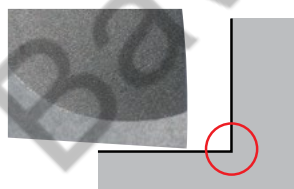
● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



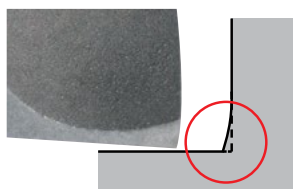
Right Angle Type for Milling Straight Corners

Right Angle Type
AE-VMSS,VMS(-RA)



Straight corners with no uncut residue.

Square Type
AE-VMSS,VMS



Choose the right angle type for milling straight corners!

Choose the square type for high processing efficiency!

See page 6 for details

Work Material

List No.	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
8226	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ good ○ best

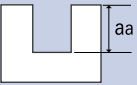


A Brand[®] AE-VMSS-RA

Speeds & Feeds

List 8226 - A Brand AE-VMSS-RA: 4 Flute, Stub Length, Right Angle Type


Slotting

Hardness	-		-		30-45 HRC		-							
Work Material	Mild Steel		Alloy Steel Tool Steel		Hardened Steel		Stainless 300, 400							
Cutting Speed	330 (260-395) SFM		295 (330-360) SFM		260 (195-330) SFM		230 (160-260) SFM							
Depth of Cut	<table border="1" style="display: inline-table; margin-right: 20px;"> <tr> <td>Dia</td> <td>aa</td> </tr> <tr> <td>D ≤ 6</td> <td>0.5D</td> </tr> <tr> <td>D > 6</td> <td>1.0D</td> </tr> </table>  <p style="text-align: center;">$ar=1.0xD$</p>								Dia	aa	D ≤ 6	0.5D	D > 6	1.0D
Dia	aa													
D ≤ 6	0.5D													
D > 6	1.0D													
Mill Dia. (mm)	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min						
1	25,000	19.5	25,000	18.1	22,300	14.2	19,100	13.4						
1.5	19,100	24.0	17,000	18.9	14,900	16.5	12,700	14.2						
2	14,300	24.8	12,700	20.1	11,100	17.3	9,600	15.0						
2.5	11,500	30.7	10,200	22.4	8,900	18.1	7,600	16.9						
3	10,600	36.6	9,600	27.2	8,500	20.1	7,400	18.5						
4	8,000	37.8	7,200	28.3	6,400	20.1	5,600	19.3						
5	6,400	40.2	5,700	31.5	5,100	24.0	4,500	22.0						
6	5,300	40.6	4,800	35.4	4,200	26.4	3,700	14.6						
8	4,000	35.8	3,600	28.3	3,200	25.2	2,800	14.6						
10	3,200	33.1	2,900	27.6	2,500	21.7	2,200	13.8						
12	2,700	31.9	2,400	26.4	2,100	21.7	1,900	13.0						



List 8226 - A Brand AE-VMSS-RA (Cont.): 4 Flute, Stub Length, Right Angle Type

Side Milling

Hardness	-		-		30-45 HRC		-	
Work Material	Mild Steel		Alloy Steel Tool Steel		Hardened Steel		Stainless 300, 400	
Cutting Speed	430 (330-495) SFM		395 (330-495) SFM		330 (260-395) SFM		260 (195-330) SFM	
Depth of Cut	$a_a = 1.5xD$ $a_r = 0.02xD$ 							
Mill Dia. (mm)	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1	25,000	21.7	25,000	23.7	25,000	20.1	22,300	17.7
1.5	25,000	35.5	21,200	29.9	17,000	21.3	14,900	18.1
2	19,900	56.3	17,500	33.1	14,300	24.8	11,100	18.5
2.5	15,900	62.6	14,000	35.4	11,500	27.2	8,900	18.9
3	13,800	65.4	12,700	42.1	10,600	29.9	8,000	18.9
4	10,400	72.0	9,600	45.3	8,000	31.5	6,000	20.9
5	8,300	78.3	7,600	48.0	6,400	35.4	4,800	22.0
6	6,900	81.5	6,400	60.6	5,300	41.7	4,200	25.2
8	5,200	69.7	4,800	60.6	4,000	40.9	3,200	24.0
10	4,100	64.6	3,800	53.9	3,200	35.4	2,500	22.8
12	3,500	55.1	3,200	50.4	2,700	29.9	2,100	20.9

BavandAbzar.com

A Brand[®] AE-VML, AE-NIK-VML, AE-CR-VML

Overview

A Brand AE-VML, AE-NIK-VML, AE-CR-VML

The AE-VM end mills bring you the new standard for milling. Variable lead geometry suppresses vibration and enables stable and high efficiency milling. Along with its substrate of micrograin carbide, it also comes with OSG's newest multi-layer DUARISE coating for superior surface quality. With a full offering including square, corner radius, and long reach, it is sure to cover all your needs.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/a-brand-ae-vm



List Numbers

Size Range

NEW	List Number	Size Range
	8201 - A Brand AE-VML (Inch)	1/4"-1"
	8207 - A Brand AE-VML (Metric)	6mm-20mm
	8271 - A Brand AE-CR-VML (Inch)	1/4"-1/2"
	8277 - A Brand AE-CR-VML (Metric)	6mm-12mm
	8202 - A Brand AE-NIK-VML (Inch, Nicked)	1/4"-1"
	8208 - A Brand AE-NIK-VML (Metric, Nicked)	6mm-20mm

Primary Applications

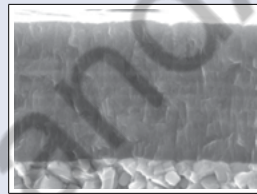
- Reduces Vibration During Roughing and Finishing Operations
- Burr Free Machining & Long Wall Machining

Features & Product Solutions

Superior Surface Quality

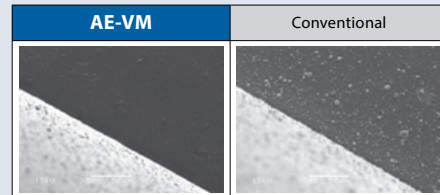
DUARISE Coating

OSG's DUARISE coating provides excellent lubricity, superior friction-resistance, and high oxidation temperature. Multi-layer construction minimizes the thermal cracks that often occur when using water-soluble oil.



Multi-Layer Construction
Adhesion Reinforcing Layer

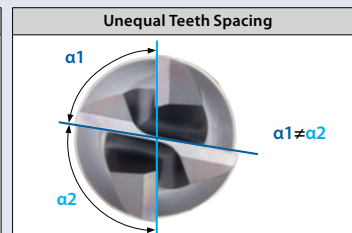
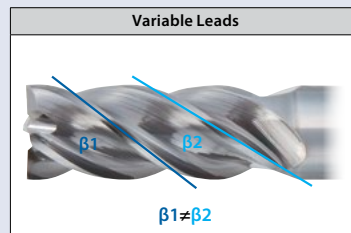
DUARISE Coating Provides Excellent Surface Finish



Stable, High Efficiency Milling

Vibration Suppression

Unequal spacing of teeth and variable-lead geometry enables stable and high efficiency milling.



Excellent Surface Finish

Suppression of Chattering by the Microrelief Geometry

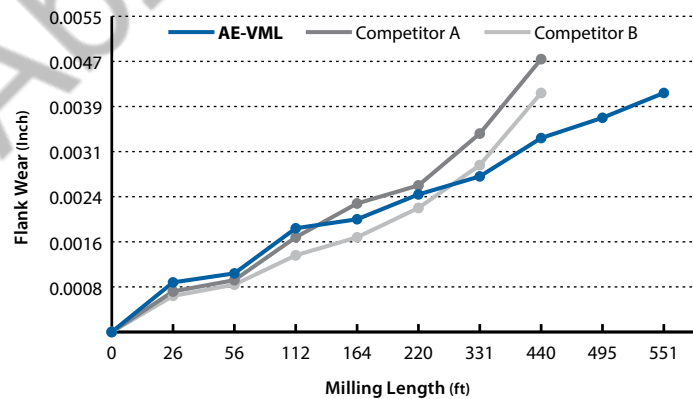
Tool	AE-VML
Tool Size	Ø12x38
Work Material	P20 Tool Steel (40 HRC)
Cutting Speed	640 SFM (5,175 RPM)
Feed	23.6 IPM (0.0012 IPT)
Depth of Cut	Aa= 1.42" ; Ar= .012"
Machine	Vertical Machining Center
Surface Roughness	Ra= 0.09µm (3.54µin) ; Rz=0.55µm (21.65µin)



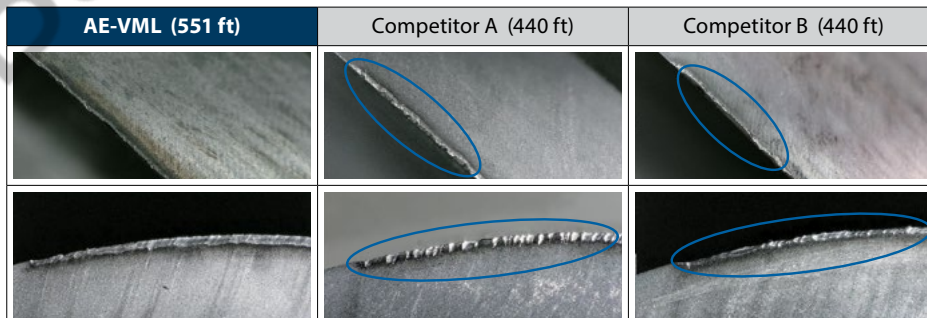
Long Tool Life

DUARISE Coating Greatly Reduces Tool Wear

Tool	AE-VML	Competitors
Tool Size	Ø10x31	
Work Material	4140 (30 HRC)	
Milling Method	Side Milling	
Cutting Speed	590 SFM (5,700 RPM)	
Feed	55.1 IPM (0.0024 IPT)	
Depth of Cut	Aa= 0.984" ; Ar= 0.039"	
Coolant	Water-Soluble	
Machine	Vertical Machining Center (BT40)	



Wear Comparison of the Peripheral Cutting Edge



A Brand® AE-VML

Advanced Performance Anti-Vibration Carbide End Mills

List 8201

AE-VML, Multiple Flute, Long Length



NEW SIZES	SPEED FEED P80-83	CARBIDE	DUARISE	Var.°	SHRINK FIT
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Milling Diameter Tolerance	
D < 1/2	0/-0.0008"
D ≥ 1/2	0/-0.0012"

Units: Inch

EDP Number	Mill Diameter	OAL	Length of Cut	Shank Diameter	Number of Flutes	Status
	D	L	Lc	d		
82010021	1/4	2-3/4	3/4	1/4	4	●
82010121	1/4	2-3/4	1	1/4	4	●
82010221	5/16	3-1/2	15/16	5/16	4	●
82010321	5/16	3-1/2	1-1/4	5/16	4	●
82010421	3/8	3-3/4	1-1/8	3/8	4	●
82010521	3/8	4	1-1/2	3/8	4	●
82010621	1/2	4	1-1/2	1/2	4	●
82010721	1/2	4-1/2	2	1/2	4	●
82010821	5/8	5	1-7/8	5/8	5	●
82010921	5/8	5-1/2	2-1/2	5/8	5	●
82011021	3/4	5-1/2	2-1/4	3/4	5	●
82011121	3/4	6	3	3/4	5	●
82011221	1	7	3	1	5	●
82011321	1	7	4	1	5	●

Packed: 1 pc. Available Duarise coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzar.com

Watch it in Action!

List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
8201	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ good ○ best



List 8207

AE-VML, Multiple Flute, Long Length

NEW SIZES	SPEED FEED P80-83	CARBIDE	DUARISE	Var.°	SHRINK FIT
------------------	-----------------------------	----------------	----------------	--------------	-------------------

Milling Diameter Tolerance	
D ≤ 12mm	0/-0.020mm
D > 12mm	0/-0.030mm



Units: mm

EDP Number	Mill Diameter	OAL	Length of Cut	Shank Diameter	Number of Flutes	Status
	D	L	Lc	d		
8556320	6	70	19	6	4	●
8556328	6	70	24	6	4	●
8556322	8	80	25	8	4	●
8556330	8	90	32	8	4	●
8556324	10	90	31	10	4	●
8556332	10	100	40	10	4	●
8556326	12	100	38	12	4	●
8556334	12	110	48	12	4	●
8556374	16	125	50	16	5	●
8556378	16	140	64	16	5	●
8556376	20	135	62	20	5	●
8556380	20	155	80	20	5	●

Packed: 1 pc. Available Duarise coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzal.com

Watch it in Action!

List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
8207	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

○ good ○ best

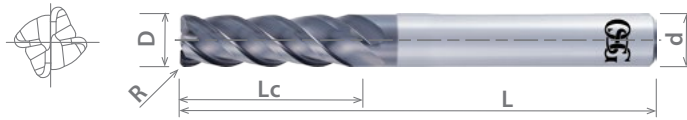


A Brand[®] AE-CR-VML

Advanced Performance Anti-Vibration Carbide End Mills

List 8271

AE-CR-VML, 4 Flute, Long Length, Corner Radius



NEW	SPEED FEED P80-83	CARBIDE	DUARISE	± 0.03	Var.	SHRINK FIT
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Milling Diameter Tolerance	
D ≤ 1/2	0 ~ -0.0008"

Units: Inch

EDP Number	Mill Diameter	Corner Radius	OAL	Length of Cut	Shank Diameter	Status
	D	R	L	Lc	d	
82710021	1/4	0.015	2 3/4	3/4	1/4	●
82710121	1/4	0.030	2 3/4	3/4	1/4	●
82710221	5/16	0.015	3 1/2	15/16	5/16	●
82710321	5/16	0.030	3 1/2	15/16	5/16	○
82710421	3/8	0.015	3 3/4	1 1/8	3/8	●
82710521	3/8	0.030	3 3/4	1 1/8	3/8	●
82710621	3/8	0.060	3 3/4	1 1/8	3/8	○
82710721	1/2	0.015	4	1 1/2	1/2	●
82710821	1/2	0.030	4	1 1/2	1/2	●
82710921	1/2	0.045	4	1 1/2	1/2	○
82711021	1/2	0.060	4	1 1/2	1/2	●
82711121	1/2	0.090	4	1 1/2	1/2	○
82711221	1/4	0.015	2 3/4	1	1/4	●
82711321	1/4	0.030	2 3/4	1	1/4	●
82711421	5/16	0.015	3 1/2	1 1/4	5/16	●
82711521	5/16	0.030	3 1/2	1 1/4	5/16	○
82711621	3/8	0.015	4	1 1/2	3/8	●
82711721	3/8	0.030	4	1 1/2	3/8	●
82711821	3/8	0.060	4	1 1/2	3/8	○
82711921	1/2	0.015	4 1/2	2	1/2	●
82712021	1/2	0.030	4 1/2	2	1/2	●
82712121	1/2	0.045	4 1/2	2	1/2	○
82712221	1/2	0.060	4 1/2	2	1/2	●
82712321	1/2	0.090	4 1/2	2	1/2	○

Packed: 1 pc. Available Duarise coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
8271	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ good ○ best

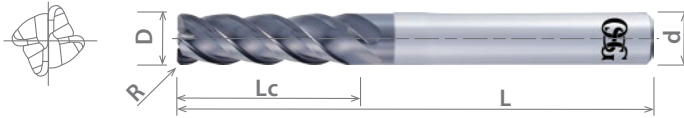


List 8277

AE-CR-VML, 4 Flute, Long Length, Corner Radius

NEW	SPEED FEED P80-83	CARBIDE	DUARISE	R ± 0.03	Var.	SHRINK FIT
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Milling Diameter Tolerance	
D ≤ 12mm	0~0.020mm



Units: mm

EDP Number	Mill Diameter	Corner Radius	OAL	Length of Cut	Shank Diameter	Status
	D	R	L	Lc	d	
8556336	6	0.3	70	19	6	●
8556337	6	0.5	70	19	6	●
8556338	6	1.0	70	19	6	●
8556339	8	0.3	80	25	8	▲
8556340	8	0.5	80	25	8	▲
8556341	8	1.0	80	25	8	●
8556342	8	1.5	80	25	8	▲
8556343	8	2.0	80	25	8	●
8556344	10	0.3	90	31	10	▲
8556345	10	0.5	90	31	10	▲
8556346	10	1.0	90	31	10	●
8556347	10	1.5	90	31	10	▲
8556348	10	2.0	90	31	10	●
8556349	10	3.0	90	31	10	●
8556350	12	0.5	100	38	12	●
8556351	12	1.0	100	38	12	▲
8556352	12	1.5	100	38	12	▲
8556353	12	2.0	100	38	12	▲
8556354	12	3.0	100	38	12	●
8556355	6	0.3	70	24	6	●
8556356	6	0.5	70	24	6	●
8556357	6	1.0	70	24	6	●
8556358	8	0.3	90	32	8	▲
8556359	8	0.5	90	32	8	●
8556360	8	1.0	90	32	8	●
8556361	8	1.5	90	32	8	▲
8556362	8	2.0	90	32	8	●
8556363	10	0.3	100	40	10	▲
8556364	10	0.5	100	40	10	▲
8556365	10	1.0	100	40	10	●
8556366	10	1.5	100	40	10	▲
8556367	10	2.0	100	40	10	▲
8556368	10	3.0	100	40	10	●
8556369	12	0.5	110	48	12	●
8556370	12	1.0	110	48	12	●
8556371	12	1.5	110	48	12	▲
8556372	12	2.0	110	48	12	▲
8556373	12	3.0	110	48	12	●

Packed: 1 pc. Available Duarise coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
8277	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ good ○ best



A Brand[®] AE-NIK-VML

Advanced Performance Anti-Vibration Carbide End Mills

List 8202

AE-NIK-VML, Multiple Flute, Long Length, Nicked

NEW SIZES	SPEED FEED P80-83	CARBIDE	DUARISE		Var.°	SHRINK FIT
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Milling Diameter Tolerance	
D < 1/2	0/-0.0008"
D >= 1/2	0/-0.0012"



Units: Inch

EDP Number	Mill Diameter	OAL	Length of Cut	Shank Diameter	Number of Flutes	Status
	D	L	Lc	d		
82020021	1/4	2-3/4	3/4	1/4	4	●
82020121	1/4	2-3/4	1	1/4	4	●
82020221	5/16	3-1/2	15/16	5/16	4	●
82020321	5/16	3-1/2	1-1/4	5/16	4	●
82020421	3/8	3-3/4	1-1/8	3/8	4	●
82020521	3/8	4	1-1/2	3/8	4	●
82020621	1/2	4	1-1/2	1/2	4	●
82020721	1/2	4-1/2	2	1/2	4	●
82020821	5/8	5	1 7/8	5/8	5	●
82020921	5/8	5 1/2	2 1/2	5/8	5	●
82021021	3/4	5 1/2	2 1/4	3/4	5	●
82021121	3/4	6	3	3/4	5	●
82021221	1	7	3	1	5	●
82021321	1	7	4	1	5	●

Packed: 1 pc. Available Duarise coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzar.com

Watch it in Action!

List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
8202	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ good ○ best



List 8208

AE-NIK-VML, Multiple Flute, Long Length, Nicked

NEW SIZES	SPEED FEED P80-83	CARBIDE	DUARISE	Var.°	SHRINK FIT
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Milling Diameter Tolerance	
D ≤ 12mm	0/-0.020mm
D > 12mm	0/-0.030mm



Units: mm

EDP Number	Mill Diameter	OAL	Length of Cut	Shank Diameter	Number of Flutes	Status
	D	L	Lc	d		
8556321	6	70	19	6	4	●
8556329	6	70	24	6	4	●
8556323	8	80	25	8	4	●
8556331	8	90	32	8	4	●
8556325	10	90	31	10	4	●
8556333	10	100	40	10	4	●
8556327	12	100	38	12	4	●
8556335	12	110	48	12	4	●
8556375	16	125	50	16	5	●
8556379	16	140	64	16	5	●
8556377	20	135	62	20	5	●
8556381	20	155	80	20	5	●

Packed: 1 pc. Available Duarise coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzal.com

Watch it in Action!

List No.	Work Material																
	P					M			K	N		S	H				
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC
8208	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

○ good ○ best



A Brand® AE-VMFE & AE-CR-VMFE

Overview

A Brand AE-VMFE & AE-CR-VMFE

The A Brand AE-VMFE for deep side milling is an anti-vibration carbide end mill series engineered to excel in a wide range of materials including carbon steel, alloy steel, stainless steel, titanium alloys and Ni-based alloys. With the AE-VMFE deep side milling at L/D of 5D or more can be machined with high efficiency and high accuracy by large step milling up to 2D with its 2.5D cutting length configuration.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/a-brand-ae-vm



List Numbers

8245 - A Brand AE-VMFE (Metric)
8246 - A Brand AE-CR-VMFE (Metric)

Size Range

6mm-12mm
6mm-12mm

Primary Applications

- Customers milling deep walls.
- Depth up to L/D = 8D.

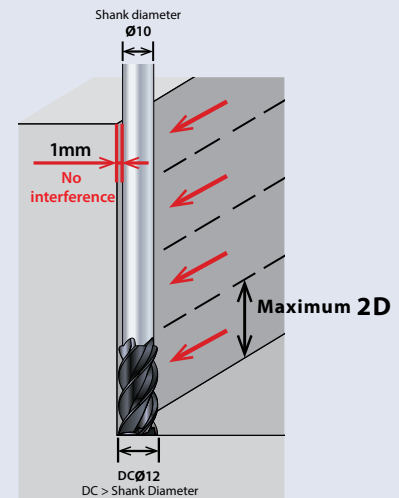
Features & Product Solutions

Highly Efficient Deep Side Milling

2.5D Cutting Length

Highly efficient deep side milling is possible with large step milling of up to 2xD*.

*The recommended depth of cut varies depending on the overhang length.



Supports Various Machining Depths

Long Length Reduced Shank Type

Reduced shank types are tools with an outer diameter that is larger than the shank diameter.

- Supports deep side milling and pocket milling of mold parts, etc.
- Supports various machining depth by changing the overhang length.

Reduced Streak Generation

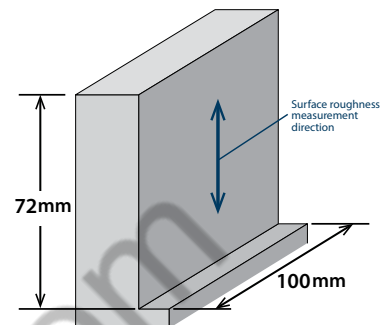
R Shape on the Shank Side Edge

The R Shape on the shank side edge suppresses streak generation by side step milling.

High Efficiency and High Precision in Deep Side Milling

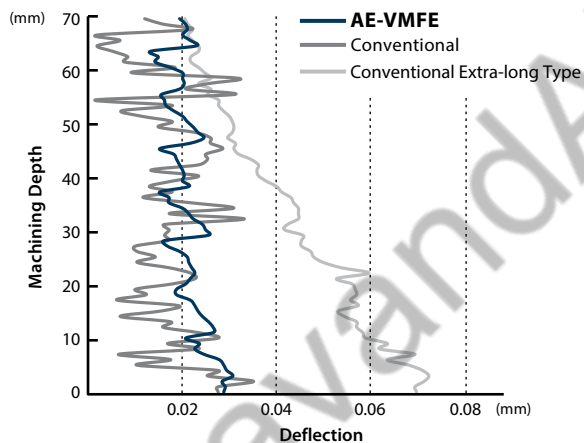
Achieves Good Milling Accuracy with About Twice the Efficiency Versus Conventional Products

Tool	AE-VMFE (30mm)	Conventional (18mm)	Conventional Extra-Long Type (90mm)
Tool Size	Ø12		
Work Material	H13 (40HRC)		
Milling Method	Side Step Milling		Side Milling
Cutting Speed	394 SFM (3,183 RPM)	295 SFM (2,387 RPM)	82 SFM (663 RPM)
Feed	41.8 IPM (0.0033 IPT)	31.5 IPM (0.0033 IPT)	5.2 IPM (0.0020 IPT)
Depth of Cut	Aa=0.71"x4 4 times Ar=0.002"	Aa=0.47"x6 6 times Ar=0.002"	Aa=2.83" Ar=0.002"
Overhang Length	3.3" L/D=7		3.9"
Processing Time	~23 Seconds	~45 Seconds	~45 Seconds
Coolant	Air Blow		
Machine	Vertical Machining Center		



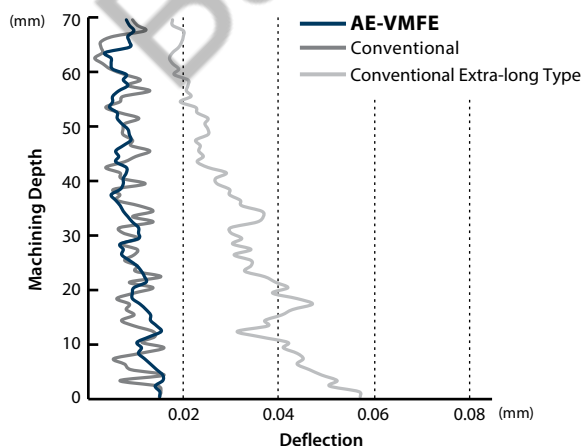
Machining Accuracy

After machining



AE-VMFE	Conventional	Conventional Extra-long Type
Ra : 0.09µm Rz : 1.03µm	Ra : 1.45µm Rz : 7.49µm	Ra : 1.46µm Rz : 8.07µm

After zero cut



AE-VMFE	Conventional	Conventional Extra-long Type
Ra : 0.08µm Rz : 0.96µm	Ra : 1.07µm Rz : 6.37µm	Ra : 1.17µm Rz : 6.99µm

A Brand[®] AE-VMFE & AE-CR-VMFE

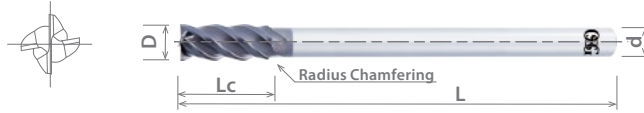
Advanced Performance Anti-Vibration Reduced Shank Carbide End Mills

List 8245

AE-VMFE, SQ, 4 Flute

NEW	SPEED FEED P87	CARBIDE	DUARISE		Var.°	SHRINK FIT
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Milling Diameter Tolerance	
D≤12mm	0~-0.02mm



Units: mm

EDP Number	Mill Diameter	Corner Radius	OAL	Length of Cut	Shank Diameter	Status
	D	R	L	Lc	d	
8549916	6	-	100	15	4	●
8549918	8	-	110	20	6	●
8549920	10	-	130	25	8	●
8549922	12	-	150	30	10	●

Packed: 1 pc.

Available DUARISE coating only. The radius chamfering is not a full radius since it is for preventing streaks during step milling.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 8246

AE-CR-VMFE, CR, 4 Flute

NEW	SPEED FEED P87	CARBIDE	DUARISE		Var.°	SHRINK FIT
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Milling Diameter Tolerance	
D≤12mm	0~-0.02mm



Units: mm

EDP Number	Mill Diameter	Corner Radius	OAL	Length of Cut	Shank Diameter	Status
	D	R	L	Lc	d	
8549945	6	0.5	100	15	4	●
8549955	8	0.5	110	20	6	●
8549965	10	0.5	130	25	8	●
8549966	10	1	130	25	8	●
8549975	12	0.5	150	30	10	●
8549976	12	1	150	30	10	●

Packed: 1 pc.

Available DUARISE coating only. The radius chamfering is not a full radius since it is for preventing streaks during step milling.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



Watch it in Action!

List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
8245	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
8246	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

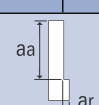
○ good ○ best



List 8425 - A Brand AE-VMFE: SQ, 4 Flute

List 8426 - A Brand AE-CR-VMFE: CR, 4 Flute

Side Milling

Hardness	-	Up to 30 HRC	-	-	-	-	30-45 HRC							
Work Material	Mild Steels Carbon Steels Cast Iron	Tool Steel Alloy Steel	Stainless Steel	Precipitation Stainless Steel	Titanium Alloy	Ni-Based Alloy Inconel 718	Prehardened Steels Hardened Steels							
Cutting Speed	330-460 SFM	330-460 SFM	330-460 SFM	330-430 SFM	300-400 SFM	200-260 SFM	330-460 SFM							
Depth of Cut	$a_a=2.0D$ $a_r=0.1D$ 													
Mill Dia. (Inch)	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	Speed RPM	Feed in/min	Speed RPM	Feed in/min
6.0	6,392	99.7	6,392	89.5	6,392	76.7	6149	64.0	5664	54.4	3722	31.3	6,392	81.8
8.0	4,794	74.8	4,794	67.1	4,794	57.5	4612	48.0	4248	40.8	2791	23.4	4,794	61.4
10.0	3,835	59.8	3,835	53.7	3,835	46.0	3690	38.4	3398	32.6	2233	18.8	3,835	49.1
12.0	3,196	49.9	3,196	44.7	3,196	38.4	3075	32.0	2832	27.2	1861	15.6	3,196	40.9

- The above milling condition is a guideline for overhang length 5xD.
- Use a rigid and precise machine and holder.
- Please use a suitable fluid with high smoke retardant properties.
- During dry (no fluid) milling, please use air blow to remove chips from the milling area and to eliminate chip packing.
- Please use water-soluble coolant when machining stainless steel, precipitation stainless steel, titanium alloy, Ni-based alloy.
- Reduce speed and feed as well as depth of cut when high precision is required.
- Adjust the speed and feed accordingly when the overhang length is longer than specified (refer to Parameter Reduction Chart below).

Parameter Reduction Chart by Length to Diameter Ratio

Hardness		-	Up to 30 HRC	-	-	-	-	30-45 HRC						
Work Material		Mild Steels Carbon Steels Cast Iron	Tool Steel Alloy Steel	Stainless Steel	Precipitation Stainless Steel	Titanium Alloy	Ni-Based Alloy Inconel 718	Prehardened Steels Hardened Steels						
L/D	Depth of Cut		Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed
	Aa	Ar	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min
Side Milling	6	1.7D	0.08D	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%
	7	1.6D	0.05D	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%	65%
	8	1.5D	0.03D	50%	50%	40%	40%	30%	30%	30%	30%	30%	30%	40%



A Brand AE-MS-H, AE-CR-MS-H & AE-MSS-H

Overview

A Brand AE-MS-H, AE-CR-MS-H & AE-MSS-H

Multi-flute square type and radius type carbide end mills designed for stable and high-efficiency milling of high-hardness steels. With the addition of the new DUREY coating uniquely engineered for high-hardness steels, high chipping resistance is made possible even in work materials exceeding 60 HRC, allowing long tool life and high speed milling.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/a-brand-ae-h

List Numbers

8540 - A Brand AE-MS-H (Metric)
 8440 - A Brand AE-MS-H (Inch)
 8570 - A Brand AE-CR-MS-H (Metric)
 8470 - A Brand AE-CR-MS-H (Inch)
 8541 - A Brand AE-MSS-H (Metric)
 8441 - A Brand AE-MSS-H (Inch)

Size Range

1mm-12mm
 1/16"-1"
 3mm-12mm
 1/16"-1"
 3mm-12mm
 1/16"-1/2"

Primary Applications

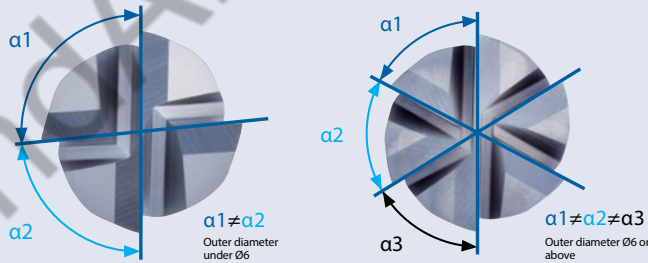
- Side milling hardened steel (up to 70 HRC)
- Stable tool life in super hard steels
- Rough and finish milling of hardened steels

Features & Product Solutions

Suppresses Chattering

Variable Indexing

For suppression of cutting vibration, enabling more consistent tool life and cutting quality.



Stable Machining of High-Hardness Steels

Cutting Edge Geometry

Improved durability in high-hardened steel up to 65HRC~70HRC.

Tool	AE-MS-H (Ø4)
Work Material	STAVAX (52 HRC)
Milling Method	Side Milling
Cutting Speed	328 SFM (7,950 rpm)
Feed	49.2 IPM (0.0015 IPT)
Depth of Cut	Aa = 0.2362", Ar = 0.0079"
Coolant	Air Blow
Machine	Vertical Machining Center

Wear condition of the cutting edge

AE-MS-H	Conventional
1,151 ft Milling Length	588 ft Milling Length

Outstanding Performance in High-Hardness Steels

DUREY Coating

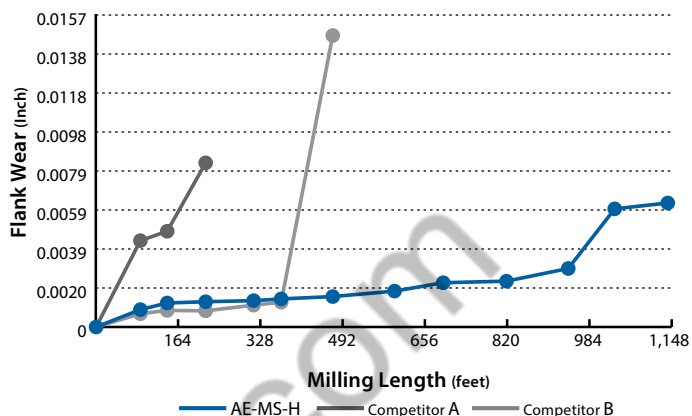
Newest hard milling grade coating, for outstanding performance in high hardened materials.



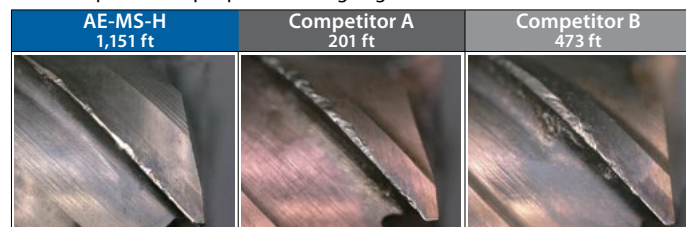
Stable Performance

Stable Performance Even in Pre-Hardened Steel STAVAX (52 HRC)

Tool	AE-MS-H (Ø4)
Work Material	STAVAX (52 HRC)
Milling Method	Side Milling
Cutting Speed	328 SFM (7,950 RPM)
Feed	49.2 IPM (0.0015 IPT)
Depth of Cut	Aa = 0.2362", Ar = 0.0079"
Coolant	Air Blow
Machine	Vertical Machining Center (BT40)



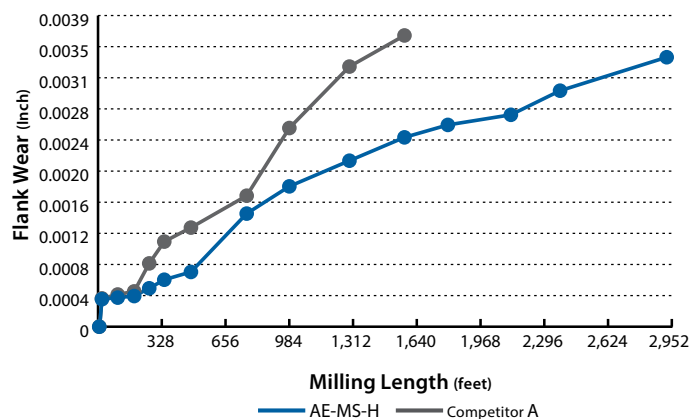
Wear comparison for peripheral cutting edge



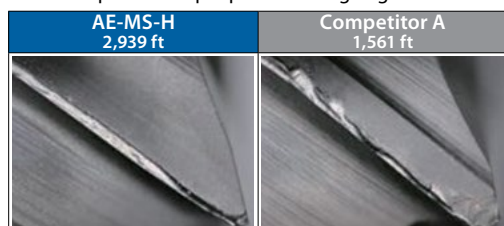
Long Tool Life

Demonstrates Good Cutting Performance Even in Pre-Hardened Steel NAK80 Tool Steel (40 HRC)

Tool	AE-MS-H (Ø3)
Work Material	NAK80 (40 HRC)
Milling Method	Side Milling
Cutting Speed	335 SFM (10,823 RPM)
Feed	34.1 IPM (0.0008 IPT)
Depth of Cut	Aa = 0.1772", Ar = 0.0079"
Coolant	Air Blow
Machine	Horizontal Machining Center (HSK63)



Wear comparison for peripheral cutting edge



A Brand AE-MS-H

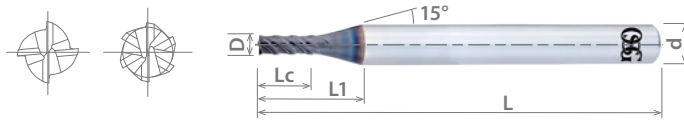
Advanced Performance Carbide End Mills with DUOREY Coating

List 8540

AE-MS-H, Multi-flute, Regular Length, Square

NEW	SPEED FEED P96-97	CARBIDE	DUOREY		REG	43°	SHRINK FIT
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Milling Radius Tolerance	
D (mm)	0 ~ -0.02 mm
D (in)	0 ~ -.0008"



Units: mm

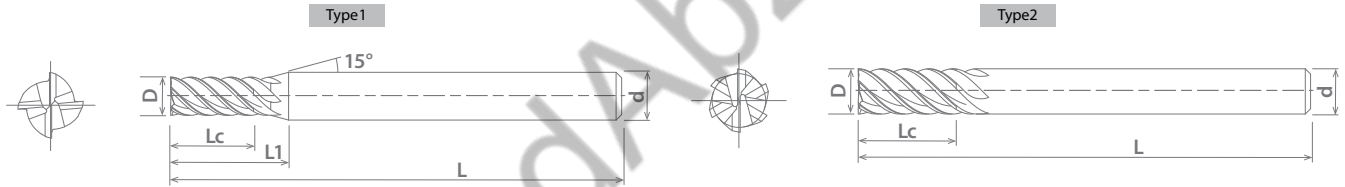
EDP Number	Mill Dia.	OAL	Length of Cut	Neck Length	Shank Dia.	Type	No. of Flutes	Status
	D	L	Lc	L1	d			
8549710	1	60	2.5	12.7	6	1	4	●
8549715	1.5	60	3.8	13.0	6	1	4	●
8549720	2	60	5	13.9	6	1	4	●
8549725	2.5	60	6.3	14.5	6	1	4	●
8549730	3	60	7.5	15.4	6	1	4	●
8549740	4	60	10	16.1	6	1	4	●
8549750	5	60	12.5	16.7	6	1	4	●
8549760	6	60	15	-	6	2	6	●
8549780	8	70	20	-	8	2	6	●
8549810	10	80	25	-	10	2	6	●
8549812	12	90	30	-	12	2	6	●

Packed: 1 pc.

Available DUOREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzali.com

Watch it in Action!

List No.	Work Material																
	P					M			K	N		S	H				
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
8540	1010 1018	1035 1045	1065	4140 4340	○	○							○	○	○	○	

○ good ○ best

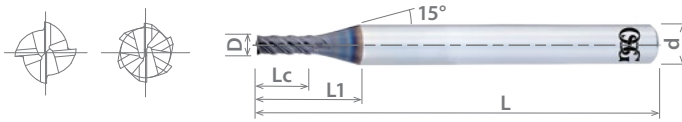


List 8440

AE-MS-H, Multi-flute, Regular Length, Square

NEW	SPEED FEED P96-97	CARBIDE	DUOREY		REG	43°	SHRINK FIT
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Milling Radius Tolerance	
D (mm)	0 ~ -0.02 mm
D (in)	0 ~ -.0008"



Units: Inch

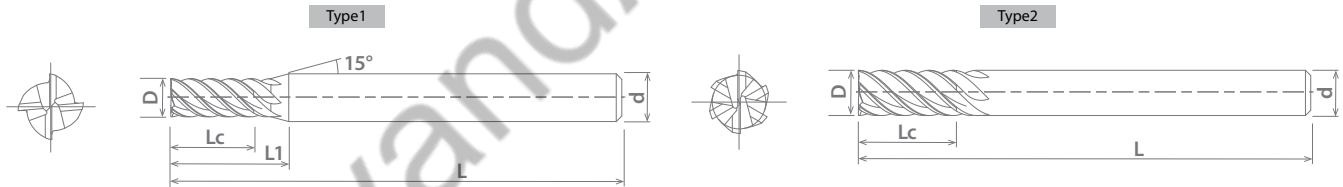
EDP Number	Mill Dia.	OAL	Length of Cut	Neck Length	Shank Dia.	Type	No. of Flutes	Status
	D	L	Lc	L1	d			
84400023	1/16	2 1/2	0.156	0.776	1/4	1	4	●
84400123	5/64	2 1/2	0.195	0.861	1/4	1	4	○
84400223	3/32	2 1/2	0.234	0.952	1/4	1	4	●
84400323	7/64	2 1/2	0.273	0.962	1/4	1	4	●
84400423	1/8	2 1/2	0.313	1.019	1/4	1	4	●
84400523	5/32	2 1/2	0.391	1.236	1/4	1	4	●
84400623	3/16	2 1/2	0.469	1.255	1/4	1	4	●
84400723	7/32	2 1/2	0.547	1.438	1/4	1	4	○
84400823	1/4	2 1/2	0.625	-	1/4	2	6	●
84400923	9/32	2 1/2	0.703	-	5/16	2	6	○
84401023	5/16	2 3/4	0.781	-	5/16	2	6	●
84401123	3/8	3	0.938	-	3/8	2	6	●
84401223	7/16	3	1.094	-	7/16	2	6	●
84401323	1/2	3 1/2	1.250	-	1/2	2	6	●
84401423	5/8	4	1.563	-	5/8	2	6	●
84401523	3/4	4 1/4	1.875	-	3/4	2	6	●
84401623	1	4 1/2	2.500	-	1	2	8	○

Packed: 1 pc.

