



# CATALOGUE VII

THREADING DRILLING MILLING



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# INTRODUCTION

OSG Corporation is the world's largest manufacturer of round cutting tools. Established in 1938, OSG has a longstanding reputation as a total solution round shank cutting tools provider throughout the manufacturing industry.

OSG holds the No.1 position in the Japanese cutting tool market as well as a top-ranking position globally, with a production, sales and technical network spanning 33 countries.





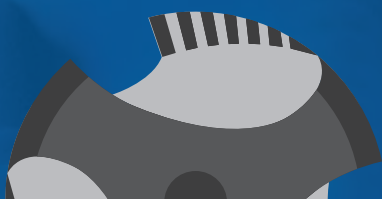
## ***shaping your dreams***

*We listen to our customers, think from our customers' perspective, develop products that meet customers' needs and get them to the market first. In addition, we offer fine-tuned after-sales service, while providing information feedback to customers.*

*OSG derives its strengths from a business model that integrates the sales of products, technology development and manufacturing, and makes active use of know-how gained through close communication with our customers.*

# PRODUCT GROUP

OSG strives to support the growth of the manufacturing industry worldwide with highly accurate and efficient products through its advanced technological know-how. We provide specific solutions to our customers' problems by supplying highly competitive products manufactured to world-class quality standards.



**TAPS**



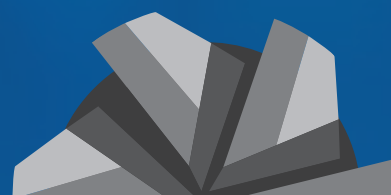
Taps are used to cut screw threads on the inside surfaces of holes, creating the "female" half (nut) of the screw. High precision is of vital importance, particularly in areas such as automobile engines, which require precision screws. We offer a lineup of taps with diameters ranging from small to large and with specifications suitable for a wide variety of uses. We have the top market share for taps not just in Japan but also in the world.



**DRILLS**



Drills are used to make holes in a wide range of surfaces. We have received high acclaim for our development of high-precision, high-value-added products for use in automotive and aircraft part manufacture, which demands advanced processing techniques and zero margin of error.



**END MILLS**



End mills are used to cut and contour molds for plastic parts, for instance for electric home appliances, as well as diecasting dies for automotive parts and stamping molds. To meet today's demanding requirements, such as smaller size, lower weight and reduced cost, we see growing demand for carbide end mills that are excellent in both processing accuracy and durability. In this area, we are currently focusing on developing new products that utilize our advanced proprietary coating technique.



### ROLLING DIES



Thread rolling dies are used to copy threading onto “male” screws (bolts); the process consists of rolling a metal bar between two thread rolling dies tightly pressed to each side. OSG manufactures cylindrical and flat rolling dies for screws, worms and serrations, thread rolling planetary dies and counter-flow rolling dies, in accordance with their intended use.



### INDEXABLE TOOLS



Indexable tools are used to shape metal molds and machine parts. While end mills are used for finishing, indexable tools are intended for rough cutting and contouring, and use disposable inserts attached to the tool body.



### GAUGES



Gauges are used to check the final dimensions of screw threads and holes. OSG was an early adopter of changes in the Japan Industrial Standards (JIS), and today we offer a range of screw gauges based on ISO standards. Precision checking is an extremely important process because of the trends toward increasing product precision and compliance with international standards.

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# CORPORATE DATA



Capital . . . . .	12,239 million yen
FY2021 Sales Amount . . . . .	126,156 million yen (consolidated)
Number of Employees . . . . .	7,489 (consolidated)
Stock Listings . . . . .	1st Section Tokyo & Nagoya Stock Exchange
Stock Code . . . . .	6136

OSG is our company name and trademark:

“O” stands for OSAWA, our founder

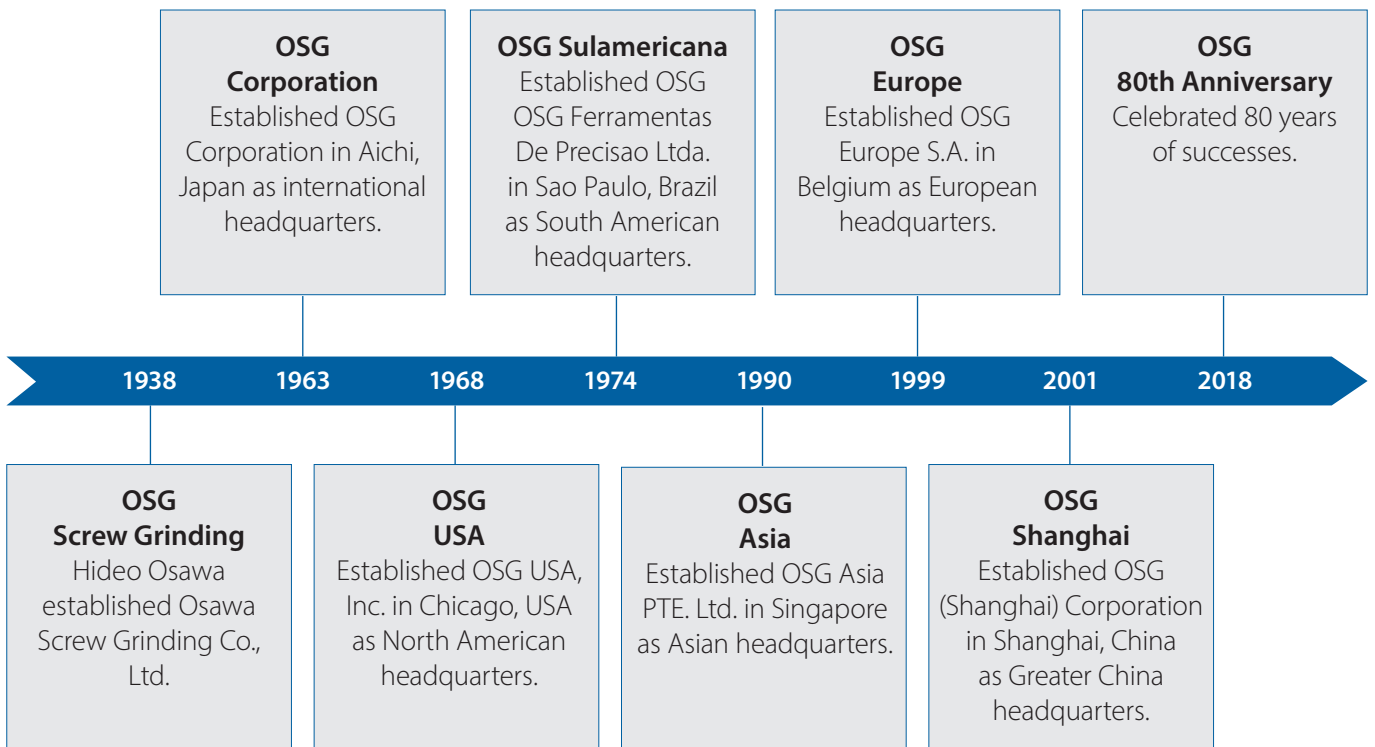
“S” stands for SCREW

“G” stands for GRINDING

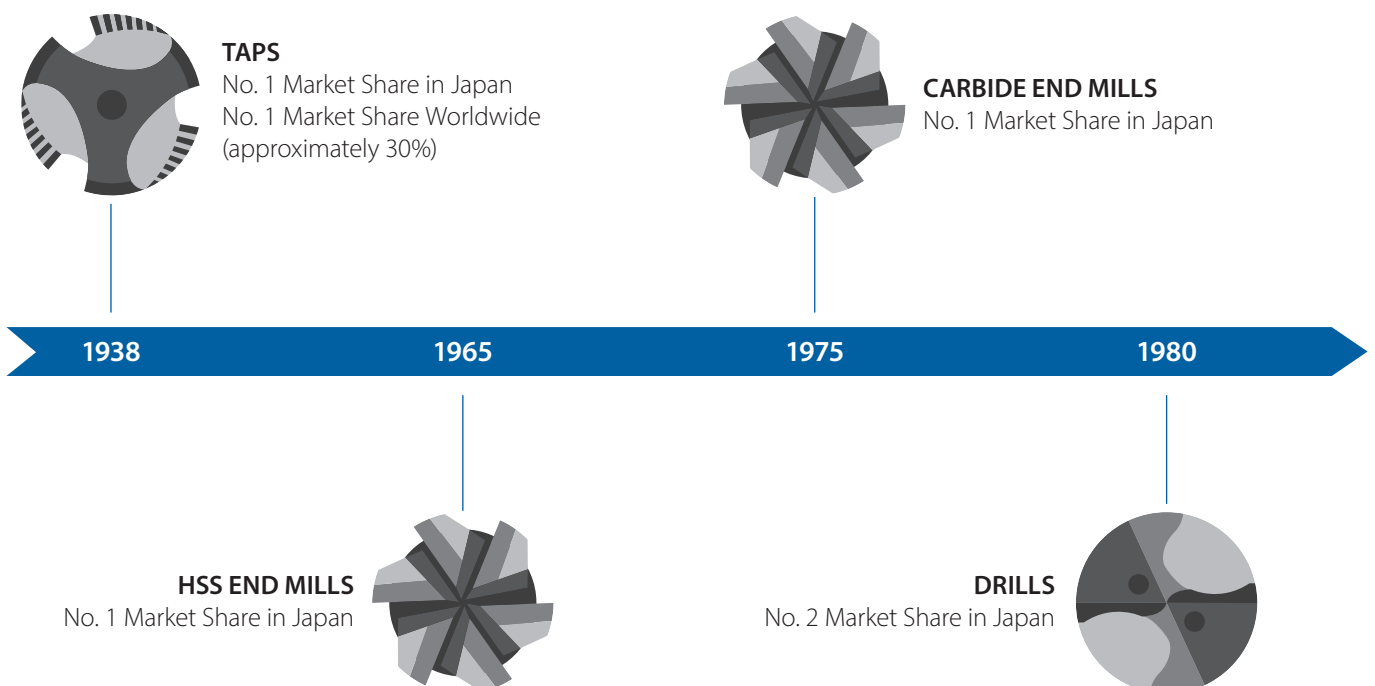


OSG's first factory in 1938

# MILESTONES



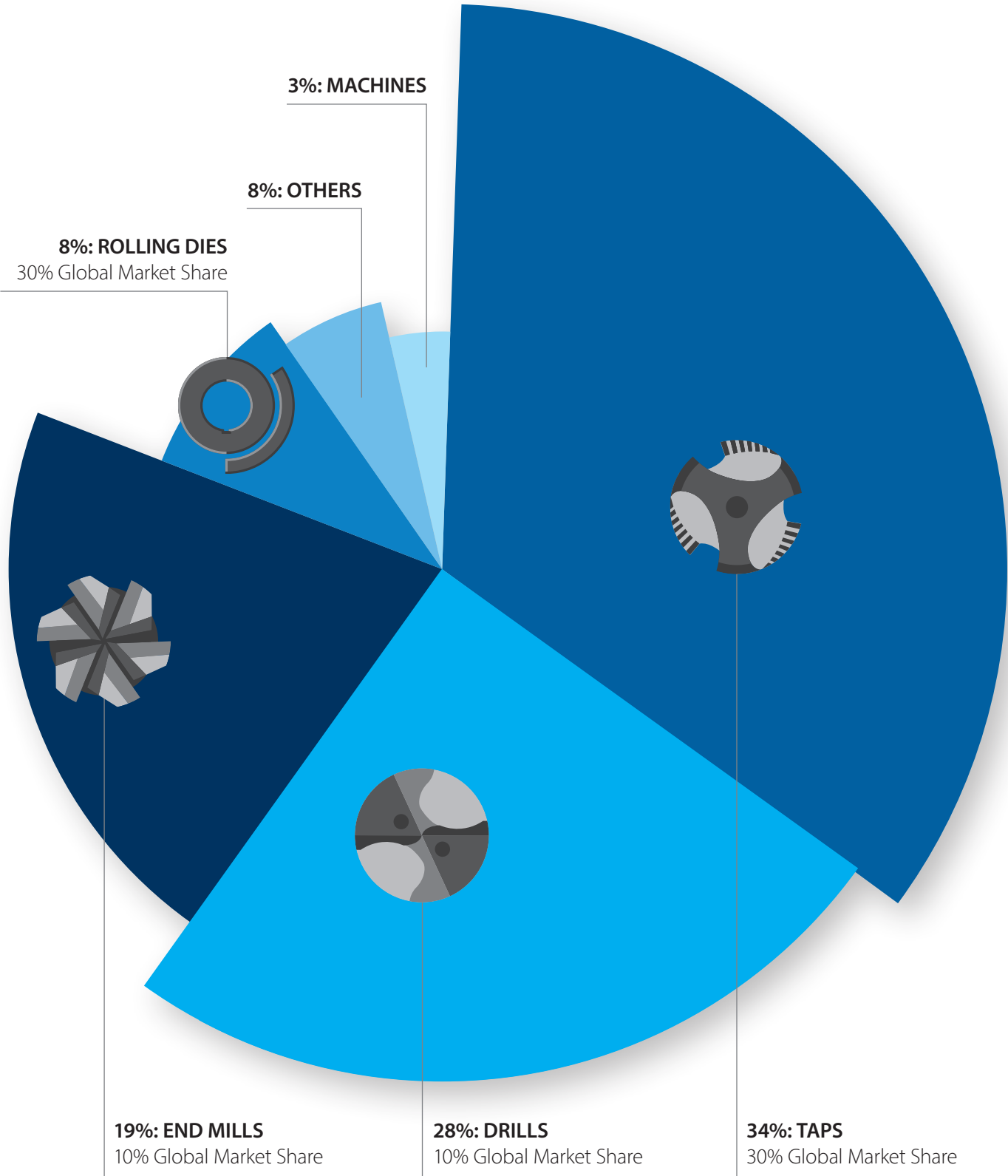
# PRODUCT DEVELOPMENT TIMELINE



# NET SALES BY PRODUCT

OSG enjoys high market share globally in four of its core product offering - taps, rolling dies, drills and end mills.

FY2021 Consolidated Results  
Internal Data



# ABSOLUTE QUALITY CONTROL

OSG maintains absolute control over every aspect of our manufacturing capabilities. OSG products are produced in-house – from the production of tool material, creation of tool geometry, to the development of our own proprietary coatings – the vital elements in the manufacturing of superior cutting tools.

## TOOL GEOMETRY

Attribute for strength and performance

Provider: OSG Design Centre & Global Technology Centre

## TOOL MATERIAL

Attribute for hardness and toughness

Provider: Nihon Hard Material



## SUPERIOR CUTTING TOOLS

## TOOL COATING

Attribute for heat and wear resistance

Provider: OSG Coating Service (OCS)

# The A-Brand

The A Brand is OSG's premium tooling brand. With a commitment to only the best, the A Brand emanates innovations essential for shaping the future of global manufacturing.



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## A-SERIES TAPS

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**AT-1** - One pass thread mill

**AT-2** - Thread mill for hardness steels

**A-SFT & A-POT** - High efficient multi-purpose tap

**A-CSF & A-CHT** - Carbide tap

**XPF** - X performer forming tap

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## A-SERIES DRILLS

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**ADF** - Carbide flat drill

**AD & ADO** - Carbide drill

**ADO-SUS** - Carbide drill for stainless steel & Titanium alloy

**ADO-TRS** - 3-flute carbide drill

**ADO-MICRO** - Micro carbide drill

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## A-SERIES END MILLS

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**AE-VM series** - Anti-vibration carbide end mill

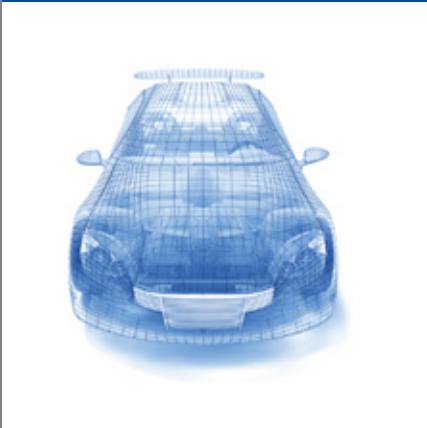
**AE-N series** - Carbide end mill for Non-ferrous materials

**AE-H series** - Carbide end mill for hardness materials

# BUSINESS DOMAINS

OSG has traditionally maintained a powerful marketing presence in manufacturing industries including automotive, aerospace and mold & die. OSG also supplies products to energy-related industries including the shipbuilding industry, construction equipment industry, as well as to the manufacturers of precision equipment, such as medical devices.

## AUTOMOTIVE



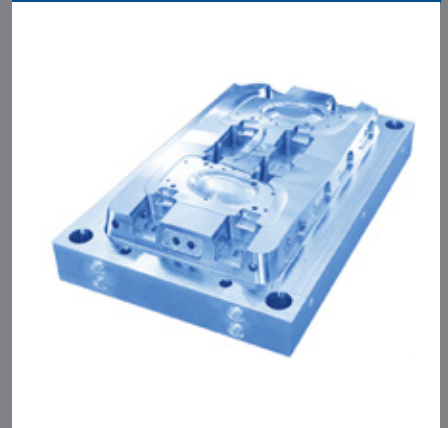
OSG not only supplies powerful cutting tools for the automotive industry, but also provides tailored application solutions to facilitate better processing with higher efficiency and longer durability.

## AEROSPACE



The aerospace industry's mission is to manufacture more environmentally progressive, longer-range and faster aircrafts that require lower operating costs. OSG's cutting tools share the same mission.

## MOLD & DIE



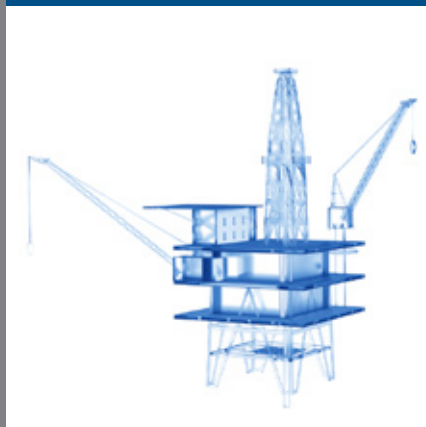
In mold and die manufacturing, a part's quality is highly correlated to the performance of the overall product. OSG's end mills supply speed with size variations and unrivalled quality even for the most complicated mold production.

## MEDICAL



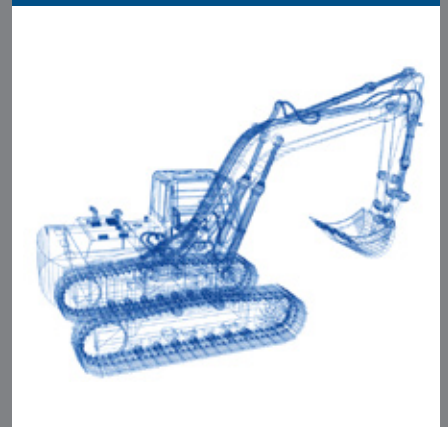
OSG's cutting tools are able to achieve high precision and accuracy in the machining of titanium alloy, cobalt-chrome and stainless steel, all of which are common materials used in the processing of medical equipment components.

## ENERGY



The energy industry provides fuel necessary for our daily lives and requires precision machining of large parts and difficult-to-machine materials that can withstand various hostile conditions. OSG offers optimized cutting tool solutions for the most demanding requirements of power generation metal cutting.

## HEAVY INDUSTRY



OSG offers large diameter tooling for the machining of big components, common in the heavy industry such as shipbuilding and construction machinery. OSG has developed a spectrum of products designated for various materials and sizes to help manufacturers achieve the best possible result.







# THREADING

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# ICONS LEGEND

Threading | Icons legend

## Thread type

<b>M</b> Metric	<b>G</b> G	<b>EG UNJC</b> HELICOIL UNJC	<b>EG M</b> HELICOIL M
<b>UN</b> UN	<b>Pg</b> PG	<b>BSF</b> BSF	<b>EG UNJF</b> HELICOIL UNJF
<b>UNJC</b> UNJC	<b>MF</b> Metric fine	<b>Rc (PT)</b> Rc (PT)	<b>BA</b> BA
<b>EG MJ</b> HELICOIL MJ	<b>UNF</b> UNF	<b>UNC</b> UNC	<b>NPT</b> NPT
<b>BSW</b> BSW	<b>UNJF</b> UNJF	<b>MJ</b> MJ	

## Tool material

<b>CARBIDE</b> Carbide	<b>HSS-Co</b> HSS Cobalt (Co8)	<b>XPM</b> High grade powder metallurgy HSS (XPM) (Co10+V5)
<b>HSSE</b> High Vanadium HSS-EV3	<b>PM</b> Powder metallurgy HSS (PM-T15) (Co5 + V5)	<b>HSS</b> HSS

## Coating / surface treatment

<b>CrN</b> Chromium nitride	<b>HR</b> Coating HR	<b>NI-OX</b> Nitride Oxide
<b>OX</b> Steam oxide	<b>TiN</b> Coating TiN	<b>V</b> Multilayer coating TiCN
<b>WX</b> Multilayer composite TiAlN	<b>SC</b> Smooth coating	<b>WXS</b> Multilayer coating WXS
<b>EgiAs</b> EgiAs coating	<b>DLC-IGUSS</b> DLC IGUSS coating	<b>DUROREY</b> DUROREY coating

## Helix angle

<b>30°</b> Helix angle
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## Tool tolerance

<b>ISO 2 6H</b> Tool tolerance	<b>6H +0.1</b> Oversized +0,1 mm thread tolerance
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## Chamfer length

<b>A/6</b> Form A (6 pitch)	<b>B/5</b> Form B (5 pitch)	<b>C/3</b> Form C (3 pitch)
<b>D/5</b> Form D (5 pitch)	<b>E/1,5</b> Form E (1,5 pitch)	<b>8 THDS</b> 8 pitch






Threading | Icons legend








# ICONS LEGEND

## Threading | Icons legend

### Shank

-  Shank diameter tolerance
-  Suitable for Shrink fit system
-  Straight shank
-  Reinforced shank
-  Weldon shank

### Hole specification / thread depth

-  For blind holes
-  For through holes
-  Threading depth
-  For blind holes - helicoil
-  For through holes - helicoil

### Standard DIN

-  Standard DIN
-  Left-hand threads

### Coolant

-  Centre through
-  Side through


### Recommendation

-  Steel Full recommendation
-  Stainless steel Full recommendation
-  Cast iron Full recommendation
-  Steel Suitable
-  Stainless steel Suitable
-  Cast iron Suitable
-  Non-ferrous materials Full recommendation
-  Super alloys Full recommendation
-  Hardened material Full recommendation
-  Non-ferrous materials Suitable
-  Super alloys Suitable
-  Hardened material Suitable







### A-Brand

-  A-Brand product

### Page reference

-  Cutting conditions page reference

### Product group

-  Cutting taps
-  Thread mills
-  Gauges
-  Forming taps
-  Round dies
-  Synchrofit



# MATERIAL OVERVIEW

Threading | Overview DIN ISO 513

Threading | Material overview

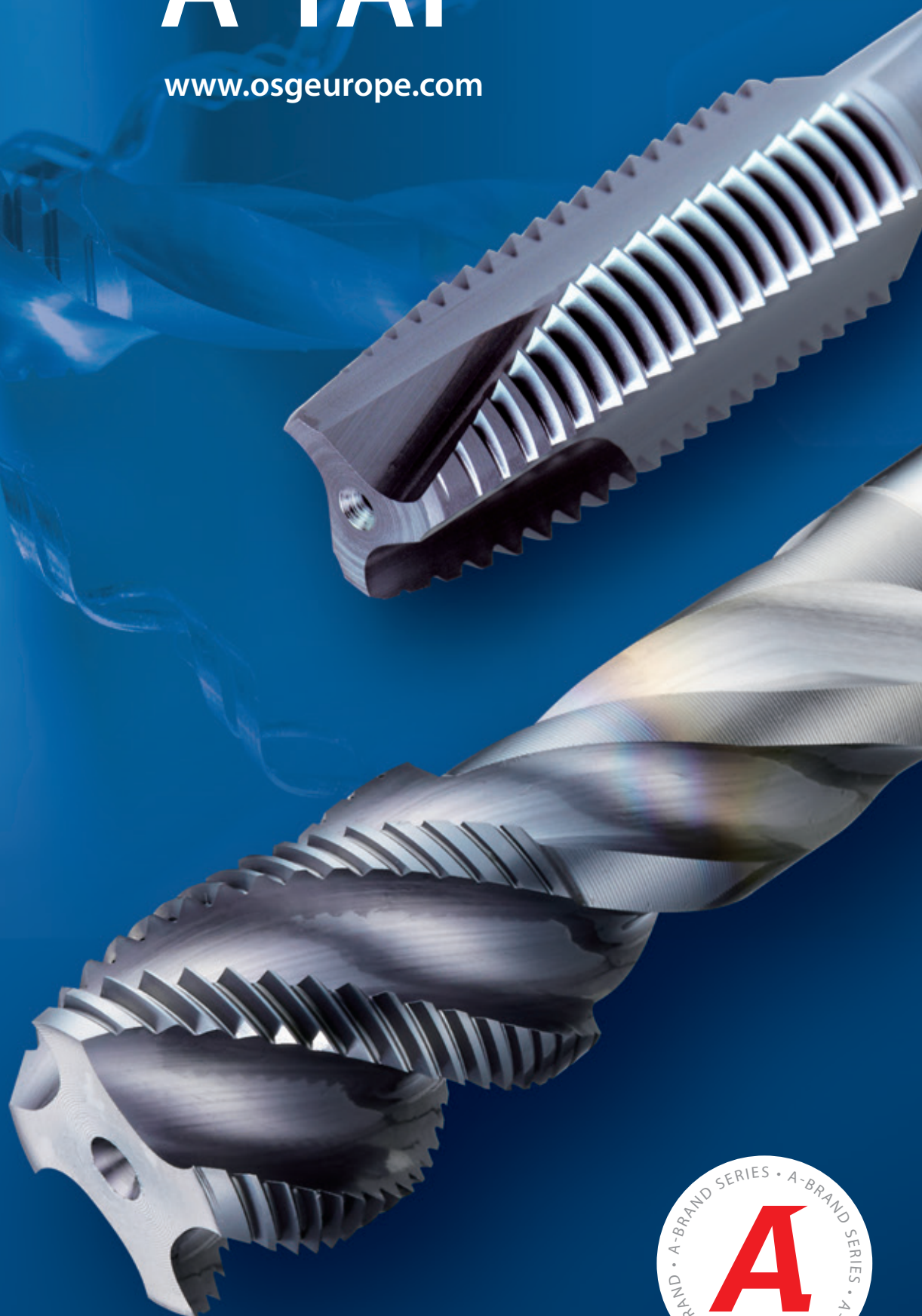


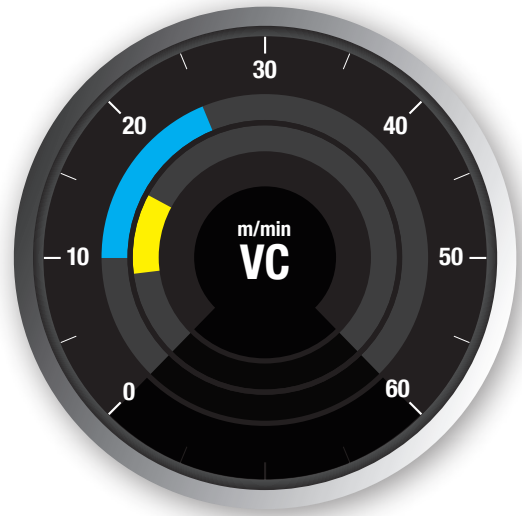
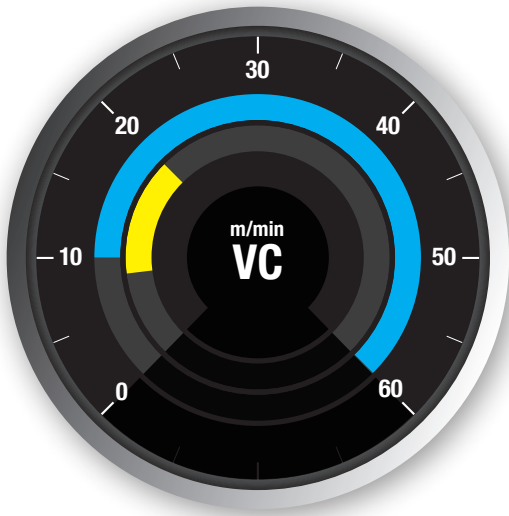
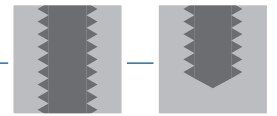
Work Material		DIN
P	C: ≤0,2%	Low carbon steel 1.0116 (S235J2G3) 1.0401 (C15)
	C: 0,25-0,45%	Medium carbon steel 1.0501 (C35)
	C: ≥0,45%	High carbon steel 1.0535 (C55) 1.0553 (S355J0)
	SCM	Alloy steel 1.7225 (42CrMo4)
M	INOX	Stainless steel 1.4301 (X5CrNi18-10)
K	GG	Cast iron 0.6025 (EN-GJL-250/GG25)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

CFRP	CFRP
Honeycomb	Honeycomb
Graphite	Graphite

# A-TAP

[www.osgeurope.com](http://www.osgeurope.com)





Product map



## A-TAP Series

First choice in quality and performance

Powder metal cutting tap

Multilayer V coating: extreme wear resistance

High speed tapping in general steels, aluminium, stainless steels



## S-TAP Series

HSSE cutting tap

Steam oxide treatment

General purpose tapping in steels and stainless steels



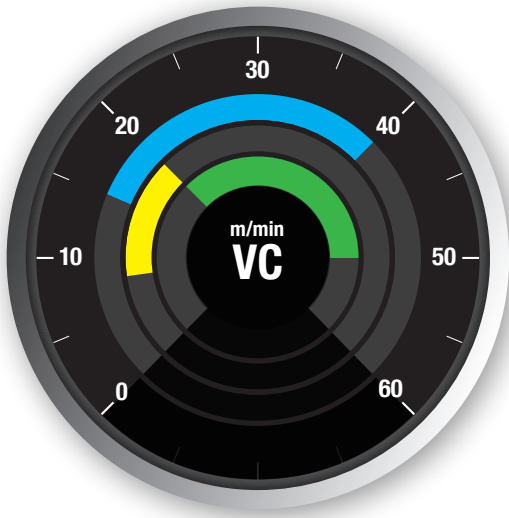
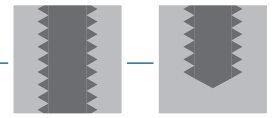
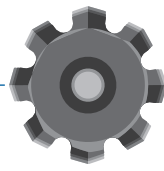
	M	MF	UNC	UNF	BSW	BSF
	A.128	A.233	A.273	A.284	A.330	A.334
	BA	G	Rc (PT)	Rc (ISO)	NPT	
	A.338	A.343	A.358	A.357	A.360	

	M	MF	UNC	UNF	BSW	BSF
	A.139	A.238	A.274	A.285	A.331	A.335
	BA	G	Rc (PT)			
	A.339	A.344	A.359			

	M	MF	UNC	UNF	BSW	BSF
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	BA	G				
	A.336	A.340				

	M	MF	UNC	UNF	BSW	BSF
	A.102	A.226	A.271	A.282	A.329	A.333
	BA	G				
	A.337	A.341				





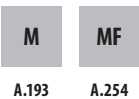
## A-XPF Series

First choice in quality and performance

Powder metal forming tap for through and blind holes

Multilayer V coating: extreme wear resistance

High speed tapping in general steels, aluminium, stainless steels



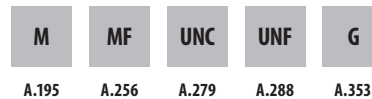
## S-XPF Series

First choice in quality and performance

HSSE forming tap for through and blind holes

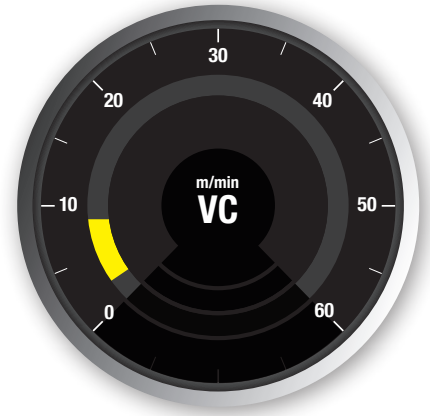
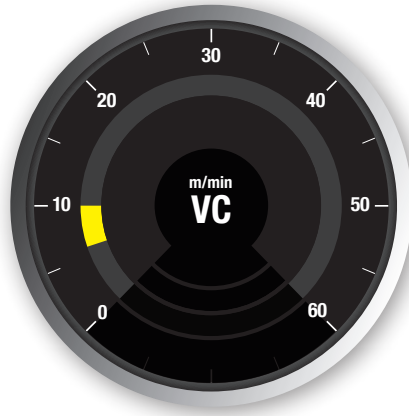
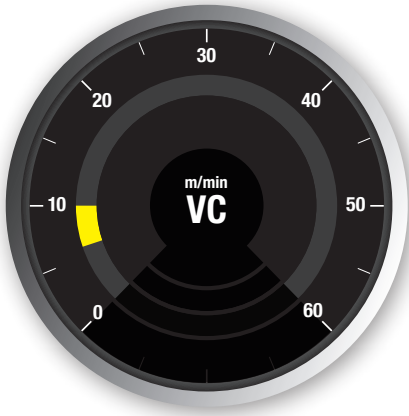
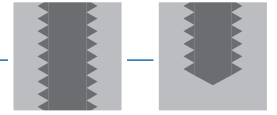
Multilayer V coating: extreme wear resistance

For general steels, stainless steels, aluminium



Product map





Product map



## CC-NEO-SFT

HSSE spiral-fluted cutting tap for blind holes

TiN coating

For general steels, stainless steels and aluminium

Variable helix for better chip evacuation



## CC-Series

HSSE cutting tap

CrN coating

For general steels, stainless steels and aluminium

Developed for rigid tapping on CNC machines



## M-SFT-DUPLEX

Powder metal cutting tap

TiN coating

For stainless steels, DUPLEX and SUPER DUPLEX

Variable helix for better chip evacuation



A.164 A.290



A.162 A.243 A.298 A.309



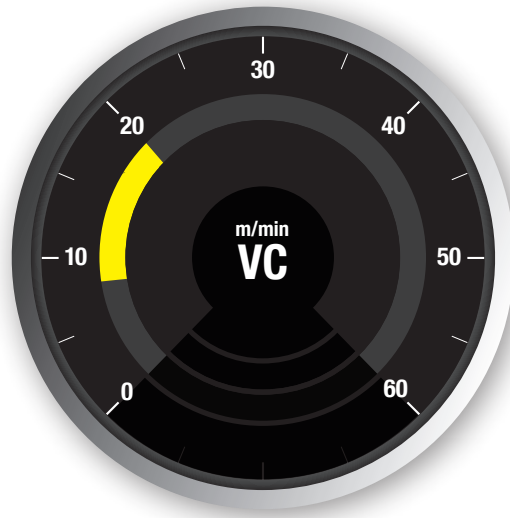
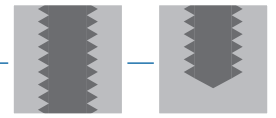
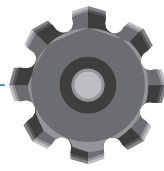
A.349 A.314 A.325



A.161 A.348



A.117 A.231



TiN PM

## M-NRT Series

Powder metal forming tap for through and blind holes

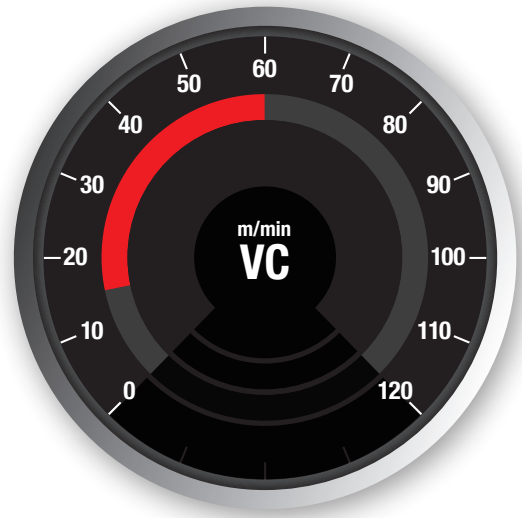
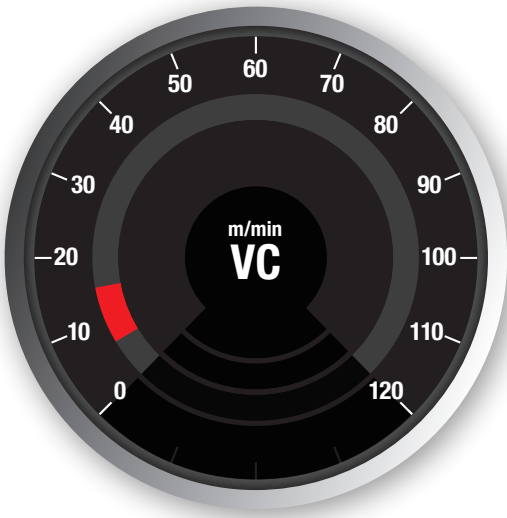
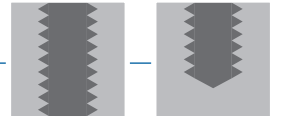
TiN coating

For stainless steels and aluminium



M	MF	G
A.218	A.269	A.356





Product map



## GG-MT

HSSE straight flute cutting tap for blind and through holes

NiOx coating

For cast iron

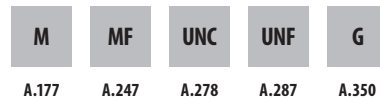


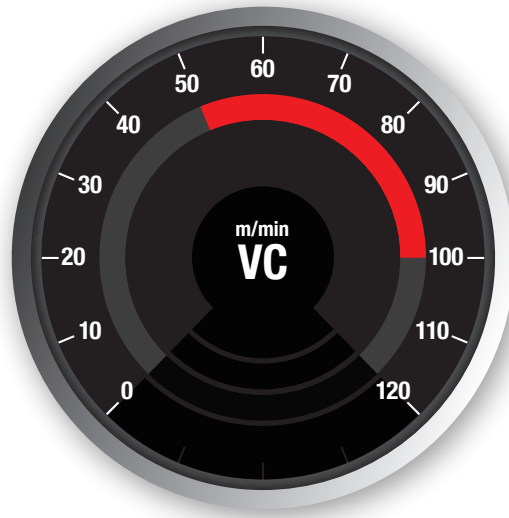
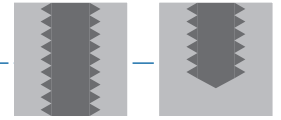
## VP-DC

Powder metal straight flute cutting tap for through and blind holes

Multilayer V coating

For cast iron and aluminium cast





## A-CHT

First choice in quality and performance

Carbide straight flute cutting tap for through and blind holes

TiAlN coating

For cast iron and aluminium cast

Centre through or side through coolant

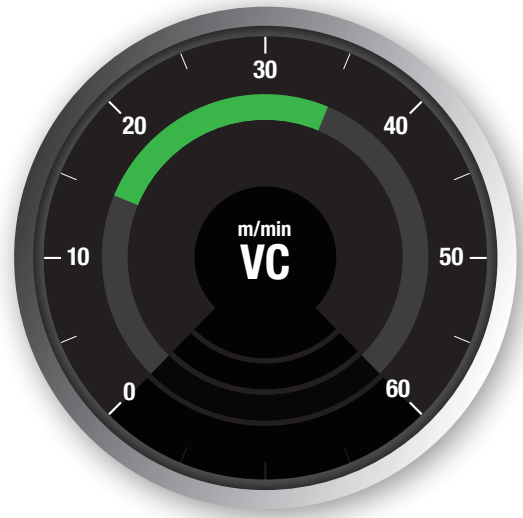
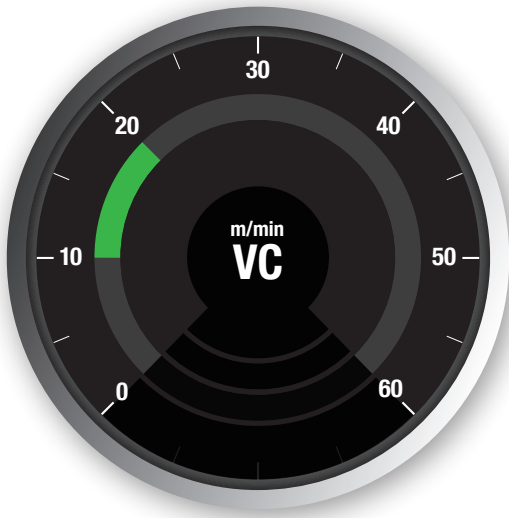
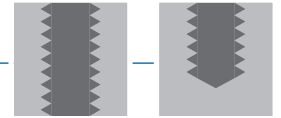


A.182

A.250

Product map





Product map

HSSE

## AL Series

HSSE cutting tap

Bright finish

For aluminium and cast aluminium



CrN

HSSE

## CC Series

HSSE cutting tap

CrN coating

For general steels, stainless steels and aluminium

Developed for rigid tapping on CNC machines



M

A.167

MF

A.245

M

A.120



M

A.162

MF

A.243

UNJC

A.298

UNJF

A.309

EG M

A.314

EG UNJF

A.325

G

A.349

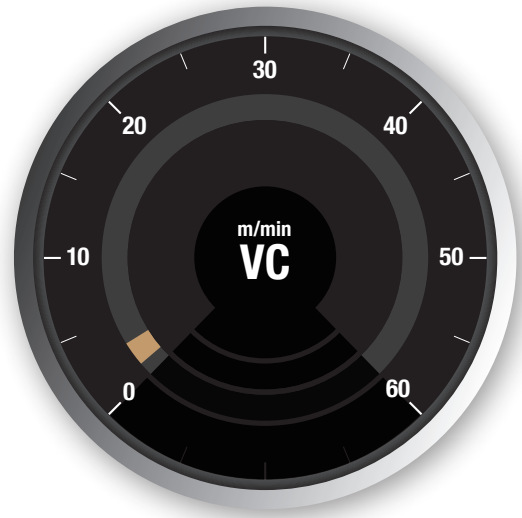
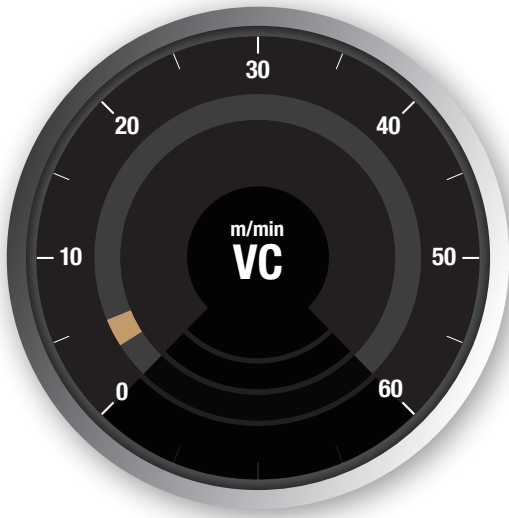
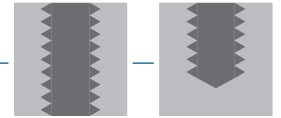


M

A.117

MF

A.231



## V-TI Series

Powder metal low spiral-fluted cutting tap for blind holes

Multilayer V coating

For Titanium alloys



## WHR-NI Series

Powder metal low spiral-fluted cutting tap for blind holes

HR coating

For Nickel-based alloys including Inconel 718



Product map



- M  
A.169
- MJ  
A.291
- UNJC  
A.299
- UNJF  
A.310



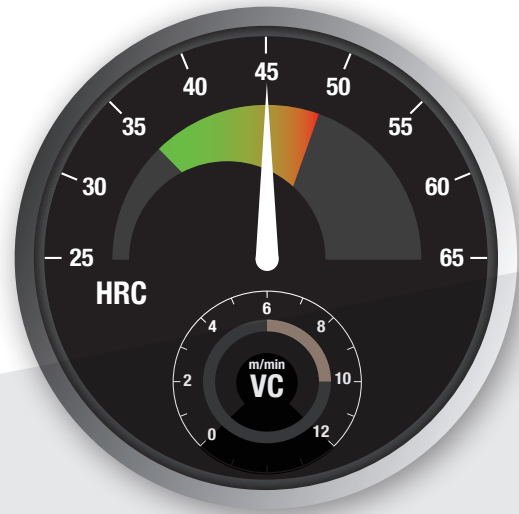
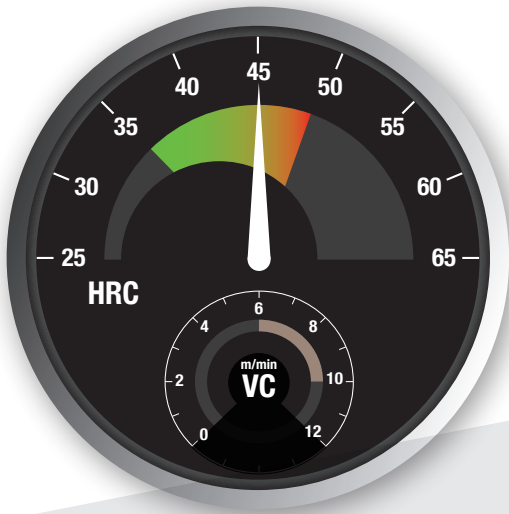
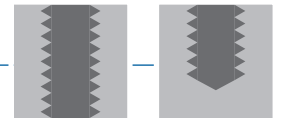
- M  
A.171
- UNJC  
A.301
- UNJF  
A.312



- M  
A.121
- UNJC  
A.293
- UNJF  
A.304



- M  
A.123
- UNJC  
A.295
- UNJF  
A.306



Product map



## H-TAP

Powder metal low spiral-fluted cutting tap for blind holes

Steam oxide treatment

For hardened steels up to **45 HRC**



## VP-H

Powder metal low spiral-fluted cutting tap for blind holes

Multilayer V coating

For hardened steels up to **45 HRC**



M	MF	UNJC	UNJF
A.173	A.246	A.302	A.313
EG MJ	EG UNJC	EG UNJF	
A.318	A.322	A.327	



M
A.174

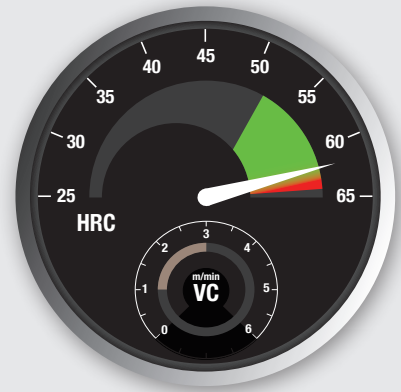
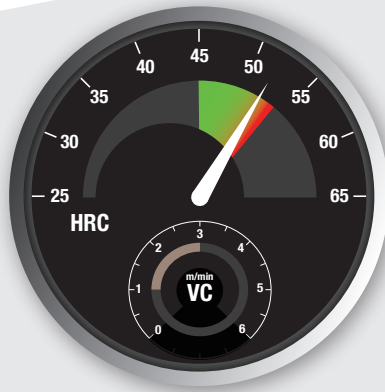
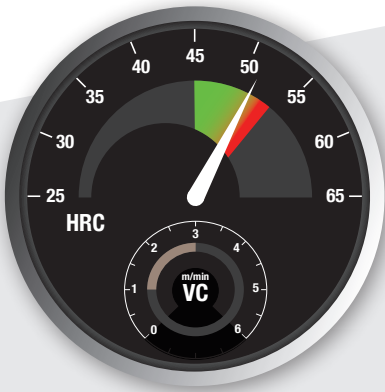
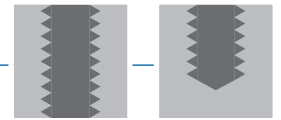


M	MF	UNJC	UNJF
A.125	A.232	A.296	A.307
EG MJ	EG UNJC	EG UNJF	
A.316	A.320	A.324	



M
A.126





## V-XPM-HT

Powder metal straight flute cutting tap for through and blind holes

Multilayer V coating

For hardened steels up to **52 HRC**



## WH55-OT

Carbide straight flute cutting tap for through and blind holes

Multilayer V coating

For hardened steels up to **55 HRC**



## VX-OT

Carbide straight flute cutting tap for through and blind holes

Multilayer V coating

For hardened steels up to **62 HRC**



A.188



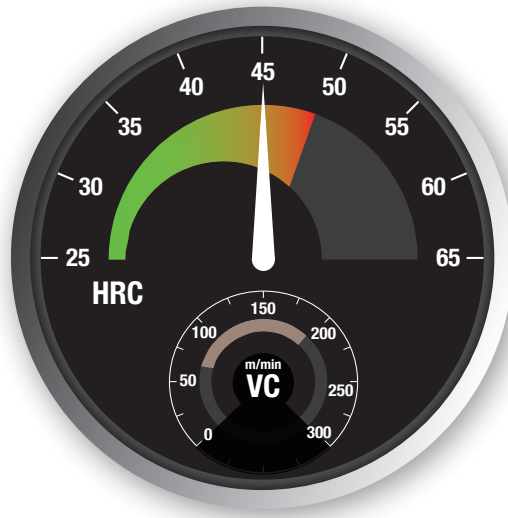
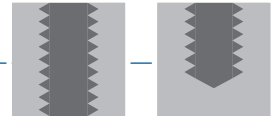
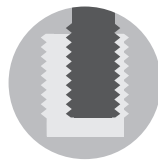
A.190



A.192



A.352



Product map



## AT-1

First choice in quality and performance

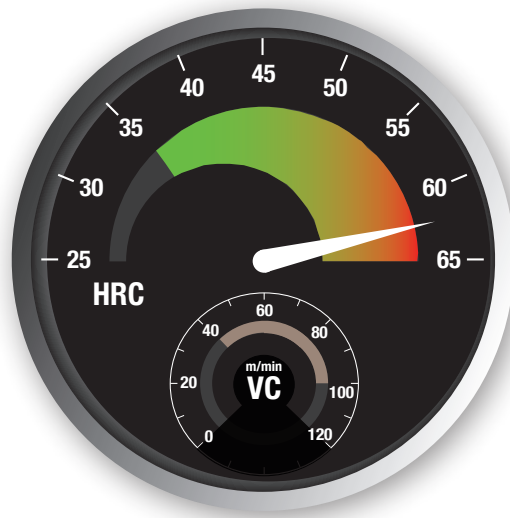
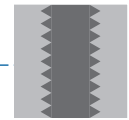
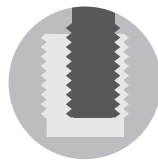
One pass thread mill

EgiAs coating

Variable helix and unequal spacing



<b>M</b>	<b>MF</b>	<b>MJ</b>	<b>UNC</b>	<b>UNJC</b>
A.367	A.367	A.367	A.376	A.376
<b>UNF</b>	<b>UNJF</b>	<b>R (PT)</b>	<b>Rc (PT)</b>	<b>Rp (PS)</b>
A.376	A.376	A.382	A.382	A.385
<b>G (PF)</b>	<b>NPT</b>			
A.385	A.386			



## AT-2

First choice in quality and performance

Thread mill with end-cutting edge for high hardness steels

DUOREY coating

Up to 65HRC



Product map







































































<b>M</b>	<b>UNC</b>	<b>UNJC</b>	<b>UNF</b>	<b>UNJF</b>
A.368	A.377	A.377	A.377	A.377
<b>Rc (PT)</b>	<b>NPT</b>			
A.383	A.387			

# SELECTION CHART

Threading | Selection chart | By material

Threading | Cutting taps | Through hole

				Tolerance				A-Brand	Product series	M	MF	UNC	UNF	MJ	UNJC	UNJF	EG-M	EG-MJ	EG-UNJC
-		FORM B	6HX	PM	-		<b>A</b>		A-POT	A.94	A.223	A.270	A.281						
-		FORM B	6HX	PM			<b>A</b>		A-OIL-POT	A.95	A.224								
-		FORM B	<b>6GX</b>	PM	-		<b>A</b>		A-POT 6GX	A.96	A.225								
-		FORM B	<b>7GX</b>	PM	-		<b>A</b>		A-POT 7GX	A.97									
-		FORM B	<b>6H +0.1</b>	PM	-		<b>A</b>		A-POT +0.1	A.98									
-		FORM B	6HX	PM	-		<b>A</b>		A-LT-POT	A.99									
-		FORM B	6HX	PM	-		<b>A</b>		A-POT-LH	A.100									
-		FORM B	6HX	PM	-		<b>A</b>		A-POT-HB Weldon	A.101									
-		FORM B	6H	HSSE	-				S-POT	A.102	A.226	A.271	A.282						
-		FORM B	<b>6G</b>	HSSE	-				S-POT 6G	A.103	A.227								
-		FORM B	<b>7G</b>	HSSE	-				S-POT 7G	A.104									
-		FORM B	<b>6H +0.1</b>	HSSE	-				S-POT +0.1	A.105									
-		FORM B	6H	HSSE	-				S-LT-POT	A.106									
-		FORM B	6H	HSSE	-				S-POT-LH	A.107									
-		FORM B	6H	HSSE	-				S-POT-HB Weldon	A.108									
-		FORM B	6H	HSSE	-				VA-POT	A.109	A.228	A.272	A.283		A.292	A.303			
-		FORM B	<b>6G</b>	HSSE	-				VA-POT 6G	A.110									
-		FORM B	6HX	PM	-				Z-POT	A.111	A.229								
-		FORM B	6HX	PM					Z-OIL-POT	A.112									
-		FORM B	6H	HSSE	-	-			POT	A.113	A.230								
-		FORM B	6H	HSSE	-				TIN-POT	A.115									
-		FORM B	6H	HSSE	-				TICN-POT	A.116									
-		FORM B	6HX	HSSE	-				CC-POT	A.117	A.231								
-		FORM B	6HX	HSSE	-				CC-LT-POT	A.118									
-		FORM A	6H	HSSE	-				HS-RFT-TIN	A.119									
-		FORM B	6H	HSSE	-	-			AL-POT	A.120									
-		FORM B	6H	PM	-				V-TI-POT	A.121					A.293	A.304			
-		FORM B	6H	PM	-	-			E-(HL)-POT	A.122					A.294	A.305		A.315	A.319
-		FORM B	6HX	PM	-				WHR-NI-POT	A.123					A.295	A.306			
-		FORM B	6H	PM	-	-			CPM-POT	A.124									
-		FORM B	6H	PM	-				H-(HL)-POT	A.125	A.232				A.296	A.307		A.316	A.320
-		FORM B	6HX	PM	-				VP-H-POT	A.126									
-		FORM B	6HX	PM					VPO-H-POT	A.127									

Threading | Selection chart

By material

EG-UNJF	BSW	BSF	BA	G	Rc	NPT	PG	P				M	K		N		S	H					
								C <0,2%	0,25 < C <0,4	0,25 < C <0,4	SCM	INOX	GG	GGG	Al	ACADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
	A.328	A.332	A.336	A.340				15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-25	15-60	10-25	8-20	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
	A.329	A.333	A.337	A.341				15-24	10-15	10-15	8-13	8-16		10-15									
								15-24	10-15	10-15	8-13	8-16		10-15									
								15-24	10-15	10-15	8-13	8-16		10-15									
								15-24	10-15	10-15	8-13	8-16		10-15									
								15-24	10-15	10-15	8-13	8-16		10-15									
								15-24	10-15	10-15	8-13	8-16		10-15									
								15-24	10-15	10-15	8-13	8-16		10-15									
								15-24	10-15	10-15	8-13	8-16		10-15									
								15-24	15-24	15-24	8-20	8-20			20-40	20-40	10-15		8-15				
								15-24	15-24	15-24	8-20	8-20			20-40	20-40	10-15		8-15				
				A.342				12-20	8-12	8-12	8-12			8-12	15-25	15-20							
								15-24	10-15	10-15	8-13	8-16		10-15	15-25	15-20							
								15-24	10-15	10-15	8-13	8-16		10-15	15-25	15-20							
								15-25	15-25	10-25	10-25	6-15			20-40								
								15-25	15-25	10-25	10-25	6-15			20-40								
								27-32	27-32	22-27	22-27	15-20			50-100	40-100							
															15-25	15-20							
																	4-6						
A.323																			2-4				
																			2-4				
										8-13				10-15						6-10	6-10		
A.324										8-13				10-15			4-6	2-4	6-10	6-10			
										8-13				10-15			4-6	2-4	6-10	6-10			
										8-13				10-15			4-6	2-4	6-10	6-10			