Available DUOREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List No.	Work Material																
	P					M			K	N		S	H				
	Carbon Steels			Alloy Steels 4140 4340	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy Inconel	Titanium 6Al4V (30 HRC)	Hardened Steels			
	Low 1010 1018	Med. 1035 1045	High 1065			300	400	17-4 PH		6061 7075	Casting			~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
8440				○	○								○	○	○	○	

○ good ⊗ best



A Brand AE-CR-MS-H

Advanced Performance Multi Flute Corner Radius End Mill for Hardened Steels

List 8470

AE-CR-MS-H, Multi-flute, Regular Length, Corner Radius

COMING SOON!
Check Stock Levels Now!



NEW

SPEED FEED
P96-97

CARBIDE

DUROREY

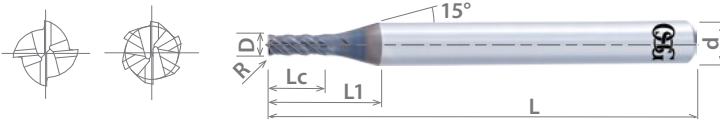


REG



43°

SHRINK
FIT



Milling Radius Tolerance	
D (mm)	0 ~ -0.02 mm
D (in)	0 ~ -.0008"

Units: Inch

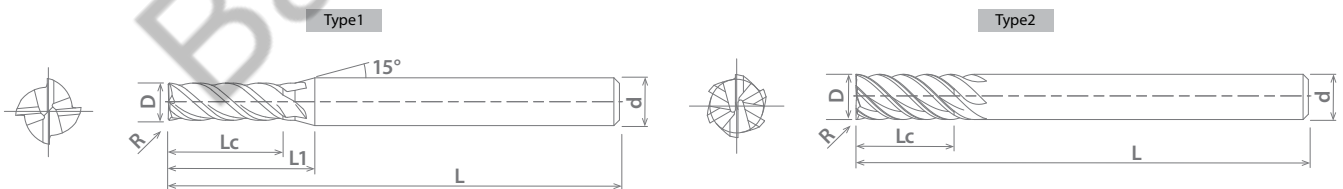
EDP Number	Mill Dia.	Corner Radius	OAL	Length of Cut	Neck Length	Shank Dia.	Type	No. of Flutes	Status
	D	R	L	Lc	L1	d			
84700023	1/16	0.010	2.50	0.156	0.662	1/4	1	4	●
84700123	5/64	0.010	2.50	0.195	0.711	1/4	1	4	●
84700223	3/32	0.010	2.50	0.234	0.760	1/4	1	4	●
84700323	7/64	0.010	2.50	0.273	0.809	1/4	1	4	●
84700423	1/8	0.010	2.50	0.313	0.858	1/4	1	4	●
84700523	1/8	0.020	2.50	0.313	0.858	1/4	1	4	●
84700623	1/8	0.030	2.50	0.313	0.858	1/4	1	4	○
84700723	5/32	0.020	2.50	0.391	0.956	1/4	1	4	●
84700823	5/32	0.030	2.50	0.391	0.956	1/4	1	4	○
84700923	3/16	0.010	2.50	0.469	1.054	1/4	1	4	●
84701023	3/16	0.020	2.50	0.469	1.054	1/4	1	4	●
84701123	3/16	0.030	2.50	0.469	1.054	1/4	1	4	○
84701223	7/32	0.020	2.50	0.547	1.152	1/4	1	4	●
84701323	1/4	0.010	2.50	0.625	-	1/4	2	6	●
84701423	1/4	0.020	2.50	0.625	-	1/4	2	6	●
84701523	1/4	0.030	2.50	0.625	-	1/4	2	6	○
84701623	9/32	0.020	2.50	0.703	1.465	5/16	1	6	○
84701723	5/16	0.020	2.75	0.781	-	5/16	2	6	●
84701823	3/8	0.020	3.00	0.938	-	3/8	2	6	●
84701923	3/8	0.030	3.00	0.938	-	3/8	2	6	●
84702023	3/8	0.060	3.00	0.938	-	3/8	2	6	○
84702123	7/16	0.030	3.00	1.094	-	7/16	2	6	●
84702223	1/2	0.020	3.50	1.250	-	1/2	2	6	●
84702323	1/2	0.030	3.50	1.250	-	1/2	2	6	●
84702423	1/2	0.060	3.50	1.250	-	1/2	2	6	○
84702523	5/8	0.030	4.00	1.563	-	5/8	2	6	●
84702623	5/8	0.060	4.00	1.563	-	5/8	2	6	●
84702723	3/4	0.030	4.25	1.875	-	3/4	2	6	●
84702823	3/4	0.060	4.25	1.875	-	3/4	2	6	○
84702923	1	0.060	4.50	2.500	-	1	2	8	○
84703023	1	0.090	4.50	2.500	-	1	2	8	○

Packed: 1 pc.

Available DUOREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels 4140 4340	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy Inconel	Titanium 6Al4V (30 HRC)	Hardened Steels			
	Low 1010 1018	Med. 1035 1045	High 1065			300	400	17-4 PH		6061 7075	Casting			~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
8470				○	○								○	○	○	○	

○ good ⊗ best

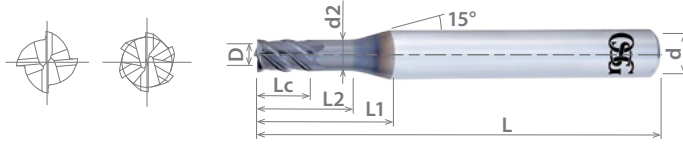


A Brand AE-MSS-H

Advanced Performance Carbide End Mills with DUREY Coating

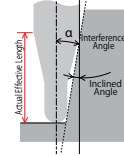
List 8541

AE-MSS-H, Multi-flute, Stub Length, Reduced Neck, Square



NEW	SPEED FEED P98-99	CARBIDE	DUREY		STUB	43°	SHRINK FIT
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Milling Radius Tolerance	
D (mm)	0 ~ -0.02 mm
D (in)	0 ~ -.0008"



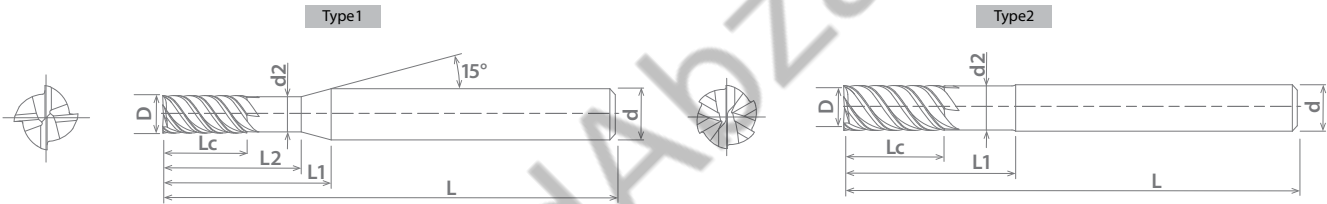
EDP Number	Mill Dia. D	OAL L	Length of Cut Lc	Neck Length L1	Non-Tapered L2	Neck Dia. d2	Interference Angle alpha	Effective Neck Length by Incline Angle					Shank Dia. d	Type	No. of Flutes	Status
								0.5°	1.0°	1.5°	2.0°	3.0°				
8549830	3	45	4.5	14.8	9	2.85	5.78°	9.46	9.87	10.23	10.62	11.48	6	1	4	●
8549831	4	50	6	16	12	3.85	3.59°	12.6	13.09	13.56	14.07	15.21	6	1	4	●
8549832	5	60	7.5	17.1	15	4.85	1.68°	15.72	16.3	16.88	-	-	6	1	4	●
8549833	6	80	9	-	18	5.85	-	-	-	-	-	-	6	2	6	●
8549834	8	90	12	-	24	7.85	-	-	-	-	-	-	8	2	6	●
8549835	10	100	15	-	30	9.85	-	-	-	-	-	-	10	2	6	●
8549836	12	110	18	-	36	11.8	-	-	-	-	-	-	12	2	6	●

Packed: 1 pc.

Available DUREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzaz.com

Watch it in Action!

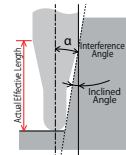
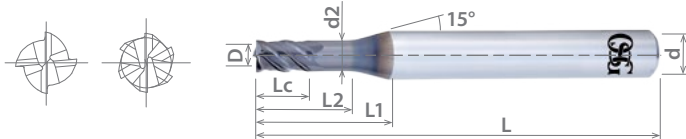
List No.	Work Material																
	P					M			K	N		S	H				
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
8541				○	○									○	○	○	○



List 8441

AE-MSS-H, Multi-flute, Stub Length, Reduced Neck, Square

NEW	SPEED FEED P98-99	CARBIDE	DUREY	STUB	43°	SHRINK FIT
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Milling Radius Tolerance	
D (mm)	0 ~ -0.02 mm
D (in)	0 ~ -.0008"

Units: Inch

EDP Number	Mill Dia. D	OAL L	Length of Cut Lc	Neck Length		Non-Tapered L2	Neck Dia. d2	Interference Angle α	Effective Neck Length by Incline Angle					Shank Dia. d	Type	No. of Flutes	Status
				L1	L1				0.5°	1.0°	1.5°	2.0°	3.0°				
84410023	1/16	2 1/2	0.094	0.304	0.188	0.0605	9.89°	0.194	0.201	0.208	0.216	0.234	1/4	1	4	●	
84410123	5/64	2 1/2	0.117	0.380	0.234	0.0761	8.81°	0.242	0.250	0.259	0.269	0.291	1/4	1	4	●	
84410223	3/32	2 1/2	0.141	0.456	0.281	0.0918	7.77°	0.290	0.301	0.311	0.323	0.349	1/4	1	4	●	
84410323	7/64	2 1/2	0.164	0.532	0.328	0.1054	6.79°	0.339	0.351	0.364	0.377	0.408	1/4	1	4	●	
84410423	1/8	2 1/2	0.188	0.608	0.375	0.1191	5.87°	0.388	0.401	0.416	0.431	0.466	1/4	1	4	●	
84410523	5/32	2 1/2	0.234	0.760	0.469	0.1503	4.16°	0.485	0.502	0.520	0.539	0.583	1/4	1	4	●	
84410623	3/16	2 1/2	0.281	0.912	0.563	0.1816	2.63°	0.582	0.602	0.624	0.647	-	1/4	1	4	●	
84410723	7/32	2 1/2	0.328	1.064	0.656	0.2128	1.25°	0.678	0.705	-	-	-	1/4	1	4	●	
84410823	1/4	2 1/2	0.375	-	0.750	0.2441	-	-	-	-	-	-	1/4	2	6	●	
84410923	9/32	3	0.422	1.369	0.844	0.2753	0.99°	0.872	-	-	-	-	5/16	1	6	●	
84411023	5/16	3	0.469	-	0.938	0.3066	-	-	-	-	-	-	5/16	2	6	●	
84411123	3/8	3 1/2	0.563	-	1.125	0.3691	-	-	-	-	-	-	3/8	2	6	●	
84411223	7/16	3 1/2	0.656	-	1.313	0.4316	-	-	-	-	-	-	7/16	2	6	●	
84411323	1/2	4	0.750	-	1.500	0.4921	-	-	-	-	-	-	1/2	2	6	●	

Packed: 1 pc.

Available DUREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



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YouTube

Watch it in Action!

List No.	Work Material															
	P					M			K	N		S	H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels		
	Low	Med.	High				300	400		17-4 PH		6061	Casting	Inconel	6Al4V (30 HRC)	~35 HRC
8441	1010 1018	1035 1045	1065	4140 4340					7075							



A Brand AE-MS-H & AE-CR-MS-H

Advanced Performance Carbide End Mills with DUROREY Coating

List 8440, 8540, 8470, 8570: Multi-Flute, Regular Length, Square & Corner Rad.

Side Milling

Hardness	Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC																							
Work Material	Tool Steels Hardened Steels Alloy Steels		Hardened Steels																													
Cutting Speed (SFM)	360 - 425		260 - 330		195 - 260		165 - 230		130 - 200																							
Depth of Cut	<table border="1"> <tr> <th>Dia</th> <th>aa</th> <th>ar</th> </tr> <tr> <td>D ≤ 1.5</td> <td>1.5D</td> <td>0.02D</td> </tr> <tr> <td>1.5 < D ≤ 2.5</td> <td>1.5D</td> <td>0.05D</td> </tr> <tr> <td>2.5 < D</td> <td>1.5D</td> <td>0.1D</td> </tr> </table> ar Max=1mm		Dia	aa	ar	D ≤ 1.5	1.5D	0.02D	1.5 < D ≤ 2.5	1.5D	0.05D	2.5 < D	1.5D	0.1D	<table border="1"> <tr> <th>aa</th> <th>ar</th> </tr> <tr> <td>1.5D</td> <td>0.05D</td> </tr> </table> ar Max=1mm		aa	ar	1.5D	0.05D	<table border="1"> <tr> <th>aa</th> <th>ar</th> </tr> <tr> <td>1.5D</td> <td>0.03D</td> </tr> </table> ar Max=0.5mm		aa	ar	1.5D	0.03D	 <table border="1"> <tr> <th>aa</th> <th>ar</th> </tr> <tr> <td>1D</td> <td>0.02D</td> </tr> </table> ar Max=0.5mm		aa	ar	1D	0.02D
	Dia	aa	ar																													
D ≤ 1.5	1.5D	0.02D																														
1.5 < D ≤ 2.5	1.5D	0.05D																														
2.5 < D	1.5D	0.1D																														
aa	ar																															
1.5D	0.05D																															
aa	ar																															
1.5D	0.03D																															
aa	ar																															
1D	0.02D																															
Mill Dia.		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																					
Inch	mm																															
-	1	38,220	60.2	28,660	45.3	22,290	24.4	19,110	18.1	15,920	13.0																					
1/16	-	24,061	60.2	18,076	45.3	14,046	24.4	12,031	18.1	10,015	13.0																					
-	1.5	25,480	60.2	19,110	45.3	14,860	24.4	12,740	18.1	10,620	13.0																					
5/64	-	19,249	60.2	14,461	45.3	11,237	24.4	9,624	18.1	8,012	13.0																					
-	2	19,110	60.2	14,330	45.3	11,150	24.4	9,550	18.1	7,960	13.0																					
3/32	-	16,041	60.2	12,051	45.3	9,364	24.4	8,020	18.1	6,677	13.0																					
-	2.5	15,290	60.2	11,460	45.3	8,920	24.4	7,640	18.1	6,370	13.0																					
7/64	-	13,749	60.2	10,329	45.3	8,026	24.4	6,875	18.1	5,723	13.0																					
-	3	12,740	60.2	9,550	45.3	7,430	24.4	6,370	18.1	5,310	13.0																					
1/8	-	12,031	60.2	9,038	45.3	7,023	24.4	6,015	18.1	5,008	13.0																					
5/32	-	9,624	60.2	7,231	45.3	5,618	24.4	4,812	18.1	4,006	13.0																					
-	4	9,550	60.2	7,170	45.3	5,570	24.4	4,730	18.1	3,980	13.0																					
3/16	-	8,020	60.2	6,025	45.3	4,682	24.4	4,010	18.1	3,338	13.0																					
-	5	7,640	60.2	5,730	45.3	4,460	24.4	3,820	18.1	3,180	13.0																					
7/32	-	6,875	60.2	5,165	45.3	4,013	24.4	3,437	18.1	2,862	13.0																					
-	6	6,370	90.2	4,780	67.7	3,720	37.0	3,180	27.2	2,650	20.1																					
1/4	-	6,015	90.2	4,519	67.7	3,511	37.0	3,008	27.2	2,504	20.1																					
9/32	-	5,347	90.2	4,017	67.7	3,121	37.0	2,673	27.2	2,226	20.1																					
5/16	-	4,812	90.2	3,615	67.7	2,809	37.0	2,406	27.2	2,003	20.1																					
-	8	4,780	90.2	3,580	67.7	2,790	37.0	2,390	27.2	1,990	20.1																					
3/8	-	4,010	90.2	3,013	67.7	2,341	37.0	2,005	27.2	1,669	20.1																					
-	10	3,820	90.2	2,870	67.7	2,230	37.0	1,910	27.2	1,590	20.1																					
7/16	-	3,437	90.2	2,582	67.7	2,007	37.0	1,719	27.2	1,431	20.1																					
-	12	3,180	90.2	2,390	67.7	1,860	37.0	1,590	27.2	1,330	20.1																					
1/2	-	3,008	90.2	2,260	67.7	1,756	37.0	1,504	27.2	1,252	20.1																					
5/8	-	2,406	90.2	1,808	67.7	1,405	37.0	1,203	27.2	1,002	20.1																					
3/4	-	2,005	90.2	1,506	67.7	1,170	37.0	1,003	27.2	835	20.1																					
1	-	1,504	90.2	1,130	67.7	878	37.0	752	27.2	626	20.1																					

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use an air blow or a suitable cutting fluid with high smoke retardant properties.



A Brand AE-MS-H & AE-CR-MS-H

Advanced Performance Carbide End Mills with DUOREY Coating

List 8440, 8540, 8470, 8570: Multi-Flute, Regular Length, Square & Corner Rad. (Cont.)

High Speed Milling

Hardness		Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC																	
Work Material		Tool Steels Hardened Steels Alloy Steels		Hardened Steels																							
Cutting Speed (SFM)		950 - 1,020		785 - 850		490 - 560		425 - 490		295 - 360																	
Depth of Cut		<table border="1"> <tr><th>aa</th><th>ar</th></tr> <tr><td>1D</td><td>0.05D</td></tr> </table> $\bar{a}r \text{ Max}=0.5\text{mm}$		aa	ar	1D	0.05D	<table border="1"> <tr><th>aa</th><th>ar</th></tr> <tr><td>1D</td><td>0.03D</td></tr> </table> $\bar{a}r \text{ Max}=0.5\text{mm}$		aa	ar	1D	0.03D	<table border="1"> <tr><th>aa</th><th>ar</th></tr> <tr><td>1D</td><td>0.02D</td></tr> </table> $\bar{a}r \text{ Max}=0.2\text{mm}$		aa	ar	1D	0.02D	<table border="1"> <tr><th>aa</th><th>ar</th></tr> <tr><td>1D</td><td>0.01D</td></tr> </table> $\bar{a}r \text{ Max}=0.2\text{mm}$				aa	ar	1D	0.01D
aa	ar																										
1D	0.05D																										
aa	ar																										
1D	0.03D																										
aa	ar																										
1D	0.02D																										
aa	ar																										
1D	0.01D																										
Mill Dia.		Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed																
Inch	mm	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min																
-	1	50,000	78.7	50,000	78.7	50,000	63.0	44,590	49.2	31,850	27.6																
1/16	-	50,000	125.0	50,000	125.0	32,122	64.2	28,092	49.2	20,031	31.0																
-	1.5	50,000	118.1	50,000	118.1	33,970	64.2	29,720	49.2	21,230	29.9																
5/64	-	48,171	150.5	40,110	125.3	25,698	64.2	22,473	49.2	16,024	31.0																
-	2	47,770	150.4	39,810	125.2	25,480	64.2	22,290	49.2	15,920	31.5																
3/32	-	40,142	150.5	33,425	125.3	21,415	64.2	18,728	49.2	13,354	31.0																
-	2.5	38,220	150.4	31,850	125.6	20,380	64.2	17,830	49.2	12,740	31.9																
7/64	-	34,408	150.5	28,650	125.3	18,356	64.2	16,052	49.2	11,446	31.0																
-	3	31,850	150.4	26,540	125.2	16,990	64.2	14,860	49.2	10,620	31.9																
1/8	-	30,107	150.5	25,069	125.3	16,061	64.2	14,046	49.2	10,015	31.0																
5/32	-	24,085	150.5	20,055	125.3	12,849	64.2	11,237	49.2	8,012	31.0																
-	4	23,890	150.4	19,900	125.2	12,740	64.2	11,150	49.2	7,960	31.9																
3/16	-	20,071	150.5	16,712	125.3	10,707	64.2	9,364	49.2	6,677	31.0																
-	5	19,110	150.4	15,920	125.2	10,190	64.2	8,920	49.2	6,370	31.9																
7/32	-	17,204	150.5	14,325	125.3	9,178	64.2	8,026	49.2	5,723	31.0																
-	6	15,920	225.6	13,270	188.2	8,490	96.5	7,430	73.6	5,310	47.6																
1/4	-	15,053	225.8	12,534	188.0	8,031	96.4	7,023	73.7	5,008	46.6																
9/32	-	13,381	225.8	11,142	188.0	7,138	96.4	6,243	73.7	4,451	46.6																
5/16	-	12,043	225.8	10,027	188.0	6,424	96.4	5,618	73.7	4,006	46.6																
-	8	11,940	225.6	9,950	188.2	6,370	96.5	5,570	73.6	3,980	47.6																
3/8	-	10,036	225.8	8,356	188.0	5,354	96.4	4,682	73.7	3,338	46.6																
-	10	9,550	225.6	7,960	188.2	5,100	96.5	4,460	73.6	3,180	47.6																
7/16	-	8,602	225.8	7,162	188.0	4,589	96.4	4,013	73.7	2,862	46.6																
-	12	7,960	225.6	6,630	188.2	4,250	96.5	3,720	73.6	2,650	47.6																
1/2	-	7,527	225.8	6,267	188.0	4,015	96.4	3,511	73.7	2,504	46.6																
5/8	-	6,021	225.8	5,014	188.0	3,212	96.4	2,809	73.7	2,003	46.6																
3/4	-	5,018	225.8	4,178	188.0	2,677	96.4	2,340	73.7	1,669	46.6																
1	-	3,763	225.8	3,134	188.0	2,008	96.4	1,756	73.7	1,252	46.6																

1. Tools can cause sparks. Do not use flammable fluids.
2. Use an air blow or a suitable cutting fluid with high smoke retardant properties.




A Brand AE-MSS-H

Advanced Performance Carbide End Mills with DUOREY Coating

List 8441, 8541: Multi-Flute, Stub Length, Reduced Neck, Square End

Side Milling

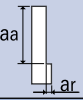
Hardness	Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC		
Work Material	Tool Steels Hardened Steels Alloy Steels		Hardened Steels								
Cutting Speed (SFM)	360 - 425		260 - 330		195 - 260		165 - 230		130 - 200		
Depth of Cut	$a_a \leq 1.5D$ $a_r \leq 0.1D$ $a_r \text{ Max} = 1\text{mm}$ 		$a_a \leq 1.5D$ $a_r \leq 0.05D$ $a_r \text{ Max} = 0.5\text{mm}$				$a_a \leq 1.5D$ $a_r \leq 0.03D$ $a_r \text{ Max} = 0.3\text{mm}$				
Mill Dia.		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
Inch	mm										
1/16	-	24,061	48.1	18,076	35.3	14,046	21.0	12,031	15.8	10,015	9.9
5/64	-	19,249	48.1	14,461	35.3	11,237	21.0	9,624	15.8	8,012	9.9
3/32	-	16,041	48.1	12,051	35.3	9,364	21.0	8,020	15.8	6,677	9.9
7/64	-	13,749	48.1	10,329	35.3	8,026	21.0	6,875	15.8	5,723	9.9
-	3	12,740	48.0	9,550	34.6	7,430	20.9	6,370	15.7	5,310	9.8
1/8	-	12,031	48.1	9,038	35.3	7,023	21.0	6,015	15.8	5,008	9.9
5/32	-	9,624	48.1	7,231	35.3	5,618	21.0	4,812	15.8	4,006	9.9
-	4	9,550	48.0	7,170	35.0	5,570	20.9	4,780	15.7	3,980	9.8
3/16	-	8,020	48.1	6,025	35.3	4,682	21.0	4,010	15.8	3,338	9.9
-	5	7,640	48.0	5,730	36.2	4,460	21.3	3,820	15.7	3,180	9.8
7/32	-	6,875	48.1	5,165	35.3	4,013	21.0	3,437	15.8	2,862	9.9
-	6	6,370	72.0	4,780	53.1	3,720	31.5	3,180	23.6	2,650	15.0
1/4	-	6,015	72.1	4,519	52.9	3,511	31.5	3,008	23.6	2,504	14.9
9/32	-	5,347	72.1	4,017	52.9	3,121	31.5	2,673	23.6	2,226	14.9
5/16	-	4,812	72.1	3,615	52.9	2,809	31.5	2,406	23.6	2,003	14.9
-	8	4,780	72.4	3,580	53.1	2,790	31.5	2,390	23.6	1,990	15.0
3/8	-	4,010	72.1	3,013	52.9	2,341	31.5	2,005	23.6	1,669	14.9
-	10	3,820	72.0	2,870	52.8	2,230	31.5	1,910	23.6	1,590	15.0
7/16	-	3,437	72.1	2,582	52.9	2,007	31.5	1,719	23.6	1,431	14.9
-	12	3,180	72.0	2,390	52.4	1,860	31.5	1,590	23.6	1,330	15.0
1/2	-	3,008	72.1	2,260	52.9	1,756	31.5	1,504	23.6	1,252	14.9

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use an air blow or a suitable cutting fluid with high smoke retardant properties.



List 8441, 8541: Multi-Flute, Stub Length, Reduced Neck, Square End

High Speed Milling

Hardness		Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC	
Work Material		Tool Steels Hardened Steels Alloy Steels		Hardened Steels							
Cutting Speed (SFM)		950 - 1,020		785 - 850		490 - 560		425 - 490		295 - 360	
Depth of Cut		$a_a \leq 1.5D$ $a_r \leq 0.02D$ $a_r \text{ Max} = 0.2\text{mm}$ 						$a_a \leq 1.5D$ $a_r \leq 0.01D$ $a_r \text{ Max} = 0.1\text{mm}$			
Mill Dia.		Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed
Inch	mm	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min
1/16	-	50,000	112.5	50,000	112.5	32,122	60.2	28,092	49.2	20,031	28.0
5/64	-	48,171	135.5	40,110	112.8	25,698	60.2	22,473	49.2	16,024	28.0
3/32	-	40,142	135.5	33,425	112.8	21,415	60.2	18,728	49.2	13,354	28.0
7/64	-	34,408	135.5	28,650	112.8	18,356	60.2	16,052	49.2	11,446	28.0
-	3	31,850	135.4	26,540	113.0	16,990	60.2	14,860	46.9	10,620	28.3
1/8	-	30,107	135.5	25,069	112.8	16,061	60.2	14,046	49.2	10,015	28.0
5/32	-	24,085	135.5	20,055	112.8	12,849	60.2	11,237	49.2	8,012	28.0
-	4	23,890	135.4	19,900	113.0	12,740	60.2	11,150	46.9	7,960	28.3
3/16	-	20,071	135.5	16,712	112.8	10,707	60.2	9,364	49.2	6,677	28.0
-	5	19,110	135.4	15,920	113.0	10,190	60.2	8,920	46.9	6,370	28.3
7/32	-	17,204	135.5	14,325	112.8	9,178	60.2	8,026	49.2	5,723	28.0
-	6	15,920	203.1	13,270	169.3	8,490	90.2	7,430	70.1	5,310	42.5
1/4	-	15,053	203.2	12,534	169.2	8,031	90.3	7,023	73.7	5,008	42.1
9/32	-	13,381	203.2	11,142	169.2	7,138	90.3	6,243	73.7	4,451	42.1
5/16	-	12,043	203.2	10,027	169.2	6,424	90.3	5,618	73.7	4,006	42.1
-	8	11,940	203.1	9,950	169.3	6,370	90.2	5,570	69.7	3,980	42.5
3/8	-	10,036	203.2	8,356	169.2	5,354	90.3	4,682	46.0	3,338	42.1
-	10	9,550	203.1	7,960	169.3	5,100	90.2	4,460	46.1	3,180	42.5
7/16	-	8,602	203.2	7,162	169.2	4,589	90.3	4,013	46.0	2,862	42.1
-	12	7,960	203.1	6,630	169.3	4,250	90.2	3,720	46.1	2,650	42.5
1/2	-	7,527	203.2	6,267	169.2	4,015	90.3	3,511	46.0	2,504	42.1

1. Tools can cause sparks. Do not use flammable fluids.
2. Use an air blow or a suitable cutting fluid with high smoke retardant properties.

A Brand AE-ML-H

Overview

A Brand AE-ML-H

Multi-flute square type carbide end mills designed for stable and high-efficiency milling of high-hardness steels. With the addition of the new DUROREY coating uniquely engineered for high-hardness steels, high chipping resistance is made possible even in work materials exceeding 60 HRC, allowing long tool life and high speed milling.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/a-brand-ae-h

List Numbers

8442 - A Brand AE-ML-H (Inch)
8542 - A Brand AE-ML-H (Metric)

Size Range

1/8"-1/2"
3mm-12mm

Primary Applications

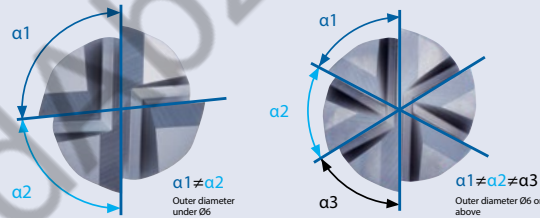
- Side milling hardened steel (up to 70 HRC).
- Stable tool life if super hard steels.
- Rough and finish milling of hardened steels.

Features & Product Solutions

Variable Indexing

Suppresses Chattering

For suppression of cutting vibration, enabling more consistent tool life and cutting quality.



Improved Rigidity

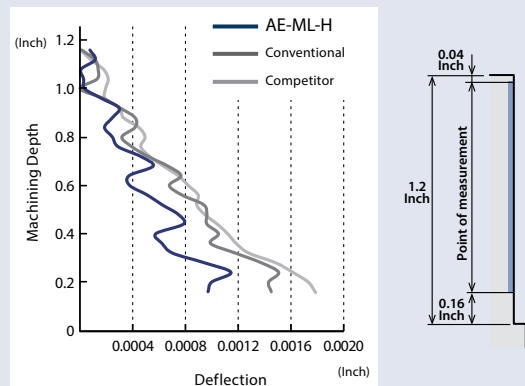
Improved Tool Rigidity with Web Taper Geometry

The web taper geometry, where the thickness of core changes from the cutting edge to the shank, greatly improves tool rigidity, thereby prevents the machining surface from tilting.

Tool	AE-ML-H (Ø10 6FL)
Work Material	STAVAX (51-52 HRC)
Milling Method	Side Milling
Cutting Speed	164 SFM (1,590 rpm)
Feed	26.3 IPM (0.00275 IPT)
Depth of Cut	Aa = 1.181", Ar = 0.0039"
Coolant	Air Blow
Machine	Horizontal Machining Center



The amount of deflection of the machined surface at cutting length of 138 linear inches



DUROREY Coating

Outstanding Performance in High-Hardness Steels

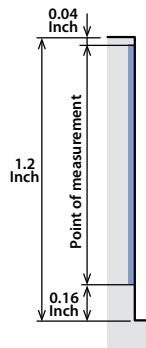
Newest hard milling grade coating, for outstanding performance in high-hardened materials.

High Precision Milling

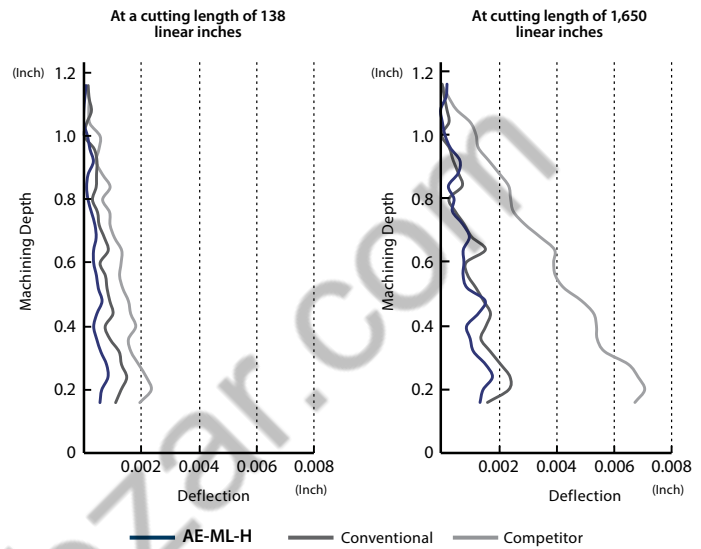
Achieves Stable Milling Accuracy in High-Hardness Steel Machining

Stable machining accuracy can be obtained with little change in the amount of deflection of the machined surface regardless of the cutting length.

Tool	AE-ML-H (Ø10 6FL)
Work Material	D2 Tool Steel (60 HRC)
Milling Method	Side Milling
Cutting Speed	98.5 SFM (955 RPM)
Feed	10.2 IPM (0.00177 IPT)
Depth of Cut	Aa = 1.181", Ar = 0.002"
Coolant	Air Blow
Machine	Horizontal Machining Center (HSK63)



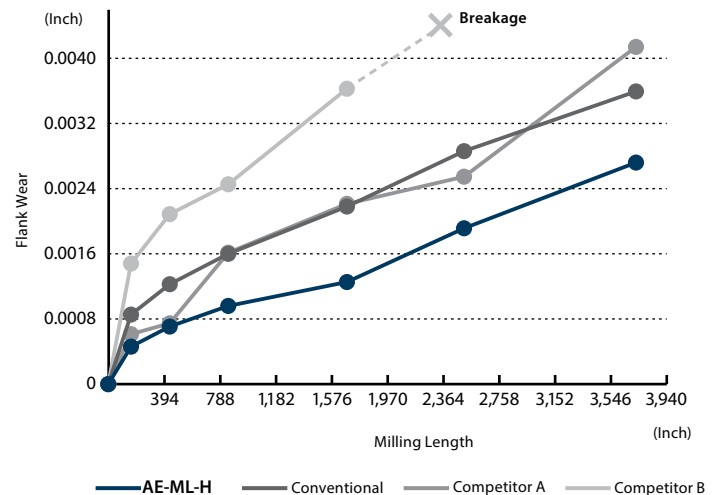
Comparison of the amount of deflection of the machined surface



Long Tool Life

Achieves Stable Durability in High-Hardness Steel Machining

Tool	AE-ML-H (Ø10 6FL)
Work Material	SKD11 (60 HRC)
Milling Method	Side Milling
Cutting Speed	98.5 SFM (955 RPM)
Feed	10.2 IPM (0.00177 IPT)
Depth of Cut	Aa = 1.181", Ar = 0.002"
Coolant	Air Blow
Machine	Horizontal Machining Center (HSK63)



A Brand AE-ML-H

Advanced Performance Carbide End Mills with Long LOC for Hardened Steels

List 8442

AE-ML-H, Multi-flute, Long Length, Square

COMING SOON!
Check Stock Levels Now!



NEW

SPEED FEED
P103

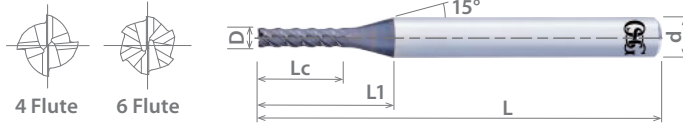
CARBIDE

DUROREY



43°

SHRINK FIT



Milling Radius Tolerance	
D (mm)	0 ~ -0.02mm
D (in)	0 ~ -.0008"

Units: Inch

EDP Number	Mill Dia.	OAL	Length of Cut	Neck Length	Shank Dia.	Type	No. of Flutes	Status
	D	L	Lc	L1	d			
84420123	1/8	2-1/2	1/2	0.863	1/4	1	4	●
84420223	3/16	2-1/2	3/4	1.046	1/4	1	4	●
84420323	1/4	2-3/4	1	-	1/4	2	6	●
84420423	5/16	3-3/4	1-1/4	-	5/16	2	6	●
84420523	3/8	4	1-1/2	-	3/8	2	6	●
84420623	1/2	4-1/2	2	-	1/2	2	6	●

Packed: 1 pc.

Available DUROREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 8542

AE-ML-H, Multi-flute, Long Length, Square

NEW

SPEED FEED
P103

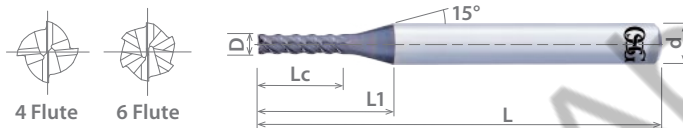
CARBIDE

DUROREY



43°

SHRINK FIT



Milling Radius Tolerance	
D (mm)	0 ~ -0.02mm
D (in)	0 ~ -.0008"

Units: mm

EDP Number	Mill Dia.	OAL	Length of Cut	Neck Length	Shank Dia.	Type	No. of Flutes	Status
	D	L	Lc	L1	d			
8550010	3	60	12	19.9	6	1	4	●
8550011	4	60	16	22.1	6	1	4	●
8550012	5	70	20	24.2	6	1	4	●
8550013	6	70	24	-	6	2	6	●
8550014	8	80	32	-	8	2	6	●
8550015	10	100	40	-	10	2	6	●
8550016	12	110	48	-	12	2	6	●

Packed: 1 pc.

Available DUROREY coating only.

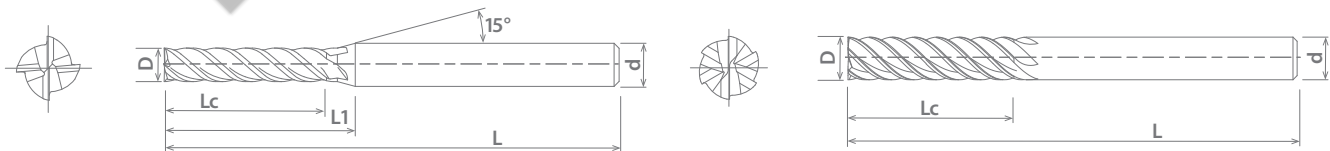
● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



Type1

Type2



Work Material

List No.	P					M			K	N		S	H				
	Carbon Steels			Alloy Steels 4140 4340	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy Inconel	Titanium 6Al4V (30 HRC)	Hardened Steels			
	Low 1010 1018	Med. 1035 1045	High 1065			300	400	17-4 PH		6061 7075	Casting			~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
8442				○	○								○	○	○	○	
8542				○	○								○	○	○	○	

○ good ○ best



List 8442, 8542: Multi-Flute, Long Length, Square

Side Milling

Hardness	Up to 45 HRC	45-55 HRC	55-62 HRC	62-66 HRC	66-70 HRC									
Work Material	Tool Steels Hardened Steels Alloy Steels	Hardened Steels												
Cutting Speed (SFM)	195 SFM	145 SFM	100 SFM	65 SFM	50 SFM									
Depth of Cut	<table border="1"> <tr> <td>aa</td> <td>ar</td> </tr> <tr> <td>3D</td> <td>0.01D</td> </tr> </table> <p>ar Max=0.0079"</p>			aa	ar	3D	0.01D	<table border="1"> <tr> <td>aa</td> <td>ar</td> </tr> <tr> <td>3D</td> <td>0.005D</td> </tr> </table> <p>ar Max=0.0039"</p>			aa	ar	3D	0.005D
aa	ar													
3D	0.01D													
aa	ar													
3D	0.005D													
Mill Dia.	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				
Inch	mm													
-	3	6,370	25.6	4,780	14.6	3,180	6.7	2,120	3.9	1,590	2.4			
1/8	-	5,954	25.3	4,427	14.4	3,053	6.9	1,985	3.9	1,527	2.4			
-	4	4,780	25.6	3,580	14.6	2,390	6.7	1,590	3.9	1,190	2.4			
3/16	-	3,969	25.3	2,952	14.4	2,036	6.9	1,323	3.9	1,018	2.4			
-	5	3,820	25.6	2,870	14.6	1,910	6.7	1,270	3.9	960	2.4			
-	6	3,180	38.2	2,390	22.0	1,590	10.2	1,060	5.9	800	3.5			
1/4	-	2,977	38.0	2,214	21.6	1,527	10.3	992	5.8	763	3.5			
5/16	-	2,382	38.0	1,771	21.6	1,221	10.3	794	5.8	611	3.5			
-	8	2,390	38.2	1,790	22.0	1,190	10.2	800	5.9	600	3.5			
3/8	-	1,985	38.0	1,476	21.6	1,018	10.3	662	5.8	509	3.5			
-	10	1,910	38.2	1,430	22.0	960	10.2	640	5.9	480	3.5			
-	12	1,590	38.2	1,190	22.0	800	10.2	530	5.9	400	3.5			
1/2	-	1,489	38.0	1,107	21.6	763	10.3	496	5.8	382	3.5			

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use an air blow or a suitable cutting fluid with high smoke retardant properties.

A Brand AE-BM-H

Overview

A Brand AE-BM-H

Carbide ball end mills for high -precision finishing of high-hardness steel with emphasis on machined surface accuracy. The new DUROREY coating enables longer tool life in high-hardness steel and is high chipping resistant in work materials exceeding 60 HRC.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/a-brand-ae-h

List Numbers

8430 - A Brand AE-BM-H (Inch)
8530 - A Brand AE-BM-H (Metric)

Size Range

1/8"-1/2"
1mm-12mm

Primary Applications

- Die Mold Shops Machining Hard Materials the Need Long Tool Life
- Hard Steel Applications (Over 55HRC)

Features & Product Solutions

Stable Performance with Extended Tool Life

Sharp Spiral Curve

The AE-BM-H features a sharp spiral curve that reduces cutting resistance and enables stable performance with extended tool life.

Surface Accuracy & Chip Control




Center 2-Flute Design

The center 2-flute design controls tear when milling flat areas to improve surface accuracy and secures chip pockets to control the flow of chips.

Superior Precision for a Wide Range of Processes

Superior Ball Radius Precision

The high precision makes the AE-BM-H suitable for a wide range of processes, from roughing to semi-roughing.

 ± 0.005 R ≤ 1.5	 ± 0.007 1.5 < R ≤ 3	 ± 0.01 3 < R
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*Tolerances noted are in mm.

Suppresses Vibration

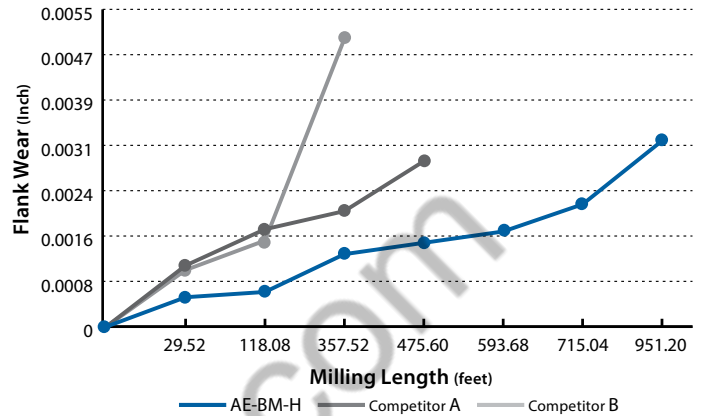
Unequal Flute Spacing

Controls harmonic vibration commonly generated during milling with multiple flutes to enable high-efficiency milling.

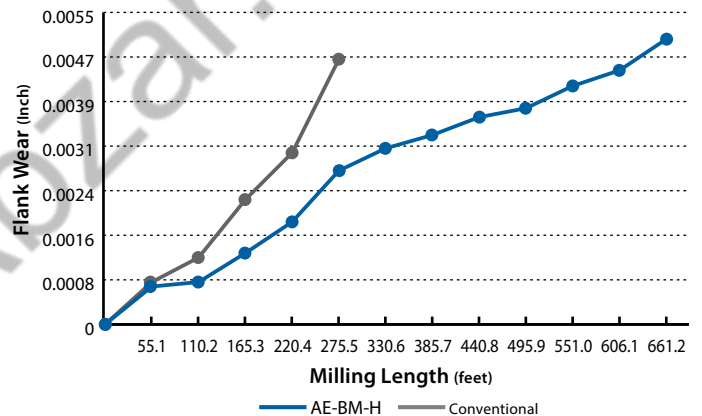
Superior Endurance in High-Hardness Steel

D2 Tool Steel (60 HRC) & M2 High Speed Steel (65 HRC)

Tool	AE-BM-H (10mm)	Competitors
Work Material	D2 Tool Steel (60 HRC)	
Milling Method	Pocketing	
Cutting Speed	180 SFM (1,750 RPM)	
Feed	30.9 IPM (0.0049 IPT)	
Depth of Cut	Aa = 0.0295", Ar = 0.0886"	
Coolant	Air Blow	
Machine	Vertical Machining Center (BT40)	



Tool	AE-BM-H (10mm)	Conventional
Work Material	M2 High Speed Steel (65 HRC)	
Milling Method	Pocketing	
Cutting Speed	410 SFM (4,000 RPM)	
Feed	78.7 IPM (0.0049 IPT)	
Depth of Cut	Aa = 0.0118", Ar = 0.0472"	
Coolant	Air Blow	
Machine	Horizontal Machining Center (HSK63)	

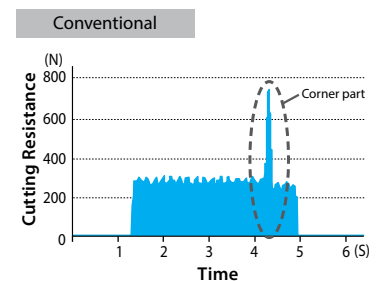
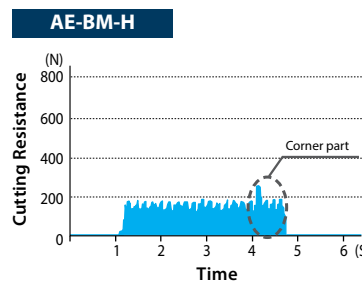
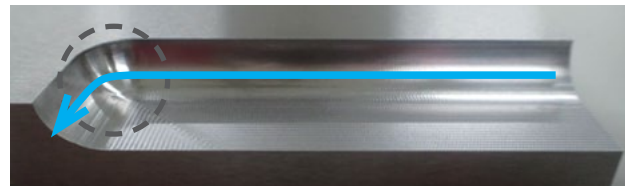


Low Cutting Force

D2 Tool Steel (60 HRC)

The AE-BM-H features a spiral curve and unequal flute spacing that enables stable milling with low resistance.

Tool	AE-BM-H (10mm)	Conventional
Work Material	D2 Tool Steel (60 HRC)	
Milling Method	Corner Milling	
Cutting Speed	260 SFM (2,550 RPM)	
Feed	78.7 IPM (0.0077 IPT)	
Depth of Cut	Aa = 0.1969", Ar = 0.0039"	
Coolant	Air Blow	
Machine	Vertical Machining Center (BT40)	



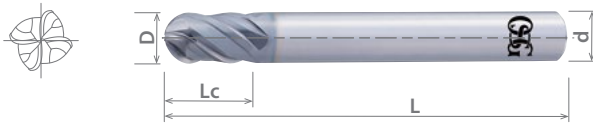
A Brand AE-BM-H

Advanced Performance Carbide End Mills with DUOREY Coating

List 8430

AE-BM-H, 4 Flute, Regular Length, Ball End

NEW	SPEED FEED P108-111	CARBIDE	DUOREY		REG	40°	SHANK h4
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Milling Diameter Tolerance	
D < 1/4	+/- 0.00028"
1/4 <= D	+/- 0.00039"

Units: Inch

EDP Number	Mill Dia.	OAL	Length of Cut	Shank Dia.	Status
	D	L	Lc	d	
84300023	1/8	2	1/4	1/8	●
84300123	3/16	2 1/2	3/8	3/16	●
84300223	1/4	3 1/2	1/2	1/4	●
84300323	5/16	4	5/8	5/16	●
84300423	3/8	4	3/4	3/8	●
84300523	1/2	4 3/8	7/8	1/2	●

Packed: 1 pc.

Available DUOREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzar.com

Watch it in Action!

List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
8430				○	○									○	○	○	○

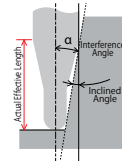
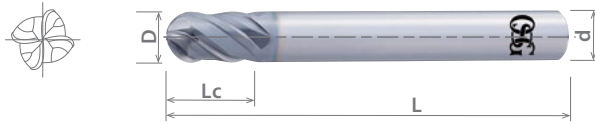
○ good ○ best



List 8530

AE-BM-H, 4 Flute, Regular Length, Ball End

NEW	SPEED FEED P108-111	CARBIDE	DUREY		REG	40°	SHANK h4
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Milling Diameter Tolerance	
D ≤ 3	+/- 0.005mm
3 < D ≤ 6	+/- 0.007mm
6 < D	+/- 0.010mm

Units: mm

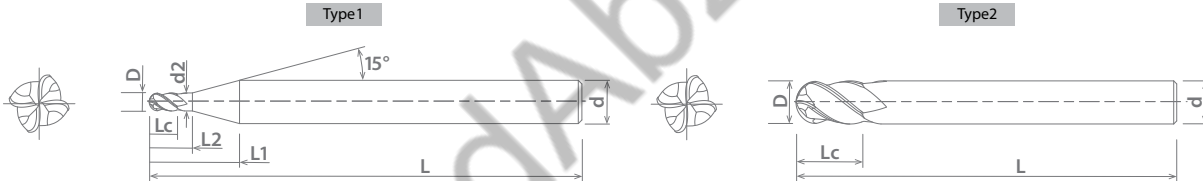
EDP Number	Mill Dia.	OAL	Length of Cut	Neck Length	Non-Tapered Neck Length	Neck Dia	Interference Angle	Effective Neck Length by Incline Angle					Shank Dia.	Type	Status
								0.5°	1.0°	1.5°	2.0°	3.0°			
85300023	1	50	2	8	2	0.95	11.85°	2.13	2.19	2.25	2.32	2.46	4	1	●
85300123	1.5		3		3	1.45	10.15°	2.64	2.71	2.78	2.85	3.02			
8549602	2		2		4	1.95	10.64°	4.19	4.30	4.42	4.55	4.85			
85300223	2.5	60	5	12	5	2.45	9.57°	5.32	5.40	5.52	5.64	5.81	6	1	●
8549603	3		3		6	2.85	8.15°	6.44	6.61	6.79	7.00	7.45			
8549604	4		4		8	3.85	5.65°	8.49	8.71	8.96	9.22	9.81			
8549605	5	70	5	12.2	10	4.85	2.95°	10.54	10.82	11.12	11.45	8	2	●	
8549606	6		9		-	-	-	-	-	-	-				-
8549608	8		12		-	-	-	-	-	-	-				-
8549610	10	80	15	-	-	-	-	-	-	-	-	10	2	●	
8549612	12		18		-	-	-	-	-	-	-				-

Packed: 1 pc.

Available DUREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



YouTube
Watch it in Action!

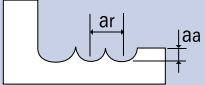
List No.	Work Material															
	P					M			K	N		S	H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels		
8530	Low	Med.	High			4140 4340	300	400		17-4 PH	6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
	1010 1018	1035 1045	1065	○	○				○							

○ good ⊙ best

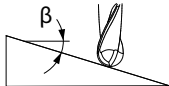


List 8430, 8530: 4 Flute, Regular Length, Ball End

Roughing - Contouring

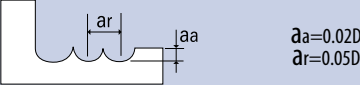
Hardness	Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC																						
Work Material	Tool Steels Hardened Steels Alloy Steels		Hardened Steels																												
Cutting Speed	425 - 500 SFM		375 - 450 SFM		325 - 400 SFM		300 - 360 SFM		200 - 260 SFM																						
Depth of Cut			<table border="1"> <thead> <tr> <th>Dia</th> <th>aa</th> <th>ar</th> </tr> </thead> <tbody> <tr> <td>D<6</td> <td>0.15D</td> <td>0.2D</td> </tr> <tr> <td>6≤D</td> <td>0.1D</td> <td>0.2D</td> </tr> </tbody> </table>			Dia	aa	ar	D<6	0.15D	0.2D	6≤D	0.1D	0.2D	<table border="1"> <thead> <tr> <th>Dia</th> <th>aa</th> <th>ar</th> </tr> </thead> <tbody> <tr> <td>D<6</td> <td>0.12D</td> <td>0.15D</td> </tr> <tr> <td>6≤D</td> <td>0.07D</td> <td>0.15D</td> </tr> </tbody> </table>			Dia	aa	ar	D<6	0.12D	0.15D	6≤D	0.07D	0.15D	da=0.05D dr=0.15D				
			Dia	aa	ar																										
D<6	0.15D	0.2D																													
6≤D	0.1D	0.2D																													
Dia	aa	ar																													
D<6	0.12D	0.15D																													
6≤D	0.07D	0.15D																													
Mill Dia.		Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed	Speed	Feed																				
Inch	mm	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min	RPM	in/min																				
-	2	20,850	131	18,450	73	16,000	63	14,550	57	9,700	31																				
-	3	13,900	110	12,300	68	10,650	58	9,700	53	6,450	31																				
1/8	-	13,150	108	11,600	67	10,100	58	9,150	53	6,100	31																				
-	4	10,450	99	9,200	65	8,000	57	7,300	52	4,850	31																				
3/16	-	8,750	103	7,750	73	6,700	63	6,100	57	4,050	35																				
-	5	8,350	105	7,350	75	6,400	65	5,800	59	3,900	37																				
-	6	6,950	110	6,150	77	5,350	68	4,850	61	3,250	36																				
1/4	-	6,550	103	5,800	73	5,050	64	4,600	58	3,050	34																				
5/16	-	5,250	98	4,650	72	4,050	63	3,650	57	2,450	34																				
-	8	5,200	98	4,600	72	4,000	63	3,650	57	2,450	35																				
3/8	-	4,700	95	4,200	72	3,650	62	3,350	57	2,350	35																				
-	10	4,450	91	4,000	69	3,500	61	3,200	55	2,250	34																				
-	12	4,050	89	3,650	69	3,250	62	2,900	55	2,100	33																				
1/2	-	3,800	84	3,450	65	3,050	58	2,750	52	2,000	31																				

1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
3. The above parameters are applicable to an overhang of 4xD maximum. When the overhang is longer, please reduce feed, speed, and cutting depth.
4. The above parameters are standard starting values for contouring and side milling operations. If vibration or chatter occurs due to machine or part setup, please adjust the speed, feed, and depth of cut accordingly.
5. If contouring includes corners of radius less than 1.5 times the tool diameter, reduce speed and feed to 50-80% of above and reduce Ar to 20-60% of above.
6. When the part incline angle (β) is more than 15°, reduce the speed to 40-60% of above parameters, the feed to 30-50% of above parameters, and Aa to 30-60% of above parameters.
7. If the cutting depth is small it is possible to increase the speed and feed above the recommended parameters.

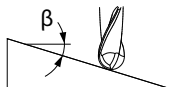


List 8430, 8530: 4 Flute, Regular Length, Ball End (Continued)

Finishing - Contouring

Hardness	Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC		
Work Material	Tool Steels Hardened Steels Alloy Steels		Hardened Steels								
Cutting Speed	550 - 625 SFM		500 - 575 SFM		450 - 525 SFM		375 - 425 SFM		275 - 350 SFM		
Depth of Cut											
Mill Dia.		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
Inch	mm										
-	2	25,000	157	24,750	97	22,300	70	18,450	58	13,600	43
-	3	18,100	143	16,500	91	14,900	70	12,300	58	9,050	43
1/8	-	17,100	140	15,600	90	14,050	70	11,600	58	8,550	43
-	4	13,600	129	12,350	87	11,150	70	9,200	58	6,800	43
3/16	-	11,400	135	10,400	98	9,350	81	7,750	67	5,700	49
-	5	10,850	137	9,900	101	8,950	85	7,350	69	5,450	52
-	6	9,050	143	8,250	104	7,450	82	6,150	68	4,550	50
1/4	-	8,550	135	7,800	98	7,050	78	5,800	64	4,300	47
5/16	-	6,850	127	6,250	97	5,600	69	4,650	58	3,400	42
-	8	6,800	128	6,200	98	5,600	71	4,600	58	3,400	43
3/8	-	6,000	121	5,600	95	5,000	69	4,200	58	3,150	44
-	10	5,700	116	5,350	93	4,750	67	4,000	57	3,000	43
-	12	5,000	110	4,600	87	4,200	66	3,500	55	2,850	45
1/2	-	4,750	105	4,350	82	3,950	62	3,300	52	2,650	42

1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
3. The above parameters are applicable to an overhang of 4xD maximum. When the overhang is longer, please reduce feed, speed, and cutting depth.
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5. If contouring includes corners of radius less than 1.5 times the tool diameter, reduce speed and feed to 50-80% of above and reduce Ar to 20-60% of above.
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7. If the cutting depth is small it is possible to increase the speed and feed above the recommended parameters.



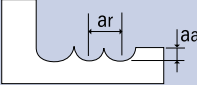
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A Brand AE-BM-H

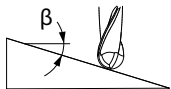
Advanced Performance Carbide End Mills with DUOREY Coating

List 8430, 8530: 4 Flute, Regular Length, Ball End (Continued)

Roughing - High Speed Contouring

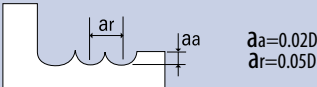
Hardness	Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC		
Work Material	Tool Steels Hardened Steels Alloy Steels		Hardened Steels								
Cutting Speed	750 - 1000 SFM		675 - 900 SFM		600 - 800 SFM		525 - 725 SFM		350 - 525 SFM		
Depth of Cut	$a_d=0.1D$ $a_r=0.2D$		$a_d=0.08D$ $a_r=0.2D$				$a_d=0.05D$ $a_r=0.1D$				
Mill Dia.		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
Inch	mm										
-	2	25,000	157	25,000	98	25,000	98	25,000	79	17,000	54
-	3	24,900	196	22,000	121	19,100	105	17,150	81	11,300	53
1/8	-	23,550	186	20,800	115	18,050	99	16,200	77	10,700	51
-	4	20,600	195	18,200	129	16,000	113	14,300	90	9,600	60
3/16	-	17,300	204	15,300	136	13,450	119	12,000	94	8,050	63
-	5	16,500	208	14,550	149	12,800	131	11,450	108	7,650	72
-	6	13,750	217	12,150	153	10,650	134	9,550	105	6,400	71
1/4	-	13,000	205	11,450	144	10,100	127	9,000	99	6,050	67
5/16	-	10,400	203	9,300	145	8,050	126	7,200	99	4,850	66
-	8	10,300	195	9,200	145	8,000	126	7,150	101	4,800	68
3/8	-	9,150	196	8,400	150	7,350	131	6,700	108	4,700	76
-	10	8,750	179	8,000	139	7,000	121	6,400	101	4,450	70
-	12	8,100	179	7,300	138	6,400	121	5,800	91	4,200	66
1/2	-	7,650	169	6,900	130	6,050	114	5,500	87	3,950	62

1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
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5. If contouring includes corners of radius less than 1.5 times the tool diameter, reduce speed and feed to 50-80% of above and reduce Ar to 20-60% of above.
6. When the part incline angle (β) is more than 15°, reduce the speed to 40-60% of above parameters, the feed to 30-50% of above parameters, and Aa to 30-60% of above parameters.
7. If the cutting depth is small it is possible to increase the speed and feed above the recommended parameters.

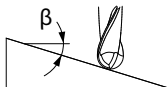


List 8430, 8530: 4 Flute, Regular Length, Ball End (Continued)

Finishing - High Speed Contouring

Hardness	Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC		
Work Material	Tool Steels Hardened Steels Alloy Steels		Hardened Steels								
Cutting Speed	825 - 1125 SFM		750 - 1050 SFM		700 - 950 SFM		575 - 775 SFM		425 - 625 SFM		
Depth of Cut											
Mill Dia.		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
Inch	mm										
-	2	25,000	157	25,000	98	25,000	79	25,000	79	20,400	64
-	3	25,000	197	24,600	136	22,300	105	18,100	86	13,600	64
1/8	-	25,000	197	23,250	128	21,100	106	17,100	86	12,850	64
-	4	24,250	229	22,300	158	20,150	127	16,500	104	12,150	77
3/16	-	20,350	240	18,750	166	16,900	146	13,850	120	10,200	88
-	5	19,400	244	17,850	183	16,100	152	13,200	125	9,700	92
-	6	16,150	254	14,900	188	13,400	148	11,000	121	8,100	89
1/4	-	15,300	241	14,050	177	12,700	140	10,400	115	7,650	84
5/16	-	12,200	238	11,250	176	10,150	139	8,300	114	6,100	83
-	8	12,150	230	11,150	176	10,050	127	8,250	104	6,050	76
3/8	-	10,800	231	9,950	178	9,050	125	7,550	105	5,700	79
-	10	10,300	211	9,450	164	8,650	123	7,200	102	5,450	77
-	12	9,050	199	8,350	158	7,600	120	6,250	99	5,000	79
1/2	-	8,550	188	7,850	148	7,200	114	5,900	93	4,750	75

1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
3. The above parameters are applicable to an overhang of 4xD maximum. When the overhang is longer, please reduce feed, speed, and cutting depth.
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6. When the part incline angle (β) is more than 15°, reduce the speed to 40-60% of above parameters, the feed to 30-50% of above parameters, and Aa to 30-60% of above parameters.
7. If the cutting depth is small it is possible to increase the speed and feed above the recommended parameters.



A Brand AE-BD-H

Overview

A Brand AE-BD-H

Carbide ball end mills for high-precision finishing of high-hardness steel with emphasis on machined surface accuracy. The new DUROREY coating enables longer tool life in high-hardness steel and is high chipping resistant in work materials exceeding 60 HRC.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/ae-h



List Numbers

8410 - A Brand AE-BD-H (Inch)
8510 - A Brand AE-BD-H (Metric)

Size Range

1/32"-1/2"
0.2mm-12mm

Primary Applications

- Die Mold Shops Machining Hard Materials the Need Long Tool Life
- Hard Steel Applications (Over 55HRC)

Features & Product Solutions

Controls Chipping

Variable Negative Spiral Gash

Controls chipping with a larger negative angle at the tip of the cutting edge, while securing cutting quality by making the negative angle weaker near the outer periphery. Chipping resistance is enhanced in combination with the weaker helix angle specification.



Increased Tool Life and Chip Control

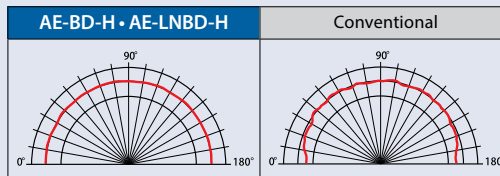
Thick Center Core

The thickening of the center core prevents deformation of the ball tip and improves control of chipping.

Excellent Part Precision

Superior Ball Radius Precision

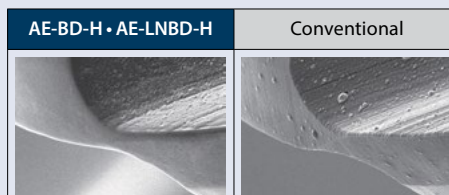
Secures stable R accuracy across 180°.



Improves Surface Quality

Smooth Surface Treatment

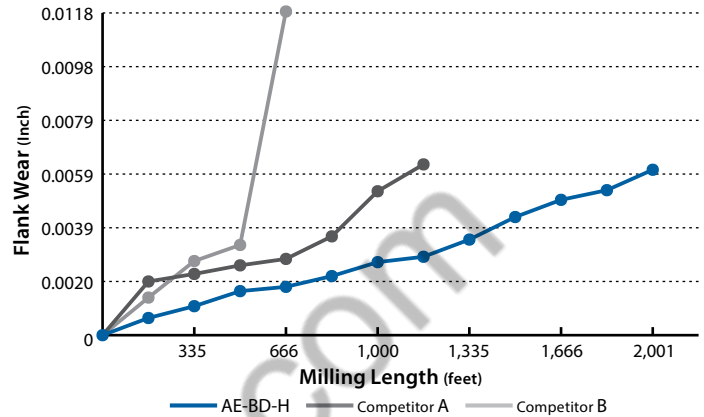
The AE-BD-H features a smooth coating surface for improved surface accuracy.



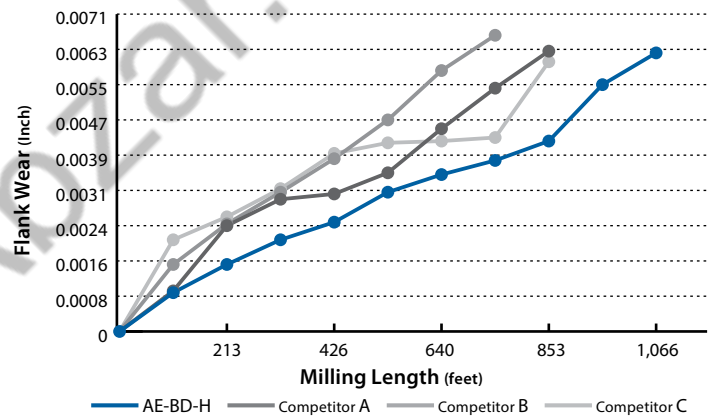
Superior Endurance in High-Hardness Steel

D2 Tool Steel (60 HRC) & M2 High Speed Steel (65 HRC)

Tool	AE-BD-H (10mm)	Competitor
Work Material	D2 Tool Steel (60 HRC)	
Milling Method	Pocketing	
Cutting Speed	490 SFM (4,800 RPM)	
Feed	43.2 IPM (0.0035 IPT)	
Depth of Cut	Aa = 0.0079", Ar = 0.0197"	
Coolant	Air Blow	
Machine	Horizontal Machining Center (HSK63)	



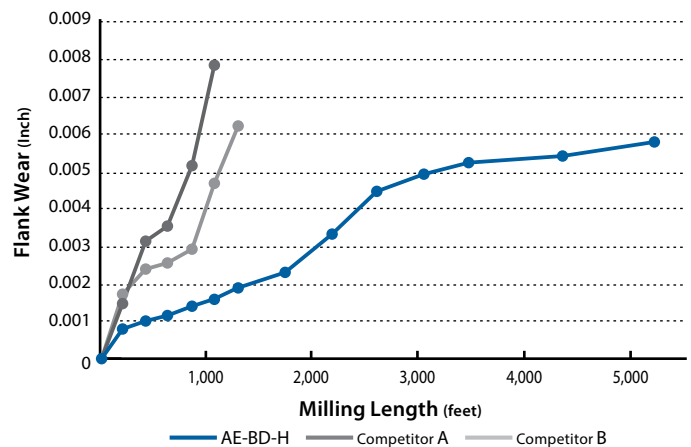
Tool	AE-BD-H (10mm)	Competitor
Work Material	M2 High Speed Steel (65 HRC)	
Milling Method	Pocketing	
Cutting Speed	390 SFM (3,850 RPM)	
Feed	27.6 IPM (0.0035 IPT)	
Depth of Cut	Aa = 0.0079", Ar = 0.0197"	
Coolant	Air Blow	
Machine	Horizontal Machining Center (HSK63)	



Stable Machining in High-Speed Milling Applications

STAVAX (420ESR, 53 HRC)

Tool	AE-BD-H (10mm)	Competitor
Work Material	STAVAX (420ESR, 53 HRC)	
Milling Method	Pocketing	
Cutting Speed	980 SFM (9,550 RPM)	
Feed	105.1 IPM (0.0055 IPT)	
Depth of Cut	Aa = 0.0079", Ar = 0.0197"	
Coolant	Air Blow	
Machine	Horizontal Machining Center (HSK63)	



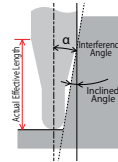
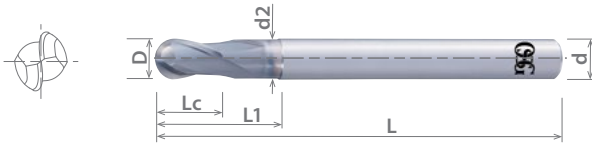
A Brand AE-BD-H

Advanced Performance Carbide End Mills with DUOREY Coating

List 8410

AE-BD-H, 2 Flute, Stub Length, Ball End

NEW SPEED FEED P116-117 CARBIDE DUOREY REG 25° SHANK h4



Milling Diameter Tolerance	
1/32 ≤ D ≤ 1/2	+/- 0.00028"

Units: Inch

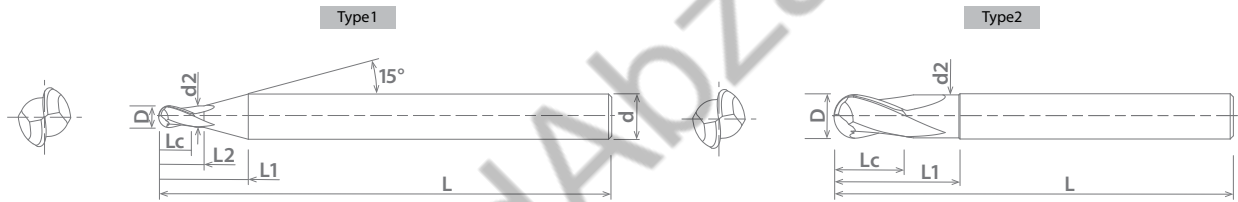
EDP Number	Mill Dia. D	OAL L	Length of Cut Lc	Neck Length L1	Non-Tapered L2	Neck Dia d2	Interference Angle α	Effective Neck Length by Incline Angle					Shank Dia. d	Type	Status
								0.5°	1.0°	1.5°	2.0°	3.0°			
84100023	1/32	1 1/2	0.024	0.512	0.094	0.029	12.39	0.105	0.108	0.112	0.115	0.124	1/4	1	●
84100123	1/16		0.051	0.520	0.157	0.060	10.39	0.172	0.178	0.183	0.189	0.202			
84100223	3/32		0.075	0.504	0.189	0.092	8.89	0.208	0.218	0.228	0.237	0.255			
84100323	1/8	2	0.098	0.508	0.252	0.123	7.03	0.274	0.286	0.297	0.308	0.329			
84100423	3/16	2 1/2	0.150	0.425	0.283	0.185	4.19	0.305	0.317	0.328	0.339	0.36			
84100523	1/4	3	0.374	0.504	-	0.246	-	-	-	-	-	-			
84100623	5/16	3 1/2	0.469	0.630	-	0.308	-	-	-	-	-	-	5/16	2	●
84100723	3/8		0.563	0.756		0.371							3/8		
84100823	1/2		0.752	1.000		0.496							1/2		

Packed: 1 pc.

Available DUOREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzard.com

YouTube Watch it in Action!

List No.	Work Material																
	P					M			K	N		S	H				
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low 1010 1018	Med. 1035 1045	High 1065	4140 4340		300	400	17-4 PH			6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC
8410				○	○									○	○	○	○

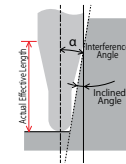
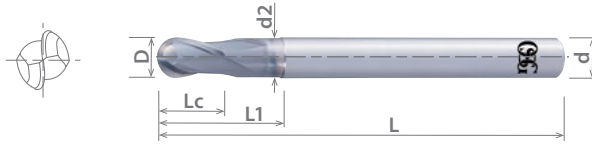
○ good ○ best



List 8510

AE-BD-H, 2 Flute, Stub Length, Ball End

NEW	SPEED FEED P116-117	CARBIDE	DUROREY		REG	25°	SHANK h4
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Milling Radius Tolerance	
0.2 < D < 12	+/- 0.005mm

Units: mm

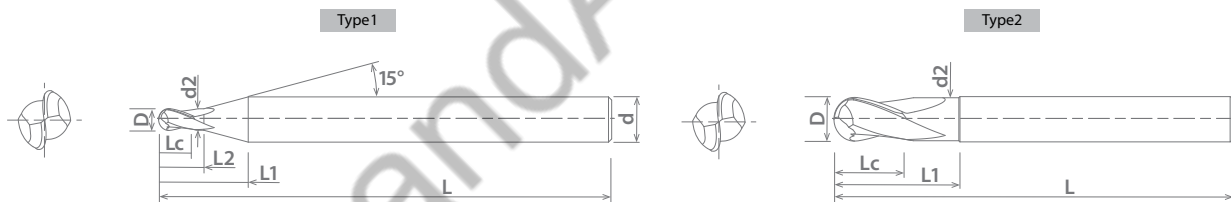
EDP Number	Mill Dia. D	OAL L	Length of Cut Lc	Neck Length L1	Non-Tapered L2	Neck Dia d2	Interference Angle α	Effective Neck Length by Incline Angle					Shank Dia. d	Type	Status
								0.5°	1.0°	1.5°	2.0°	3.0°			
85100023	0.2	40	0.16	7.31	0.40	0.19	14.78°	0.21	0.23	0.24	0.25	0.28	4	1	●
85100123	0.8		0.60	7.66	1.60	0.75	12.50°	1.70	1.74	1.79	1.84	1.93			
3042001	1	50	0.80	7.70	2.00	0.95	11.71°	2.14	2.20	2.26	2.33	2.48			
85100223	1.4		1.10	7.74	2.80	1.35	10.50°	2.95	3.02	3.07	3.13	3.27			
3042002	1.5	60	1.20	7.90	3.00	1.45	10.03°	3.17	3.25	3.34	3.44	3.66			
3042003	2		1.60	12.00	4.00	1.95	10.64°	4.19	4.30	4.42	4.55	4.85			
85100323	2.5	70	2.00	8.08	5.00	2.35	6.46°	5.21	5.31	5.43	5.54	5.82			
3042004	3		2.40	11.90	6.00	2.85	8.15°	6.44	6.61	6.79	7.00	7.45			
3042005	4	80	-	-	8.00	3.85	-	-	-	-	-	-			
3042006	4		3.40	12.10	-	-	5.65°	8.49	8.71	8.96	9.22	9.81			
3042008	5	90	4.20	12.20	10.00	4.80	2.92°	10.63	10.90	11.22	11.55	-			
3042010	6		9.00	-	-	-	-	-	-	-	-	-			
3042012	8	100	12.00	-	-	7.70	-	-	-	-	-	-			
3042014	10		15.00	-	-	9.70	-	-	-	-	-	-			
3042016	12		18.00	-	-	11.70	-	-	-	-	-	-			

Packed: 1 pc.

Available DUROREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



Watch it in Action!

List No.	Work Material																
	P					M			K	N		S	H				
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum	Nickel Alloy	Titanium	Hardened Steels				
	Low 1010 1018	Med. 1035 1045	High 1065	4140 4340		300	400	17-4 PH		6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
8510				○	○									○	○	○	○

○ good ○ best

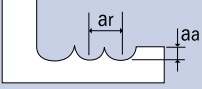


A Brand AE-BD-H

Advanced Performance Carbide End Mills with DUREY Coating

List 8410, 8510: 2 Flute, Stub Length, Ball End

Finishing - Contouring

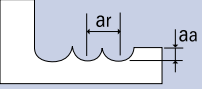
Hardness		Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC	
Work Material		Tool Steels Hardened Steels Alloy Steels		Hardened Steels							
Depth of Cut		$a_a=0.05D$ $a_r=0.1D$				$a_a=0.03D$ $a_r=0.1D$		$a_a=0.02D$ $a_r=0.05D$			
Mill Dia.		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
Inch	mm										
-	0.2	25000	14.8	25000	14.8	25000	14.8	25000	11.7	25000	11.7
1/32	0.8	25000	49.2	25000	49.2	25000	49.2	25000	35.8	25000	35.8
-	1	25000	60.2	25000	60.2	25000	51.3	25000	41.0	25000	41.0
-	1.4	25000	73.0	25000	73.0	25000	59.8	25000	54.9	25000	54.9
-	1.5	25000	78.2	25000	78.2	25000	64.1	25000	58.8	25000	58.8
1/16	-	25000	73.2	25000	72.2	25000	59.7	25000	57.0	25000	57.0
-	2	25000	92.3	25000	91.0	25000	75.2	23750	68.2	23750	68.2
3/32	-	25000	109.9	25000	108.3	24050	86.1	19950	68.2	19950	68.2
-	2.5	25000	109.3	25000	108.9	22900	82.2	19400	66.2	19400	66.2
-	3	25000	123.8	25000	125.0	19100	78.3	16150	62.8	16150	62.8
1/8	-	25000	131.0	23850	126.2	18050	78.3	15300	63.0	15300	63.0
-	4	24000	143.7	19150	115.8	14300	74.3	11900	59.1	11900	59.1
3/16	-	20150	137.7	15700	104.0	12000	66.5	10000	53.3	10000	53.3
-	5	19200	137.8	14950	104.0	11450	66.6	9500	53.1	9500	53.1
-	6	16150	131.5	12600	90.6	9550	61.3	7900	48.6	7900	48.6
1/4	-	15300	131.8	11900	90.5	9000	61.2	7500	48.8	7500	48.8
5/16	-	12000	112.3	9550	80.5	7200	53.5	6000	41.7	6000	41.7
-	8	11900	112.2	9450	80.3	7150	53.5	5950	41.7	5950	41.7
3/8	-	10000	100.7	7950	70.6	6100	45.4	5000	34.2	5000	34.2
-	10	9500	100.4	7550	70.4	5800	45.3	4750	34.1	4750	34.1
-	12	8000	94.5	6400	65.0	4750	37.2	3950	30.9	3950	30.9
1/2	-	7550	94.4	6050	65.0	4500	37.3	3750	31.1	3750	31.1

1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
3. The above parameters are standard starting values for contouring and side milling operations. If vibration or chatter occurs due to machine or part setup, please adjust the speed, feed, and depth of cut accordingly.
4. If the cutting depth is small it is possible to increase the speed and feed above the recommended parameters.



List 8410, 8510: 2 Flute, Stub Length, Ball End (Continued)

Finishing - High Speed Contouring

Hardness	Up to 45 HRC		45-55 HRC		55-62 HRC		62-66 HRC		66-70 HRC		
Work Material	Tool Steels Hardened Steels Alloy Steels		Hardened Steels								
Depth of Cut	$a_a=0.02D$ $a_r=0.05D$ 						$a_a=0.01D$ $a_r=0.05D$				
	Mill Dia. Inch	mm	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM
-	0.2	25000	20.8	25000	20.8	25000	17.5	25000	14.6	25000	13.5
1/32	0.8	25000	63.6	25000	63.6	25000	53.3	25000	44.7	25000	41.3
-	1	25000	72.8	25000	72.8	25000	61.0	25000	51.2	25000	47.2
-	1.4	25000	88.2	25000	88.2	25000	71.7	25000	56.0	25000	55.0
-	1.5	25000	94.5	25000	94.5	25000	76.8	25000	60.0	25000	59.0
1/16	-	25000	87.5	25000	83.6	25000	59.4	25000	57.0	25000	57.0
-	2	25000	110.2	25000	105.3	25000	74.8	25000	71.8	25000	71.8
3/32	-	25000	131.3	25000	125.4	25000	89.1	25000	85.4	24050	82.2
-	2.5	25000	120.0	25000	117.1	25000	90.0	25000	86.4	22900	78.3
-	3	25000	122.5	25000	123.0	25000	103.7	25000	99.6	19100	74.4
1/8	-	25000	129.7	25000	130.2	25000	109.7	23850	100.6	18050	74.4
-	4	25000	150.8	25000	150.4	24000	126.0	19150	94.2	14300	70.4
3/16	-	25000	170.3	23850	156.9	20150	112.2	16300	84.2	12000	62.6
-	5	25000	178.8	22700	156.8	19200	112.2	15500	84.1	11450	62.7
-	6	24600	204.7	19250	136.2	16150	100.1	12600	80.7	9550	61.3
1/4	-	23250	204.8	18200	136.3	15300	100.3	11900	80.7	9000	61.2
5/16	-	18750	175.2	14550	120.4	12000	88.6	9550	70.7	7200	53.5
-	8	18600	175.2	14450	120.5	11900	88.6	9450	70.5	7150	53.5
3/8	-	15750	155.5	12100	104.6	10000	75.0	7950	60.8	6100	45.4
-	10	15000	155.5	11550	104.8	9500	74.8	7550	60.6	5800	45.3
-	12	12600	145.7	9450	97.9	8000	63.0	6400	53.1	4750	38.8
1/2	-	11900	145.6	8950	98.1	7550	62.9	6050	53.2	4500	38.9

1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
3. The above parameters are standard starting values for contouring and side milling operations. If vibration or chatter occurs due to machine or part setup, please adjust the speed, feed, and depth of cut accordingly.
4. If the cutting depth is small it is possible to increase the speed and feed above the recommended parameters.