Threading | Selection chart



By material

# SELECTION CHART

Threading | Selection chart | By material

Threading | Cutting taps | Blind Hole

			Tolerance				A-Brand	Product series	M	MF	UNC	UNF	MJ	UNJC	UNJF	EG-M	EG-MJ	EG-UNJC
--	--	--	-----------	--	--	--	---------	----------------	---	----	-----	-----	----	------	------	------	-------	---------

	-	FORM C	6HX	PM	-		<b>A</b>	A-SFT	A.128	A.233	A.273	A.284						
	-	FORM C	6HX	PM			<b>A</b>	A-OIL-SFT	A.129	A.234								
	-	FORM C	<b>6GX</b>	PM	-		<b>A</b>	A-SFT 6GX	A.130	A.235								
	-	FORM C	<b>7GX</b>	PM	-		<b>A</b>	A-SFT 7GX	A.131									
	-	FORM C	<b>6H +0.1</b>	PM	-		<b>A</b>	A-SFT +0.1	A.132									
	-	<b>FORM E</b>	6HX	PM	-		<b>A</b>	A-SFT FORM E	A.133									
	-	FORM C	6HX	PM	-		<b>A</b>	A-LT-SFT	A.134									
	-	FORM C	6HX	PM	-		<b>A</b>	A-SFT-LH	A.135									
	-	FORM C	6HX	PM	-		<b>A</b>	A-SFT-HB Weldon	A.136									
	-	FORM C	6HX	CARBIDE			<b>A</b>	A-CSF OIL	A.137	A.236								
	-	<b>FORM E</b>	6HX	CARBIDE			<b>A</b>	A-CSF OIL FORM E	A.138	A.237								
	-	FORM C	6H	HSSE	-			S-SFT	A.139	A.238	A.274	A.285						
	-	FORM C	<b>6G</b>	HSSE	-			S-SFT 6G	A.140	A.239								
	-	FORM C	<b>7G</b>	HSSE	-			S-SFT 7G	A.141									
	-	FORM C	<b>6H +0.1</b>	HSSE	-			S-SFT +0.1	A.142									
	-	<b>FORM E</b>	6H	HSSE	-			S-SFT FORM E	A.143									
	-	FORM C	6H	HSSE	-			S-LT-SFT	A.144									
	-	FORM C	6H	HSSE	-			S-SFT-LH	A.145									
	-	FORM C	6H	HSSE	-			S-SFT-HB Weldon	A.146									
	-	FORM C	6H	HSSE	-			VA-SFT	A.147	A.240	A.275	A.286		A.297	A.308			
	-	FORM C	<b>6G</b>	HSSE	-			VA-SFT 6G	A.148									
	-	<b>FORM E</b>	6H	HSSE	-			VA-SFT FORM E	A.149									
	-	FORM C	6H	PM	-			Z-SFT	A.150	A.241								
	-	FORM C	6H	PM				Z-OIL-SFT	A.151									
	-	FORM C	6H	HSSE	-	-		SFT	A.152	A.242								
	-	FORM C	6H	HSSE	-			TIN-SFT	A.154									
	-	FORM C	6H	HSSE	-			TICN-SFT	A.155									
	-	FORM C	6HX	HSSE	-			HXL-SFT	A.156		A.276							
	-	FORM C	6HX	HSSE				OIL-HXL-SFT	A.157									
	-	FORM C	6HX	HSSE	-			VXL-SFT	A.158		A.277							
	-	FORM C	6HX	HSSE				OIL-VXL-SFT	A.159									
	-	FORM C	6H	HSSE	-	-		SH-SFT	A.160									
	-	FORM C	6HX	PM	-			M-SFT-DUPLEX NEW	A.161									
	-	FORM C	6HX	HSSE	-			CC-(HL)-SFT	A.162	A.243				A.298	A.309	A.314		

Threading | Selection chart

By material

EG-UNJF	BSW	BSF	BA	G	Rc	NPT	PG	P				M	K		N		S		H				
								C <0,2%	0,25 < C <0,4	0,25 < C <0,4	SCM	INOX	GG	GGG	Al	ACADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
	A.330	A.334	A.338	A.343	A.357	A.360		15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-25	15-25	10-25	8-20	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
								15-60	15-60	10-60	8-30	8-20			15-35	15-35	5-10		8-20				
													50-100	30-60		20-60							
													50-100	30-60		20-60							
	A.331	A.335	A.339	A.344				10-15	8-14	8-14	7-11	7-12		7-14									
								10-15	8-14	8-14	7-11	7-12		7-14									
								10-15	8-14	8-14	7-11	7-12		7-14									
								10-15	8-14	8-14	7-11	7-12		7-14									
								10-15	8-14	8-14	7-11	7-12		7-14									
								10-15	8-14	8-14	7-11	7-12		7-14									
								10-15	8-14	8-14	7-11	7-12		7-14									
								10-15	8-14	8-14	7-11	7-12		7-14									
				A.345				10-15	8-14	8-14	7-11	7-12		7-14									
								10-15	8-14	8-14	7-11	7-12		7-14									
								10-15	8-14	8-14	7-11	7-12		7-14									
								10-25	10-25	10-25	8-20	8-20			15-35	15-35	5-10		8-15				
								10-25	10-25	10-25	8-20	8-20			15-35	15-35	5-10		8-15				
				A.346				8-13	7-12	7-12	6-9			6-8	10-20	10-15							
								8-13	7-12	7-12	6-9	5-8		7-12	10-20	10-15							
								8-13	7-12	7-12	6-9	5-8		7-12	10-20	10-15							
								8-13	7-12	7-12	6-9	5-8	7-12	7-12								3-5	
								8-13	7-12	7-12	6-9	5-8	7-12	7-12								3-5	
								8-13	7-12	7-12	6-9	5-8										3-5	
								8-13	7-12	7-12	6-9	5-8										3-5	
				A.347					7-12	7-12	6-9		7-12	6-8		10-15							
				A.348								3-8											
A.325				A.349				15-25	15-25	10-25	10-25	6-10			15-35								



# SELECTION CHART

Threading | Selection chart | By material

Threading | Cutting taps | Blind Hole

			Tolerance				A-Brand	Product series	M	MF	UNC	UNF	MJ	UNJC	UNJF	EG-M	EG-MJ	EG-UNJC
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	-	FORM C	6HX	HSSE	-			CC-LT-SFT	A.163									
	-	FORM C	6HX	HSSE	-			CC-NEO-SFT	A.164				A.290					
	-	FORM C	6HX	HSSE	-			SUS-SFT	A.165	A.244								
	-	FORM C	6H	HSSE	-			HS-SFT-TIN	A.166									
	-	FORM C	6H	HSSE	-	-		AL-SFT	A.167	A.245								
	-	FORM C	6H	HSSE	-			US-AL-SFT	A.168									
	-	FORM C	6H	PM	-			V-TI-SFT	A.169				A.291	A.299	A.310			
	-	FORM C	6H	PM	-	-		E-(HL)-SFT	A.170					A.300	A.311		A.317	A.321
	-	FORM C	6HX	PM	-			WHR-NI-SFT	A.171					A.301	A.312			
	-	FORM C	6H	PM	-	-		CPM-SFT	A.172									
	-	FORM C	6H	PM	-			H-(HL)-SFT	A.173	A.246				A.302	A.313		A.318	A.322
	-	FORM C	6HX	PM	-			VP-H-SFT	A.174									
	-	FORM C	6HX	PM				VPO-H-SFT	A.175									
	-	FORM C	6H	HSSE				V-EM-SFT	A.176									

Threading | Selection chart

By material



EG-UNJF	BSW	BSF	BA	G	Rc	NPT	PG	P				M	K		N		S	H							
								C <0,2%	0,25 < C <0,4	0,25 < C <0,4	SCM	INOX	GG	GGG	AI	ACADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC			
								15-25	15-25	10-25	10-25	6-10			15-35										
								15-25	15-25	10-25	10-25	6-10			15-35										
												6-10													
								27-32	27-32	22-27	22-27	15-20			50-100	40-100									
														10-20	10-15										
														100-400	100-400										
																3-5									
A.326																									
A.327																									

Threading | Selection chart

By material

# SELECTION CHART

Threading | Selection chart | By material

Threading | Cutting taps | Blind and Through hole

			Tolerance				A-Brand	Product series	M	MF	UNC	UNF	MJ	UNJC	UNJF	EG-M	EG-MJ	EG-UNJC
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		FORM C	6HX	PM	-			VP-DC-MT	A.177	A.247	A.278	A.287						
		FORM E	6HX	PM	-			VP-DC-MT FORM E	A.178									
	-	FORM C	6HX	PM				VPO-DC-MT Center	A.179	A.248								
-		FORM C	6HX	PM				VPO-DC-MT Side	A.180	A.249								
	-	FORM E	6HX	PM				VPO-DC-MT FORM E	A.181									
	-	FORM C	6HX	CARBIDE			<b>A</b>	A-CHT OIL Center	A.182	A.250								
-		FORM C	6HX	CARBIDE			<b>A</b>	A-CHT OIL Side	A.183	A.251								
	-	FORM E	6HX	CARBIDE			<b>A</b>	A-CHT OIL FORM E	A.184	A.252								
		FORM C	6HX	HSSE	-			GG-MT	A.185	A.253								
		FORM C	6HX	HSSE				OIL-TXL-MT	A.186									
		FORM C	6H	HSSE	-			EX-MCT	A.187									
		FORM C	6HX	XPM	-			V-XPM-HT	A.188									
-		FORM D	6HX	XPM	-			V-XPM-HT FORM D NEW	A.189									
		FORM C	6HX	CARBIDE	-			WH55-OT	A.190									
-		FORM D	6HX	CARBIDE	-			WH55-OT FORM D	A.191									
		FORM C	6HX	CARBIDE	-			VX-OT	A.192									
		FORM C	-	PM	-		<b>A</b>	A-TPT										
		FORM C	-	HSSE	-			S-TPT										
		FORM C	-	HSSE	-	-		NPT										
		FORM C	-	HSSE	-	-		PG										

Threading | Selection chart

By material

EG- UNJF	BSW	BSF	BA	G	Rc	NPT	PG	P				M	K			N		S		H			
								C <0,2%	0,25 < C <0,4	0,25 <C <0,4	SCM	INOX	GG	GGG	Al	ACADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
				A.350								15-60	15-40		25-70			8-20	8-20				
												15-60	15-40		25-70			8-20	8-20				
												15-60	15-40		25-70			8-20	8-20				
												15-60	15-40		25-70			8-20	8-20				
												15-60	15-40		25-70			8-20	8-20				
												50-100	30-60		20-60								
												50-100	30-60		20-60								
												50-100	30-60		20-60								
				A.351								10-15	7-12										
												10-15	7-12					3-5					
												10-15	7-12		10-15								
																				1-3			
																				1-3			
																				2-4	1-3		
																				2-4	1-3		
				A.352																	1-3		
					A.358										5-10	10-15							
					A.359										5-10	10-15							
						A.361						2-5	4-8		5-10	10-15							
							A.362						7-12		10-20	10-15							

Threading | Selection chart  
By material



# SELECTION CHART

Threading | Selection chart | By material

Threading | Forming taps | Blind and Through hole

			Tolerance				A-Brand	Product series	M	MF	UNC	UNF	MJ	UNJC	UNJF	EG-M	EG-MJ	EG-UNJC
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Threading | Selection chart

By material

		FORM C	6HX	PM	-			A	A-XPf	A.193	A.254							
		FORM C	6HX	PM				A	A-OIL-XPf	A.194	A.255							
		FORM C	6HX	HSS-Co	-			A	S-XPf	A.195	A.256	A.279	A.288					
		FORM C	6HX	HSS-Co				A	S-OIL-XPf	A.196	A.257	A.280	A.289					
		FORM C	6GX	HSS-Co	-			A	S-XPf 6GX	A.197	A.258							
		FORM C	6GX	HSS-Co				A	S-OIL-XPf 6GX	A.198	A.259							
		FORM C	7GX	HSS-Co	-			A	S-XPf 7GX	A.199								
		FORM C	6H +0.1	HSS-Co	-			A	S-XPf +0.1	A.200								
-		FORM D	6HX	HSS-Co	-			A	S-XPf FORM D	A.201	A.260							
	-	FORM E	6HX	HSS-Co	-			A	S-XPf FORM E	A.202	A.261							
	-	FORM E	6HX	HSS-Co				A	S-OIL-XPf FORM E	A.203	A.262							
		FORM C	6HX	HSS-Co	-			A	S-LT-XPf	A.204								
		FORM C	6HX	HSS-Co				A	S-OIL-LT-XPf	A.205	A.263							
		FORM C	6HX	HSS-Co	-			A	S-XPf-LH	A.206								
		FORM C	6HX	HSS-Co	-			A	S-XPf-HB Weldon	A.207								
		FORM C	6HX	HSS-Co	-			A	S-XPf-GL	A.208	A.264							
		FORM C	6GX	HSS-Co	-			A	S-XPf-GL 6GX	A.209	A.265							
		FORM C	6HX	CARBIDE				A	C-OIL-XPf	A.210	A.266							
		FORM C	6HX	HSS	-				R-XPf	A.211								
-		FORM D	6HX	HSS	-				R-XPf FORM D	A.212								
		FORM C	6GX	HSS	-				R-XPf 6GX	A.213								
		FORM C	6HX	HSS-Co	-				V-NRT	A.214	A.267							
		FORM C	6GX	HSS-Co	-				V-NRT 6GX	A.215								
-		FORM D	6HX	HSS-Co	-				V-NRT FORM D	A.216	A.268							
-		FORM D	6GX	HSS-Co	-				V-NRT 6GX FORM D	A.217								
		FORM C	6HX	PM	-			TiN	M-NRT NEW	A.218	A.269							
		FORM C	6HX	PM				TiN	M-OIL-NRT NEW	A.219								
		FORM C	6GX	PM	-			TiN	M-NRT 6GX NEW	A.220								
		FORM E	6HX	PM	-			TiN	M-NRT FORM E NEW	A.221								
	-	FORM E	6HX	PM				TiN	M-OIL-NRT FORM E NEW	A.222								

EG-UNJF	BSW	BSF	BA	G	Rc	NPT	PG	P				M	K		N		S		H				
								C <0,2%	0,25 < C <0,4	0,25 < C <0,4	SCM	INOX	GG	GGG	Al	ACADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
				A.353				15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
				A.354				15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
				A.355				10-20	10-20	10-20	10-20	8-15			10-15	10-15							
								10-20	10-20	10-20	10-20	8-15			10-15	10-15							
								15-40	15-40	15-30	15-30	8-20			20-50	20-40			5-20				
								15-40	15-40	15-30	15-30	5-15			20-40	20-40							
								15-40	15-40	15-30	15-30	5-15			20-40	20-40							
								15-40	15-40	15-30	15-30	5-15			20-40	20-40							
								10-15	10-15	10-15	8-12	5-10			10-20	10-20							
								10-15	10-15	10-15	8-12	5-10			10-20	10-20							
								10-15	10-15	10-15	8-12	5-10			10-20	10-20							
								10-15	10-15	10-15	8-12	5-10			10-20	10-20							
				A.356				15-40	15-40	15-30	15-30	6-12			10-50	10-40							
								15-40	15-40	15-30	15-30	6-12			10-50	10-40							
								15-40	15-40	15-30	15-30	6-12			10-50	10-40							
								15-40	15-40	15-30	15-30	6-12			10-50	10-40							
								15-40	15-40	15-30	15-30	6-12			10-50	10-40							

Threading | Selection chart

By material

























# SELECTION CHART

Threading | Selection chart | By material

Threading | Thread Mills | Blind and Through hole

		Tolerance			A-Brand	Product series	M	MF	UNJ	UNC	UNF	UNJC	UNJF	EG-MJ	EG-UNJC
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		-	-	CARBIDE	-	EgiAs	<b>A</b>	AT-1	A.367	A.367	A.376	A.376	A.376	A.376	A.376	
		-	-	CARBIDE		DUOREY	<b>A</b>	AT-2	A.368		A.377	A.377	A.377	A.377	A.377	
		-	-	CARBIDE		DLC-HUSS	<b>A</b>	AT-2 R-SPEC	A.369							
		-	-	CARBIDE	-	WXS		WH-EM-PNC	A.370							
		-	-	CARBIDE		WXS		WHO-EM-PNC	A.371							
		-	-	CARBIDE	-	SC		WX-ST-PNC-3P	A.372	A.372						
		-	-	CARBIDE	-	SC		WH-VM-PNC	A.373	A.373	A.378	A.378	A.378	A.378	A.378	
		-	-	CARBIDE	-	WX		WX-PNC	A.374	A.374	A.379	A.379	A.379	A.379	A.379	
		-	-	CARBIDE		WX		WXO-ST-PNC	A.375	A.375						

Threading | Selection chart

By material

Rp	BSW	BSF	BA	G	Rc	NPT	PG	P				M	K		N		S		H			
								C <0,2%	0,25 < C <0,4	0,25 < C <0,4	SCM	INOX	GG	GGG	Al	ACADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC
A.385					A.382	A.386		80-160	80-160	80-160	60-120	60-120	80-160	60-120	80-160	100-300			80-200	80-200		
					A.383	A.387		35-55	35-160	35-160	35-120	35-100	35-100	35-100			35-55	35-55	35-75	35-75	35-65	35-55
															100-300	100-300						
								40-100	40-100	40-100	40-100	40-100	40-120	40-100	40-100	40-160	40-80	40-80	40-100	40-100	30-80	30-50
								35-55	35-160	35-160	35-120	35-100	35-100	35-100			35-55	35-55	35-75	35-75	35-65	35-55
				A.380				60-90	60-90	60-90	30-60	60-90	50-100	50-70	50-100	50-100	20-60	20-60	30-60	30-60	30-60	
								60-90	60-90	60-90	30-60	60-90	50-100	50-70	50-100	50-100	20-60	20-60	30-60	30-60	30-60	
				A.381	A.384	A.388		50-75	50-75	40-70	15-30	20-40	50-100	50-65	50-70	65-130	20-60	20-60	15-30	15-30		
								80-120	80-120	80-120	80-120	40-80	50-100	50-65	50-70	65-130			60-100	60-100		



# SELECTION CHART

Threading | Selection chart | By size

M



Threading | Selection chart

By size

Product series			A-POT	A-OIL-POT	A-POT 6GX	A-POT 7GX	A-POT +0.1	A-LT-POT	A-POT-LH	A-POT-HB Weldon	S-POT	S-POT 6G	S-POT 7G	S-POT +0.1	S-LT-POT	S-POT-LH	S-POT-HB Weldon	VA-POT
A-Brand			<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>								
Page			A.94	A.95	A.96	A.97	A.98	A.99	A.100	A.101	A.102	A.103	A.104	A.105	A.106	A.107	A.108	A.109
Ø	I	Ø	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376
1	0,25	0,75	•								•							
1,1	0,25	0,85	•								•							
1,2	0,25	0,95	•								•							
1,4	0,3	1,1	•								•							
1,6	0,35	1,25	•								•							
1,7	0,35	1,35	•								•							
1,8	0,35	1,45	•								•							
2	0,4	1,6	•		•	•		•			•		•		•			•
2,2	0,45	1,75	•								•							•
2,3	0,4	1,85	•								•							
2,5	0,45	2,05	•		•	•		•			•		•		•			•
2,6	0,45	2,15	•								•							
3	0,5	2,5	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•
3,5	0,6	2,9	•								•							•
4	0,7	3,3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
4,5	0,75	3,7	•								•							
5	0,8	4,2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
5,5	0,9	4,6	•								•							
6	1	5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
7	1	6	•	•							•							
8	1,25	6,8	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
9	1,25	7,8	•	•							•							
10	1,5	8,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
11	1,5	9,5	•								•							
12	1,75	10,2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
14	2	12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
16	2	14	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
18	2,5	15,5	•	•							•				•	•	•	•
20	2,5	17,5	•	•					•		•				•	•	•	•
22	2,5	19,5	•	•					•		•				•	•	•	•
24	3	21	•	•					•		•				•	•	•	•
27	3	24																•
30	3,5	26,5																•
33	3,5	29,5																•
36	4	32																•
39	4	35																
42	4,5	37,5																
45	4,5	40,5																
48	5	43																
52	5	47																
56	5,5	50,5																
Blind / through			V	V	V	V	V	V	V	V	OX	OX	OX	OX	OX	OX	OX	OX
	PM	PM	PM	PM	PM	PM	PM	PM	PM	PM	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE
	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B
Tolerance	6HX	6HX	6GX	7GX	6H+0.1	6HX	6HX	6HX	6HX	6H	6G	7G	6H+0.1	6H	6H	6H	6H	6H
<b>P</b>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>M</b>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>K</b>											•	•	•	•	•	•	•	•
<b>N</b>	•	•	•	•	•	•	•	•	•									
<b>S</b>	•	•	•	•	•	•	•	•	•									
<b>H</b>	•	•	•	•	•	•	•	•	•									



# SELECTION CHART

Threading | Selection chart | By size

M



Product series			VA-POT 6G	Z-POT	Z-OIL-POT	POT	POT D352	TIN-POT	TICN-POT	CC-POT	CC-LT-POT	HS-RFT-TIN	AL-POT	V-TI-POT	E-POT	WHR-NI-POT	CPM-POT	
A-Brand																		
Page			A.110	A.111	A.112	A.113	A.114	A.115	A.116	A.117	A.118	A.119	A.120	A.121	A.122	A.123	A.124	
Ø	I	Ø	DN 371	DN 376	DN 371	DN 376	DN 371	DN 376	DN 371	DN 376	DN 371	DN 376	DN 371	DN 376	DN 371	DN 376	DN 371	DN 376
1	0,25	0,75																
1,1	0,25	0,85																
1,2	0,25	0,95																
1,4	0,3	1,1																
1,6	0,35	1,25																
1,7	0,35	1,35																
1,8	0,35	1,45																
2	0,4	1,6	•	•		•		•	•	•	•		•					
2,2	0,45	1,75																
2,3	0,4	1,85																
2,5	0,45	2,05	•	•		•		•		•	•		•					
2,6	0,45	2,15																
3	0,5	2,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
3,5	0,6	2,9				•		•										•
4	0,7	3,3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
4,5	0,75	3,7																
5	0,8	4,2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
5,5	0,9	4,6																
6	1	5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
7	1	6																
8	1,25	6,8	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
9	1,25	7,8																
10	1,5	8,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
11	1,5	9,5																
12	1,75	10,2		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
14	2	12		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
16	2	14		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
18	2,5	15,5			•	•	•	•	•	•	•	•	•	•	•	•	•	•
20	2,5	17,5			•	•	•	•	•	•	•	•	•	•	•	•	•	•
22	2,5	19,5			•	•	•	•	•	•	•	•	•	•	•	•	•	•
24	3	21			•	•	•	•	•	•	•	•	•	•	•	•	•	•
27	3	24			•	•	•	•	•	•	•	•	•	•	•	•	•	•
30	3,5	26,5			•	•	•	•	•	•	•	•	•	•	•	•	•	•
33	3,5	29,5				•		•										
36	4	32				•												
39	4	35																
42	4,5	37,5																
45	4,5	40,5																
48	5	43																
52	5	47																
56	5,5	50,5																
Blind / through																		
	OX	V	V	-	-	TIN	V	CrN	CrN	TIN	-	V	-	HR	-			
	HSSE	PM	PM	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	PM	PM	PM	PM		
	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM A	FORM B	FORM B	FORM B	FORM B	FORM B		
Tolerance	6G	6HX	6HX	6H	6H	6H	6H	6HX	6HX	6H	6H	6H	6H	6H	6HX	6H		
P	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
M	•	•	•															
K	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	
N		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
S		•	•											•	•	•	•	
H		•	•														•	

Threading | Selection chart



By size

# SELECTION CHART

Threading | Selection chart | By size

M



Threading | Selection chart

By size

Product series			H-POT	VP-H-POT	VPO-H-POT	A-SFT	A-OIL-SFT	A-SFT 6GX	A-SFT 7GX	A-SFT +0.1	A-SFT FORM E	A-LT-SFT	A-SFT-LH	A-SFT-HB Weldon	A-CSF OIL	A-CSF OIL FORM E	S-SFT	S-SFT 6G
A-Brand						<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>		
Page			A.125	A.126	A.127	A.128	A.129	A.130	A.131	A.132	A.133	A.134	A.135	A.136	A.137	A.138	A.139	A.140
Ø	I	Ø	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376
			1	0,25	0,75				•									
1,1	0,25	0,85				•											•	
1,2	0,25	0,95				•											•	
1,4	0,3	1,1				•											•	
1,6	0,35	1,25				•											•	
1,7	0,35	1,35				•											•	
1,8	0,35	1,45				•											•	
2	0,4	1,6	•	•		•		•	•			•					•	•
2,2	0,45	1,75				•											•	
2,3	0,4	1,85				•											•	
2,5	0,45	2,05	•	•		•		•	•			•					•	•
2,6	0,45	2,15				•											•	
3	0,5	2,5	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
3,5	0,6	2,9				•											•	
4	0,7	3,3	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
4,5	0,75	3,7				•											•	
5	0,8	4,2	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
5,5	0,9	4,6				•											•	
6	1	5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
7	1	6				•	•	•	•	•	•	•	•	•	•	•	•	•
8	1,25	6,8	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
9	1,25	7,8				•	•	•	•	•	•	•	•	•	•	•	•	•
10	1,5	8,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
11	1,5	9,5				•											•	
12	1,75	10,2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
14	2	12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
16	2	14	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
18	2,5	15,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
20	2,5	17,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
22	2,5	19,5				•	•	•	•	•	•	•	•	•	•	•	•	•
24	3	21				•	•	•	•	•	•	•	•	•	•	•	•	•
27	3	24				•	•	•	•	•	•	•	•	•	•	•	•	•
30	3,5	26,5				•	•	•	•	•	•	•	•	•	•	•	•	•
33	3,5	29,5				•	•	•	•	•	•	•	•	•	•	•	•	•
36	4	32				•	•	•	•	•	•	•	•	•	•	•	•	•
39	4	35				•	•	•	•	•	•	•	•	•	•	•	•	•
42	4,5	37,5				•	•	•	•	•	•	•	•	•	•	•	•	•
45	4,5	40,5				•	•	•	•	•	•	•	•	•	•	•	•	•
48	5	43				•	•	•	•	•	•	•	•	•	•	•	•	•
52	5	47				•	•	•	•	•	•	•	•	•	•	•	•	•
56	5,5	50,5				•	•	•	•	•	•	•	•	•	•	•	•	•
Blind / through			OX	V	V	V	V	V	V	V	V	V	V	V	FX	FX	OX	OX
			PM	PM	PM	PM	PM	PM	PM	PM	PM	PM	PM	PM	CARBIDE	CARBIDE	HSSE	HSSE
			FORM B	FORM B	FORM B	FORM C	FORM C	FORM C	FORM C	FORM C	FORM E	FORM C	FORM C	FORM C	FORM C	FORM E	FORM C	FORM C
Tolerance			6H	6HX	6H	6HX	6HX	6GX	7GX	6H+0.1	6HX	6HX	6HX	6HX	6HX	6HX	6H	6G
P			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
M						•	•	•	•	•	•	•	•	•	•	•	•	•
K			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
N						•	•	•	•	•	•	•	•	•	•	•	•	•
S			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

# SELECTION CHART

Threading | Selection chart | By size

M



Product series			S-SFT 7G	S-SFT +0.1	S-SFT FORM E	S-LT-SFT	S-SFT-LH	S-SFT-HB Weldon	VA-SFT	VA-SFT 6G	VA-SFT FORM E	Z-SFT	Z-OIL-SFT	SFT	SFT D352	TIN-SFT	TICN-SFT	HXL-SFT	
A-Brand																			
Page			A.141	A.142	A.143	A.144	A.145	A.146	A.147	A.148	A.149	A.150	A.151	A.152	A.153	A.154	A.155	A.156	
Ø	I	Ø	DN 371	DN 376	DN 371	DN 376	DN 371	DN 376	DN 371	DN 376	DN 371	DN 376	DN 371	DN 376	DN 352	DN 371	DN 376	DN 371	DN 376
1	0,25	0,75																	
1,1	0,25	0,85																	
1,2	0,25	0,95																	
1,4	0,3	1,1																	
1,6	0,35	1,25																	
1,7	0,35	1,35																	
1,8	0,35	1,45																	
2	0,4	1,6	•			•		•	•			•		•		•	•		
2,2	0,45	1,75						•											
2,3	0,4	1,85																	
2,5	0,45	2,05	•			•		•	•			•		•		•			
2,6	0,45	2,15																	
3	0,5	2,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
3,5	0,6	2,9						•						•		•			
4	0,7	3,3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
4,5	0,75	3,7																	
5	0,8	4,2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
5,5	0,9	4,6																	
6	1	5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
7	1	6																	
8	1,25	6,8	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
9	1,25	7,8																	
10	1,5	8,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
11	1,5	9,5																	
12	1,75	10,2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
14	2	12	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
16	2	14	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
18	2,5	15,5						•						•		•			
20	2,5	17,5						•						•		•			•
22	2,5	19,5						•						•		•			•
24	3	21						•						•		•			•
27	3	24						•						•		•			•
30	3,5	26,5						•						•		•			•
33	3,5	29,5						•						•		•			•
36	4	32						•						•		•			•
39	4	35																	•
42	4,5	37,5																	•
45	4,5	40,5																	•
48	5	43																	•
52	5	47																	•
56	5,5	50,5																	•
Blind / through			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Coating	OX	OX	OX	OX	OX	OX	OX	OX	OX	OX	OX	V	V	-	-	TIN	V	OX	
Material	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	PM	PM	HSSE	HSSE	HSSE	HSSE	HSSE	
Form	FORM C	FORM C	FORM E	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	
Tolerance	7G	6H+0.1	6H	6H	6H	6H	6H	6H	6G	6H	6H	6H	6H	6H	6H	6H	6H	6HX	
P	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
M	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
K	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
N												•	•	•	•	•	•	•	
S												•	•	•	•	•	•	•	
H												•	•	•	•	•	•	•	

Threading | Selection chart



By size

# SELECTION CHART

Threading | Selection chart | By size

M



Threading | Selection chart

By size

Product series			OIL-HXL-SFT	VXL-SFT	OIL-VXL-SFT	SH-SFT	M-SFT-DUPLEX	CC-SFT	CC-LT-SFT	CC-NEO-SFT	SUS-SFT	HS-SFT-TIN JIS	AL-SFT	US-AL-SFT JIS	V-TI-SFT	E-SFT	WHR-NI-SFT	CPM-SFT		
A-Brand																				
Page			A.157	A.158	A.159	A.160	A.161	A.162	A.163	A.164	A.165	A.166	A.167	A.168	A.169	A.170	A.171	A.172		
Ø	I	Ø			DN 371		DN 376		DN 371		DN 376		DN 371		DN 376		DN 371		DN 376	
1	0,25	0,75																		
1,1	0,25	0,85																		
1,2	0,25	0,95																		
1,4	0,3	1,1																		
1,6	0,35	1,25																		
1,7	0,35	1,35																		
1,8	0,35	1,45																		
2	0,4	1,6																		
2,2	0,45	1,75																		
2,3	0,4	1,85																		
2,5	0,45	2,05																		
2,6	0,45	2,15																		
3	0,5	2,5																		
3,5	0,6	2,9																		
4	0,7	3,3																		
4,5	0,75	3,7																		
5	0,8	4,2																		
5,5	0,9	4,6																		
6	1	5																		
7	1	6																		
8	1,25	6,8																		
9	1,25	7,8																		
10	1,5	8,5																		
11	1,5	9,5																		
12	1,75	10,2																		
14	2	12																		
16	2	14																		
18	2,5	15,5																		
20	2,5	17,5																		
22	2,5	19,5																		
24	3	21																		
27	3	24																		
30	3,5	26,5																		
33	3,5	29,5																		
36	4	32																		
39	4	35																		
42	4,5	37,5																		
45	4,5	40,5																		
48	5	43																		
52	5	47																		
56	5,5	50,5																		
Blind / through																				
	OX	OX	OX	-	TIN	CrN	CrN	TIN	OX	TIN	-	V	V	-	HR	-				
	HSSE	HSSE	HSSE	HSSE	PM	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	PM	PM	PM	PM			
	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C			
Tolerance	6HX	6HX	6HX	6H	6HX	6HX	6HX	6HX	6HX	6HX	6H	6H	6H	6H	6H	6HX	6H			
<b>P</b>																				
<b>M</b>																				
<b>K</b>																				
<b>N</b>																				
<b>S</b>																				
<b>A</b>																				

# SELECTION CHART

Threading | Selection chart | By size

M



Product series			H-SFT	VP-H-SFT	VPO-H-SFT	V-EM-SFT	VP-DC-MT	VP-DC-MT FORM E	VPO-DC-MT Center	VPO-DC-MT Side	VPO-DC-MT FORM E	A-CHT OIL Center	A-CHT OIL Side	A-CHT OIL FORM E	GG-MT	OIL-TXL-MT	EX-MCT	V-XPM-HT			
A-Brand												<b>A</b>	<b>A</b>	<b>A</b>							
Page			A.173	A.174	A.175	A.176	A.177	A.178	A.179	A.180	A.181	A.182	A.183	A.184	A.185	A.186	A.187	A.188			
Ø	I	Ø	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376	DIN 371	DIN 376					
			1	0,25	0,75																
1,1	0,25	0,85																			
1,2	0,25	0,95																			
1,4	0,3	1,1																			
1,6	0,35	1,25																			
1,7	0,35	1,35																			
1,8	0,35	1,45																			
2	0,4	1,6	•	•			•														
2,2	0,45	1,75																			
2,3	0,4	1,85																			
2,5	0,45	2,05	•	•			•														
2,6	0,45	2,15																			
3	0,5	2,5	•	•			•	•											•		
3,5	0,6	2,9					•														
4	0,7	3,3	•	•		•	•	•							•	•			•		
4,5	0,75	3,7																			
5	0,8	4,2	•	•		•	•	•				•	•	•	•	•			•		
5,5	0,9	4,6																			
6	1	5	•	•	•		•	•	•			•	•	•	•	•			•		
7	1	6						•													
8	1,25	6,8	•	•	•		•	•	•			•	•	•	•	•			•		
9	1,25	7,8																			
10	1,5	8,5	•	•	•		•	•	•			•	•	•	•	•			•		
11	1,5	9,5						•													
12	1,75	10,2		•	•		•	•	•			•	•	•	•	•			•		
14	2	12	•	•	•		•	•	•			•	•	•	•	•			•		
16	2	14	•	•	•	•		•	•			•	•	•	•	•			•		
18	2,5	15,5	•	•	•		•	•	•			•	•	•	•	•			•		
20	2,5	17,5	•	•	•		•	•	•			•	•	•	•	•			•		
22	2,5	19,5		•	•		•	•	•			•	•	•	•	•			•		
24	3	21		•	•		•	•	•			•	•	•	•	•			•		
27	3	24		•	•		•	•	•			•	•	•	•	•			•		
30	3,5	26,5		•	•		•	•	•			•	•	•	•	•			•		
33	3,5	29,5		•	•		•	•	•			•	•	•	•	•			•		
36	4	32		•	•		•	•	•			•	•	•	•	•			•		
39	4	35																			
42	4,5	37,5																			
45	4,5	40,5																			
48	5	43																			
52	5	47																			
56	5,5	50,5																			
Blind / through			Blind	Blind	Blind	Blind	Blind	Blind	Blind	Blind	Blind	Blind	Blind	Blind	Blind	Blind	Blind	Blind	Blind		
			OX	V	V	V	V	V	V	V	V	V	V	V	FX	FX	FX	NI-OX	OX	OX	V
			PM	PM	PM	HSSE	PM	PM	PM	PM	PM	CARBIDE	CARBIDE	CARBIDE	HSSE	HSSE	HSSE	XPM			
			FORM C	FORM C	FORM C	FORM C	FORM C	FORM E	FORM C	FORM C	FORM E	FORM C	FORM C	FORM E	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	
Tolerance			6H	6HX	6HX	6H	6HX	6HX	6HX	6HX	6HX	6HX	6HX	6HX	6HX	6HX	6H	6HX	6H	6HX	
P			•	•	•		•	•	•	•	•					•	•				
M																					
K			•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•		
N						•	•	•	•	•	•	•	•	•					•		
S			•	•	•																
H			•	•	•		•	•	•	•	•								•		

Threading | Selection chart



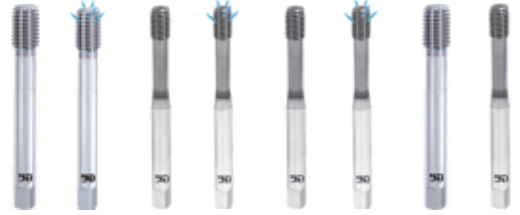
By size

A

# SELECTION CHART

Threading | Selection chart | By size

M



Threading | Selection chart

By size


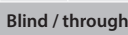
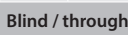
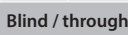
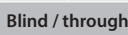
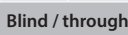
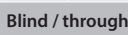
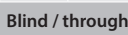
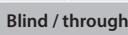
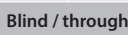
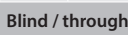
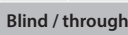
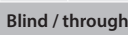
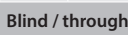
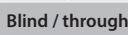
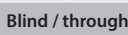
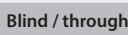
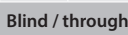



Product series			V-XPM-HT FORM D	WH55- OT	WH55- OT FORM D	VX-OT	Product series				A-XPF	A-OIL- XPF	S-XPF	S-OIL- XPF	S-XPF 6GX	S-OIL- XPF 6GX	S-XPF 7GX	S-XPF +0.1
A-Brand							A-Brand				<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>
Page			A.189	A.190	A.191	A.192	Page				A.193	A.194	A.195	A.196	A.197	A.198	A.199	A.200
Ø	I	Ø					Ø	I min.	Ø max.	Ø								
1	0,25	0,75					1	0,25	0,89	0,90								
1,1	0,25	0,85					1,1	0,25	0,99	1,00								
1,2	0,25	0,95					1,2	0,25	1,09	1,10								
1,4	0,3	1,1					1,4	0,3	1,26	1,28								
1,6	0,35	1,25					1,6	0,35	1,45	1,48								
1,7	0,35	1,35					1,7	0,35	1,55	1,58								
1,8	0,35	1,45					1,8	0,35	1,65	1,68								
2	0,4	1,6					2	0,4	1,82	1,85								
2,2	0,45	1,75					2,2	0,45	2,00	2,04								
2,3	0,4	1,85					2,3	0,4	2,12	2,15								
2,5	0,45	2,05					2,5	0,45	2,30	2,34								
2,6	0,45	2,15					2,6	0,45	2,40	2,44								
3	0,5	2,5	•	•	•	•	3	0,5	2,77	2,82	•							
3,5	0,6	2,9					3,5	0,6	3,23	3,28								
4	0,7	3,3	•	•	•	•	4	0,7	3,67	3,72	•							
4,5	0,75	3,7					4,5	0,75	4,14	4,20								
5	0,8	4,2	•	•	•	•	5	0,8	4,62	4,68	•	•	•	•	•	•	•	•
5,5	0,9	4,6					5,5	0,9	5,06	5,13								
6	1	5	•	•	•	•	6	1	5,51	5,59	•	•	•	•	•	•	•	•
7	1	6					7	1	6,51	6,59								
8	1,25	6,8	•	•	•	•	8	1,25	7,37	7,45	•	•	•	•	•	•	•	•
9	1,25	7,8					9	1,25	8,37	8,45								
10	1,5	8,5	•	•	•	•	10	1,5	9,24	9,33	•	•	•	•	•	•	•	•
11	1,5	9,5					11	1,5	10,24	10,33								
12	1,75	10,2	•	•	•	•	12	1,75	11,1	11,2								
14	2	12					14	2	12,96	13,08	•	•	•	•	•	•	•	•
16	2	14					16	2	14,96	15,08	•	•	•	•	•	•	•	•
18	2,5	15,5					18	2,5	16,66	16,81	•	•	•	•	•	•	•	•
20	2,5	17,5					20	2,5	18,66	18,81	•	•	•	•	•	•	•	•
22	2,5	19,5					22	2,5	20,66	20,81	•	•	•	•	•	•	•	•
24	3	21					24	3	22,39	22,56	•	•	•	•	•	•	•	•
27	3	24					27	3	25,39	25,56	•	•	•	•	•	•	•	•
30	3,5	26,5					30	3,5	28,09	28,28	•	•	•	•	•	•	•	•
33	3,5	29,5					33	3,5	31,09	31,28								
36	4	32					36	4	33,8	34,01								
39	4	35					39	4	36,8	37,01								
42	4,5	37,5					42	4,5	39,52	39,73								
45	4,5	40,5					45	4,5	42,52	42,73								
48	5	43																
52	5	47																
56	5,5	50,5																
Blind / through			Blind	Through	Blind	Through	Blind / through				Blind	Through	Blind	Through	Blind	Through	Blind	Through
			V	V	V	V					V	V	V	V	V	V	V	V
			XPM	CARBIDE	CARBIDE	CARBIDE					PM	PM	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co
			FORM D	FORM C	FORM D	FORM C					FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C
Tolerance			6HX	6HX	6HX	6HX	Tolerance				6HX	6HX	6HX	6HX	6GX	6GX	7GX	6HX+0.1
P							P											
M							M											
K							K											
N							N											
S							S											
H							H											

# SELECTION CHART

Threading | Selection chart | By size

M



Product series				S-XPF FORM D	S-XPF FORM E	S-OIL-XPF FORM E	S-LT-XPF	S-OIL-LT-XPF	S-XPF-LH	S-XPF-HB Weldon	S-XPF-GL	S-XPF-GL 6GX	C-OIL-XPF	R-XPF	R-XPF FORM D	R-XPF 6GX	V-NRT	V-NRT 6GX	V-NRT FORM D	
A-Brand				<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>							
Page				A.201	A.202	A.203	A.204	A.205	A.206	A.207	A.208	A.209	A.210	A.211	A.212	A.213	A.214	A.215	A.216	
	$\Phi$	$\Phi_{I}$	$\Phi_{min.}$	$\Phi_{max.}$																
1	0,25	0,89	0,90																	
1,1	0,25	0,99	1,00																	
1,2	0,25	1,09	1,10																	
1,4	0,3	1,26	1,28																	
1,6	0,35	1,45	1,48																	
1,7	0,35	1,55	1,58																	
1,8	0,35	1,65	1,68																	
2	0,4	1,82	1,85																	
2,2	0,45	2,00	2,04																	
2,3	0,4	2,12	2,15																	
2,5	0,45	2,30	2,34																	
2,6	0,45	2,40	2,44																	
3	0,5	2,77	2,82																	
3,5	0,6	3,23	3,28																	
4	0,7	3,67	3,72																	
4,5	0,75	4,14	4,20																	
5	0,8	4,62	4,68																	
5,5	0,9	5,06	5,13																	
6	1	5,51	5,59																	
7	1	6,51	6,59																	
8	1,25	7,37	7,45																	
9	1,25	8,37	8,45																	
10	1,5	9,24	9,33																	
11	1,5	10,24	10,33																	
12	1,75	11,1	11,2																	
14	2	12,96	13,08																	
16	2	14,96	15,08																	
18	2,5	16,66	16,81																	
20	2,5	18,66	18,81																	
22	2,5	20,66	20,81																	
24	3	22,39	22,56																	
27	3	25,39	25,56																	
30	3,5	28,09	28,28																	
33	3,5	31,09	31,28																	
36	4	33,8	34,01																	
39	4	36,8	37,01																	
42	4,5	39,52	39,73																	
45	4,5	42,52	42,73																	
Blind / through																				
				V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	V
				HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	CARBIDE	HSS	HSS	HSS	HSS-Co	HSS-Co	HSS-Co	HSS-Co
				FORM D	FORM E	FORM E	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM D	FORM C	FORM C	FORM C	FORM D
Tolerance				6HX	6HX	6HX	6HX	6HX	6HX	6HX	6HX	6HX	6GX	6HX	6HX	6HX	6GX	6HX	6GX	6HX
P																				
M																				
K																				
N																				
S																				
H																				

Threading | Selection chart



By size

# SELECTION CHART

Threading | Selection chart | By size

M



Threading | Selection chart

By size

Product series		V-NRT 6GX FORM D	M-NRT	M-OIL-NRT	M-NRT 6GX	M-NRT FORM E	M-OIL-NRT FORM-E													
A-Brand																				
Page		A.217	A.218	A.219	A.220	A.221	A.222													
Ø	I	Ø <sub>min.</sub>	Ø <sub>max.</sub>																	
1	0,25	0,89	0,90		•															
1,1	0,25	0,99	1,00																	
1,2	0,25	1,09	1,10																	
1,4	0,3	1,26	1,28		•															
1,6	0,35	1,45	1,48		•															
1,7	0,35	1,55	1,58																	
1,8	0,35	1,65	1,68																	
2	0,4	1,82	1,85	•	•		•	•												
2,2	0,45	2,00	2,04	•																
2,3	0,4	2,12	2,15																	
2,5	0,45	2,30	2,34	•	•		•	•												
2,6	0,45	2,40	2,44																	
3	0,5	2,77	2,82	•	•		•	•												
3,5	0,6	3,23	3,28	•	•		•	•												
4	0,7	3,67	3,72	•	•		•	•												
4,5	0,75	4,14	4,20		•															
5	0,8	4,62	4,68	•	•	•	•	•	•											
5,5	0,9	5,06	5,13		•															
6	1	5,51	5,59	•	•	•	•	•	•											
7	1	6,51	6,59		•															
8	1,25	7,37	7,45	•	•	•	•	•	•											
9	1,25	8,37	8,45		•															
10	1,5	9,24	9,33	•	•	•	•	•	•											
11	1,5	10,24	10,33		•															
12	1,75	11,1	11,2		•	•	•	•	•											
14	2	12,96	13,08		•	•	•	•	•											
16	2	14,96	15,08		•	•	•	•	•											
18	2,5	16,66	16,81		•	•														
20	2,5	18,66	18,81		•	•														
22	2,5	20,66	20,81		•	•														
24	3	22,39	22,56		•	•														
27	3	25,39	25,56																	
30	3,5	28,09	28,28																	
33	3,5	31,09	31,28																	
36	4	33,8	34,01																	
39	4	36,8	37,01																	
42	4,5	39,52	39,73																	
45	4,5	42,52	42,73																	
Blind / through																				
		V	TIN	TIN	TIN	TIN	TIN													
		HSS-Co	PM	PM	PM	PM	PM													
		FORM D	FORM C	FORM C	FORM C	FORM E	FORM E													
Tolerance		6GX	6HX	6HX	6GX	6HX	6HX													
P		•	•	•	•	•	•													
M		•	•	•	•	•	•													
K																				
N		•	•	•	•	•	•													
S																				
H																				



# SELECTION CHART

Threading | Selection chart | By size

**MF**



Product series			A-POT	A-OIL-POT	A-POT 6GX	S-POT	S-POT 6G	VA-POT	Z-POT	POT	CC-POT	H-POT	A-SFT	A-OIL-SFT	A-SFT 6GX	A-CSF OIL	A-CSF OIL-FORM E
A-Brand			<b>A</b>	<b>A</b>	<b>A</b>								<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>
Page			A.223	A.224	A.225	A.226	A.227	A.228	A.229	A.230	A.231	A.232	A.233	A.234	A.235	A.236	A.237
Ø	I	Ø	DIN 371	DIN 374	DIN 374	DIN 374	DIN 374	DIN 374	DIN 374	DIN 374	DIN 374	DIN 374	DIN 371	DIN 374	DIN 374	DIN 374	DIN 374
2,5	0,35	2,15	•										•				
2,6	0,35	2,25	•										•				
3	0,35	2,65	•			•		•	•				•				
3,5	0,35	3,15	•										•				
4	0,35	3,65	•										•				
4	0,5	3,5	•			•		•	•	•			•				
4,5	0,5	4	•										•				
5	0,5	4,5	•			•		•	•	•			•				
6	0,5	5,5	•	•		•		•	•	•			•	•			
6	0,75	5,25	•	•		•		•	•	•			•		•		
7	0,75	6,25	•			•		•	•	•			•				
8	0,75	7,25	•	•		•		•	•	•			•	•		•	
8	1	7	•	•	•	•		•	•	•			•	•	•	•	•
9	1	8	•	•		•		•	•	•			•	•			
10	0,75	9,25	•	•		•		•	•	•			•	•			
10	1	9	•	•	•	•		•	•	•			•	•	•	•	•
10	1,25	8,75	•	•	•	•		•	•	•			•	•	•	•	•
11	1	10	•	•		•		•	•	•			•	•			
12	1	11	•			•		•	•	•			•	•		•	•
12	1,25	10,75	•			•		•	•	•			•	•		•	•
12	1,5	10,5	•	•	•	•		•	•	•			•	•	•	•	•
14	1	13	•			•		•	•	•			•	•			
14	1,25	12,75	•			•		•	•	•			•	•			
14	1,5	12,5	•	•	•	•		•	•	•			•	•	•	•	•
16	1	15	•			•		•	•	•			•	•			
16	1,5	14,5	•	•	•	•		•	•	•			•	•	•	•	•
18	1	17	•			•		•	•	•			•	•			
18	1,5	16,5	•	•	•	•		•	•	•			•	•	•	•	•
18	2	16								•							
20	1	19	•			•		•	•	•			•	•			
20	1,5	18,5	•	•	•	•		•	•	•			•	•	•	•	•
20	2	18	•			•		•	•	•			•	•			
22	1	21	•			•		•	•	•			•	•			
22	1,5	20,5	•			•		•	•	•			•	•			
22	2	20	•			•		•	•	•			•	•			
24	1	23	•			•		•	•	•			•	•			
24	1,5	22,5	•			•		•	•	•			•	•	•		
24	2	22	•			•		•	•	•			•	•			
30	2	28								•							
Blind / through																	
	V	V	V	OX	OX	OX	V	-	CrN	OX	V	V	V	V	FX	FX	
	PM	PM	PM	HSSE	HSSE	HSSE	PM	HSSE	HSSE	PM	PM	PM	PM	PM	CARBIDE	CARBIDE	
	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM B	FORM C	FORM C	FORM C	FORM C	FORM C	FORM E
Tolerance	6HX	6HX	6GX	6H	6G	6H	6HX	6H	6HX	6H	6HX	6H	6HX	6HX	6GX	6HX	6HX
<b>P</b>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>M</b>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>K</b>				•	•	•		•			•					•	•
<b>N</b>	•	•	•				•	•	•	•			•	•	•	•	•
<b>S</b>	•	•	•						•				•	•	•	•	•
<b>H</b>	•	•	•						•				•	•	•	•	•

Threading | Selection chart

By size



# SELECTION CHART

Threading | Selection chart | By size



**MF**

Threading | Selection chart

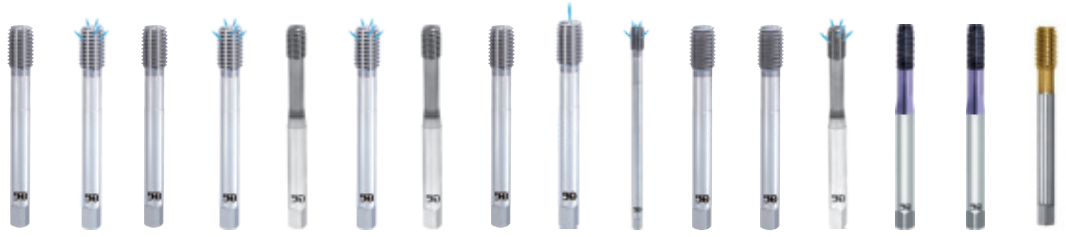
By size

Product series			S-SFT	S-SFT 6G	VA-SFT	Z-SFT	SFT	CC-SFT	SUS-SFT	AL-SFT	H-SFT	VP-DC-MT	VPO-DC-MT Center	VPO-DC-MT Side	A-CHT OIL Center	A-CHT OIL Side	A-CHT OIL FORM E	GG-MT
A-Brand															<b>A</b>	<b>A</b>	<b>A</b>	
Page			A.238	A.239	A.240	A.241	A.242	A.243	A.244	A.245	A.246	A.247	A.248	A.249	A.250	A.251	A.252	A.253
Ø	I	Ø	DN 374	DN 374	DN 374	DN 374	DN 374	DN 374	DN 374	DN 374	DN 374	DN 374	DN 374	DN 374	DN 374	DN 374	DN 374	DN 374
2,5	0,35	2,15																
2,6	0,35	2,25																
3	0,35	2,65	•		•	•					•	•						•
3,5	0,35	3,15																•
4	0,35	3,65																
4	0,5	3,5	•		•	•	•				•	•						•
4,5	0,5	4																
5	0,5	4,5	•		•	•	•				•	•						•
6	0,5	5,5	•		•	•	•	•			•	•						•
6	0,75	5,25	•	•	•	•	•	•			•	•						•
7	0,75	6,25																
8	0,75	7,25	•	•	•	•	•	•			•	•						•
8	1	7	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•
9	1	8	•															
10	0,75	9,25	•				•											
10	1	9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
10	1,25	8,75	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
11	1	10	•															
12	1	11	•	•	•	•	•	•	•	•	•	•			•	•	•	•
12	1,25	10,75	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
12	1,5	10,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
14	1	13	•				•											•
14	1,25	12,75	•				•											
14	1,5	12,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
16	1	15	•				•											•
16	1,5	14,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
18	1	17	•				•											•
18	1,5	16,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
18	2	16					•											•
20	1	19	•				•											
20	1,5	18,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
20	2	18	•				•											
22	1	21	•				•											
22	1,5	20,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
22	2	20	•				•											
24	1	23	•				•											
24	1,5	22,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
24	2	22	•				•											
30	2	28					•											
Blind / through																		
	OX	OX	OX	V	-	CrN	OX	-	OX	V	V	V	FX	FX	FX	NI-OX		
	HSSE	HSSE	HSSE	PM	HSSE	HSSE	HSSE	HSSE	PM	PM	PM	PM	CARBIDE	CARBIDE	CARBIDE	HSSE		
	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM E	FORM C	
Tolerance	6H	6G	6H	6H	6H	6HX	6HX	6H	6H	6HX	6HX	6HX	6HX	6HX	6HX	6HX	6HX	
<b>P</b>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<b>M</b>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<b>K</b>	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<b>N</b>				•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<b>S</b>				•	•	•	•	•	•	•	•	•	•	•	•	•	•	
<b>A</b>				•	•	•	•	•	•	•	•	•	•	•	•	•	•	