A Brand AE-LNBD-H

Overview

A Brand AE-LNBD-H

Carbide ball end mills for high-precision finishing of high-hardness steel with emphasis on machined surface accuracy. The new DUOREY coating enables longer tool life in high-hardness steel and is high chipping resistant in work materials exceeding 60 HRC.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/a-brand-ae-h

List Numbers

8590 - A Brand AE-LNBD-H (Metric)

Size Range

0.1mm-6mm

Primary Applications

- Die Mold Shops Machining Hard Materials the Need Long Tool Life
- Hard Steel Applications (Over 55HRC)

Features & Product Solutions

Increased Tool Life & Chip Control

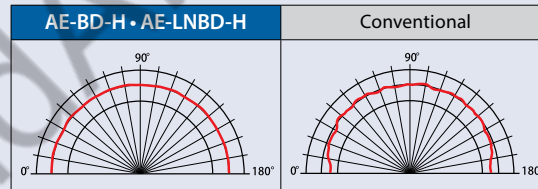
Thick Center Core

The thickening of the center core prevents deformation of the ball tip and improves control of chipping.

Superior Ball Radius Precision

Superior Ball Radius Precision

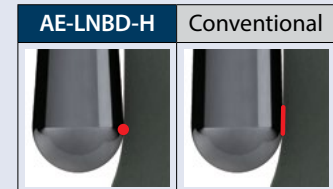
Secures stable R accuracy across 180°.



Reduced Chatter

Teardrop-Shape Outer Periphery

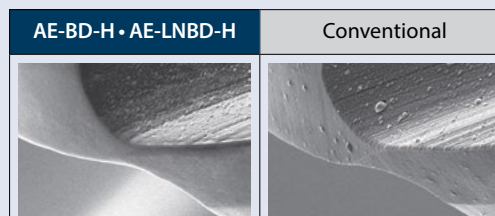
Strong back taper geometry enables milling by point, which prevents chattering and chipping, resulting in improvement of surface accuracy.



Improved Surface Accuracy

Smooth Surface Treatment

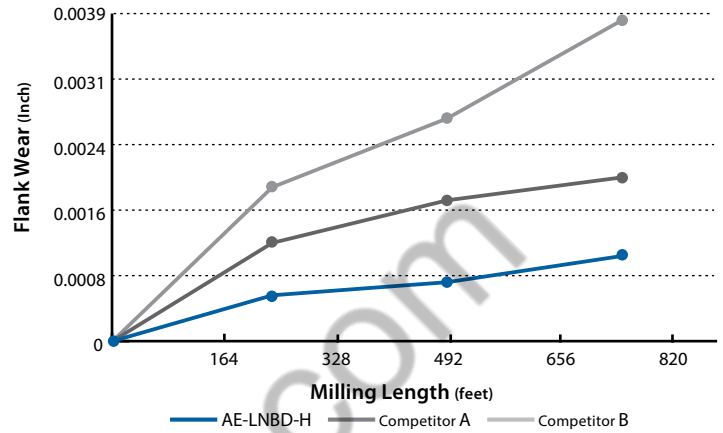
The AE-BD-H features a smooth coating surface for improved surface accuracy.



Superior Durability & Stable Performance

D2 Tool Steel (60 HRC)

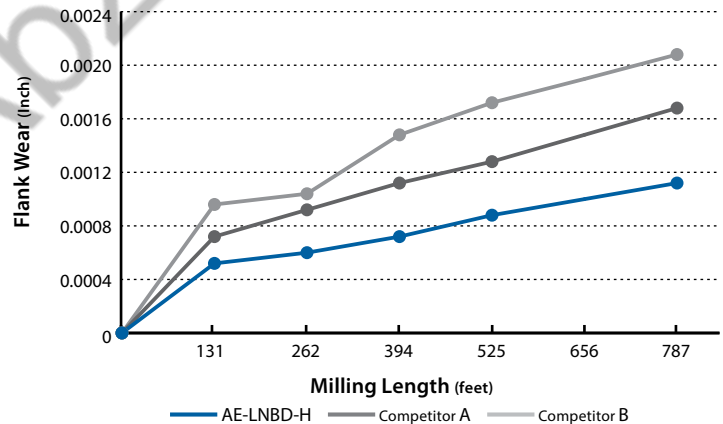
Tool	AE-LNBD-H (2mm x 10mm)	Competitor
Work Material	D2 Tool Steel (60 HRC)	
Milling Method	Contouring	
Cutting Speed	350 SFM (17,000 RPM)	
Feed	55.1 IPM (0.0016 IPT)	
Depth of Cut	Aa = 0.0020", Ar = 0.0039"	
Coolant	Air Blow	
Machine	Vertical Machining Center (HSK32)	



Long Tool Life in Hot Die Steel

DH31S Die Steel (43 HRC)

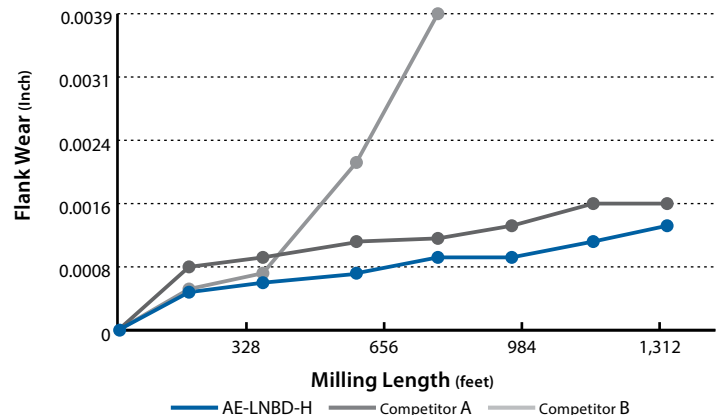
Tool	AE-LNBD-H (2mm x 10mm)	Competitor
Work Material	DH31S Die Steel (43 HRC)	
Milling Method	Pocketing	
Cutting Speed	290 SFM (14,000 RPM)	
Feed	39.4 IPM (0.0014 IPT)	
Depth of Cut	Aa = 0.0020", Ar = 0.0039"	
Coolant	Air Blow	
Machine	Horizontal Machining Center (HSK63)	



Excellent Durability and Surface Finish

STAVAX (420 ESR, 53 HRC)

Tool	AE-LNBD-H (2mm x 10mm)	Competitor
Work Material	STAVAX (420ESR, 53 HRC)	
Milling Method	Contouring	
Cutting Speed	490 SFM (24,000 RPM)	
Feed	94.5 IPM (0.0020 IPT)	
Depth of Cut	Aa = 0.0020", Ar = 0.0039"	
Coolant	Air Blow	
Machine	Vertical Machining Center (HSK32)	



A Brand AE-LNBD-H

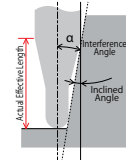
Advanced Performance Carbide End Mills with DUREOREY Coating

List 8590

AE-LNBD-H, 2 Flute, Stub Length, Long Neck, Ball End, Rib Processing



NEW	SPEED FEED P124-127	CARBIDE	DUREOREY		STUB	30°	SHANK h4
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Milling Diameter Tolerance	
D ≤ 0.5	+/- 0.003mm
0.5 < D	+/- 0.005mm

Units: mm

EDP	Mill Dia.	OAL	Length of Cut	Neck Length	Non-Tapered Neck Length	Neck Dia	Interference Angle	Effective Neck Length (Le) by Incline Angle (α)					Shank Dia.	Type	Status			
	D	L	Lc	L1	L2	d2	Øk	0.5°	1.0°	1.5°	2.0°	3.0°	d					
3056101	0.1	45	0.08	7.60	0.30	0.095	14.52°	0.30	0.31	0.32	0.33	0.36	4	1	●			
3056102				7.80	0.50		14.16°	0.51	0.53	0.54	0.56	0.60			●			
3056104	0.2		0.16	7.60	0.50	0.190	14.18°	0.53	0.54	0.56	0.58	0.62			●			
3056105				7.90	0.75		13.74°	0.79	0.81	0.84	0.86	0.93			●			
3056106				8.10	1.00		13.33°	1.04	1.08	1.11	1.15	1.24			●			
3056109				8.60	1.50		12.58°	1.56	1.61	1.67	1.73	1.86			●			
3056110				8.90	1.75		12.23°	1.82	1.88	1.94	2.01	2.17			●			
3056111				9.10	2.00		11.9°	2.08	2.15	2.22	2.30	2.48			●			
3056115	0.3		0.24	7.50	0.60	0.290	14.06°	0.63	0.65	0.66	0.68	0.73			●			
3056117				7.90	1.00		13.36°	1.04	1.07	1.11	1.14	1.23			●			
3056118				8.20	1.25		12.96°	1.30	1.34	1.39	1.43	1.54			●			
3056119				8.40	1.50		12.59°	1.56	1.61	1.66	1.72	1.85			●			
3056122				8.90	2.00		11.89°	2.08	2.14	2.22	2.29	2.47			●			
3056124				9.40	2.50		11.27°	2.59	2.68	2.77	2.87	3.09			●			
3056125				9.90	3.00		10.71°	3.11	3.21	3.32	3.44	3.71			●			
3056127				10.90	4.00		9.74°	4.14	4.28	4.43	4.59	4.96			●			
3056129				11.90	5.00		8.93°	5.18	5.35	5.54	5.74	6.20			●			
3056132				0.4	0.30		7.60	0.80	0.380	13.71°	0.85	0.88			0.90	0.93	0.99	●
3056133							7.80	1.00		13.37°	1.06	1.09			1.12	1.16	1.24	●
3056135							8.30	1.50		12.57°	1.58	1.63			1.68	1.73	1.86	●
3056136	8.80		2.00			11.86°	2.09	2.16		2.23	2.31	2.48			●			
3056138	9.30		2.50			11.22°	2.61	2.70		2.79	2.88	3.10			●			
3056139	9.80		3.00			10.65°	3.13	3.23		3.34	3.46	3.72			●			
3056140	10.30		3.50			10.14°	3.64	3.76		3.89	4.03	4.35			●			
3056141	10.80	4.00	9.67°			4.16	4.30	4.45		4.61	4.97	●						
3056143	11.80	5.00	8.85°			5.20	5.37	5.56		5.76	6.21	●						
3056145	12.80	6.00	8.15°			6.23	6.44	6.66		6.91	7.45	●						
3056147	0.5	0.40	7.60	1.00	0.480	13.4°	1.06	1.09	1.12	1.15	1.23	●						
3056148			8.10	1.50		12.58°	1.58	1.62	1.67	1.73	1.85	●						
3056149			8.60	2.00		11.85°	2.09	2.16	2.23	2.30	2.47	●						
3056150			9.10	2.50		11.2°	2.61	2.69	2.78	2.88	3.09	●						
3056151			9.60	3.00		10.62°	3.13	3.23	3.33	3.45	3.71	●						
3056152			10.10	3.50		10.09°	3.64	3.76	3.89	4.03	4.33	●						
3056153			10.60	4.00		9.61°	4.16	4.30	4.44	4.60	4.95	●						
3056154			11.10	4.50		9.18°	4.68	4.83	5.00	5.18	5.58	●						
3056155			11.60	5.00		8.78°	5.19	5.37	5.55	5.75	6.20	●						
3056157			12.60	6.00		8.08°	6.23	6.44	6.66	6.90	7.44	●						
3056159			14.60	8.00		6.97°	8.29	8.58	8.88	9.20	9.93	●						
3056161			16.60	10.00		6.12°	10.36	10.71	11.09	11.50	12.41	●						
3056164			0.6	45		7.60	1.20	0.550	12.99°	1.32	1.36	1.40	1.44	1.53	●			
3056166						8.40	2.00		11.76°	2.15	2.21	2.28	2.36	2.53	●			
3056168	8.90	2.50			11.1°	2.67	2.75		2.84	2.93	3.15	●						
3056169	9.40	3.00			10.51°	3.70	3.82		3.95	4.08	4.39	●						
3056171	9.90	3.50			9.98°	4.22	4.35		4.50	4.66	5.01	●						
3056172	10.40	4.00			9.5°	4.77	4.96		5.16	5.38	5.88	●						
3056175	11.40	5.00			8.67°	5.25	5.42		5.61	5.81	6.26	●						
3056176	11.90	5.50			8.3°	5.77	5.96		6.16	6.38	6.88	●						
3056177	12.40	6.00			7.96°	6.28	6.49		6.72	6.96	7.50	●						
3056178	12.90	6.50			7.65°	6.80	7.03		7.27	7.53	8.12	●						
3056181	14.40	8.00			6.85°	8.35	8.63		8.93	9.26	9.99	●						
3056185	16.40	10.00			6.01°	10.42	10.77		11.15	11.56	12.47	●						
3056187	50	18.40			12.00	5.36°	12.49		12.91	13.37	13.86	14.96	●					

Packed: 1 pc.

Available DUREOREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



YouTube
Watch it in Action!



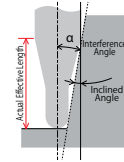
A Brand AE-LNBD-H

Advanced Performance Carbide End Mills with DUREY Coating

List 8590 (Continued)

AE-LNBD-H, 2 Flute, Stub Length, Long Neck, Ball End, Rib Processing

NEW	SPEED FEED P124-127	CARBIDE	DUREY	STUB	30°	SHANK h4
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Milling Diameter Tolerance	
D ≤ 0.5	+/- 0.003mm
0.5 < D	+/- 0.005mm



Units: mm

EDP	Mill Dia.	OAL	Length of Cut	Neck Length	Non-Tapered Neck Length	Neck Dia	Interference Angle	Effective Neck Length (Le) by Incline Angle (α)					Shank Dia.	Type	Status
	D	L	Lc	L1	L2	d2	∅k	0.5°	1.0°	1.5°	2.0°	3.0°	d		
3056265	1.6	45	1.30	12.60	8.00	1.550	5.81°	8.33	8.60	8.88	9.18	9.87	4	1	●
3056266				16.60	12.00		4.35°	12.47	12.88	13.31	13.78	14.84			●
3056267				20.60	16.00		3.47°	16.60	17.15	17.75	18.38	19.81			●
3056268	24.60	20.00	2.89°	20.74	21.43	22.18	22.98	-	●						
3056272	2.0	45	1.60	7.80	4.00	1.950	8.25°	4.19	4.30	4.42	4.55	4.85			●
3056275				9.80	6.00		6.43°	6.26	6.44	6.64	6.85	7.33			●
3056277	2.0	45	1.60	11.80	8.00	1.950	5.26°	8.33	8.58	8.86	9.15	9.82			●
3056279				13.80	10.00		4.45°	10.39	10.72	11.07	11.45	12.31			●
3056281				15.80	12.00		3.86°	12.46	12.86	13.29	13.75	14.79			●
3056284				17.80	14.00		3.4°	14.53	15.00	15.51	16.05	17.28			●
3056285				19.80	16.00		3.04°	16.60	17.14	17.72	18.35	19.76			●
3056288				23.80	20.00		2.51°	20.73	21.42	22.16	22.95	-			●
3056290		25.80	22.00	2.31°	22.80	23.56	24.37	25.25	-	●					
3056291		28.80	25.00	2.06°	25.90	26.77	27.70	28.70	-	●					
3056293		33.80	30.00	1.75°	31.07	32.12	33.24	-	-	●					
3056294		38.80	35.00	1.52°	36.24	37.46	38.78	-	-	●					
3056295		43.80	40.00	1.34°	41.40	42.81	-	-	-	●					
3056298		45	2.00	2.00	13.10	10.00	2.350	3.62°	10.58	10.90	11.25	11.63	12.48	●	
3056299	50	18.10	15.00	2.55°	15.75	16.25		16.80	17.38	-	●				
3056300	55	23.10	20.00	1.97°	20.92	21.60		22.34	-	-	●				
3056303	70	38.10	35.00	1.17°	36.42	37.65		-	-	-	●				
3056304	3.0	50	2.40	11.90	6.00	2.850	8.15°	6.44	6.61	6.79	7.00	7.45	6	1	●
3056305				13.90	8.00		6.87°	8.50	8.75	9.01	9.29	9.93			●
3056306				15.90	10.00		5.93°	10.57	10.89	11.23	11.59	12.42			●
3056307				17.90	12.00		5.22°	12.64	13.03	13.44	13.89	14.91			●
3056309				19.90	14.00		4.66°	14.71	15.17	15.66	16.19	17.39			●
3056310		20.90	15.00	4.42°	15.74	16.24	16.77	17.34	18.63	●					
3056311		21.90	16.00	4.2°	16.77	17.31	17.88	18.49	19.88	●					
3056312		25.90	20.00	3.52°	20.91	21.58	22.31	23.09	24.85	●					
3056313		30.90	25.00	2.92°	26.08	26.93	27.85	28.84	-	●					
3056314		35.90	30.00	2.5°	31.24	32.28	33.39	34.59	-	●					
3056318	3.5	55	2.80	19.90	15.00	3.350	3.92°	15.73	16.22	16.74	17.31	18.58	●		

Packed: 1 pc.

Available DUREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 8590 (Continued)

NEW	SPEED FEED P124-127	CARBIDE	DUOREY		STUB	30°	SHANK h4
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AE-LNBD-H, 2 Flute, Stub Length, Long Neck, Ball End, Rib Processing

Units: mm

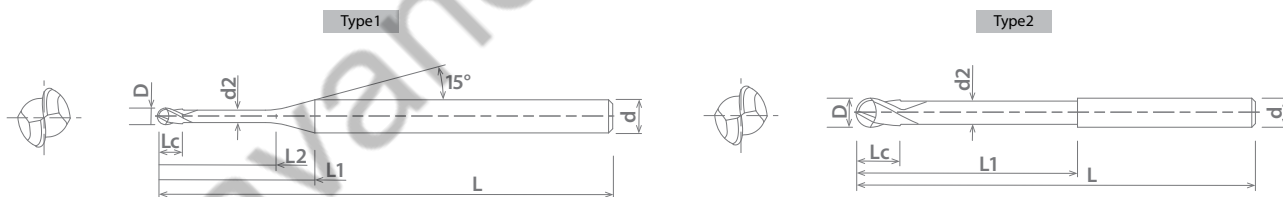
EDP	Mill Dia.		Length of Cut Lc	Neck Length		Non-Tapered Neck Length		Neck Dia d2	Effective Neck Length (Le) by Incline Angle (α)					Shank Dia. d	Type	Status	
	D	L		L1	L2	L1	L2		0.5°	1.0°	1.5°	2.0°	3.0°				
3056327	4.0	60	3.20	12.00	8.00	3.850	3.850	5.65°	8.49	8.71	8.96	9.22	9.81	1	●		
3056328								4.73°	10.55	10.85	11.17	11.52	12.30				
3056329								16.00	12.00	4.07°	12.62	12.99	13.39			13.82	14.79
3056333								20.00	16.00	3.17°	16.76	17.27	17.82			18.42	19.76
3056334								65	24.00	20.00	2.6°	20.89	21.55			22.26	23.02
3056335																	
3056336		70	34.00	30.00	1.79°	31.23	32.25	33.34									
3056337									39.00	35.00	1.55°	36.40	37.60			38.88	
3056338		80	44.00	40.00	1.37°	41.56	42.94	-	-								
3056339										49.00	45.00	1.22°	46.73			48.29	
3056341										12.10	10.00	2.95°	10.54			10.82	11.12
3056342		5.0	60	4.00	17.10	15.00	4.850	4.850	1.95°	15.71	16.17	-	-			6	●
3056344	27.10								25.00	1.17°	26.04			26.86			
3056345	32.10								30.00	0.97°	31.21						
3056347	42.10								40.00	0.73°	41.55						
3056351	6.0	60	4.80	-	-	5.850	5.850	-	-	-	16.66	-	2	●			
3056353															70	20.00	
3056355															80	30.00	
3056356															100	35.00	
3056358															120	45.00	
3056359															120	50.00	

Packed: 1 pc.

Available DUOREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



Watch it in Action!

List No.	Work Material															
	P				M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels		
	Low	Med.	High	4140			300	400		17-4 PH	6061	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
8590	1010	1035	1065	4340	○				7075				○	○	⊙	⊙

○ good ⊙ best



A Brand AE-TL-N

Overview

A Brand AE-TL-N

A Brand AE-TL-N are OSG's advanced performance DLC coated carbide end mills for non-ferrous materials. With excellent cutting sharpness, they are able to suppress burrs to achieve excellent surface finish and are extremely effective for non-ferrous materials such as aluminum alloys that require welding resistance and lubricity.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/a-brand-ae-n



List Numbers

8630 - A Brand AE-TL-N (Inch)
8730 - A Brand AE-TL-N (Metric)

Size Range

1/8"-1"
3mm-12mm

Primary Applications

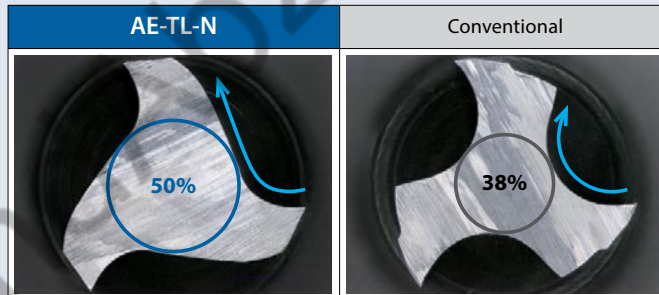
- Customers who are milling non-ferrous material
- Rough and finish milling up from 3D to 5D

Features & Product Solutions

High Rigidity & Excellent Chip Evacuation

Large Core & New Flute Form

Rigidity is enhanced by increasing the core thickness, which enables the suppression of chattering. By adopting an optimal flute form, high rigidity can be maintained while ensuring trouble-free chip evacuation.



Arrow: indicates chip discharge direction

Achieves Both Rigidity & Sharpness

Unique Cutting Edge

Unique cutting edge that achieves high durability and good surface finish.

Superior Surface Accuracy

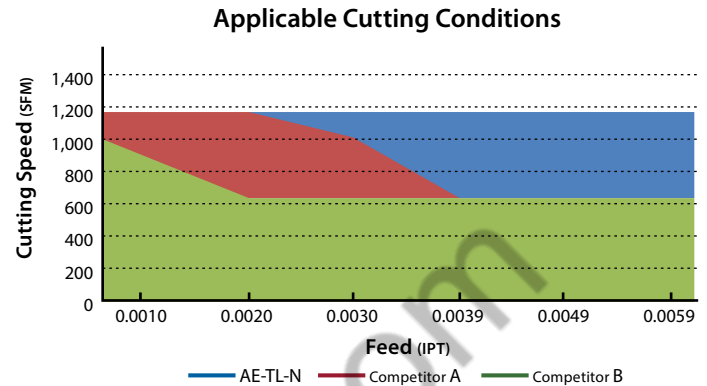
DLC Super Hard Coating

Due to the smoothness of the coating surface, it is extremely effective for non-ferrous materials such as aluminum alloys that require welding resistance and lubricity. Furthermore, its excellent sharpness and ability to suppress burrs enable superior surface finish.

High Efficiency Milling

High Efficiency Even in Slotting with 3D Length of Cut

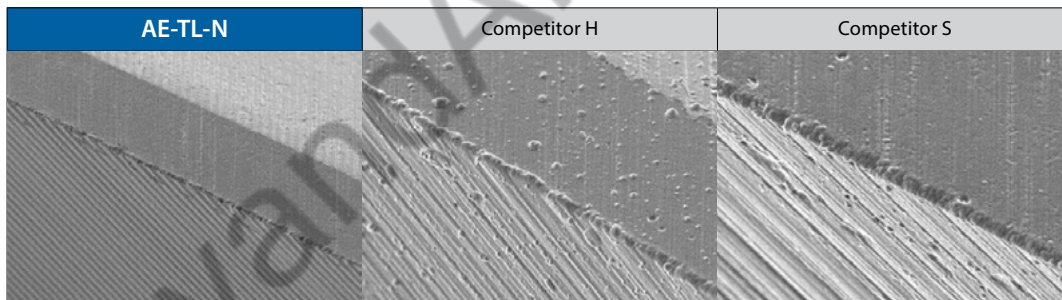
Tool	AE-TL-N
Size	0.2362" x 0.7087"
Work Material	A7075
Machining Method	Slotting
Depth of Cut	0.2362"
Coolant	Water Soluble



Superior Surface Accuracy

DLC Super Hard Coating

DLC super hard coating has less droplet comparing to other competitor tool that has coating for non-ferrous material, and it enable the tool to prevent welding achieve better surface finish.



A Brand AE-TL-N

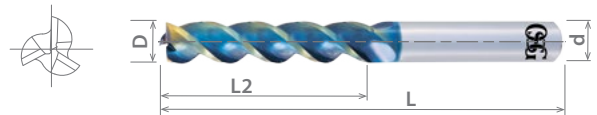
Advanced Performance DLC Coated End Mills for Non-Ferrous Materials

List 8730

AE-TL-N, 3 Flutes, Long Length

NEW SPEED FEED P132-135 CARBIDE DLC ~40° SHRINK FIT

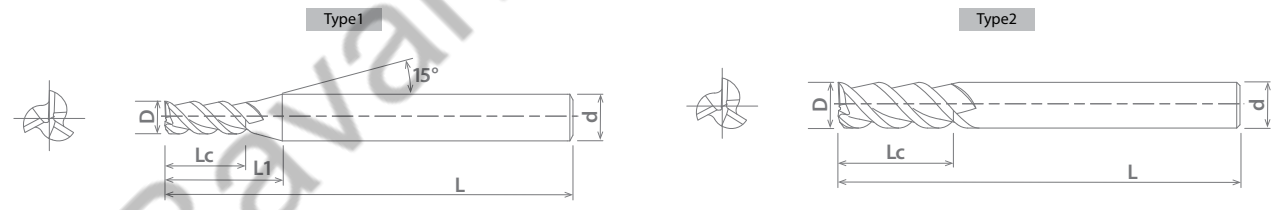
Milling Diameter Tolerance	
3 ≤ D ≤ 12	0 / -0.020mm



Units: mm

EDP Number	Mill Dia.	OAL	Length of Cut	Shank Dia.	Type	Status
	D	L	Lc	d		
8557340	3	55	9	6	1	▲
8557350	3	55	15	6	1	▲
8557341	4	55	12	6	1	▲
8557351	4	60	20	6	1	▲
8557342	5	55	15	6	1	▲
8557352	5	65	25	6	1	▲
8557343	6	60	18	6	2	▲
8557353	6	75	30	6	2	▲
8557344	8	70	24	8	2	▲
8557354	8	90	40	8	2	▲
8557345	10	75	30	10	2	▲
8557355	10	100	50	10	2	▲
8557346	12	80	36	12	2	▲
8557356	12	110	60	12	2	▲

Packed: 1 pc.
 Available DLC coating only.
 ● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked
 Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



YouTube Watch it in Action!

List No.	Work Material																
	P				M			K	N		S		H				
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
8730										⊙	⊙						

A Brand AE-TL-N

Advanced Performance DLC Coated End Mills for Non-Ferrous Materials

List 8630, 8730: 3xD Length of Cut

Slotting

Work Material		Aluminum Alloys, Magnesium Alloys A5052, A6061, A7075, AZ91, AZ80A		Aluminum Alloy Casting AC4C, ADC		Copper Alloy C1100	
Cutting Speed		600 ~ 1500 SFM		600 ~ 1500 SFM		300 ~ 900 SFM	
Depth of Cut		$a_a=1xD$				$a_a=0.5xD$	
Mill Dia.		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
Inch	mm						
-	3	25,000	70.9	25,000	70.9	19,400	55.0
1/8	-	25,000	70.9	25,000	70.9	18,300	51.9
-	4	25,000	82.7	25,000	82.7	14,500	48.0
3/16	-	24,400	92.2	24,400	92.2	12,200	46.1
-	5	23,300	96.3	23,300	96.3	11,600	48.0
-	6	19,400	96.2	19,400	96.2	9,700	48.1
1/4	-	18,300	95.1	18,300	95.1	9,200	47.8
5/16	-	14,700	97.2	14,700	97.2	7,300	48.3
-	8	14,500	95.9	14,500	95.9	7,300	48.3
3/8	-	12,200	92.2	12,200	92.2	6,100	46.1
-	10	11,600	95.9	11,600	95.9	5,800	48.0
-	12	9,700	96.2	9,700	96.2	4,800	47.6
1/2	-	9,200	95.6	9,200	95.6	4,600	47.8
5/8	-	7,300	96.6	7,300	96.6	3,700	48.9
3/4	-	6,100	98.0	6,100	98.0	3,100	49.8
1	-	4,600	91.3	4,600	91.3	2,300	45.6

1. Use a rigid and precise machine and holder.
2. The indicated speeds and feeds are for milling with water-soluble coolant.
3. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
4. Reduce speed and feed as well as depth of cut when high precision is required.
5. Please always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys. Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.

List 8630, 8730: 3xD Length of Cut

Side Milling

Work Material		Aluminum Alloys, Magnesium Alloys A5052, A6061, A7075, AZ91, AZ80A		Aluminum Alloy Casting AC4C, ADC		Copper Alloy C1100	
Cutting Speed		800 ~ 2200 SFM		800 ~ 2200 SFM		600 ~ 1200 SFM	
Depth of Cut		$a_a=3xD \cdot a_r=0.1xD$					
Mill Dia.		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
Inch	mm						
-	3	25,000	79.7	25,000	79.7	25,000	79.7
1/8	-	25,000	88.6	25,000	88.6	25,000	88.6
-	4	25,000	102.8	25,000	102.8	21,800	89.6
3/16	-	25,000	118.1	25,000	118.1	18,300	86.5
-	5	25,000	128.4	25,000	128.4	17,500	89.9
-	6	25,000	154.1	25,000	154.1	14,500	89.4
1/4	-	25,000	162.4	25,000	162.4	13,700	89.0
5/16	-	20,800	172.0	20,800	172.0	11,000	90.9
-	8	20,600	169.3	20,600	169.3	10,900	89.6
3/8	-	17,300	163.5	17,300	163.5	9,200	86.9
-	10	16,500	169.5	16,500	169.5	8,700	89.4
-	12	13,700	168.9	13,700	168.9	7,300	90.0
1/2	-	13,000	168.9	13,000	168.9	6,900	89.7
5/8	-	10,400	172.0	10,400	172.0	5,500	90.9
3/4	-	8,700	174.7	8,700	174.7	4,600	92.4
1	-	6,500	161.2	6,500	161.2	3,400	84.3

1. Use a rigid and precise machine and holder.
2. The indicated speeds and feeds are for milling with water-soluble coolant.
3. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
4. Reduce speed and feed as well as depth of cut when high precision is required.
5. Please always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys. Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.



List 8630, 8730: 3xD Length of Cut

Plunging

Work Material		Aluminum Alloys, Magnesium Alloys A5052, A6061, A7075, AZ91, AZ80A		Aluminum Alloy Casting AC4C, ADC		Copper Alloy C1100	
Cutting Speed		230 SFM		230 SFM		164 SFM	
Depth of Cut		$a_d=1xD$				$a_d=0.5xD$	
Mill Dia.		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
Inch	mm						
-	3	7,500	13.8	7,500	13.8	5,300	3.9
1/8	-	7,023	13.7	7,023	13.7	5,008	4.0
-	4	5,600	13.8	5,600	13.8	3,980	3.9
3/16	-	4,682	14.4	4,682	14.4	3,338	4.2
-	5	4,460	13.8	4,460	13.8	3,180	3.9
-	6	3,680	15.7	3,680	15.7	2,650	4.3
1/4	-	3,511	15.1	3,511	15.1	2,504	4.4
5/16	-	2,809	15.8	2,809	15.8	2,003	4.6
-	8	2,800	17.7	2,800	17.7	1,990	4.7
3/8	-	2,341	16.5	2,341	16.5	1,669	4.8
-	10	2,230	17.7	2,230	17.7	1,590	4.7
-	12	1,840	17.7	1,840	17.7	1,330	4.7
1/2	-	1,756	17.9	1,756	17.9	1,252	5.2
5/8	-	1,405	19.3	1,405	19.3	1,002	5.6
3/4	-	1,170	20.7	1,170	20.7	835	6.0
1	-	878	23.4	878	23.4	626	6.8

1. Use a rigid and precise machine and holder.
2. The indicated speeds and feeds are for milling with water-soluble coolant.
3. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
4. Reduce speed and feed as well as depth of cut when high precision is required.
5. Please always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys. Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.

A Brand AE-TL-N

Advanced Performance DLC Coated End Mills for Non-Ferrous Materials

List 8630, 8730: 4xD Length of Cut

Side Milling

Work Material	Aluminum Alloys, Magnesium Alloys A5052, A6061, A7075, AZ91, AZ80A		Aluminum Alloy Casting AC4C, ADC		Copper Alloy C1100		
Cutting Speed	800 ~ 1600 SFM		800 ~ 1600 SFM		300 ~ 900 SFM		
Depth of Cut	$a_a=4xD \cdot a_r=0.2xD$						
Mill Dia.		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
Inch	mm						
-	3	25,000	79.7	25,000	79.7	25,000	79.7
1/8	-	25,000	88.6	25,000	88.6	18,300	64.8
-	4	25,000	102.8	25,000	102.8	14,500	59.6
3/16	-	24,400	115.3	24,400	115.3	12,200	57.6
-	5	23,300	119.7	23,300	119.7	11,600	59.6
-	6	19,400	119.6	19,400	119.6	9,700	59.8
1/4	-	18,300	118.9	18,300	118.9	9,200	59.8
-	8	14,500	119.2	14,500	119.2	7,300	60.0
3/8	-	12,200	115.3	12,200	115.3	6,100	57.6
-	10	11,600	119.2	11,600	119.2	5,800	59.6
-	12	9,700	119.6	9,700	119.6	4,800	59.2
1/2	-	9,200	119.5	9,200	119.5	4,600	59.8
5/8	-	7,300	120.7	7,300	120.7	3,700	61.2
3/4	-	4,600	122.5	4,600	122.5	3,100	62.2

1. Use a rigid and precise machine and holder.
2. The indicated speeds and feeds are for milling with water-soluble coolant.
3. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
4. Reduce speed and feed as well as depth of cut when high precision is required.
5. Please always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys. Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.



List 8630, 8730: 5xD Length of Cut

Side Milling

Work Material	Aluminum Alloys, Magnesium Alloys A5052, A6061, A7075, AZ91, AZ80A		Aluminum Alloy Casting AC4C, ADC		Copper Alloy C1100		
Cutting Speed	600 ~ 1200 SFM		600 ~ 1200 SFM		200 ~ 600 SFM		
Depth of Cut	$a_a=5xD \cdot a_r=0.1xD$						
Mill Dia.		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
Inch	mm						
-	3	25,000	79.7	25,000	79.7	12,900	41.1
-	4	21,800	92.7	21,800	92.7	9,700	41.2
-	5	17,500	89.9	17,500	89.9	7,800	40.1
-	6	14,500	89.4	14,500	89.4	6,500	40.1
1/4	-	13,700	89.0	13,700	89.0	6,100	39.6
-	8	10,900	89.6	10,900	89.6	4,800	39.5
-	10	8,700	89.4	8,700	89.4	3,900	40.0
-	12	7,300	90.0	7,300	90.0	3,200	39.5
1/2	-	6,900	89.7	6,900	89.7	3,100	40.3
5/8	-	5,500	90.9	5,500	90.9	2,400	39.7

1. Use a rigid and precise machine and holder.
2. The indicated speeds and feeds are for milling with water-soluble coolant.
3. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
4. Reduce speed and feed as well as depth of cut when high precision is required.
5. Please always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys. Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.

A Brand AE-VTS-N

Overview

A Brand AE-VTS-N

A Brand AE-VTS-N are OSG's advanced performance DLC-IGUSS coated carbide end mills for non-ferrous materials. With excellent cutting sharpness, they are able to suppress burrs to achieve excellent surface finish and are extremely effective for non-ferrous materials such as aluminum alloys that require welding resistance and lubricity.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/a-brand-ae-n



List Numbers

8830 - A Brand AE-VTS-N (Inch)
8930 - A Brand AE-VTS-N (Metric)

Size Range

1/8"-1/2"
3mm-12mm

Primary Applications

- Customers who are milling non-ferrous material
- Rough and finish milling

Features & Product Solutions

High Speed Milling

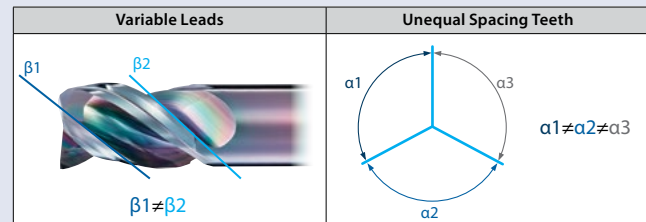
3 Cutting Edges at Center

The cutting load is equalized among the cutting edges with greater stability to enable high speed milling. Highly effective for plunging and ramping.

Stable & High Efficiency Milling

Vibration Suppression

Stable and high efficiency milling is made possible by the suppression of chattering.



Improved Durability & Effectiveness for Non-Ferrous Materials

DLC-IGUSS Coating

Due to the smoothness of the coating surface, it is extremely effective for non-ferrous materials such as aluminum alloys that require welding resistance and lubricity. Tool durability is also improved.

High Rigidity Prevents Chattering

Large Core Design

Achieves Higher Precision Machined Surface Quality

Flat Cutting Edge

Can Be Used for Plunging

Center Cutting Edge

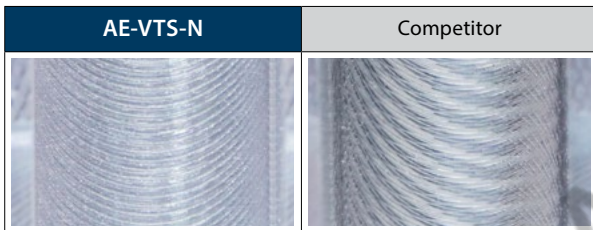
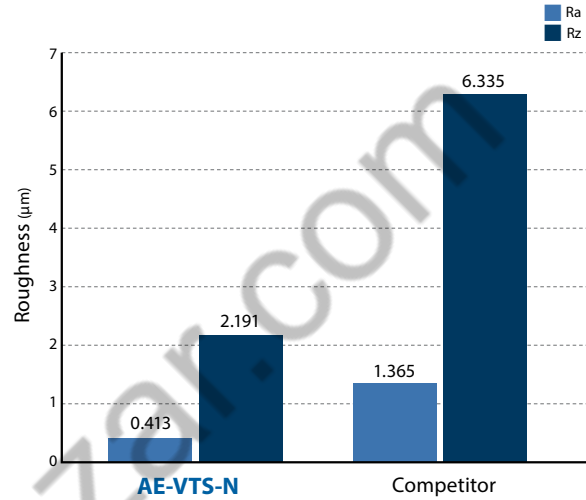
High Efficiency Milling

Good Machined Surface Quality Even Under High Speed Cutting Conditions

Due to the anti-welding effect of the DLC coating, the anti-vibration effect of the variable lead and unequal spacing teeth geometry, and the effect of the flat cutting edge specification, good machined surface can be achieved even under aggressive cutting condition.

Tool	AE-VTS-N	Competitor
Size	0.3937"	
Coating	DLC-IGUSS	Non-Coated
Work Material	A7075	
Machining Method	Slotting	
Cutting Speed	1,340 SFM (13,000 rpm)	985 SFM (9,550 rpm)
Feed	187.2 IPM (0.0048 IPT)	57.3 IPM (0.0020 IPT)
Depth of Cut	Aa = .3937" (1 x D)	
Coolant	Water Soluble	
Machine	Vertical MC (BT40)	

Surface Roughness After 433 Inches



Excellent Surface Finish

With DLC Coating and Flat Cutting Edge

Due to the effect of the DLC coating and the flat cutting edge specification, excellent machined surface quality is achieved.