# SELECTION CHART

Threading | Selection chart | By size

**MF**



Product series				A-XPf	A-OIL-XPf	S-XPf	S-OIL-XPf	S-XPf 6GX	S-OIL-XPf 6GX	S-XPf FORM D	S-XPf FORM E	S-OIL-XPf FORM E	S-OIL-LT-XPf	S-XPf-GL	S-XPf-GL 6GX	C-OIL-XPf	V-NRT	V-NRT FORM D	M-NRT	
A-Brand				<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>					
Page				A.254	A.255	A.256	A.257	A.258	A.259	A.260	A.261	A.262	A.263	A.264	A.265	A.266	A.267	A.268	A.269	
Ø	I	Ø min.	Ø max.	DIN 2174	DIN 2174	DIN 2174	DIN 2174	DIN 2174	DIN 2174	DIN 2174	DIN 2174	DIN 2174	DIN 2174	DIN 2174	DIN 2174	DIN 2174	DIN 2174	DIN 2174		
				4	0,5	3,77	3,82			•										
5	0,5	4,77	4,82			•														•
6	0,5	5,79	5,83			•														•
6	0,75	5,65	5,71			•														•
7	0,75	6,65	6,71			•														•
8	0,5	7,79	7,83			•														•
8	0,75	7,65	7,71			•														•
8	1	7,51	7,59	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
10	1	9,51	9,59	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
10	1,25	9,37	9,45	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
12	1	11,52	11,60	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
12	1,25	11,39	11,46	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
12	1,5	11,25	11,34	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
14	1	13,52	13,60			•	•													•
14	1,25	13,39	13,46	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
14	1,5	13,25	13,34	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
16	1	15,52	15,60			•	•													•
16	1,5	15,25	15,34	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
18	1	17,52	17,60			•	•													•
18	1,5	17,25	17,34	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
20	1	19,52	19,60			•	•													•
20	1,5	19,25	19,34	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
22	1,5	21,25	21,34	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
24	1,5	23,25	23,34	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Blind / through					V	V	V	V	V	V	V	V	V	V	V	V	V	V	V	TIN
				PM	PM	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	HSS-Co	CARBIDE	HSS-Co	HSS-Co	PM	
				FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM D	FORM E	FORM E	FORM C	FORM C	FORM C	FORM C	FORM C	FORM D	FORM C	
Tolerance				6HX	6HX	6HX	6HX	6GX	6GX	6HX	6HX	6HX	6HX	6HX	6GX	6HX	6HX	6HX	6HX	
P				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
M				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
K				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
N				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
S				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
H				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Threading | Selection chart



By size



# SELECTION CHART

Threading | Selection chart | By size



Product series			A-POT	S-POT	VA-POT	A-SFT	S-SFT	VA-SFT	VP-DC-MT	Product series				S-XP	S-OIL-XP		
A-Brand			<b>A</b>			<b>A</b>				A-Brand				<b>A</b>	<b>A</b>		
Page			A.281	A.282	A.283	A.284	A.285	A.286	A.287	Page				A.288	A.289		
		$\emptyset$	$\emptyset_{min}$		$\emptyset_{max}$							$\emptyset_{min}$	$\emptyset_{max}$				
N°.2	64	1,85	•	•		•	•		•	N°.6	40	3,19	3,26	•			
N°.3	56	2,15	•	•		•	•		•	N°.10	32	4,41	4,47	•			
N°.4	48	2,4	•	•		•	•		•	1/4	28	5,87	5,94	•	•		
N°.5	44	2,7	•	•		•	•		•	5/16	24	7,39	7,47	•	•		
N°.6	40	2,95	•	•	•	•	•	•	•	3/8	24	8,98	9,06	•	•		
N°.8	36	3,5	•	•		•	•		•	7/16	20	10,45	10,55	•	•		
N°.10	32	4,1	•	•	•	•	•	•	•	1/2	20	12,04	12,14	•	•		
N°.12	28	4,6	•	•		•	•		•	9/16	18	13,56	13,64	•	•		
1/4	28	5,5	•	•	•	•	•	•	•	5/8	18	15,15	15,23	•	•		
5/16	24	6,9	•	•	•	•	•	•	•	3/4	16	18,22	18,30	•	•		
3/8	24	8,5	•	•	•	•	•	•	•	7/8	14	21,27	21,38	•	•		
7/16	20	9,9	•	•	•	•	•	•	•	1	12	24,26	24,37	•	•		
1/2	20	11,5	•	•	•	•	•	•	•								
9/16	18	12,9	•	•	•	•	•	•	•								
5/8	18	14,5	•	•	•	•	•	•	•								
3/4	16	17,5	•	•	•	•	•	•	•								
7/8	14	20,4	•	•	•	•	•	•	•								
1	12	23,25	•	•	•	•	•	•	•								

Blind / through								Blind / through				
	V	OX	OX	V	OX	OX	V		V	V		
	PM	HSSE	HSSE	PM	HSSE	HSSE	PM		HSS-Co	HSS-Co		
	FORM B	FORM B	FORM B	FORM C	FORM C	FORM C	FORM C		FORM C	FORM C		
Tolerance	2BX	2B	2B	2BX	2B	2B	2BX	Tolerance	2BX	2BX		
P	•	•	•	•	•	•	•	P	•	•		
M	•	•	•	•	•	•	•	M	•	•		
K	•	•	•	•	•	•	•	K	•	•		
N	•	•	•	•	•	•	•	N	•	•		
S	•	•	•	•	•	•	•	S	•	•		
H	•	•	•	•	•	•	•	H	•	•		

Threading | Selection chart



By size

# SELECTION CHART

Threading | Selection chart | By size

Threading | Selection chart

By size



Product series			CC-NEO-SFT	V-TI-SFT	Product series			VA-POT	V-TI-POT	E-POT	WHR-NI-POT	H-POT	VA-SFT	CC-SFT	V-TI-SFT	E-SFT	WHR-NI-SFT	H-SFT
A-Brand					A-Brand													
Page			A.290	A.291	Page			A.292	A.293	A.294	A.295	A.296	A.297	A.298	A.299	A.300	A.301	A.302
Ø	I	Ø	DN 271	DN 276	DN 271	DN 276	Ø	I	Ø	DN 2184-1	DN 2184-1	DN 2184-1	DN 2184-1	DN 2184-1	DN 2184-1	DN 2184-1	DN 2184-1	DN 2184-1
2	0,4	1,610 - 1,722	•	•	N°.4	40	2,35	•	•	•	•	•	•	•	•	•	•	•
3	0,5	2,513 - 2,653	•	•	N°.6	32	2,7	•	•	•	•	•	•	•	•	•	•	•
4	0,7	3,318 - 3,498	•	•	N°.8	32	3,5	•	•	•	•	•	•	•	•	•	•	•
5	0,8	4,221 - 4,421	•	•	N°.10	24	3,8			•	•			•		•	•	
6	1	5,026 - 5,216	•	•	1/4	20	5,1			•	•			•		•	•	
8	1,25	6,782 - 6,994	•	•	5/16	18	6,5			•	•			•		•	•	
10	1,5	8,539 - 8,775	•	•	3/8	16	7,9			•	•			•		•	•	
12	1,75	10,295 - 10,560	•	•	7/16	14	9,3			•	•			•		•	•	
					1/2	13	10,7			•	•			•		•	•	
					9/16	12	12,3							•				
					5/8	11	13,5			•	•			•		•	•	
					3/4	10	16,5			•	•			•		•	•	
					7/8	9	19,3			•	•			•		•	•	
					1	8	22,25			•	•			•		•	•	
<b>Blind / through</b>			TIN	V	<b>Blind / through</b>			OX	V	-	HR	OX	OX	CrN	V	-	HR	OX
			HSSE	PM				HSSE	PM	PM	PM	PM	HSSE	HSSE	PM	PM	PM	PM
			FORM C	FORM C				FORM B	FORM B	FORM B	FORM B	FORM B	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C
<b>Tolerance</b>			4H	4H	<b>Tolerance</b>			3B	3B	3B	3B	3B	3B	3B	3B	3B	3B	3B
<b>P</b>			•		<b>P</b>			•				•	•	•				•
<b>M</b>			•		<b>M</b>			•					•	•				
<b>K</b>					<b>K</b>			•				•	•					•
<b>N</b>			•		<b>N</b>								•					
<b>S</b>				•	<b>S</b>				•	•	•	•			•	•	•	•
<b>H</b>					<b>H</b>							•						•

# SELECTION CHART

Threading | Selection chart | By size



**UNJF**

**EG M**

Product series			VA-POT	V-TI-POT	E-POT	WHR-NI-POT	H-POT	VA-SFT	CC-SFT	V-TI-SFT	E-SFT	WHR-NI-SFT	H-SFT	Product series			CC-HL-SFT		
A-Brand														A-Brand					
Page			A.303	A.304	A.305	A.306	A.307	A.308	A.309	A.310	A.311	A.312	A.313	Page			A.314		
Nº.10	32	4,1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
1/4	28	5,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
5/16	24	6,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
3/8	24	8,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
7/16	20	9,9	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
1/2	20	11,5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
9/16	18	12,9			•	•			•		•	•			•	•			•
5/8	18	14,5			•	•			•		•	•			•	•			•
3/4	16	17,5			•	•			•		•	•			•	•			•
7/8	14	20,4			•	•			•		•	•			•	•			•
1	12	23,25							•										
<b>Blind / through</b>																			
<b>Tolerance</b>			3B	3B	3B	3B	3B	3B	3B	3B	3B	3B	3B	3B	3B	3B	3B	3B	3B
<b>P</b>			•				•	•	•					•				•	
<b>M</b>			•				•	•	•					•				•	
<b>K</b>			•				•	•	•					•				•	
<b>N</b>									•										•
<b>S</b>				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
<b>H</b>							•							•					•

Threading | Selection chart



By size

# SELECTION CHART

Threading | Selection chart | By size

EG  
MJ



EG  
UNJC



Threading | Selection chart

By size

Product series			E-HL-POT	H-HL-POT	E-HL-SFT	H-HL-SFT	Product series			E-HL-POT	H-HL-POT	E-HL-SFT	H-HL-SFT				
A-Brand							A-Brand										
Page			A.315	A.316	A.317	A.318	Page			A.319	A.320	A.321	A.322				
Ø	I	Ø	DIN 371	DIN 371	DIN 371	DIN 371	Ø	I	Ø	DIN 2184-1	DIN 2184-1	DIN 2184-1	DIN 2184-1				
2	0,4	2,1	•	•	•	•	4	40	3	•	•	•	•				
2,5	0,45	2,6	•	•	•	•	6	32	3,7	•	•	•	•				
3	0,5	3,2	•	•	•	•	8	32	4,4	•	•	•	•				
4	0,7	4,2	•	•	•	•											
5	0,8	5,2	•	•	•	•											
6	1	6,3	•	•	•	•											
8	1,25	8,4	•	•	•	•											
10	1,5	10,4	•	•	•	•											
Blind / through			-	OX	-	OX	Blind / through			-	OX	-	OX				
			PM	PM	PM	PM				PM	PM	PM	PM				
			FORM B	FORM B	FORM C	FORM C				FORM B	FORM B	FORM C	FORM C				
Tolerance			4H	4H	4H	4H	Tolerance			3B	3B	3B	3B				
P				•		•	P				•		•				
M							M										
K				•		•	K				•		•				
N							N										
S			•	•	•	•	S			•	•	•	•				
H				•		•	H				•		•				



# SELECTION CHART

Threading | Selection chart | By size

**EG  
UNJF**



**BSW**



Product series			E-HL-POT	H-HL-POT	CC-HL-SFT	E-HL-SFT	H-HL-SFT	Product series			A-POT	S-POT	A-SFT	S-SFT				
A-Brand								A-Brand			<b>A</b>		<b>A</b>					
Page			A.323	A.324	A.325	A.326	A.327	Page			A.328	A.329	A.330	A.331				
Ø	I	Ø	DIN2184-L	DIN2184-L	DIN2184-L	DIN2184-L	DIN2184-L	Ø	I	Ø	DIN2184-L	DIN2184-L	DIN2184-L	DIN2184-L				
10	32	5,1	•	•	•	•	•	1/8	40	2,5	•	•	•	•				
1/4	28	6,6	•	•	•	•	•	3/16	24	3,6	•	•	•	•				
5/16	24	8,3	•	•	•	•	•	1/4	20	5	•	•	•	•				
3/8	24	9,8	•	•	•	•	•	5/16	18	6,5	•	•	•	•				
7/16	20	11,5	•	•		•	•	3/8	16	7,9	•	•	•	•				
1/2	20	13,1	•	•		•	•	7/16	14	9,2	•	•	•	•				
								1/2	12	10,5	•	•	•	•				
								5/8	11	13,4	•	•	•	•				
								3/4	10	16,4	•	•	•	•				
								7/8	9	19,25	•	•	•	•				
								1	8	22	•	•	•	•				
Blind / through								Blind / through										
Blind / through			-	OX	CrN	-	OX	Blind / through			V	OX	V	OX				
Blind / through			PM	PM	HSSE	PM	PM	Blind / through			PM	HSSE	PM	HSSE				
Blind / through			FORM B	FORM B	FORM C	FORM C	FORM C	Blind / through			FORM B	FORM B	FORM C	FORM C				
Tolerance			3B	3B	3B	3B	3B	Tolerance			MED	MED	MED	MED				
P				•	•		•	P			•	•	•	•				
M					•			M			•	•	•	•				
K				•				K				•		•				
N					•			N			•		•	•				
S			•	•		•	•	S			•		•					
H				•			•	H			•		•					

Threading | Selection chart



By size

# SELECTION CHART

Threading | Selection chart | By size

**BSF**



**BA (BS93)**



Threading | Selection chart



By size

Product series				A-POT	S-POT	A-SFT	S-SFT	Product series				A-POT	S-POT	A-SFT	S-SFT
A-Brand				<b>A</b>		<b>A</b>		A-Brand				<b>A</b>		<b>A</b>	
Page				A.332	A.333	A.334	A.335	Page				A.336	A.337	A.338	A.339
Ø	I	Ø	Ø	Ø	Ø	Ø	Ø	Ø	I	Ø	Ø	Ø	Ø	Ø	Ø
1/4	26	5,3	•	•	•	•	•	0	1	5	•	•	•	•	
5/16	22	6,8	•	•	•	•	•	1	0,9	4,4	•	•	•	•	
3/8	20	8,3	•	•	•	•	•	2	0,81	3,9	•	•	•	•	
7/16	18	9,7	•	•	•	•	•	3	0,73	3,4	•	•	•	•	
1/2	16	11	•	•	•	•	•	4	0,66	3	•	•	•	•	
5/8	14	14	•	•	•	•	•	5	0,59	2,6	•	•	•	•	
3/4	12	16,8	•	•	•	•	•	6	0,53	2,3	•	•	•	•	
1	10	22,7	•	•	•	•	•	7	0,48	2	•	•	•	•	
								8	0,43	1,8	•	•	•	•	
								9	0,39	1,5	•	•	•	•	
								10	0,35	1,3	•	•	•	•	
								11	0,31	1,2	•	•	•	•	
								12	0,28	1	•	•	•	•	

Blind / through	V	OX	V	OX	Blind / through	V	OX	V	OX
	PM	HSSE	PM	HSSE		PM	HSSE	PM	HSSE
	FORM B	FORM B	FORM C	FORM C		FORM B	FORM B	FORM C	FORM C
<b>Tolerance</b>	MED	MED	MED	MED	<b>Tolerance</b>	-	-	-	-
<b>P</b>	•	•	•	•	<b>P</b>	•	•	•	•
<b>M</b>	•	•	•	•	<b>M</b>	•	•	•	•
<b>K</b>		•		•	<b>K</b>		•		•
<b>N</b>	•				<b>N</b>	•			
<b>S</b>	•				<b>S</b>	•			
<b>H</b>	•				<b>H</b>	•			

# SELECTION CHART

Threading | Selection chart | By size

**G**



Product series			A-POT	S-POT	POT	A-SFT	S-SFT	VA-SFT	SFT	SH-SFT	M-SFT DUPLEX	CC-SFT	VP-DC-MT	GG-MT	VX-OT
A-Brand			<b>A</b>			<b>A</b>									
Page			A.340	A.341	A.342	A.343	A.344	A.345	A.346	A.347	A.348	A.349	A.350	A.351	A.352
			DIN 5156	DIN 5156	DIN 5156	DIN 5156	DIN 5156	DIN 5156	DIN 5156	DIN 5156	DIN 5156	DIN 5156	DIN 5156	DIN 5156	-
1/16	28	6,8													
1/8	28	8,7	•	•	•	•	•	•	•	•	•	•	•	•	•
1/4	19	11,8	•	•	•	•	•	•	•	•	•	•	•	•	•
3/8	19	15,25	•	•	•	•	•	•	•	•	•	•	•	•	•
1/2	14	19	•	•	•	•	•	•	•	•	•	•	•	•	•
5/8	14	21	•	•	•	•	•	•	•	•	•	•	•	•	•
3/4	14	24,5	•	•	•	•	•	•	•	•	•	•	•	•	•
7/8	14	28,25	•	•	•	•	•	•	•	•	•	•	•	•	•
1	11	30,75	•	•	•	•	•	•	•	•	•	•	•	•	•
1 1/8	11	35,5											•		
1 1/4	11	39,5											•		
1 1/2	11	45,25											•		
1 3/4	11	51											•		
2	11	57											•		
Blind / through															
Blind / through			V	OX	-	V	OX	OX	-	-	TIN	CrN	V	NI-OX	V
			PM	HSSE	HSSE	PM	HSSE	HSSE	HSSE	HSSE	PM	HSSE	PM	HSSE	CARBIDE
			FORM B	FORM B	FORM B	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C	FORM C
Tolerance			-	-	-	-	-	-	-	-	-	-	-	-	-
P			•	•	•	•	•	•	•	•	•	•	•	•	•
M			•	•	•	•	•	•	•	•	•	•	•	•	•
K			•	•	•	•	•	•	•	•	•	•	•	•	•
N			•	•	•	•	•	•	•	•	•	•	•	•	•
S			•	•	•	•	•	•	•	•	•	•	•	•	•
H			•	•	•	•	•	•	•	•	•	•	•	•	•

Threading | Selection chart

By size



# SELECTION CHART

Threading | Selection chart | By size



**Rc  
(PT)**



**NPT**

**G**



Threading | Selection chart

By size

Product series				S-XPf	S-OIL-XPf	S-XPf-GL	M-NRT	Product series				A-SFT	A-TPT	S-TPT	Product series			A-SFT NPT	NPT
A-Brand				<b>A</b>	<b>A</b>	<b>A</b>		A-Brand				<b>A</b>	<b>A</b>		A-Brand			<b>A</b>	
Page				A.353	A.354	A.355	A.356	Page				A.357	A.358	A.359	Page			A.360	A.361
Ø	I	Ø <sub>min.</sub>	Ø <sub>max.</sub>	DN 2189	DN 2189	DN 2189	DN 2189	Ø	I	Ø	DN 5156	DN 5156	DN 5156	Ø	I	Ø	DN 5156	DN 2181	
1/8	28	9,24	9,35	•	•	•	•	1/16	28	6,15	•	•	•	1/16	27	6,15	•	•	
1/4	19	12,41	12,62	•	•	•	•	1/8	28	8,3	•	•	•	1/8	27	8,4	•	•	
3/8	19	15,92	16,12	•	•	•	•	1/4	19	11	•	•	•	1/4	18	11,1	•	•	
1/2	14	19,93	20,15	•	•	•	•	3/8	19	14,5	•	•	•	3/8	18	14,3	•	•	
5/8	14	21,89	22,11	•	•	•	•	1/2	14	18,1	•	•	•	1/2	14	17,9	•	•	
3/4	14	25,42	25,64	•	•	•	•	3/4	14	23,5	•	•	•	3/4	14	23,3	•	•	
7/8	14	29,18	29,40	•	•	•	•	1	11	29,6	•	•	•	1	11,5	29	•	•	
1	11	31,92	32,20	•	•	•	•												
Blind / through				V	V	V	TIN	Blind / through				V	V	OX	Blind / through			V	-
				HSS-Co	HSS-Co	HSS-Co	PM					PM	PM	HSSE				PM	HSSE
				FORM C	FORM C	FORM C	FORM C					FORM C	FORM C	FORM C				FORM C	FORM C
Tolerance				-	-	-	-	Tolerance				-	-	-	Tolerance			-	-
P				•	•	•	•	P				•	•	•	P			•	•
M				•	•	•	•	M				•	•	•	M			•	•
K				•	•	•	•	K				•	•	•	K			•	•
N				•	•	•	•	N				•	•	•	N			•	•
S				•	•	•	•	S				•	•	•	S			•	•
H				•	•	•	•	H				•	•	•	H			•	•






















# INDEX

## Threading

### Metric - Through hole

#### Cutting taps

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A-OIL-POT		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels Side through coolant	M6 - M24	A.95
A-POT 6GX		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels For 6G internal thread tolerance	M2 - M16	A.96
A-POT 7GX		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels For 7G internal thread tolerance	M2 - M16	A.97
A-POT+0.1		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels Oversized tap for 6H +0,1mm thread tolerance	M3 - M16	A.98
A-LT-POT		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels With long shank for long reach threading	M2 - M20	A.99
A-POT-LH		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels For left-hand threads	M3 - M24	A.100
A-POT-HB Weldon		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels With Weldon shank	M3 - M16	A.101
S-POT			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	M1 - M24	A.102
S-POT 6G			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels For 6G internal thread tolerance	M2 - M16	A.103
S-POT 7G			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels For 7G internal thread tolerance	M2 - M16	A.104
S-POT+0.1			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels Oversized tap for 6H +0,1mm thread tolerance	M3 - M16	A.105
S-LT-POT			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels With long shank for long reach threading	M2 - M20	A.106
S-POT-LH			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels For left-hand threads	M3 - M24	A.107
S-POT-HB Weldon			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels With Weldon shank	M3 - M16	A.108
VA-POT			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	M2 - M36	A.109
VA-POT 6G			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	M2 - M16	A.110
Z-POT			Powder metal spiral-point cutting tap for through holes High speed tapping in general steels and stainless steels	M2 - M30	A.111
Z-OIL-POT			Powder metal spiral-point cutting tap for through holes High speed tapping in general steels and stainless steels Side through coolant	M6 - M20	A.112





























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## Threading

### Metric - Through hole

#### Cutting taps

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	POT		HSSE spiral-point cutting tap for through holes For general purpose applications According to DIN 352 shank reduced length	M3 - M10	A.114
	TIN-POT	 TiN	HSSE spiral-point cutting tap for through holes For steels up to 850 N/mm <sup>2</sup>	M2 - M30	A.115
	TICN-POT	 V	HSSE spiral-point cutting tap for through holes For steels up to 1000 N/mm <sup>2</sup>	M2 - M24	A.116
	CC-POT	 CrN	HSSE spiral-point cutting tap for through holes For general steels and stainless steels Developed for rigid tapping on CNC machines	M2 - M30	A.117
	CC-LT-POT	 CrN	HSSE spiral-point cutting tap for through holes For general steels and stainless steels With long shank for long reach threading	M2 - M12	A.118
	HS-RFT-TIN	 TiN	HSSE spiral-flute cutting tap for through holes For high speed tapping in various materials Right-hand cut with left-hand flute for chip evacuation towards front	M3 - M12	A.119
	AL-POT		HSSE spiral-point cutting tap for through holes For aluminium and cast aluminium	M2 - M20	A.120
	V-TI-POT	 V	Powder metal spiral-point cutting tap for through holes For Titanium alloys	M3 - M12	A.121
	E-POT		Powder metal spiral-point cutting tap for through holes For Nickel-based alloys including Inconel 718	M3 - M12	A.122
	WHR-NI-POT	 HR	Powder metal spiral-point cutting tap for through holes For Nickel-based alloys including Inconel 718	M3 - M12	A.123
	CPM-POT		Powder metal spiral-point cutting tap for through holes For steels up to 900 N/mm <sup>2</sup> and cast iron	M3 - M20	A.124
	H-POT	 0X	Powder metal spiral-point cutting tap for through holes For hardened steels up to 45 HRC	M2 - M20	A.125
	VP-H-POT	 V	Powder metal spiral-point cutting tap for through holes For hardened steels up to 45 HRC	M2 - M36	A.126
	VPO-H-POT	 V	Powder metal spiral-point cutting tap for through holes For hardened steels up to 45 HRC Side through coolant	M6 - M36	A.127























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## Threading

### Metric - Blind hole

#### Cutting taps

Product series		A-Brand	Features	Range	Page
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A-OIL-SFT	 V	<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels Centre through coolant	M6 - M56	A.129
A-SFT 6GX	 V	<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels For 6G internal thread tolerance	M2 - M16	A.130
A-SFT 7GX	 V	<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels For 7G internal thread tolerance	M2 - M16	A.131
A-SFT +0.1	 V	<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels Oversized tap for 6H +0,1mm thread tolerance	M3 - M16	A.132
A-SFT FORM E	 V	<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels Form E chamfer	M3 - M16	A.133
A-LT-SFT	 V	<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels With long shank for long reach threading	M2 - M20	A.134
A-SFT-LH	 V	<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels For left-hand threads	M3 - M24	A.135
A-SFT-HB Weldon	 V	<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels With Weldon shank	M3 - M16	A.136
A-CSF OIL	 FX	<b>A</b>	Carbide spiral-fluted cutting tap for blind holes For cast iron and aluminium cast Centre through coolant	M5 - M12	A.137
A-CSF OIL FORM E	 FX	<b>A</b>	Carbide spiral-fluted cutting tap for blind holes For cast iron and aluminium cast Centre through coolant, Form E chamfer	M5 - M12	A.138
S-SFT	 OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	M1 - M24	A.139
S-SFT 6G	 OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels For 6G internal thread tolerance	M2 - M16	A.140
S-SFT 7G	 OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels For 7G internal thread tolerance	M2 - M16	A.141
S-SFT+0.1	 OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels Oversized tap for 6H +0,1mm thread tolerance	M3 - M16	A.142
S-SFT FORM E	 OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels Form E chamfer	M3 - M16	A.143
S-LT-SFT	 OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels With long shank for long reach threading	M2 - M20	A.144
S-SFT-LH	 OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels For left-hand threads	M3 - M24	A.145
S-SFT-HB Weldon	 OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels With Weldon shank	M3 - M16	A.146























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### Metric - Blind hole

#### Cutting taps

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	VA-SFT 6G	OX	HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels For 6G internal thread tolerance	M2 - M16	A.148
	VA-SFT FORM E	OX	HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels Form E chamfer	M3 - M16	A.149
	Z-SFT	V	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels and stainless steels	M2 - M30	A.150
	Z-OIL-SFT	V	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels and stainless steels Centre through coolant	M6 - M20	A.151
	SFT		HSSE spiral-flute cutting tap for blind holes For general purpose applications	M2 - M36	A.152
	SFT		HSSE spiral-flute cutting tap for blind holes For general purpose applications According to DIN 352 shank reduced length	M3 - M10	A.153
	TIN-SFT	TiN	HSSE spiral-flute cutting tap for blind holes For steels up to 850 N/mm <sup>2</sup>	M2 - M30	A.154
	TICN-SFT	V	HSSE spiral-flute cutting tap for blind holes For steels up to 850 N/mm <sup>2</sup>	M2 - M24	A.155
	HXL-SFT	OX	HSSE low spiral-fluted cutting tap for blind holes For steels and cast iron For horizontal applications in oil and heavy industry	M20 - M56	A.156
	OIL-HXL-SFT	OX	HSSE low spiral-fluted cutting tap for blind holes For steels and cast iron Centre through coolant, for horizontal applications in oil and heavy industry	M20 - M56	A.157
	VXL-SFT	OX	HSSE high spiral-fluted cutting tap for blind holes For general steels For vertical applications in oil and heavy industry	M20 - M56	A.158
	OIL-VXL-SFT	OX	HSSE high spiral-fluted cutting tap for blind holes For general steels Centre through coolant, for vertical applications in oil and heavy industry	M20 - M56	A.159
	SH-SFT		HSSE low spiral-fluted cutting tap for blind holes For alloyed steels $\geq 1100\text{N/mm}^2$ Short chip creation	M3 - M20	A.160
	M-SFT-DUPLEX NEW	TiN	Powder metal spiral-fluted cutting tap for blind holes For stainless steels, DUPLEX and Super Duplex	M2 - M24	A.161
	CC-SFT	CrN	HSSE spiral-flute cutting tap for blind holes For general steels, stainless steels and aluminium Developed for rigid tapping on CNC machines	M2 - M36	A.162
	CC-LT-SFT	CrN	HSSE spiral-flute cutting tap for blind holes For general steels, stainless steels and aluminium With long shank for long reach threading	M2 - M12	A.163
	CC-NEO-SFT	TiN	HSSE spiral-flute cutting tap for blind holes For general steels, stainless steels and aluminium Variable helix for better chip evacuation	M2 - M16	A.164



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## Threading

### Metric - Blind hole

#### Cutting taps

Product series	A-Brand	Features	Range	Page
SUS-SFT	OX	HSSE high spiral-fluted cutting tap for blind holes For stainless steels	M2 - M24	A.165
HS-SFT-TIN	TiN	HSSE spiral-flute cutting tap for blind holes For high speed tapping in various materials	M3 - M12	A.166
AL-SFT		HSSE spiral-flute cutting tap for blind holes For aluminium and cast aluminium	M1,6 - M20	A.167
US-AL-SFT	V	HSSE spiral-flute cutting tap for blind holes For high speed tapping in aluminium and cast aluminium Developed for rigid tapping on CNC machines	M3 - M12	A.168
V-TI-SFT	V	Powder metal low spiral-fluted cutting tap for blind holes For Titanium alloys	M1,6 - M12	A.169
E-SFT		Powder metal low spiral-fluted cutting tap for blind holes For Nickel-based alloys including Inconel 718	M3 - M12	A.170
WHR-NI-SFT	HR	Powder metal low spiral-fluted cutting tap for blind holes For Nickel-based alloys including Inconel 718	M3 - M12	A.171
CPM-SFT		Powder metal low spiral-fluted cutting tap for blind holes For steels up to 900 N/mm <sup>2</sup> and cast iron	M3 - M16	A.172
H-SFT	OX	Powder metal low spiral-fluted cutting tap for blind holes For hardened steels up to 45 HRC	M2 - M20	A.173
VP-H-SFT	V	Powder metal low spiral-fluted cutting tap for blind holes For hardened steels up to 45 HRC	M2 - M36	A.174
VPO-H-SFT	V	Powder metal spiral-fluted cutting tap for blind holes For hardened steels up to 45 HRC Centre through coolant	M6 - M36	A.175
V-EM-SFT	V	HSSE spiral-flute cutting tap for blind holes For die cast aluminium Centre through coolant, with end cut, for pre-formed cast holes	M4 - M16	A.176

### Metric - Through & Blind hole

#### Cutting taps

Product series	A-Brand	Features	Range	Page
VP-DC-MT	V	Powder metal straight flute cutting tap for through and blind holes For cast iron and aluminium cast Synchro taps at cutting speeds > 30 m/min	M2 - M30	A.177
VP-DC-MT FORM E	V	Powder metal straight flute cutting tap for through and blind holes For cast iron and aluminium cast Synchro taps at cutting speeds > 30 m/min, chamfer Form E	M3 - M24	A.178
VPO-DC-MT Centre	V	Powder metal straight flute cutting tap for blind holes For cast iron and aluminium cast Synchro taps at cutting speeds > 30 m/min, with centre through coolant	M6 - M20	A.179
VPO-DC-MT Side	V	Powder metal straight flute cutting tap for through and blind holes For cast iron and aluminium cast Synchro taps at cutting speeds > 30 m/min, with side through coolant	M6 - M20	A.180
VPO-DC-MT FORM E	V	Powder metal straight flute cutting tap for blind holes For cast iron and aluminium cast Synchro taps at cutting speeds > 30 m/min, centre coolant through, chamfer Form E	M6 - M24	A.181


























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## Threading

### Metric - Through & Blind hole












#### Cutting taps

Product series		A-Brand	Features	Range	Page
 A-CHT OIL Centre	 FX	<b>A</b>	Carbide straight flute cutting tap for blind holes For cast iron and aluminium cast Centre through coolant	M5 - M12	A.182
 A-CHT OIL Side	 FX	<b>A</b>	Carbide straight flute cutting tap for through and blind holes For cast iron and aluminium cast Side through coolant	M5 - M12	A.183
 A-CHT OIL FORM E	 FX	<b>A</b>	Carbide straight flute cutting tap for blind holes For cast iron and aluminium cast Centre through coolant Form E chamfer	M5 - M12	A.184
 GG-MT	 NI-0X		HSSE straight flute cutting tap for blind and through holes For cast iron	M4 - M20	A.185
 OIL-TXL-MT	 0X		HSSE straight flute cutting tap for blind and through holes For cast iron and general steels For vertical and horizontal applications, side through coolant Up to M56	M20 - M56	A.186
 EX-MCT	 0X		HSSE low left-hand helix for blind and through holes For cast iron, cast aluminium and general steels Long shank for long reach tapping	M6 - M20	A.187
 V-XPM-HT	 V		Powder metal straight flute cutting tap for through and blind holes For hardened steels up to 52 HRC Highly wear resistant XPM tool substrate	M3 - M12	A.188
 V-XPM-HT FORM D NEW	 V		Powder metal straight flute cutting tap for through and blind holes For hardened steels up to 52 HRC, Chamfer Form D Highly wear resistant XPM tool substrate	M3 - M12	A.189
 WH55-OT	 V		Carbide straight flute cutting tap for blind and through holes For hardened steels up to 55 HRC	M3 - M12	A.190
 WH55-OT FORM D	 V		Carbide straight flute cutting tap for through holes For hardened steels up to 55 HRC Chamfer Form D	M3 - M12	A.191
 VX-OT	 V		Carbide straight flute cutting tap for blind and through holes For hardened steels up to 62 HRC	M3 - M12	A.192



### Metric - Forming

#### Forming taps

Product series		A-Brand	Features	Range	Page
 A-XPF	 V	<b>A</b>	Powder metal forming tap for through and blind holes High speed tapping in general steels, aluminium, stainless steels Powder metal for long tool life	M3 - M30	A.193
 A-OIL-XPF	 V	<b>A</b>	Powder metal forming tap for through and blind holes High speed tapping in general steels, aluminium, stainless steels Side through coolant	M5 - M45	A.194
 S-XPF	 V	<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium	M1 - M30	A.195
 S-OIL-XPF	 V	<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Side through coolant	M5 - M45	A.196
 S-XPF 6GX	 V	<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium For 6G internal thread tolerance	M2 - M16	A.197

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


















## Threading

### Metric - Forming

#### Forming taps

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Product series		A-Brand	Features	Range	Page
S-OIL-XPf 6GX		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium For 6G internal thread tolerance, side through coolant	M5 - M16	A.198
S-XPf 7GX		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium For 7G internal thread tolerance	M2 - M16	A.199
S-XPf+0.1		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Oversized tap for 6H +0,1mm thread tolerance	M3 - M16	A.200
S-XPf FORM D		<b>A</b>	HSSE forming tap for through holes For general steels, stainless steels, aluminium Chamfer Form D	M3 - M16	A.201
S-XPf FORM E		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Chamfer Form E	M2 - M16	A.202
S-OIL-XPf FORM E		<b>A</b>	HSSE forming tap for blind holes For general steels, stainless steels, aluminium Centre through coolant, chamfer Form E	M5 - M16	A.203
S-LT-XPf		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium With long shank for long reach threading	M2 - M12	A.204
S-OIL-LT-XPf		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium With long shank for long reach threading, side through coolant	M6 - M12	A.205
S-XPf-LH		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium For left-hand threads	M3 - M24	A.206
S-XPf-HB Weldon		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium With Weldon shank	M3 - M16	A.207
S-XPf-GL		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Without oil grooves for higher rigidity	M3 - M12	A.208
S-XPf-GL 6GX		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Without oil grooves for higher rigidity, For 6G internal thread tolerance	M3 - M12	A.209
C-OIL-XPf		<b>A</b>	Carbide forming tap for through and blind holes For general steels, stainless steels, aluminium With side through coolant	M5 - M16	A.210
R-XPf			HSS forming tap for through and blind holes For general steels, stainless steels, aluminium	M3 - M6	A.211
R-XPf FORM D			HSS forming tap for through holes For general steels, stainless steels, aluminium	M3 - M6	A.212
R-XPf 6GX			HSS forming tap for through and blind holes For general steels, stainless steels, aluminium For 6G internal thread tolerance	M3 - M6	A.213
V-NRT			HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium	M1 - M12	A.214
V-NRT 6GX			HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium For 6G internal thread tolerance	M2 - M10	A.215
V-NRT FORM D			HSSE forming tap for through holes For general steels, stainless steels, aluminium Chamfer Form D	M2 - M12	A.216

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## Threading

### Metric - Forming

#### Forming taps












Product series		A-Brand	Features	Range	Page
V-NRT 6GX FORM D			HSSE forming tap for through holes For general steels, stainless steels, aluminium For 6G internal thread tolerance, chamfer Form D	M2 - M10	A.217
M-NRT NEW			Powder metal forming tap for through and blind holes For stainless steel and aluminium	M1 - M24	A.218
M-OIL-NRT NEW			Powder metal forming tap for through and blind holes For stainless steel and aluminium Side through coolant	M5 - M24	A.219
M-NRT 6GX NEW			Powder metal forming tap for through and blind holes For stainless steel and aluminium For 6G internal thread tolerance	M2 - M16	A.220
M-NRT FORM E NEW			Powder metal forming tap for through and blind holes For stainless steel and aluminium Chamfer Form E	M2 - M16	A.221
M-OIL-NRT FORM E NEW			Powder metal forming tap for blind holes For stainless steel and aluminium Centre through coolant, Chamfer Form E	M5 - M16	A.222

### Metric Fine - Through hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
A-POT		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels	MF2,5 - MF24	A.223
A-OIL-POT		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels Side through coolant	MF8 - MF20	A.224
A-POT 6GX		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels For 6G internal thread tolerance	MF6 - MF24	A.225
S-POT			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	MF3 - MF24	A.226
S-POT 6G			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels For 6G internal thread tolerance	MF6 - MF24	A.227
VA-POT			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	MF3 - MF24	A.228
Z-POT			Powder metal spiral-point cutting tap for through holes High speed tapping in steels and stainless steels	MF3 - MF24	A.229
POT	-		HSSE spiral-point cutting tap for through holes For general purpose applications	MF4 - MF30	A.230
CC-POT			HSSE spiral-point cutting tap for through holes For general steels and stainless steels Developed for rigid tapping on CNC machines	MF6 - MF24	A.231
H-POT			Powder metal spiral-point cutting tap for through holes For hardened steels up to 45 HRC	MF3 - MF24	A.232















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## Threading

### Metric Fine - Blind hole

#### Cutting taps

Product series		A-Brand	Features	Range	Page
A-SFT		<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels	MF2,5 - MF24	A.233
A-OIL-SFT		<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels Centre through coolant	MF8 - MF20	A.234
A-SFT 6GX		<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels For 6G internal thread tolerance	MF6 - MF24	A.235
A-CSF OIL		<b>A</b>	Carbide spiral-fluted cutting tap for blind holes For cast iron and aluminium cast Centre through coolant	MF8 - MF20	A.236
A-CSF OIL FORM E		<b>A</b>	Carbide spiral-fluted cutting tap for blind holes For cast iron and aluminium cast Centre through coolant Form E chamfer	MF8 - MF16	A.237
S-SFT			HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	MF3 - MF24	A.238
S-SFT 6G			HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels For 6G internal thread tolerance	MF6 - MF24	A.239
VA-SFT			HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	MF3 - MF24	A.240
Z-SFT			Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels and stainless steels	MF3 - MF24	A.241
SFT			HSSE spiral-flute cutting tap for blind holes For general purpose applications	MF4 - MF30	A.242
CC-SFT			HSSE spiral-flute cutting tap for blind holes For general steels, stainless steels and aluminium Developed for rigid tapping on CNC machines	MF6 - MF24	A.243
SUS-SFT			HSSE high spiral-fluted cutting tap for blind holes For stainless steels	MF8 - MF24	A.244
AL-SFT			HSSE spiral-flute cutting tap for blind holes For aluminium and cast aluminium	MF8 - MF12	A.245
H-SFT			Powder metal low spiral-fluted cutting tap for blind holes For hardened steels up to 45 HRC	MF3 - MF24	A.246

















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## Threading







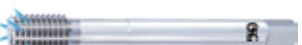





### Metric Fine - Through & Blind hole

#### Cutting taps

	Product series		A-Brand	Features	Range	Page
	VP-DC-MT			Powder metal straight flute cutting tap for through and blind holes For cast iron and aluminium cast Synchro taps at cutting speeds > 30 m/min	MF3 - MF24	A.247
	VPO-DC-MT Centre			Powder metal straight flute cutting tap for blind holes For cast iron and aluminium cast Synchro taps at cutting speeds > 30 m/min Centre through coolant	MF8 - MF20	A.248
	VPO-DC-MT Side			Powder metal straight flute cutting tap for through holes For cast iron and aluminium cast Synchro taps at cutting speeds > 30 m/min Side through coolant	MF8 - MF20	A.249
	A-CHT OIL Centre		<b>A</b>	Carbide straight flute cutting tap for blind holes For cast iron and aluminium cast Centre through coolant	MF8 - MF20	A.250
	A-CHT OIL Side		<b>A</b>	Carbide straight flute cutting tap for through holes For cast iron and aluminium cast Side through coolant	MF8 - MF20	A.251
	A-CHT OIL FORM E		<b>A</b>	Carbide straight flute cutting tap for blind holes For cast iron and aluminium cast Centre through coolant Form E chamfer	MF10 - MF16	A.252
	GG-MT			HSSE straight flute cutting tap for blind and through holes For cast iron	MF3 - MF24	A.253

### Metric Fine - Forming

#### Forming taps

	Product series		A-Brand	Features	Range	Page
	A-XPF		<b>A</b>	Powder metal forming tap for through and blind holes High speed tapping in general steels, aluminium, stainless steels Powder metal for long tool life	MF8 - MF24	A.254
	A-OIL-XPF		<b>A</b>	Powder metal forming tap for through and blind holes High speed tapping in general steels, aluminium, stainless steels Side through coolant	MF8 - MF24	A.255
	S-XPF		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium	MF4 - MF24	A.256
	S-OIL-XPF		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Side through coolant	MF8 - MF24	A.257
	S-XPF 6GX		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium For 6G internal thread tolerance	MF8 - MF24	A.258
	S-OIL-XPF 6GX		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Side through coolant For 6G internal thread tolerance	MF8 - MF24	A.259














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## Threading

### Metric Fine - Forming





#### Forming taps

Product series	 A-Brand	Features	Range	Page
S-XPf FORM D	 <b>V</b> <b>A</b>	HSSE forming tap for through holes For general steels, stainless steels, aluminium Chamfer Form D	MF8 - MF20	A.260
S-XPf FORM E	 <b>V</b> <b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Chamfer Form E	MF10 - MF16	A.261
S-OIL-XPf FORM E	 <b>V</b> <b>A</b>	HSSE forming tap for blind holes For general steels, stainless steels, aluminium Centre through coolant Chamfer Form E	MF8 - MF24	A.262
S-OIL-LT-XPf	 <b>V</b> <b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium With long shank for long reach threading, side through coolant	MF8 - MF14	A.263
S-XPf-GL	 <b>V</b> <b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Without oil grooves for higher rigidity	MF8 - MF24	A.264
S-XPf-GL 6GX	 <b>V</b> <b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Without oil grooves for higher rigidity, For 6G internal thread tolerance	MF8 - MF24	A.265
C-OIL-XPf	 <b>V</b> <b>A</b>	Carbide forming tap for through and blind holes For general steels, stainless steels, aluminium Side through coolant	MF8 - MF16	A.266
V-NRT	 <b>V</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium	MF8 - MF12	A.267
V-NRT FORM D	 <b>V</b>	HSSE forming tap for through holes For general steels, stainless steels, aluminium Chamfer Form D	MF8 - MF12	A.268
M-NRT NEW	 <b>TIN</b>	Powder metal forming tap for through and blind holes For stainless steel and aluminium	MF4 - MF24	A.269

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### UNC - Through hole

#### Cutting taps

Product series	 A-Brand	Features	Range	Page
A-POT	 <b>V</b> <b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels	N.2 - 1"	A.270
S-POT	 <b>OX</b>	HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	N.2 - 1"	A.271
VA-POT	 <b>OX</b>	HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	N.4 - 1"	A.272



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## Threading

### UNC - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
A-SFT		<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels	N.2 - 1"	A.273
S-SFT			HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	N.2 - 1 1/2"	A.274
VA-SFT			HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	N.4 - 1"	A.275
HXL-SFT			HSSE low spiral-fluted cutting tap for blind holes For steels and cast iron For horizontal applications in oil and heavy industry	3/4 - 2 1/2"	A.276
VXL-SFT			HSSE high spiral-fluted cutting tap for blind holes For general steels For vertical applications in oil and heavy industry	3/4 - 2 1/2"	A.277

### UNC - Through & Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
VP-DC-MT			Powder metal straight flute cutting tap for through and blind holes For cast iron and aluminium cast Synchro taps at cutting speeds > 30 m/min	N.2 - 1"	A.278

### UNC - Forming

#### Forming taps



Product series		A-Brand	Features	Range	Page
S-XPF		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium	N.5 - 1"	A.279
S-OIL-XPF		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Side through coolant	1/4 - 1"	A.280






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## Threading

### UNF - Through hole

#### Cutting taps






Product series		A-Brand	Features	Range	Page
A-POT	 V	<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels	N.2 - 1"	A.281
S-POT	 OX		HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	N.2 - 1"	A.282
VA-POT	 OX		HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	N.6 - 1"	A.283

### UNF - Blind hole

#### Cutting taps




Product series		A-Brand	Features	Range	Page
A-SFT	 V	<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels	N.2 - 1"	A.284
S-SFT	 OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	N.2 - 1"	A.285
VA-SFT	 OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	N.6 - 1"	A.286

### UNF - Through & Blind hole

#### Cutting taps





Product series		A-Brand	Features	Range	Page
VP-DC-MT	 V		Powder metal straight flute cutting tap for through and blind holes For cast iron and aluminium cast Synchro taps at cutting speeds > 30 m/min	N.2 - 1"	A.287

### UNF - Forming

#### Forming taps



Product series		A-Brand	Features	Range	Page
S-XPF	 V	<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium	N.6 - 1"	A.288
S-OIL-XPF	 V	<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Side through coolant	1/4 - 1"	A.289



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## Threading

### MJ - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
CC-NEO-SFT		TiN	HSSE spiral-flute cutting tap for blind holes For general steels, stainless steels and aluminium Variable helix for better chip evacuation	MJ2 - MJ12	A.290
V-TI-SFT		V	Powder metal low spiral-fluted cutting tap for blind holes For Titanium alloys	MJ2 - MJ12	A.291

### UNJC - Through hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
VA-POT		OX	HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	N.4 - N.8	A.292
V-TI-POT		V	Powder metal spiral-point cutting tap for through holes For Titanium alloys	N.4 - N.8	A.293
E-POT			Powder metal spiral-point cutting tap for through holes For Nickel-based alloys including Inconel 718	N.4 - 1"	A.294
WHR-NI-POT		HR	Powder metal spiral-point cutting tap for through holes For Nickel-based alloys including Inconel 718	N.4 - 1"	A.295
H-POT		OX	Powder metal spiral-point cutting tap for through holes For hardened steels up to 45 HRC	N.4 - N.8	A.296

### UNJC - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
VA-SFT		OX	HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	N.4 - N.8	A.297
CC-SFT		CrN	HSSE spiral-flute cutting tap for blind holes For general steels, stainless steels and aluminium Developed for rigid tapping on CNC machines	N.4 - 1"	A.298
V-TI-SFT		V	Powder metal low spiral-fluted cutting tap for blind holes For Titanium alloys	N.4 - N.8	A.299
E-SFT			Powder metal low spiral-fluted cutting tap for blind holes For Nickel-based alloys including Inconel 718	N.4 - 1"	A.300
WHR-NI-SFT		HR	Powder metal low spiral-fluted cutting tap for blind holes For Nickel-based alloys including Inconel 718	N.4 - 1"	A.301
H-SFT		OX	Powder metal low spiral-fluted cutting tap for blind holes For hardened steels up to 45 HRC	N.4 - N.8	A.302



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## Threading

### UNJF - Through hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
VA-POT	OX		HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	N.10 - 1/2	A.303
V-TI-POT	V		Powder metal spiral-point cutting tap for through holes For Titanium alloys	N.10 - 1/2	A.304
E-POT			Powder metal spiral-point cutting tap for through holes For Nickel-based alloys including Inconel 718	N.10 - 7/8	A.305
WHR-NI-POT	HR		Powder metal spiral-point cutting tap for through holes For Nickel-based alloys including Inconel 718	N.10 - 7/8	A.306
H-POT	OX		Powder metal spiral-point cutting tap for through holes For hardened steels up to 45 HRC	N.10 - 1/2	A.307

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### UNJF - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
VA-SFT	OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	N.10 - 1/2	A.308
CC-SFT	CrN		HSSE spiral-flute cutting tap for blind holes For general steels, stainless steels and aluminium Developed for rigid tapping on CNC machines	N.10 - 1"	A.309
V-TI-SFT	V		Powder metal low spiral-fluted cutting tap for blind holes For Titanium alloys	N.10 - 1/2	A.310
E-SFT			Powder metal low spiral-fluted cutting tap for blind holes For Nickel-based alloys including Inconel 718	N.10 - 7/8	A.311
WHR-NI-SFT	HR		Powder metal low spiral-fluted cutting tap for blind holes For Nickel-based alloys including Inconel 718	N.10 - 7/8	A.312
H-SFT	OX		Powder metal low spiral-fluted cutting tap for blind holes For hardened steels up to 45 HRC	N.10 - 1/2	A.313

### HELICOIL M - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
CC-HL-SFT	CrN		HSSE spiral-flute cutting tap for blind holes For general steels, stainless steels and aluminium Developed for rigid tapping on CNC machines, for thread insert	M3 - M20	A.314

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## Threading

### HELICOIL MJ - Through hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
E-HL-POT			Powder metal spiral-point cutting tap for through holes For Nickel-based alloys including Inconel 718 For thread insert	MJ2 - MJ10	A.315
H-HL-POT			Powder metal spiral-point cutting tap for through holes For hardened steels up to 45 HRC For thread insert	MJ2 - MJ10	A.316

### HELICOIL MJ - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
E-HL-SFT			Powder metal low spiral-fluted cutting tap for blind holes For Nickel-based alloys including Inconel 718 For thread insert	MJ2 - MJ10	A.317
H-HL-SFT			Powder metal spiral-fluted cutting tap for blind holes For hardened steels up to 45 HRC For thread insert	MJ2 - MJ10	A.318

### HELICOIL UNJC - Through hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
E-HL-POT			Powder metal spiral-point cutting tap for through holes For Nickel-based alloys including Inconel 718 For thread insert	N.4 - N.8	A.319
H-HL-POT			Powder metal spiral-point cutting tap for through holes For hardened steels up to 45 HRC For thread insert	N.4 - N.8	A.320

### HELICOIL UNJC - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
E-HL-SFT			Powder metal low spiral-fluted cutting tap for blind holes For Nickel-based alloys including Inconel 718 For thread insert	N.4 - N.8	A.321
H-HL-SFT			Powder metal low spiral-fluted cutting tap for blind holes For hardened steels up to 45 HRC For thread insert	N.4 - N.8	A.322



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## Threading

### HELICOIL UNJF - Through hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
E-HL-POT			Powder metal spiral-point cutting tap for through holes For Nickel-based alloys including Inconel 718 For thread insert	N.10 - 1/2	A.323
H-HL-POT	OX		Powder metal spiral-point cutting tap for through holes For hardened steels up to 45 HRC For thread insert	N.10 - 1/2	A.324

### HELICOIL UNJF - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
CC-HL-SFT	CrN		HSSE spiral-flute cutting tap for blind holes For general steels, stainless steels and aluminium Developed for rigid tapping on CNC machines, for thread insert	N.10 - 3/8	A.325
E-HL-SFT			Powder metal low spiral-fluted cutting tap for blind holes For Nickel-based alloys including Inconel 718 For thread insert	N.10 - 1/2	A.326
H-HL-SFT	OX		Powder metal low spiral-fluted cutting tap for blind holes For hardened steels up to 45 HRC For thread insert	N.10 - 1/2	A.327

### BSW - Through hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
A-POT	V	A	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels	1/8 - 1"	A.328
S-POT	OX		HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	1/8 - 1"	A.329

### BSW - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
A-SFT	V	A	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels	1/8 - 1"	A.330
S-SFT	OX		HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	1/8 - 1"	A.331



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## Threading

### BSF - Through hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
A-POT		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels	1/4 - 1"	A.332
S-POT			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	1/4 - 1"	A.333

### BSF - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
A-SFT		<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels	1/4 - 1"	A.334
S-SFT			HSSE spiral-point cutting tap for blind holes General purpose tapping in steels and stainless steels	1/4 - 1"	A.335

### BA - Through hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
A-POT		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels	N.0 - N.12	A.336
S-POT			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	N.0 - N.12	A.337

### BA - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
A-SFT		<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels	N.0 - N.12	A.338
S-SFT			HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	N.0 - N.12	A.339



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## Threading

### G - Through hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
A-POT		<b>A</b>	Powder metal spiral-point cutting tap for through holes High speed tapping in general steels, aluminium, stainless steels	1/8 - 1"	A.340
S-POT			HSSE spiral-point cutting tap for through holes General purpose tapping in steels and stainless steels	1/8 - 1"	A.341
POT			HSSE spiral-point cutting tap for through holes For general purpose applications	1/8 - 1"	A.342

### G - Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
A-SFT		<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels, aluminium, stainless steels	1/8 - 1"	A.343
S-SFT			HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	1/8 - 1"	A.344
VA-SFT			HSSE spiral-flute cutting tap for blind holes General purpose tapping in steels and stainless steels	1/8 - 1"	A.345
SFT			HSSE spiral-flute cutting tap for blind holes For general purpose applications	1/8 - 1"	A.346
SH-SFT			HSSE low spiral-fluted cutting tap for blind holes For alloyed steels $\geq 1100\text{N/mm}^2$ Short chip creation	1/8 - 1/2"	A.347
M-SFT-DUPLEX NEW			Powder metal spiral-fluted cutting tap for blind holes For stainless steels, DUPLEX and Super Duplex	1/8 - 1"	A.348
CC-SFT			HSSE spiral-flute cutting tap for blind holes For general steels, stainless steels and aluminium Developed for rigid tapping on CNC machines	1/8 - 1/2"	A.349

### G - Through & Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
VP-DC-MT			Powder metal straight flute cutting tap for through and blind holes For cast iron and cast aluminium Synchro taps at cutting speeds $> 30\text{ m/min}$	1/16 - 2"	A.350
GG-MT			HSSE straight flute cutting tap for blind and through holes NiOx coating For cast iron	1/8 - 1/2"	A.351
VX-OT			Carbide straight flute cutting tap for blind and through holes For hardened steels up to 62 HRC	1/8 - 1/2"	A.352







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## Threading

### G - Forming

#### Forming taps






Product series		A-Brand	Features	Range	Page
S-XPf		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium	1/8 - 1"	A.353
S-OIL-XPf		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Side through coolant	1/4 - 1"	A.354
S-XPf-GL		<b>A</b>	HSSE forming tap for through and blind holes For general steels, stainless steels, aluminium Without oil grooves for higher rigidity	1/8 - 1"	A.355
M-NRT NEW			Powder metal forming tap for through and blind holes For stainless steel and aluminium	1/8 - 3/4"	A.356

### Rc (BSPT) - Through & Blind hole

#### Cutting taps




Product series		A-Brand	Features	Range	Page
A-SFT RC		<b>A</b>	Powder metal spiral flute cutting tap for blind holes High speed tapping in general steels and aluminium RC (ISO) tapered 1:16	1/16 - 1"	A.357
A-TPT		<b>A</b>	Powder metal straight flute cutting tap for through and blind holes High speed tapping in general steels and aluminium RC (BSPT) tapered 1:16	1/8 - 1"	A.358
S-TPT			HSSE straight flute cutting tap for through and blind holes For general steels and aluminium RC (BSPT) tapered 1:16	1/8 - 1"	A.359

### NPT - Through & Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
A-SFT NPT NEW		<b>A</b>	Powder metal spiral-fluted cutting tap for blind holes High speed tapping in general steels and aluminium Tapered 1:16	1/16 - 1"	A.360
NPT			HSSE straight flute cutting tap for through and blind holes For general steels, aluminium and cast iron Tapered 1:16	1/16 - 1"	A.361