Tool	AE-VTS-N	Competitor
Size	0.1181"	
Work Material	A7075	
Machining Method	Facing	
Cutting Speed	656 SFM (21,000 rpm)	
Feed	124.0 IPM (0.002 IPT)	
Depth of Cut	Aa = 0.0118 • Ar = 0.0945	
Coolant	Water Soluble	

AE-VTS-N (With Wiper)	Competitor A (Without Wiper)	Competitor B (Without Wiper)	Competitor C (Without Wiper)
Rz = 1.37 µm Ra = 0.215 µm	Rz = 12.51 µm Ra = 3.206 µm	Rz = 4.98 µm Ra = 0.967 µm	Rz = 5.97 µm Ra = 1.061 µm

A Brand AE-VTS-N

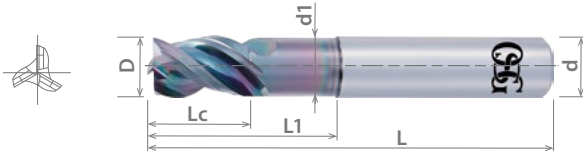
Advanced Performance DLC Coated End Mills for Non-Ferrous Materials

List 8930

AE-VTS-N, 3 Flutes, Regular Length, Reduced Neck

NEW	SPEED FEED	CARBIDE	DLC+IGUSS	Var.°	SHRINK FIT
	P142-143				

Milling Diameter Tolerance	
3 ≤ D ≤ 12	0 / -0.020mm



Units: mm

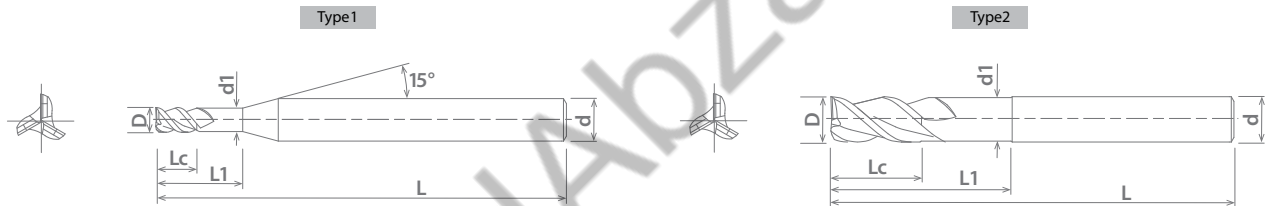
EDP Number	Mill Dia.	OAL	Length of Cut	Neck Length	Neck Diameter	Shank Dia.	Type	Status
	D	L	Lc	L1	d1	d		
8557360	3	55	4.5	9	2.85	6	1	▲
8557361	4	55	6	12	3.8	6	1	▲
8557362	5	55	7.5	15	4.8	6	1	▲
8557363	6	60	9	18	5.8	6	2	▲
8557364	8	70	12	24	7.7	8	2	▲
8557365	10	75	15	30	9.7	10	2	▲
8557366	12	80	18	36	11.7	12	2	▲

Packed: 1 pc.

Available DLC-IGUSS coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzar.com

YouTube
 Watch it in Action!

List No.	Work Material																
	P					M			K	N		S	H				
	Carbon Steels			Alloy Steels 4140 4340	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy Inconel	Titanium 6Al4V (30 HRC)	Hardened Steels			
	Low 1010 1018	Med. 1035 1045	High 1065			300	400	17-4 PH		6061 7075	Casting			~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
8930									○	○							

○ good ⊗ best



A Brand AE-CR-VTS-N

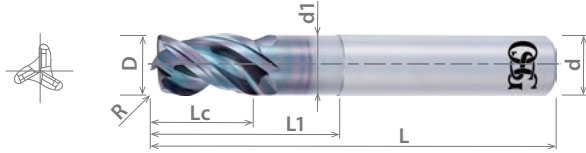
Advanced Performance DLC Coated End Mills for Non-Ferrous Materials

List 8870

AE-CR-VTS-N, 3 Flutes, Regular Length, Reduced Neck, Corner Radius

NEW	SPEED FEED P142-143	CARBIDE	DLC-IGUSS		Var.°	SHRINK FIT
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Milling Diameter Tolerance	
1/8 ≤ D ≤ 1/2	0 / -0.0008"



Units: Inch

EDP Number	Mill Dia.	Corner Radius	OAL	Length of Cut	Neck Length	Neck Diameter	Shank Dia.	Status
	D	R	L	Lc	L1	d1	d	
88700009	1/8	0.015	2 1/4	1/4	3/8	0.120	1/8	●
88700109	3/16	0.015	2 1/4	3/8	9/16	0.181	3/16	●
88700209	3/16	0.030	2 1/4	3/8	9/16	0.181	3/16	●
88700309	1/4	0.015	2 1/2	1/2	3/4	0.242	1/4	●
88700409	1/4	0.030	2 1/2	1/2	3/4	0.242	1/4	●
88700509	5/16	0.015	3	3/4	15/16	0.305	5/16	●
88700609	5/16	0.030	3	3/4	15/16	0.305	5/16	●
88700709	3/8	0.015	3	7/8	1 1/8	0.367	3/8	●
88700809	3/8	0.030	3	7/8	1 1/8	0.367	3/8	●
88700909	3/8	0.060	3	7/8	1 1/8	0.367	3/8	●
88701009	1/2	0.030	3 1/4	1 1/8	1 1/2	0.488	1/2	●
88701109	1/2	0.060	3 1/4	1 1/8	1 1/2	0.488	1/2	●
88701209	1/2	0.090	3 1/4	1 1/8	1 1/2	0.488	1/2	●
88701309	1/2	0.120	3 1/4	1 1/8	1 1/2	0.488	1/2	●

Packed: 1 pc.

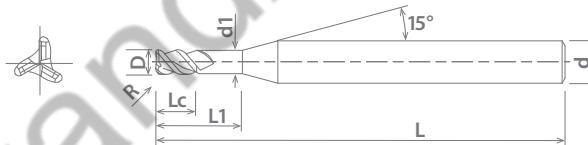
Available DLC-IGUSS coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



Type1



Work Material																
List No.	P				Die Steels	M			K Cast Iron	N		S Nickel Alloy	H			
	Carbon Steels			Alloy Steels		Stainless Steels ≤200HB				Aluminum			Titanium	Hardened Steels		
	8870	Low 1010 1018	Med. 1035 1045			High 1065	4140 4340	300		400	17-4 PH	6061 7075		Casting	Inconel	6Al4V (30 HRC)

○ good ⊙ best



A Brand AE-VTS-N & AE-CR-VTS-N

Advanced Performance DLC Coated End Mills for Non-Ferrous Materials

List 8830, 8930, 8870, 8970: 3-Flute, Regular Length, Reduced Neck

Slotting

Work Material		Aluminum Alloys, Magnesium Alloys A5052, A6061, A7075, AZ91, AZ80A		Aluminum Alloy Casting AC4C, ADC		Copper Alloy C1100	
Cutting Speed		600 - 1700 SFM		600 - 1700 SFM		400 - 1000 SFM	
Depth of Cut		$\bar{a}_a=1xD$				$\bar{a}_a=0.5xD$	
Mill Dia.		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
Inch	mm						
-	3	25,000	79.7	25,000	79.7	22,600	72.1
1/8	-	25,000	88.6	25,000	88.6	21,400	75.8
-	4	25,000	102.8	25,000	102.8	17,000	69.9
3/16	-	25,000	118.1	25,000	118.1	14,200	67.1
-	5	25,000	128.4	25,000	128.4	13,600	69.9
-	6	21,000	129.5	21,000	129.5	11,300	69.7
1/4	-	19,800	128.6	19,800	128.6	10,700	69.5
5/16	-	15,900	131.5	15,900	131.5	8,500	70.3
-	8	15,800	129.9	15,800	129.9	8,500	69.9
3/8	-	13,200	124.7	13,200	124.7	7,100	67.1
-	10	12,600	129.5	12,600	129.5	6,800	69.9
-	12	10,500	129.5	10,500	129.5	5,700	70.3
1/2	-	9,900	128.6	9,900	128.6	5,300	68.9

1. The above milling condition is a guideline for the overhang length is 4xD.
2. Use a rigid and precise machine and holder.
3. The indicated speeds and feeds are for milling with water-soluble coolant.
4. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
5. Reduce speed and feed as well as depth of cut when high precision is required.
6. Adjust the speed and feed accordingly when the overhang length is longer than specified (refer to p.143).
7. Please always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys.
Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.

List 8830, 8930, 8870, 8970: 3-Flute, Regular Length, Reduced Neck (Cont.)

Side Milling

Work Material		Aluminum Alloys, Magnesium Alloys A5052, A6061, A7075, AZ91, AZ80A		Aluminum Alloy Casting AC4C, ADC		Copper Alloy C1100	
Cutting Speed		800 - 2200 SFM		800 - 2200 SFM		600 - 1200 SFM	
Depth of Cut		$A_a = 1.5xD$ $A_r = 0.4xD$				$A_a = 1.5xD$ $A_r = 0.1xD$	
Mill Dia.		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
Inch	mm						
-	3	25,000	79.7	25,000	79.7	25,000	79.7
1/8	-	25,000	88.6	25,000	88.6	25,000	88.6
-	4	25,000	102.8	25,000	102.8	21,800	89.6
3/16	-	25,000	118.1	25,000	118.1	18,300	86.5
-	5	25,000	128.4	25,000	128.4	17,500	89.9
-	6	25,000	154.1	25,000	154.1	14,500	89.4
1/4	-	25,000	162.4	25,000	162.4	13,700	89.0
5/16	-	20,800	172.0	20,800	172.0	11,000	90.9
-	8	20,600	169.3	20,600	169.3	10,900	89.6
3/8	-	17,300	163.5	17,300	163.5	9,200	86.9
-	10	16,500	169.5	16,500	169.5	8,700	89.4
-	12	13,700	168.9	13,700	168.9	7,300	90.0
1/2	-	13,000	168.9	13,000	168.9	6,900	89.7

1. The above milling condition is a guideline for the overhang length is 4xD.
2. Use a rigid and precise machine and holder.
3. The indicated speeds and feeds are for milling with water-soluble coolant.
4. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
5. Reduce speed and feed as well as depth of cut when high precision is required.
6. Adjust the speed and feed accordingly when the overhang length is longer than specified (refer to p.143).
7. Please always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys.
Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.



A Brand AE-VTS-N & AE-CR-VTS-N

Advanced Performance DLC Coated End Mills for Non-Ferrous Materials

List 8830, 8930, 8870, 8970: 3-Flute, Regular Length, Reduced Neck

Plunging

Work Material		Aluminum Alloys, Magnesium Alloys A5052, A6061, A7075, AZ91, AZ80A		Aluminum Alloy Casting AC4C, ADC		Copper Alloy C1100	
Cutting Speed		495 SFM		495 SFM		248 SFM	
Depth of Cut		Aa = 1xD				Aa = 0.5xD	
Mill Dia.		Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
Inch	mm						
-	3	15,900	19.7	15,900	19.7	8,000	5.9
1/8	-	15,110	19.8	15,110	19.8	7,570	6.0
-	4	12,000	19.7	12,000	19.7	6,000	5.9
3/16	-	10,070	19.8	10,070	19.8	5,040	6.0
-	5	9,600	19.7	9,600	19.7	4,800	5.9
-	6	8,000	23.6	8,000	23.6	4,000	7.1
1/4	-	7,550	23.8	7,550	23.8	3,780	7.1
5/16	-	6,040	23.8	6,040	23.8	3,020	7.1
-	8	6,000	27.6	6,000	27.6	3,000	8.3
3/8	-	5,030	27.7	5,030	27.7	2,520	8.2
-	10	4,800	27.6	4,800	27.6	2,400	8.3
-	12	4,000	27.6	4,000	27.6	2,000	8.3
1/2	-	3,770	27.7	3,770	27.7	1,890	8.2

- The above milling condition is a guideline for the overhang length is 4xD.
- Use a rigid and precise machine and holder.
- The indicated speeds and feeds are for milling with water-soluble coolant.
- Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
- Reduce speed and feed as well as depth of cut when high precision is required.
- Adjust the speed and feed accordingly when the overhang length is longer than specified (See table below).
- Please always use the appropriate cutting fluid recommended by the cutting fluid manufacturer in the machining of magnesium alloys.
Be cautious with the cutting chips as they are highly flammable and may pose a serious fire risk if not properly handled.

Cutting Condition Guide for Changes in Overhang Length

	Work Material	Aluminum Alloys, Magnesium Alloys A5052, A6061, A7075, AZ91, AZ80A		Aluminum Alloy Casting AC4C, ADC		Copper Alloy C1100	
		L/D	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM
Slotting	5		70%		70%		70%
	6		50%		50%		50%
Side Milling	5		70%		70%		70%
	6		50%		50%		50%
Plunging	5		80%		80%		80%
	6		60%		60%		60%

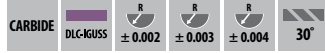


A Brand AE-LNBD-N

Overview

A Brand AE-LNBD-N

The AE-LNBD-N high performance DLC coated carbide end mill for non-ferrous materials is suitable for a wide variety of applications with high efficiency and quality. Its DLC-IGUSS coating further improves tool life with excellent welding resistance and lubricity, which is effective in the machining of non-ferrous materials such as aluminum alloys.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/ae-lnbd-n



List Numbers

8990 - A Brand AE-LNBD-N (Metric)

Size Range

0.1mm-6mm

Primary Applications

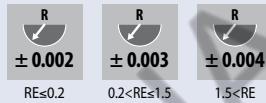
- Milling non-ferrous material.
- Milling by point enabled by teardrop-shaped outer periphery.
- Die/Mold Applications.

Features & Product Solutions

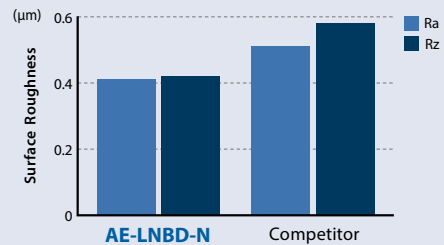
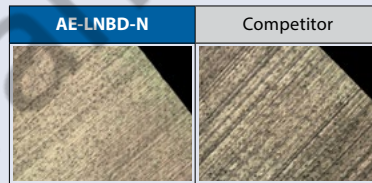
High Quality Milling

Precise Ball Specifications the Enable High Quality Milling

- Optimal cutting edge shape for milling copper alloy
- Superior Ball R Precision



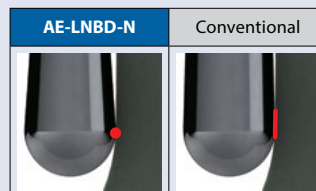
- High Quality Primary Relief Surface



Superior Surface Accuracy

Teardrop-Shaped Outer Periphery Prevents Chattering & Chipping

Strong back taper geometry enables milling by point, which prevents chattering and chipping, resulting in improvement of surface accuracy.



Note: Teardrop-shaped specification does not apply to items above R2.

Superior Shank Accuracy

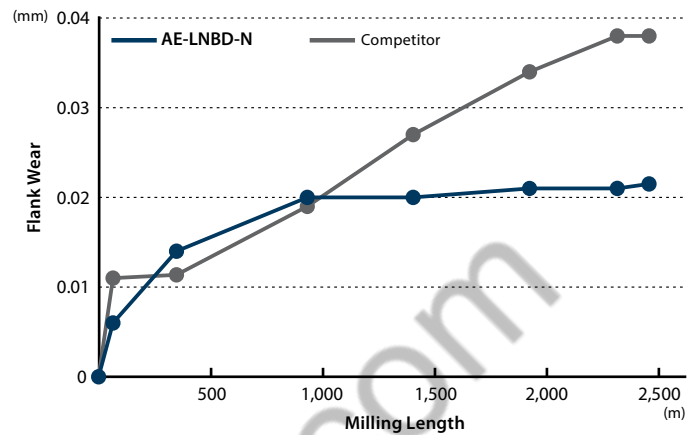
Supports H4 Tolerance (0/-0.004)



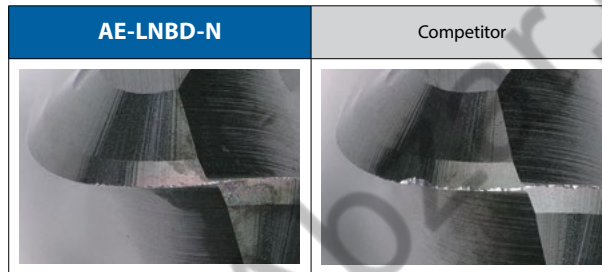
Long Tool Life

DLC-IGUSS Coating Enables Consistent Tool Wear

Tool	AE-LNBD-N	Competitor
Size	R1 x 10 x 4	
Work Material	C1100	
Machining Method	Pick Milling	
Cutting Speed	413 SFM (20,000 RPM)	
Feed	79 IPM (0.002 IPT)	
Depth of Cut	Aa = 0.2mm (0.1D) Ar = 0.4mm (0.2D)	
Coolant	Water Soluble	
Machine	Vertical Machining Center (BT40)	



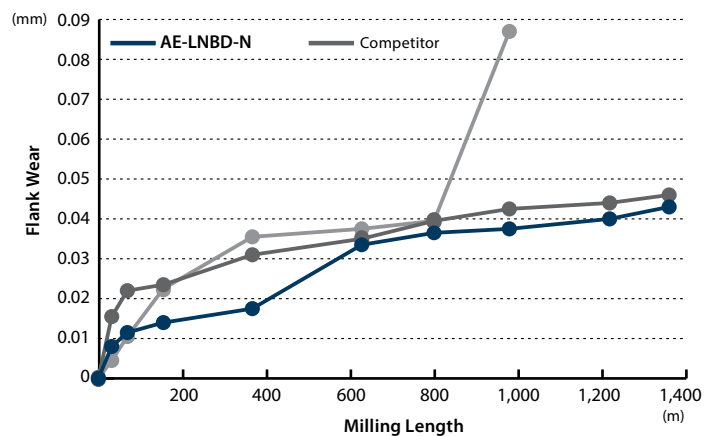
Wearing condition of ball flank after milling 2,480m.



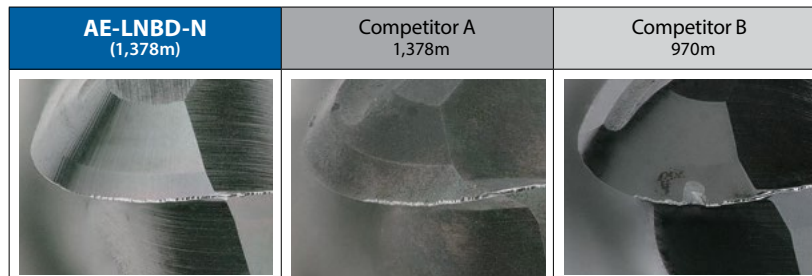
Long Tool Life

Exhibits Superior Endurance in Copper Tungsten

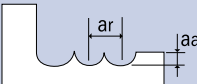
Tool	AE-LNBD-N	Competitor
Size	R1 x 10 x 4	
Work Material	C1100	
Machining Method	Pick Milling	
Cutting Speed	413 SFM (20,000 RPM)	
Feed	79 IPM (0.002 IPT)	
Depth of Cut	Aa = 0.2mm (0.1D) Ar = 0.4mm (0.2D)	
Coolant	Water Soluble	
Machine	Vertical Machining Center (BT40)	



Wear condition of ball flank.



Contouring

Hardness		-				-			
Work Material		Copper, Aluminum				Copper Alloy, Aluminum Alloy			
Depth of Cut									
Mill Dia.	Neck Length	Speed RPM	Feed IPM	Aa	Ar	Speed RPM	Feed IPM	Aa	Ar
mm	mm			(Inch)	(Inch)			(Inch)	(Inch)
3	16	12,000	44.29	0.01575	0.03307	10,000	28.35	0.01417	0.03307
3	20	12,000	44.29	0.01575	0.03307	10,000	28.35	0.01417	0.03307
3	25	12,000	44.29	0.01575	0.03307	10,000	28.35	0.01417	0.03307
3	30	10,800	36.93	0.01575	0.03307	9,000	23.62	0.01417	0.03307
4	10	10,800	118.11	0.03937	0.05118	9,000	75.59	0.03543	0.05118
4	15	10,800	9.84	0.03937	0.05118	9,000	56.69	0.03543	0.05118
4	20	4,800	59.06	0.03937	0.05118	7,000	37.80	0.03543	0.05118
4	25	4,800	59.06	0.03937	0.05118	7,000	37.80	0.03543	0.05118
4	30	4,800	59.06	0.03150	0.05118	7,000	37.80	0.02756	0.05118
4	40	6,000	36.93	0.02756	0.05118	5,000	23.62	0.02362	0.05118
6	10	10,800	132.87	0.04724	0.07087	9,000	85.04	0.04331	0.07087
6	15	10,800	132.87	0.04724	0.07087	9,000	85.04	0.04331	0.07087
6	20	8,400	73.82	0.04724	0.07087	7,000	47.24	0.04331	0.07087
6	30	7,200	73.82	0.04724	0.07087	6,000	47.24	0.04331	0.07087
6	50	6,000	44.29	0.03150	0.07087	5,000	28.35	0.02756	0.07087

1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Use a water soluble fluid.
4. Use a non-water-soluble cutting fluid if the machined surface and accuracy are of critical importance.
5. Always use a cutting fluid recommended by the cutting fluid manufacturer as the workpiece may discolor.

HY-PRO® CARB VGM Series

Overview

HY-PRO® CARB VGM Series

The HY-PRO® CARB VGM end mill is a series of variable geometry end mills for dynamic milling ideal in steel and stainless steel.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/hypro-carb-vgm-series



List Numbers

VGM5 - HY-PRO® CARB VGM (Inch)
VGM5-LN - HY-PRO® CARB VGM (Inch)
VGM6 - HY-PRO® CARB VGM (Inch)
VGM7 - HY-PRO® CARB VGM (Inch)

Size Range

1/8"-1"
1/8"-1"
1/4"-1"
1/4"-1"

Primary Applications

- Customers looking for the next generation tool for Dynamic Milling/High Efficiency Milling
- Shops who cut difficult to machine alloys
- Customers desiring consistent milling tool life

Features & Product Solutions

Promotes Smooth, Stable Cutting with Low Cutting Forces

Variable Index & Unique Flute Geometry

Variable Index:

Unequal flute spacing reduces vibration during machining by altering the timing of each flute engaging in the workpiece.

Unique Flute Geometry:

Sharp rake angle, high helix and adjusted core diameter maintain excellent cutting edge sharpness and tool rigidity to promote smooth, stable cutting with low cutting force.

Provides Long Tool Life

EXO Coating

OSG's proprietary multi-layer coating provides longer tool life through higher wear and heat resistance than conventional TiAlN coatings.

Series	Coating	Type	Hardness (HV)	Thickness (µm)	Coefficient of Friction	Oxidation Temp (C)
VGx	TiAlN	TiAlN	2,800	3	0.3	800
VGM	EXO	TiAlN Multilayer	2,800	3	0.3	850

Comprehensive Offering

5-, 6-, and 7-Flute Lineups

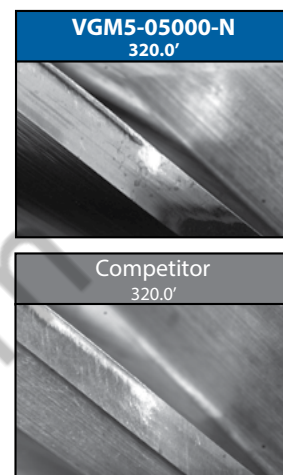
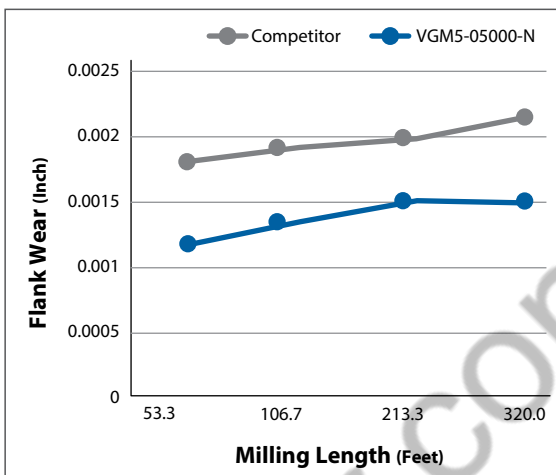
OSG's VGM offering features 5-, 6-, and 7-flute lineups, and is available with multiple Lengths of Cut, with both Square End and Corner Radius variations.

Name	No. of Flutes	End Cut Type	LOC	Reduced Neck	Neck Length	Total # of EDPs
VGM-5	5	SQ & CR	1.25 to 6D	N/A	-	277
VGM-5-LN	5	SQ & CR	1.25D	Yes	3 to 10D	211
VGM-6	6	SQ & CR	1.25 to 6D	N/A	-	186
VGM-7	7	SQ & CR	1.25 to 6D	N/A	-	110

VGM5 - Stable Performance Even in Stainless Steel

304 Stainless Steel

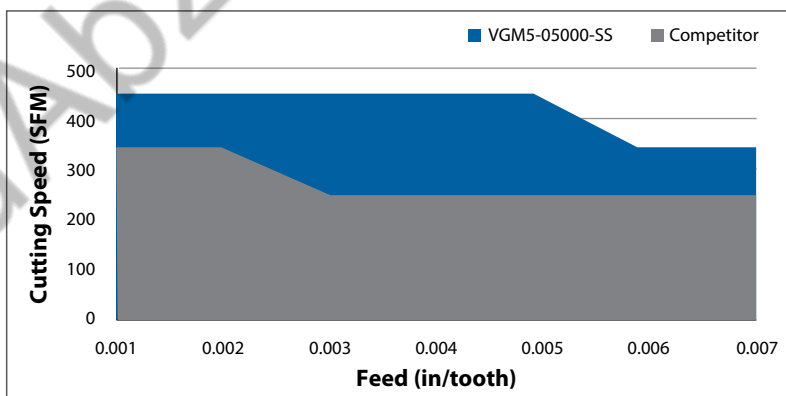
Tool	VGM5-05000-N	Competitor
Tool Size	1/2"	
Work Material	304 Stainless Steel	
Milling Method	Side Milling	
Cutting Speed	250 SFM (1,910 RPM)	
Feed	33.4 IPM (.0035IPT)	
Depth of Cut	Aa=1.2", Ar=0.05"	
Coolant	Water-Soluble	
Machine	Vertical Machining Center (CAT50)	



VGM5 - Stable Performance in a Wide Range of Conditions

304 Stainless Steel

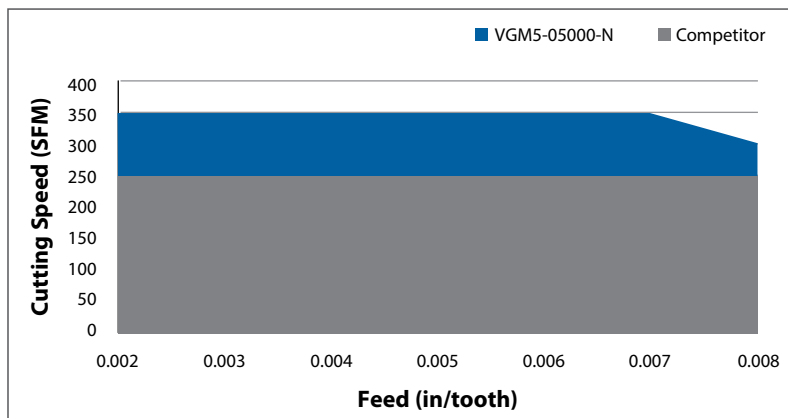
Tool Size	1/2"
Work Material	304 Stainless Steel
Milling Method	Side Milling
Depth of Cut	Aa=0.625", Ar=0.075"
Coolant	Water-Soluble
Machine	Vertical Machining Center (CAT50)



VGM5 - Stable Performance in a Wide Range of Conditions

304 Stainless Steel

Tool Size	1/2"
Work Material	304 Stainless Steel
Milling Method	Side Milling
Depth of Cut	Aa=1.25", Ar=0.05"
Coolant	Water-Soluble
Machine	Vertical Machining Center (CAT50)



EXOCARB® AM-EBT

Overview



EXOCARB® AM-EBT

The OSG EXOCARB® AM-EBT carbide ball end mills with 3D negative robust geometry are designed for post-processing of additive manufacturing and milling in hardened steels.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/am-ebt

List Numbers

- 4730 - EXOCARB® AM-EBT (mm)
- 4630 - EXOCARB® AM-EBT (Inch)

Size Range

- 2mm-20mm
- 3/32"-1/2"

Primary Applications

- 3D printed and additively manufactured materials.
- 3D print-mill hybrid machines.
- Weld and die mold repair applications.

Features & Product Solutions

Superior Performance in High Hardness and Welded Materials

Extremely Negative Rake Angle

Can Handle Large Variations in Chipload

Large Chip Pockets

Prevents Recutting and Enables Polishing

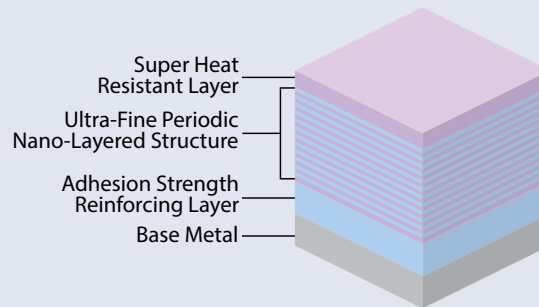
Large Relief

Optimized for High Hardness Steel Machining

DUOREY Coating

OSG's newly developed DUOREY coating, with its unique coating structure, provides superior heat resistance and toughness for high-hardness steel milling. DUOREY coating also suppresses chipping and achieves longer tool life.

Coating Structure



Coating Color	Coating Structure	Hardness (GPa)	Oxidation Temperature (°C)	Heat Resistance	Adhesion Strength	Surface Roughness	Wear Resistance	Welding Resistance	Toughness
Black Gray	Ultra-Fine Periodic Nano-Layered	41	1,300	⊙	○	Fair	⊙	○	○

○ good ⊙ best

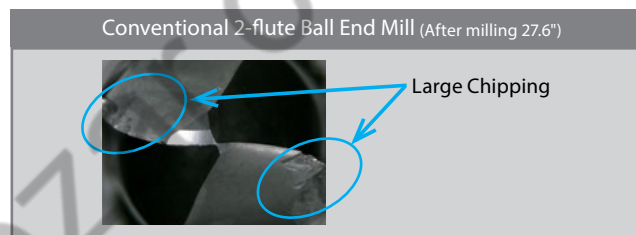
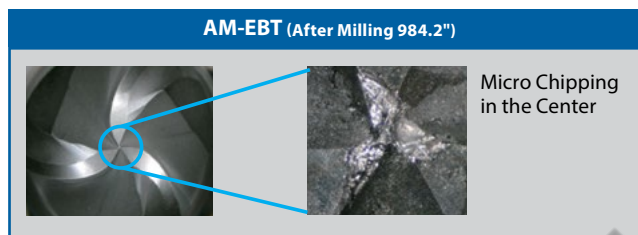
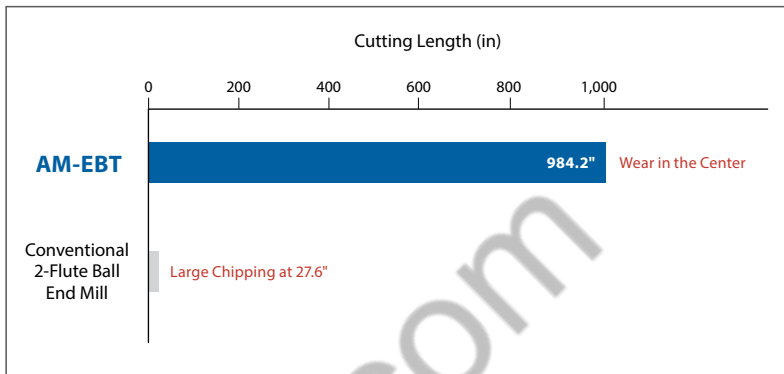


Long Tool Life Milling Built-up Welding Parts

BK-660R

The AM-EBT performed exceptionally well, even when milling built-up welding parts with large depth of cut.

Tool	AM-EBT (R6x12)	Conventional (2-Flute Ball End Mill)
Work Material	BK-660R	
Milling Method	Linear Machining	
Cutting Speed	122 SFM (1,000 RPM)	
Feed	39.3 IPM (0.013 IPT)	
Depth of Cut	Aa = 0.12", Ar = 0.20"	
Coolant	Air Blow	
Machine	Vertical Machining Center	



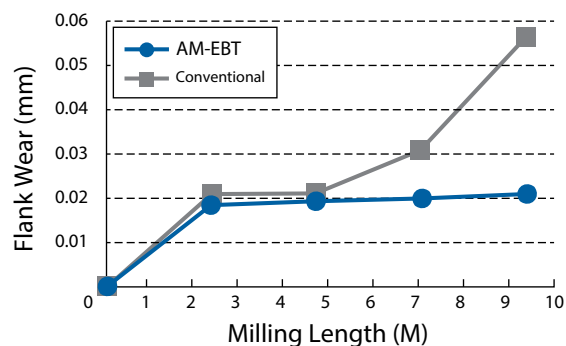
High Hardness Milling

Stable Machining and Steady Wear Progression (66HRC)

AM-EBT achieved stable wear transition and excellent machined surface without peeling.

Tool	AM-EBT (R3x6)
Work Material	Additive High-Speed Steel (~66 HRC)
Milling Method	Pick Milling (Direction perpendicular to the deposited direction)
Cutting Speed	90 m/min (4,800 mim-1)
Feed	1,340 mm/min (0.093 mm/t)
Depth of Cut	Aa = 0.3mm, Ar = 0.9mm
Coolant	Air Blow
Machine	Horizontal Machining Center

Okuma Corporation: Wear Progression Testing



Molded with LASER-EX manufactured by Bear Corporation

	Tool Condition After Machining 9.38m		Machined Surface
	Flank	Rake Face	
AM-EBT			
Conventional			

AM-EBT: Additively Manufactured Inconel Wing

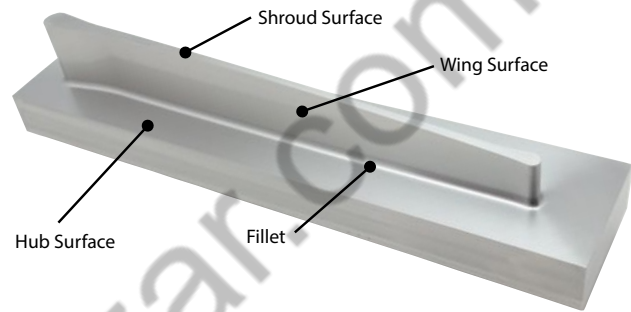
High Efficiency Surface Milling in Layered Inconel 718

Application Details	
Workpiece	Inconel Wing
Material	Layered Inconel 718
Machine	5-axis BT50
Holder	Shrink Fit
Coolant	Water Soluble

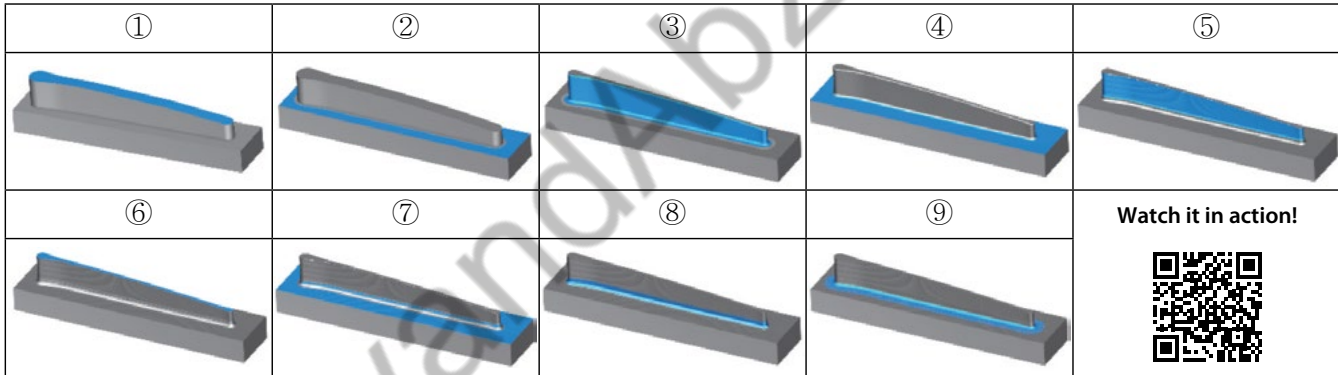
Shape of Work Material Before Machining



After Machining



Workpiece provided by: Hitachi Metals, Ltd. Global Research & Innovative Technology Center (GRIT)



Watch it in action!



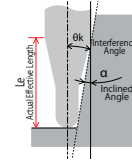
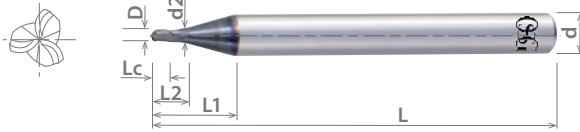
Process	Milling Application	Milling Process	Tool	Cutting Speed (SFM)	Feed (IPM)	ap (in)	ae(in)	Cutting Time
①	Shroud Surface	Roughing	AM-HFC 12xR1.5	196	45.12 (0.0047 IPT)	0.012"	0.177"	0:46
②	Hub Surface	Roughing		196	45.12 (0.0047 IPT)	0.012"	0.177"	0:24
③	Win Surface	Roughing		196	45.12 (0.0047 IPT)	0.012"	0.177"	0:54
④	Hub Surface	Semi-roughing	AM-HFC 12xR1.5	196	45.12 (0.0047 IPT)	0.012"	0.177"	0:04
⑤	Wing Surface	Finishing	AM-EBT R5x10	148	16.93 (0.0039 IPT)	0.004"	0.018"	1:37
⑥	Shroud Surface	Finishing		148	16.93 (0.0039 IPT)	0.004"	0.018"	1:16
⑦	Hub Surface	Finishing	AM-EBT R3x6	131	24.41 (0.0039 IPT)	0.004"	0.018"	0:15
⑧	Fillet	Finishing		131	24.41 (0.0039 IPT)	0.004"	0.018"	0:12
⑨	Fillet	Finishing		131	24.41 (0.0039 IPT)	0.004"	0.018"	0:25

Total processing time: 6 hours

List 4730

AM-EBT, 3-Flute, Stub Length, Ball End

SPEED FEED P175	CARBIDE	DUROREY	± 0.01		STUB	30°	SHANK h4
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Milling Diameter Tolerance	
2 ≤ D ≤ 20	+/- 0.03mm

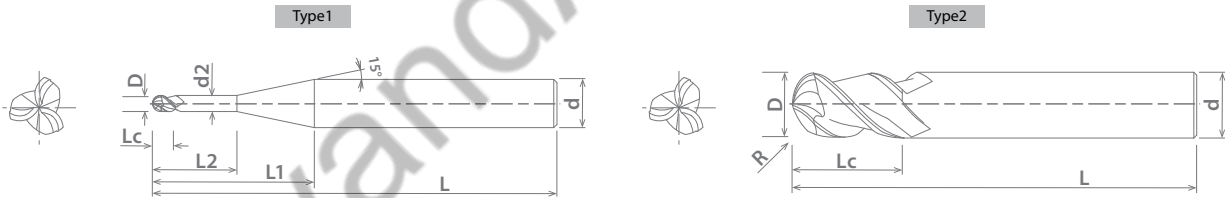
Units: mm

EDP	Mill Dia.		Length of Cut Lc	Neck Length		Non-Tapered Neck Length L2	Neck Dia d2	Interference Angle θk	Effective Neck Length (Le) by Incline Angle (α)					Shank Dia. d	Type	Status
	D	L		L1	L2				0.5°	1.0°	1.5°	2.0°	3.0°			
3187240	2	60	2	11.9	4	1.95	10.64	4.19	4.33	4.42	4.55	4.85	6	1	●	
3187280				15.9	8	1.95	7.79	8.33	5.58	5.86	9.15	9.82				
3187360	3		3	11.8	6	2.85	8.15	6.44	6.61	6.79	7.00	7.45				
3187392				17.8	12	2.85	5.22	12.64	13.03	13.44	13.89	14.91				
3187408	4		4	12	8	3.85	5.65	8.49	8.71	8.96	9.22	9.81				
3187416				20	16	3.85	3.17	16.76	17.27	17.82	18.42	19.76				
3187510	5	5	12.1	10	4.85	2.95	10.54	10.82	11.12	11.45	-					
3187520			22.1	20	4.85	1.46	20.87	21.52	-	-	-					
3188060	6	70	9	-	-	-	-	-	-	-	-	-	8	2	●	
3188080	8		12	-	-	-	-	-	-	-	-	-				
3188100	10		15	-	-	-	-	-	-	-	-	-				
3188120	12		18	-	-	-	-	-	-	-	-	-				
3188160	16		24	-	-	-	-	-	-	-	-	-				
3188200	20		30	-	-	-	-	-	-	-	-	-				

Packed: 1 pc. Available DUROREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



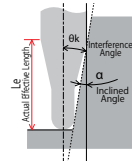
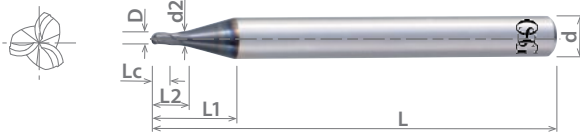
List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low 1010 1018	Med. 1035 1045	High 1065			4140 4340	300	400		17-4 PH		6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
4730					○	○	○				○	○		○	○	○	

○ good ○ best



List 4630

AM-EBT, 3-Flute, Stub Length, Ball End



Milling Diameter Tolerance	
$3/32 \leq D \leq 1/2$	$\pm 0.0012''$

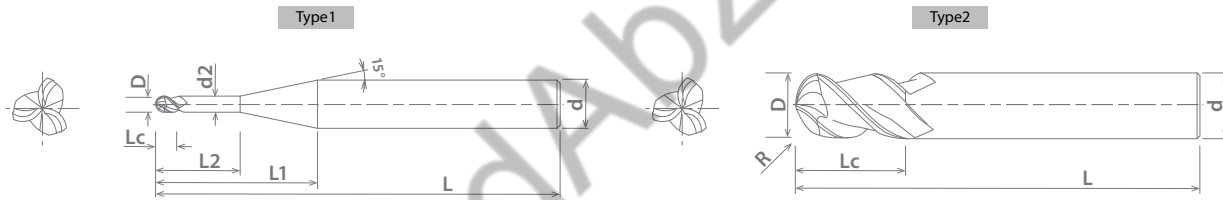
Units: Inch

EDP	Mill Dia.	OAL	Length of Cut	Neck Length	Non-Tapered Neck Length	Neck Dia.	Interference Angle	Effective Neck Length (Le) by Incline Angle (α)					Shank Dia.	Type	Status		
								0.5°	1.0°	1.5°	2.0°	3.0°					
46300023	3/32	2	3/32	0.4961	3/16	0.0905	10.33	0.192	0.197	0.203	0.209	0.222	1/4	1	●		
46300123	1/8		1/8	0.6850	3/8	0.0905	7.382	0.386	0.398	0.411	0.424	0.455			●		
46300223		0.4921		1/4	0.1181	8.496	0.256	0.263	0.27	0.278	0.296	●					
46300323	0.7402	1/2	0.1181	5.399	0.515	0.531	0.547	0.566	0.607	●							
46300423	3/16	2.5	3/16	0.5039	3/8	0.1811	4.768	0.384	0.395	0.406	0.417	0.444			●		
46300523	1/4	3	1/4	0.8780	3/4	0.1811	2.498	0.772	0.796	0.821	0.849	-			●		
46300623	5/16	3.5	5/16	-	-	-	-	-	-	-	-	-			5/16	2	●
46300723	3/8		9/16	-	-	-	-	-	-	-	-	-			3/8		●
46300823	1/2		3/4	-	-	-	-	-	-	-	-	-	1/2	●			

Packed: 1 pc. Available DUROREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List No.	Work Material															
	P				M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels		
	Low	Med.	High				300	400		17-4 PH		6061 7075	Casting	Inconel	6Al4V (30 HRC)	~35 HRC
4630	○	○	○		○	○	○				○	○		○	○	○

○ good ○ best



EXOCARB® AM-CRE

Overview

EXOCARB® AM-CRE

The OSG EXOCARB® AM-CRE carbide radius type (6-Flute/8-Flute) end mills designed for post-processing of additive manufacturing and milling in hardened steels.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/am-cre



List Numbers

4770 - EXOCARB® AM-CRE (mm)
4670 - EXOCARB® AM-CRE (Inch)

Size Range

6mm-20mm
1/4"-1/2"

Primary Applications

- 3D printed and additively manufactured materials.
- 3D print-mill hybrid machines.
- Weld and die mold repair applications.

Features & Product Solutions

High Efficiency Machining

Multifluted Geometry

Multifluted geometry promotes greater tool life and high efficiency milling.



< 10mm: 6 flutes



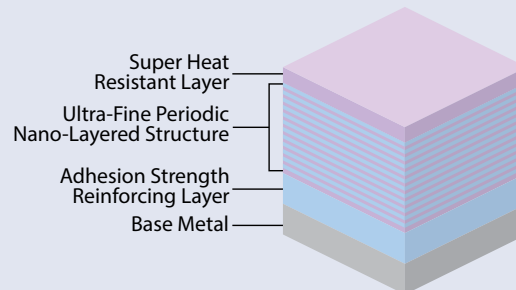
≥ 12 mm: 8 flutes

Optimized for High Hardness Steel Machining

DUREY Coating

OSG's newly developed DUREY coating, with its unique coating structure, provides superior heat resistance and toughness for high-hardness steel milling. DUREY coating also suppresses chipping and achieves longer tool life.

Coating Structure



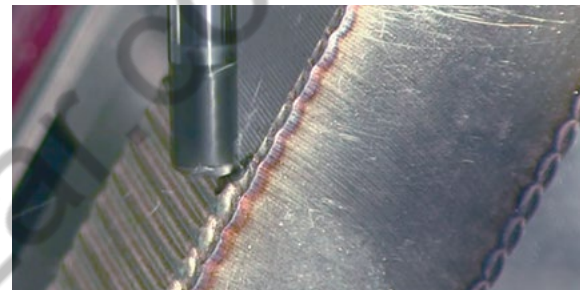
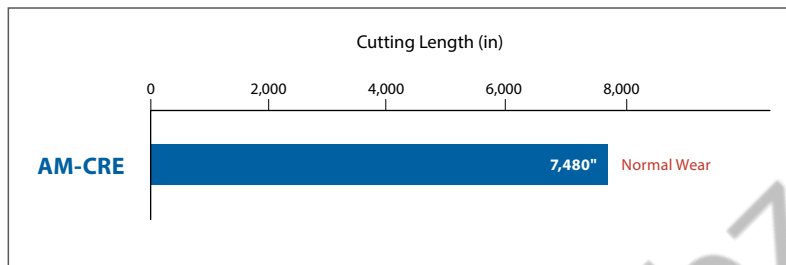
Coating Color	Coating Structure	Hardness (GPa)	Oxidation Temperature (°C)	Heat Resistance	Adhesion Strength	Surface Roughness	Wear Resistance	Welding Resistance	Toughness
Black Gray	Ultra-Fine Periodic Nano-Layered	41	1,300	⊙	○	Fair	⊙	○	○

○ good ⊙ best

Milling Example in Stellite Alloys

Stellite Alloys (48HRC)

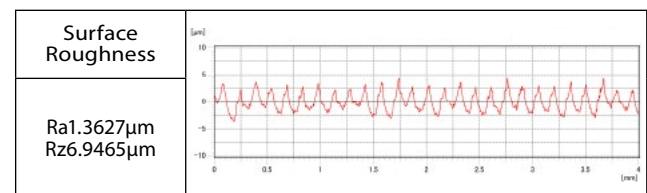
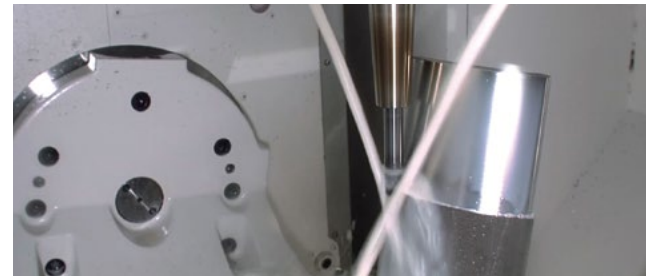
Tool	AM-CRE (Ø8xR2 - 6-Flute)
Work Material	Stellite (48HRC)
Milling Method	Contour Line Operation
Cutting Speed	164 SFM (2,000 RPM)
Feed	23.6 IPM (0.002 IPT)
Depth of Cut	Aa = 0.002", Ar = 0.002"
Coolant	Air Blow
Machine	Vertical Machining Center



Layered Hardened Stainless Steel

Precipitation Hardening Stainless Steel Additive Material (45HRC)

Tool	AM-CRE (Ø8xR2 - 6-Flute)
Work Material	SUS630 (45HRC)
Milling Method	Contour Line Operation
Cutting Speed	63m/min (2,500 mim-1)
Feed	869 mm/min (0.058 mm/t)
Depth of Cut	Aa = 0.1mm, Ar = 1.0mm
Coolant	Water-Soluble
Machine	Five-Axis Machining Center



Mold Application:

Additive manufacturing end mills in welded applications

Welded material covers the majority of the part in a mold repair application. In addition to the high hardness of the material, there is a change in the cutting allowance making the part difficult to process. The AM series end mills make it possible to cope with the large variance in these welded parts through an exceptionally strong cutting edge.



EXOCARB® AM-HFC

The OSG EXOCARB® AM-HFC carbide radius type high feed end mills designed for post-processing of additive manufacturing and milling in hardened steels.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/am-hfc



List Numbers

4970 - EXOCARB® AM-HFC (Inch)

Size Range

1/4"-1/2"

Primary Applications

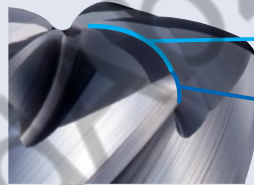
- 3D printed and additively manufactured materials.
- 3D print-mill hybrid machines.
- Weld and die mold repair applications.

Features & Product Solutions

Optimized for Flat Surface Machining

Composite Radius Shape

Strong cutting edge can withstand unstable depths of cut.



Bottom Edge Radius

Corner Radius

Improved Surface Quality

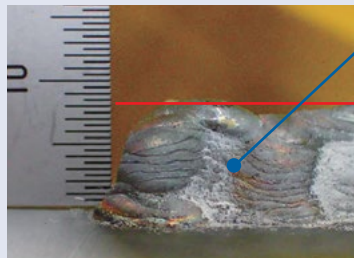
Flat Cutting Edge

- Suppresses chipping of the end cutting edge.
- Achieves good machined surface quality.



For Additive Manufacturing

Typical Part Surface



Challenge:

Welded material; large variations in the amount of material to be removed.

Requirement:

Cutting edge resistant to chipping, even in varying depths of cut.

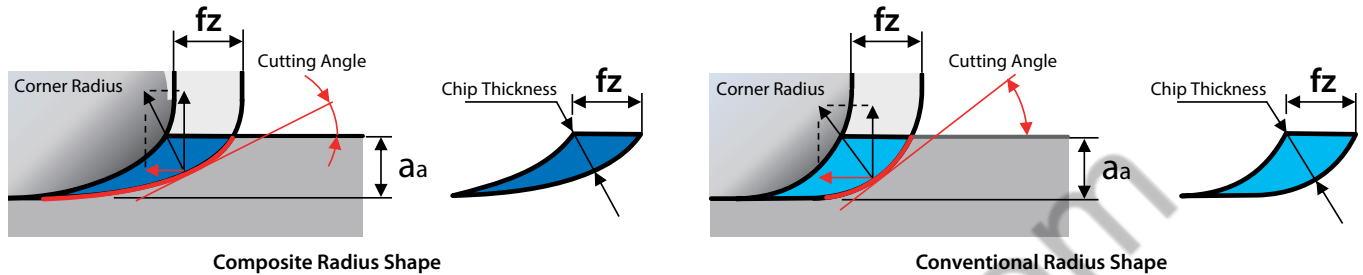
Benefit:

Stable machining & reduced processing time.

High Efficiency Machining

Composite Radius Shape for Flat Surface Machining

Since the depth of cut is small, cutting resistance in the feed direction is reduced, and vibration & deflection of the tool are suppressed. By reducing the chip thickness, cutting heat is easily transferred to the chip and it is difficult for heat to remain on the tool edge and work material.

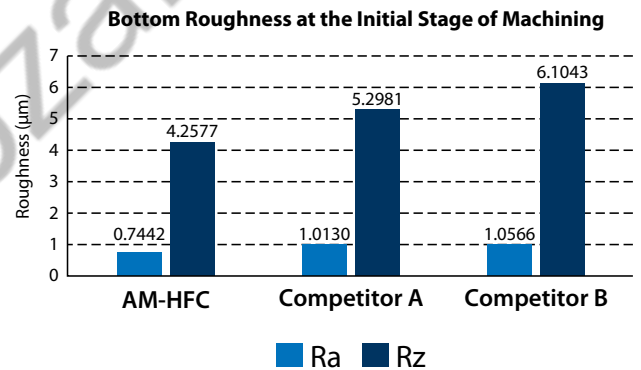


AM-HFC: Flat Cutting Edge

SKD61 (50HRC)

Achieved a good, flat machined surface with Composite Radius

Tool	AM-HFC	Competitor A	Competitor B
Size	Ø4 x R0.5	6FL	4FL
Work Material	SKD61 (50 HRC), welded		
Milling Method	Facing (perpendicular to welding direction)		
Cutting Speed	196 SFM (4775 RPM)		
Feed	169.3 IPM		
Feed per Tooth	0.006 IPT	0.006 IPT	0.009 IPT
Depth of Cut	Aa = 0.006 in, Ar = 0.079 in		
Coolant	Air		
Machine	Vertical Machining Center		

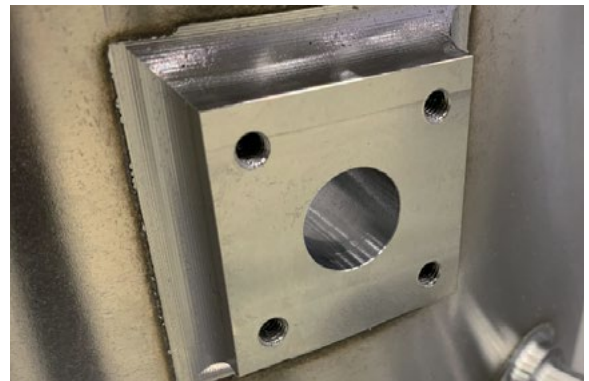


AM-HFC: Excellent Durability in Nickel-Alloys

Inconel 718 - Welded

AM-HFC was able to process up to 8 workpieces, with a total cutting amount of 11.5 in³.

Tool	AM-HFC
Size	Ø10 x R1.2
Work Material	Inconel 718, welded
Milling Method	Facing
Cutting Speed	164 SFM (1592 RPM)
Feed	18.8 IPM (0.0019 ipt)
Depth of Cut	Aa = 0.020 in, Ar = 0.079 in
Coolant	Air
Machine	5-Axis Machining Center



Molded and machined with the LASER EX manufactured by Okuma Corporation.

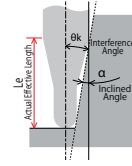
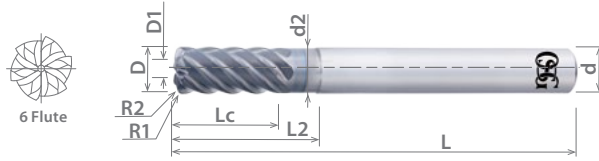
Cooperation: Okuma Corporation

List 4970

AM-HFC, High Feed Radius Type

NEW	SPEED FEED P183-185	CARBIDE	DUROREY	± 0.03	45°	SHRINK FIT
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Milling Diameter Tolerance	
$1/4 \leq D \leq 1/2$	$\pm 0.0004''$



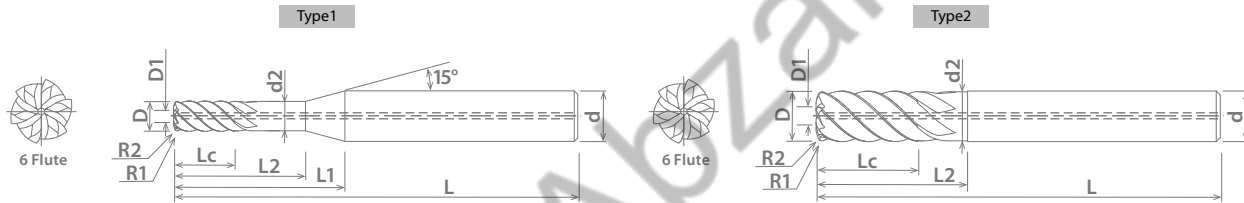
Units: mm

EDP	Mill Dia. X Effective Corner Radius	Effective Diameter	Overall Length	Length of Cut	Corner Radius	Endcut Radius	Neck Length	Non-Tapered Neck Length	Neck Dia	Interference Angle	Effective Neck Length (Le) by Incline Angle (α)					Shank Diameter		Status
											0.5°	1.0°	1.5°	2.0°	3.0°	d	TYPE	
3188204	4XR0.5	2	50	8	0.4	2.5	15.9	12	3.8	3.73°	12.53	12.98	13.43	13.91	15	6	1	●
3188205	5XR0.6	2.5	60	10	0.5	3	17	15	4.8	1.76°	15.64	16.18	16.74	-	-	6	1	●
3188206	6XR0.8	3	60	12	0.6	3.5	-	18	5.8	-	-	-	-	-	-	6	2	●
3188208	8XR1	4	70	16	0.8	5	-	24	7.7	-	-	-	-	-	-	8	2	●
3188210	10XR1.2	5	80	20	1	6	-	30	9.7	-	-	-	-	-	-	10	2	●
3188212	12XR1.5	6	90	24	1.2	7	-	36	11.7	-	-	-	-	-	-	12	2	●

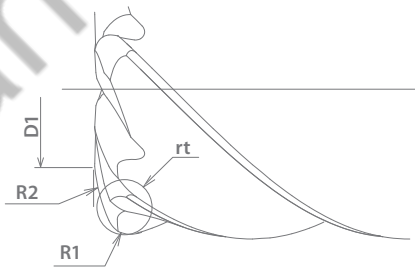
Packed: 1 pc. Available DUROREY coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



Details of Corner Radius



YouTube
Watch it in Action!

List No.	Work Material																	
	P				M			K	N		S	H						
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels				
	Low	Med.	High															
	1010	1035	1065	4140					6061	Casting	Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC	45-50 HRC	50-70 HRC		
4970	1018	1045		4340			17-4 PH		7075								○	○

○ good ○ best

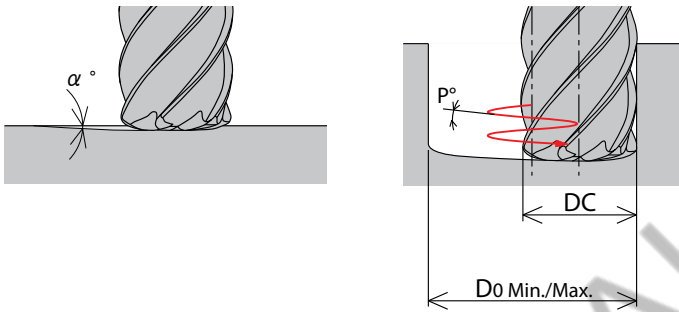


AM-HFC

Ramping Angles & Flute Shape Definitions

AM-HFC Maximum Ramping Angle (α) & Maximum Helical Angle (P)

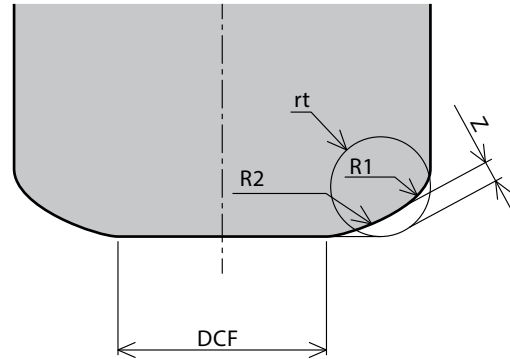
DCxrt	Ramping Angle	Helical Milling (mm)		Helical Angle
	α	D0 Min.	D0 Max.	P°
4 × R0.5	3°	6	7	1.5°
5 × R0.6		7.5	9	
6 × R0.8		9	11	
8 × R1		12	15	
10 × R1.2		15	19	
12 × R1.5		18	23	



Edge shape definitions for the purpose of creating a program.

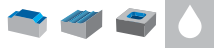
DC	rt	Remainder
		Z
4	R0.5	0.11
5	R0.6	0.15
6	R0.8	0.17
8	R1	0.22
10	R1.2	0.31
12	R1.5	0.36

During machining, please program the milling paths according to the recommended simulated R (rt) respective to the individual end mill diameter.



PHOENIX® PXHF-AM

The OSG PHOENIX PXHF-AM high feed radius type exchangeable head end mills are designed for post-processing of additive manufacturing materials and milling in hardened steels.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/pxhf-am



List Numbers

78PXHF-AM - PHOENIX® PXHF-AM

Size Range

1/2"-1", 12mm-20mm

Primary Applications

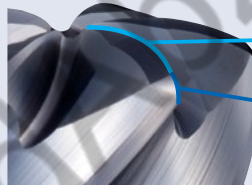
- High Feed milling of 3D-printed & other additively manufactured parts.
- Stable, efficient machining with reduced processing times in hardened steel & welded material applications.

Features & Product Solutions

Optimized for Flat Surface Machining

Composite Radius Shape

Strong cutting edge can withstand unstable depths of cut.



Bottom Edge Radius

Corner Radius

Improved Surface Quality

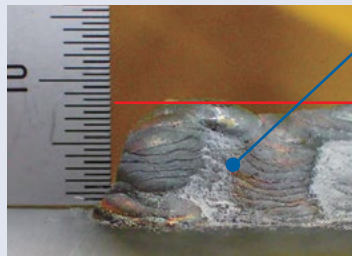
Flat Cutting Edge

- Suppresses chipping of the end cutting edge.
- Achieves good machined surface quality.



For Additive Manufacturing

Typical Part Surface



Challenge:

Welded material; large variations in the amount of material to be removed.

Requirement:

Cutting edge resistant to chipping, even in varying depths of cut.

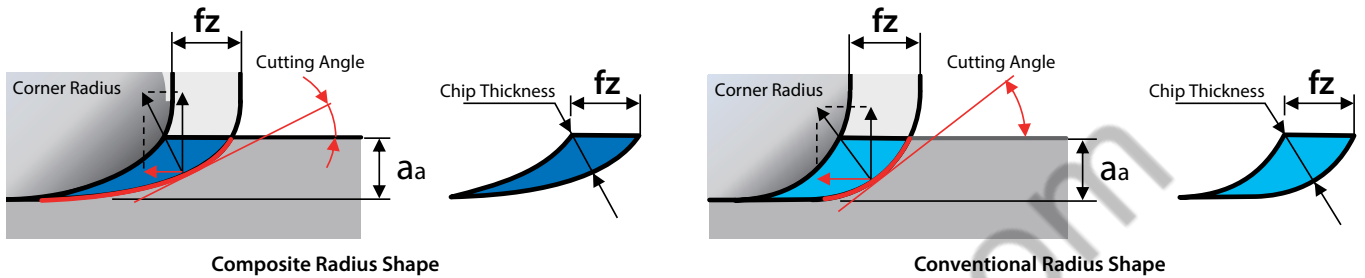
Benefit:

Stable machining & reduced processing time.

High Efficiency Machining

Composite Radius Shape for Flat Surface Machining

Since the depth of cut is small, cutting resistance in the feed direction is reduced, and vibration & deflection of the tool are suppressed. By reducing the chip thickness, cutting heat is easily transferred to the chip and it is difficult for heat to remain on the tool edge and work material.

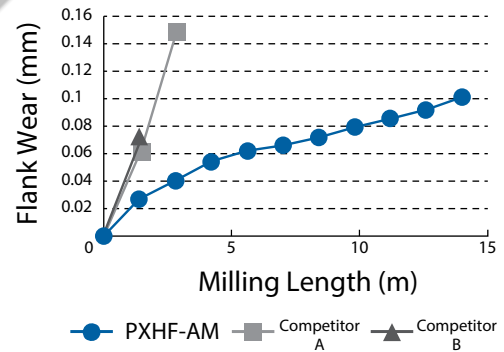


PXHF-AM: Excellent Tool Life in Hardened Steel

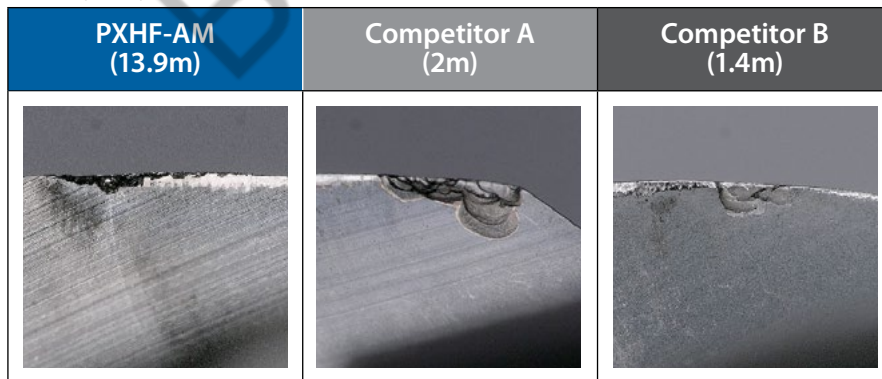
SKH51 (65 HRC)

In SKH51 (65 HRC), the durability of PXHF-AM was 4 times that of the competitor.

Tool	PXHF-AM	Competitors
Size	Ø16 (6FL)	Ø16 (4FL)
Work Material	SKH51 (65 HRC)	
Milling Method	Facing	
Cutting Speed	197 SFM (1200 RPM)	
Feed	56.7 IPM (0.0079 ipt)	56.7 IPM (0.0118 ipt)
Depth of Cut	Aa = 0.012 in, Ar = 0.315 in	
Coolant	Air	
Machine	Vertical Machining Center	



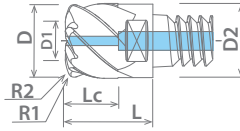
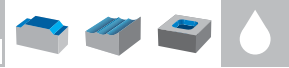
Cutting Edge Wear on Corner Radius



List 78PXHF-AM

PXHF-AM Exchangeable Heads (Inch & Metric), 6 Flutes, High Feed, Corner Radius, Coolant-Through

NEW
SPEED FEED
P191-193



EDP#	Type	Designation	Head Dia.		Effective Dia.		Effective Radius		Corner Radius		Bottom Edge Radius		Length of Cut		Overall Length		Flange Dia.		Helix Angle	Grade	Status
			D		D1		rt		R1		R2		Lc		L		D2				
			mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch			
52313000	PXHF-AM	PXHF-AM0500AC12-06R060-O	-	0.500	-	0.250	-	0.060	-	0.050	-	0.300	-	0.350	-	0.598	-	0.488	45°	XP6703	●
52313001		PXHF-AM0625AC16-06R080-O	-	0.625	-	0.313	-	0.080	-	0.063	-	0.375	-	0.438	-	0.732	-	0.613	45°	XP6703	●
52313002		PXHF-AM0750AC20-06R100-O	-	0.750	-	0.375	-	0.100	-	0.075	-	0.450	-	0.525	-	0.807	-	0.736	45°	XP6703	●
52313003		PXHF-AM1000AC25-06R120-O	-	1.000	-	0.500	-	0.120	-	0.100	-	0.600	-	0.700	-	1.098	-	0.960	45°	XP6703	●
7830377		PXHF-AM120C12-06R150-O	12	-	6	-	1.5	-	1.2	-	7	-	8.4	-	14.4	-	11.7	-	45°	XP6703	●
7830378		PXHF-AM160C16-06R200-O	16	-	8	-	2	-	1.6	-	9.5	-	11.2	-	18.7	-	15.7	-	45°	XP6703	●
7830379		PXHF-AM200C20-06R250-O	20	-	10	-	2.5	-	2	-	12	-	14	-	21.5	-	19.6	-	45°	XP6703	●

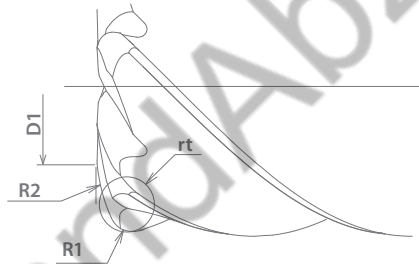
Packed: 1 pc.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



Details of Corner Radius

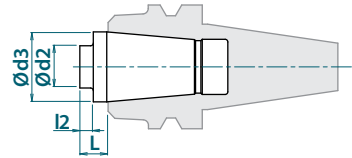


BavandAbzar.com



List 78340

PXMC (Metric)



EDP No.	Body Type	Designation	Neck Dia. (mm)	Body Dia. (mm)	Projection Length (mm)	Neck Length (mm)	Applicable Head (mm)	Status
			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 separately.

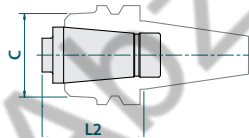
● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



HY-PRO® Shrink

2 Piece Base Holders



EDP No.	Body Type	Designation	Nose Diameter (mm)	Gage Length (mm)		Status
			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 p1523.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.

List 7808H

PXM Accessories

Appearance	EDP No.	Designation	Applicable Head		Recommended Tightening	Status
			(inch)	(mm)		
 Spanner Wrench	7801890	PXMP8-10	0.375	10-12	10.0 Nm	●
			0.500	12-14	12.0 Nm	●
	7801891	PXMP13-16	0.625	16-18	30.0 Nm	●
			0.750	20-22	50.0 Nm	●
			1.000	25	60.0 Nm	●
7801897	PXMP24	1.250	32	60.0 Nm	●	

Packed: Wrench = 1 pc.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.

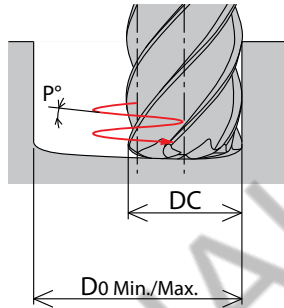
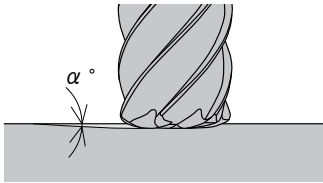


PXHF-AM

Ramping Angles & Flute Shape Definitions

PXHF-AM Maximum Ramping Angle (α°) & Maximum Helical Angle (P°)

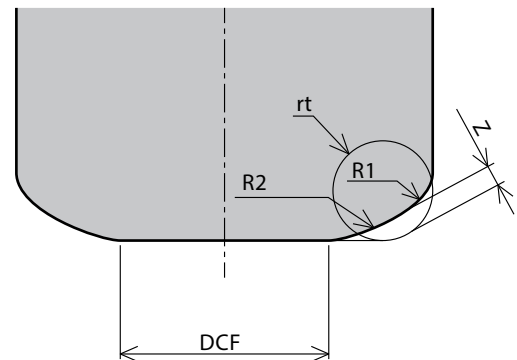
PXHF-AM Head	Ramping Angle	Helical Milling		Helical Angle
	α°	D ₀ min	D ₀ max	P $^\circ$
PXHF-AM0500AC12-06R060-O	3°	0.750	0.960	1.5°
PXHF-AM0625AC16-06R080-O		0.937	1.210	
PXHF-AM0750AC20-06R100-O		1.125	1.460	
PXHF-AM1000AC25-06R120-O		1.500	1.960	
PXHF-AM120C12-06R150-O		18mm	23mm	
PXHF-AM160C16-06R200-O		24mm	31mm	
PXHF-AM200C20-06R250-O		30mm	39mm	



PXHF-AM Flute Shape Definitions for the Purpose of Creating a Program

PXHF-AM Head	Effective Radius	Uncut Amount
	rt	Z
PXHF-AM0500AC12-06R060-O	R0.060	0.015
PXHF-AM0625AC16-06R080-O	R0.080	0.018
PXHF-AM0750AC20-06R100-O	R0.100	0.020
PXHF-AM1000AC25-06R120-O	R0.120	0.031
PXHF-AM120C12-06R150-O	R1.5 mm	0.36 mm
PXHF-AM160C16-06R200-O	R2 mm	0.47 mm
PXHF-AM200C20-06R250-O	R2.5 mm	0.59mm

During machining, please program the milling paths according to the recommended Effective Radius (rt) for the corresponding end mill diameter.



Cutting Conditions: PXHF-AM

Slotting ($5 < L/D \leq 6$)

Hardness	< 45 HRC		< 62 HRC		< 70 HRC		-	-	-	-						
Work Material	Hardened Steel Prehardened Steel		Hardened Steel		Hardened Steel		Stainless Steel	Cobalt-Chrome Alloy Stellite	Titanium Alloy	Nickel-based Alloy Inconel 718						
Cutting Speed	295 - 360 SFM		230 - 295 SFM		165 - 230 SFM		330 - 395 SFM	295 - 360 SFM	230 - 295 SFM	65 - 130 SFM						
Depth of Cut	Aa=0.02Dc Max • Ar=0.5Dc Max															
Mill Dia.	Speed		Feed		Speed		Feed		Speed		Feed		Speed		Feed	
	(in)	(mm)	(RPM)	(in/min)	(RPM)	(in/min)	(RPM)	(in/min)	(RPM)	(in/min)	(RPM)	(in/min)	(RPM)	(in/min)	(RPM)	(in/min)
-	12		2650	105.12	2120	83.46	1590	31.50	2920	115.75	2650	105.12	2120	84.25	800	13.78
1/2	-		2520	105.12	2000	83.46	1500	31.50	2750	115.75	2520	105.12	2000	84.25	760	13.78
5/8	-		2010	105.12	1600	83.46	1200	31.50	2200	115.75	2010	105.12	1600	84.25	610	13.78
-	16		1990	105.12	1590	83.46	1190	31.50	2190	115.75	1990	105.12	1590	84.25	600	13.78
3/4	-		1680	105.12	1330	83.46	1000	31.50	1830	115.75	1680	105.12	1330	84.25	510	13.78
-	20		1590	105.12	1270	83.46	960	31.50	1750	115.75	1590	105.12	1270	84.25	480	13.78
1	-		1260	105.12	1000	83.46	750	31.50	1380	115.75	1260	105.12	1000	84.25	380	13.78

1. This tool is recommended for the roughing of additive manufacturing and mold overlay surfaces.
2. Please use machines and holders that are rigid and highly accurate.
3. The values listed above are for reference. Please set the cutting condition in accordance with the actual machining environment.
4. Please reduce the feed rate when the depth of cut is greater than specified.
5. Please adjust the cutting condition when the overhang length is longer.
6. Please use a suitable fluid with high smoke retardant properties.
7. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
8. Please use water-soluble coolant when machining stainless steel, cobalt-chromium alloy, titanium alloy, and Ni-based alloy.
9. Tool runout should be kept to a minimum for maximum accuracy.
10. When the cutting load fluctuates in areas such as the corners, please reduce the rotational speed.
11. If Ar is greater than 0.5Dc, there may be a cusp in the machined surface.

Side Milling

Hardness	< 45 HRC		< 62 HRC		< 70 HRC		-	-	-	-						
Work Material	Hardened Steel Prehardened Steel		Hardened Steel		Hardened Steel		Stainless Steel	Cobalt-Chrome Alloy Stellite	Titanium Alloy	Nickel-based Alloy Inconel 718						
Cutting Speed	260 - 330 SFM		165 - 230 SFM		165 - 230 SFM		330 - 395 SFM	295 - 360 SFM	100 - 165 SFM							
Depth of Cut	Aa=0.5Dc Max • Ar=0.05Dc Max		Aa=0.5Dc Max • Ar=0.02Dc Max				Aa=0.5Dc Max • Ar=0.05Dc Max				Aa=0.5Dc Max • Ar=0.02Dc Max					
Mill Dia.	Speed		Feed		Speed		Feed		Speed		Feed		Speed		Feed	
	(in)	(mm)	(RPM)	(in/min)	(RPM)	(in/min)	(RPM)	(in/min)	(RPM)	(in/min)	(RPM)	(in/min)	(RPM)	(in/min)	(RPM)	(in/min)
-	12		2390	47.25	1590	22.83	1060	9.06	2650	52.75	2390	47.25	1590	22.83	800	9.06
1/2	-		2250	47.25	1490	22.83	990	9.06	2520	52.75	2250	47.25	1490	22.83	760	9.06
5/8	-		1800	47.25	1190	22.83	790	9.06	2010	52.75	1800	47.25	1190	22.83	610	9.06
-	16		1790	47.25	1190	22.83	800	9.06	1990	52.75	1790	47.25	1190	22.83	600	9.06
3/4	-		1500	47.25	990	22.83	660	9.06	1680	52.75	1500	47.25	990	22.83	510	9.06
-	20		1430	47.25	960	22.83	640	9.06	1590	52.75	1430	47.25	960	22.83	480	9.06
1	-		1120	47.25	740	22.83	500	9.06	1260	52.75	1120	47.25	740	22.83	380	9.06

1. This tool is recommended for the roughing of additive manufacturing and mold overlay surfaces.
2. Please use machines and holders that are rigid and highly accurate.
3. The values listed above are for reference. Please set the cutting condition in accordance with the actual machining environment.
4. Please reduce the feed rate when the depth of cut is greater than specified.
5. The above table is a guide when the amount of protrusion of the tool is 4D or less. If the amount of protrusion is large, chattering is likely to occur. Please adjust the rotation speed, feed speed, and depth of cut.
6. Please use a suitable fluid with high smoke retardant properties.
7. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
8. Please use water-soluble coolant when machining stainless steel, cobalt-chromium alloy, titanium alloy, and Ni-based alloy.
9. Tool runout should be kept to a minimum for maximum accuracy.
10. When the cutting load fluctuates in areas such as the corners, please reduce the rotational speed.

EXOCARB® VU-TBR

The OSG EXOCARB® VU-TBR series variant shape finishing tools with a large radius configuration, are designed for high machining efficiency and superior machined surface quality. The tapered barrel type end mill is engineered with a large peripheral edge R and multi-flute specification to allow higher processing efficiency.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/vu-tbr



List Numbers

3785 - EXOCARB® VU-TBR (mm)

Size Range

6mm-16mm

Primary Applications

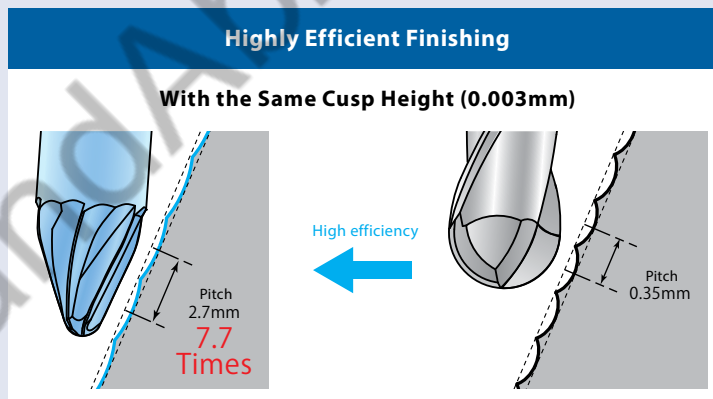
- Ideal for 3D finishing operations where precision and surface finish are critical.
- Where high efficiency is needed.
- 5-Axis machine applications.

Features & Product Solutions

Increased Milling Efficiency

Large Peripheral Edge Radius and Multi-Flute Configuration

The large peripheral edge R allows the cusp height to be kept at a minimal level even when the pitch is increased.



Reduced Machining Time Compared to Ball Nose End Mills

Increased Step Over

Improves Surface Finish

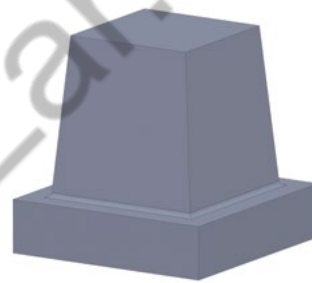
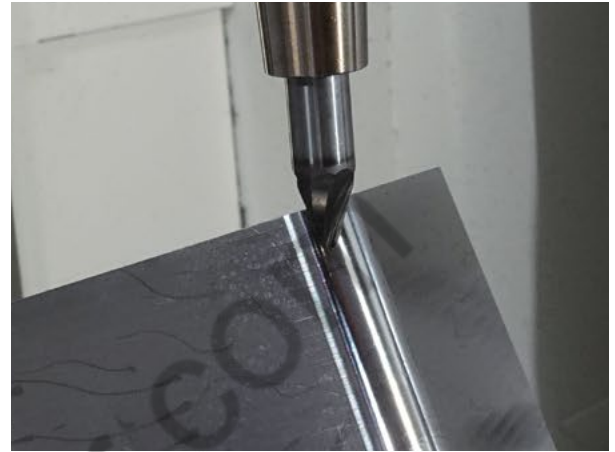
Reduced Cusp Height

VU-TBR Cutting Data

High Efficiency 5-Axis Machining On Vertical Slope

By increasing the pitch with a large radius and increasing the feed rate, approximately 10 times the efficiency is achieved.