### PG - Through & Blind hole

#### Cutting taps



Product series		A-Brand	Features	Range	Page
PG			HSSE straight flute cutting tap for through and blind holes For general steels, aluminium and cast iron For PG thread	7 - 48"	A.362



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## Threading

### Serial Form - Through & Blind hole

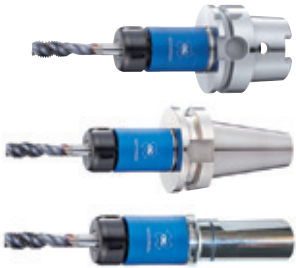
#### Cutting taps



Product series		A-Brand	Features	Range	Page
HT			HSS straight flute cutting tap for through and blind holes For general steels, aluminium and cast iron Progressive thread, set of 3 taps with short shank	M2 - M20	A.363
HT-VA-OX	OX		HSSE straight flute cutting tap for through and blind holes For general steels, aluminium and cast iron Progressive thread, set of 3 taps with short shank	M2 - M20	A.364

### Tapping Holder

#### Cutting taps



Product series		A-Brand	Features	Range	Page
SynchronMaster			Tap holder synchronized For tapping sizes from M3 to M12 HSK type, for ER16 collet type	-	A.365
SynchronMaster			Tap holder synchronized For tapping sizes from M3 to M12 BT type, for ER16 collet type	-	A.365
SynchronMaster			Tap holder synchronized For tapping sizes from M3 to M12 Straight shank type, for ER16 collet type	-	A.365

### Thread Mill

#### Thread Mill



Product series		A-Brand	Features	Range	Page
AT-1	EgiAs	A	One pass thread mill Milling for internal thread	M6 - M24	A.367
AT-2 NEW	DUREY	A	Thread milling without pre-drilled hole for hardened materials Left-hand (spindle rotation left) Up to 65HRC	M3 - M20	A.368
AT-2 R-SPEC NEW	DLC-IGUSS	A	Thread milling without pre-drilled hole Left-hand (spindle rotation left), 2 flutes For aluminium	M3 - M12	A.369
WH-EM-PNC	WXS		Thread milling without pre-drilled hole Left-hand (spindle rotation left)	M3 - M12	A.370
WHO-EM-PNC NEW	WXS		Thread milling without pre-drilled hole for hardened materials Left-hand (spindle rotation left) Centre through coolant Up to 62HRC	M3 - M16	A.371
WX-ST-PNC-3P	SC WXS		Carbide thread milling cutter with 3 crest thread length For all materials and hardened steels up to 50 HRC	M1,8 - M20	A.372
WH-VM-PNC	SC WXS		Carbide thread milling cutter for small sizes For all materials and hardened steels up to 50 HRC	M1 - M5	A.373
WX-PNC	WX		Carbide thread milling cutter For all materials	M6 - M27	A.374
WXO-ST-PNC	WX		Carbide thread milling cutter with centre through coolant For all materials and hardened steels up to 45 HRC	M6 - M27	A.375















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## Threading

### Thread Mill

#### Thread Mill



Product series		A-Brand	Features	Range	Page
AT-1		<b>A</b>	One pass thread mill Milling for internal thread	1/4 - 1	A.376
AT-2 NEW		<b>A</b>	Thread milling without pre-drilled hole for hardened materials Left-hand (spindle rotation left) Up to 65HRC	No.8 - 1/2	A.377
WH-VM-PNC			Carbide thread milling cutter for small sizes For all materials and hardened steels up to 50 HRC	N.8	A.378
WX-PNC			Carbide thread milling cutter For all materials	1/4 - 7/8	A.379
WX-ST-PNC-3P			Carbide thread milling cutter with 3 crest thread length For all materials and hardened steels up to 50 HRC	G1/8 - G2	A.380
WX-PNC			Carbide thread milling cutter For all materials	1/16 - 3/8	A.381
AT-1		<b>A</b>	One pass thread mill Milling for internal thread	1/16 - 2	A.382
AT-2 NEW		<b>A</b>	Thread milling without pre-drilled hole for hardened materials Left-hand (spindle rotation left) Up to 65HRC	Rc 1/16 - Rc 1	A.383
WX-PNC			Carbide thread milling cutter For all materials	Rc1/8 - Rc 2	A.384
AT-1 NEW		<b>A</b>	One pass thread mill Milling for internal thread	Rp 1/16 - Rp 2	A.385
AT-1 NEW		<b>A</b>	One pass thread mill Milling for internal thread	NPT 1/16 - NPT 2	A.386
AT-2 NEW		<b>A</b>	Thread milling without pre-drilled hole for hardened materials Left-hand (spindle rotation left) Up to 65HRC	NPT 1/16 -NPT 1	A.387
WX-PNC			Carbide thread milling cutter For all materials	NPT 1/16 -NPT 2	A.388

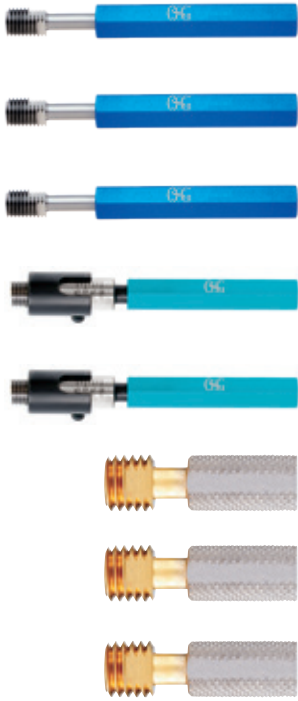


# INDEX

## Threading

### Thread Gauge

#### Thread Gauge



Product series	A-Brand	Features	Range	Page
E-DCT		Diameter correction tool for thread mill Reduce the set up and machining time	M(J)3 - M(J)20	A.389
E-DCT		Diameter correction tool for thread mill Reduce the set up and machining time	1/4 - 3/4 UNJC 1/4 - 3/4 UNJF	A.390
E-DCT NEW		Diameter correction tool for thread mill Reduce the set up and machining time	1/4 - 3/4 EG-UNJC 1/4 - 3/4 EG-UNJF	A.390
DCT		Diameter correction tool for thread mill Reduce the set up and machining time Measurable range 100% ~50% tolerance of thread size 6H	M6 - M24	A.391
DCT		Diameter correction tool for thread mill Reduce the set up and machining time Measurable range 100% ~50% tolerance of thread size 3B	5/16UNJF	A.392
DCT75		Diameter correction tool for thread mill Reduce the set up and machining time Measurable range 100% ~50% tolerance of thread size 6H	M6 - M16	A.393
DCT75		Diameter correction tool for thread mill Reduce the set up and machining time Measurable range 100% ~50% tolerance of thread size 3B	1/4UNC - 1/2UNC 1/4UNF - 1/2UNF	A.394
DCT75		Diameter correction tool for thread mill Reduce the set up and machining time Measurable internal thread class R screw and PT screw	Rc1/16 - Rc3/8	A.395

Threading | Index

### Serial Solid Circular Dies

#### Serial Solid Circular Dies



Product series	A-Brand	Features	Range	Page
DIN 223B		HSS solid circular dies DIN223B With spiral entry for forward chip ejection Chamfer lead on both sides	M3 - M20	A.398
DIN 223B		HSS solid circular dies DIN223B With spiral entry for forward chip ejection Chamfer lead on both sides	1/8 - 1/2	A.399

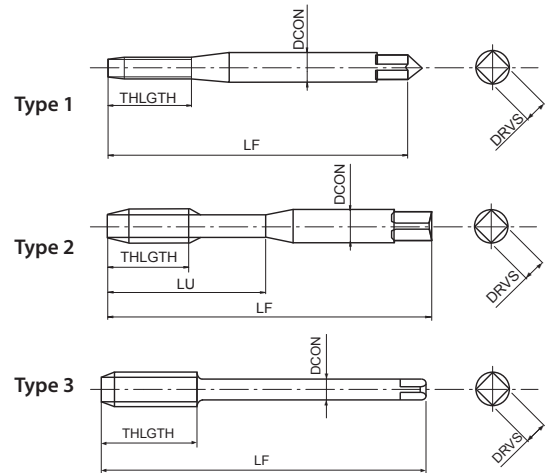


# A-POT

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels



Threading | Cutting taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

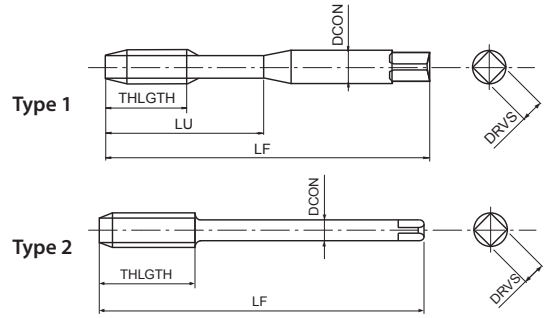


EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48145111	1	0,25	40	5	-	2,5	2,1	2	1	371
48145112	1,1	0,25	40	5	-	2,5	2,1	2	1	371
48145113	1,2	0,25	40	5	-	2,5	2,1	2	1	371
48145115	1,4	0,3	40	7	-	2,5	2,1	2	1	371
48145118	1,6	0,35	40	8	-	2,5	2,1	2	1	371
48145119	1,7	0,35	40	8	-	2,5	2,1	2	1	371
48145120	1,8	0,35	40	8	-	2,5	2,1	2	1	371
48145125	2	0,4	45	8	-	2,8	2,1	2	1	371
48145127	2,2	0,45	45	9	-	2,8	2,1	2	1	371
48145128	2,3	0,4	45	9	-	2,8	2,1	2	1	371
48145133	2,5	0,45	50	9	-	2,8	2,1	2	1	371
48145136	2,6	0,45	50	9	-	2,8	2,1	2	1	371
48145138	3	0,5	56	11	18	3,5	2,7	3	2	371
48145142	3,5	0,6	56	12	20	4	3	3	2	371
48145144	4	0,7	63	13	21	4,5	3,4	3	2	371
48145147	4,5	0,75	70	16	25	6	4,9	3	2	371
48145149	5	0,8	70	16	25	6	4,9	3	2	371
48145152	5,5	0,9	80	17	30	6	4,9	3	2	371
48145155	6	1	80	19	30	6	4,9	3	2	371
48145158	7	1	80	19	30	7	5,5	3	2	371
48145161	8	1,25	90	22	35	8	6,2	3	2	371
48145165	9	1,25	90	22	35	9	7	3	2	371
48145169	10	1,5	100	24	39	10	8	3	2	371
48145139	3	0,5	56	11	-	2,2	-	3	3	376
48145185	4	0,7	63	13	-	2,8	2,1	3	3	376
48145150	5	0,8	70	16	-	3,5	2,7	3	3	376
48145187	6	1	80	19	-	4,5	3,4	3	3	376
48145159	7	1	80	19	-	5,5	4,3	3	3	376
48145188	8	1,25	90	22	-	6	4,9	3	3	376
48145166	9	1,25	90	22	-	7	5,5	3	3	376
48145189	10	1,5	100	24	-	7	5,5	3	3	376
48145175	11	1,5	100	24	-	8	6,2	3	3	376
48145179	12	1,75	110	28	-	9	7	3	3	376
48145191	14	2	110	30	-	11	9	3	3	376
48145202	16	2	110	32	-	12	9	3	3	376
48145214	18	2,5	125	34	-	14	11	3	3	376
48145228	20	2,5	140	34	-	16	12	3	3	376
48145238	22	2,5	140	34	-	18	14,5	3	3	376
48145247	24	3	160	38	-	18	14,5	3	3	376

Metric

# A-OIL-POT

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- Side through coolant

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>				<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48214155	6	1	80	19	30	6	4,9	3	1	371
48214161	8	1,25	90	22	35	8	6,2	3	1	371
48214169	10	1,5	100	24	39	10	8	3	1	371
48214179	12	1,75	110	28	-	9	7	3	2	376
48214191	14	2	110	30	-	11	9	3	2	376
48214202	16	2	110	32	-	12	9	3	2	376
48214214	18	2,5	125	34	-	14	11	3	2	376
48214228	20	2,5	140	34	-	16	12	3	2	376
48214238	22	2,5	140	34	-	18	14,5	3	2	376
48214247	24	3	160	38	-	18	14,5	3	2	376

Threading | Cutting taps

Metric

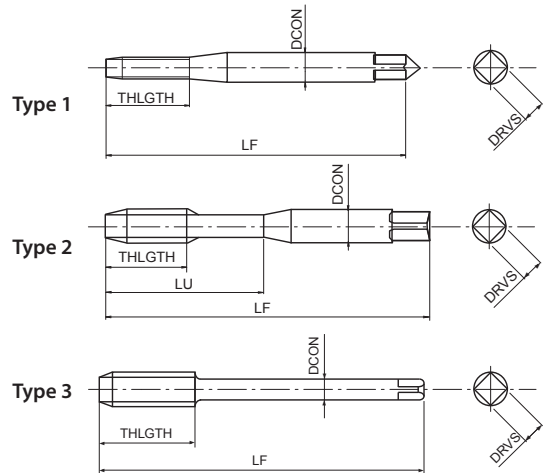


# A-POT 6GX

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- For 6G internal thread tolerance



Threading | Cutting taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min



EDP	TD	TP	Oversize	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48205125	2	0,4	0,0190	45	8	-	2,8	2,1	2	1	371
48205133	2,5	0,45	0,0200	50	9	-	2,8	2,1	2	1	371
48205138	3	0,5	0,0200	56	11	18	3,5	2,7	3	2	371
48205144	4	0,7	0,0220	63	13	21	4,5	3,4	3	2	371
48205149	5	0,8	0,0240	70	16	25	6	4,9	3	2	371
48205155	6	1	0,0260	80	19	30	6	4,9	3	2	371
48205161	8	1,25	0,0280	90	22	35	8	6,2	3	2	371
48205169	10	1,5	0,0320	100	24	39	10	8	3	2	371
48205179	12	1,75	0,0340	110	28	-	9	7	3	3	376
48205202	16	2	0,0380	110	32	-	12	9	3	3	376

Metric

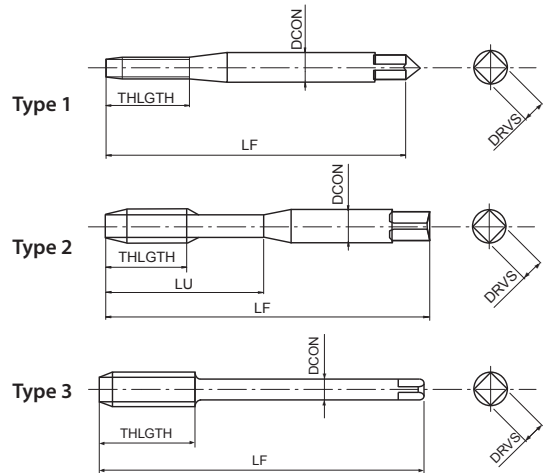


# A-POT 7GX

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- For 7G internal thread tolerance



<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	<b>7GX</b>	<b>B/4</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	Oversize	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48206125	2	0,4	0,0380	45	8	-	2,8	2,1	2	1	371
48206133	2,5	0,45	0,0400	50	9	-	2,8	2,1	2	1	371
48206138	3	0,5	0,0400	56	11	18	3,5	2,7	3	2	371
48206144	4	0,7	0,0440	63	13	21	4,5	3,4	3	2	371
48206149	5	0,8	0,0480	70	16	25	6	4,9	3	2	371
48206155	6	1	0,0520	80	19	30	6	4,9	3	2	371
48206161	8	1,25	0,0560	90	22	35	8	6,2	3	2	371
48206169	10	1,5	0,0640	100	24	39	10	8	3	2	371
48206179	12	1,75	0,0680	110	14	-	28	7	3	3	376
48206202	16	2	0,0760	110	16	-	32	9	3	3	376

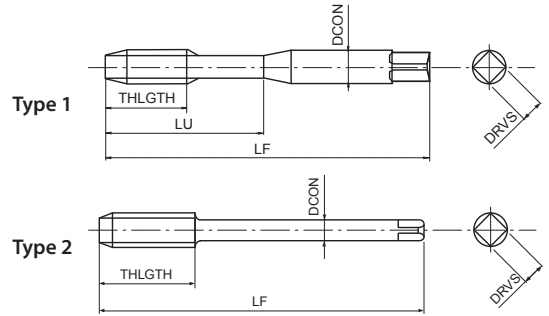
Threading | Cutting taps

Metric



# A-POT +0.1

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- Oversized tap for 6H +0,1mm thread tolerance

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC		
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min	
<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	<b>6H +0.1</b>	<b>B/4</b>		<b>DIN 371</b>	<b>DIN 376</b>		

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48259138	3	0,5	56	11	18	3,5	2,7	3	1	371
48259144	4	0,7	63	13	21	4,5	3,4	3	1	371
48259149	5	0,8	70	16	25	6	4,9	3	1	371
48259155	6	1	80	19	30	6	4,9	3	1	371
48259161	8	1,25	90	22	35	8	6,2	3	1	371
48259169	10	1,5	100	24	39	10	8	3	1	371
48259179	12	1,75	110	28	-	9	7	3	2	376
48259202	16	2	110	32	-	12	9	3	2	376

Threading | Cutting taps

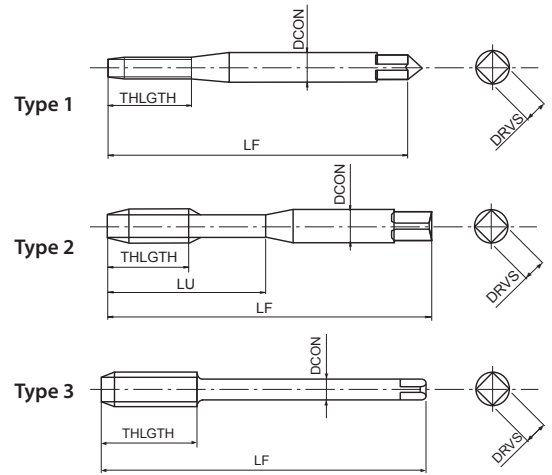
Metric

# A-LT-POT

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- With long shank for long reach threading



<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	m/min
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	

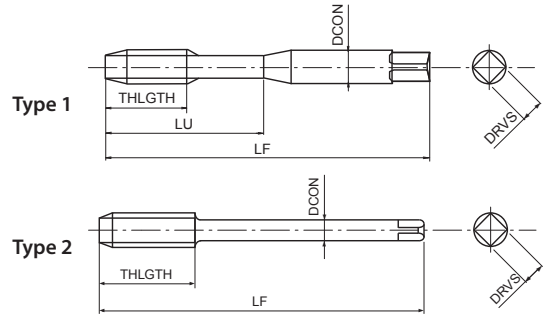
<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>B/4</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48210125	2	0,4	80	8	-	2,8	2,1	2	1	371
48210133	2,5	0,45	100	9	-	2,8	2,1	2	1	371
48210138	3	0,5	100	11	18	3,5	2,7	3	2	371
48210144	4	0,7	125	13	21	4,5	3,4	3	2	371
48210149	5	0,8	160	16	25	6	4,9	3	2	371
48210155	6	1	160	19	30	6	4,9	3	2	371
48210161	8	1,25	180	22	35	8	6,2	3	2	371
48210169	10	1,5	200	24	39	10	8	3	2	371
48211155	6	1	160	19	-	4,5	3,4	3	3	376
48211161	8	1,25	180	22	-	6	4,9	3	3	376
48211169	10	1,5	200	24	-	7	5,5	3	3	376
48211179	12	1,75	200	28	-	9	7	3	3	376
48211191	14	2	200	30	-	11	9	3	3	376
48211202	16	2	200	32	-	12	9	3	3	376
48211214	18	2,5	200	34	-	14	11	3	3	376
48211228	20	2,5	200	34	-	16	12	3	3	376



# A-POT-LH

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- For left-hand threads

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	m/min	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20		
<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>						

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48218138	3	0,5	56	11	18	3,5	2,7	3	1	371
48218144	4	0,7	63	13	21	4,5	3,4	3	1	371
48218149	5	0,8	70	16	25	6	4,9	3	1	371
48218155	6	1	80	19	30	6	4,9	3	1	371
48218161	8	1,25	90	22	35	8	6,2	3	1	371
48218169	10	1,5	100	24	39	10	8	3	1	371
48218179	12	1,75	110	28	-	9	7	3	2	376
48218191	14	2	110	30	-	11	9	3	2	376
48218202	16	2	110	32	-	12	9	3	2	376
48218214	18	2,5	125	34	-	14	11	3	2	376
48218228	20	2,5	140	34	-	16	12	3	2	376
48218238	22	2,5	140	34	-	18	14,5	3	2	376
48218247	24	3	160	38	-	18	14,5	3	2	376

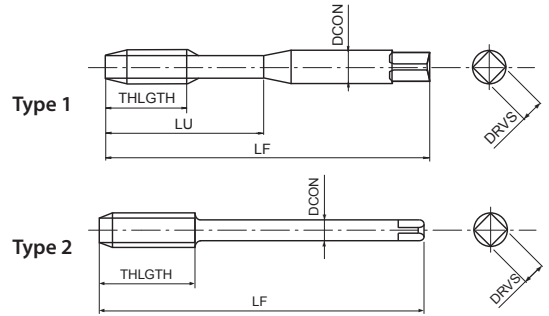


Metric



# S-POT

Threading | Cutting taps | Metric



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	m/min
15-24	10-15	10-15	8-13	8-16	10-15	

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>ISO 2 6H</b>	<b>ISO 1 5H &lt; M1,4</b>	<b>B/4</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48224111	1	0,25	40	5	-	2,5	2,1	2	1	371
48224112	1,1	0,25	40	5	-	2,5	2,1	2	1	371
48224113	1,2	0,25	40	5	-	2,5	2,1	2	1	371
48224115	1,4	0,3	40	7	-	2,5	2,1	2	1	371
48224118	1,6	0,35	40	8	-	2,5	2,1	2	1	371
48224119	1,7	0,35	40	8	-	2,5	2,1	2	1	371
48224120	1,8	0,35	40	8	-	2,5	2,1	2	1	371
48224125	2	0,4	45	8	-	2,8	2,1	2	1	371
48224127	2,2	0,45	45	9	-	2,8	2,1	2	1	371
48224128	2,3	0,4	45	9	-	2,8	2,1	2	1	371
48224133	2,5	0,45	50	9	-	2,8	2,1	2	1	371
48224136	2,6	0,45	50	9	-	2,8	2,1	2	1	371
48224138	3	0,5	56	11	18	3,5	2,7	3	1	371
48224142	3,5	0,6	56	12	20	4	3	3	1	371
48224144	4	0,7	63	13	21	4,5	3,4	3	1	371
48224147	4,5	0,75	70	16	25	6	4,9	3	1	371
48224149	5	0,8	70	16	25	6	4,9	3	1	371
48224152	5,5	0,9	80	17	30	6	4,9	3	1	371
48224155	6	1	80	19	30	6	4,9	3	1	371
48224158	7	1	80	19	30	7	5,5	3	1	371
48224161	8	1,25	90	22	35	8	6,2	3	1	371
48224165	9	1,25	90	22	35	9	7	3	1	371
48224169	10	1,5	100	24	39	10	8	3	1	371
48224140	3	0,5	56	11	-	2,2	-	3	2	376
48224185	4	0,7	63	13	-	2,8	2,1	3	2	376
48224150	5	0,8	70	16	-	3,5	2,7	3	2	376
48224187	6	1	80	19	-	4,5	3,4	3	2	376
48224159	7	1	80	19	-	5,5	4,3	3	2	376
48224188	8	1,25	90	22	-	6	4,9	3	2	376
48224166	9	1,25	90	22	-	7	5,5	3	2	376
48224189	10	1,5	100	24	-	7	5,5	3	2	376
48224175	11	1,5	100	24	-	8	6,2	3	2	376
48224179	12	1,75	110	28	-	9	7	3	2	376
48224191	14	2	110	30	-	11	9	3	2	376
48224202	16	2	110	32	-	12	9	3	2	376
48224214	18	2,5	125	34	-	14	11	3	2	376
48224228	20	2,5	140	34	-	16	12	3	2	376
48224238	22	2,5	140	34	-	18	14,5	3	2	376
48224247	24	3	160	38	-	18	14,5	3	2	376

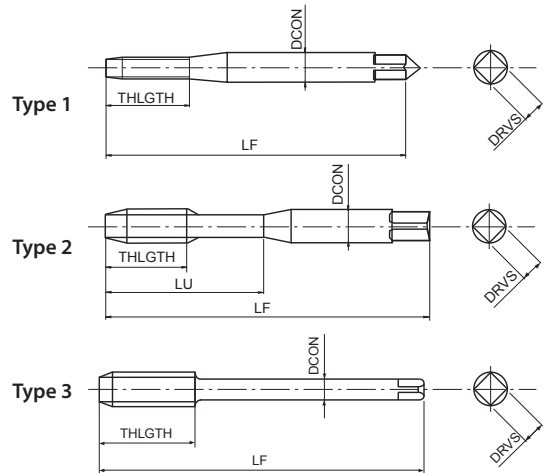
Metric

# S-POT 6G

Threading | Cutting taps | Metric



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- For 6G internal thread tolerance



<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
15-24	10-15	10-15	8-13	8-16	10-15	m/min

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>ISO 3 6G</b>	<b>B/4</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	Oversize	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48272125	2	0,4	0,0190	45	8	-	2,8	2,1	2	1	371
48272133	2,5	0,45	0,0200	50	9	-	2,8	2,1	2	1	371
48272138	3	0,5	0,0200	56	11	18	3,5	2,7	3	2	371
48272144	4	0,7	0,0220	63	13	21	4,5	3,4	3	2	371
48272149	5	0,8	0,0240	70	16	25	6	4,9	3	2	371
48272155	6	1	0,0260	80	19	30	6	4,9	3	2	371
48272161	8	1,25	0,0280	90	22	35	8	6,2	3	2	371
48272169	10	1,5	0,0320	100	24	39	10	8	3	2	371
48272179	12	1,75	0,0340	110	28	-	9	7	3	3	376
48272191	14	2	0,0380	110	30	-	11	9	3	3	376
48272202	16	2	0,0380	110	32	-	12	9	3	3	376

Threading | Cutting taps

Metric

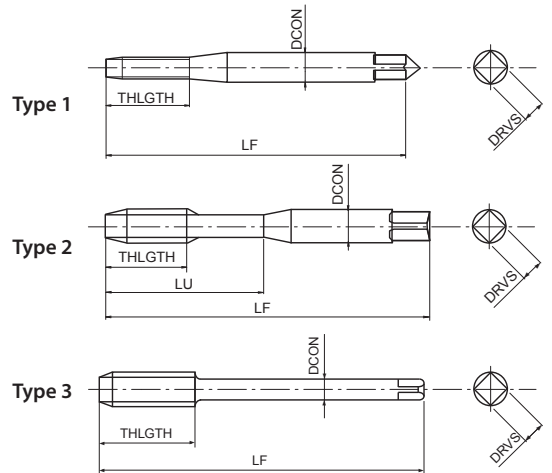


# S-POT 7G

Threading | Cutting taps | Metric



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- For 7G internal thread tolerance



Threading | Cutting taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GGG	
15-24	10-15	10-15	8-13	8-16	10-15	m/min

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>7G</b>	<b>B/4</b>		<b>DIN 371</b>	<b>DIN 376</b>
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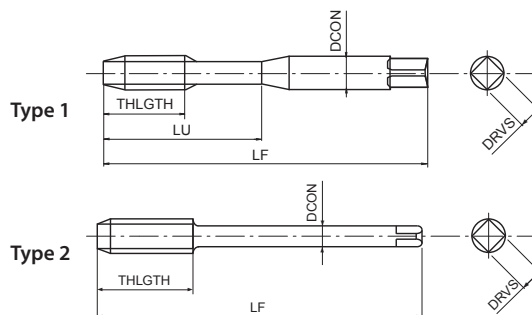
EDP	TD	TP	OverSize	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48273125	2	0,4	0,0380	45	8	-	2,8	2,1	2	1	371
48273133	2,5	0,45	0,0400	50	9	-	2,8	2,1	2	1	371
48273138	3	0,5	0,0400	56	11	18	3,5	2,7	3	2	371
48273144	4	0,7	0,0440	63	13	21	4,5	3,4	3	2	371
48273149	5	0,8	0,0480	70	16	25	6	4,9	3	2	371
48273155	6	1	0,0520	80	19	30	6	4,9	3	2	371
48273161	8	1,25	0,0560	90	22	35	8	6,2	3	2	371
48273169	10	1,5	0,0640	100	24	39	10	8	3	2	371
48273179	12	1,75	0,0680	110	28	-	9	7	3	3	376
48273191	14	2	0,0760	110	30	-	11	9	3	3	376
48273202	16	2	0,0760	110	32	-	12	9	3	3	376

Metric



# S-POT +0.1

Threading | Cutting taps | Metric



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- Oversized tap for 6H +0,1mm thread tolerance

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
15-24	10-15	10-15	8-13	8-16	10-15	m/min

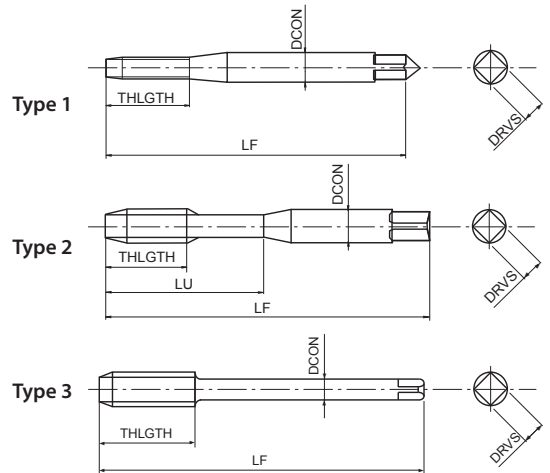
<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>6H +0.1</b>	<b>B/4</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48271138	3	0,5	56	11	18	3,5	2,7	3	1	371
48271144	4	0,7	63	13	21	4,5	3,4	3	1	371
48271149	5	0,8	70	16	25	6	4,9	3	1	371
48271155	6	1	80	19	30	6	4,9	3	1	371
48271161	8	1,25	90	22	35	8	6,2	3	1	371
48271169	10	1,5	100	24	39	10	8	3	1	371
48271179	12	1,75	110	28	-	9	7	3	2	376
48271191	14	2	110	30	-	11	9	3	2	376
48271202	16	2	110	32	-	12	9	3	2	376



# S-LT-POT

Threading | Cutting taps | Metric



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- With long shank for long reach threading

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	m/min
15-24	10-15	10-15	8-13	8-16	10-15	



Metric

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type
48278125	2	0,4	80	8	-	2,8	2,1	2	1
48278133	2,5	0,45	100	9	-	2,8	2,1	2	1
48278138	3	0,5	100	11	18	3,5	2,7	3	2
48278144	4	0,7	125	13	21	4,5	3,4	3	2
48278149	5	0,8	160	16	25	6	4,9	3	2
48278155	6	1	160	19	30	6	4,9	3	2
48278187	6	1	160	19	-	4,5	3,4	3	2
48278161	8	1,25	180	22	35	8	6,2	3	2
48278188	8	1,25	180	22	-	6	4,9	3	2
48278169	10	1,5	200	24	39	10	8	3	2
48278189	10	1,5	200	24	-	7	5,5	3	2
48278179	12	1,75	200	28	-	9	7	3	3
48278191	14	2	200	30	-	11	9	3	3
48278202	16	2	200	32	-	12	9	3	3
48278214	18	2,5	200	34	-	14	11	3	3
48278228	20	2,5	200	34	-	16	12	3	3



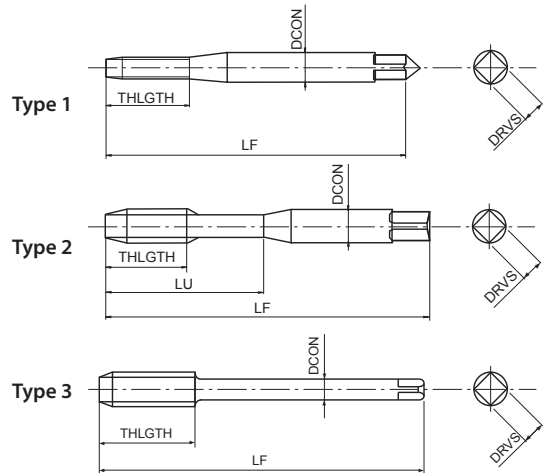


# VA-POT

Threading | Cutting taps | Metric



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels



<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
15-24	10-15	10-15	8-13	8-16	10-15	m/min

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>ISO 2 6H</b>	<b>B/4</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
63812560	2	0,4	45	8	-	2,8	2,1	2	1	371
63812860	2,2	0,45	45	9	-	2,8	2,1	2	1	371
63813360	2,5	0,45	50	9	-	2,8	2,1	2	1	371
63813860	3	0,5	56	-	18	3,5	2,7	3	2	371
63814060	3,5	0,6	56	-	20	4	3	3	2	371
63814460	4	0,7	63	-	21	4,5	3,4	3	2	371
63814960	5	0,8	70	-	25	6	4,9	3	2	371
63815560	6	1	80	-	30	6	4,9	3	2	371
63816160	8	1,25	90	-	35	8	6,2	3	2	371
63816960	10	1,5	100	-	39	10	8	3	2	371
63913860	3	0,5	56	11	-	2,2	-	3	3	376
63914460	4	0,7	63	13	-	2,8	2,1	3	3	376
63914960	5	0,8	70	16	-	3,5	2,7	3	3	376
63915560	6	1	80	19	-	4,5	3,4	3	3	376
63916160	8	1,25	90	22	-	6	4,9	3	3	376
63916960	10	1,5	100	24	-	7	5,5	3	3	376
63917960	12	1,75	110	28	-	9	7	3	3	376
63919160	14	2	110	30	-	11	9	3	3	376
63920260	16	2	110	32	-	12	9	3	3	376
63921460	18	2,5	125	34	-	14	11	3	3	376
63922860	20	2,5	140	34	-	16	12	3	3	376
63923860	22	2,5	140	34	-	18	14,5	3	3	376
63924760	24	3	160	38	-	18	14,5	3	3	376
63926260	27	3	160	38	-	20	16	4	3	376
63927160	30	3,5	180	45	-	22	18	4	3	376
63928160	33	3,5	180	50	-	25	20	4	3	376
63929460	36	4	200	56	-	28	22	4	3	376

Threading | Cutting taps

Metric

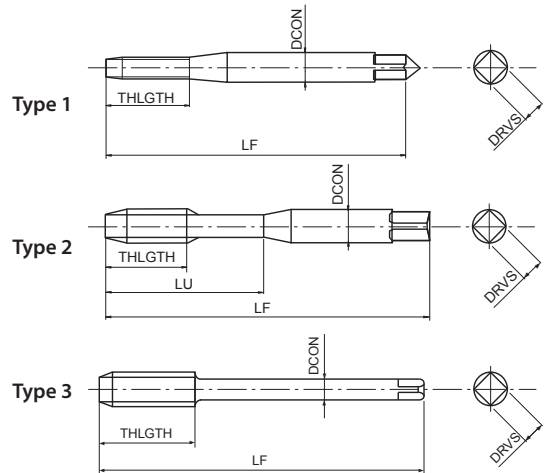
A

# VA-POT 6G

Threading | Cutting taps | Metric



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- For 6G internal thread tolerance



Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
15-24	10-15	10-15	8-13	8-16	10-15	m/min

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>ISO 3 6G</b>	<b>B/4</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	Oversize	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
63812599	2	0,4	0,0190	45	8	-	2,8	2,1	2	1	371
63813399	2,5	0,45	0,0200	50	9	-	2,8	2,1	2	1	371
63813899	3	0,5	0,0200	56	-	18	3,5	2,7	3	2	371
63814499	4	0,7	0,0220	63	-	21	4,5	3,4	3	2	371
63814999	5	0,8	0,0240	70	-	25	6	4,9	3	2	371
63815599	6	1	0,0260	80	-	30	6	4,9	3	2	371
63816199	8	1,25	0,0280	90	-	35	8	6,2	3	2	371
63816999	10	1,5	0,0320	100	-	39	10	8	3	2	371
63917999	12	1,75	0,0340	110	28	-	9	7	3	3	376
63919199	14	2	0,0380	110	30	-	11	9	3	3	376
63920299	16	2	0,0380	110	32	-	12	9	3	3	376



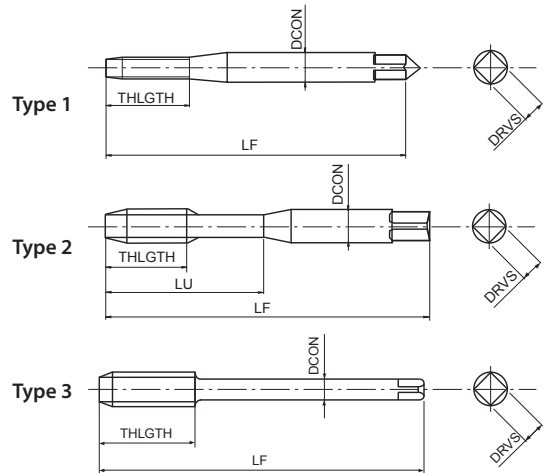
Metric

# Z-POT

Threading | Cutting taps | Metric



- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels and stainless steels



<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-24	15-24	15-24	8-20	8-20	20-40	20-40	10-15	8-15	m/min

<b>M</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>B/4</b>		<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
83812568	2	0,4	45	8	-	2,8	2,1	2	1	371
83813368	2,5	0,45	50	9	-	2,8	2,1	2	1	371
83813868	3	0,5	56	-	18	3,5	2,7	3	2	371
83814468	4	0,7	63	-	21	4,5	3,4	3	2	371
83814968	5	0,8	70	-	25	6	4,9	3	2	371
83815568	6	1	80	-	30	6	4,9	3	2	371
83816168	8	1,25	90	-	35	8	6,2	3	2	371
83816968	10	1,5	100	-	39	10	8	3	2	371
83913868	3	0,5	56	11	-	2,2	-	3	3	376
83914468	4	0,7	63	13	-	2,8	2,1	3	3	376
83914968	5	0,8	70	16	-	3,5	2,7	3	3	376
83915568	6	1	80	19	-	4,5	3,4	3	3	376
83916168	8	1,25	90	22	-	6	4,9	3	3	376
83916968	10	1,5	100	24	-	7	5,5	3	3	376
83917968	12	1,75	110	28	-	9	7	3	3	376
83919168	14	2	110	30	-	11	9	3	3	376
83920268	16	2	110	32	-	12	9	3	3	376
83921468	18	2,5	125	34	-	14	11	3	3	376
83922868	20	2,5	140	34	-	16	12	3	3	376
83923868	22	2,5	140	34	-	18	14,5	3	3	376
83924768	24	3	160	38	-	18	14,5	3	3	376
83926268	27	3	160	38	-	20	16	4	3	376
83927168	30	3,5	180	45	-	22	18	4	3	376

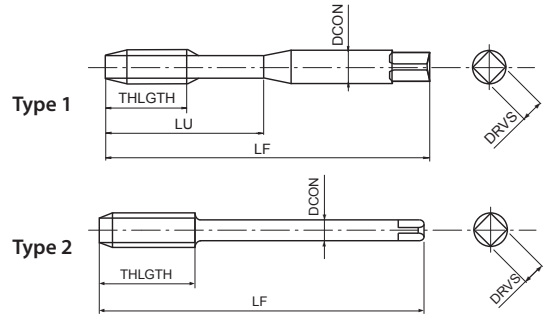
Threading | Cutting taps

Metric



# Z-OIL-POT

Threading | Cutting taps | Metric



- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels and stainless steels
- Side through coolant

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC		m/min
15-24	15-24	15-24	8-20	8-20	20-40	20-40	10-15	8-15		
<b>M</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>	 B/4			<b>DIN 371</b>	<b>DIN 376</b>		

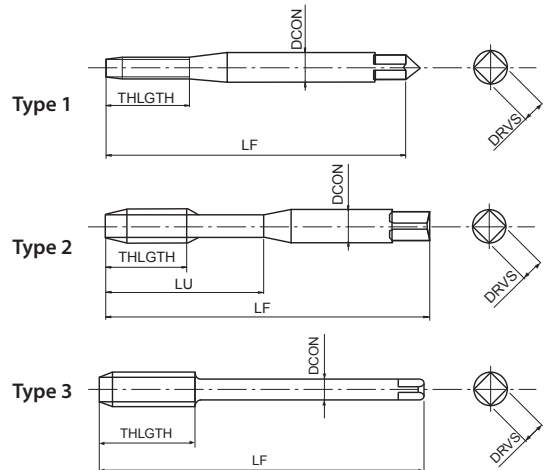
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
83815588	6	1	80	-	30	6	4,9	3	1	371
83816188	8	1,25	90	-	35	8	6,2	3	1	371
83816988	10	1,5	100	-	39	10	8	3	1	371
83917988	12	1,75	110	28	-	9	7	3	2	376
83919188	14	2	110	30	-	11	9	3	2	376
83920288	16	2	110	32	-	12	9	3	2	376
83921488	18	2,5	125	34	-	14	11	3	2	376
83922888	20	2,5	140	34	-	16	12	3	2	376

Threading | Cutting taps  
Metric





- HSSE spiral-point cutting tap for through holes
- Bright finish
- For general purpose applications



<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ● AC, ADC	
12-20	8-12	8-12	8-12	8-12	15-25	15-20	m/min

<b>M</b>	<b>HSSE</b>	<b>ISO 2 6H</b>			
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
60712560	2	0,4	45	8	-	2,8	2,1	2	1	371
60713360	2,5	0,45	50	9	-	2,8	2,1	2	1	371
60713860	3	0,5	56	-	18	3,5	2,7	3	2	371
60714060	3,5	0,6	56	-	20	4	3	3	2	371
60714460	4	0,7	63	-	21	4,5	3,4	3	2	371
60714960	5	0,8	70	-	25	6	4,9	3	2	371
60715560	6	1	80	-	30	6	4,9	3	2	371
60716160	8	1,25	90	-	35	8	6,2	3	2	371
60716960	10	1,5	100	-	39	10	8	3	2	371
60813860	3	0,5	56	11	-	2,2	-	3	3	376
60814460	4	0,7	63	13	-	2,8	2,1	3	3	376
60814960	5	0,8	70	16	-	3,5	2,7	3	3	376
60815560	6	1	80	19	-	4,5	3,4	3	3	376
60816160	8	1,25	90	22	-	6	4,9	3	3	376
60816960	10	1,5	100	24	-	7	5,5	3	3	376
60817960	12	1,75	110	28	-	9	7	3	3	376
60819160	14	2	110	30	-	11	9	3	3	376
60820260	16	2	110	32	-	12	9	3	3	376
60821460	18	2,5	125	34	-	14	11	3	3	376
60822860	20	2,5	140	34	-	16	12	3	3	376
60823860	22	2,5	140	34	-	18	14,5	3	3	376
60824760	24	3	160	38	-	18	14,5	3	3	376
60826260	27	3	160	38	-	20	16	4	3	376
60827160	30	3,5	180	45	-	22	18	4	3	376
60828160	33	3,5	180	50	-	25	20	4	3	376
60829460	36	4	200	56	-	28	22	4	3	376

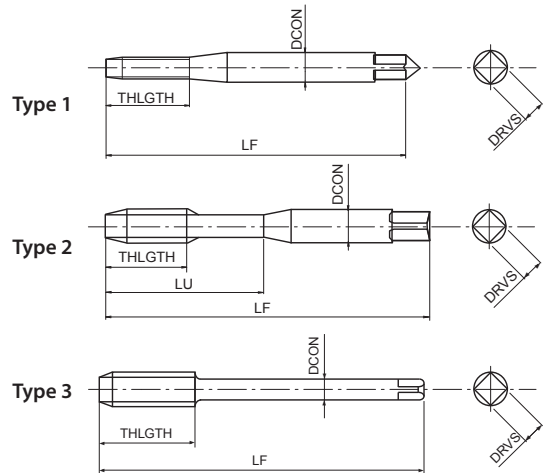


# TIN-POT

Threading | Cutting taps | Metric



- HSSE spiral-point cutting tap for through holes
- TIN coating
- For steels up to 850 N/mm<sup>2</sup>



<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ● INOX	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>S</b> ○ Ti		m/min
15-24	10-15	10-15	8-13	8-16	10-15	15-25	15-20	6-9		

<b>M</b>	<b>HSSE</b>	<b>TiN</b>	<b>ISO 2 6H</b>	<b>B/4</b>	<b>DIN 371</b>	<b>DIN 376</b>
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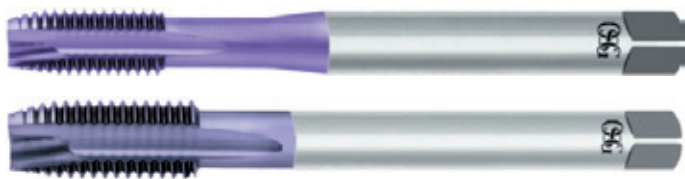
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
6071256001	2	0,4	45	8	-	2,8	2,1	2	1	371
6071336001	2,5	0,45	50	9	-	2,8	2,1	2	1	371
6071386001	3	0,5	56	-	18	3,5	2,7	3	2	371
6071406001	3,5	0,6	56	-	20	4	3	3	2	371
6071446001	4	0,7	63	-	21	4,5	3,4	3	2	371
6071496001	5	0,8	70	-	25	6	4,9	3	2	371
6071556001	6	1	80	-	30	6	4,9	3	2	371
6071616001	8	1,25	90	-	35	8	6,2	3	2	371
6071696001	10	1,5	100	-	39	10	8	3	2	371
6081386001	3	0,5	56	11	-	2,2	-	3	3	376
6081446001	4	0,7	63	13	-	2,8	2,1	3	3	376
6081496001	5	0,8	70	16	-	3,5	2,7	3	3	376
6081556001	6	1	80	19	-	4,5	3,4	3	3	376
6081616001	8	1,25	90	22	-	6	4,9	3	3	376
6081696001	10	1,5	100	24	-	7	5,5	3	3	376
6081796001	12	1,75	110	28	-	9	7	3	3	376
6081916001	14	2	110	30	-	11	9	3	3	376
6082026001	16	2	110	32	-	12	9	3	3	376
6082146001	18	2,5	125	34	-	14	11	3	3	376
6082286001	20	2,5	140	34	-	16	12	3	3	376
6082386001	22	2,5	140	34	-	18	14,5	3	3	376
6082476001	24	3	160	38	-	18	14,5	3	3	376
6082626001	27	3	160	38	-	20	16	4	3	376
6082716001	30	3,5	180	45	-	22	18	4	3	376

Threading | Cutting taps

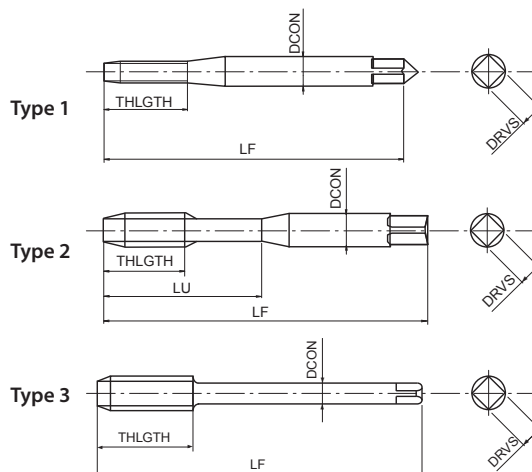
Metric

# TICN-POT

Threading | Cutting taps | Metric



- HSSE spiral-point cutting tap for through holes
- Multilayer TiCN coating
- For steels up to 1000 N/mm<sup>2</sup>



Threading | Cutting taps

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>S</b> ○ Ti		m/min
15-24	10-15	10-15	8-13	8-16	10-15	15-25	15-20	6-9		

<b>M</b>	<b>HSSE</b>	<b>V</b>	<b>ISO 2 6H</b>	<b>B/4</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
6071256002	2	0,4	45	8	-	2,8	2,1	2	1	371
6071386002	3	0,5	56	-	18	3,5	2,7	3	2	371
6071446002	4	0,7	63	-	21	4,5	3,4	3	2	371
6071496002	5	0,8	70	-	25	6	4,9	3	2	371
6071556002	6	1	80	-	30	6	4,9	3	2	371
6071616002	8	1,25	90	-	35	8	6,2	3	2	371
6071696002	10	1,5	100	-	39	10	8	3	2	371
6081796002	12	1,75	110	28	-	9	7	3	3	376
6081916002	14	2	110	30	-	11	9	3	3	376
6082026002	16	2	110	32	-	12	9	3	3	376
6082146002	18	2,5	125	34	-	14	11	3	3	376
6082286002	20	2,5	140	34	-	16	12	3	3	376
6082386002	22	2,5	140	34	-	18	14,5	3	3	376
6082476002	24	3	160	38	-	18	14,5	3	3	376



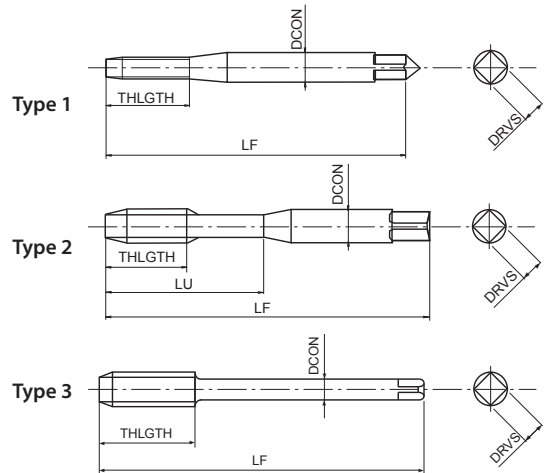
Metric

# CC-POT

Threading | Cutting taps | Metric



- HSSE spiral-point cutting tap for through holes
- CrN coating
- For general steels and stainless steels
- Developed for rigid tapping on CNC machines



<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	
15-25	15-25	10-25	10-25	6-15	20-40	m/min

<b>M</b>	<b>HSSE</b>	<b>CrN</b>	<b>ISO 2 6HX</b>	<b>B/4</b>		<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48059125	2	0,4	45	8	-	2,8	2,1	2	1	371
48059133	2,5	0,45	50	9	-	2,8	2,1	2	1	371
48059138	3	0,5	56	-	18	3,5	2,7	3	2	371
48059144	4	0,7	63	-	21	4,5	3,4	3	2	371
48059149	5	0,8	70	-	25	6	4,9	3	2	371
48059155	6	1	80	-	30	6	4,9	3	2	371
48059161	8	1,25	90	-	35	8	6,2	3	2	371
48059169	10	1,5	100	-	39	10	8	3	2	371
48060138	3	0,5	56	11	-	2,2	-	3	3	376
48060144	4	0,7	63	13	-	2,8	2,1	3	3	376
48060149	5	0,8	70	16	-	3,5	2,7	3	3	376
48060155	6	1	80	19	-	4,5	3,4	3	3	376
48060161	8	1,25	90	22	-	6	4,9	3	3	376
48060169	10	1,5	100	24	-	7	5,5	3	3	376
48060179	12	1,75	110	28	-	9	7	3	3	376
48060191	14	2	110	30	-	11	9	3	3	376
48060202	16	2	110	32	-	12	9	3	3	376
48060214	18	2,5	125	34	-	14	11	3	3	376
48060228	20	2,5	140	34	-	16	12	3	3	376
48060238	22	2,5	140	34	-	18	14,5	3	3	376
48060247	24	3	160	38	-	18	14,5	3	3	376
48060262	27	3	160	38	-	20	16	4	3	376
48060271	30	3,5	180	45	-	22	18	4	3	376

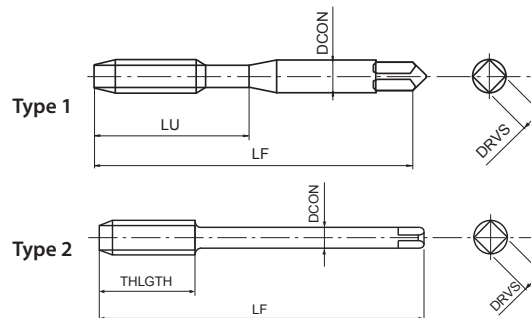
Threading | Cutting taps

Metric



# HS-RFT-TIN

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for through holes
- TiN coating
- For high speed tapping in various materials
- Right-hand cut with left-hand flute for chip evacuation towards front

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	m/min
27-32	27-32	22-27	22-27	15-20	50-100	40-100	

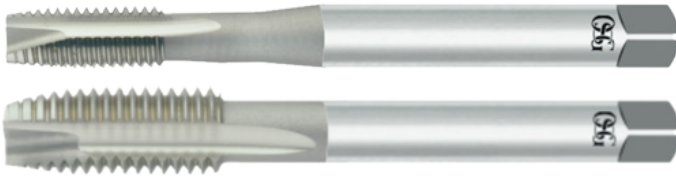
  

<b>M</b>	<b>HSSE</b>	<b>TiN</b>	<b>20°</b>	<b>ISO 2 6H</b>	<b>A/6</b>	
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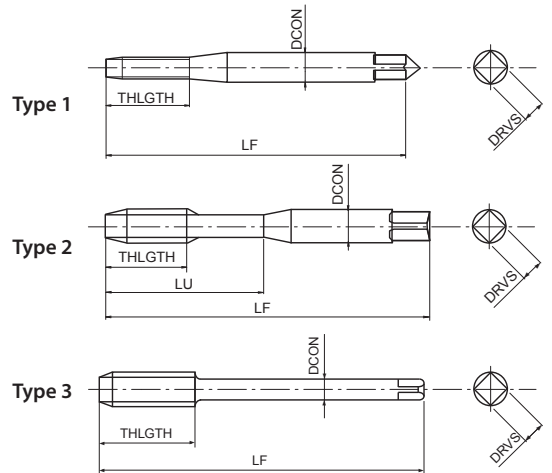
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type
20710	3	0,5	46	11	19	4	3,2	3	1
20714	4	0,7	52	13	21	6	4,5	3	1
20718	5	0,8	60	16	24	6	4,5	3	1
20722	6	1	62	19	29	6	4,5	3	1
20728	8	1,25	70	22	37	8	6	3	1
20734	10	1,5	75	24	41	8	6	3	2
20739	12	1,75	82	29	48	10	8	3	2

# AL-POT

Threading | Cutting taps | Metric



- HSSE spiral-point cutting tap for through holes
- Bright finish
- For aluminium and cast aluminium



Threading | Cutting taps

<b>N</b> AI	<b>N</b> AC, ADC	
15-25	15-20	m/min

<b>M</b>	<b>HSSE</b>	<b>ISO 2 6H</b>	<b>B/4</b>	<b>DIN 371</b>	<b>DIN 376</b>
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Metric

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48019125	2	0,4	45	8	-	2,8	2,1	2	1	371
48019133	2,5	0,45	50	9	-	2,8	2,1	2	1	371
66113860	3	0,5	56	-	18	3,5	2,7	3	2	371
66114460	4	0,7	63	-	21	4,5	3,4	3	2	371
66114960	5	0,8	70	-	25	6	4,9	3	2	371
66115560	6	1	80	-	30	6	4,9	3	2	371
66116160	8	1,25	90	-	35	8	6,2	3	2	371
66116960	10	1,5	100	-	39	10	8	3	2	371
48019179	12	1,75	110	28	-	9	7	3	3	376
48019191	14	2	110	30	-	11	9	3	3	376
48019202	16	2	110	32	-	12	9	3	3	376
48019214	18	2,5	125	34	-	14	11	3	3	376
48019228	20	2,5	140	34	-	16	12	3	3	376