Tool	VU-TBR	Conventional Ball End Mill
Size	R1.5 x R300 x 20°	R5
No. of Flutes	4	2
Work Material	NAK80 (40 HRC)	
Cutting Speed	765 SFM (11937 RPM)	925 SFM (9549 RPM)
Feed	37.6 IPM (0.0008 in/t)	30.1 IPM (0.0016 in/t)
Pitch	0.1063 in	0.0134 in
Depth of Cut	0.0118 in	0.0118 in
Cusp Height	0.0001 in	
Overhang	1.378 in	
Surface Roughness	Ra = 0.12 µm Rz = 1.39 µm	Ra = 0.61 µm Rz = 2.59 µm
Coolant	Air	
Machine	5-Axis MC	



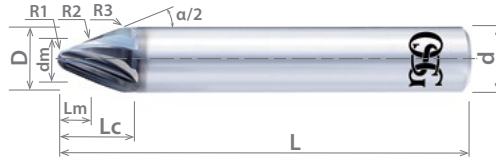
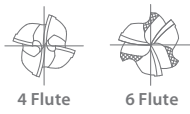
BavandAbzar.com

EXOCARB® VU-TBR

Taper Barrel End Mill for Finishing

List 3785

VU-TBR, Multiple Flute, Taper Barrel



NEW	SPEED FEED P197	CARBIDE	WXL		15°	SHANK h5	SHRINK FIT
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Form Tolerance	
6 ≤ D ≤ 16	+0.010mm / -0.010mm

Units: mm

EDP	Tilt Angle	Mill Diameter	Tip Radius	Peripheral Edge Radius	Edge Radius	Length to Center of Radius	Diameter at Center of Radius	Overall Length	Length of Cut	Shank Diameter	No. of Flutes	Status
	$\alpha/2$	D	R1	R2	R3	Lm	dm	L	Lc	d		
8549544	20°	6	0.5	150	5	3.43	3.27	50	8.2	6	4	●
8549545	20°	8	1	150	5	4.48	4.78	60	9.9	8	4	●
8549546	20°	10	1.5	300	5	5.52	6.2	70	11.7	10	4	●
8549547	20°	12	2	300	5	6.57	7.7	80	13.5	12	6	●
8549548	20°	16	2.5	500	5	8.99	10.18	100	18	16	6	●
8549549	20°	16	3	500	5	8.67	10.62	100	17.1	16	6	●

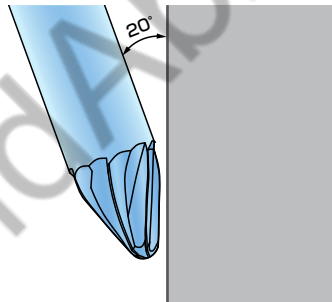
Packed: 1 pc. Available WXL coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



Note: When using the peripheral edge R (R2), set the tilt angle ($\alpha/2$) to 20°.



Work Material																	
List No.	P					M			K	N		S	H				
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels ≤200HB			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
3785	○	○	○	○	○								○	○	○	○	

○ good ○ best



List 3785: EXOCARB VU-TBR: Taper Barrel, Multiple Flute

Hardness	< 30 HRC			30 - 45 HRC			45 - 55 HRC		
Work Material	Carbon Steel Alloy Steel			Hardened Steel Prehardened Steel			Hardened Steel Prehardened Steel		
Cutting Speed	360 SFM			300 SFM			230 SFM		
Depth of Cut	Aa = 0.012"			Aa = 0.012"			Aa = 0.012"		
Mill Dia.	Speed RPM	Feed in/min	Pitch	Speed RPM	Feed in/min	Pitch	Speed RPM	Feed in/min	Pitch
6 (R0.5 x R150 x 20°)	10700	133.9	Based on cusp height (See chart below)	8800	98.5	Based on cusp height (See chart below)	6800	63	Based on cusp height (See chart below)
8 (R1 x R150 x 20°)	7300	90.6		6000	67		4700	43.4	
10 (R1.5 x R300 x 20°)	5600	70.9		4600	51.2		3600	35.5	
12 (R2 x R300 x 20°)	4500	86.7		3700	63		2900	39.4	
16 (R2.5 x R500 x 20°)	3400	63.0		2800	47.3		2200	31.5	
16 (R3 x R500 x 20°)	3300	63.0		2700	43.4		2100	31.5	

- This chart should be used when machining with the Peripheral Edge Radius, R2.
- Use a rigid and precise machine and holder.
- Use a coolant with low air-blow or fuming property according to the work material. MQL (oil mist coolant) is recommended for cutting hardened steels.
- Using Peripheral Edge Radius (R2)" is the guide to use the intermediate position of peripheral edge radius. Please adjust the rotation speed, feed rate and cutting pitch based on the cutting shape, machine rigidity, workpiece and holding conditions.
- When chattering, vibration or abnormal cutting noise occurs, please adjust the rotation speed, feed rate and cutting pitch.
- In order to change the rotation speed, both the rotation speed and the feed rate should be changed at the same ratio.

Hardness	< 30 HRC			30 - 45 HRC			45 - 55 HRC		
Work Material	Carbon Steel Alloy Steel			Hardened Steel Prehardened Steel			Hardened Steel Prehardened Steel		
Cutting Speed	660 SFM			525 SFM			460 SFM		
Depth of Cut	D=6 Aa = 0.004" D=8 Aa = 0.008" D=10 Aa = 0.010" D≥12 Aa = 0.012"			D=6 Aa = 0.004" D=8 Aa = 0.008" D=10 Aa = 0.010" D≥12 Aa = 0.012"			D=6 Aa = 0.004" D=8 Aa = 0.008" D=10 Aa = 0.010" D≥12 Aa = 0.012"		
Mill Dia.	Speed RPM	Feed in/min	Pitch	Speed RPM	Feed in/min	Pitch	Speed RPM	Feed in/min	Pitch
6 (R0.5 x R150 x 20°)	19500	244.1	Based on cusp height (See chart below)	15600	173.3	Based on cusp height (See chart below)	13600	130.0	Based on cusp height (See chart below)
8 (R1 x R150 x 20°)	13300	169.3		10700	118.2		9300	86.7	
10 (R1.5 x R300 x 20°)	10300	130.0		8200	90.6		7200	67.0	
12 (R2 x R300 x 20°)	8300	157.5		6600	110.3		5800	82.7	
16 (R2.5 x R500 x 20°)	6300	118.2		5000	82.7		4400	63.0	
16 (R3 x R500 x 20°)	6000	114.2		4800	78.8		4200	59.1	

- This chart should be used when machining with the Tip Radius, R1.
- Use a rigid and precise machine and holder.
- Use a coolant with low air-blow or fuming property according to the work material. MQL (oil mist coolant) is recommended for cutting hardened steels.
- Using Tip Radius (R1)" is the guide to use the tip radius. Please adjust the rotation speed, feed rate and cutting pitch based on the cutting shape, machine rigidity, workpiece and holding conditions.
- When chattering, vibration or abnormal cutting noise occurs, please adjust the rotation speed, feed rate and cutting pitch.
- In order to change the rotation speed, both the rotation speed and the feed rate should be changed at the same ratio.



PHOENIX® PFB

PHOENIX® PFB is a series of high precision indexable finish ballnose end mills for superior surface finish and tool life.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/pfb



List Numbers

78014 - PHOENIX® PFB SS (mm)
 78114 - PHOENIX® PFB SF (mm)
 78PFB - PHOENIX® PFB Inserts (mm)
 7808H - PHOENIX® PFB Accessories

Size Range

8mm-32mm
 10mm-30mm
 10mm-32mm

Primary Applications

- Higher milling efficiency in 3D contouring by increasing stepover.
- Improved surface quality in finishing by reducing cusp height.
- Longer tool life by reducing the number of cutting passes.

Features & Product Solutions

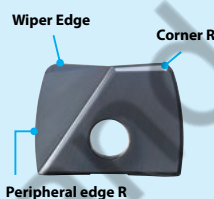
Ball End Mill for Finishing

Barrel and Lens Shape Inserts

Original geometry that enables smooth machined surface and higher cutting efficiency.

PFB-BR

Barrel Type

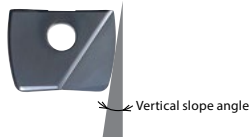


Contour milling of vertical slope

Flat bottom milling

Applicable to vertical slopes up to 17.1° (see table below)

* For 3-axis machining

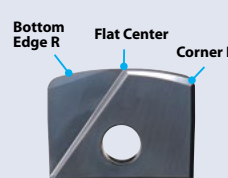


Applicable maximum vertical slope angle

Ø10 (R15)	16.6°
Ø12 (R18)	17.1°
Ø16 (R24)	15.8°
Ø20 (R30)	16.6°
Ø25 (R37.5)	16.6°
Ø32 (R48)	16.7°

PFB-LZ

Lens Type

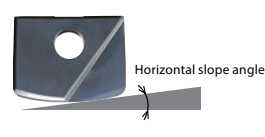


Copy milling of horizontal slope

Copy milling of curved surface

Applicable to horizontal slopes up to 15.7° (see table below)

* For 3-axis machining



Applicable maximum horizontal slope angle

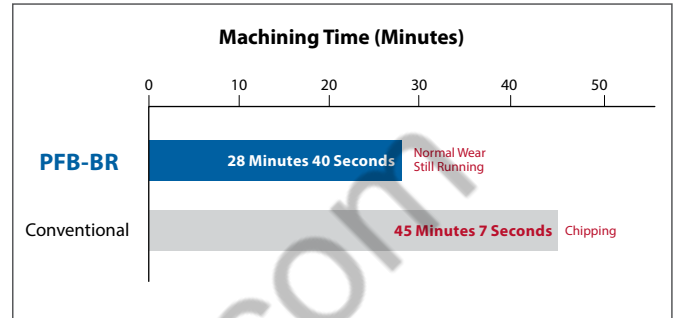
Ø10 (R15)	15°
Ø12 (R18)	15.7°
Ø16 (R24)	14.4°
Ø20 (R30)	14.7°
Ø25 (R37.5)	15.1°
Ø32 (R48)	15.4°

PFB-BR

3-Axis Finishing of Fixed Die by PFB-BR Barrel Tool (DH31S)

The conventional radius type insert needs to be replaced before finishing one workpiece due to small pitch. With the barrel type insert (PFB-BR), because the cutting distance became shorter due to the larger pitch, it was possible to complete cutting one workpiece without replacing the tool. The level of precision was also high enough to eliminate polishing.

Tool	PFB-R200SF10		Ø20 x R3 Conventional Radius Cutter
Insert (Grade)	PFB200R300-BR-ST (XP3225)		
Work Material	DH31S		
Cutting Speed	721 SFM (3510 RPM)		
Feed	38.7 IPM (0.0055 in/t)	68.9 IPM (0.0110 in/t)	
Pitch	0.0315 in	0.0138 in	
Depth of Cut	0.0059 in	0.0059 in	
Overhang Length	3.858 in		
Coolant	Air		
Machining Time	28m 40s	45m 7s	
Cusp Height	0.00008 in	0.0002 in	
Machine	HMC		



Finished Surface by PFB-BR



The machined surface quality was so superior that a clear reflection can be seen.

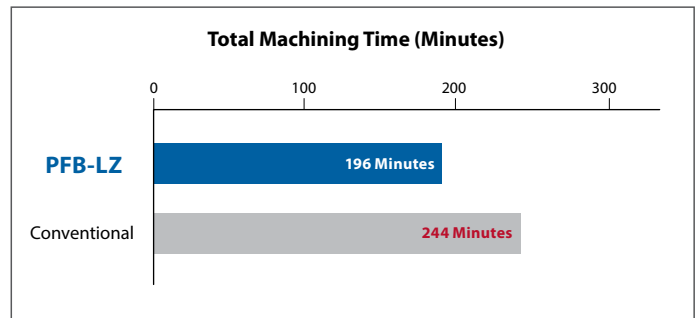
PFB-BR	Conventional
Wear: 0.011mm	Wear: 0.046mm
Wear: 0.014mm	Wear: 0.088mm

PFB-LZ

5-Axis Finishing of Blade by PFB-LZ Lens Tool (430 Stainless Steel)

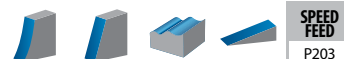
By using PFB-LZ R30 to make the pitch larger, machining time is shortened.

Tool	PFB-R200SF10		R20 Competitor Lens Tool
Insert (Grade)	PFB200R300-LZ-ST (XP3225)		
Work Material	430 Stainless Steel		
Cutting Speed	1640 SFM (7961 RPM)		
Feed	94.0 IPM (0.0059 in/t)	94.0 IPM (0.0039 in/t)	
Pitch	0.0488 in	0.0398 in	
Cusp Height	0.0079 in	0.0079 in	
Overhang Length	3.543 in		
Coolant	Water-Soluble		
Cusp Height	0.0002 in		
Machining Time	196 m	244 m	
Number of Parts	12		
Machine	Turbine Blade-processing machine		



List 78014

PFB SS (Metric)



Recommended Materials: 203
Accessories & Inserts: p202



Steel Shank



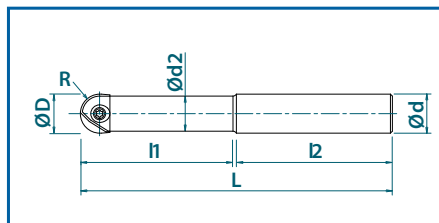
Carbide Shank

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)	Status
			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	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	●
7801407	PFB-R320SS32-S180	32	16	180	96	3	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	2	6	70	5.4	●
7801440		PFB-R080SS08-L120CS	8	4	120	40	5	2	8	80	7	●
7801441		PFB-R100SS10-L130CS	10	5	130	50	5	2	10	80	9	●
7801442		PFB-R120SS12-L140CS	12	6	140	60	5	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	2	25	100	22	●
7801446	PFB-R300SS32-L220CS	30	15	220	120	4	2	32	100	27	●	
7801447	PFB-R320SS32-L230CS	32	16	230	128	4	2	32	102	29	●	
7801419	Cylindrical Shank Extra-Long Carbide	PFB-R060SS06-LL120CS	6	3	120	42	7	2	6	78	5.4	●
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	●	
7801427	PFB-R320SS32-LL300CS	32	16	300	176	5.5	2	32	124	29	●	

Packed: 1 pc.

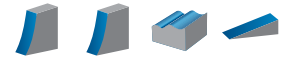
● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



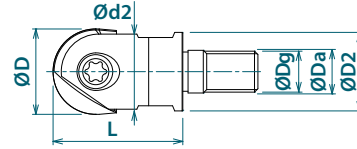
List 78114

PFB SF (Metric)



SPEED FEED
P203

Recommended Materials: 203
Accessories & Inserts: p202



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	Status
			D		Da	Dg		L	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	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	14		▲
7801494		PFB-R250SF12	25	2	12.5	M12	38	22	23	17		▲
7801495		PFB-R300SF16	30	2	17	M16	43	27	28	22		▲

Packed: 1 pc.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



OSG PHOENIX® SF Screw-Fit End Mills

SF Arbor SS
Cylindrical Shank Steel Arbor



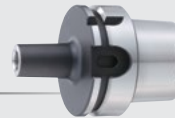
SF Arbor SS
Cylindrical Shank Carbide Arbor



SF Arbor BT
BT30/40 Arbor



SF Arbor HSK
HSK-A63/100 Arbor



Please see OSG Cutting Tool Solutions catalog for details.



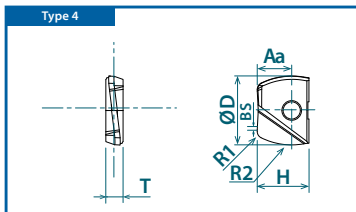
List 78PFB

NEW

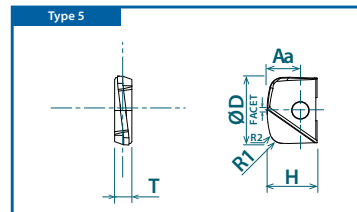
PFB Inserts (mm)



Barrel Type
Type 4



Lens Type
Type 5



Designation	Type	Specification	No. of Cutting Edges	Insert Size							EDP Number		Status	
				D (mm)	R2 (mm)	R1 (mm)	Aa (mm)	BS (mm)	FACET (mm)	T (mm)	H (mm)	XP3225		XP3310
PFB100R150-BR-ST	4	Multi-Purpose Type	2	10	15	1	5	0.3	-	2.6	8.5	7820071	-	●
PFB120R180-BR-ST				12	18	1	6	0.3	-	3	10	7820072	-	●
PFB160R240-BR-ST				16	24	2	8	0.5	-	4	12	7820073	-	●
PFB200R300-BR-ST				20	30	2	10	0.5	-	5	15	7820074	-	●
PFB250R375-BR-ST				25	37.5	2.5	12.5	0.5	-	6	18.5	7820075	-	●
PFB320R480-BR-ST				32	48	3	16	0.5	-	7	23.5	7820076	-	●
PFB100R150-BR-SH	4	Reinforced Edge Type	2	10	15	1	5	0.3	-	2.6	8.5	-	7820081	●
PFB120R180-BR-SH				12	18	1	6	0.3	-	3	10	-	7820082	●
PFB160R240-BR-SH				16	24	2	8	0.5	-	4	12	-	7820083	●
PFB200R300-BR-SH				20	30	2	10	0.5	-	5	15	-	7820084	●
PFB250R375-BR-SH				25	37.5	2.5	12.5	0.5	-	6	18.5	-	7820085	●
PFB320R480-BR-SH				32	48	3	16	0.5	-	7	23.5	-	7820086	●
PFB100R150-LZ-ST	5	Multi-Purpose Type	2	10	15	1	3.3	-	0.75	2.6	8.5	7820091	-	●
PFB120R180-LZ-ST				12	18	1	4	-	0.75	3	10	7820092	-	●
PFB160R240-LZ-ST				16	24	2	5.3	-	1	4	12	7820093	-	●
PFB200R300-LZ-ST				20	30	2	6.7	-	1.75	5	15	7820094	-	●
PFB250R375-LZ-ST				25	37.5	2.5	8.3	-	1.75	6	18.5	7820095	-	●
PFB320R480-LZ-ST				32	48	3	10.7	-	2	7	23.5	7820096	-	●
PFB100R150-LZ-SH	5	Reinforced Edge Type	2	10	15	1	3.3	-	0.75	2.6	8.5	-	7820101	●
PFB120R180-LZ-SH				12	18	1	4	-	0.75	3	10	-	7820102	●
PFB160R240-LZ-SH				16	24	2	5.3	-	1	4	12	-	7820103	●
PFB200R300-LZ-SH				20	30	2	6.7	-	1.75	5	15	-	7820104	●
PFB250R375-LZ-SH				25	37.5	2.5	8.3	-	1.75	6	18.5	-	7820105	●
PFB320R480-LZ-SH				32	48	3	10.7	-	2	7	23.5	-	7820106	●

Packed: 1 pc

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 7808H

PFB Accessories

Appearance	EDP No.	Designation	Applicable Insert		Recommended Tightening Torque	Status
			(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	●
 Wrench	7808122	FS80624RB (Torx 30)	1.250	30-32	6.0 Nm	●
	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.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.

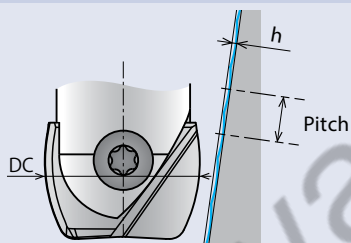


PFB-BR & PFB-LZ Cutting Conditions

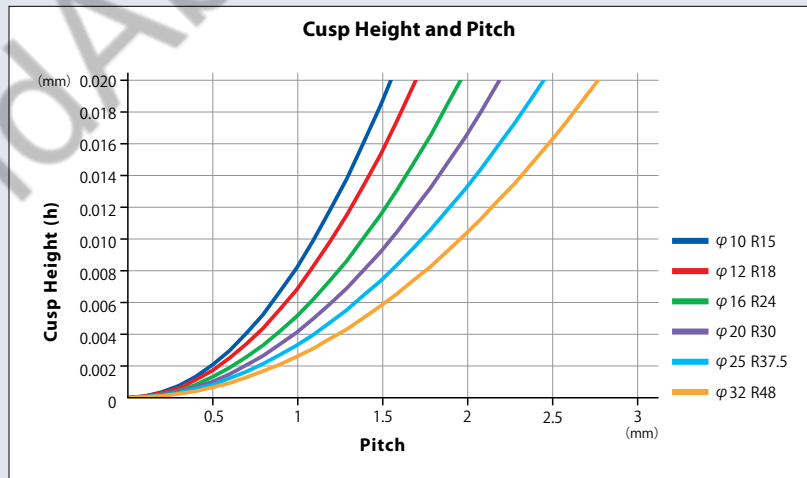
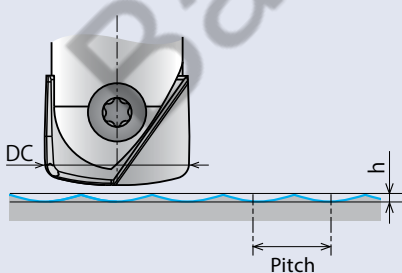
Work Material	Tensile Strength - Hardness	Milling Speed Vc (SFM)	Depth of Cut		Feed Per Tooth fz (in/t)		
			Pitch (mm)	Depth of Cut (in)	Ø10-12mm	Ø16-20mm	Ø25-32mm
P Mild Steels, Carbon Steels (1010, 1018) Carbon Steels, Alloy Steels (1050, 4140) Die Steels (H13, D2)	~180 HB	985 (655 - 2625)	Based on Cusp Height (see chart below)	0.0078	0.0047	0.0055	0.0071
	~280 HB	985 (655 - 2625)		0.0078	0.0039	0.0047	0.0055
	~280 HB	820 (490 - 1970)		0.0078	0.0039	0.0047	0.0055
M Stainless Steels (304SS, 420SS)	~250 HB	820 (490 - 2130)		0.0078	0.0047	0.0055	0.0067
K Cast Iron (FC250) Ductile Cast Iron (60-40-18)	~350 N/mm ²	1310 (985 - 2625)		0.0078	0.0055	0.0071	0.0087
	~600 N/mm ²	985 (655 - 2625)		0.0078	0.0047	0.0055	0.0071
S Heat Resistant Alloys (Inconel 718) Titanium Alloy (Ti-6Al-4V)	-	165 (80 - 260)		0.0059	0.0019	0.0024	0.0024
	-	295 (130 - 395)		0.0078	0.0031	0.0044	0.0051
H Pre-hardened Steel (P20, Stavax) Die Cast Steels (A2, S7) Hardened Steels (D2)	40 - 43 HRC	655 (330 - 1150)		0.0059	0.0027	0.0031	0.0039
	43 - 48 HRC	590 (295 - 1150)		0.0059	0.0024	0.0027	0.0027
	50 - 55 HRC	495 (330 - 985)	0.0039	0.0024	0.0027	0.0027	

Theoretical Cusp Height

PFB-BR
Barrel Type Tool



PFB-LZ
Lens Type Tool



$$h = 0.5 \times (2 \times RE2 - \sqrt{(2 \times RE2)^2 - P^2})$$

h: Cusp Height P: Pitch RE2: Peripheral Edge R

Recommended Materials by Application

Insert Grade	P	M	K	N	S	H
XP3225	⊙	○			○	
XP3310			⊙			⊙

○ good ⊙ best

EXOCARB® WXL

EXOCARB® WXL end mills are the new industry standard for hard milling. Everything about WXL is designed for rigidity and performance in wide variety of materials and a wide variety of milling applications. Substrates, geometry, and proprietary WXL coating are all specifically tailored for nonferrous materials, mild steels, and steels up to 50HRC.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/WXL



List Numbers

Size Range

SQUARE	3604 - EXOCARB® WXL-EMS (Inch)	1/16"-1"
	3704 - EXOCARB® WX-EMS (Metric)	1mm-12mm
	3642 - EXOCARB® WXL-EML (Inch) NEW!	1/16"-5/8"
	3742 - EXOCARB® WXL-EML (Metric)	3mm-26mm
	3619 - EXOCARB® WXL-1.5D-DE (Inch)	1/16"-1/2"
	3620 - EXOCARB® WXL-2D-DE (Inch)	1/16"-3/4"
	3621 - EXOCARB® WXL-3D-DE (Inch)	1/16"-3/4"
	3720 - EXOCARB® WXL-1.5D-DE (Metric)	0.1mm-6mm
	3721 - EXOCARB® WXL-2D-DE (Metric)	0.1mm-20mm
	3722 - EXOCARB® WXL-3D-DE (Metric)	0.1mm-20mm
CR	3723 - EXOCARB® WXL-4D-DE (Metric)	0.2mm-12mm
	3670 - EXOCARB® WXL-CR-EMS (Inch)	1/16"-1"
	3770 - EXOCARB® WXL-CR-EDS (Metric)	0.6mm-12mm
	4445 - EXOCARB® WXL-CR-EHS (Inch)	1/8"-1/2"
Ball	3610 - EXOCARB® WXL-EBD (Inch)	1/32"-1/2"
	3710 - EXOCARB® WXL-EBD (Metric)	0.1mm-20mm
	3711 - EXOCARB® WXL-LS-EBD (Metric)	1mm-18mm
RIB	3690 - EXOCARB® WXL-LN-EBD (Inch)	1/64"-1/4"
	3790 - EXOCARB® WXL-LN-EBD (Metric)	0.1mm-6mm
	3791 - EXOCARB® WXL-LN-EDS (Metric)	0.2mm-5mm
	3794 - EXOCARB® WXL-LN-EMS (Metric)	1mm-3mm
	3712 - EXOCARB® WXL-PC-EBD (Metric)	0.2mm-6mm

Primary Applications

- Ideally suited for Hardened steel < 50 HRC.
- Use in combination with High Speed Machining Techniques to optimize performance.
- High Performance End Mills for Dental Applications in PMMA, PEEK, WAX and Metal.

Features & Product Solutions

Incredible Wear Resistance

Ultra-Fine Micrograin Carbide

The hardest most wear resistant carbide possible for incredible wear resistance.

High Accuracy

High Precision Geometry

High accuracy all but eliminates need for benching and rework for mold makers.

Ultimate Strength and Rigidity

High Strength Core Diameter

Tools utilize thicker core diameters for the ultimate in strength and rigidity.

+1100 Celsius Oxidation Temp. & +3100Hv in hardness

WXL coating

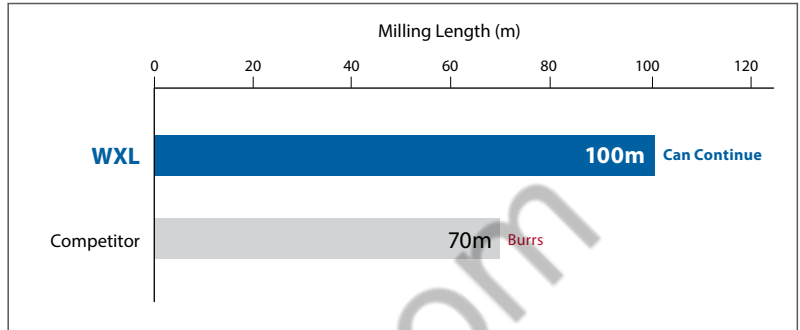
Higher coating oxidation temp & hardness dramatically improve wear resistance.

Stable Milling and Long Tool Life

Milling in Steel (SS400)

WXL's coating allowed for stable milling at high speeds with emulsion coolant, thus prolonging tool life and reducing tool usage by 25%.

Tool	WXL-2D-DE	Competitor
Tool Size	Ø0.5	
Work Material	SS400	
Milling Method	Slotting	
Cutting Speed	98 SFM (20,000 RPM)	
Feed Rate	23.6 IPM (0.0006 in/t)	
Depth of Cut	Aa=0.001" • Ar=0.020"	
Coolant	Water Soluble	
Machine	Vertical Machining Center	



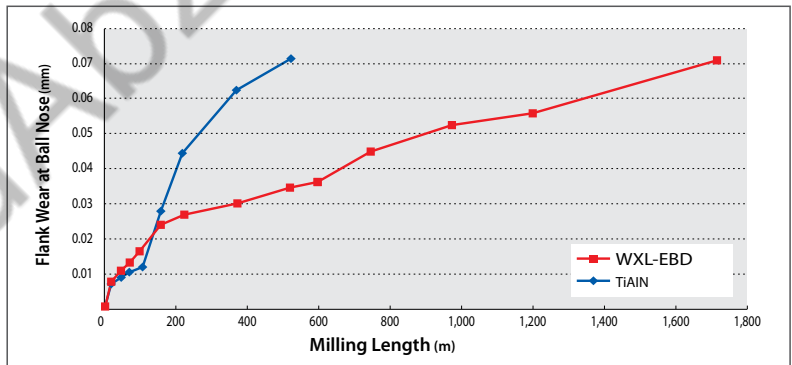
The competitor tool created burrs after milling 70 meters. The tool had to be replaced almost every two hours. The WXL-2D-DE, on the other hand, did not create burrs even after milling 100 meters, and was in good enough condition to continue milling.

Durability in Many Materials

Milling in Copper (C1100)

The WXL series is capable of performing in a wide range of materials. In copper, its durability is 3 times greater than TiAlN-coated tools.

Tool	WXL-EBD	Competitor
Tool Size	R3x12	
Work Material	C1100	
Milling Method	Pick Milling	
Cutting Speed	803 SFM (13,000 RPM)	
Feed Rate	153.5 IPM (0.006 in/t)	
Depth of Cut	Aa=0.012" • Ar=0.024"	
Coolant	Water Soluble	
Machine	Vertical Machining Center	

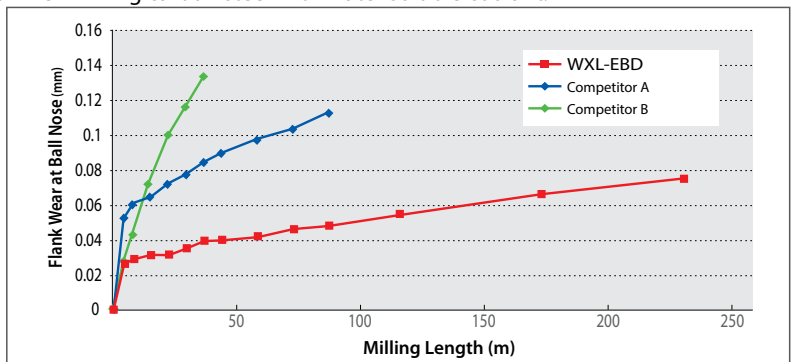


Superior Durability in Wet Applications

Milling in Carbon Steel (1050)

The WXL exhibited 3 times the durability of the competitors when milling carbon steel with water soluble coolant.

Tool	WXL-EBD	Competitors
Tool Size	R3 x 12	
Work Material	1050 Carbon Steel	
Milling Method	Pick Milling	
Cutting Speed	655 SFM (10,600 RPM)	
Feed Rate	101.2 IPM (0.005 in/t)	
Depth of Cut	Aa=0.012" • Ar=0.024"	
Coolant	Water Soluble	
Machine	Vertical Machining Center	



EXOCARB® WXL-EML

Premium Performance Carbide End Mills with OSG's Proprietary WXL® Coating

List 3642

WXL-EML, 4 Flute, Long Length



SPEED FEED P207	CARBIDE	WXL	LONG	30°	SHANK h6
--------------------	---------	-----	------	-----	-------------

Milling Diameter Tolerance	
1/16 ≤ D ≤ 1/2	0 / -0.0008"
1/2 < D ≤ 5/8	0 / -0.0012"

Units: Inch

EDP Number	Mill Diameter	Overall Length	Length of Cut	Shank Diameter	Status
	D	L	Lc	d	
36420012	1/16	1 1/2	1/4	1/8	●
36420112	5/64	1 1/2	5/16	1/8	○
36420212	3/32	1 1/2	1/2	1/8	○
36420312	7/64	1 1/2	1/2	1/8	○
36420412	1/8	1 1/2	5/8	1/8	●
36420512	5/32	2	11/16	3/16	●
36420612	3/16	2	3/4	3/16	●
36420712	7/32	2 1/2	7/8	1/4	●
36420812	1/4	2 1/2	1	1/4	●
36420912	5/16	3	1 1/8	5/16	●
36421012	3/8	4	1 3/8	3/8	●
36421112	1/2	4	1 5/8	1/2	●
36421212	5/8	5	2	5/8	●

Packed: 1 pc. Available WXL® coating only.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzar.com

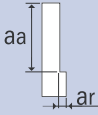
List No.	Work Material																
	P					M			K	N		S		H			
	Carbon Steels			Alloy Steels	Die Steels	Stainless Steels			Cast Iron	Aluminum		Nickel Alloy	Titanium	Hardened Steels			
	Low	Med.	High			300	400	17-4 PH		6061 7075	Casting			Inconel	6Al4V (30 HRC)	~35 HRC	35-45 HRC
3642	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

○ good ○ best



List 3642 - EXOCARB® WXL®: 4 Flute, Square End, Long Length

Side Milling

Hardness	Up to 20 HRC		20 to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		
Work Material	Mild Steel Carbon Steels Cast Iron		Alloy Steels Tool Steels		Hardened Steels Pre-hardened Steels		Hardened Steels Pre-hardened Steels		Hardened Steels		
Cutting Speed	200 SFM		160 SFM		130 SFM		110 SFM		80 SFM		
Depth of Cut	Dia.		aa	ar			Dia.		aa	ar	
	D≤20	20<D	2.5D	0.05D			D≤8	8<D	1D	1D	0.01D
Mill Dia.		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
Inch	mm										
1/16	-	11,900	8.8	10,000	7.5	7,930	5.9	6,990	0.0	3,960	2.9
5/64	-	9,520	8.8	8,000	7.5	6,350	5.9	5,590	0.0	3,170	2.9
3/32	-	7,930	8.8	6,670	7.5	5,290	5.9	4,660	0.0	2,640	2.9
7/64	-	6,800	8.8	5,710	7.5	4,530	5.9	3,990	0.0	2,260	2.9
-	3.0	6,350	8.9	5,300	7.5	4,200	5.9	3,700	5.2	2,100	2.9
1/8	-	5,950	8.8	5,000	7.5	3,960	5.9	3,490	0.0	1,980	2.9
-	3.5	5,450	8.9	4,540	7.5	3,590	5.9	3,170	5.2	1,790	2.9
5/32	-	4,760	8.8	4,000	7.5	3,170	5.9	2,790	0.0	1,580	2.9
-	4.0	4,750	8.9	3,950	7.5	3,150	5.9	2,750	5.2	1,550	2.9
-	4.5	4,240	8.9	3,530	7.5	2,790	5.9	2,460	5.2	1,390	2.9
3/16	-	3,960	8.8	3,330	7.5	2,640	5.9	2,330	0.0	1,320	2.9
-	5.0	3,800	8.9	3,150	7.5	2,500	5.9	2,200	5.2	1,250	2.9
-	5.5	3,470	8.9	2,890	7.5	2,290	5.9	2,010	5.2	1,140	2.9
7/32	-	3,400	8.8	2,850	7.5	2,260	5.9	2,000	0.0	1,130	2.9
-	6.0	3,150	8.8	2,650	7.5	2,100	5.9	1,850	5.2	1,050	3.0
1/4	-	2,970	8.8	2,500	7.5	1,980	5.9	1,750	0.0	990	3.0
-	6.5	2,930	8.9	2,440	7.5	1,930	5.9	1,700	5.2	960	3.0
-	7.0	2,720	8.9	2,270	7.5	1,790	5.9	1,580	5.2	890	3.0
-	7.5	2,540	8.9	2,110	7.5	1,670	5.9	1,470	5.2	830	3.0
5/16	-	2,380	8.8	2,000	7.5	1,580	5.9	1,400	0.0	790	3.0
-	8.0	2,350	8.8	1,950	7.5	1,550	5.9	1,350	5.1	995	3.8
-	8.5	2,240	8.9	1,870	7.5	1,480	5.9	1,300	5.2	740	3.8
-	9.0	2,120	8.9	1,760	7.5	1,390	5.9	1,230	5.2	690	3.8
-	9.5	2,010	8.9	1,670	7.5	1,320	5.9	1,160	5.2	660	3.8
3/8	-	1,980	8.8	1,660	7.5	1,320	5.9	1,160	0.0	660	3.8
-	10.0	1,900	8.9	1,550	7.5	1,250	5.9	1,100	5.2	795	3.7
-	10.5	1,810	8.9	1,510	7.5	1,190	5.9	1,050	5.2	590	3.7
-	11.0	1,730	8.9	1,440	7.5	1,140	5.9	1,000	5.2	570	3.7
-	11.5	1,660	8.9	1,380	7.5	1,090	5.9	960	5.2	540	3.7
-	12.0	1,550	8.7	1,300	7.5	1,050	6.0	925	5.3	660	3.8
1/2	-	1,480	8.8	1,250	7.5	990	6.0	870	0.0	490	3.8
-	13.0	1,460	8.8	1,220	7.5	960	6.0	850	5.2	480	3.8
-	14.0	1,350	8.8	1,100	7.5	905	6.0	795	5.2	565	3.7
-	15.0	1,270	8.9	1,050	7.5	830	6.0	730	5.2	410	3.7
5/8	-	1,190	8.8	1,000	7.5	790	6.0	700	0.0	390	3.7
-	16.0	1,150	8.6	995	7.5	795	6.2	695	5.4	495	3.8
-	18.0	1,050	8.8	880	7.5	705	6.0	615	5.2	440	3.7
-	20.0	955	8.9	795	7.5	635	5.9	555	5.2	395	3.7
-	23.0	830	8.9	690	7.5	540	5.9	480	5.2	270	3.7
-	24.0	795	8.7	660	7.1	530	5.8	460	5.0	330	3.6
-	25.0	760	8.3	635	6.7	505	5.5	445	4.9	315	3.4
-	26.0	730	7.9	610	6.3	480	5.2	420	4.6	240	3.1

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously,
3. Use a suitable cutting fluid with high smoke retardant.

PHOENIX® PMD

PHOENIX® PMD is a versatile series of indexable end mills for multiple applications, including milling, drilling & plunging, with a single tool.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/phoenix-pmd-sf-metric



List Numbers

53400 - PHOENIX® PMD (Inch)
 78234 - PHOENIX® PMD (mm)
 52606 - PHOENIX® PMD SF (Inch)
 78334 - PHOENIX® PMD SF (mm)
 78PZAG - PHOENIX® PMD Inserts
 78PSE - PHOENIX® PMD Inserts

Size Range

1"-1.25"
 20mm-32mm
 1"-1.25"
 20mm-32mm

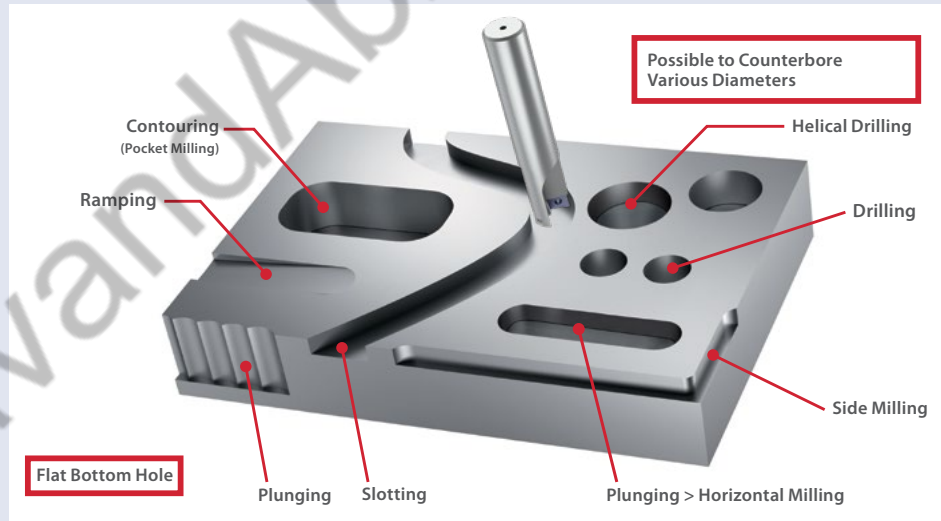
Primary Applications

- Milling & drilling/plunging with a single indexable tool.
- Flexible tooling solution for smaller MC's with limited tool magazines.

Features & Product Solutions

Supports a Wide Range of Applications with a Single Tool

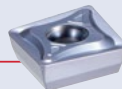
Versatile Design



Continuous Cutting from Plunging to Horizontal Milling

Two Types of Inserts

Inserts for Drilling and Plunging Edge



Superior chip breaking capability for stable machining without chip trouble. Uses the same insert as the PZAG counterboring cutter.

Inserts for Peripheral Cutting Edge



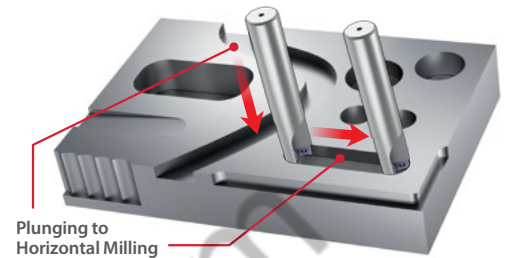
High rigidity and sharp cutting edge ensure stable long tool life without chattering. Uses the same insert as the PSE shoulder cutter.

Plunging & Slotting

1050 Carbon Steel

Excellent milling surface finish without chattering.