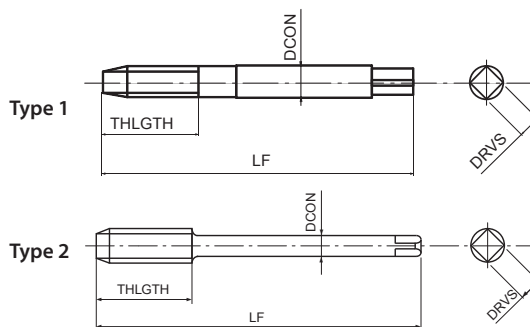






# WHR-NI-POT

Threading | Cutting taps | Metric



- Powder metal spiral-point cutting tap for through holes
- HR coating
- For Nickel-based alloys including Inconel 718



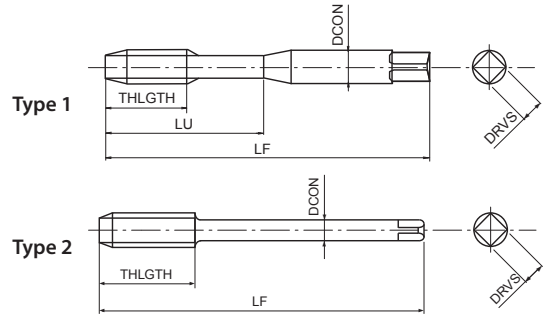
2-4 m/min



EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	Type	DIN
48079138	3	0,5	56	12	3,5	2,7	3	1	371
48079144	4	0,7	63	16	4,5	3,4	3	1	371
48079149	5	0,8	70	19	6	4,9	3	1	371
48079155	6	1	80	23	6	4,9	3	1	371
48079161	8	1,25	90	30	8	6,2	3	1	371
48079169	10	1,5	100	38	10	8	3	1	371
48079179	12	1,75	110	28	10	8	3	2	376

# CPM-POT

Threading | Cutting taps | Metric



- Powder metal spiral-point cutting tap for through holes
- Bright finish
- For steels up to 900 N/mm<sup>2</sup> and cast iron

Threading | Cutting taps

<b>P</b> C ≥ 0,45%	<b>K</b> GGG	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	
8-13	10-15	6-10	6-10	m/min

<b>M</b>	<b>PM</b>	<b>ISO 2 6H</b>	<b>B/5</b>		<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
80713860	3	0,5	56	-	11	3,5	2,7	3	1	371
80714460	4	0,7	63	-	13	4,5	3,4	3	1	371
80714960	5	0,8	70	-	16	6	4,9	3	1	371
80715560	6	1	80	-	19	6	4,9	3	1	371
80716160	8	1,25	90	-	22	8	6,2	3	1	371
80716960	10	1,5	100	-	24	10	8	3	1	371
80815560	6	1	80	19	-	4,5	3,4	3	2	376
80816160	8	1,25	90	22	-	6	4,9	3	2	376
80816960	10	1,5	100	24	-	7	5,5	3	2	376
80817960	12	1,75	110	28	-	9	7	3	2	376
80819160	14	2	110	30	-	11	9	3	2	376
80820260	16	2	110	32	-	12	9	4	2	376
80821460	18	2,5	125	34	-	14	11	4	2	376
80822860	20	2,5	140	34	-	16	12	4	2	376



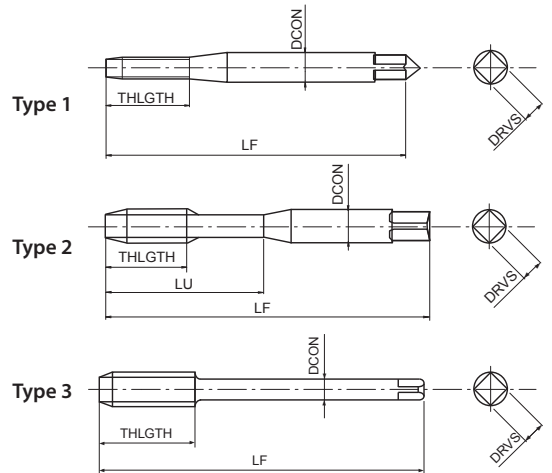
Metric

# H-POT

Threading | Cutting taps | Metric



- Powder metal spiral-point cutting tap for through holes
- Steam oxide treatment
- For hardened steels up to 45 HRC



<b>P</b> C ≥ 0,45%	<b>K</b> GGG	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	
8-13	10-15	4-6	2-4	6-10	6-10	m/min

<b>M</b>	<b>PM</b>	<b>OX</b>	<b>ISO 2 6H</b>	 B/5	 DIN 371	 DIN 376
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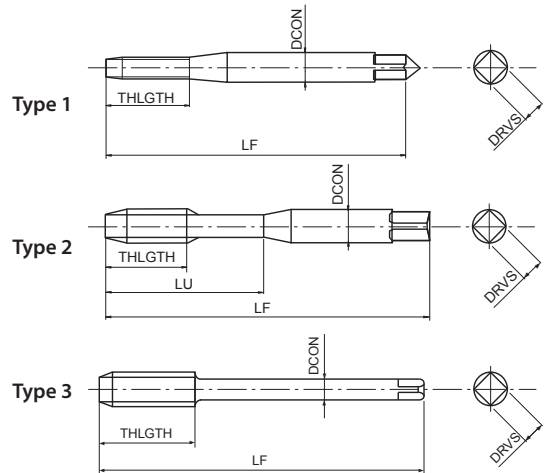
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
88412560	2	0,4	45	8	-	2,8	2,1	2	1	371
88413360	2,5	0,45	50	9	-	2,8	2,1	2	1	371
88413860	3	0,5	56	-	18	3,5	2,7	3	2	371
88414460	4	0,7	63	-	21	4,5	3,4	3	2	371
88414960	5	0,8	70	-	25	6	4,9	3	2	371
88415560	6	1	80	-	30	6	4,9	3	2	371
88416160	8	1,25	90	-	35	8	6,2	3	2	371
88416960	10	1,5	100	-	39	10	8	3	2	371
88517960	12	1,75	110	28	-	9	7	3	3	376
88519160	14	2	110	30	-	11	9	3	3	376
88520260	16	2	110	32	-	12	9	4	3	376
88521460	18	2,5	125	34	-	14	11	4	3	376
88522860	20	2,5	140	34	-	16	12	4	3	376

# VP-H-POT

Threading | Cutting taps | Metric



- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- For hardened steels up to 45 HRC



Threading | Cutting taps

<b>P</b> C ≥ 0,45%	<b>K</b> GGG	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	
8-13	10-15	4-6	2-4	6-10	6-10	m/min

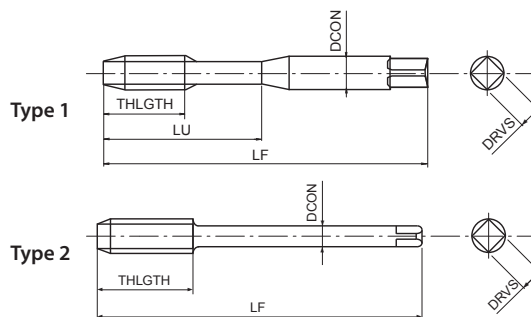
<b>M</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>B/5</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48084125	2	0,4	45	8	-	2,8	2,1	2	1	371
48084133	2,5	0,45	50	9	-	2,8	2,1	2	1	371
48084138	3	0,5	56	-	18	3,5	2,7	3	2	371
48084144	4	0,7	63	-	21	4,5	3,4	3	2	371
48084149	5	0,8	70	-	25	6	4,9	3	2	371
48084155	6	1	80	-	30	6	4,9	3	2	371
48084161	8	1,25	90	-	35	8	6,2	3	2	371
48084169	10	1,5	100	-	39	10	8	3	2	371
48084179	12	1,75	110	28	-	9	7	3	3	376
48084191	14	2	110	30	-	11	9	3	3	376
48084202	16	2	110	32	-	12	9	4	3	376
48084214	18	2,5	125	34	-	14	11	4	3	376
48084228	20	2,5	140	34	-	16	12	4	3	376
48084238	22	2,5	140	34	-	18	14,5	4	3	376
48084247	24	3	160	38	-	18	14,5	4	3	376
48084262	27	3	160	38	-	20	16	4	3	376
48084271	30	3,5	180	45	-	22	18	4	3	376
48084281	33	3,5	180	50	-	25	20	4	3	376
48084294	36	4	200	56	-	28	22	4	3	376

Metric

# VPO-H-POT

Threading | Cutting taps | Metric



- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- For hardened steels up to 45 HRC
- Side through coolant

<b>P</b> C ≥ 0,45%	<b>K</b> GGG	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	
8-13	10-15	4-6	2-4	6-10	6-10	m/min

<b>M</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>B/5</b>			<b>DIN 371</b>	<b>DIN 376</b>
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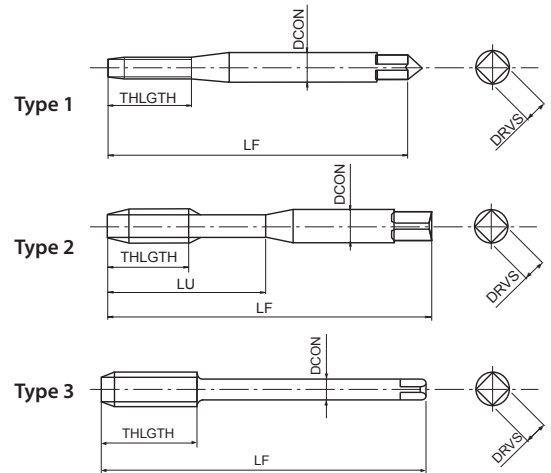
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48085155	6	1	80	-	30	6	4,9	3	1	371
48085161	8	1,25	90	-	35	8	6,2	3	1	371
48085169	10	1,5	100	-	39	10	8	3	1	371
48085179	12	1,75	110	28	-	9	7	3	2	376
48085191	14	2	110	30	-	11	9	3	2	376
48085202	16	2	110	32	-	12	9	4	2	376
48085214	18	2,5	125	34	-	14	11	4	2	376
48085228	20	2,5	140	34	-	16	12	4	2	376
48085238	22	2,5	140	34	-	18	14,5	4	2	376
48085247	24	3	160	38	-	18	14,5	4	2	376
48085262	27	3	160	38	-	20	16	4	2	376
48085271	30	3,5	180	45	-	22	18	4	2	376
48085281	33	3,5	180	50	-	25	20	4	2	376
48085294	36	4	200	56	-	28	22	4	2	376

# A-SFT

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels



Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC		m/min
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20		

<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	45°	ISO 2 6HX	C/2,5		DIN 371	DIN 376
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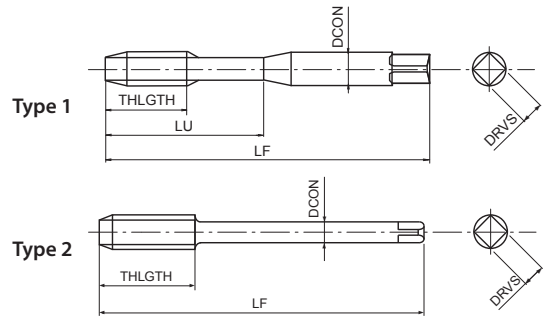
Metric

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48139111	1	0,25	40	-	5	2,5	2,1	2	1	371
48139112	1,1	0,25	40	-	5	2,5	2,1	2	1	371
48139113	1,2	0,25	40	-	5	2,5	2,1	2	1	371
48139115	1,4	0,3	40	-	6	2,5	2,1	2	1	371
48139118	1,6	0,35	40	-	7	2,5	2,1	2	1	371
48139119	1,7	0,35	40	-	8	2,5	2,1	2	1	371
48139120	1,8	0,35	40	-	8	2,5	2,1	2	1	371
48139125	2	0,4	45	3,2	10	2,8	2,1	2	2	371
48139127	2,2	0,45	45	3,6	11	2,8	2,1	2	2	371
48139128	2,3	0,4	45	3,6	12	2,8	2,1	2	2	371
48139133	2,5	0,45	50	3,6	13	2,8	2,1	2	2	371
48139136	2,6	0,45	50	3,6	13	2,8	2,1	2	2	371
48139138	3	0,5	56	4	18	3,5	2,7	3	2	371
48139142	3,5	0,6	56	4,8	20	4	3	3	2	371
48139144	4	0,7	63	5,6	21	4,5	3,4	3	2	371
48139147	4,5	0,75	70	6	25	6	4,9	3	2	371
48139149	5	0,8	70	6,4	25	6	4,9	3	2	371
48139152	5,5	0,9	80	7,2	30	6	4,9	3	2	371
48139155	6	1	80	8	30	6	4,9	3	2	371
48139158	7	1	80	8	30	7	5,5	3	2	371
48139161	8	1,25	90	10	35	8	6,2	3	2	371
48139165	9	1,25	90	10	35	9	7	3	2	371
48139169	10	1,5	100	12	39	10	8	3	2	371
48139139	3	0,5	56	4	-	2,2	-	3	3	376
48139185	4	0,7	63	5,6	-	2,8	2,1	3	3	376
48139150	5	0,8	70	6,4	-	3,5	2,7	3	3	376
48139187	6	1	80	8	-	4,5	3,4	3	3	376
48139159	7	1	80	8	-	5,5	4,3	3	3	376
48139188	8	1,25	90	10	-	6	4,9	3	3	376
48139166	9	1,25	90	10	-	7	5,5	3	3	376
48139189	10	1,5	100	12	-	7	5,5	3	3	376
48139175	11	1,5	100	12	-	8	6,2	3	3	376
48139179	12	1,75	110	14	-	9	7	3	3	376
48139191	14	2	110	16	-	11	9	3	3	376
48139202	16	2	110	16	-	12	9	3	3	376
48139214	18	2,5	125	25	-	14	11	4	3	376
48139228	20	2,5	140	25	-	16	12	4	3	376
48139238	22	2,5	140	25	-	18	14,5	4	3	376
48139247	24	3	160	30	-	18	14,5	4	3	376



# A-OIL-SFT

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- Centre through coolant

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	45°	ISO 2 6HX	C/2,5			DIN 371	DIN 376
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48140155	6	1	80	8	30	6	4,9	3	1	371
48140161	8	1,25	90	10	35	8	6,2	3	1	371
48140169	10	1,5	100	12	39	10	8	3	1	371
48140179	12	1,75	110	14	-	9	7	3	2	376
48140191	14	2	110	16	-	11	9	3	2	376
48140202	16	2	110	16	-	12	9	3	2	376
48140214	18	2,5	125	25	-	14	11	4	2	376
48140228	20	2,5	140	25	-	16	12	4	2	376
48140238	22	2,5	140	25	-	18	14,5	4	2	376
48140247	24	3	160	30	-	18	14,5	4	2	376
48140262	27	3	160	36	-	20	16	4	2	376
48140271	30	3,5	180	42	-	22	18	4	2	376
48140281	33	3,5	180	42	-	25	20	4	2	376
48140294	36	4	200	48	-	28	22	4	2	376
48140304	39	4	200	48	-	32	24	4	2	376
48140314	42	4,5	200	54	-	32	24	4	2	376
48140319	45	4,5	220	54	-	36	29	4	2	376
48140325	48	5	250	60	-	36	29	4	2	376
48140337	52	5	250	60	-	40	32	4	2	376
48140347	56	5,5	250	66	-	40	32	4	2	376

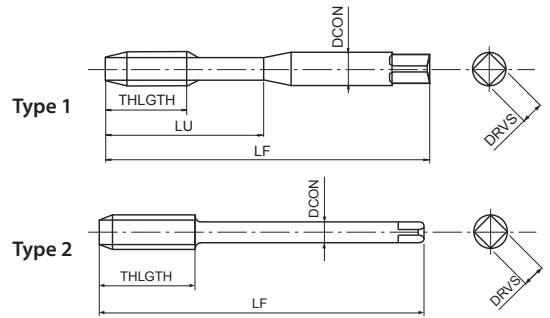
Threading | Cutting taps

Metric



# A-SFT 6GX

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- For 6G internal thread tolerance

Threading | Cutting taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
$C < 0,2\%$	$0,25 < C < 0,4$	$C \geq 0,45\%$	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

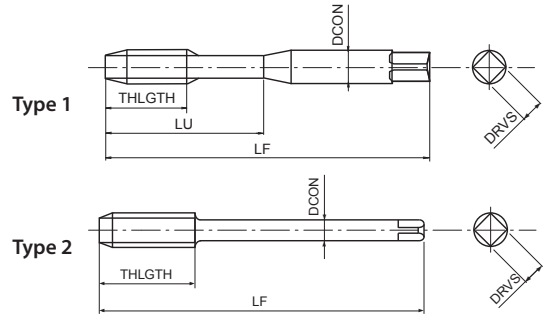
<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	45°	ISO 3 6GX	C/2,5		DIN 371	DIN 376
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EDP	TD	TP	Oversize	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48201125	2	0,4	0,0190	45	3,2	10	2,8	2,1	2	1	371
48201133	2,5	0,45	0,0200	50	3,6	13	2,8	2,1	2	1	371
48201138	3	0,5	0,0200	56	4	18	3,5	2,7	3	1	371
48201144	4	0,7	0,0220	63	5,6	21	4,5	3,4	3	1	371
48201149	5	0,8	0,0240	70	6,4	25	6	4,9	3	1	371
48201155	6	1	0,0260	80	8	30	6	4,9	3	1	371
48201161	8	1,25	0,0280	90	10	35	8	6,2	3	1	371
48201169	10	1,5	0,0320	100	12	39	10	8	3	1	371
48201179	12	1,75	0,0340	110	14	-	9	7	3	2	376
48201202	16	2	0,0380	110	16	-	12	9	3	2	376

Metric

# A-SFT 7GX

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- For 7G internal thread tolerance

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC		m/min
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20		

<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	<b>45°</b>	<b>7GX</b>	<b>C/2,5</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	Overdose	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48202125	2	0,4	0,0380	45	3,2	10	2,8	2,1	2	1	371
48202133	2,5	0,45	0,0400	50	3,6	13	2,8	2,1	2	1	371
48202138	3	0,5	0,0400	56	4	18	3,5	2,7	3	1	371
48202144	4	0,7	0,0440	63	5,6	21	4,5	3,4	3	1	371
48202149	5	0,8	0,0480	70	6,4	25	6	4,9	3	1	371
48202155	6	1	0,0520	80	8	30	6	4,9	3	1	371
48202161	8	1,25	0,0560	90	10	35	8	6,2	3	1	371
48202169	10	1,5	0,0640	100	12	39	10	8	3	1	371
48202179	12	1,75	0,0680	110	14	-	9	7	3	2	376
48202202	16	2	0,0760	110	16	-	12	9	3	2	376

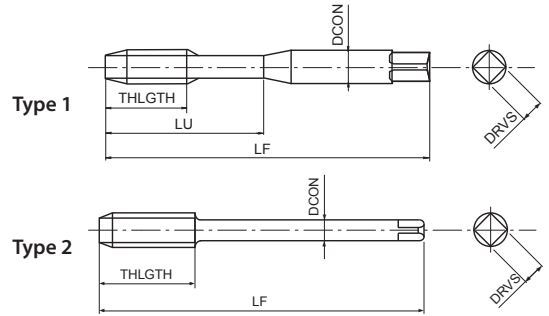
Threading | Cutting taps

Metric



# A-SFT FORM E

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- Chamfer Form E

<b>P</b> ●	<b>P</b> ●	<b>P</b> ●	<b>P</b> ●	<b>M</b> ●	<b>N</b> ○	<b>N</b> ○	<b>S</b> ○	<b>H</b> ○	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	45°	ISO 2 6HX	E/1,5		
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48203138	3	0,5	56	4	18	3,5	2,7	3	1	371
48203144	4	0,7	63	5,6	21	4,5	3,4	3	1	371
48203149	5	0,8	70	6,4	25	6	4,9	3	1	371
48203155	6	1	80	8	30	6	4,9	3	1	371
48203161	8	1,25	90	10	35	8	6,2	3	1	371
48203169	10	1,5	100	12	39	10	8	3	1	371
48203179	12	1,75	110	14	-	9	7	3	2	376
48203191	14	2	110	16	-	11	9	3	2	376
48203202	16	2	110	16	-	12	9	3	2	376

Threading | Cutting taps

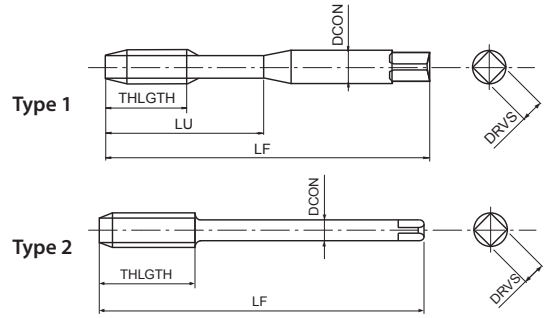
Metric





# A-SFT-LH

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- For left-hand threads

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	<b>45°</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>	<b>DIN 371</b>	<b>DIN 376</b>	<b>LH</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48217138	3	0,5	56	4	18	3,5	2,7	3	1	371
48217144	4	0,7	63	5,6	21	4,5	3,4	3	1	371
48217149	5	0,8	70	6,4	25	6	4,9	3	1	371
48217155	6	1	80	8	30	6	4,9	3	1	371
48217161	8	1,25	90	10	35	8	6,2	3	1	371
48217169	10	1,5	100	12	39	10	8	3	1	371
48217179	12	1,75	110	14	-	9	7	3	2	376
48217191	14	2	110	16	-	11	9	3	2	376
48217202	16	2	110	16	-	12	9	3	2	376
48217214	18	2,5	125	25	-	14	11	4	2	376
48217228	20	2,5	140	25	-	16	12	4	2	376
48217238	22	2,5	140	25	-	18	14,5	4	2	376
48217247	24	3	160	30	-	18	14,5	4	2	376

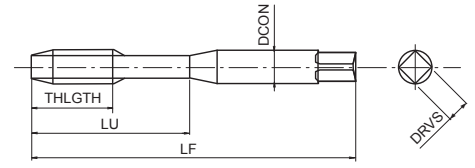
Threading | Cutting taps

Metric



# A-SFT-HB Weldon

Threading | Cutting taps | Metric



- First choice in quality and performance
- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- With Weldon shank

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC		
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20		m/min

<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	<b>45°</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>	<b>DIN 371</b>	<b>DIN 1835</b>	<b>HB</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	DIN
48220138	3	0,5	56	4	18	6	4,9	3	371/1835
48220144	4	0,7	63	5,6	21	6	4,9	3	371/1835
48220149	5	0,8	70	6,4	25	6	4,9	3	371/1835
48220155	6	1	80	8	30	6	4,9	3	371/1835
48220161	8	1,25	90	10	35	8	6,2	3	371/1835
48220169	10	1,5	100	12	39	10	8	3	371/1835
48220179	12	1,75	110	14	46	12	9	3	371/1835
48220191	14	2	110	16	49	14	11	3	371/1835
48220202	16	2	110	16	56	16	12	3	371/1835

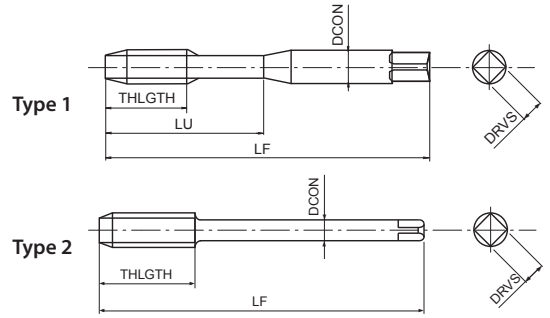
Metric





# A-CSF OIL FORM E

Threading | Cutting taps | Metric



- First choice in quality and performance
- Carbide spiral-fluted cutting tap for blind holes
- TiAlN coating
- For cast iron and aluminium cast
- Centre through coolant, Chamfer Form E

Threading | Cutting taps

<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	m/min
10-100	10-100	10-100	

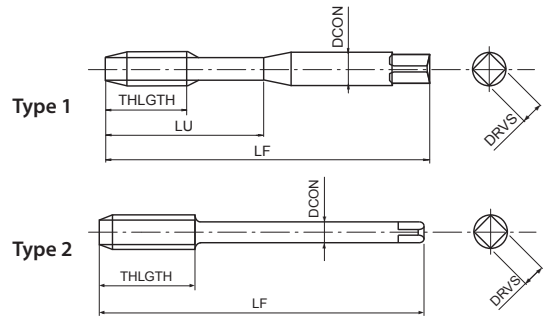
<b>A</b>	<b>M</b>	<b>CARBIDE</b>	<b>FX</b>	<b>h6</b>	<b>15°</b>	<b>ISO 2 6HX</b>	<b>E/1,5</b>			<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48266149	5	0,8	70	10	25	6	4,9	3	1	371
48266155	6	1	80	12	30	6	4,9	3	1	371
48266161	8	1,25	90	15	35	8	6,2	3	1	371
48266169	10	1,5	100	18	39	10	8	3	1	371
48266179	12	1,75	110	21	-	9	7	3	2	376

Metric

# S-SFT

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>ISO 1 5H &lt; M1,4</b>	<b>C/2,5</b>		<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48223111	1	0,25	40	-	5	2,5	2,1	2	1	371
48223112	1,1	0,25	40	-	5	2,5	2,1	2	1	371
48223113	1,2	0,25	40	-	5	2,5	2,1	2	1	371
48223115	1,4	0,3	40	-	6	2,5	2,1	2	1	371
48223118	1,6	0,35	40	-	7	2,5	2,1	2	1	371
48223119	1,7	0,35	40	-	8	2,5	2,1	2	1	371
48223120	1,8	0,35	40	-	8	2,5	2,1	2	1	371
48223125	2	0,4	45	4	10	2,8	2,1	2	1	371
48223127	2,2	0,45	45	5	11	2,8	2,1	2	1	371
48223128	2,3	0,4	45	4	12	2,8	2,1	2	1	371
48223133	2,5	0,45	50	4,5	13	2,8	2,1	2	1	371
48223136	2,6	0,45	50	4,5	13	2,8	2,1	2	1	371
48223138	3	0,5	56	5	18	3,5	2,7	3	1	371
48223142	3,5	0,6	56	6	20	4	3	3	1	371
48223144	4	0,7	63	7	21	4,5	3,4	3	1	371
48223147	4,5	0,75	70	7,5	25	6	4,9	3	1	371
48223149	5	0,8	70	8	25	6	4,9	3	1	371
48223152	5,5	0,9	80	9	30	6	4,9	3	1	371
48223155	6	1	80	10	30	6	4,9	3	1	371
48223158	7	1	80	10	30	7	5,5	3	1	371
48223161	8	1,25	90	13	35	8	6,2	3	1	371
48223165	9	1,25	90	13	35	9	7	3	1	371
48223169	10	1,5	100	15	39	10	8	3	1	371
48223140	3	0,5	56	5	-	2,2	-	3	2	376
48223185	4	0,7	63	7	-	2,8	2,1	3	2	376
48223150	5	0,8	70	8	-	3,5	2,7	3	2	376
48223187	6	1	80	10	-	4,5	3,4	3	2	376
48223159	7	1	80	10	-	5,5	4,3	3	2	376
48223188	8	1,25	90	13	-	6	4,9	3	2	376
48223166	9	1,25	90	13	-	7	5,5	3	2	376
48223189	10	1,5	100	15	-	7	5,5	3	2	376
48223175	11	1,5	100	15	-	8	6,2	3	2	376
48223179	12	1,75	110	18	-	9	7	4	2	376
48223191	14	2	110	20	-	11	9	4	2	376
48223202	16	2	110	20	-	12	9	4	2	376
48223214	18	2,5	125	25	-	14	11	4	2	376
48223228	20	2,5	140	25	-	16	12	4	2	376
48223238	22	2,5	140	25	-	18	14,5	4	2	376
48223247	24	3	160	30	-	18	14,5	4	2	376

Threading | Cutting taps

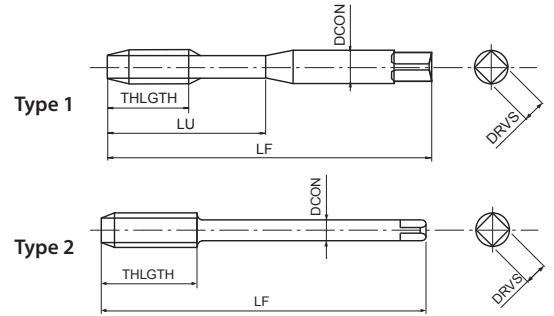
Metric



A

# S-SFT 6G

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- For 6G internal thread tolerance

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

M	HSSE	OX	40°	ISO 2 6G	C/2,5	DIN 371	DIN 376
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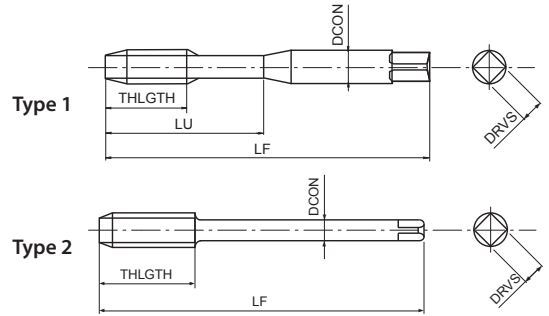
EDP	TD	TP	Oversize	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48269125	2	0,4	0,0190	45	3,2	10	2,8	2,1	2	1	371
48269133	2,5	0,45	0,0200	50	3,6	13	2,8	2,1	2	1	371
48269138	3	0,5	0,0200	56	4	18	3,5	2,7	3	1	371
48269144	4	0,7	0,0220	63	5,6	21	4,5	3,4	3	1	371
48269149	5	0,8	0,0240	70	6,4	25	6	4,9	3	1	371
48269155	6	1	0,0260	80	8	30	6	4,9	3	1	371
48269161	8	1,25	0,0280	90	10	35	8	6,2	3	1	371
48269169	10	1,5	0,0320	100	12	39	10	8	3	1	371
48269179	12	1,75	0,0340	110	14	-	9	7	3	2	376
48269191	14	2	0,0380	110	16	-	11	9	3	2	376
48269202	16	2	0,0380	110	16	-	12	9	3	2	376

Metric



# S-SFT 7G

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- For 7G internal thread tolerance

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>7G</b>	<b>C/2,5</b>		
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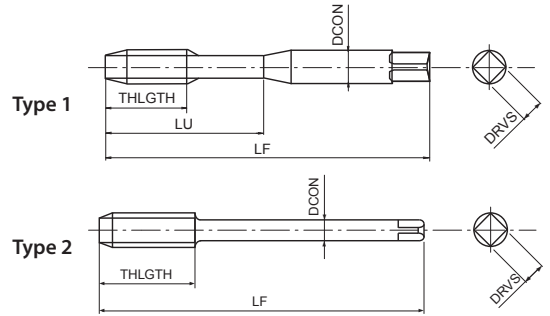
EDP	TD	TP	Oversize	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48274125	2	0,4	0,0380	45	3,2	10	2,8	2,1	2	1	371
48274133	2,5	0,45	0,0400	50	3,6	13	2,8	2,1	2	1	371
48274138	3	0,5	0,0400	56	4	18	3,5	2,7	3	1	371
48274144	4	0,7	0,0440	63	5,6	21	4,5	3,4	3	1	371
48274149	5	0,8	0,0480	70	6,4	25	6	4,9	3	1	371
48274155	6	1	0,0520	80	8	30	6	4,9	3	1	371
48274161	8	1,25	0,0560	90	10	35	8	6,2	3	1	371
48274169	10	1,5	0,0640	100	12	39	10	8	3	1	371
48274179	12	1,75	0,0680	110	14	-	9	7	3	2	376
48274191	14	2	0,0760	110	16	-	11	9	3	2	376
48274202	16	2	0,0760	110	16	-	12	9	3	2	376





# S-SFT FORM E

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- Chamfer Form E

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	<b>m/min</b>
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GGG	
10-15	8-14	8-14	7-11	7-12	7-14	

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>E/1,5</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48268138	3	0,5	56	4	18	3,5	2,7	3	1	371
48268144	4	0,7	63	5,6	21	4,5	3,4	3	1	371
48268149	5	0,8	70	6,4	25	6	4,9	3	1	371
48268155	6	1	80	8	30	6	4,9	3	1	371
48268161	8	1,25	90	10	35	8	6,2	3	1	371
48268169	10	1,5	100	12	39	10	8	3	1	371
48268179	12	1,75	110	14	-	9	7	3	2	376
48268191	14	2	110	16	-	11	9	3	2	376
48268202	16	2	110	16	-	12	9	3	2	376

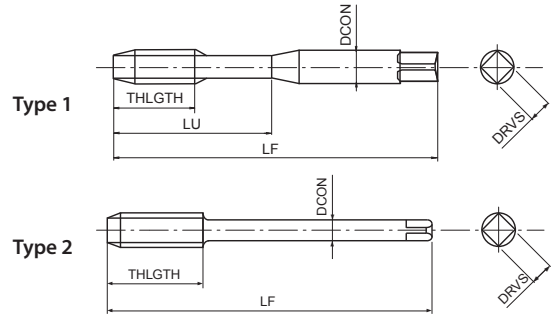
Threading | Cutting taps



Metric

# S-LT-SFT

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- With long shank for long reach threading

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min
<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>	

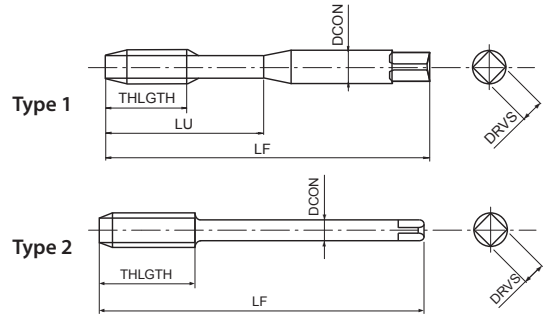
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type
48275125	2	0,4	80	3,2	10	2,8	2,1	2	1
48275133	2,5	0,45	100	3,6	13	2,8	2,1	2	1
48275138	3	0,5	100	4	18	3,5	2,7	3	1
48275144	4	0,7	125	5,6	21	4,5	3,4	3	1
48275149	5	0,8	160	6,4	25	6	4,9	3	1
48275155	6	1	160	8	30	6	4,9	3	1
48275187	6	1	160	10	-	4,5	3,4	3	2
48275161	8	1,25	180	10	35	8	6,2	3	1
48275188	8	1,25	180	11	-	6	4,9	3	2
48275169	10	1,5	200	12	39	10	8	3	1
48275189	10	1,5	200	14	-	7	5,5	3	2
48275179	12	1,75	200	14	-	9	7	3	2
48275191	14	2	200	16	-	11	9	3	2
48275202	16	2	200	16	-	12	9	3	2
48275214	18	2,5	200	25	-	14	11	4	2
48275228	20	2,5	200	25	-	16	12	4	2

Metric



# S-SFT-LH

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- For left-hand threads

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>	<b>DIN 371</b>	<b>DIN 376</b>	<b>LH</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48276138	3	0,5	56	4	18	3,5	2,7	3	1	371
48276144	4	0,7	63	5,6	21	4,5	3,4	3	1	371
48276149	5	0,8	70	6,4	25	6	4,9	3	1	371
48276155	6	1	80	8	30	6	4,9	3	1	371
48276161	8	1,25	90	10	35	8	6,2	3	1	371
48276169	10	1,5	100	12	39	10	8	3	1	371
48276179	12	1,75	110	14	-	9	7	3	2	376
48276191	14	2	110	16	-	11	9	3	2	376
48276202	16	2	110	16	-	12	9	3	2	376
48276214	18	2,5	125	25	-	14	11	4	2	376
48276228	20	2,5	140	25	-	16	12	4	2	376
48276238	22	2,5	140	25	-	18	14,5	4	2	376
48276247	24	3	160	30	-	18	14,5	4	2	376

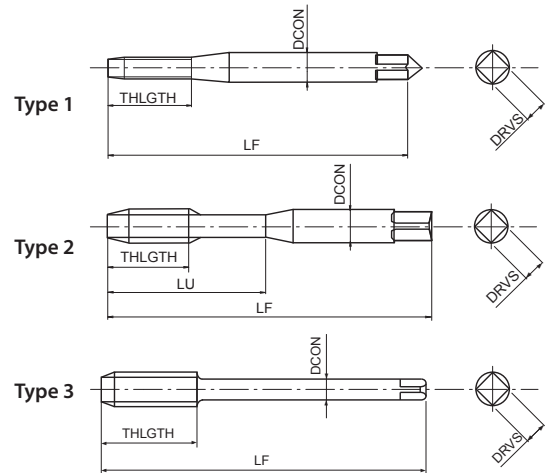


# VA-SFT

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels



<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
65312560	2	0,4	45	-	8	2,8	2,1	2	1	371
65312860	2,2	0,45	45	-	9	2,8	2,1	2	1	371
65313360	2,5	0,45	50	-	9	2,8	2,1	2	1	371
65313860	3	0,5	56	-	18	3,5	2,7	3	2	371
65314060	3,5	0,6	56	-	20	4	3	3	2	371
65314460	4	0,7	63	-	21	4,5	3,4	3	2	371
65314960	5	0,8	70	-	25	6	4,9	3	2	371
65315560	6	1	80	-	30	6	4,9	3	2	371
65316160	8	1,25	90	-	35	8	6,2	3	2	371
65316960	10	1,5	100	-	39	10	8	3	2	371
65413860	3	0,5	56	5	-	2,2	-	3	3	376
65414460	4	0,7	63	7	-	2,8	2,1	3	3	376
65414960	5	0,8	70	8	-	3,5	2,7	3	3	376
65415560	6	1	80	10	-	4,5	3,4	3	3	376
65416160	8	1,25	90	13	-	6	4,9	3	3	376
65416960	10	1,5	100	15	-	7	5,5	3	3	376
65417960	12	1,75	110	18	-	9	7	4	3	376
65419160	14	2	110	20	-	11	9	4	3	376
65420260	16	2	110	20	-	12	9	4	3	376
65421460	18	2,5	125	25	-	14	11	4	3	376
65422860	20	2,5	140	25	-	16	12	4	3	376
65423860	22	2,5	140	25	-	18	14,5	4	3	376
65424760	24	3	160	30	-	18	14,5	4	3	376
65426260	27	3	160	30	-	20	16	4	3	376
65427160	30	3,5	180	35	-	22	18	5	3	376
65428160	33	3,5	180	35	-	25	20	5	3	376
65429460	36	4	200	40	-	28	22	5	3	376

Threading | Cutting taps

Metric

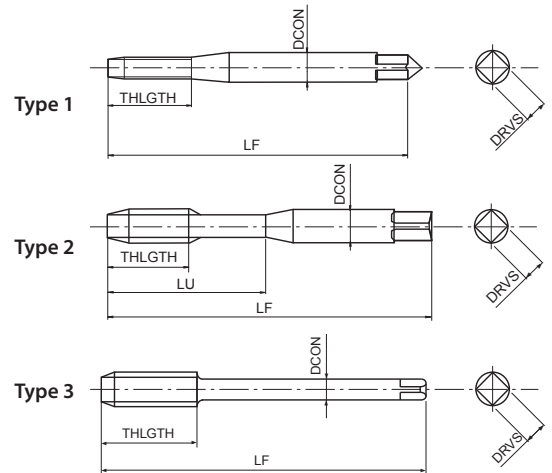
A

# VA-SFT 6G

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- For 6G internal thread tolerance



Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ISO 3 6G</b>	<b>C/2,5</b>	<b>DIN 371</b>	<b>DIN 376</b>
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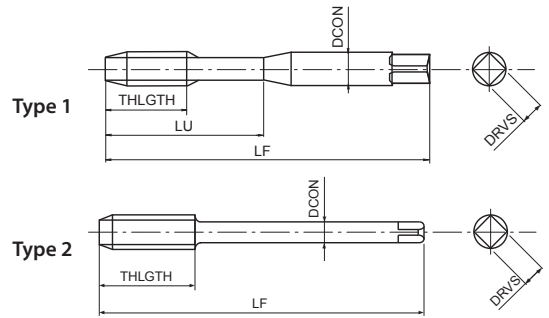
EDP	TD	TP	OverSize	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
65312599	2	0,4	0,0190	45	-	8	2,8	2,1	2	1	371
65313399	2,5	0,45	0,0200	50	-	9	2,8	2,1	2	1	371
65313899	3	0,5	0,0200	56	-	18	3,5	2,7	3	2	371
65314499	4	0,7	0,0220	63	-	21	4,5	3,4	3	2	371
65314999	5	0,8	0,0240	70	-	25	6	4,9	3	2	371
65315599	6	1	0,0260	80	-	30	6	4,9	3	2	371
65316199	8	1,25	0,0280	90	-	35	8	6,2	3	2	371
65316999	10	1,5	0,0320	100	-	39	10	8	3	2	371
65417999	12	1,75	0,0340	110	18	-	9	7	4	3	376
65419199	14	2	0,0380	110	20	-	11	9	4	3	376
65420299	16	2	0,0380	110	20	-	12	9	4	3	376



Metric

# VA-SFT FORM E

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels
- Chamfer Form E

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	
$C < 0,2\%$	$0,25 < C < 0,4$	$C \geq 0,45\%$	SCM	INOX	GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>E/1,5</b>	<b>DIN 371</b>	<b>DIN 376</b>
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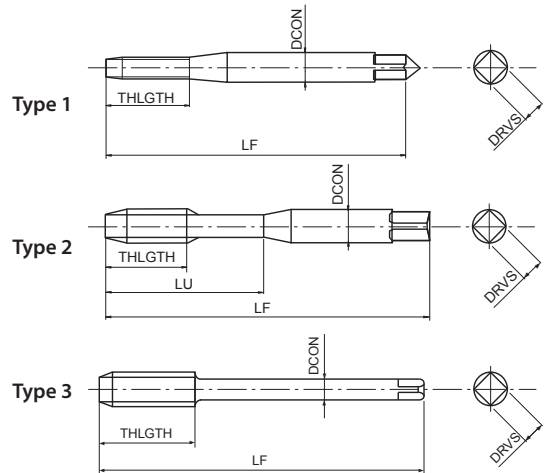
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48036138	3	0,5	56	-	18	3,5	2,7	3	1	371
48036144	4	0,7	63	-	21	4,5	3,4	3	1	371
48036149	5	0,8	70	-	25	6	4,9	3	1	371
48036155	6	1	80	-	30	6	4,9	3	1	371
48036161	8	1,25	90	-	35	8	6,2	3	1	371
48036169	10	1,5	100	-	39	10	8	3	1	371
48036179	12	1,75	110	18	-	9	7	3	2	376
48036191	14	2	110	20	-	11	9	3	2	376
48036202	16	2	110	20	-	12	9	3	2	376

# Z-SFT

Threading | Cutting taps | Metric



- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels and stainless steels



Threading | Cutting taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
10-25	10-25	10-25	8-20	8-20	15-35	15-35	5-10	8-15	m/min
<b>M</b>	<b>PM</b>	<b>V</b>	<b>50°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>		<b>DIN 371</b>	<b>DIN 376</b>	

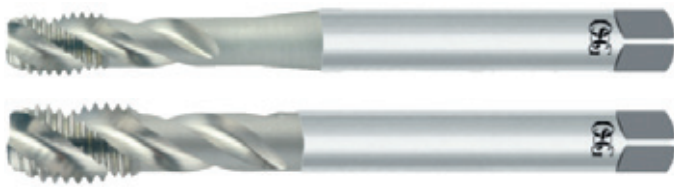
Metric

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
80512568	2	0,4	45	-	8	2,8	2,1	2	1	371
80513368	2,5	0,45	50	-	9	2,8	2,1	2	1	371
80513868	3	0,5	56	-	18	3,5	2,7	3	2	371
80514468	4	0,7	63	-	21	4,5	3,4	3	2	371
80514968	5	0,8	70	-	25	6	4,9	3	2	371
80515568	6	1	80	-	30	6	4,9	3	2	371
80516168	8	1,25	90	-	35	8	6,2	3	2	371
80516968	10	1,5	100	-	39	10	8	3	2	371
80613868	3	0,5	56	5	-	2,2	-	3	3	376
80614468	4	0,7	63	7	-	2,8	2,1	3	3	376
80614968	5	0,8	70	8	-	3,5	2,7	3	3	376
80615568	6	1	80	10	-	4,5	3,4	3	3	376
80616168	8	1,25	90	13	-	6	4,9	3	3	376
80616968	10	1,5	100	15	-	7	5,5	3	3	376
80617968	12	1,75	110	18	-	9	7	4	3	376
80619168	14	2	110	20	-	11	9	4	3	376
80620268	16	2	110	20	-	12	9	4	3	376
80621468	18	2,5	125	25	-	14	11	4	3	376
80622868	20	2,5	140	25	-	16	12	4	3	376
81623868	22	2,5	140	25	-	18	14,5	4	3	376
81624768	24	3	160	30	-	18	14,5	4	3	376
81626268	27	3	160	30	-	20	16	4	3	376
81627168	30	3,5	180	35	-	22	18	4	3	376

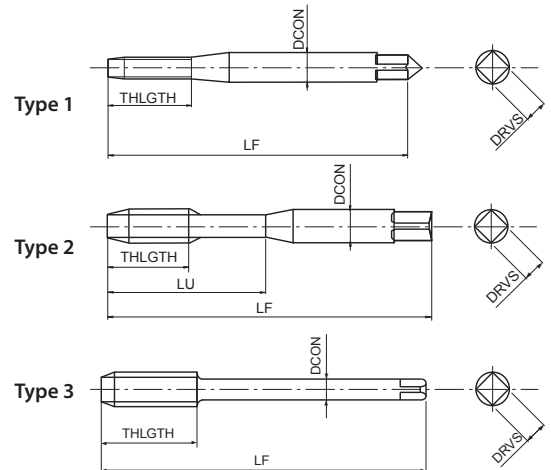


# SFT

## Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Bright finish
- For general purpose applications



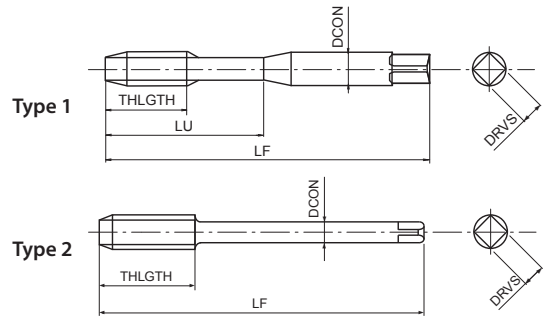
Threading | Cutting taps

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	
8-13	7-12	7-12	6-9	6-8	10-20	10-15	m/min
<b>M</b>	<b>HSSE</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>	<b>DIN 371</b>	<b>DIN 376</b>	

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
61312560	2	0,4	45	-	8	2,8	2,1	2	1	371
61313360	2,5	0,45	50	-	9	2,8	2,1	2	1	371
61313860	3	0,5	56	-	18	3,5	2,7	3	2	371
61314060	3,5	0,6	56	-	20	4	3	3	2	371
61314460	4	0,7	63	-	21	4,5	3,4	3	2	371
61314960	5	0,8	70	-	25	6	4,9	3	2	371
61315560	6	1	80	-	30	6	4,9	3	2	371
61316160	8	1,25	90	-	35	8	6,2	3	2	371
61316960	10	1,5	100	-	39	10	8	3	2	371
61413860	3	0,5	56	5	-	2,2	-	3	3	376
61414460	4	0,7	63	7	-	2,8	2,1	3	3	376
61414960	5	0,8	70	8	-	3,5	2,7	3	3	376
61415560	6	1	80	10	-	4,5	3,4	3	3	376
61416160	8	1,25	90	13	-	6	4,9	3	3	376
61416960	10	1,5	100	15	-	7	5,5	3	3	376
61417960	12	1,75	110	18	-	9	7	3	3	376
61419160	14	2	110	20	-	11	9	3	3	376
61420260	16	2	110	20	-	12	9	3	3	376
61421460	18	2,5	125	25	-	14	11	4	3	376
61422860	20	2,5	140	25	-	16	12	4	3	376
61423860	22	2,5	140	25	-	18	14,5	4	3	376
61424760	24	3	160	30	-	18	14,5	4	3	376
61426260	27	3	160	30	-	20	16	4	3	376
61427160	30	3,5	180	35	-	22	18	4	3	376
61428160	33	3,5	180	35	-	25	20	4	3	376
61429460	36	4	200	40	-	28	22	4	3	376

Metric





- HSSE spiral-flute cutting tap for blind holes
- Bright finish
- For general purpose applications
- According to DIN 352 shank reduced length

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC		
8-13	7-12	7-12	6-9	6-8	10-20	10-15	m/min	

<b>M</b>	<b>HSSE</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>	<b>DIN 352</b>
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EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	Type	DIN
60413860	3	0,5	40	18	3,5	2,7	3	1	352
60414460	4	0,7	45	21	4,5	3,4	3	1	352
60414960	5	0,8	50	24	6	4,9	3	1	352
60415560	6	1	50	27	6	4,9	3	1	352
60416160	8	1,25	63	13	6	4,9	3	2	352
60416960	10	1,5	70	15	7	5,5	3	2	352

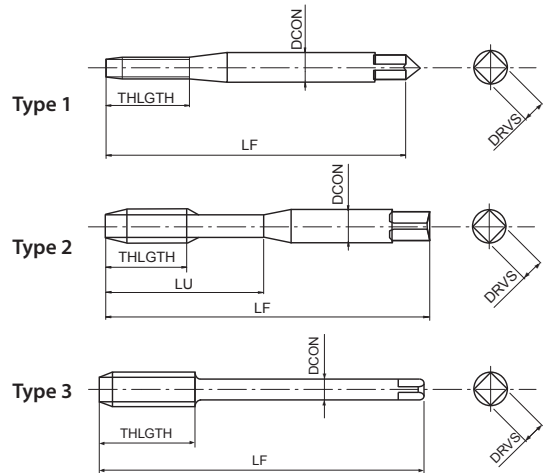
Threading | Cutting taps  
Metric

# TIN-SFT

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- TIN coating
- For steels up to 850 N/mm<sup>2</sup>



Threading | Cutting taps

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ○ INOX	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC		
8-13	7-12	7-12	6-9	5-8	7-12	10-20	10-15		m/min
<b>M</b>	<b>HSSE</b>	<b>TiN</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>	<b>DIN 371</b>	<b>DIN 376</b>		

Metric

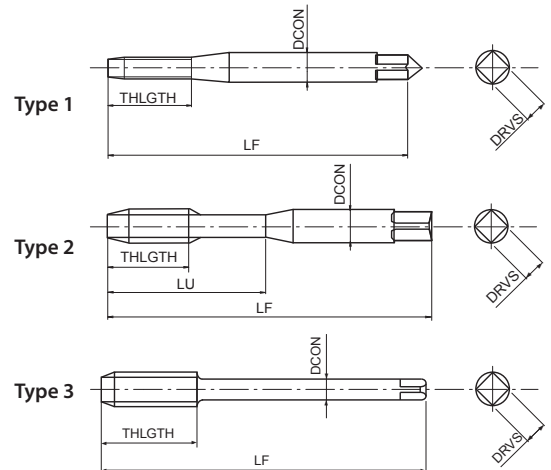
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
6131256001	2	0,4	45	-	8	2,8	2,1	2	1	371
6131336001	2,5	0,45	50	-	9	2,8	2,1	2	1	371
6131386001	3	0,5	56	-	18	3,5	2,7	3	2	371
6131406001	3,5	0,6	56	-	20	4	3	3	2	371
6131446001	4	0,7	63	-	21	4,5	3,4	3	2	371
6131496001	5	0,8	70	-	25	6	4,9	3	2	371
6131556001	6	1	80	-	30	6	4,9	3	2	371
6131616001	8	1,25	90	-	36	8	6,2	3	2	371
6131696001	10	1,5	100	-	39	10	8	3	2	371
6141386001	3	0,5	56	5	-	2,2	-	3	3	376
6141446001	4	0,7	63	7	-	2,8	2,1	3	3	376
6141496001	5	0,8	70	8	-	3,5	2,7	3	3	376
6141556001	6	1	80	10	-	4,5	3,4	3	3	376
6141616001	8	1,25	90	13	-	6	4,9	3	3	376
6141696001	10	1,5	100	15	-	7	5,5	3	3	376
6141796001	12	1,75	110	18	-	9	7	3	3	376
6141916001	14	2	110	20	-	11	9	3	3	376
6142026001	16	2	110	20	-	12	9	3	3	376
6142146001	18	2,5	125	25	-	14	11	4	3	376
6142286001	20	2,5	140	25	-	16	12	4	3	376
6142386001	22	2,5	140	25	-	18	14,5	4	3	376
6142476001	24	3	160	30	-	18	14,5	4	3	376
6142626001	27	3	160	30	-	20	16	4	3	376
6142716001	30	3,5	180	35	-	22	18	4	3	376

# TICN-SFT

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Multilayer TiCN coating
- For steels up to 850 N/mm<sup>2</sup>



<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ○ INOX	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC			
8-13	7-12	7-12	6-9	5-8	7-12	10-20	10-15			m/min
<b>M</b>	<b>HSSE</b>	<b>V</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>	<b>DIN 371</b>	<b>DIN 376</b>			

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
6131256002	2	0,4	45	-	8	2,8	2,1	2	1	371
6131386002	3	0,5	56	-	18	3,5	2,7	3	2	371
6131446002	4	0,7	63	-	21	4,5	3,4	3	2	371
6131496002	5	0,8	70	-	25	6	4,9	3	2	371
6131556002	6	1	80	-	30	6	4,9	3	2	371
6131616002	8	1,25	90	-	36	8	6,2	3	2	371
6131696002	10	1,5	100	-	39	10	8	3	2	371
6141796002	12	1,75	110	18	-	9	7	3	3	376
6141916002	14	2	110	20	-	11	9	3	3	376
6142026002	16	2	110	20	-	12	9	3	3	376
6142146002	18	2,5	125	25	-	14	11	4	3	376
6142286002	20	2,5	140	25	-	16	12	4	3	376
6142386002	22	2,5	140	25	-	18	14,5	4	3	376
6142476002	24	3	160	30	-	18	14,5	4	3	376

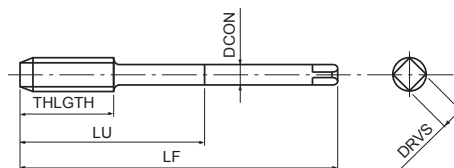
Threading | Cutting taps

Metric



# HXL-SFT

Threading | Cutting taps | Metric



- HSSE low spiral-fluted cutting tap for blind holes
- Steam oxide treatment
- For steels and cast iron
- For horizontal applications in oil and heavy industry

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ○ 25-35 HRC			
8-13	7-12	7-12	6-9	5-8	7-12	7-12	3-5	m/min		
<b>M</b>	<b>HSSE</b>	<b>OX</b>	15°	<b>ISO 2 6HX</b>	<b>C/2,5</b>					

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF
48045228	20	2,5	140	20	69	16	12	5
48045247	24	3	160	24	81	18	14,5	5
48045262	27	3	160	24	90	20	16	5
48045271	30	3,5	250	28	161	22	18	5
48045281	33	3,5	250	28	176	25	20	5
48045294	36	4	250	32	174	28	22	5
48045304	39	4	300	32	188	32	24	5
48045314	42	4,5	300	36	203	32	24	6
48045325	48	5	300	40	183	36	29	6
48045337	52	5	300	40	197	40	32	6
48045347	56	5,5	300	44	213	45	35	6

Threading | Cutting taps

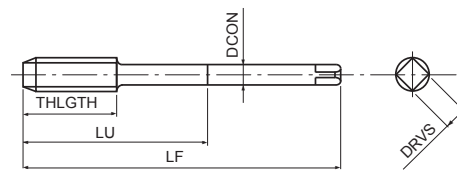
Metric





# VXL-SFT

Threading | Cutting taps | Metric



- HSSE high spiral-fluted cutting tap for blind holes
- Steam oxide treatment
- For general steels
- For vertical applications in oil and heavy industry