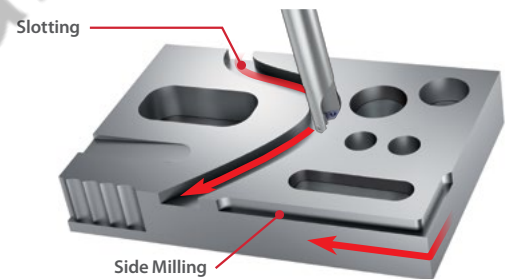
Tool	PMD11R025SS25-1S	
Insert (grade)	ZPNT130508EN (XP8030) ZDKT11T308SR-GM (XC3030)	
Operation	Plunging	Slotting
Work Material	1050 Carbon Steel	
Cutting Speed	1274 RPM (330 SFM)	
Feed	4.0 IPM (0.003 in/rev)	8.0 IPM (0.006 in/rev)
Depth of Cut	Aa = 0.275", Ar = 0.984"	
Coolant	Air	
Machine	VMC	



Slotting & Side Milling

1050 Carbon Steel

Tool	PMD11R025SS25-1S	
Insert (grade)	ZPNT130508EN (XP8030) ZDKT11T308SR-GM (XC3030)	
Operation	Slotting	Side Milling
Work Material	1050 Carbon Steel	
Cutting Speed	1910 RPM (492 SFM)	
Feed	15.0 IPM (0.008 in/rev)	
Depth of Cut	Aa = 0.275", Ar = 0.984"	Aa = 0.393", Ar = 0.098"
Coolant	Air	
Machine	VMC	



Helical Drilling & Ramping

1050 Carbon Steel

No burrs at the hole entry and no uncut material in the center of the hole after processing.

Tool	PMD11R025SS25-1S	
Insert (grade)	ZPNT130508EN (XP8030) ZDKT11T308SR-GM (XC3030)	
Operation	Helical Drilling	Ramping
Processing Angle	2.5°	3°
Work Material	1050 Carbon Steel	
Cutting Speed	1910 RPM (492 SFM)	
Feed	4.2 IPM (0.006 in/rev)	11.3 IPM (0.006 in/rev)
Depth of Cut	Aa = 0.984"	Aa = 0.275"
Coolant	Air	
Machine	VMC	



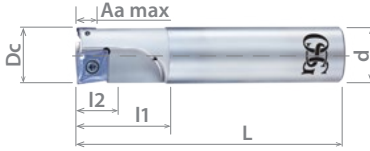
List 53400

NEW



PMD SA (Inch)

Recommended Materials: p215
Accessories & Inserts: p212-213



EDP No.	Body Type	Teeth Type	Designation	Tool Dia. (inch)	No. of Flutes	No. of Teeth	Shank Dia. (inch)	Overall Length (inch)	Neck Length (inch)	Effective Depth (inch)	Max Depth of Cut (inch)	Center Insert	Peripheral Insert	Status
				D			d	L	I1	I2	Aa max			
5340001	Cylindrical Shank Short	Normal	PMD11R100SA100-1S	1.000	2	1	1.000	5.500	1.750	1.000	0.393	ZPNT13	ZDKT11	●
5340002	Cylindrical Shank Short		PMD11R125SA125-1S	1.250	2	1	1.250	6.000	2.000	1.250	0.393	ZPNT17		●
5340004	Cylindrical Shank Long		PMD11R100SA100-1L	1.000	2	1	1.000	8.000	4.000	1.000	0.393	ZPNT13		●
5340005	Cylindrical Shank Long		PMD11R125SA125-1L	1.250	2	1	1.250	9.000	5.000	1.250	0.393	ZPNT17		●

Packed: 1 pc.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



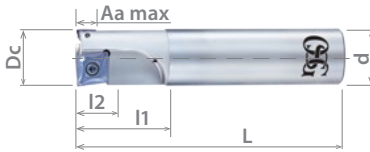
List 78234

NEW



PMD SS (Metric)

Recommended Materials: p215
Accessories & Inserts: p212-213



EDP No.	Body Type	Teeth Type	Designation	Tool Dia. (mm)	No. of Flutes	No. of Teeth	Shank Dia. (mm)	Overall Length (mm)	Neck Length (mm)	Effective Depth (mm)	Max Depth of Cut (mm)	Center Insert	Peripheral Insert	Status
				D			d	L	I1	I2	Aa max			
7803410	Cylindrical Shank Short	Normal	PMD11R020SS020-1S	20	2	1	20	130	35	20	10	ZPNT10	ZDKT11	▲
7803411			PMD11R025SS025-1S	25	2	1	25	140	45	25	10	ZPNT13		▲
7803412			PMD11R032SS032-1S	32	2	1	32	150	50	28	10	ZPNT17		▲
7803413	Cylindrical Shank Long	Normal	PMD11R020SS020-1L	20	2	1	20	185	60	20	10	ZPNT10	ZDKT11	▲
7803414			PMD11R025SS025-1L	25	2	1	25	220	75	25	10	ZPNT13		▲
7803415			PMD11R032SS032-1L	32	2	1	32	230	90	28	10	ZPNT17		▲

Packed: 1 pc.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.

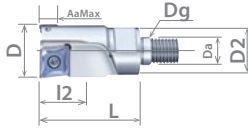


List 52606

PMD ASF (Inch)



Recommended Materials: p215
Accessories & Inserts: p212-213
SF Arbors: p1461 of Cutting Tool Solutions 2020 catalog



EDP No.	Body Type	Designation	Tool Dia. (inch)	No. of Flutes	No. of Teeth	Pilot Dia. (mm)	Thread Dia. (mm)	Overall Length (inch)	Effective Depth (inch)	Flange Dia. (inch)	Max Depth of Cut (inch)	Wrench Size	Center Insert	Peripheral Insert	Status
			D			Da	Dg	L	I2	D2	Aa Max				
52606001	Screw Fit Head	PMD11R100ASF12-1	1.000	2	1	0.492	M12	1.890	1.000	0.905	0.393	17	ZPNT13	ZDKT11	○
52606002		PMD11R125ASF16-1	1.250	2	1	0.669	M16	2.087	1.250	1.102	0.393	22	ZPNT17		○

Packed: 1 pc.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.

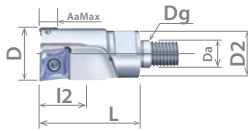


List 78334

PMD SF (Metric)



Recommended Materials: p215
Accessories & Inserts: p212-213
SF Arbors: p1462 of Cutting Tool Solutions 2020 catalog



EDP No.	Body Type	Designation	Tool Dia. (mm)	No. of Flutes	No. of Teeth	Pilot Dia. (mm)	Thread Dia. (mm)	Overall Length (mm)	Effective Depth (mm)	Flange Dia. (mm)	Max Depth of Cut (mm)	Wrench Size	Center Insert	Peripheral Insert	Status
			D			Da	Dg	L	I2	D2	Aa Max				
7803416	Screw Fit Head	PMD11R020SF10-1	20	2	1	10.5	M10	48	20	18	10	14	ZPNT10	ZDKT11	▲
7803417		PMD11R025SF12-1	25	2	1	12.5	M12	48	25	23	10	17	ZPNT13		▲
7803418		PMD11R032SF16-1	32	2	1	17	M16	58	28	28	10	22	ZPNT17		▲

Packed: 1 pc.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

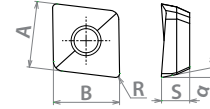
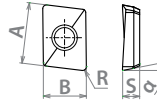
Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 78PZAG

NEW

PZAG Inserts for Drilling & Plunging Edge



Designation	No. of Cutting Edges	Insert Size				EDP Number	Status
		A x B (mm)	S (mm)	α	R (mm)		
ZPNT100408EN	2	10.95 x 10.95	4.65	11°	0.8	XP8030	●
ZPNT130508EN	2	13.92 x 13.92	5.46	11°	0.8	7814110	●
ZPNT170608EN	2	17.85 x 17.85	6.31	11°	0.8	7814111	●

Packed: 10 pcs.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

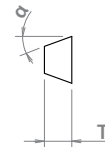
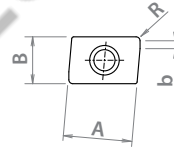
Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.

PXI

List 78PSE

NEW

OSG Phoenix PSE/PSEL Inserts for Peripheral Cutting Edge



Designation	No. of Cutting Edges	Insert Size					EDP Number										Status							
		AxB (mm)	T (mm)	α	R (mm)	b (mm)	CK010	XC3020	XP3025	XC3030	XP3035	XP2025	XP2040	XC1015	XC5035	XC5040		XP6015						
ZDKT11T308FR-NM	2	11x6.8	3.8	15°	0.8	1.4	7811023	-	-	-	-	-	-	-	-	-	-	●						
ZDKT11T308SR-GL							-	7827026	7828026	7825026	7814026	7826026	7813026	-	-	-	-	-	-	-	-	●		
ZDKT11T308SR-GM							-	7827032	7828032	7825032	7814032	7826032	7813032	-	-	-	-	-	-	-	-	-	●	
ZDKT11T308SR-GR							-	7827033	7828033	7825033	7814033	-	7813033	7812033	-	-	-	-	-	-	-	-	●	
ZDKT11T308SR-HR							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7824035	-	●
ZDKT11T308ER-SM							-	-	-	-	-	-	-	-	-	-	-	-	-	7815031	7816031	-	-	●

Packed: 10 pcs.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked


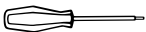
Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.

PXI



List 7808H

PMD Accessories

Appearance	EDP No.	Designation	Applicable Insert	Applicable Cutter		Recommended Tightening Torque	Status
				(mm)	(inch)		
 Clamping Screw	7808107	FS25656PP (M2.5 x 5.6, Torx 8IP)	ZDKT11...	PMD11 Ø20-32	PMD11 Ø1-1.25"	1.6 Nm	●
	7808115	FS35686P (M3.5 x 8.6, Torx 15IP)	ZPNT10...	PMD11 Ø20	n/a	3.2 Nm	●
	7808114	FS45510P (M4.5 x 10, Torx 20IP)	ZPNT13...	PMD11 Ø25	PMD11 Ø1"	5.0 Nm	●
ZPNT17...			PMD11 Ø32	PMD11 Ø1.25"	-	●	
 Wrench	7808225	8IP-D (Torx 8IP)	ZDKT11...	PMD11 Ø20-32	PMD11 Ø1-1.25"	-	●
	7808228	15IP-D (Torx 15IP)	ZPNT10...	PMD11 Ø20	n/a	-	●
	7808229	20IP-D (Torx 20IP)	ZPNT13...	PMD11 Ø25	PMD11 Ø1"	-	●
			ZPNT17...	PMD11 Ø32	PMD11 Ø1.25"	-	●

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

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BavandAbzar.com

Cutting Conditions - For Side Milling & Slotting

Work Material	Tensile Strength - Hardness	Side Milling Aa: 0.393" • Ar: 0.2D		Face Milling Aa: 0.118" • Ar: 1.0xD	
		Cutting Speed Vc (SFM)	Feed per Tooth fz (in/t)	Cutting Speed Vc (SFM)	Feed per Tooth fz (in/t)
P Mild Steels, Carbon Steels (1010, 1018) Carbon Steels, Alloy Steels (1050, 4140) Die Steels (D2, H13)	~180 HB	590 (330 - 820)	0.010 (0.008 - 0.020)	590 (330 - 820)	0.005 (0.002 - 0.008)
	~280 HB	590 (330 - 820)	0.008 (0.006 - 0.016)	590 (330 - 820)	0.004 (0.002 - 0.008)
	~280 HB	495 (260 - 655)	0.008 (0.006 - 0.016)	495 (260 - 655)	0.004 (0.002 - 0.007)
M Stainless Steels (Dry) (304, 420) Stainless Steels (Wet) (304, 420)	~250 HB	495 (260 - 655)	0.007 (0.006 - 0.016)	495 (260 - 655)	0.004 (0.002 - 0.007)
	~250 HB	260 (195 - 395)	0.007 (0.006 - 0.016)	260 (195 - 395)	0.004 (0.002 - 0.007)
K Cast Iron (FC250) Ductile Cast Iron (60-40-18)	~350 N/mm ²	590 (330 - 985)	0.010 (0.006 - 0.020)	590 (330 - 985)	0.005 (0.002 - 0.008)
	~800 N/mm ²	590 (330 - 820)	0.006 (0.004 - 0.016)	590 (330 - 820)	0.005 (0.002 - 0.008)
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)
S Heat Resistant Alloys (Inconel 718) Titanium Alloy (Ti-6Al-4V)	-	115 (85 - 195)	0.006 (0.004 - 0.012)	115 (85 - 195)	0.004 (0.002 - 0.006)
	-	130 (100 - 395)	0.007 (0.004 - 0.014)	130 (100 - 395)	0.004 (0.003 - 0.010)
H Pre-hardened Steel (P20, Stavax) Die Cast Steels (A2, S7) Hardened Steels (D2)	40 - 43 Hrc	330 (130 - 495)	0.007 (0.004 - 0.012)	295 (130 - 495)	0.004 (0.003 - 0.008)
	43 - 48 Hrc	260 (130 - 395)	0.005 (0.003 - 0.008)	230 (130 - 395)	0.003 (0.002 - 0.006)
	50 - 55 Hrc	195 (130 - 295)	0.004 (0.002 - 0.008)	165 (130 - 295)	0.002 (0.002 - 0.004)

1. Above recommended Cutting Speed is for short shank type; for long shank type, use 80% of the Cutting Speed shown in the above table.

Cutting Conditions - For Counterboring & Plunging

Work Material	Tensile Strength - Hardness	Cutting Speed Vc (SFM)	Feed Rate f (in/rev)		
			Ø0.750	Ø1.000	Ø1.250
P Mild Steels, Carbon Steels (1010, 1018) Carbon Steels, Alloy Steels (1050, 4140) Die Steels (D2, H13)	~180 HB	525 (330 - 655)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)
	~280 HB	495 (330 - 655)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)
	~280 HB	395 (265 - 590)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)
M Stainless Steels (304, 420)	~250 HB	425 (265 - 590)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)
K Cast Iron (FC250) Ductile Cast Iron (60-40-18)	~350 N/mm ²	525 (330 - 855)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)
	~800 N/mm ²	525 (330 - 720)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)
N Aluminum Alloys (6061, 7075)	~13% Si	655 (330 - 2625)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)
S Heat Resistant Alloys (Inconel 718) Titanium Alloy (Ti-6Al-4V)	-	165 (100 - 200)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)
	-	195 (100 - 330)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)
H Pre-hardened Steel (P20, Stavax) Die Cast Steels (A2, S7) Hardened Steels (D2)	40 - 43 Hrc	330 (195 - 395)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)
	43 - 48 Hrc	265 (130 - 330)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)
	50 - 55 Hrc	195 (130 - 265)	0.0027 (0.002 - 0.003)	0.003 (0.002 - 0.004)	0.004 (0.003 - 0.005)

1. Above recommended Cutting Speed is for short shank type; for long shank type, use 80% of the Cutting Speed shown in the above table.

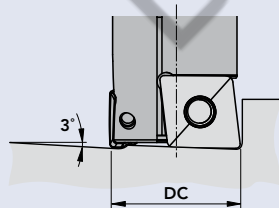
Recommended Materials by Application

Insert Grade	Chip Breaker	Coolant	P	M	K	N	S	H
XP8030	-	Yes	⊙	⊙	○	○	○	○
CK010	NM	Yes				⊙		
XC3020	GL / GM / GR	-	⊙		○			
XP3025	GL / GM / GR	Yes	⊙		○			
XC3030	GL / GM / GR	-	⊙		○			
XP3035	GL / GM / GR	-	⊙	○	○			
		Yes	⊙	○	○			
XP2025	GL / GM	Yes	○	⊙			○	
XP2040	GL / GM	-	○	○				○
		Yes	○	⊙			○	
XC1015	GM / GR	-			⊙			
XC5035	SM	-		⊙				
		Yes		○			○	
XC5040	SM	Yes		○			⊙	
XP6015	HR	-	○		○			⊙

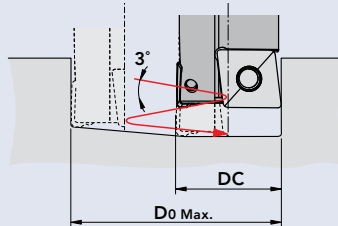
○ good ⊙ best

Maximum Processing Angle During Ramping and Helical Drilling Operations 3°

Ramping



Helical Drilling



Diameter (Inch)	Maximum Helical Milling Diameter (Inch)
Dc	D ₀ Max
0.750	1.381
1.000	1.881
1.250	2.381

Diameter (mm)	Maximum Helical Milling Diameter (mm)
Dc	D ₀ Max
20	37
25	47
32	61

PHOENIX® PSE

PHOENIX® PSE is 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.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/pse



List Numbers

- 78013 - PHOENIX® PSE SA/FA (Inch)
- 78011 - PHOENIX® PSE SS (MM)
- 78012 - PHOENIX® PSE Bore (Inch)
- 78010 - PHOENIX® PSE Bore (mm)
- 52601 - PHOENIX® PSE ASF (Inch)
- 78016 - PHOENIX® PSE SF (mm)
- 78PSE - PHOENIX® PSE Inserts
- 7808H - PHOENIX® PSE Accessories

Size Range

- 0.375"-1.5"
- 10mm-63mm
- 2"-6"
- 40mm-125mm
- 0.375"-1.5"
- 10mm-40mm

Primary Applications

- Any applications where ramping or helical milling is needed or could improve efficiency
- When high quality surface finish is desired in side milling operation
- When performing any shoulder milling operation

Features & Product Solutions

Superior Surface Finishes in Side Milling Applications

Side Cutting Edge Margins

The margin on the side cutting edge of the PSE insert acts like a wiper, enabling superior surface finished in side milling applications.



Efficient Ramping and Helical Milling

Bottom Notch

The notch on the end 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.



Multiple Grades and Chip Breakers for all Materials

Insert Variety

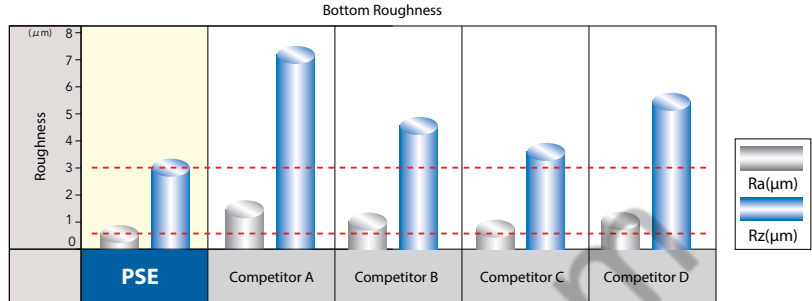
Grade	CK010	XC3020 XP3025 XC3030 XP3035 XP2025 XP2040	XC5035 XC5040	XC3020 XP3025 XC3030 XP3035 XP2025 XP2040 XC1015	XC3020 XP3025 XC3030 XP3035 XP2040 XC1015	XP6015
Chip Breaker	NM	GL	SM	GM	GR	HR
Rake Angle	30°	25°	15°	15°	7°	3°
Application	Aluminum Alloy & Non-Ferrous Metal Machining	Low-Resistance Machining	Superalloy & Difficult-to-Cut Material Machining	Multi-Purpose Machining	Interrupted Machining & Long Overhang Machining	High-Hardened Material

High Precision Insert

Bottom Roughness

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

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

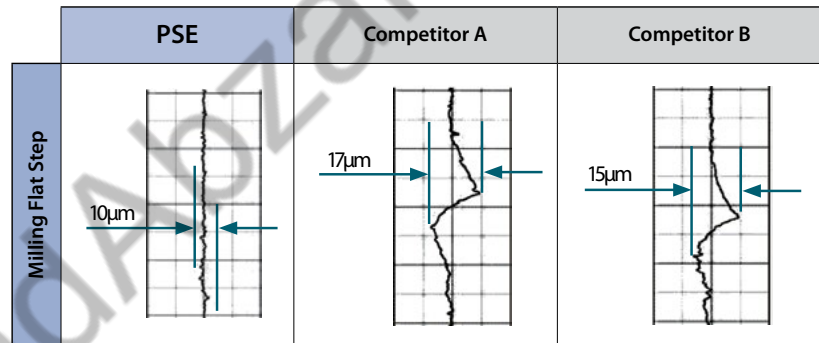


High Precision Insert

Side Milling Offset

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

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

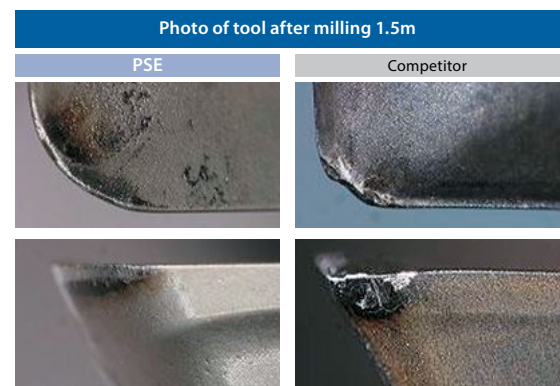


Long Tool Life in Heat Resistant Super Alloys

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	



List 78011 (Continued)

NEW SIZES



SPEED FEED
P228-229

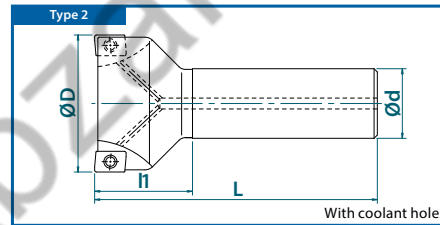
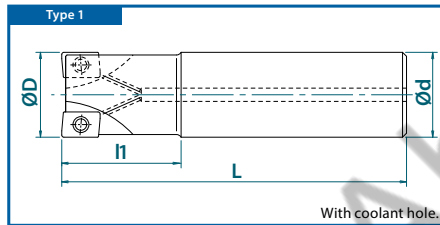
PSE SS (Metric)

EDP No.	Body Type	Teeth Type	Designation	Type	Tool Dia. (mm)	No. of Teeth	Shank Dia. (mm)	Overall Length (mm)	Neck Length (mm)	Applicable Insert	Status
					D		d	L	L1		
7801133	Cylindrical Shank Long	Close	PSE15R025SS25-2L	1	25	2	25	170	70	ZDKT15...	▲
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).

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



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Cutting Conditions


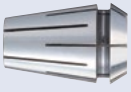

Work Material		Tensile Strength - Hardness	Insert Size			
			ZDKT07...			
			Side Milling Aa: 0.236" • Ar: 0.15D		Face Milling Aa: 0.031" • Ar: 1.0D	
			Milling Speed Vc (SFM)	Feed Per Tooth fz(in/t)	Milling Speed Vc (SFM)	Feed Per Tooth fz(in/t)
P	Mild Steels, Carbon Steels (1010, 1018)	~180 HB	590 (330 - 820)	0.004 (0.001-0.005)	590 (330 - 820)	0.003 (0.001-0.004)
	Carbon Steels, Alloy Steels (1050, 4140)	~280 HB	590 (330 - 820)	0.003 (0.001-0.004)	590 (330 - 820)	0.003 (0.001-0.004)
	Die Steels (H13, D2)	~280 HB	460 (260 - 590)	0.003 (0.001-0.004)	460 (260 - 590)	0.003 (0.001-0.004)
M	Stainless Steels(Dry) (304SS, 420SS)	~250 HB	460 (260 - 590)	0.002 (0.001-0.003)	460 (260 - 590)	0.002 (0.001-0.004)
	Stainless Steels(Wet) (304SS, 420SS)	~250 HB	260 (195 - 330)	0.002 (0.001-0.003)	260 (195 - 330)	0.002 (0.001-0.004)
K	Cast Iron (FC250)	~350 N/mm ²	590 (330 - 985)	0.004 (0.001-0.005)	590 (330 - 985)	0.004 (0.001-0.005)
	Ductile Cast Iron (60-40-18)	~800 N/mm ²	590 (330 - 820)	0.003 (0.001-0.004)	590 (330 - 820)	0.002 (0.001-0.003)
N	Aluminum Alloys (6061, 7075)	~13% Si	985 (655 - 4920)	0.006 (0.001-0.012)	985 (655 - 4920)	0.005 (0.001-0.008)
S	Heat Resistant Alloys (Inconel 718)	-	115 (85 - 195)	0.003 (0.001-0.004)	115 (85 - 195)	0.002 (0.001-0.003)
	Titanium Alloy (Ti-6Al-4V)	-	150 (115 - 230)	0.003 (0.001-0.004)	150 (115 - 230)	0.003 (0.001-0.004)
H	Pre-hardened Steel (P20, Stavax)	40 - 43 HRC	330 (130 - 495)	0.003 (0.001-0.005)	330 (130 - 495)	0.002 (0.001-0.003)
	Die Cast Steels (A2, S7)	43 - 48 HRC	260 (130 - 330)	0.002 (0.001-0.003)	260 (130 - 330)	0.002 (0.001-0.003)
	Hardened Steels (D2)	50 - 55 HRC	195 (130 - 230)	0.002 (0.001-0.003)	195 (130 - 230)	0.002 (0.001-0.003)

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/mm ²	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/mm ²	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)



Illustrated Index

List	Product	Overview	Page	Inch/Metric	Tool Features
9950	SynchroMaster Tap Holders 	234-235	236-237	Inch/Metric	BT30, BT40, HSK40A, HSK63A, ST20D*, ST25D*, and CAT40 Micro Float Tap Holders for rigid tapping (*Straight Shank)
9953	SynchroMaster Collet 	-	238-239	Inch/Metric	ER16 Sealed Collets for coolant-through without sealing disc
9955	SynchroMaster Accessories 	-	240	-	





SynchroMaster

Overview



SynchroMaster

Synchronized Tap Holder Designed to Maximize Performance.



For more information use your phone to scan the QR code to the right and visit: osgtool.com/synchroMaster

List Numbers

- 9950 - SynchroMaster Tap Holder
- 9953 - SynchroMaster Collet
- 9955 - SynchroMaster Accessories

Primary Applications

- Synchronous Tapping
- Preventing breakage and/or unstable tool life
- Large volume production

Features & Product Solutions

Long Tool Life without Maintenance

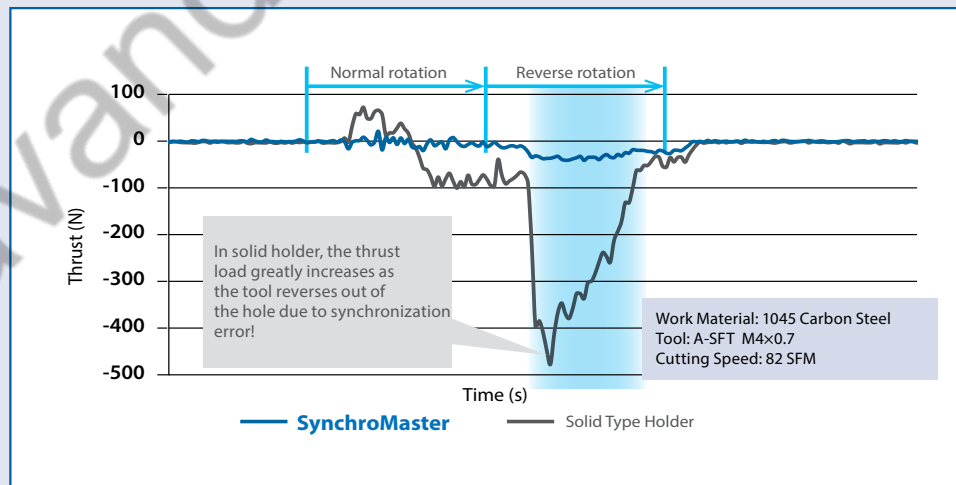
Single Unit Construction & Metal Flexure Mechanism

The **Single Unit Construction** and **Metal Flexure Mechanism** enables long holder tool life without maintenance.

Combined for Maximum Potential

A-Tap + SynchroMaster

SynchroMaster reduces axial and radial forces to enable the A-Tap series to reach their maximum potential.



Machine	Holder	Tap (example)	Recommendation
Machine with synchronous feed mechanism	SynchroMaster	A-TAP (A-SFT,A-POT,S-XPFF)	⊙
		General Purpose Tap	○
		Synchro Tap	-*

*Synchro Tap is recommended to be used in combination with a solid holder and machine with synchronous feed mechanism

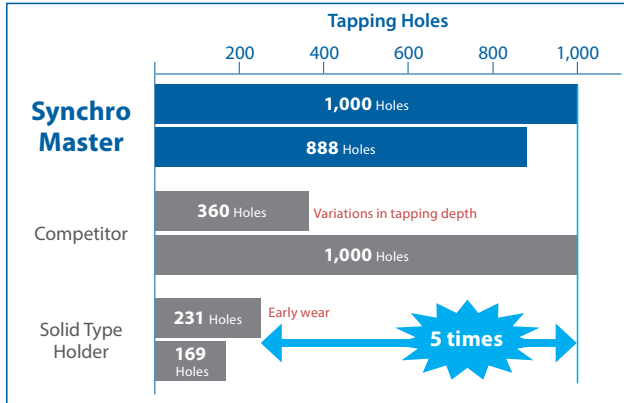
○ good ⊙ best



Long Tool Life

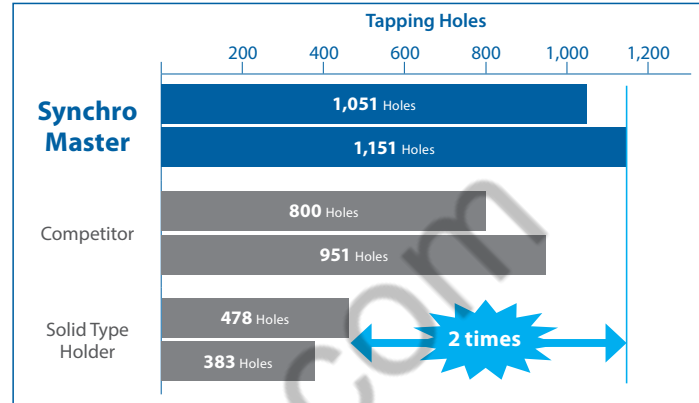
Stable Performance and Improved Durability

Stable performance even with difficult short chamfer



Work Material: 1045 Carbon Steel
 Tool: A-SFT M4x0.7 1P
 Cutting Speed: 33 SFM

Durability of forming taps can also be improved

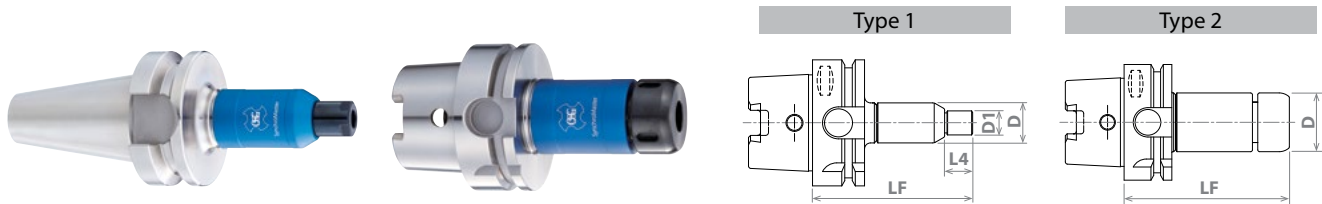


Work Material: 4140 Alloy Steel (30HRC)
 Tool: S-XPf M10x1.5 2P
 Cutting Speed: 50 SFM



List 9950

SynchroMaster Tap Holders



HSK Holders

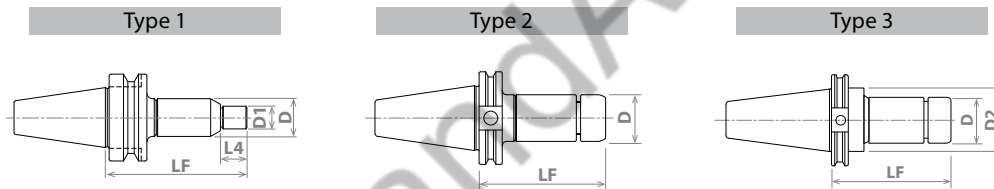
EDP Number	Description	Type	D	D1	LF	L4	Collet Type	Status
76903	HSK63A-SMH8-80	1	20	12	80	14	ER8GHC	●
79912	HSK40A-SMH16-85	2	32	-	85	-	ER16GH ER16GHC	●
79913	HSK63A-SMH16-90	2	32	-	90	-	ER16GH ER16GHC	●
79969	HSK63A-SMH32-108	2	50	-	108	-	ER32GH	●

Packed: 1 pc.

1. The collet and spanner are sold separately. 2. Please use a machine with synchronous feed capability.
* The HSK40A is without manual clamping hole.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



CAT Holders

EDP Number	Description	Type	D	D1	LF	L4	Collet Type	Status
99500003	CAT40-SMH8-80	1	20	12	80	14	ER8GHC	●
79926	CAT40-SMH16-90	2	32	-	90	-	ER16GH ER16GHC	●
99500001	CAT40-SMH32-120	2	50	-	120	-	ER32GH	●
99500002	CAT50-SMH32-120	3	50	69.9	120	-	ER32GH	●

Packed: 1 pc.

1. The collet and spanner are sold separately. 2. Please use a machine with synchronous feed capability.

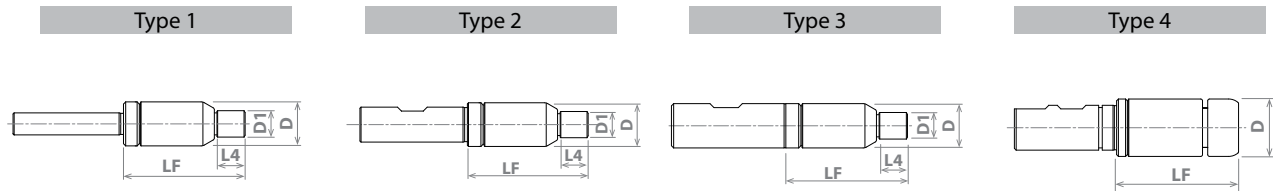
● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

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List 9950 (Continued)

SynchroMaster Tap Holders



Straight Shank Holders

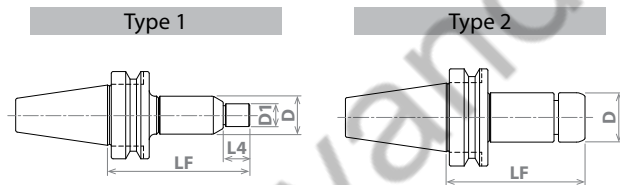
EDP Number	Description	Type	D	D1	LF	L4	Collet Type	Status
99500004	ST10-SMH8-55	1	20	12	55	14	ER8GHC	●
99500005	ST16D-SMH8-55	2	20	12	55	14	ER8GHC	●
76904	ST20D-SMH8-55	3	20	12	55	14	ER8GHC	●
79924	ST20D-SMH16-68	4	32	-	68	-	ER16GH ER16GHC	●
79925	ST25D-SMH16-68	4	32	-	68	-	ER16GH ER16GHC	●

Packed: 1 pc.

1. The collet and spanner are sold separately. 2. Please use a machine with synchronous feed capability.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



BT Holders

EDP Number	Description	Type	D	D1	LF	L4	Collet Type	Status
76900	BT30-SMH8-75	1	20	12	75	14	ER8GHC	▲
76901	BT40-SMH8-80	1	20	12	80	14	ER8GHC	▲
79910	BT30-SMH16-90	2	32	-	90	-	ER16GH ER16GHC	●
79911	BT40-SMH16-90	2	32	-	90	-	ER16GH ER16GHC	●
79967	BT40-SMH32-120	2	50	-	120	-	ER32GH	●

Packed: 1 pc.

1. The collet and spanner are sold separately. 2. Please use a machine with synchronous feed capability.

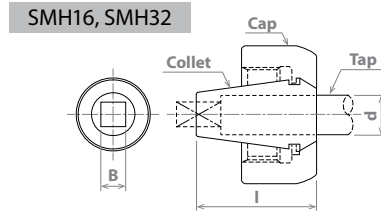
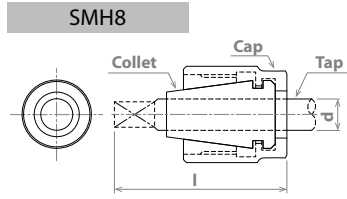
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List 9953

SynchroMaster Collet



For ANSI Shank

Coolant	EDP Number	Description	d	B	I	Tap Size		Holder Type	Standard Tightening Torque	Status
Collet Through or Flow Coolant	99530014	ER8GHC-3.6	0.141"	-	23mm	~ M3	~ No.6	SMH8	5-7Nm	●
	99530015	ER16GHC-0.141	0.141"	0.110"	13.8mm	~ M3	~ No.6	SMH16	30-35Nm	●
	99530011	ER16GHC-0.168	0.168"	0.131"	15mm	M4	No.8	SMH16	30-35Nm	●
	99530012	ER16GHC-0.194	0.194"	0.152"	18mm	M5	No.10	SMH16	30-35Nm	●
	99530013	ER16GHC-0.220	0.220"	0.165"	18mm	-	No.12	SMH16	30-35Nm	●
Center Through or Flow Coolant	79960	ER16GH-0.255	0.255"	0.191"	15mm	M6	1/4	SMH16	30-35Nm	●
	79961	ER16GH-0.318	0.318"	0.238"	18mm	M8	5/16	SMH16	30-35Nm	●
	99530001	ER32GH-0.255	0.255"	0.191"	22mm	M6	1/4	SMH32	100-105Nm	●
	99530002	ER32GH-0.318	0.318"	0.238"	22mm	M8	5/16	SMH32	100-105Nm	●
	99530003	ER32GH-0.381	0.381"	0.286"	25mm	M10	3/8	SMH32	100-105Nm	●
	99530004	ER32GH-0.323	0.323"	0.242"	22mm	-	7/16	SMH32	100-105Nm	●
	99530005	ER32GH-0.367	0.367"	0.275"	22mm	M12	1/2	SMH32	100-105Nm	●
	99530006	ER32GH-0.429	0.429"	0.322"	25mm	M14	9/16	SMH32	100-105Nm	●
	99530007	ER32GH-0.480	0.480"	0.360"	25mm	M16	5/8	SMH32	100-105Nm	●
	99530008	ER32GH-0.542	0.542"	0.406"	25mm	M18	-	SMH32	100-105Nm	●
99530009	ER32GH-0.590	0.590"	0.442"	25mm	-	3/4	SMH32	100-105Nm	●	
99530010	ER32GH-0.652	0.652"	0.489"	25mm	M20	-	SMH32	100-105Nm	●	

Packed: 1 pc.

1. For center-through coolant system, please insert tool all the way to the back of the collet. Coolant leakage may occur if the tool insertion length is too short. 2. Select the appropriate collet after confirming the dimensions of the tap to be used. 3. Confirm the tightening torque with a torque spanner or similar tool.

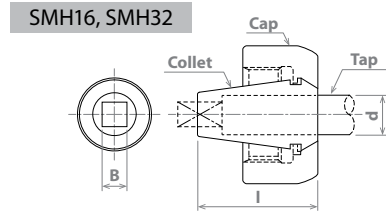
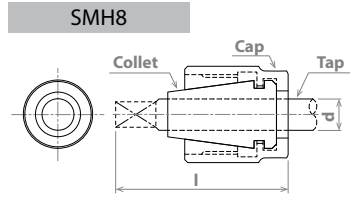
● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.



List 9953 (Continued)

SynchroMaster Collet



For JIS Shank

Coolant	EDP Number	Description	d	B	l	Tap Size	Holder Type	Standard Tightening Torque	Status	
<p>Center Through or Flow Coolant</p>	79917	ER16GH-6-4.5	6mm	4.5mm	18mm	M6	-	SMH16	30-35Nm	●
	79918	ER16GH-6.2-5	6.2mm	5mm	18mm	M8	-	SMH16	30-35Nm	●
	79919	ER16GH-7-5.5	7mm	5.5mm	18mm	M10	-	SMH16	45-50Nm	●
	79920	ER16GH-8-6	8mm	6mm	22mm	"PT1/16, PT1/8"	-	SMH16	45-50Nm	●
	79921	ER16GH-8.5-6.5	8.5mm	5.5mm	22mm	M12	-	SMH16	45-50Nm	●

Packed: 1 pc.

1. For center-through coolant system, please insert tool all the way to the back of the collet. Coolant leakage may occur if the tool insertion length is too short. 2. Select the appropriate collet after confirming the dimensions of the tap to be used. 3. Confirm the tightening torque with a torque spanner or similar tool.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

Stock and availability vary - Please go to osgtool.com or contact customer service to confirm availability.







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List 9955

SynchroMaster Accessories

Appearance	EDP Number	Description	Holder type	Status
 Spanner Wrench	76910	S-8E	SMH8	●
 Spanner Wrench	79923	FKT-32L	SMH16	●
	79993	FKT-50L	SMH32	●
 Nut	76909	ERP-8T	SMH8	●
 Nut	79922	ERP-16T	SMH16	●
	79992	ERP-32T	SMH32	●

Packed: 1 pc.

● Stocked ○ Available Upon Request; Minimum Order Quantity May Apply ▲ Japan Stocked

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