Threading | Cutting taps

<b>P</b> ○	<b>P</b> ○	<b>P</b> ●	<b>P</b> ●	<b>M</b> ○	<b>H</b> ○	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	25-35 HRC	
8-13	7-12	7-12	6-9	5-8	3-5	m/min

<b>M</b>	<b>HSSE</b>	<b>OX</b>	<b>45°</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>	
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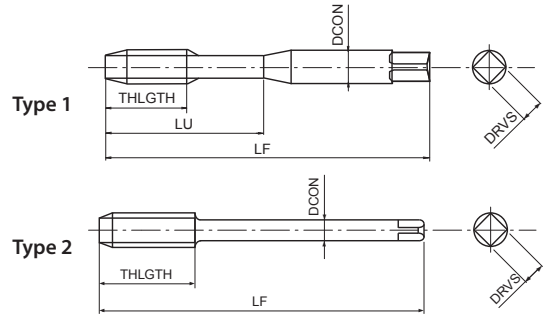
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF
48046228	20	2,5	140	20	69	16	12	4
48046247	24	3	160	24	81	18	14,5	4
48046262	27	3	160	24	90	20	16	4
48046271	30	3,5	250	28	161	22	18	5
48046281	33	3,5	250	28	176	25	20	5
48046294	36	4	250	32	174	28	22	5
48046304	39	4	300	32	188	32	24	5
48046314	42	4,5	300	36	203	32	24	6
48046325	48	5	300	40	183	36	29	6
48046337	52	5	300	40	197	40	32	6
48046347	56	5,5	300	44	213	45	35	6

Metric



# SH-SFT

Threading | Cutting taps | Metric



- HSSE low spiral-fluted cutting tap for blind holes
- Bright finish
- For alloyed steels  $\geq 1100\text{N/mm}^2$
- Short chip creation

Threading | Cutting taps

<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ○ GG	<b>K</b> ○ GGG	<b>N</b> ○ AC, ADC	
7-12	7-12	6-9	7-12	6-8	10-15	m/min

<b>M</b>	<b>HSSE</b>	<b>15°</b>	<b>ISO 2 6H</b>	<b>C/3</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
72313860	3	0,5	56	-	18	3,5	2,7	3	1	371
72314460	4	0,7	63	-	21	4,5	3,4	3	1	371
72314960	5	0,8	70	-	25	6	4,9	3	1	371
72315560	6	1	80	-	30	6	4,9	3	1	371
72316160	8	1,25	90	-	35	8	6,2	3	1	371
72316960	10	1,5	100	-	39	10	8	3	1	371
72017960	12	1,75	110	18	-	9	7	3	2	376
72019160	14	2	110	20	-	11	9	3	2	376
72020260	16	2	110	20	-	12	9	3	2	376
72021460	18	2,5	125	25	-	14	11	4	2	376
72022860	20	2,5	140	25	-	16	12	4	2	376

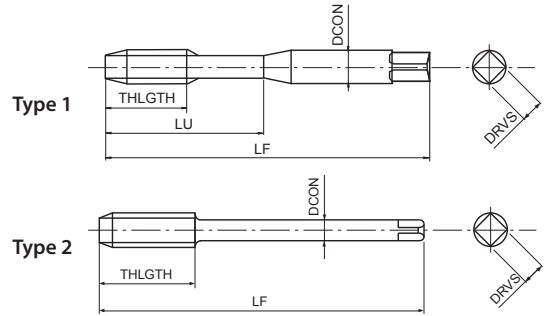


Metric



# M-SFT-DUPLEX NEW

Threading | Cutting taps | Metric



- Powder metal spiral-fluted cutting tap for blind holes
- TiN coating
- For stainless steels, Duplex, Super Duplex

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ● INOX	<b>S</b> ● Inconel 625	<b>S</b> ● Ti Gr.2	
10-25	10-25	10-25	8-20	3-15 Super Duplex	3-6 15-5 PH	2-3 17-4 PH	m/min
<b>M</b>	<b>PM</b>	<b>TiN</b>	<b>50°</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>	<b>DIN 371</b>	<b>DIN 376</b>

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48336125	2	0,4	45	3,2	10	2,8	2,1	2	1	371
48336138	3	0,5	56	4	18	3,5	2,7	3	1	371
48336144	4	0,7	63	5,6	21	4,5	3,4	3	1	371
48336149	5	0,8	70	6,4	25	6	4,9	3	1	371
48336155	6	1	80	8	30	6	4,9	3	1	371
48336161	8	1,25	90	10	35	8	6,2	3	1	371
48336169	10	1,5	100	12	39	10	8	4	1	371
48336179	12	1,75	110	14	-	9	7	4	2	376
48336191	14	2	110	16	-	11	9	4	2	376
48336202	16	2	110	16	-	12	9	4	2	376
48336214	18	2,5	125	25	-	14	11	4	2	376
48336228	20	2,5	140	25	-	16	12	4	2	376
48336238	22	2,5	140	25	-	18	14,5	4	2	376
48336247	24	3	160	30	-	18	14,5	4	2	376

Threading | Cutting taps

Metric

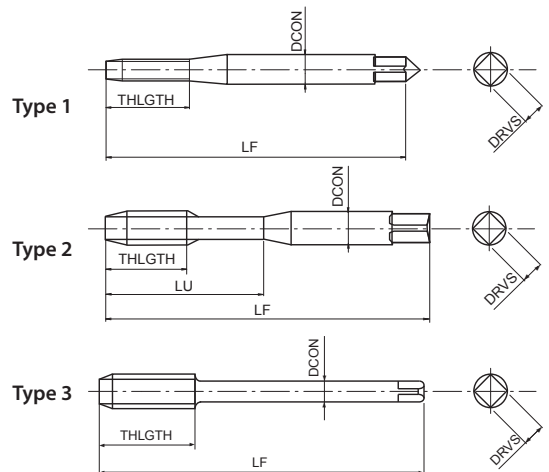


# CC-SFT

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- CrN coating
- For general steels, stainless steels and aluminium
- Developed for rigid tapping on CNC machines



Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	
15-25	15-25	10-25	10-25	6-10	15-35	m/min

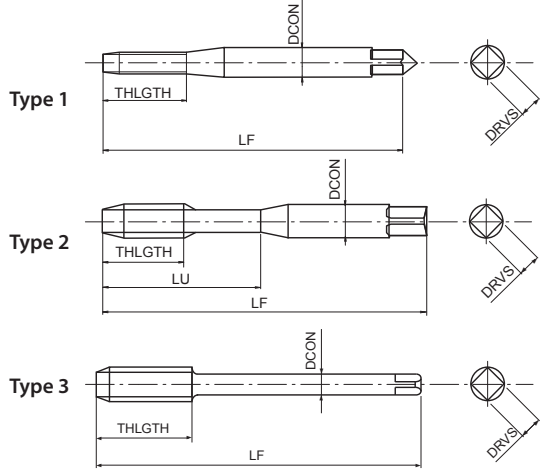
<b>M</b>	<b>HSSE</b>	<b>CrN</b>	<b>45°</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>	<b>≥2D</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48032125	2	0,4	45	-	8	2,8	2,1	2	1	371
48032133	2,5	0,45	50	-	10	2,8	2,1	2	1	371
48032138	3	0,5	56	-	12	3,5	2,7	3	1	371
48032144	4	0,7	63	-	16	4,5	3,4	3	1	371
48032149	5	0,8	70	-	20	6	4,9	3	1	371
48032155	6	1	80	-	24	6	4,9	3	1	371
48032161	8	1,25	90	-	35	8	6,2	3	2	371
48032169	10	1,5	100	-	39	10	8	4	2	371
48035138	3	0,5	56	5	-	2,2	-	3	3	376
48035144	4	0,7	63	7	-	2,8	2,1	3	3	376
48035149	5	0,8	70	8	-	3,5	2,7	3	3	376
48035155	6	1	80	10	-	4,5	3,4	3	3	376
48035161	8	1,25	90	11	-	6	4,9	3	3	376
48035169	10	1,5	100	14	-	7	5,5	4	3	376
48032179	12	1,75	110	16	-	9	7	4	3	376
48032191	14	2	110	18	-	11	9	4	3	376
48032202	16	2	110	18	-	12	9	4	3	376
48032214	18	2,5	125	23	-	14	11	4	3	376
48032228	20	2,5	140	23	-	16	12	4	3	376
48032238	22	2,5	140	23	-	18	14,5	4	3	376
48032247	24	3	160	27	-	18	14,5	4	3	376
48032262	27	3	160	27	-	20	16	4	3	376
48032271	30	3,5	180	32	-	22	18	4	3	376
48032294	36	4	200	36	-	28	22	4	3	376

Metric

# CC-LT-SFT

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- CrN coating
- For general steels, stainless steels and aluminium
- With long shank for long reach threading

Material and performance specifications:

- P** (Blue): C < 0,2%
- P** (Blue): 0,25 < C < 0,4
- P** (Blue): C ≥ 0,45%
- P** (Blue): SCM
- M** (Yellow): INOX
- N** (Green): Al

Speed ranges (m/min): 15-25, 10-25, 6-10, 15-35

Performance icons: M, HSSE, CrN, 45°, ISO 2 6HX, C/2,5, ≥2D

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type
48113125	2	0,4	80	-	8	2,8	2,1	2	1
48113133	2,5	0,45	100	-	10	2,8	2,1	2	1
48113138	3	0,5	100	-	12	3,5	2,7	3	1
48113144	4	0,7	125	-	16	4,5	3,4	3	1
48113149	5	0,8	140	-	20	6	4,9	3	1
48113155	6	1	160	-	24	6	4,9	3	1
48113161	8	1,25	180	-	35	8	6,2	3	2
48113169	10	1,5	200	-	39	10	8	4	2
48113179	12	1,75	200	16	-	9	7	4	3

Threading | Cutting taps

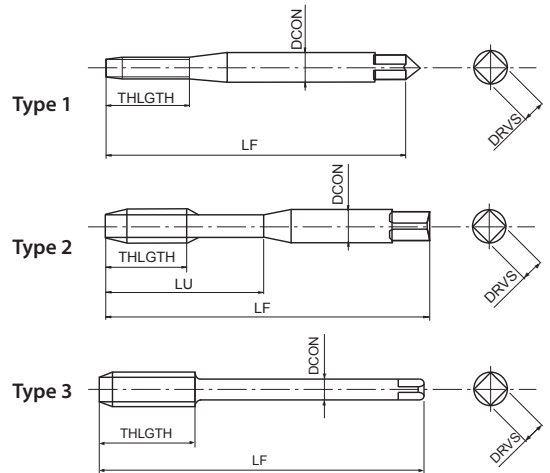


# CC-NEO-SFT

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- TiN coating
- For general steels, stainless steels and aluminium
- Variable helix for better chip evacuation



Threading | Cutting taps

<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al			
15-25	15-25	10-25	10-25	6-10	15-35	m/min		
<b>M</b>	<b>HSSE</b>	<b>TiN</b>	<b>45°</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>	<b>≥2D</b>	<b>DIN 371</b>	<b>DIN 376</b>

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48081125	2	0,4	45	-	8	2,8	2,1	2	1	371
48081133	2,5	0,45	50	-	9	2,8	2,1	2	1	371
48081138	3	0,5	56	-	18	3,5	2,7	2	2	371
48081144	4	0,7	63	-	21	4,5	3,4	2	2	371
48081149	5	0,8	70	-	25	6	4,9	2	2	371
48081155	6	1	80	-	30	6	4,9	2	2	371
48081161	8	1,25	90	-	35	8	6,2	3	2	371
48081169	10	1,5	100	-	39	10	8	3	2	371
48081179	12	1,75	110	13	-	9	7	3	3	376
48081191	14	2	110	14	-	11	9	3	3	376
48081202	16	2	110	14	-	12	9	3	3	376

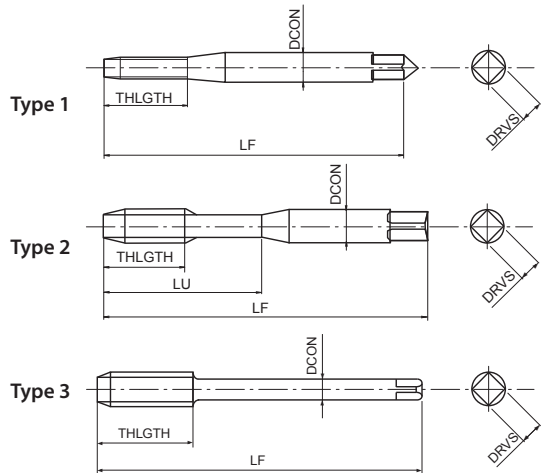
Metric

# SUS-SFT

Threading | Cutting taps | Metric



- HSSE high spiral-fluted cutting tap for blind holes
- Steam oxide treatment
- For stainless steels



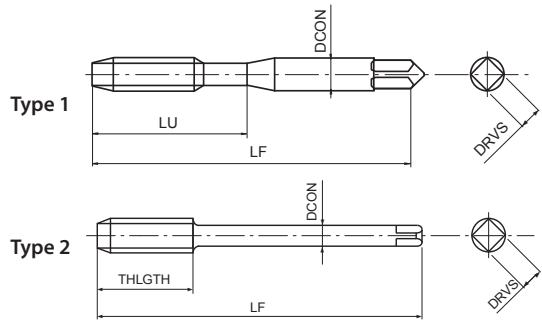
6-10 m/min



EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48025125	2	0,4	45	-	8	2,8	2,1	2	1	371
48025128	2,2	0,45	45	-	9	2,8	2,1	2	1	371
48025133	2,5	0,45	50	-	9	2,8	2,1	2	1	371
48025138	3	0,5	56	-	18	3,5	2,7	3	2	371
48025140	3,5	0,6	56	-	20	4	3	3	2	371
48025144	4	0,7	63	-	21	4,5	3,4	3	2	371
48025149	5	0,8	70	-	25	6	4,9	3	2	371
48025155	6	1	80	-	30	6	4,9	3	2	371
48025161	8	1,25	90	-	35	8	6,2	3	2	371
48025169	10	1,5	100	-	39	10	8	3	2	371
48026179	12	1,75	110	18	-	9	7	3	3	376
48026191	14	2	110	20	-	11	9	3	3	376
48026202	16	2	110	20	-	12	9	3	3	376
48026214	18	2,5	125	25	-	14	11	4	3	376
48026228	20	2,5	140	25	-	16	12	4	3	376
48026238	22	2,5	140	25	-	18	14,5	4	3	376
48026247	24	3	160	30	-	18	14,5	4	3	376

# HS-SFT-TIN

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- TIN coating
- For high speed tapping in various materials

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	
27-32	27-32	22-27	22-27	15-20	50-100	40-100	m/min

<b>M</b>	<b>HSSE</b>	<b>TiN</b>	45°	<b>ISO 2 6H</b>	C/3	
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type
20810	3	0,5	46	4	19	4	3,2	3	1
20814	4	0,7	52	5,6	21	6	4,5	3	1
20818	5	0,8	60	6,4	24	6	4,5	3	1
20822	6	1	62	8	29	6	4,5	3	1
20828	8	1,25	70	10	37	8	6	3	1
20834	10	1,5	75	12	41	8	6	3	2
20839	12	1,75	82	14	48	10	8	3	2



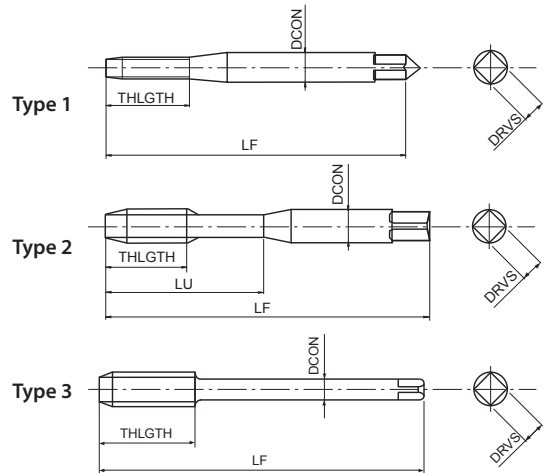
Metric

# AL-SFT

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Bright finish
- For aluminium and cast aluminium



10-20

10-15

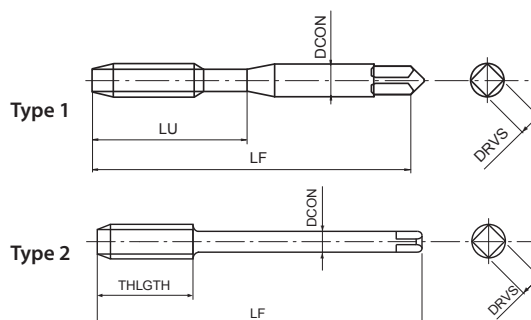
m/min



EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
70211860	1,6	0,35	40	-	8	2,5	2,1	2	1	371
70212560	2	0,4	45	-	8	2,8	2,1	2	1	371
70212860	2,2	0,45	45	-	9	2,8	2,1	2	1	371
70213360	2,5	0,45	50	-	9	2,8	2,1	2	1	371
70213860	3	0,5	56	-	18	3,5	2,7	2	2	371
70214060	3,5	0,6	56	-	20	4	3	2	2	371
70214460	4	0,7	63	-	21	4,5	3,4	2	2	371
70214960	5	0,8	70	-	25	6	4,9	2	2	371
70215560	6	1	80	-	30	6	4,9	2	2	371
70216160	8	1,25	90	-	35	8	6,2	2	2	371
70216960	10	1,5	100	-	39	10	8	2	2	371
70317960	12	1,75	110	18	-	9	7	2	3	376
70319160	14	2	110	20	-	11	9	2	3	376
70320260	16	2	110	20	-	12	9	2	3	376
70321460	18	2,5	125	25	-	14	11	2	3	376
70322860	20	2,5	140	25	-	16	12	3	3	376

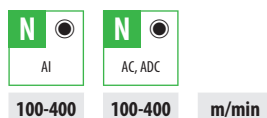
# US-AL-SFT

Threading | Cutting taps | Metric



- HSSE spiral-flute cutting tap for blind holes
- Multilayer TiCN coating
- For high speed tapping in aluminium and cast aluminium
- Developed for rigid tapping on CNC machines

Threading | Cutting taps



EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type
8311669	3	0,5	46	4	19	4	3,2	2	1
8311683	4	0,7	52	5,6	21	6	4,5	2	1
8311697	5	0,8	60	6,4	24	6	4,5	2	1
8311711	6	1	62	8	29	6	4,5	2	1
8311725	8	1,25	70	10	37	8	6	2	1
8311739	10	1,5	75	12	41	8	6	2	2
8311757	12	1,75	82	14	48	10	8	2	2

Metric

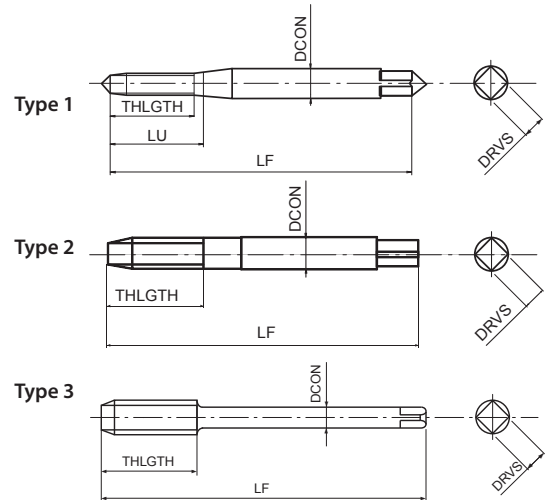


# V-TI-SFT

Threading | Cutting taps | Metric



- Powder metal low spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- For Titanium alloys



3-5

m/min



EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48011118	1,6	0,35	40	-	8	2,5	2,1	2	1	371
48011125	2	0,4	45	-	8	2,8	2,1	2	1	371
48011133	2,5	0,45	50	-	9	2,8	2,1	2	2	371
48011138	3	0,5	56	-	11	3,5	2,7	3	2	371
48011144	4	0,7	63	-	14	4,5	3,4	3	2	371
48011149	5	0,8	70	-	17	6	4,9	3	2	371
48011155	6	1	80	-	21	6	4,9	3	2	371
48011161	8	1,25	90	-	28	8	6,2	3	2	371
48011169	10	1,5	100	-	35	10	8	3	2	371
48011179	12	1,75	110	18	-	10	8	3	3	376

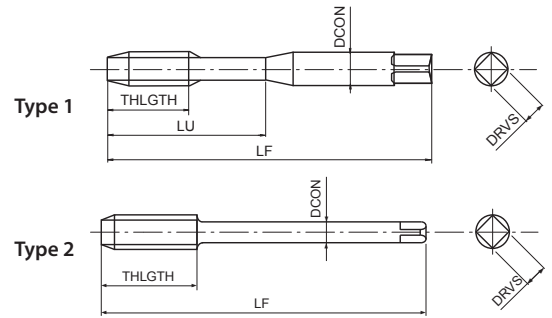
Threading | Cutting taps

Metric



# WHR-NI-SFT

Threading | Cutting taps | Metric



- Powder metal low spiral-fluted cutting tap for blind holes
- HR coating
- For Nickel-based alloys including Inconel 718



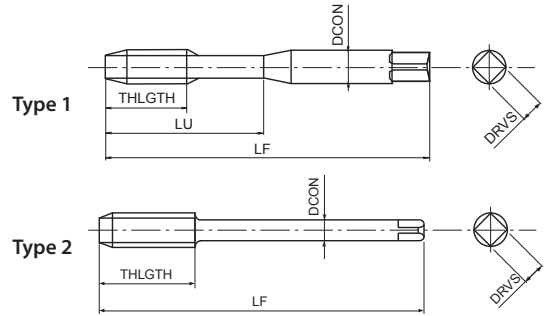
1-3 m/min

M PM HR 11° ISO 2 6H C/2,5 DIN 371 DIN 376

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48078138	3	0,5	56	-	11	3,5	2,7	3	1	371
48078144	4	0,7	63	-	14	4,5	3,4	3	1	371
48078149	5	0,8	70	-	18	6	4,9	3	1	371
48078155	6	1	80	-	21	6	4,9	3	1	371
48078161	8	1,25	90	-	28	8	6,2	3	1	371
48078169	10	1,5	100	-	35	10	8	3	1	371
48078179	12	1,75	110	18	-	10	8	3	2	376

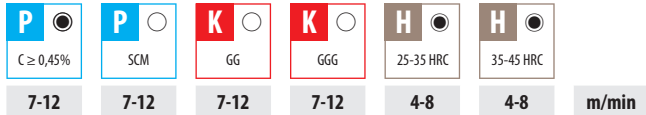
# CPM-SFT

## Threading | Cutting taps | Metric



- Powder metal low spiral-fluted cutting tap for blind holes
- Bright finish
- For steels up to 900 N/mm<sup>2</sup> and cast iron

Threading | Cutting taps



EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
81913860	3	0,5	56	-	18	3,5	2,7	3	1	371
81914460	4	0,7	63	-	21	4,5	3,4	3	1	371
81914960	5	0,8	70	-	25	6	4,9	3	1	371
81915560	6	1	80	-	30	6	4,9	3	1	371
81916160	8	1,25	90	-	35	8	6,2	3	1	371
81916960	10	1,5	100	-	39	10	8	3	1	371
82016160	8	1,25	90	13	-	6	4,9	3	2	376
82016960	10	1,5	100	15	-	7	5,5	3	2	376
82017960	12	1,75	110	18	-	9	7	3	2	376
82019160	14	2	110	20	-	11	9	3	2	376
82020260	16	2	110	20	-	12	9	3	2	376

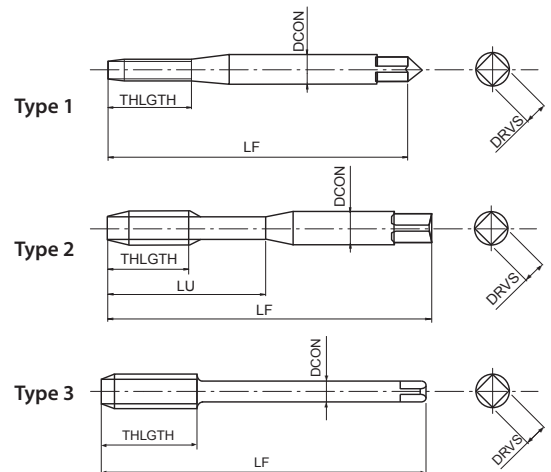
Metric

# H-SFT

Threading | Cutting taps | Metric



- Powder metal low spiral-fluted cutting tap for blind holes
- Steam oxide treatment
- For hardened steels up to 45 HRC



<b>P</b>	<b>P</b>	<b>K</b>	<b>S</b>	<b>S</b>	<b>H</b>	<b>H</b>	
C ≥ 0,45%	SCM	GGG	Ti	Ni	25-35 HRC	35-45 HRC	
7-12	7-12	7-12	3-5	1-3	4-8	4-8	m/min

<b>M</b>	<b>PM</b>	<b>OX</b>	<b>15°</b>	<b>ISO 2 6H</b>	<b>C/3</b>	<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
83212560	2	0,4	45	-	8	2,8	2,1	2	1	371
83213360	2,5	0,45	50	-	9	2,8	2,1	2	1	371
83213860	3	0,5	56	-	18	3,5	2,7	3	2	371
83214460	4	0,7	63	-	21	4,5	3,4	3	2	371
83214960	5	0,8	70	-	25	6	4,9	3	2	371
83215560	6	1	80	-	30	6	4,9	3	2	371
83216160	8	1,25	90	-	35	8	6,2	3	2	371
83216960	10	1,5	100	-	39	10	8	3	2	371
83317960	12	1,75	110	18	-	9	7	3	3	376
83319160	14	2	110	20	-	11	9	3	3	376
83320260	16	2	110	20	-	12	9	3	3	376
83321460	18	2,5	125	25	-	14	11	4	3	376
83322860	20	2,5	140	25	-	16	12	4	3	376

Threading | Cutting taps

Metric

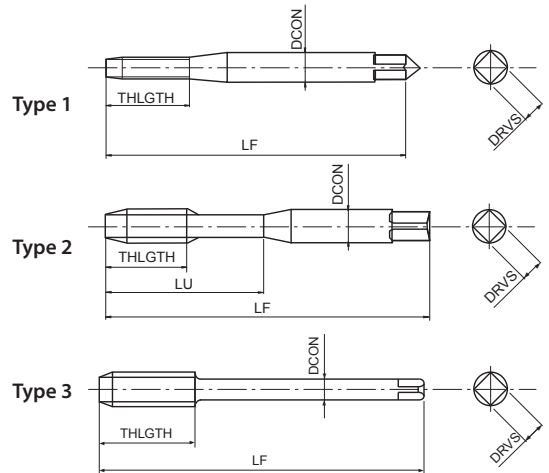


# VP-H-SFT

Threading | Cutting taps | Metric



- Powder metal low spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- For hardened steels up to 45 HRC



Threading | Cutting taps

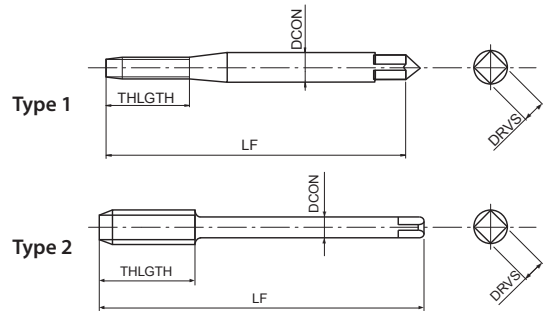
<b>P</b>	<b>P</b>	<b>K</b>	<b>S</b>	<b>S</b>	<b>H</b>	<b>H</b>	
C ≥ 0,45%	SCM	GGG	Ti	Ni	25-35 HRC	35-45 HRC	
7-12	7-12	7-12	3-5	1-3	4-8	4-8	m/min
<b>M</b>	<b>PM</b>	<b>V</b>	<b>15°</b>	<b>ISO 2 6HX</b>	<b>C/3</b>		<b>DIN 371</b> <b>DIN 376</b>

Metric

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48082125	2	0,4	45	-	8	2,8	2,1	2	1	371
48082133	2,5	0,45	50	-	9	2,8	2,1	2	1	371
48082138	3	0,5	56	-	18	3,5	2,7	3	2	371
48082144	4	0,7	63	-	21	4,5	3,4	3	2	371
48082149	5	0,8	70	-	25	6	4,9	3	2	371
48082155	6	1	80	-	30	6	4,9	3	2	371
48082161	8	1,25	90	-	35	8	6,2	3	2	371
48082169	10	1,5	100	-	39	10	8	3	2	371
48082179	12	1,75	110	18	-	9	7	3	3	376
48082191	14	2	110	20	-	11	9	3	3	376
48082202	16	2	110	20	-	12	9	3	3	376
48082214	18	2,5	125	25	-	14	11	4	3	376
48082228	20	2,5	140	25	-	16	12	4	3	376
48082238	22	2,5	140	25	-	18	14,5	4	3	376
48082247	24	3	160	30	-	18	14,5	4	3	376
48082262	27	3	160	30	-	20	16	4	3	376
48082271	30	3,5	180	35	-	22	18	4	3	376
48082281	33	3,5	180	35	-	25	20	4	3	376
48082294	36	4	200	40	-	28	22	4	3	376

# VPO-H-SFT

Threading | Cutting taps | Metric



- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- For hardened steels up to 45 HRC
- Centre through coolant

<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>K</b> GGG	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	
7-12	7-12	7-12	3-5	1-3	4-8	4-8	m/min
<b>M</b>	<b>PM</b>	<b>V</b>	<b>15°</b>	<b>ISO 2 6HX</b>	<b>C/3</b>	<b>DIN 371</b>	<b>DIN 376</b>

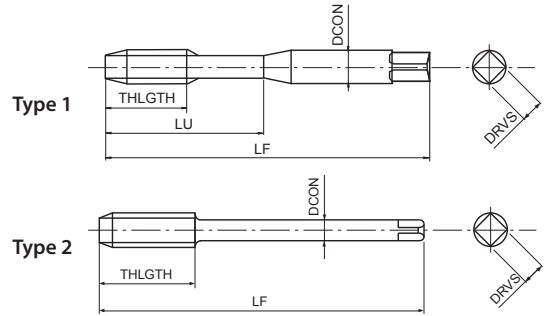
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48083155	6	1	80	-	30	6	4,9	3	1	371
48083161	8	1,25	90	-	35	8	6,2	3	1	371
48083169	10	1,5	100	-	39	10	8	3	1	371
48083179	12	1,75	110	18	-	9	7	3	2	376
48083191	14	2	110	20	-	11	9	3	2	376
48083202	16	2	110	20	-	12	9	3	2	376
48083214	18	2,5	125	25	-	14	11	4	2	376
48083228	20	2,5	140	25	-	16	12	4	2	376
48083238	22	2,5	140	25	-	18	14,5	4	2	376
48083247	24	3	160	30	-	18	14,5	4	2	376
48083262	27	3	160	30	-	20	16	4	2	376
48083271	30	3,5	180	35	-	22	18	4	2	376
48083281	33	3,5	180	35	-	25	20	4	2	376
48083294	36	4	200	40	-	28	22	4	2	376





# VP-DC-MT

Threading | Cutting taps | Metric



- Powder metal straight flute cutting tap for through and blind holes
- Multilayer TiCN coating
- For cast iron and aluminium cast
- Synchro taps at cutting speeds > 30 m/min

<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ● GG	<b>K</b> ● GGG	<b>N</b> ● AC, ADC	<b>H</b> ○ 25-35 HRC	<b>H</b> ○ 35-45 HRC	
10-25	10-20	15-60	15-40	25-70	8-20	8-20	m/min

<b>M</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>				<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48020125	2	0,4	45	-	10	2,8	2,1	3	1	371
48020133	2,5	0,45	50	-	14	2,8	2,1	3	1	371
48020138	3	0,5	56	-	18	3,5	2,7	3	1	371
48020142	3,5	0,6	56	-	20	4	3	3	1	371
48020144	4	0,7	63	-	21	4,5	3,4	3	1	371
48020149	5	0,8	70	-	25	6	4,9	3	1	371
48020155	6	1	80	-	30	6	4,9	3	1	371
48020158	7	1	80	-	30	7	5,5	4	1	371
48020161	8	1,25	90	-	35	8	6,2	4	1	371
48020169	10	1,5	100	-	39	10	8	4	1	371
48020175	11	1,5	100	18	-	8	6,2	4	2	376
48020179	12	1,75	110	21	-	9	7	4	2	376
48022191	14	2	110	24	-	11	9	4	2	376
48022202	16	2	110	24	-	12	9	4	2	376
48022214	18	2,5	125	30	-	14	11	4	2	376
48022228	20	2,5	140	30	-	16	12	4	2	376
48020238	22	2,5	140	30	-	18	14,5	5	2	376
48020247	24	3	160	36	-	18	14,5	5	2	376
48020271	30	3,5	180	42	-	22	18	6	2	376

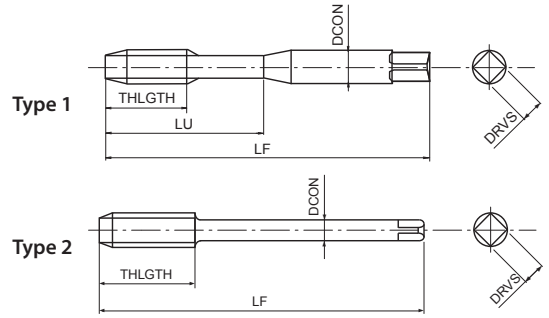
Threading | Cutting taps

Metric



# VP-DC-MT FORM E

Threading | Cutting taps | Metric



- Powder metal straight flute cutting tap for through and blind holes
- Multilayer TiCN coating
- For cast iron and aluminium cast
- Synchro taps at cutting speeds > 30 m/min, chamfer Form E

Threading | Cutting taps

<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ● GG	<b>K</b> ● GGG	<b>N</b> ● AC, ADC	<b>H</b> ○ 25-35 HRC	<b>H</b> ○ 35-45 HRC	
10-25	10-20	15-60	15-40	25-70	8-20	8-20	m/min

<b>M</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>	E/1,5	≥2D		<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48037138	3	0,5	56	-	18	3,5	2,7	3	1	371
48037144	4	0,7	63	-	21	4,5	3,4	3	1	371
48037149	5	0,8	70	-	25	6	4,9	3	1	371
48037155	6	1	80	-	30	6	4,9	3	1	371
48037161	8	1,25	90	-	35	8	6,2	4	1	371
48037169	10	1,5	100	-	39	10	8	4	1	371
48037179	12	1,75	110	21	-	9	7	4	2	376
48037191	14	2	110	24	-	11	9	4	2	376
48037202	16	2	110	24	-	12	9	4	2	376
48037214	18	2,5	125	30	-	14	11	4	2	376
48037228	20	2,5	140	30	-	16	12	4	2	376
48037238	22	2,5	140	30	-	18	14,5	5	2	376
48037247	24	3	160	36	-	18	14,5	5	2	376

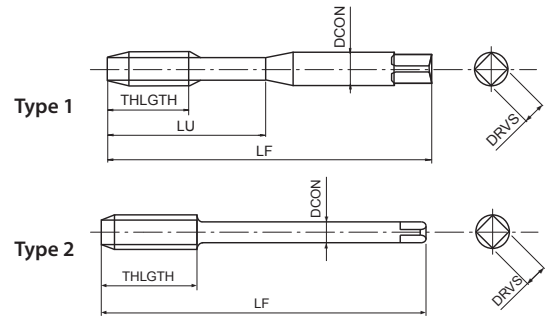
Metric





# VPO-DC-MT FORM E

Threading | Cutting taps | Metric



- Powder metal straight flute cutting tap for blind holes
- Multilayer TiCN coating
- For cast iron and aluminium cast
- Synchro taps at cutting speeds > 30 m/min, with centre through coolant, chamfer Form E

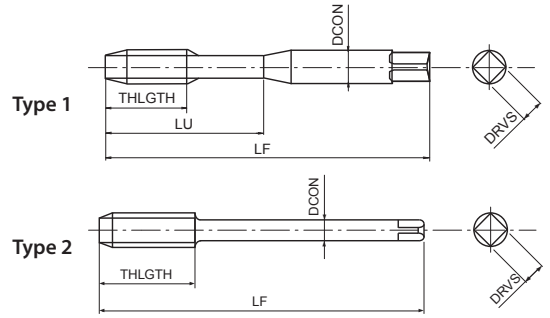
<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ● GG	<b>K</b> ● GGG	<b>N</b> ● AC, ADC	<b>H</b> ○ 25-35 HRC	<b>H</b> ○ 35-45 HRC	
10-25	10-20	15-60	15-40	25-70	8-20	8-20	m/min

<b>M</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>	E/1,5	≥2D		
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48038155	6	1	80	-	30	6	4,9	3	1	371
48038161	8	1,25	90	-	35	8	6,2	4	1	371
48038169	10	1,5	100	-	39	10	8	4	1	371
48038179	12	1,75	110	21	-	9	7	4	2	376
48038191	14	2	110	24	-	11	9	4	2	376
48038202	16	2	110	24	-	12	9	4	2	376
48038214	18	2,5	125	30	-	14	11	4	2	376
48038228	20	2,5	140	30	-	16	12	4	2	376
48038238	22	2,5	140	30	-	18	14,5	5	2	376
48038247	24	3	160	36	-	18	14,5	5	2	376

# A-CHT OIL Centre

Threading | Cutting taps | Metric



- First choice in quality and performance
- Carbide straight flute cutting tap for blind holes
- TiAlN coating
- For cast iron and aluminium cast
- Centre through coolant

Threading | Cutting taps

<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	m/min
10-100	10-100	10-100	

<b>A</b>	<b>M</b>	<b>CARBIDE</b>	<b>FX</b>	<b>h6</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>		<b>DIN 371</b>	<b>DIN 376</b>
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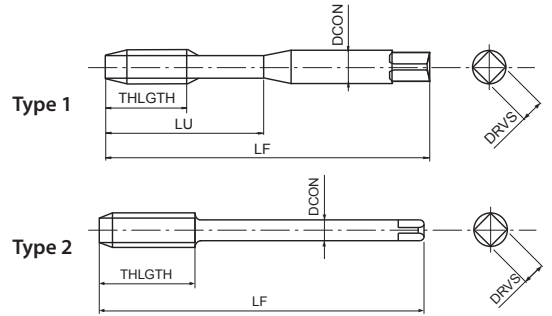
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48264149	5	0,8	70	10	25	6	4,9	3	1	371
48264155	6	1	80	12	30	6	4,9	3	1	371
48264161	8	1,25	90	15	35	8	6,2	4	1	371
48264169	10	1,5	100	18	39	10	8	4	1	371
48264179	12	1,75	110	21	-	9	7	4	2	376



Metric

# A-CHT OIL Side

Threading | Cutting taps | Metric



- First choice in quality and performance
- Carbide straight flute cutting tap for through holes
- TiAlN coating
- For cast iron and aluminium cast
- Side through coolant

<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC
10-100	10-100	10-100
m/min		

<b>A</b>	<b>M</b>	<b>CARBIDE</b>	<b>FX</b>	<b>h6</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>			<b>DIN 371</b>	<b>DIN 376</b>
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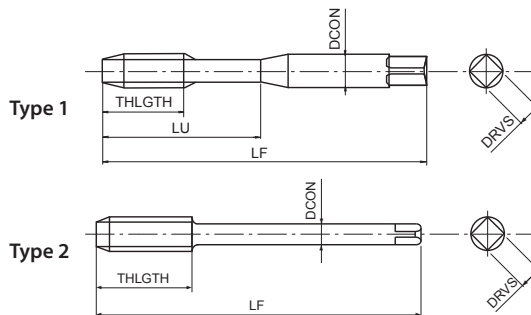
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48265149	5	0,8	70	10	25	6	4,9	3	1	371
48265155	6	1	80	12	30	6	4,9	3	1	371
48265161	8	1,25	90	15	35	8	6,2	4	1	371
48265169	10	1,5	100	18	39	10	8	4	1	371
48265179	12	1,75	110	21	-	9	7	4	2	376

Threading | Cutting taps

Metric

# A-CHT OIL FORM E

Threading | Cutting taps | Metric



- First choice in quality and performance
- Carbide straight flute cutting tap for blind holes
- TiAlN coating
- For cast iron and aluminium cast
- Centre through coolant, Chamfer Form E

Threading | Cutting taps

<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	
10-100	10-100	10-100	m/min

<b>A</b>	<b>M</b>	<b>CARBIDE</b>	<b>FX</b>	<b>h6</b>	<b>ISO 2 6HX</b>	<b>E/1,5</b>	<b>≥2D</b>		<b>DIN 371</b>	<b>DIN 376</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48263149	5	0,8	70	10	25	6	4,9	3	1	371
48263155	6	1	80	12	30	6	4,9	3	1	371
48263161	8	1,25	90	15	35	8	6,2	4	1	371
48263169	10	1,5	100	18	39	10	8	4	1	371
48263179	12	1,75	110	21	-	9	7	4	2	376

Metric



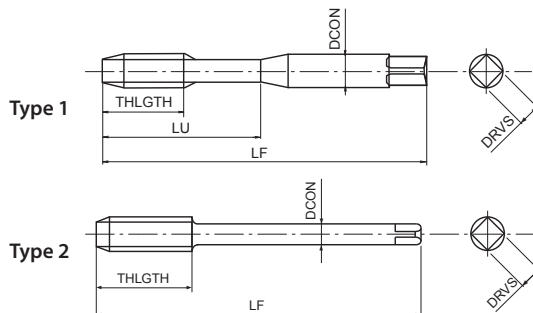






# V-XPM-HT

Threading | Cutting taps | Metric



- Powder metal straight flute cutting tap for through and blind holes
- Multilayer TiCN coating
- For hardened steels up to 52 HRC
- Highly wear resistant XPM tool substrate

Threading | Cutting taps



1-3 m/min

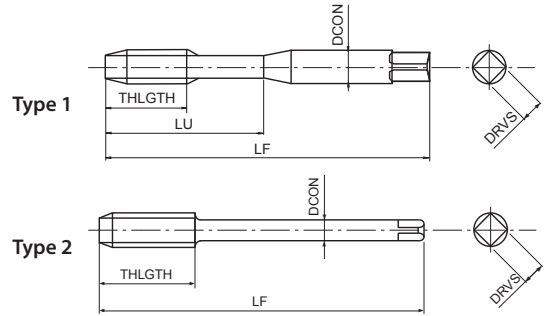


Metric

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type
89913868	3	0,5	46	11	19	3,5	2,7	4	1
89914468	4	0,7	52	13	21	4,5	3,4	4	1
89914968	5	0,8	60	16	24	6	4,9	4	1
89915568	6	1	62	19	29	6	4,9	5	1
89916168	8	1,25	70	22	37	6	4,9	5	2
89916968	10	1,5	75	24	41	7	5,5	5	2
89917968	12	1,75	82	29	48	9	7	5	2

# V-XPM-HT FORM D

Threading | Cutting taps | Metric



- Powder metal straight flute cutting tap for through holes
- Multilayer TiCN coating
- For hardened steels up to 52 HRC
- Highly wear resistant XPM tool substrate

**H** 45-52 HRC

1-3 m/min

**M** **XPM** **V** **ISO 2 6HX** **D/4**

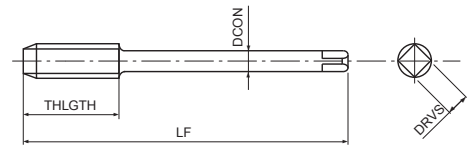
EDP	TD	TP	LF	LU	DCON	DRVS	NOF	Type
48335138	3	0,5	46	19	3,5	2,7	4	1
48335144	4	0,7	52	21	4,5	3,4	4	1
48335149	5	0,8	60	24	6	4,9	4	1
48335155	6	1	62	29	6	4,9	5	1
48335161	8	1,25	70	22	6	4,9	5	2
48335169	10	1,5	75	24	7	5,5	5	2
48335179	12	1,75	82	29	9	7	5	2

Threading | Cutting taps

Metric

# WH55-OT

Threading | Cutting taps | Metric



- Carbide straight flute cutting tap for blind and through holes
- Multilayer TiCN coating
- For hardened steels up to 55 HRC

Threading | Cutting taps

<b>H</b> 45-52 HRC	<b>H</b> 52-62 HRC	m/min	<b>M</b>	<b>CARBIDE</b>	<b>V</b>	C/2,5		
2-4	1-3							

Metric

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF
48100138	3	0,5	46	11	19	3,5	2,7	4
48100144	4	0,7	52	13	21	4,5	3,4	4
48100149	5	0,8	60	16	24	6	4,9	4
48100155	6	1	62	19	29	6	4,9	4
48100161	8	1,25	70	22	-	6	4,9	5
48100169	10	1,5	75	24	-	7	5,5	5
48100179	12	1,75	82	29	-	9	7	5

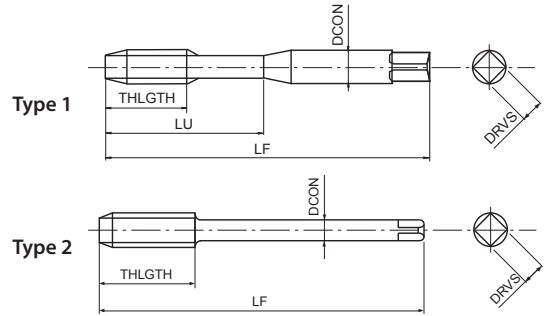






# A-XPF

Threading | Forming taps | Metric



- First choice in quality and performance
- Powder metal forming tap for through and blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- Powder metal for long tool life

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC		
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20		m/min



EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48133138	3	0,5	56	-	18	3,5	2,7	4	2,77~2,82	1	2174
48133144	4	0,7	63	-	21	4,5	3,4	4	3,66~3,72	1	2174
48133149	5	0,8	70	-	25	6	4,9	5	4,62~4,68	1	2174
48133155	6	1	80	-	30	6	4,9	5	5,51~5,59	1	2174
48133161	8	1,25	90	-	35	8	6,2	5	7,37~7,45	1	2174
48133169	10	1,5	100	-	39	10	8	8	9,24~9,33	1	2174
48133179	12	1,75	110	17	-	9	7	8	11,10~11,20	2	2174
48133191	14	2	110	20	-	11	9	8	12,96~13,08	2	2174
48133202	16	2	110	20	-	12	9	8	14,96~15,08	2	2174
48133214	18	2,5	125	20	-	14	11	8	16,66~16,81	2	2174
48133228	20	2,5	140	20	-	16	12	8	18,66~18,81	2	2174
48133238	22	2,5	140	20	-	18	14,5	8	20,66~20,81	2	2174
48133247	24	3	160	24	-	18	14,5	8	22,39~22,56	2	2174
48133262	27	3	160	18	-	20	16	8	25,39~25,56	2	2174
48133271	30	3,5	180	21	-	22	18	8	28,09~28,68	2	2174

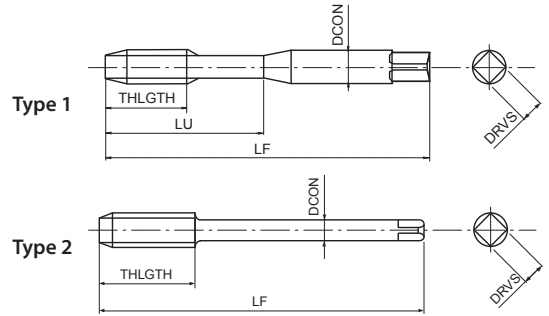
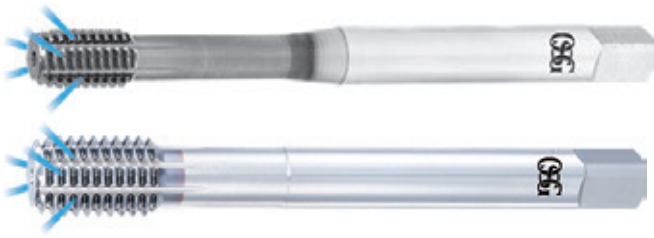
Threading | Forming taps



Metric

# A-OIL-XPF

Threading | Forming taps | Metric



- First choice in quality and performance
- Powder metal forming tap for through and blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- Side through coolant

Threading | Forming taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	25-35 HRC	m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	

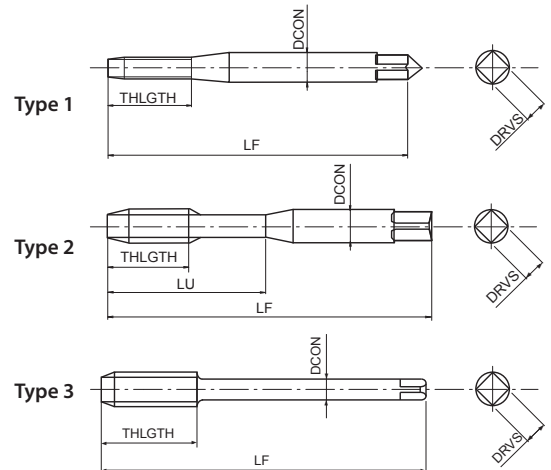
<b>A</b>	<b>M</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>							DIN 2174	DIN 2174
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48225149	5	0,8	70	-	25	6	4,9	5	4,62 ~ 4,68	1	2174
48225155	6	1	80	-	30	6	4,9	5	5,51 ~ 5,59	1	2174
48225161	8	1,25	90	-	35	8	6,2	5	7,37 ~ 7,45	1	2174
48225169	10	1,5	100	-	39	10	8	8	9,24 ~ 9,33	1	2174
48225179	12	1,75	110	17	-	9	7	8	11,10 ~ 11,20	2	2174
48225191	14	2	110	20	-	11	9	8	12,96 ~ 13,08	2	2174
48225202	16	2	110	20	-	12	9	8	14,96 ~ 15,08	2	2174
48225214	18	2,5	125	20	-	14	11	8	16,66 ~ 16,81	2	2174
48225228	20	2,5	140	20	-	16	12	8	18,66 ~ 18,81	2	2174
48225238	22	2,5	140	20	-	18	14,5	8	20,66 ~ 20,81	2	2174
48225247	24	3	160	24	-	18	14,5	8	22,39 ~ 22,56	2	2174
48225262	27	3	160	18	-	20	16	8	25,39 ~ 25,56	2	2174
48225271	30	3,5	180	21	-	22	18	8	28,09 ~ 28,28	2	2174
48225281	33	3,5	180	21	-	25	20	8	31,09 ~ 31,28	2	2174
48225294	36	4	200	32	-	28	22	8	33,80 ~ 34,01	2	2174
48225304	39	4	200	32	-	32	24	9	36,80 ~ 37,01	2	2174
48225314	42	4,5	200	36	-	32	24	9	39,52 ~ 39,73	2	2174
48225319	45	4,5	220	36	-	36	29	9	42,52 ~ 42,73	2	2174

Metric



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium



<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC	
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min

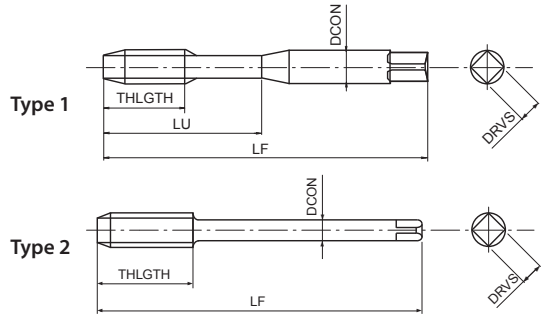
<b>A</b>	<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>	<b>DIN 2174</b>	<b>DIN 2174</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48030111	1	0,25	40	-	5,5	2,5	2,1	4	0,89 ~ 0,90	1	2174
48030112	1,1	0,25	40	-	5,5	2,5	2,1	4	0,99 ~ 1,00	1	2174
48030113	1,2	0,25	40	-	5,5	2,5	2,1	4	1,09 ~ 1,10	1	2174
48030115	1,4	0,3	40	-	7	2,5	2,1	4	1,26 ~ 1,28	1	2174
48030118	1,6	0,35	40	-	8	2,5	2,1	4	1,45 ~ 1,48	1	2174
48030119	1,7	0,35	40	-	8	2,5	2,1	4	1,55 ~ 1,58	1	2174
48030120	1,8	0,35	40	-	8	2,5	2,1	4	1,65 ~ 1,68	1	2174
48030125	2	0,4	45	-	8	2,8	2,1	4	1,82 ~ 1,85	1	2174
48030127	2,2	0,45	45	-	9	2,8	2,1	4	2,00 ~ 2,04	1	2174
48030128	2,3	0,4	45	-	9	2,8	2,1	4	2,12 ~ 2,15	1	2174
48030133	2,5	0,45	50	-	9	2,8	2,1	4	2,30 ~ 2,34	1	2174
48030136	2,6	0,45	50	-	9	2,8	2,1	4	2,40 ~ 2,44	1	2174
48030138	3	0,5	56	-	18	3,5	2,7	4	2,77 ~ 2,82	2	2174
48030142	3,5	0,6	56	-	20	4	3	4	3,23 ~ 3,28	2	2174
48030144	4	0,7	63	-	21	4,5	3,4	4	3,67 ~ 3,72	2	2174
48030147	4,5	0,75	70	-	25	6	4,9	5	4,14 ~ 4,20	2	2174
48030149	5	0,8	70	-	25	6	4,9	5	4,62 ~ 4,68	2	2174
48030152	5,5	0,9	80	-	30	6	4,9	5	5,06 ~ 5,13	2	2174
48030155	6	1	80	-	30	6	4,9	5	5,51 ~ 5,59	2	2174
48030158	7	1	80	-	30	7	5,5	5	6,51 ~ 6,59	2	2174
48030161	8	1,25	90	-	35	8	6,2	5	7,37 ~ 7,45	2	2174
48030165	9	1,25	90	12	35	9	7	8	8,37 ~ 8,45	2	2174
48030169	10	1,5	100	-	39	10	8	8	9,24 ~ 9,33	2	2174
48030175	11	1,5	100	15	-	8	6,2	8	10,24 ~ 10,33	2	2174
48030179	12	1,75	110	17	-	9	7	8	11,10 ~ 11,20	3	2174
48030191	14	2	110	20	-	11	9	8	12,96 ~ 13,08	3	2174
48030202	16	2	110	20	-	12	9	8	14,96 ~ 15,08	3	2174
48069214	18	2,5	125	20	-	14	11	8	16,66 ~ 16,81	3	2174
48069228	20	2,5	140	20	-	16	12	8	18,66 ~ 18,81	3	2174
48069238	22	2,5	140	20	-	18	14,5	8	20,66 ~ 20,81	3	2174
48069247	24	3	160	24	-	18	14,5	8	22,39 ~ 22,56	3	2174
48069262	27	3	160	18	-	20	16	8	25,39 ~ 25,56	3	2174
48069271	30	3,5	180	21	-	22	18	8	28,09 ~ 28,28	3	2174



# S-OIL-XPF

Threading | Forming taps | Metric



- First choice in quality and performance
- HSSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Side through coolant

Threading | Forming taps  
Metric

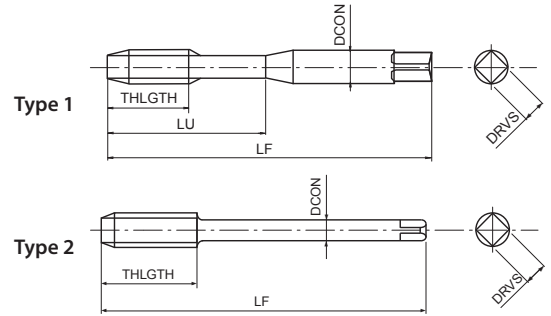
<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC		m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20		

<b>A</b>	<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>	<b>ISO 1</b>	<b>ISO 2</b>	<b>ISO 3</b>	<b>DIN 2174</b>	<b>DIN 2174</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48042149	5	0,8	70	-	25	6	4,9	5	4,62 ~ 4,68	1	2174
48042155	6	1	80	-	30	6	4,9	5	5,51 ~ 5,59	1	2174
48042161	8	1,25	90	-	35	8	6,2	5	7,37 ~ 7,45	1	2174
48042169	10	1,5	100	-	39	10	8	8	9,24 ~ 9,33	1	2174
48042179	12	1,75	110	17	-	9	7	8	11,10 ~ 11,20	2	2174
48042191	14	2	110	20	-	11	9	8	12,96 ~ 13,08	2	2174
48042202	16	2	110	20	-	12	9	8	14,96 ~ 15,08	2	2174
48071214	18	2,5	125	20	-	14	11	8	16,66 ~ 16,81	2	2174
48071228	20	2,5	140	20	-	16	12	8	18,66 ~ 18,81	2	2174
48071238	22	2,5	140	20	-	18	14,5	8	20,66 ~ 20,81	2	2174
48071247	24	3	160	24	-	18	14,5	8	22,39 ~ 22,56	2	2174
48071262	27	3	160	18	-	20	16	8	25,39 ~ 25,56	2	2174
48071271	30	3,5	180	21	-	22	18	8	28,09 ~ 28,28	2	2174
48071281	33	3,5	180	21	-	25	20	8	31,09 ~ 31,28	2	2174
48071294	36	4	200	24	-	28	22	8	33,80 ~ 34,01	2	2174
48071304	39	4	200	24	-	32	24	9	36,80 ~ 37,01	2	2174
48071314	42	4,5	200	27	-	32	24	9	39,52 ~ 39,73	2	2174
48071319	45	4,5	220	27	-	36	29	9	42,52 ~ 42,73	2	2174

# S-XPF 6GX

Threading | Forming taps | Metric



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- For 6G internal thread tolerance

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC		m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20		

<b>A</b>	<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 3 6GX</b>	<b>C/2,5</b>	<b>DIN 2174</b>	<b>DIN 2174</b>
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EDP	TD	TP	Oversize	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48086125	2	0,4	0,0190	45	-	8	2,8	2,1	4	1,85 ~ 1,88	1	2174
48086133	2,5	0,45	0,0200	50	-	9	2,8	2,1	4	2,32 ~ 2,35	1	2174
48086138	3	0,5	0,0200	56	-	18	3,5	2,7	4	2,79 ~ 2,83	1	2174
48086142	3,5	0,6	0,0210	56	-	20	4	3	4	3,24 ~ 3,29	1	2174
48086144	4	0,7	0,0220	63	-	21	4,5	3,4	4	3,69 ~ 3,75	1	2174
48086149	5	0,8	0,0240	70	-	25	6	4,9	5	4,64 ~ 4,71	1	2174
48086155	6	1	0,0260	80	-	30	6	4,9	5	5,55 ~ 5,63	1	2174
48086161	8	1,25	0,0280	90	-	35	8	6,2	5	7,40 ~ 7,47	1	2174
48086169	10	1,5	0,0320	100	-	39	10	8	8	9,26 ~ 9,35	1	2174
48086179	12	1,75	0,0340	110	17	-	9	7	8	11,14 ~ 11,24	2	2174
48086191	14	2	0,0380	110	20	-	11	9	8	13,00 ~ 13,12	2	2174
48086202	16	2	0,0380	110	20	-	12	9	8	15,00 ~ 15,12	2	2174

Threading | Forming taps

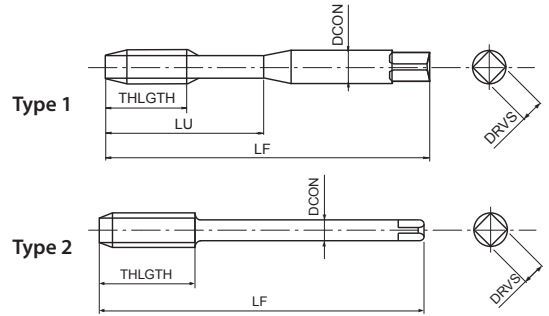


Metric



# S-XPF 7GX

Threading | Forming taps | Metric



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- For 7G internal thread tolerance

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	25-35 HRC	
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min

<b>A</b>	<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>7GX</b>						
					C/2,5			DIN 2174	DIN 2174	

EDP	TD	TP	Oversize	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48087125	2	0,4	0,0380	45	-	8	2,8	2,1	4	1,86 ~ 1,90	1	2174
48087133	2,5	0,45	0,0400	50	-	9	2,8	2,1	4	2,34 ~ 2,38	1	2174
48087138	3	0,5	0,0400	56	-	18	3,5	2,7	4	2,81 ~ 2,85	1	2174
48087142	3,5	0,6	0,0440	56	-	20	4	3	4	3,27 ~ 3,31	1	2174
48087144	4	0,7	0,0440	63	-	21	4,5	3,4	4	3,71 ~ 3,77	1	2174
48087149	5	0,8	0,0480	70	-	25	6	4,9	5	4,67 ~ 4,73	1	2174
48087155	6	1	0,0520	80	-	30	6	4,9	5	5,56 ~ 5,64	1	2174
48087161	8	1,25	0,0560	90	-	35	8	6,2	5	7,42 ~ 7,50	1	2174
48087169	10	1,5	0,0640	100	-	39	10	8	8	9,30 ~ 9,39	1	2174
48087179	12	1,75	0,0680	110	17	-	9	7	8	11,17 ~ 11,28	2	2174
48087191	14	2	0,0760	110	20	-	11	9	8	13,04 ~ 13,16	2	2174
48087202	16	2	0,0760	110	20	-	12	9	8	15,04 ~ 15,16	2	2174

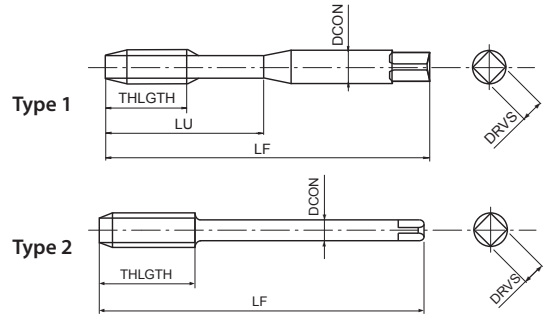
Threading | Forming taps



Metric

# S-XPF +0.1

Threading | Forming taps | Metric



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Oversized tap for 6H +0,1mm thread tolerance

Threading | Forming taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC		
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20		m/min

<b>A</b>	<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>6H +0.1</b>	<b>C/2,5</b>	<b>DIN 2174</b>	<b>DIN 2174</b>
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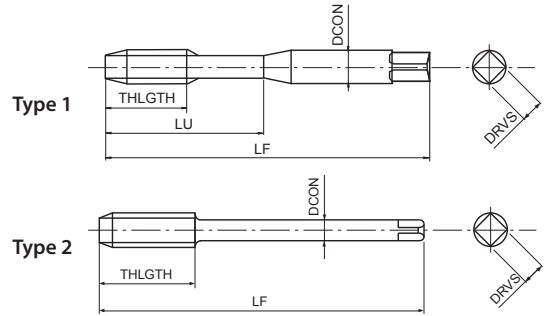
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48298138	3	0,5	56	-	18	3,5	2,7	4	2,87 ~ 2,92	1	2174
48298144	4	0,7	63	-	21	4,5	3,4	4	3,77 ~ 3,82	1	2174
48298149	5	0,8	70	-	25	6	4,9	5	4,72 ~ 4,78	1	2174
48298155	6	1	80	-	30	6	4,9	5	5,61 ~ 5,69	1	2174
48298161	8	1,25	90	-	35	8	6,2	5	7,47 ~ 7,55	1	2174
48298169	10	1,5	100	-	39	10	8	8	9,34 ~ 9,43	1	2174
48298179	12	1,75	110	18	-	9	7	8	11,20 ~ 11,30	2	2174
48298202	16	2	110	20	-	12	9	8	15,06 ~ 15,18	2	2174

Metric



# S-XPF FORM D

Threading | Forming taps | Metric



- First choice in quality and performance
- HSE forming tap for through holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Chamfer Form D

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC	m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	

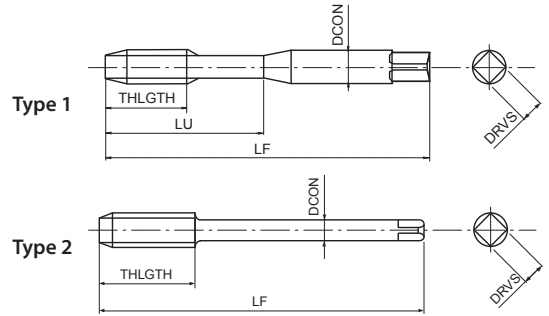
<b>A</b>	<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>D/4</b>	<b>DIN 2174</b>	<b>DIN 2174</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48088138	3	0,5	56	-	18	3,5	2,7	4	2,77~2,82	1	2174
48088144	4	0,7	63	-	21	4,5	3,4	4	3,67~3,72	1	2174
48088149	5	0,8	70	-	25	6	4,9	5	4,62~4,68	1	2174
48088155	6	1	80	-	30	6	4,9	5	5,51~5,59	1	2174
48088161	8	1,25	90	-	35	8	6,2	5	7,37~7,45	1	2174
48088169	10	1,5	100	-	39	10	8	8	9,24~9,33	1	2174
48088179	12	1,75	110	17	-	9	7	8	11,10~11,20	2	2174
48088191	14	2	110	20	-	11	9	8	12,96~13,08	2	2174
48088202	16	2	110	20	-	12	9	8	14,96~15,08	2	2174



# S-XPF FORM E

Threading | Forming taps | Metric



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Chamfer Form E

Threading | Forming taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC		m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20		

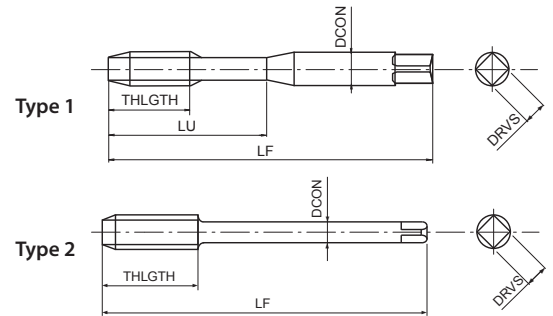
<b>A</b>	<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>E/1,5</b>	<b>DIN 2174</b>	<b>DIN 2174</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48089125	2	0,4	45	-	8	2,8	2,1	4	1,82 ~ 1,85	1	2174
48089133	2,5	0,45	50	-	9	2,8	2,1	4	2,30 ~ 2,34	1	2174
48089138	3	0,5	56	-	18	3,5	2,7	4	2,77 ~ 2,82	1	2174
48089142	3,5	0,6	56	-	20	4	3	4	3,23 ~ 3,28	1	2174
48089144	4	0,7	63	-	21	4,5	3,4	4	3,66 ~ 3,72	1	2174
48089149	5	0,8	70	-	25	6	4,9	5	4,62 ~ 4,68	1	2174
48089155	6	1	80	-	30	6	4,9	5	5,51 ~ 5,59	1	2174
48089161	8	1,25	90	-	35	8	6,2	5	7,37 ~ 7,45	1	2174
48089169	10	1,5	100	-	39	10	8	8	9,24 ~ 9,33	1	2174
48089179	12	1,75	110	17	-	9	7	8	11,10 ~ 11,20	2	2174
48089191	14	2	110	20	-	11	9	8	12,96 ~ 13,08	2	2174
48089202	16	2	110	20	-	12	9	8	14,96 ~ 15,08	2	2174

Metric

# S-OIL-XPF FORM E

Threading | Forming taps | Metric



- First choice in quality and performance
- HSE forming tap for blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Centre through coolant, chamfer Form E

Material and speed selection icons:

- P** C < 0,2% 15-40
- P** 0,25 < C < 0,4 15-40
- P** C ≥ 0,45% 15-30
- P** SCM 15-30
- M** INOX 8-20
- N** Al 20-50
- N** AC, ADC 20-40
- H** 25-35 HRC 5-20

Speed: **m/min**

Performance and specification icons:

- A**
- M**
- HSS-Co**
- V**
- ISO 2 6HX**
- E/1,5**
- DIN 2174**
- DIN 2174**

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48294149	5	0,8	70	-	25	6	4,9	5	4,62 ~ 4,68	1	2174
48294155	6	1	80	-	30	6	4,9	5	5,51 ~ 5,59	1	2174
48294161	8	1,25	90	-	35	8	6,2	5	7,37 ~ 7,45	1	2174
48294169	10	1,5	100	-	39	10	8	8	9,24 ~ 9,33	1	2174
48294179	12	1,75	110	18	-	9	7	8	11,10 ~ 11,20	2	2174
48294191	14	2	110	20	-	11	9	8	12,96 ~ 13,08	2	2174
48294202	16	2	110	20	-	12	9	8	14,96 ~ 15,08	2	2174

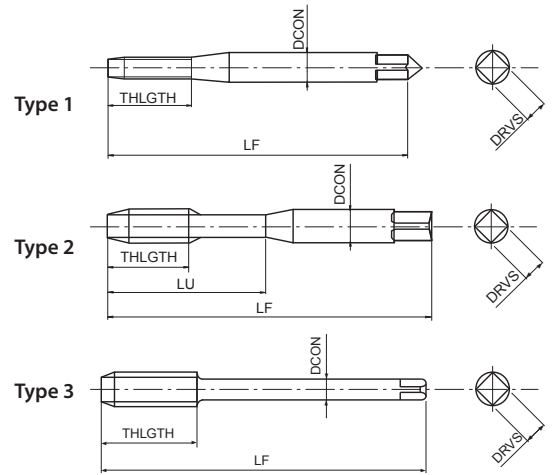


# S-LT-XPf

Threading | Forming taps | Metric



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- With long shank for long reach threading



Threading | Forming taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC	
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min

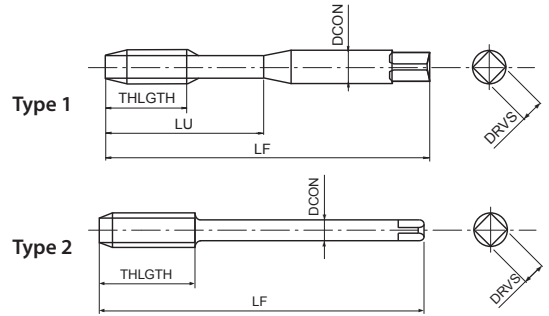
<b>A</b>	<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>					
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type
48115125	2	0,4	80	-	8	2,8	2,1	0	1,82 ~ 1,85	1
48115133	2,5	0,45	100	-	9	2,8	2,1	0	2,30 ~ 2,34	1
48115138	3	0,5	100	-	18	3,5	2,7	4	2,77 ~ 2,82	2
48115144	4	0,7	125	-	21	4,5	3,4	4	3,67 ~ 3,72	2
48115149	5	0,8	140	-	25	6	4,9	5	4,62 ~ 4,68	2
48115155	6	1	160	-	30	6	4,9	5	5,51 ~ 5,59	2
48115161	8	1,25	180	-	35	8	6,2	5	7,37 ~ 7,45	2
48115169	10	1,5	200	-	39	10	8	8	9,24 ~ 9,33	2
48115179	12	1,75	200	17	-	9	7	8	11,10 ~ 11,20	3



# S-XPFLH

Threading | Forming taps | Metric



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- For left-hand threads

Threading | Forming taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	25-35 HRC	m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	

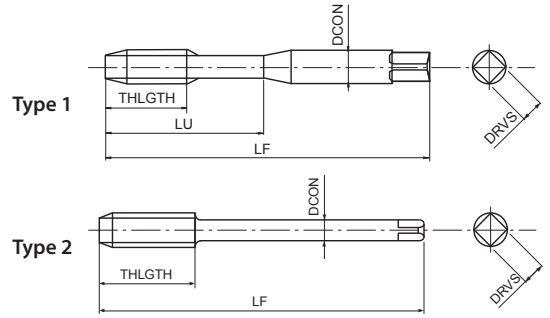


EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48219138	3	0,5	56	-	18	3,5	2,7	4	2,77 ~ 2,82	1	2174
48219144	4	0,7	63	-	21	4,5	3,4	4	3,67 ~ 3,72	1	2174
48219149	5	0,8	70	-	25	6	4,9	5	4,62 ~ 4,68	1	2174
48219155	6	1	80	-	30	6	4,9	5	5,51 ~ 5,59	1	2174
48219161	8	1,25	90	-	35	8	6,2	5	7,37 ~ 7,45	1	2174
48219169	10	1,5	100	-	39	10	8	8	9,24 ~ 9,33	1	2174
48219179	12	1,75	110	17	-	9	7	8	11,10 ~ 11,20	2	2174
48219191	14	2	110	20	-	11	9	8	12,96 ~ 13,08	2	2174
48219202	16	2	110	20	-	12	9	8	14,96 ~ 15,08	2	2174
48219214	18	2,5	125	20	-	14	11	8	16,66 ~ 16,81	2	2174
48219228	20	2,5	140	20	-	16	12	8	18,66 ~ 18,81	2	2174
48219238	22	2,5	140	20	-	18	14,5	8	20,66 ~ 20,81	2	2174
48219247	24	3	160	24	-	18	14,5	8	22,39 ~ 22,56	2	2174

Metric

# S-XPF-HB Weldon

Threading | Forming taps | Metric



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- With Weldon shank

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC	m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	

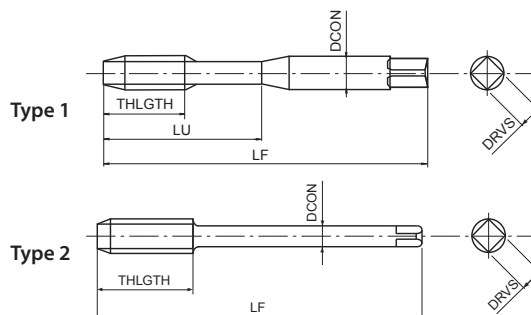
<b>A</b>	<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 2 6HX</b>	C/2,5		<b>DIN 2174</b>	<b>DIN 2174</b>	<b>DIN 1835</b>	<b>HB</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48222138	3	0,5	56	-	18	6	4,9	4	2,77 ~ 2,82	1	2174/1835
48222144	4	0,7	63	-	21	6	4,9	4	3,67 ~ 3,72	1	2174/1835
48222149	5	0,8	70	-	25	6	4,9	5	4,62 ~ 4,68	1	2174/1835
48222155	6	1	80	-	30	6	4,9	5	5,51 ~ 5,59	1	2174/1835
48222161	8	1,25	90	-	35	8	6,2	5	7,37 ~ 7,45	1	2174/1835
48222169	10	1,5	100	-	39	10	8	8	9,24 ~ 9,33	1	2174/1835
48222179	12	1,75	110	17	-	12	9	8	11,10 ~ 11,20	2	2174/1835
48222191	14	2	110	20	-	14	11	8	12,96 ~ 13,08	2	2174/1835
48222202	16	2	110	20	-	16	12	8	14,96 ~ 15,08	2	2174/1835



# S-XPF-GL

Threading | Forming taps | Metric



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Without oil grooves for higher rigidity

Threading | Forming taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC		
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20		m/min



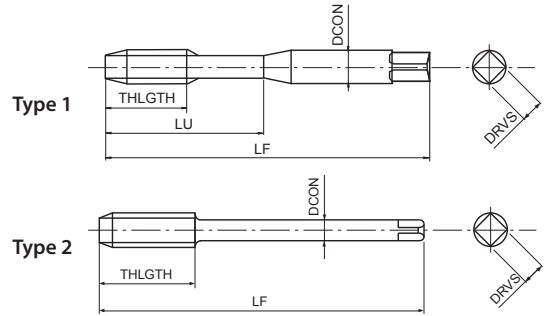
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48296138	3	0,5	56	4	18	3,5	2,7	0	2,77 ~ 2,82	1	2174
48296144	4	0,7	63	5,6	21	4,5	3,4	0	3,67 ~ 3,72	1	2174
48296149	5	0,8	70	6,4	25	6	4,9	0	4,62 ~ 4,68	1	2174
48296155	6	1	80	8	30	6	4,9	0	5,51 ~ 5,59	1	2174
48296161	8	1,25	90	10	35	8	6,2	0	7,37 ~ 7,45	1	2174
48296169	10	1,5	100	12	39	10	8	0	9,24 ~ 9,33	1	2174
48296179	12	1,75	110	17	-	9	7	0	11,10 ~ 11,20	2	2174

Metric



# S-XPF-GL 6GX

Threading | Forming taps | Metric



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Without oil grooves for higher rigidity, for 6G internal thread tolerance

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC		m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20		

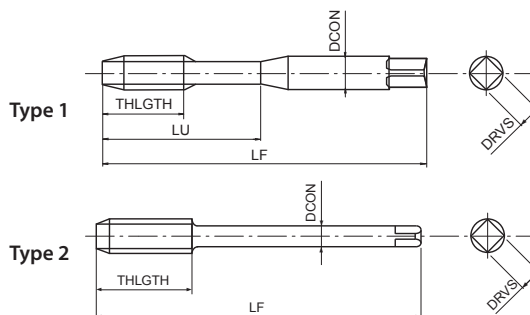
<b>A</b>	<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 3 6GX</b>	<b>C/2,5</b>	<b>DIN 2174</b>	<b>DIN 2174</b>
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EDP	TD	TP	Oversize	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48297138	3	0,5	0,0200	56	-	18	3,5	2,7	0	2,79 ~ 2,83	1	2174
48297144	4	0,7	0,0220	63	-	21	4,5	3,4	0	3,69 ~ 3,75	1	2174
48297149	5	0,8	0,0240	70	-	25	6	4,9	0	4,64 ~ 4,71	1	2174
48297155	6	1	0,0260	80	-	30	6	4,9	0	5,55 ~ 5,63	1	2174
48297161	8	1,25	0,0280	90	-	35	8	6,2	0	7,40 ~ 7,47	1	2174
48297169	10	1,5	0,0320	100	-	39	10	8	0	9,26 ~ 9,35	1	2174
48297179	12	1,75	0,0340	110	18	-	9	7	0	11,14 ~ 11,24	2	2174



# C-OIL-XPF

Threading | Forming taps | Metric



- First choice in quality and performance
- Carbide forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- With side through coolant

Threading | Forming taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC			m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20			

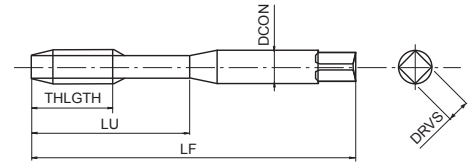
  

<b>A</b>	<b>M</b>	<b>CARBIDE</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>				<b>DIN 2174</b>	<b>DIN 2174</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48226149	5	0,8	70	-	25	6	4,9	5	4,62 ~ 4,68	1	2174
48226155	6	1	80	-	30	6	4,9	5	5,51 ~ 5,59	1	2174
48226161	8	1,25	90	-	35	8	6,2	5	7,37 ~ 7,45	1	2174
48226169	10	1,5	100	-	39	10	8	8	9,24 ~ 9,33	1	2174
48226179	12	1,75	110	17	-	9	7	8	11,10 ~ 11,20	2	2174
48226191	14	2	110	20	-	11	9	8	12,96 ~ 13,08	2	2174
48226202	16	2	110	20	-	12	9	8	14,96 ~ 15,08	2	2174



Metric



- HSS forming tap for through & blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium

<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	
0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	
15-40	15-30	15-30	5-15	20-40	20-40	m/min

<b>M</b>	<b>HSS</b>	<b>V</b>	<b>15°</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>			<b>DIN 2174</b>
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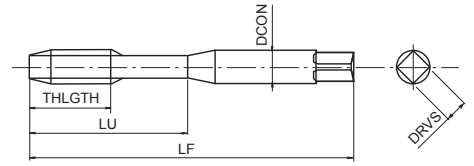
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	PHD	DIN
48116138	3	0,5	56	11	18	3,5	2,7	2,77 ~ 2,82	2174
48116144	4	0,7	63	13	21	4,5	3,4	3,67 ~ 3,72	2174
48116149	5	0,8	70	16	25	6	4,9	4,62 ~ 4,68	2174
48116155	6	1	80	19	30	6	4,9	5,51 ~ 5,59	2174



# R-XPF FORM D

## WHILE STOCK LASTS

### Threading | Forming taps | Metric



- HSS forming tap for through holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium

Threading | Forming taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	
0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	
15-40	15-30	15-30	5-15	20-40	20-40	m/min

<b>M</b>	<b>HSS</b>	<b>V</b>	15°	ISO 2 6HX	D/4		DIN 2174
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	PHD	DIN
48117138	3	0,5	56	11	18	3,5	2,7	2,77 ~ 2,82	2174
48117144	4	0,7	63	13	21	4,5	3,4	3,67 ~ 3,72	2174
48117149	5	0,8	70	16	25	6	4,9	4,62 ~ 4,68	2174
48117155	6	1	80	19	30	6	4,9	5,51 ~ 5,59	2174

Metric

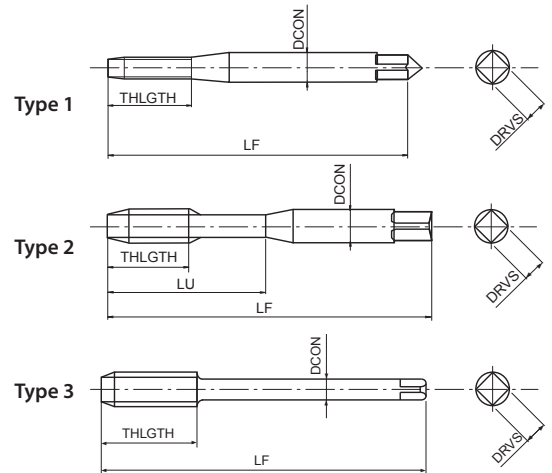


# V-NRT

Threading | Forming taps | Metric



- HSSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium



Threading | Forming taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	
10-15	10-15	10-15	8-12	5-10	10-20	10-20	m/min

<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>	<b>DIN 2174</b>	<b>DIN 2174</b>
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Metric

EDP	TD	TP	LF	THLGTH	LU	DCN	DRVS	NOF	PHD	Type	DIN
48003111	1	0,25	40	5,5	-	2,5	2,1	0	0,89 ~ 0,90	1	2174
48003113	1,2	0,25	40	5,5	-	2,5	2,1	0	1,09 ~ 1,10	1	2174
66711568	1,4	0,3	40	7	-	2,5	2,1	0	1,26 ~ 1,28	1	2174
66711868	1,6	0,35	40	8	-	2,5	2,1	0	1,45 ~ 1,48	1	2174
66712568	2	0,4	45	8	-	2,8	2,1	0	1,82 ~ 1,85	1	2174
66712868	2,2	0,45	45	9	-	2,8	2,1	0	2,00 ~ 2,04	1	2174
66713368	2,5	0,45	50	9	-	2,8	2,1	0	2,30 ~ 2,34	1	2174
66713868	3	0,5	56	11	18	3,5	2,7	2	2,77 ~ 2,82	2	2174
66714068	3,5	0,6	56	12	20	4	3	2	3,23 ~ 3,28	2	2174
66714468	4	0,7	63	13	21	4,5	3,4	2	3,67 ~ 3,72	2	2174
66714968	5	0,8	70	16	25	6	4,9	2	4,62 ~ 4,68	2	2174
66715568	6	1	80	19	30	6	4,9	2	5,51 ~ 5,59	2	2174
66716168	8	1,25	90	22	35	8	6,2	3	7,37 ~ 7,45	2	2174
66716968	10	1,5	100	24	39	10	8	4	9,24 ~ 9,33	2	2174
69117968	12	1,75	110	28	-	9	7	4	11,10 ~ 11,20	3	2174

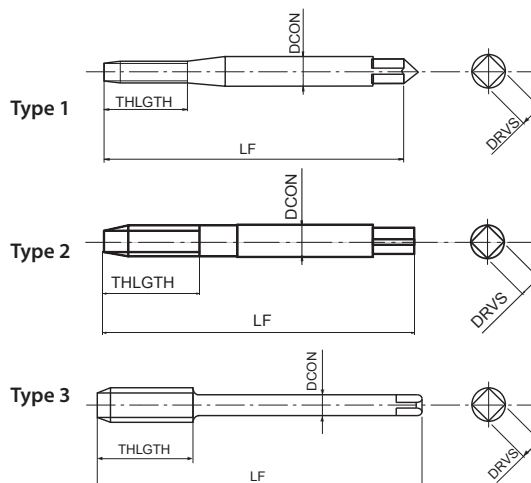


# V-NRT FORM D

Threading | Forming taps | Metric



- HSSE forming tap for through holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Chamfer Form D



Threading | Forming taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	
10-15	10-15	10-15	8-12	5-10	10-20	10-20	m/min
<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>D/4</b>		<b>DIN 2174</b>	<b>DIN 2174</b>

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
66612568	2	0,4	45	8	-	2,8	2,1	0	1,82 ~ 1,85	1	2174
66612868	2,2	0,45	45	9	-	2,8	2,1	0	2,00 ~ 2,04	1	2174
66613368	2,5	0,45	50	9	-	2,8	2,1	0	2,30 ~ 2,34	1	2174
66613868	3	0,5	56	11	18	3,5	2,7	2	2,77 ~ 2,82	2	2174
66614068	3,5	0,6	56	12	20	4	3	2	3,23 ~ 3,28	2	2174
66614468	4	0,7	63	13	21	4,5	3,4	2	3,66 ~ 3,72	2	2174
66614968	5	0,8	70	16	25	6	4,9	2	4,62 ~ 4,68	2	2174
66615568	6	1	80	19	30	6	4,9	2	5,51 ~ 5,59	2	2174
66616168	8	1,25	90	22	35	8	6,2	3	7,37 ~ 7,45	2	2174
66616968	10	1,5	100	24	39	10	8	4	9,24 ~ 9,33	2	2174
69017968	12	1,75	110	28	-	9	7	4	11,10 ~ 11,20	3	2174

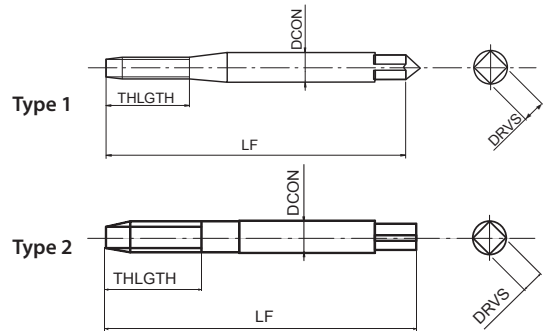


Metric



# V-NRT 6GX FORM D

Threading | Forming taps | Metric



- HSS-E forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- For 6G internal thread tolerance, chamfer Form D

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC
10-15	10-15	10-15	8-12	5-10	10-20	10-20

m/min

<b>M</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 3 6GX</b>	<b>D/4</b>	<b>DIN 2174</b>
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EDP	TD	TP	Overdose	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48004125	2	0,4	0,0190	45	8	-	2,8	2,1	0	1,85 ~ 1,88	1	2174
48004128	2,2	0,45	0,0200	45	9	-	2,8	2,1	0	2,02 ~ 2,05	1	2174
48004133	2,5	0,45	0,0200	50	9	-	2,8	2,1	0	2,32 ~ 2,35	1	2174
48004138	3	0,5	0,0200	56	11	18	3,5	2,7	0	2,79 ~ 2,83	2	2174
48004140	3,5	0,6	0,0210	56	12	20	4	3	2	3,24 ~ 3,29	2	2174
48004144	4	0,7	0,0220	63	13	21	4,5	3,4	2	3,69 ~ 3,75	2	2174
48004149	5	0,8	0,0240	70	16	25	6	4,9	2	4,64 ~ 4,71	2	2174
48004155	6	1	0,0260	80	19	30	6	4,9	2	5,55 ~ 5,63	2	2174
48004161	8	1,25	0,0280	90	22	35	8	6,2	3	7,40 ~ 7,47	2	2174
48004169	10	1,5	0,0320	100	24	39	10	8	4	9,26 ~ 9,35	2	2174

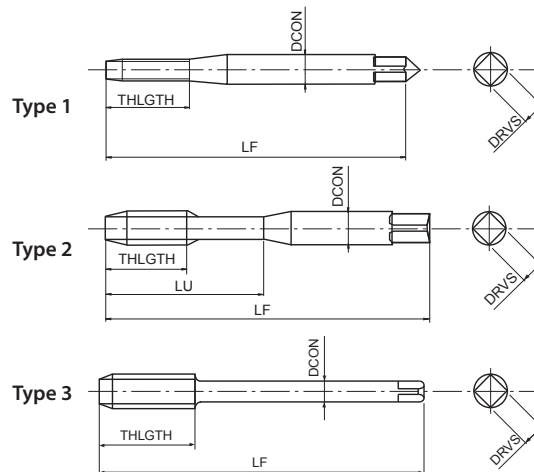


# M-NRT NEW

Threading | Forming taps | Metric



- Powder metal forming tap for through and blind holes
- TiN coating
- For general steels, stainless steels and aluminium



Threading | Forming taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	m/min
20-30	20-30	15-30	10-20	6-12	10-25	15-40	

<b>M</b>	<b>PM</b>	<b>TiN</b>	<b>ISO 2 6HX</b>					
				C/2,5			DIN 2174	DIN 2174

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
EP0203111	1	0,25	40	5,5	-	2,5	2,1	3	0,89	1	2174
EP0203115	1,4	0,3	40	7	-	2,5	2,1	3	1,27	1	2174
EP0203118	1,6	0,35	40	8	-	2,5	2,1	3	1,44	1	2174
EP0203125	2	0,4	45	9	-	2,8	2,1	3	1,82	1	2174
EP0203133	2,5	0,45	50	9	14	2,8	2,1	4	2,3	2	2174
EP0203138	3	0,5	56	10	18	3,5	2,7	4	2,8	2	2174
EP0203142	3,5	0,6	56	11	20	4	3	4	3,25	2	2174
EP0203144	4	0,7	63	12	21	4,5	3,4	4	3,7	2	2174
EP0203147	4,5	0,75	70	14	25	6	4,9	4	4,15	2	2174
EP0203149	5	0,8	70	14	25	6	4,9	5	4,65	2	2174
EP0203152	5,5	0,9	80	14	30	6	4,9	5	5,1	2	2174
EP0203155	6	1	80	16	30	6	4,9	5	5,55	2	2174
EP0203158	7	1	80	16	30	7	5,5	5	6,55	2	2174
EP0203161	8	1,25	90	18	35	8	6,2	5	7,45	2	2174
EP0203165	9	1,25	90	18	35	9	7	5	8,45	2	2174
EP0203169	10	1,5	100	20	39	10	8	5	9,35	2	2174
EP0203175	11	1,5	100	22	-	8	6,2	5	10,35	3	2174
EP0203179	12	1,75	110	24	-	9	7	5	11,2	3	2174
EP0203191	14	2	110	25	-	11	9	6	13,1	3	2174
EP0203202	16	2	110	27	-	12	9	6	15,1	3	2174
EP0203214	18	2,5	125	32	-	14	11	7	16,8	3	2174
EP0203228	20	2,5	140	32	-	16	12	7	18,8	3	2174
EP0203238	22	2,5	140	32	-	18	14,5	7	20,8	3	2174
EP0203247	24	3	160	36	-	18	14,5	7	22,6	3	2174

Metric

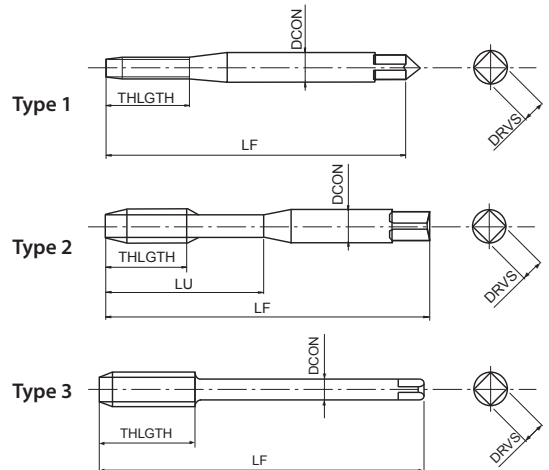


# M-NRT 6GX NEW

Threading | Forming taps | Metric



- Powder metal forming tap for through and blind holes
- TiN coating
- For general steels, stainless steels and aluminium
- For 6G internal thread tolerance



Threading | Forming taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	
20-30	20-30	15-30	10-20	6-12	10-25	15-40	m/min

<b>M</b>	<b>PM</b>	<b>TiN</b>	<b>ISO 3 6GX</b>	<b>C/2,5</b>			<b>DIN 2174</b>	<b>DIN 2174</b>
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EDP	TD	TP	Oversize	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
EP0204125	2	0,4	0,0190	45	9	-	2,8	2,1	3	1,82	1	2174
EP0204133	2,5	0,45	0,0200	50	9	14	2,8	2,1	4	2,3	2	2174
EP0204138	3	0,5	0,0200	56	10	18	3,5	2,7	4	2,8	2	2174
EP0204142	3,5	0,6	0,0210	56	11	20	4	3	4	3,25	2	2174
EP0204144	4	0,7	0,0220	63	12	21	4,5	3,4	4	3,7	2	2174
EP0204149	5	0,8	0,0240	70	14	25	6	4,9	5	4,65	2	2174
EP0204155	6	1	0,0260	80	16	30	6	4,9	5	5,55	2	2174
EP0204161	8	1,25	0,0280	90	18	35	8	6,2	5	7,45	2	2174
EP0204169	10	1,5	0,0320	100	20	39	10	8	5	9,35	2	2174
EP0204179	12	1,75	0,0340	110	24	-	9	7	5	11,2	3	2174
EP0204191	14	2	0,0380	110	25	-	11	9	6	13,1	3	2174
EP0204202	16	2	0,0380	110	27	-	12	9	6	15,1	3	2174

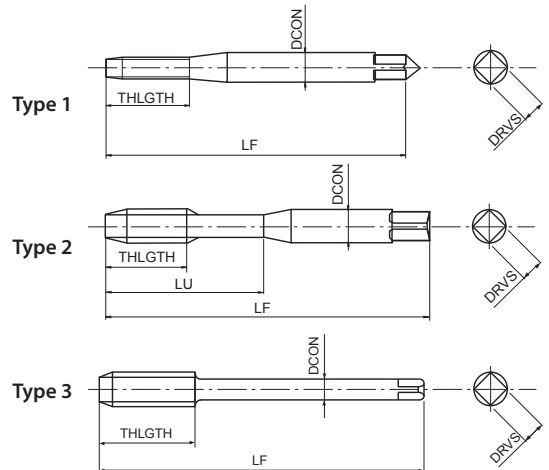
Metric

# M-NRT FORM E NEW

Threading | Forming taps | Metric



- Powder metal forming tap for through and blind holes
- TiN coating
- For general steels, stainless steels and aluminium
- Chamfer Form E



<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	
20-30	20-30	15-30	10-20	6-12	10-25	15-40	m/min

<b>M</b>	<b>PM</b>	<b>TiN</b>	<b>ISO 2 6HX</b>				<b>DIN 2174</b>	<b>DIN 2174</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
EP0205125	2	0,4	45	9	-	2,8	2,1	3	1,82	1	2174
EP0205133	2,5	0,45	50	9	14	2,8	2,1	4	2,3	2	2174
EP0205138	3	0,5	56	10	18	3,5	2,7	4	2,8	2	2174
EP0205142	3,5	0,6	56	11	20	4	3	4	3,25	2	2174
EP0205144	4	0,7	63	12	21	4,5	3,4	4	3,7	2	2174
EP0205149	5	0,8	70	14	25	6	4,9	5	4,65	2	2174
EP0205155	6	1	80	16	30	6	4,9	5	5,55	2	2174
EP0205161	8	1,25	90	18	35	8	6,2	5	7,45	2	2174
EP0205169	10	1,5	100	20	39	10	8	5	9,35	2	2174
EP0205179	12	1,75	110	24	-	9	7	5	11,2	3	2174
EP0205191	14	2	110	25	-	11	9	6	13,1	3	2174
EP0205202	16	2	110	27	-	12	9	6	15,1	3	2174

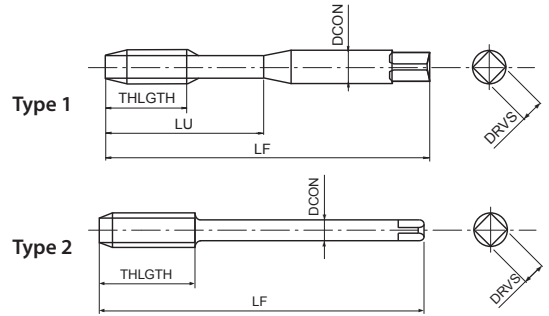
Threading | Forming taps



Metric

# M-OIL-NRT FORM E NEW

Threading | Forming taps | Metric



- Powder metal forming tap for blind holes
- TiN coating
- For general steels, stainless steels and aluminium
- Chamfer Form E, center through coolant

Threading | Forming taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	
20-30	20-30	15-30	10-20	6-12	10-25	15-40	m/min

<b>M</b>	<b>PM</b>	<b>TiN</b>	<b>ISO 2 6HX</b>	<b>E/1,5</b>			<b>DIN 2174</b>	<b>DIN 2174</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
EP0207149	5	0,8	70	14	25	6	4,9	5	4,65	1	2174
EP0207155	6	1	80	16	30	6	4,9	5	5,55	1	2174
EP0207161	8	1,25	90	18	35	8	6,2	5	7,45	1	2174
EP0207169	10	1,5	100	20	39	10	8	5	9,35	1	2174
EP0207179	12	1,75	110	24	-	9	7	5	11,2	2	2174
EP0207191	14	2	110	25	-	11	9	6	13,1	2	2174
EP0207202	16	2	110	27	-	12	9	6	15,1	2	2174

Metric

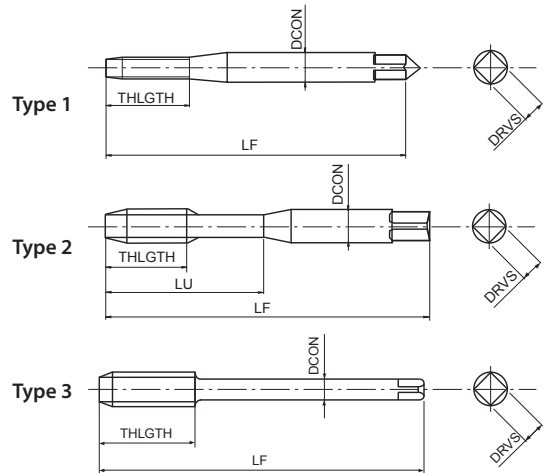


# A-POT

Threading | Cutting taps | Metric Fine



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels



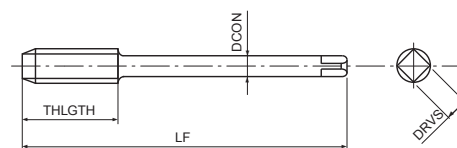
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	m/min
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	

<b>A</b>	<b>MF</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>			<b>DIN 371</b>	<b>DIN 374</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48145135	2,5	0,35	50	-	9	2,8	2,1	2	1	371
48145137	2,6	0,35	50	-	9	2,8	2,1	2	1	371
48145141	3	0,35	56	8	18	3,5	2,7	3	2	371
48145143	3,5	0,35	56	9	20	4	3	3	2	371
48145146	4	0,35	63	10	21	4,5	3,4	3	2	371
48145145	4	0,5	63	10	21	4,5	3,4	3	2	371
48145148	4,5	0,5	70	12	25	6	4,9	3	2	371
48145151	5	0,5	70	12	25	6	4,9	3	2	371
48145602	6	0,5	80	14	30	6	4,9	3	2	371
48145601	6	0,75	80	14	30	6	4,9	3	2	371
48145160	7	0,75	80	14	30	7	5,5	3	2	371
48145604	8	0,75	80	18	30	8	6,2	3	2	371
48145603	8	1	90	22	35	8	6,2	3	2	371
48145605	9	1	90	22	35	9	7	3	2	371
48145608	10	0,75	90	20	35	10	8	3	2	371
48145607	10	1	90	20	35	10	8	3	2	371
48145606	10	1,25	100	24	39	10	8	3	2	371
48145157	6	0,5	80	14	-	4,5	3,4	3	3	374
48145156	6	0,75	80	14	-	4,5	3,4	3	3	374
48145163	8	0,75	80	18	-	6	4,9	3	3	374
48145162	8	1	90	22	-	6	4,9	3	3	374
48145167	9	1	90	22	-	7	5,5	3	3	374
48145172	10	0,75	90	20	-	7	5,5	3	3	374
48145171	10	1	90	20	-	7	5,5	3	3	374
48145170	10	1,25	100	24	-	7	5,5	3	3	374
48145176	11	1	90	20	-	8	6,2	3	3	374
48145182	12	1	100	22	-	9	7	3	3	374
48145181	12	1,25	100	22	-	9	7	3	3	374
48145180	12	1,5	100	22	-	9	7	3	3	374
48145194	14	1	100	22	-	11	9	4	3	374
48145193	14	1,25	100	22	-	11	9	4	3	374
48145192	14	1,5	100	22	-	11	9	4	3	374
48145204	16	1	100	22	-	12	9	4	3	374
48145203	16	1,5	100	22	-	12	9	4	3	374
48145218	18	1	110	25	-	14	11	4	3	374
48145216	18	1,5	110	25	-	14	11	4	3	374
48145232	20	1	125	25	-	16	12	4	3	374
48145230	20	1,5	125	25	-	16	12	4	3	374
48145220	20	2	140	34	-	16	12	4	3	374
48145241	22	1	125	25	-	18	14,5	4	3	374
48145240	22	1,5	125	25	-	18	14,5	4	3	374
48145239	22	2	140	34	-	18	14,5	4	3	374
48145251	24	1	140	28	-	18	14,5	4	3	374
48145250	24	1,5	140	28	-	18	14,5	4	3	374
48145249	24	2	140	28	-	18	14,5	4	3	374

# A-OIL-POT

Threading | Cutting taps | Metric Fine



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- Side through coolant

Threading | Cutting taps

P C < 0,2%	P 0,25 < C < 0,4	P C ≥ 0,45%	P SCM	M INOX	N Al	N AC, ADC	S Ti	H 25-35 HRC		m/min
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20		

A	MF	PM	V	ISO 2 6HX	B/4			DIN 374
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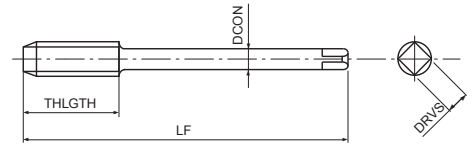
Metric Fine

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48214162	8	1	90	22	6	4,9	3	374
48214171	10	1	90	20	7	5,5	3	374
48214170	10	1,25	100	24	7	5,5	3	374
48214180	12	1,5	100	22	9	7	3	374
48214192	14	1,5	100	22	11	9	4	374
48214203	16	1,5	100	22	12	9	4	374
48214216	18	1,5	110	25	14	11	4	374
48214230	20	1,5	125	25	16	12	4	374



# A-POT 6GX

Threading | Cutting taps | Metric Fine



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- For 6G internal thread tolerance

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

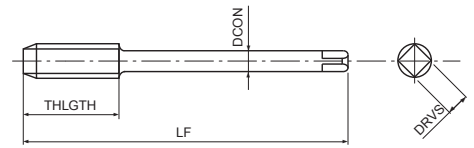
<b>A</b>	<b>MF</b>	<b>PM</b>	<b>V</b>	<b>ISO 3 6GX</b>	<b>B/4</b>		<b>DIN 374</b>
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EDP	TD	TP	Oversize	LF	THLGTH	DCON	DRVS	NOF	DIN
48205156	6	0,75	0,0220	80	14	4,5	3,4	3	374
48205163	8	0,75	0,0220	80	18	6	4,9	3	374
48205162	8	1	0,0260	80	22	6	4,9	3	374
48205171	10	1	0,0260	90	20	7	5,5	3	374
48205170	10	1,25	0,0280	90	24	7	5,5	3	374
48205182	12	1	0,0260	100	22	9	7	3	374
48205181	12	1,25	0,0280	100	22	9	7	3	374
48205180	12	1,5	0,0320	100	22	9	7	3	374
48205192	14	1,5	0,0320	100	22	11	9	4	374
48205203	16	1,5	0,0320	100	22	12	9	4	374
48205216	18	1,5	0,0320	100	25	14	11	4	374
48205230	20	1,5	0,0320	125	25	16	12	4	374
48205240	22	1,5	0,0320	125	25	18	14,5	4	374
48205250	24	1,5	0,0320	140	28	18	14,5	4	374



# S-POT

Threading | Cutting taps | Metric Fine



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
15-24	10-15	10-15	8-13	8-16	10-15	m/min
<b>MF</b>	<b>HSSE</b>	<b>OX</b>	<b>ISO 2 6H</b>	<b>B/4</b>		<b>DIN 374</b>

Metric Fine

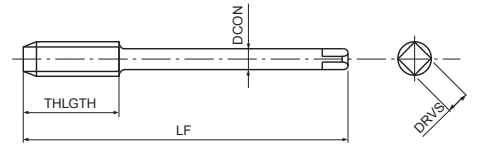
EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48224139	3	0,35	56	9	2,2	-	3	374
48224145	4	0,5	63	10	2,8	2,1	3	374
48224151	5	0,5	70	12	3,5	2,7	3	374
48224157	6	0,5	80	14	4,5	3,4	3	374
48224156	6	0,75	80	14	4,5	3,4	3	374
48224163	8	0,75	80	18	6	4,9	3	374
48224162	8	1	90	22	6	4,9	3	374
48224167	9	1	90	22	7	5,5	3	374
48224172	10	0,75	90	20	7	5,5	3	374
48224171	10	1	90	20	7	5,5	3	374
48224170	10	1,25	100	24	7	5,5	3	374
48224176	11	1	90	20	8	6,2	3	374
48224182	12	1	100	22	9	7	3	374
48224181	12	1,25	100	22	9	7	3	374
48224180	12	1,5	100	22	9	7	3	374
48224194	14	1	100	22	11	9	3	374
48224193	14	1,25	100	22	11	9	3	374
48224192	14	1,5	100	22	11	9	3	374
48224204	16	1	100	22	12	9	3	374
48224203	16	1,5	100	22	12	9	3	374
48224218	18	1	110	25	14	11	3	374
48224216	18	1,5	110	25	14	11	3	374
48224232	20	1	125	25	16	12	3	374
48224230	20	1,5	125	25	16	12	3	374
48224220	20	2	140	34	16	12	3	374
48224241	22	1	125	25	18	14,5	3	374
48224240	22	1,5	125	25	18	14,5	3	374
48224239	22	2	140	34	18	14,5	3	374
48224251	24	1	140	28	18	14,5	3	374
48224250	24	1,5	140	28	18	14,5	3	374
48224249	24	2	140	28	18	14,5	3	374





# Z-POT

Threading | Cutting taps | Metric Fine



- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels and stainless steels

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC		m/min
15-24	15-24	15-24	8-20	8-20	20-40	20-40	10-15	8-15		

<b>MF</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>B/4</b>	<b>DIN 374</b>
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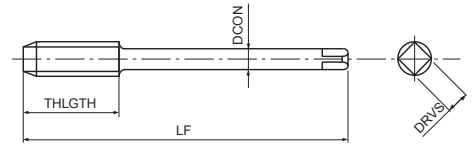
EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48028139	3	0,35	56	9	2,2	-	3	374
48028145	4	0,5	63	10	2,8	2,1	3	374
48028151	5	0,5	70	12	3,5	2,7	3	374
48028157	6	0,5	80	14	4,5	3,4	3	374
48028156	6	0,75	80	14	4,5	3,4	3	374
48028163	8	0,75	80	18	6	4,9	3	374
48028162	8	1	90	22	6	4,9	3	374
48028171	10	1	90	20	7	5,5	3	374
48028170	10	1,25	100	24	7	5,5	3	374
48028182	12	1	100	22	9	7	3	374
48028180	12	1,25	100	22	9	7	3	374
48028176	12	1,5	100	22	9	7	3	374
48028193	14	1,5	100	22	11	9	4	374
48028204	16	1,5	100	22	12	9	4	374
48028217	18	1,5	110	25	14	11	4	374
48028231	20	1,5	125	25	16	12	4	374
48028241	22	1,5	125	25	18	14,5	4	374
48028251	24	1,5	140	28	18	14,5	4	374

Threading | Cutting taps

Metric Fine

# POT

Threading | Cutting taps | Metric Fine



- HSSE spiral-point cutting tap for through holes
- Bright finish
- For general purpose applications

Threading | Cutting taps

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ● AC, ADC		
12-20	8-12	8-12	8-12	8-12	15-25	15-20		m/min
<b>MF</b>	<b>HSSE</b>	<b>ISO 2 6H</b>	<b>B/4</b>				<b>DIN 374</b>	

Metric Fine

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
60614560	4	0,5	63	10	2,8	2,1	3	374
60615160	5	0,5	70	12	3,5	2,7	3	374
60615660	6	0,75	80	14	4,5	3,4	3	374
60616360	8	0,75	80	18	6	4,9	3	374
60616260	8	1	90	22	6	4,9	3	374
60617260	10	0,75	90	18	7	5,5	3	374
60617160	10	1	90	20	7	5,5	3	374
60617060	10	1,25	100	24	7	5,5	3	374
60618260	12	1	100	22	9	7	3	374
60618160	12	1,25	100	22	9	7	3	374
60618060	12	1,5	100	22	9	7	3	374
60619460	14	1	100	18	11	9	3	374
60619360	14	1,25	100	22	11	9	3	374
60619260	14	1,5	100	22	11	9	3	374
60620460	16	1	100	18	12	9	3	374
60620360	16	1,5	100	22	12	9	3	374
60621860	18	1	110	20	14	11	3	374
60621660	18	1,5	110	25	14	11	3	374
60621560	18	2	125	26	14	11	3	374
60623260	20	1	125	20	16	12	3	374
60623060	20	1,5	125	25	16	12	3	374
60622960	20	2	140	27	16	12	3	374
60624060	22	1,5	125	25	18	14,5	3	374
60623960	22	2	140	27	18	14,5	3	374
60625060	24	1,5	140	28	18	14,5	3	374
60624960	24	2	140	27	18	14,5	3	374
60627360	30	2	150	30	22	18	4	374

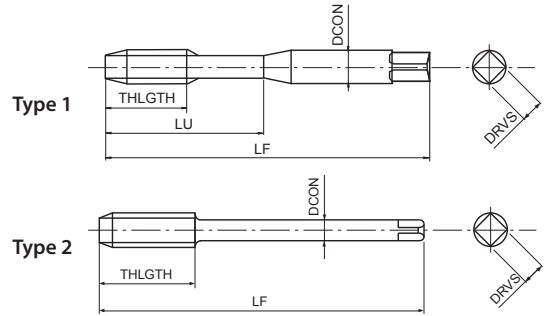






# A-SFT

Threading | Cutting taps | Metric Fine



- First choice in quality and performance
- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

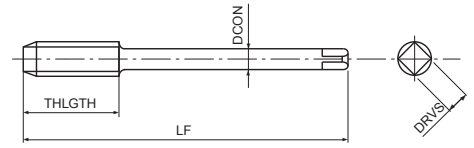
<b>A</b>	<b>MF</b>	<b>PM</b>	<b>V</b>	45°	ISO 2 6HX	C/2,5		DIN 371	DIN 374
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48139135	2,5	0,35	50	3,6	13	2,8	2,1	2	1	371
48139137	2,6	0,35	50	3,6	13	2,8	2,1	2	1	371
48139141	3	0,35	56	4	18	3,5	2,7	3	1	371
48139143	3,5	0,35	56	4,8	20	4	3	3	1	371
48139146	4	0,35	63	5,6	21	4,5	3,4	3	1	371
48139145	4	0,5	63	5,6	21	4,5	3,4	3	1	371
48139148	4,5	0,5	70	6	25	6	4,9	3	1	371
48139151	5	0,5	70	6,4	25	6	4,9	3	1	371
48139602	6	0,5	80	8	30	6	4,9	3	1	371
48139601	6	0,75	80	8	30	6	4,9	3	1	371
48139160	7	0,75	80	8	30	7	5,5	3	1	371
48139604	8	0,75	80	10	35	8	6,2	3	1	371
48139603	8	1	90	10	35	8	6,2	3	1	371
48139605	9	1	90	10	35	9	7	3	1	371
48139608	10	0,75	90	12	35	10	8	3	1	371
48139607	10	1	90	12	35	10	8	3	1	371
48139606	10	1,25	100	12	39	10	8	3	1	371
48139157	6	0,5	80	8	-	4,5	3,4	3	2	374
48139156	6	0,75	80	8	-	4,5	3,4	3	2	374
48139163	8	0,75	80	8	-	6	4,9	3	2	374
48139162	8	1	90	10	-	6	4,9	3	2	374
48139167	9	1	90	10	-	7	5,5	3	2	374
48139172	10	0,75	90	10	-	7	5,5	3	2	374
48139171	10	1	90	10	-	7	5,5	3	2	374
48139170	10	1,25	100	12	-	7	5,5	3	2	374
48139176	11	1	90	12	-	8	6,2	3	2	374
48139182	12	1	100	12	-	9	7	3	2	374
48139181	12	1,25	100	12	-	9	7	3	2	374
48139180	12	1,5	100	14	-	9	7	3	2	374
48139194	14	1	100	16	-	11	9	3	2	374
48139193	14	1,25	100	16	-	11	9	3	2	374
48139192	14	1,5	100	16	-	11	9	3	2	374
48139204	16	1	100	16	-	12	9	3	2	374
48139203	16	1,5	100	16	-	12	9	3	2	374
48139218	18	1	110	16	-	14	11	4	2	374
48139216	18	1,5	110	16	-	14	11	4	2	374
48139232	20	1	125	16	-	16	12	4	2	374
48139230	20	1,5	125	16	-	16	12	4	2	374
48139220	20	2	140	25	-	16	12	4	2	374
48139241	22	1	125	16	-	18	14,5	4	2	374
48139240	22	1,5	125	16	-	18	14,5	4	2	374
48139239	22	2	140	25	-	18	14,5	4	2	374
48139251	24	1	140	16	-	18	14,5	4	2	374
48139250	24	1,5	140	16	-	18	14,5	4	2	374
48139249	24	2	140	30	-	18	14,5	4	2	374



# A-SFT 6GX

Threading | Cutting taps | Metric Fine



- First choice in quality and performance
- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- For 6G internal thread tolerance

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

<b>A</b>	<b>MF</b>	<b>PM</b>	<b>V</b>	<b>45°</b>	<b>ISO 3 6GX</b>	<b>C/2,5</b>	<b>DIN 374</b>
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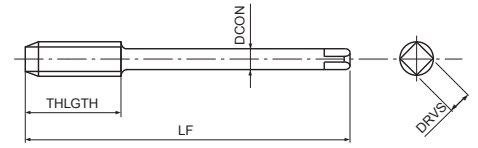
EDP	TD	TP	Oversize	LF	THLGTH	DCON	DRVS	NOF	DIN
48201156	6	0,75	0,0220	80	8	4,5	3,4	3	374
48201163	8	0,75	0,0220	80	8	6	4,9	3	374
48201162	8	1	0,0260	90	10	6	4,9	3	374
48201171	10	1	0,0260	90	10	7	5,5	3	374
48201170	10	1,25	0,0280	100	12	7	5,5	3	374
48201182	12	1	0,0260	100	12	9	7	3	374
48201181	12	1,25	0,0280	100	12	9	7	3	374
48201180	12	1,5	0,0320	100	14	9	7	3	374
48201192	14	1,5	0,0320	100	16	11	9	3	374
48201203	16	1,5	0,0320	100	16	12	9	3	374
48201216	18	1,5	0,0320	110	16	14	11	4	374
48201230	20	1,5	0,0320	125	16	16	12	4	374
48201240	22	1,5	0,0320	125	16	18	14,5	4	374
48201250	24	1,5	0,0320	140	16	18	14,5	4	374

Threading | Cutting taps

Metric Fine

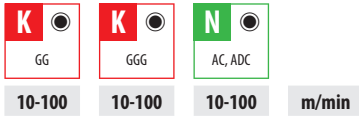
# A-CSF OIL

Threading | Cutting taps | Metric Fine



- First choice in quality and performance
- Carbide spiral-fluted cutting tap for blind holes
- TiAlN coating
- For cast iron and cast aluminium
- Centre through coolant

Threading | Cutting taps

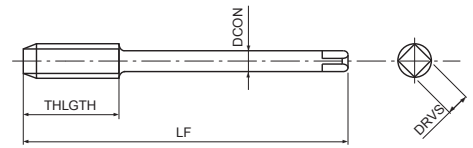


EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48267162	8	1	90	15	6	4,9	3	374
48267171	10	1	90	18	7	5,5	3	374
48267182	12	1	100	21	9	7	3	374
48267180	12	1,5	100	21	9	7	3	374
48267192	14	1,5	100	24	11	9	4	374
48267203	16	1,5	100	24	12	9	4	374
48267230	20	1,5	125	30	16	12	4	374



# S-SFT

Threading | Cutting taps | Metric Fine



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

Threading | Cutting taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

<b>MF</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>		<b>DIN 374</b>
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EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48223139	3	0,35	56	4	2,2	-	3	374
48223145	4	0,5	63	5,6	2,8	2,1	3	374
48223151	5	0,5	70	6,4	3,5	2,7	3	374
48223157	6	0,5	80	8	4,5	3,4	3	374
48223156	6	0,75	80	8	4,5	3,4	3	374
48223163	8	0,75	80	10	6	4,9	3	374
48223162	8	1	90	10	6	4,9	3	374
48223167	9	1	90	10	7	5,5	3	374
48223172	10	0,75	90	12	7	5,5	3	374
48223171	10	1	90	12	7	5,5	3	374
48223170	10	1,25	100	12	7	5,5	3	374
48223176	11	1	90	12	8	6,2	3	374
48223182	12	1	100	14	9	7	4	374
48223181	12	1,25	100	14	9	7	4	374
48223180	12	1,5	100	14	9	7	4	374
48223194	14	1	100	16	11	9	4	374
48223193	14	1,25	100	16	11	9	4	374
48223192	14	1,5	100	16	11	9	4	374
48223204	16	1	100	16	12	9	4	374
48223203	16	1,5	100	16	12	9	4	374
48223218	18	1	110	20	14	11	4	374
48223216	18	1,5	110	20	14	11	4	374
48223232	20	1	125	20	16	12	4	374
48223230	20	1,5	125	20	16	12	4	374
48223220	20	2	140	20	16	12	4	374
48223241	22	1	125	20	18	14,5	4	374
48223240	22	1,5	125	20	18	14,5	4	374
48223239	22	2	140	20	18	14,5	4	374
48223251	24	1	140	20	18	14,5	4	374
48223250	24	1,5	140	24	18	14,5	4	374
48223249	24	2	140	24	18	14,5	4	374

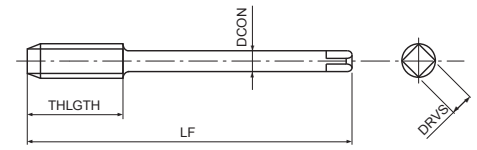
Metric Fine





# VA-SFT

Threading | Cutting taps | Metric Fine



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

<b>MF</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>		<b>DIN 374</b>
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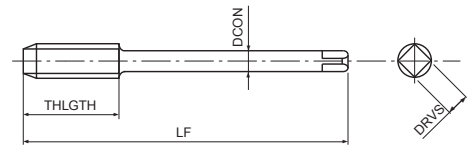
Metric Fine

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
65513960	3	0,35	56	4	2,2	-	3	374
65514560	4	0,5	63	6	2,8	2,1	3	374
65515160	5	0,5	70	7	3,5	2,7	3	374
65515760	6	0,5	80	8	4,5	3,4	3	374
65515660	6	0,75	80	8	4,5	3,4	3	374
65516360	8	0,75	80	10	6	4,9	3	374
65516260	8	1	90	10	6	4,9	3	374
65517160	10	1	90	12	7	5,5	4	374
65517060	10	1,25	100	12	7	5,5	4	374
65518260	12	1	100	14	9	7	4	374
65518160	12	1,25	100	14	9	7	4	374
65518060	12	1,5	100	14	9	7	4	374
65519260	14	1,5	100	16	11	9	4	374
65520360	16	1,5	100	16	12	9	5	374
65521660	18	1,5	110	20	14	11	5	374
65523060	20	1,5	125	20	16	12	5	374
65524060	22	1,5	125	20	18	14,5	5	374
65525060	24	1,5	140	24	18	14,5	5	374



# Z-SFT

Threading | Cutting taps | Metric Fine



- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels and stainless steels

<b>P</b> ●	<b>P</b> ●	<b>P</b> ●	<b>P</b> ○	<b>M</b> ●	<b>N</b> ○	<b>N</b> ○	<b>S</b> ○	<b>H</b> ○	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
10-25	10-25	10-25	8-20	8-20	15-35	15-35	5-10	8-15	m/min

<b>MF</b>	<b>PM</b>	<b>V</b>	<b>50°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>	<b>DIN 374</b>
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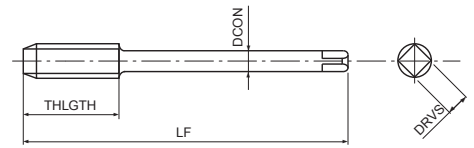
EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48029139	3	0,35	56	4	2,2	-	3	374
48029145	4	0,5	63	6	2,8	2,1	3	374
48029151	5	0,5	70	7	3,5	2,7	3	374
48029157	6	0,5	80	8	4,5	3,4	3	374
48029156	6	0,75	80	8	4,5	3,4	3	374
48029163	8	0,75	80	10	6	4,9	3	374
48029162	8	1	90	10	6	4,9	3	374
48029171	10	1	90	12	7	5,5	4	374
48029170	10	1,25	100	12	7	5,5	4	374
48029182	12	1	100	14	9	7	4	374
48029180	12	1,25	100	14	9	7	4	374
48029176	12	1,5	100	14	9	7	4	374
48029192	14	1,5	100	16	11	9	4	374
48029203	16	1,5	100	16	12	9	5	374
48029216	18	1,5	110	20	14	11	5	374
48029230	20	1,5	125	20	16	12	5	374
48029240	22	1,5	125	20	18	14,5	5	374
48029250	24	1,5	140	24	18	14,5	5	374

Threading | Cutting taps

Metric Fine

# SFT

## Threading | Cutting taps | Metric Fine



- HSSE spiral-flute cutting tap for blind holes
- Bright finish
- For general purpose applications

Threading | Cutting taps

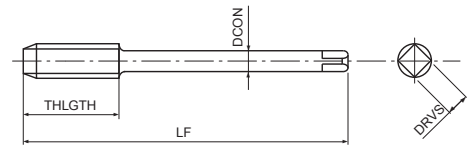
<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC		
8-13	7-12	7-12	6-9	6-8	10-20	10-15		m/min
<b>MF</b>	<b>HSSE</b>	<b>40°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>		<b>DIN 374</b>		

Metric Fine

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
61214560	4	0,5	63	6	2,8	2,1	3	374
61215160	5	0,5	70	7	3,5	2,7	3	374
61215660	6	0,75	80	8	4,5	3,4	3	374
61216360	8	0,75	80	10	6	4,9	3	374
61216260	8	1	90	10	6	4,9	3	374
61217260	10	0,75	90	12	7	5,5	3	374
61217160	10	1	90	12	7	5,5	3	374
61217060	10	1,25	100	12	7	5,5	3	374
61218260	12	1	100	14	9	7	3	374
61218160	12	1,25	100	14	9	7	3	374
61218060	12	1,5	100	14	9	7	3	374
61219460	14	1	100	11	11	9	3	374
61219360	14	1,25	100	15	11	9	3	374
61219260	14	1,5	100	16	11	9	3	374
61220460	16	1	100	12	12	9	3	374
61220360	16	1,5	100	16	12	9	3	374
61221860	18	1	110	13	14	11	4	374
61221660	18	1,5	110	20	14	11	4	374
61221560	18	2	125	20	14	11	4	374
61223260	20	1	125	20	16	12	4	374
61223060	20	1,5	125	20	16	12	4	374
61222960	20	2	140	20	16	12	4	374
61224060	22	1,5	125	20	18	14,5	4	374
61223960	22	2	140	20	18	14,5	4	374
61225060	24	1,5	140	20	18	14,5	4	374
61224960	24	2	140	20	18	14,5	4	374
61227360	30	2	150	22	22	18	4	374

# CC-SFT

Threading | Cutting taps | Metric Fine



- HSSE spiral-flute cutting tap for blind holes
- CrN coating
- For general steels, stainless steels and aluminium
- Developed for rigid tapping on CNC machines

<b>P</b> ●	<b>P</b> ●	<b>P</b> ●	<b>P</b> ○	<b>M</b> ●	<b>N</b> ●	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	
15-25	15-25	10-25	10-25	6-10	15-35	m/min

<b>MF</b>	<b>HSSE</b>	<b>CrN</b>	<b>45°</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>	<b>≥2D</b>	<b>DIN 374</b>
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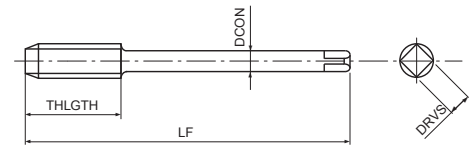
EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48032157	6	0,5	80	7,2	4,5	3,4	3	374
48032156	6	0,75	80	7,2	4,5	3,4	3	374
48032163	8	0,75	80	9	6	4,9	3	374
48032162	8	1	90	9	6	4,9	3	374
48032171	10	1	90	11	7	5,5	4	374
48032170	10	1,25	100	11	7	5,5	4	374
48032182	12	1	100	13	9	7	4	374
48032181	12	1,25	100	13	9	7	4	374
48032180	12	1,5	100	13	9	7	4	374
48032192	14	1,5	100	14	11	9	4	374
48032203	16	1,5	100	14	12	9	4	374
48032216	18	1,5	110	18	14	11	4	374
48032230	20	1,5	125	18	16	12	4	374
48032240	22	1,5	125	18	18	14,5	4	374
48032250	24	1,5	140	22	18	14,5	4	374

Threading | Cutting taps

Metric Fine

# SUS-SFT

Threading | Cutting taps | Metric Fine



- HSSE high spiral-fluted cutting tap for blind holes
- Steam oxide treatment
- For stainless steels

Threading | Cutting taps



6-10 m/min

MF HSSE OX 50° ISO 2 6HX C/2,5 <1,5D DIN 374

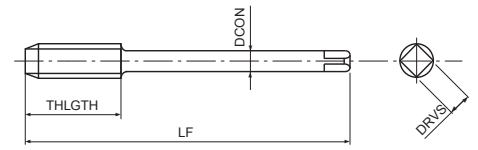
EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48027163	8	0,75	80	10	6	4,9	3	374
48027162	8	1	90	10	6	4,9	3	374
48027171	10	1	90	12	7	5,5	3	374
48027170	10	1,25	100	12	7	5,5	3	374
48027182	12	1	100	9	9	7	3	374
48027181	12	1,25	100	14	9	7	3	374
48027180	12	1,5	100	14	9	7	3	374
48027192	14	1,5	100	16	11	9	3	374
48027203	16	1,5	100	16	12	9	3	374
48027216	18	1,5	110	20	14	11	4	374
48027230	20	1,5	125	20	16	12	4	374
48027240	22	1,5	125	20	18	14,5	4	374
48027250	24	1,5	140	24	18	14,5	4	374



Metric Fine

# AL-SFT

Threading | Cutting taps | Metric Fine



- HSSE spiral-flute cutting tap for blind holes
- Bright finish
- For aluminium and cast aluminium



10-20

10-15

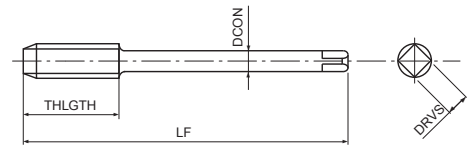
m/min



EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
70416260	8	1	90	10	6	4,9	2	374
70417160	10	1	90	12	7	5,5	2	374
70417060	10	1,25	100	12	7	5,5	2	374
70418260	12	1	100	14	9	7	2	374
70418160	12	1,25	100	14	9	7	2	374
70418060	12	1,5	100	14	9	7	2	374

# H-SFT

Threading | Cutting taps | Metric Fine



- Powder metal low spiral-fluted cutting tap for blind holes
- Steam oxide treatment
- For hardened steels up to 45 HRC

Threading | Cutting taps

<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>K</b> GGG	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	
7-12	7-12	7-12	3-5	1-3	4-8	4-8	m/min

<b>MF</b>	<b>PM</b>	<b>OX</b>	15°	ISO 2 6H	C/3	DRVS	DIN 374
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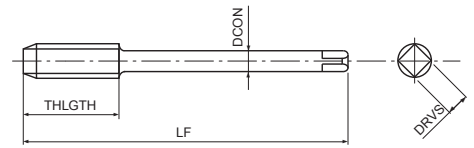


Metric Fine

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
83214060	3	0,35	56	4	2,2	-	3	374
83214560	4	0,5	63	6	2,8	2,1	3	374
83215160	5	0,5	70	7	3,5	2,7	3	374
83215760	6	0,5	80	8	4,5	3,4	3	374
83215660	6	0,75	80	8	4,5	3,4	3	374
83216360	8	0,75	80	10	6	4,9	3	374
83216260	8	1	90	10	6	4,9	3	374
83217160	10	1	90	12	7	5,5	4	374
83217060	10	1,25	100	12	7	5,5	4	374
83218260	12	1	100	14	9	7	4	374
83218160	12	1,25	100	14	9	7	4	374
83218060	12	1,5	100	14	9	7	4	374
83219260	14	1,5	100	16	11	9	5	374
83220360	16	1,5	100	16	12	9	5	374
83221660	18	1,5	110	20	14	11	5	374
83223060	20	1,5	125	20	16	12	5	374
83224060	22	1,5	125	20	18	14,5	5	374
83225060	24	1,5	140	24	18	14,5	5	374

# VP-DC-MT

Threading | Cutting taps | Metric Fine



- Powder metal straight flute cutting tap for through and blind holes
- Multilayer TiCN coating
- For cast iron and cast aluminium
- Synchro taps at cutting speeds > 30 m/min

<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	
10-25	10-20	15-60	15-40	25-70	8-20	8-20	m/min
<b>MF</b>	<b>PM</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>			<b>DIN 374</b>

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48023140	3	0,35	56	8	2,2	-	3	374
48023145	4	0,5	63	9	2,8	2,1	3	374
48023151	5	0,5	70	10	3,5	2,7	3	374
48023157	6	0,5	80	12	4,5	3,4	3	374
48023156	6	0,75	80	12	4,5	3,4	3	374
48023163	8	0,75	80	15	6	4,9	4	374
48023162	8	1	90	15	6	4,9	4	374
48023171	10	1	90	18	7	5,5	4	374
48023170	10	1,25	100	18	7	5,5	4	374
48023182	12	1	100	21	9	7	4	374
48023181	12	1,25	100	21	9	7	4	374
48023180	12	1,5	100	21	9	7	4	374
48023192	14	1,5	100	24	11	9	4	374
48023203	16	1,5	100	24	12	9	4	374
48023216	18	1,5	110	30	14	11	4	374
48023230	20	1,5	125	30	16	12	4	374
48023240	22	1,5	125	20	18	14,5	5	374
48023250	24	1,5	140	24	18	14,5	5	374



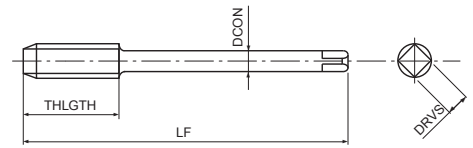






# A-CHT OIL Side

Threading | Cutting taps | Metric Fine



- First choice in quality and performance
- Carbide straight flute cutting tap for through holes
- TiAlN coating
- For cast iron and cast aluminium
- Side through coolant



10-100

10-100

10-100

m/min

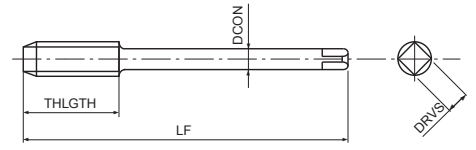


EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48265162	8	1	90	15	6	4,9	4	374
48265171	10	1	90	18	7	5,5	4	374
48265182	12	1	100	21	9	7	4	374
48265180	12	1,5	100	21	9	7	4	374
48265192	14	1,5	100	24	11	9	4	374
48265203	16	1,5	100	24	12	9	4	374
48265230	20	1,5	125	30	16	12	4	374



# A-CHT OIL FORM E

Threading | Cutting taps | Metric Fine



- First choice in quality and performance
- Carbide straight flute cutting tap for blind holes
- TiAlN coating
- For cast iron and cast aluminium
- Centre through coolant, Chamfer Form E

Threading | Cutting taps

<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC
10-100	10-100	10-100
m/min		

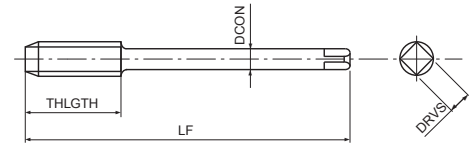
<b>A</b>	<b>MF</b>	<b>CARBIDE</b>	<b>FX</b>	<b>h6</b>	<b>ISO 2 6HX</b>	<b>E/1,5</b>		<b>DIN 374</b>
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EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48263171	10	1	90	18	7	5,5	3	374
48263182	12	1	100	21	9	7	3	374
48263180	12	1,5	100	21	9	7	3	374
48263192	14	1,5	100	24	11	9	4	374
48263203	16	1,5	100	24	12	9	4	374

Metric Fine

# GG-MT

Threading | Cutting taps | Metric Fine



- HSSE straight flute cutting tap for blind and through holes
- NiOx coating
- For cast iron



GG

10-15



GGG

7-12

m/min



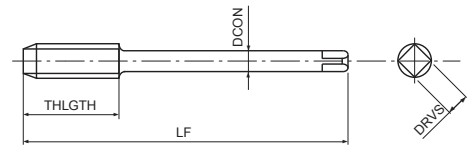
EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
62113960	3	0,35	56	9	2,2	-	3	374
62114260	3,5	0,35	56	10	2,5	-	3	374
62114560	4	0,5	63	10	2,8	2,1	3	374
62115160	5	0,5	70	12	3,5	2,7	3	374
62115760	6	0,5	80	14	4,5	3,4	3	374
62115660	6	0,75	80	12	4,5	3,4	3	374
62116360	8	0,75	80	19	6	4,9	4	374
62116260	8	1	90	22	6	4,9	4	374
62117160	10	1	90	20	7	5,5	4	374
62117060	10	1,25	100	24	7	5,5	4	374
62118260	12	1	100	20	7	7	4	374
62118160	12	1,25	100	22	9	5	4	374
62118060	12	1,5	100	22	9	7	4	374
62119460	14	1	100	22	11	9	4	374
62119260	14	1,5	100	22	11	9	4	374
62120460	16	1	100	22	12	9	4	374
62120360	16	1,5	100	22	12	9	4	374
62121660	18	1,5	110	25	14	11	4	374
62121560	18	2	125	34	14	11	4	374
62123060	20	1,5	125	25	16	12	4	374
62124060	22	1,5	125	25	18	14,5	4	374
62125060	24	1,5	140	28	18	14,5	4	374





# A-OIL-XPf

Threading | Forming taps | Metric Fine



- First choice in quality and performance
- Powder metal forming tap for through and blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels
- Side through coolant

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC		m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20		

<b>A</b>	MF	PM	<b>V</b>	ISO 2 6HX	C/2,5				DIN 2174
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EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48225162	8	1	90	10	6	4,9	5	7,51 ~ 7,59	2174
48225171	10	1	90	12	7	5,5	8	9,51 ~ 9,59	2174
48225170	10	1,25	100	12	7	5,5	8	9,37 ~ 9,45	2174
48225182	12	1	100	15	9	7	8	11,52 ~ 11,60	2174
48225181	12	1,25	100	15	9	7	8	11,39 ~ 11,46	2174
48225180	12	1,5	100	15	9	7	8	11,25 ~ 11,34	2174
48225193	14	1,25	100	12	11	9	8	13,39 ~ 13,46	2174
48225192	14	1,5	100	15	11	9	8	13,25 ~ 13,34	2174
48225203	16	1,5	100	15	12	9	8	15,25 ~ 15,34	2174
48225216	18	1,5	110	15	14	11	8	17,25 ~ 17,34	2174
48225230	20	1,5	125	15	16	12	8	19,25 ~ 19,34	2174
48225240	22	1,5	125	15	18	14,5	8	21,25 ~ 21,34	2174
48225250	24	1,5	140	15	18	14,5	8	23,25 ~ 23,34	2174

Threading | Forming taps



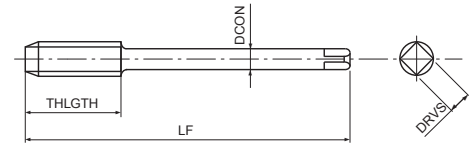
Metric Fine





# S-OIL-XPF

Threading | Forming taps | Metric Fine



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Side through coolant

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>H</b>	
$C < 0,2\%$	$0,25 < C < 0,4$	$C \geq 0,45\%$	SCM	INOX	Al	AC, ADC	25-35 HRC	m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	

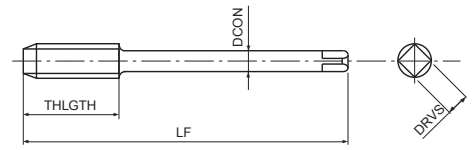


EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48042162	8	1	90	10	6	4,9	5	7,51 ~ 7,59	2174
48042171	10	1	90	12	7	5,5	8	9,51 ~ 9,59	2174
48042170	10	1,25	100	12	7	5,5	8	9,37 ~ 9,45	2174
48042182	12	1	100	15	9	7	8	11,52 ~ 11,60	2174
48042181	12	1,25	100	15	9	7	8	11,39 ~ 11,46	2174
48042180	12	1,5	100	15	9	7	8	11,25 ~ 11,34	2174
48042194	14	1	100	15	11	9	8	13,52 ~ 13,60	2174
48042193	14	1,25	100	12	11	9	8	13,39 ~ 13,46	2174
48042192	14	1,5	100	15	11	9	8	13,25 ~ 13,34	2174
48042204	16	1	100	15	12	9	8	15,52 ~ 15,60	2174
48042203	16	1,5	100	15	12	9	8	15,25 ~ 15,34	2174
48042218	18	1	110	15	14	11	8	17,52 ~ 17,60	2174
48042216	18	1,5	110	15	14	11	8	17,25 ~ 17,34	2174
48042232	20	1	125	15	16	12	8	19,52 ~ 19,60	2174
48071230	20	1,5	125	15	16	12	8	19,25 ~ 19,34	2174
48071240	22	1,5	125	15	18	14,5	8	21,25 ~ 21,34	2174
48071250	24	1,5	140	15	18	14,5	8	23,25 ~ 23,34	2174



# S-XPF 6GX

Threading | Forming taps | Metric Fine



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- For 6G internal thread tolerance

Threading | Forming taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	25-35 HRC	
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min
<b>A</b>	<b>MF</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 3 6GX</b>	<b>C/2,5</b>			<b>DIN 2174</b>

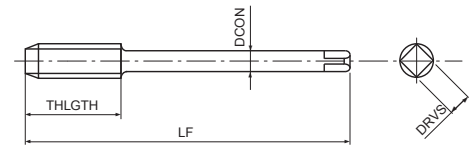
EDP	TD	TP	Oversize	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48086162	8	1	0,0260	90	12	6	4,9	5	7,55 ~ 7,62	2174
48086171	10	1	0,0260	90	12	7	5,5	8	9,54 ~ 9,62	2174
48086170	10	1,25	0,0280	100	12	7	5,5	8	9,40 ~ 9,47	2174
48086182	12	1	0,0260	100	15	9	7	8	11,55 ~ 11,63	2174
48086181	12	1,25	0,0280	100	15	9	7	8	11,41 ~ 11,49	2174
48086180	12	1,5	0,0320	100	15	9	7	8	11,27 ~ 11,36	2174
48086193	14	1,25	0,0280	100	12	11	9	8	13,41 ~ 13,49	2174
48086192	14	1,5	0,0320	100	15	11	9	8	13,27 ~ 13,36	2174
48086203	16	1,5	0,0320	100	15	12	9	8	15,27 ~ 15,36	2174
48086216	18	1,5	0,0320	110	15	14	11	8	17,27 ~ 17,36	2174
48086230	20	1,5	0,0320	125	15	16	12	8	19,27 ~ 19,36	2174
48086240	22	1,5	0,0320	125	15	18	14,5	8	21,27 ~ 21,36	2174
48086250	24	1,5	0,0320	140	15	18	14,5	8	23,29 ~ 23,38	2174

Metric Fine



# S-OIL-XPF 6GX

Threading | Forming taps | Metric Fine



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- For 6G internal thread tolerance, side through coolant

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC	
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min

<b>A</b>	<b>MF</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 3 6GX</b>	<b>C/2,5</b>					<b>DIN 2174</b>
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EDP	TD	TP	Oversize	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48293162	8	1	0,0260	90	10	6	4,9	5	7,54 ~ 7,62	2174
48293171	10	1	0,0260	90	10	7	5,5	8	9,54 ~ 9,62	2174
48293170	10	1,25	0,0280	100	12	7	5,5	8	9,40 ~ 9,47	2174
48293182	12	1	0,0260	100	12	9	7	8	11,55 ~ 11,63	2174
48293181	12	1,25	0,0280	100	12	9	7	8	11,41 ~ 11,49	2174
48293180	12	1,5	0,0320	100	15	9	7	8	11,27 ~ 11,36	2174
48293193	14	1,25	0,0280	100	16	11	9	8	13,41 ~ 13,49	2174
48293192	14	1,5	0,0320	100	16	11	9	8	13,27 ~ 13,36	2174
48293203	16	1,5	0,0320	100	15	12	9	8	15,27 ~ 15,36	2174
48293216	18	1,5	0,0320	110	15	14	11	8	17,27 ~ 17,36	2174
48293230	20	1,5	0,0320	125	15	16	12	8	19,27 ~ 19,36	2174
48293240	22	1,5	0,0320	125	15	18	14,5	8	21,27 ~ 21,36	2174
48293250	24	1,5	0,0320	140	15	18	14,5	8	23,29 ~ 23,38	2174

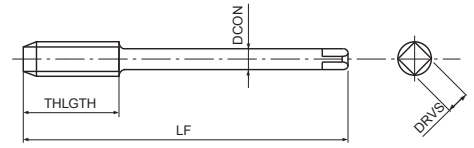
Threading | Forming taps



Metric Fine

# S-XPF FORM D

Threading | Forming taps | Metric Fine



- First choice in quality and performance
- HSE forming tap for through holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Chamfer Form D

Threading | Forming taps

<b>P</b> ●	<b>P</b> ●	<b>P</b> ●	<b>P</b> ●	<b>M</b> ●	<b>N</b> ●	<b>N</b> ●	<b>H</b> ●	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	25-35 HRC	
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min

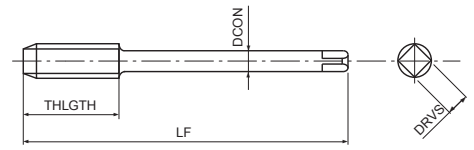
<b>A</b>	<b>MF</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>D/4</b>	<b>DIN 2174</b>
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EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48088162	8	1	90	10	6	4,9	5	7,51 ~ 7,59	2174
48088171	10	1	90	12	7	5,5	8	9,51 ~ 9,59	2174
48088170	10	1,25	100	12	7	5,5	8	9,37 ~ 9,45	2174
48088182	12	1	100	15	9	7	8	11,52 ~ 11,60	2174
48088181	12	1,25	100	15	9	7	8	11,39 ~ 11,46	2174
48088180	12	1,5	100	15	9	7	8	11,25 ~ 11,34	2174
48088192	14	1,5	100	15	11	9	8	13,25 ~ 13,34	2174
48088203	16	1,5	100	15	12	9	8	15,25 ~ 15,34	2174
48088216	18	1,5	110	15	14	11	8	17,25 ~ 17,34	2174
48088230	20	1,5	125	15	16	12	8	19,25 ~ 19,34	2174

Metric Fine

# S-XPF FORM E

Threading | Forming taps | Metric Fine



- First choice in quality and performance
- HSSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Chamfer Form E

<b>P</b> ● C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ● INOX	<b>N</b> ● Al	<b>N</b> ● AC, ADC	<b>H</b> ● 25-35 HRC		
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min	
<b>A</b>	<b>MF</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>E/1,5</b>			<b>DIN 2174</b>	

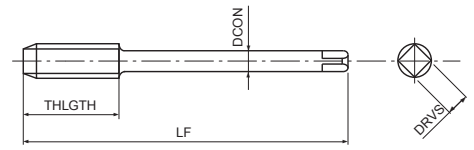
EDP	TD	TP	LF	THLGTH	D CON	DRVS	NOF	PHD	DIN
48089171	10	1	90	12	7	5,5	8	9,51 ~ 9,59	2174
48089180	12	1,5	100	15	9	7	8	11,25 ~ 11,34	2174
48089192	14	1,5	100	15	11	9	8	13,25 ~ 13,34	2174
48089203	16	1,5	100	15	12	9	8	15,25 ~ 15,34	2174





# S-OIL-LT-XPF

Threading | Forming taps | Metric Fine



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- With long shank for long reach threading, side through coolant

P

C < 0,2%

15-40

P

0,25 < C < 0,4

15-40

P

C ≥ 0,45%

15-30

P

SCM

15-30

M

INOX

8-20

N

Al

20-50

N

AC, ADC

20-40

H

25-35 HRC

5-20

m/min

A
MF
HSS-Co
V
ISO 2  
6HX
C/2,5

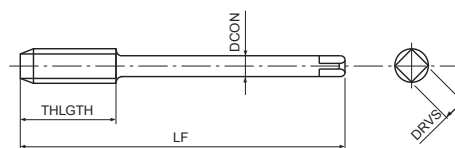


DIN 2174

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48295162	8	1	180	10	6	4,9	5	7,51 ~ 7,59	2174
48295171	10	1	200	12	7	5,5	8	9,51 ~ 9,59	2174
48295170	10	1,25	200	12	7	5,5	8	9,37 ~ 9,45	2174
48295182	12	1	200	15	9	7	8	11,52 ~ 11,60	2174
48295181	12	1,25	200	15	9	7	8	11,39 ~ 11,46	2174
48295180	12	1,5	200	15	9	7	8	11,25 ~ 11,34	2174
48295193	14	1,25	220	15	11	9	8	13,39 ~ 13,46	2174
48295192	14	1,5	220	15	11	9	8	13,25 ~ 13,34	2174

# S-XPF-GL

Threading | Forming taps | Metric Fine



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Without oil grooves for higher rigidity

Threading | Forming taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	25-35 HRC	
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min

<b>A</b>	<b>MF</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 2 6HX</b>	<b>C/2,5</b>			<b>DIN 2174</b>
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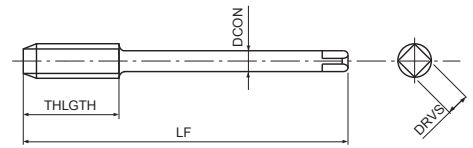
EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48296162	8	1	90	10	6	4,9	0	7,51 ~ 7,59	2174
48296171	10	1	90	10	7	5,5	0	9,51 ~ 9,59	2174
48296170	10	1,25	100	12	7	5,5	0	9,37 ~ 9,45	2174
48296182	12	1	100	12	9	7	0	11,52 ~ 11,60	2174
48296181	12	1,25	100	12	9	7	0	11,39 ~ 11,46	2174
48296180	12	1,5	100	15	9	7	0	11,25 ~ 11,34	2174
48296193	14	1,25	100	16	11	9	0	13,39 ~ 13,46	2174
48296192	14	1,5	100	16	11	9	0	13,25 ~ 13,34	2174
48296203	16	1,5	100	15	12	9	0	15,25 ~ 15,34	2174
48296216	18	1,5	110	15	14	11	0	17,25 ~ 17,34	2174
48296230	20	1,5	125	15	16	12	0	19,25 ~ 19,34	2174
48296240	22	1,5	125	15	18	14,5	0	21,25 ~ 21,34	2174
48296250	24	1,5	140	15	18	14,5	0	23,25 ~ 23,34	2174

Metric Fine



# S-XPF-GL 6GX

Threading | Forming taps | Metric Fine



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Without oil grooves for higher rigidity, for 6G internal thread tolerance

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC	
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min

<b>A</b>	<b>MF</b>	<b>HSS-Co</b>	<b>V</b>	<b>ISO 3 6GX</b>	<b>C/2,5</b>				<b>DIN 2174</b>
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EDP	TD	TP	Oversize	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48297162	8	1	0,0260	90	10	6	4,9	0	7,54 ~ 7,62	2174
48297171	10	1	0,0260	90	10	7	5,5	0	9,54 ~ 9,62	2174
48297170	10	1,25	0,0280	100	12	7	5,5	0	9,40 ~ 9,47	2174
48297182	12	1	0,0260	100	12	9	7	0	11,55 ~ 11,63	2174
48297181	12	1,25	0,0280	100	12	9	7	0	11,41 ~ 11,49	2174
48297180	12	1,5	0,0320	100	15	9	7	0	11,27 ~ 11,36	2174
48297193	14	1,25	0,0280	100	16	11	9	0	13,41 ~ 13,49	2174
48297192	14	1,5	0,0320	100	16	11	9	0	13,27 ~ 13,36	2174
48297203	16	1,5	0,0320	100	15	12	9	0	15,27 ~ 15,36	2174
48297216	18	1,5	0,0320	110	15	14	11	0	17,27 ~ 17,36	2174
48297230	20	1,5	0,0320	125	15	16	12	0	19,27 ~ 19,36	2174
48297240	22	1,5	0,0320	125	15	18	14,5	0	21,27 ~ 21,36	2174
48297250	24	1,5	0,0320	140	15	18	14,5	0	23,29 ~ 23,38	2174

Threading | Forming taps



Metric Fine

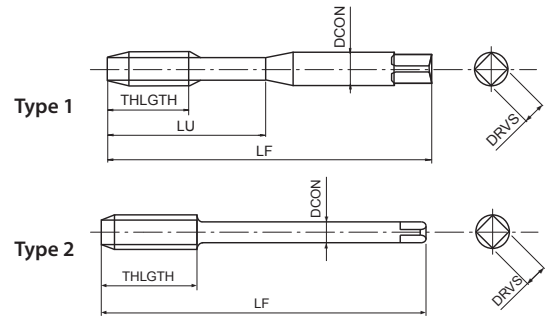






# M-NRT NEW

Threading | Forming taps | Metric Fine



- Powder metal forming tap for through and blind holes
- TiN coating
- For general steels, stainless steels and aluminium

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	
20-30	20-30	15-30	10-20	6-12	10-25	15-40	m/min

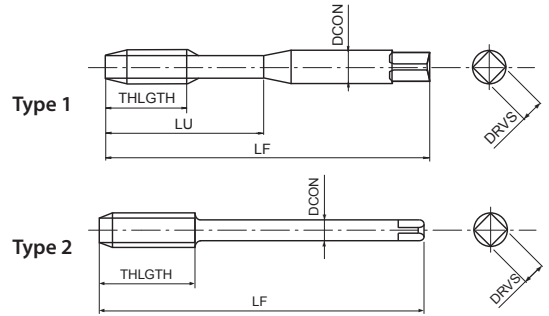
<b>MF</b>	<b>PM</b>	<b>TiN</b>	<b>ISO 2 6HX</b>					
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
EP0203145	4	0,5	63	8	21	4,5	3,4	4	3,8	1	2174
EP0203151	5	0,5	70	9	25	6	4,9	5	4,8	1	2174
EP0203157	6	0,5	80	10	30	6	4,9	5	5,8	1	2174
EP0203156	6	0,75	80	14	30	6	4,9	5	5,65	1	2174
EP0203160	7	0,75	80	14	30	7	5,5	5	6,65	1	2174
EP0203164	8	0,5	80	10	35	8	6,2	5	7,775	1	2174
EP0203163	8	0,75	80	14	35	8	6,2	5	7,65	1	2174
EP0203162	8	1	90	18	35	8	6,2	5	7,55	1	2174
EP0203171	10	1	90	18	39	10	8	5	9,55	1	2174
EP0203170	10	1,25	100	20	39	10	8	5	9,45	1	2174
EP0203182	12	1	100	22	-	9	7	5	11,55	2	2174
EP0203181	12	1,25	100	22	-	9	7	5	11,45	2	2174
EP0203180	12	1,5	100	22	-	9	7	5	11,35	2	2174
EP0203194	14	1	100	22	-	11	9	6	13,55	2	2174
EP0203193	14	1,25	100	22	-	11	9	6	13,45	2	2174
EP0203192	14	1,5	100	22	-	11	9	6	13,35	2	2174
EP0203204	16	1	100	20	-	12	9	6	15,55	2	2174
EP0203203	16	1,5	100	20	-	12	9	6	15,35	2	2174
EP0203218	18	1	110	25	-	14	11	7	17,55	2	2174
EP0203216	18	1,5	110	25	-	14	11	7	17,35	2	2174
EP0203232	20	1	125	25	-	16	12	7	19,55	2	2174
EP0203230	20	1,5	125	25	-	16	12	7	19,35	2	2174
EP0203240	22	1,5	125	25	-	18	14,5	7	21,35	2	2174
EP0203250	24	1,5	140	28	-	18	14,5	7	23,35	2	2174



# A-POT

Threading | Cutting taps | UNC



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels

Threading | Cutting taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

<b>A</b>	<b>UNC</b>	<b>PM</b>	<b>V</b>	<b>ANSI 2BX</b>	<b>B/4</b>	<b>DIN 2184-1</b>	<b>DIN 2184-1</b>
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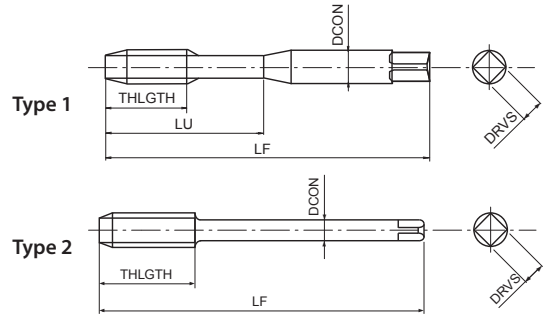
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48145453	2	56	45	-	9	2,8	2,1	2	1	2184-1
48145455	3	48	50	-	9	2,8	2,1	2	1	2184-1
48145457	4	40	56	11	18	3,5	2,7	2	1	2184-1
48145459	5	40	56	11	18	3,5	2,7	3	1	2184-1
48145461	6	32	56	12	20	4	3	3	1	2184-1
48145464	8	32	63	13	21	4,5	3,4	3	1	2184-1
48145466	10	24	70	16	25	6	4,9	3	1	2184-1
48145468	12	24	80	17	30	6	4,9	3	1	2184-1
48145471	1/4	20	80	19	30	7	5,5	3	1	2184-1
48145474	5/16	18	90	22	35	8	6,2	3	1	2184-1
48145479	3/8	16	100	24	39	10	8	3	1	2184-1
48145484	7/16	14	100	24	-	8	6,2	3	2	2184-1
48145489	1/2	13	110	28	-	9	7	3	2	2184-1
48145494	9/16	12	110	30	-	11	9	3	2	2184-1
48145501	5/8	11	110	32	-	12	9	3	2	2184-1
48145515	3/4	10	125	34	-	14	11	3	2	2184-1
48145526	7/8	9	140	34	-	18	14,5	3	2	2184-1
48145538	1	8	160	38	-	18	14,5	3	2	2184-1

UNC



# VA-POT

Threading | Cutting taps | UNC



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

Threading | Cutting taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GGG	m/min
15-24	10-15	10-15	8-13	8-16	10-15	

<b>UNC</b>	<b>HSSE</b>	<b>OX</b>	<b>ANSI 2B</b>	<b>B/4</b>		<b>DIN 2184-1</b>	<b>DIN 2184-1</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
74845720	4	40	56	-	18	3,5	2,7	2	1	2184-1
74845920	5	40	56	-	18	3,5	2,7	3	1	2184-1
74846130	6	32	56	-	20	4	3	3	1	2184-1
74846430	8	32	63	-	21	4,5	3,4	3	1	2184-1
74846630	10	24	70	-	25	6	4,9	3	1	2184-1
74847150	1/4	20	80	-	30	7	5,5	3	1	2184-1
74847450	5/16	18	90	-	35	8	6,2	3	1	2184-1
74847950	3/8	16	90	-	35	9	7	3	1	2184-1
75148450	7/16	14	100	24	-	8	6,2	3	2	2184-1
75148950	1/2	13	110	29	-	9	7	3	2	2184-1
75149450	9/16	12	110	30	-	11	9	3	2	2184-1
75150150	5/8	11	110	32	-	12	9	3	2	2184-1
75151550	3/4	10	125	34	-	14	11	3	2	2184-1
75152660	7/8	9	140	34	-	18	14,5	3	2	2184-1
75153860	1	8	160	38	-	18	14,5	3	2	2184-1

UNC

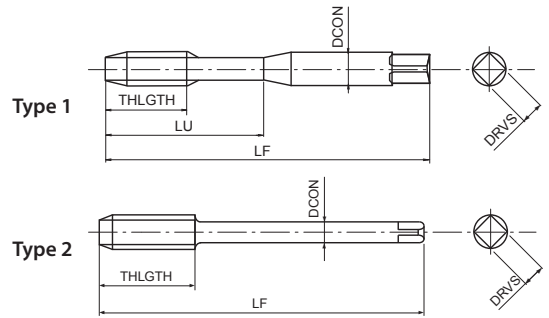






# S-SFT

Threading | Cutting taps | UNC



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min
<b>UNC</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ANSI 2B</b>	<b>C/2,5</b>	<b>DIN 2184-1</b>

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48223453	2	56	45	3,6	11	2,8	2,1	2	1	2184-1
48223455	3	48	50	3,6	13	2,8	2,1	2	1	2184-1
48223457	4	40	56	5,1	18	3,5	2,7	2	1	2184-1
48223459	5	40	56	5,1	18	3,5	2,7	2	1	2184-1
48223461	6	32	56	6,4	20	4	3	2	1	2184-1
48223464	8	32	63	6,4	21	4,5	3,4	2	1	2184-1
48223466	10	24	70	8,5	25	6	4,9	2	1	2184-1
48223468	12	24	80	8,5	30	6	4,9	2	1	2184-1
48223471	1/4	20	80	10,2	30	7	5,5	2	1	2184-1
48223474	5/16	18	90	11,3	35	8	6,2	3	1	2184-1
48223479	3/8	16	100	12,7	39	10	8	3	1	2184-1
48223484	7/16	14	100	14,5	-	8	6,2	3	2	2184-1
48223489	1/2	13	110	15,6	-	9	7	3	2	2184-1
48223494	9/16	12	110	16,9	-	11	9	3	2	2184-1
48223501	5/8	11	110	18,5	-	12	9	3	2	2184-1
48223515	3/4	10	125	25,4	-	14	11	4	2	2184-1
48223526	7/8	9	140	28,2	-	18	14,5	4	2	2184-1
48223538	1	8	160	31,8	-	18	14,5	4	2	2184-1
48223997	1 1/8	7	180	36	-	22	18	4	2	2184-1
48223998	1 1/4	7	180	36	-	22	18	4	2	2184-1
48223999	1 1/2	6	200	42	-	28	22	4	2	2184-1

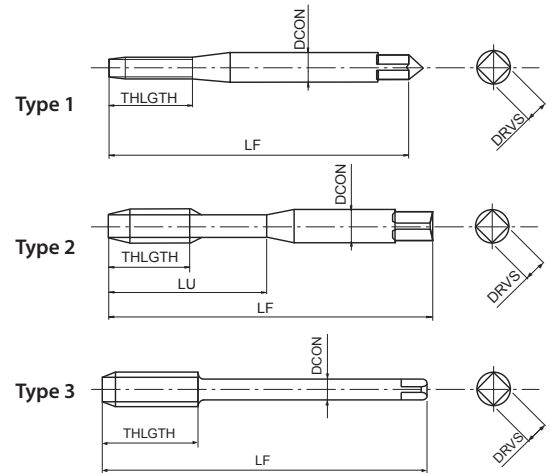
UNC







# VA-SFT

Threading | Cutting taps | UNC



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels



						
10-15	8-14	8-14	7-11	7-12	7-14	m/min

							
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
74945730	4	40	56	-	11	3,5	2,7	2	1	2184-1
74945930	5	40	56	-	18	3,5	2,7	3	2	2184-1
74946130	6	32	56	-	20	4	3	3	2	2184-1
74946430	8	32	63	-	21	4,5	3,4	3	2	2184-1
74946630	10	24	70	-	25	6	4,9	3	2	2184-1
74947150	1/4	20	80	-	30	7	5,5	3	2	2184-1
74947450	5/16	18	90	-	35	8	6,2	3	2	2184-1
74947950	3/8	16	100	-	35	9	7	3	2	2184-1
75248450	7/16	14	100	19	-	8	6,2	4	3	2184-1
75248950	1/2	13	110	20	-	9	7	4	3	2184-1
75249450	9/16	12	110	22	-	11	9	4	3	2184-1
75250150	5/8	11	110	24	-	12	9	4	3	2184-1
75251550	3/4	10	125	26	-	14	11	4	3	2184-1
75252660	7/8	9	140	29	-	18	14,5	4	3	2184-1
75253860	1	8	160	32	-	18	14,5	5	3	2184-1

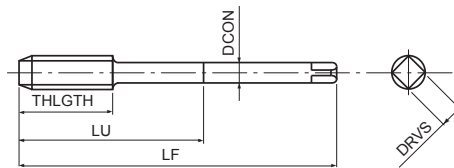
Threading | Cutting taps

UNC

A

# HXL-SFT

Threading | Cutting taps | UNC



- HSE low spiral-fluted cutting tap for blind holes
- Steam oxide treatment
- For steels and cast iron
- For horizontal applications in oil and heavy industry

Threading | Cutting taps

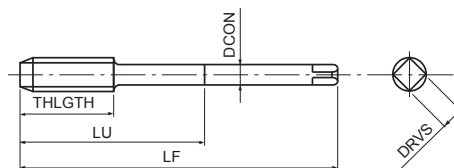
<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ⊙ C ≥ 0,45%	<b>P</b> ⊙ SCM	<b>M</b> ○ INOX	<b>K</b> ⊙ GG	<b>K</b> ⊙ GGG	<b>H</b> ○ 25-35 HRC	
8-13	7-12	7-12	6-9	5-8	7-12	7-12	3-5	m/min
UN	UNC	HSSE	OX	15°	ANSI 2B	C/2,5		

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF
48050515	3/4	10	125	20,3	61,8	14	11	4
48050526	7/8	9	140	22,6	75	18	14,5	4
48050538	1	8	160	25,4	90	18	14,5	5
48050551	1 1/8	7	180	29	100	22	18	5
48050552	1 1/8	8	180	25,4	100	22	18	5
48050564	1 1/4	7	180	29	100	22	18	5
48050565	1 1/4	8	180	25,4	100	22	18	5
48050577	1 3/8	6	200	33,9	115	28	22	5
48050578	1 3/8	8	200	25,4	115	28	22	5
48050591	1 1/2	6	200	33,9	115	32	24	5
48050592	1 1/2	8	200	25,4	115	32	24	5
48050605	1 5/8	8	200	25,4	110	32	24	6
48050618	1 3/4	8	200	25,4	110	36	29	6
48050628	1 7/8	8	225	25,4	125	36	29	6
48050639	2	8	225	25,4	125	40	32	6
48050661	2 1/2	8	275	25,4	150	50	39	6

UNC

# VXL-SFT

Threading | Cutting taps | UNC



- HSSE high spiral-fluted cutting tap for blind holes
- Steam oxide treatment
- For general steels
- For vertical applications in oil and heavy industry

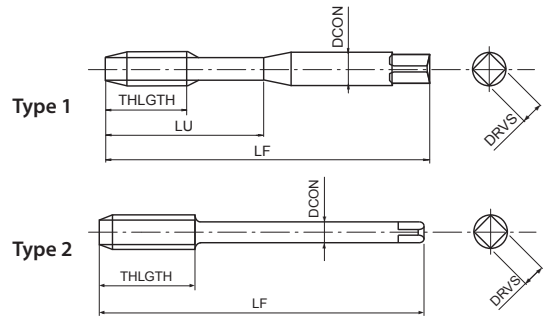
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	25-35 HRC	
8-13	7-12	7-12	6-9	5-8	3-5	m/min
<b>UN</b>	<b>UNC</b>	<b>HSSE</b>	<b>OX</b>	<b>45°</b>	<b>ANSI 2B</b>	<b>C/2,5</b>

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF
48051515	3/4	10	125	20,3	61,8	14	11	4
48051526	7/8	9	140	22,6	75	18	14,5	4
48051538	1	8	160	25,4	90	18	14,5	5
48051551	1 1/8	7	180	29	100	22	18	5
48051552	1 1/8	8	180	25,4	100	22	18	5
48051564	1 1/4	7	180	29	100	22	18	5
48051565	1 1/4	8	180	25,4	100	22	18	5
48051577	1 3/8	6	200	33,9	115	28	22	5
48051578	1 3/8	8	200	25,4	115	28	22	5
48051591	1 1/2	6	200	33,9	115	32	24	5
48051592	1 1/2	8	200	25,4	115	32	24	5
48051605	1 5/8	8	200	25,4	110	32	24	6
48051618	1 3/4	8	200	25,4	110	36	29	6
48051628	1 7/8	8	225	25,4	125	36	29	6
48051639	2	8	225	25,4	125	40	32	6
48051661	2 1/2	8	275	25,4	150	50	39	6



# S-XPF

Threading | Forming taps | UNC



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC	
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min

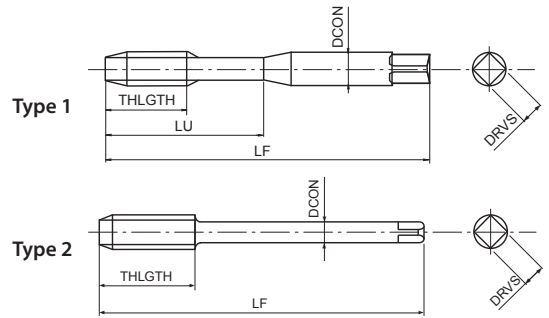
<b>A</b>	<b>UNC</b>	<b>HSS-Co</b>	<b>V</b>	<b>ANSI 2BX</b>	<b>C/2,5</b>	<b>DIN 2184-1</b>	<b>DIN 2184-1</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48091459	5	40	56	-	18	3,5	2,7	4	2,86 ~ 2,93	1	2184-1
48091461	6	32	56	-	20	4	3	4	3,09 ~ 3,17	1	2184-1
48091464	8	32	63	-	21	4,5	3,4	4	3,76 ~ 3,84	1	2184-1
48091466	10	24	70	-	25	6	4,9	5	4,26 ~ 4,35	1	2184-1
48091471	1/4	20	80	-	30	7	5,5	5	5,66 ~ 5,76	1	2184-1
48091474	5/16	18	90	-	35	8	6,2	5	7,18 ~ 7,29	1	2184-1
48091479	3/8	16	100	-	35	9	7	8	8,66 ~ 8,78	1	2184-1
48091484	7/16	14	100	18,1	-	8	6,2	8	10,12 ~ 10,27	2	2184-1
48091489	1/2	13	110	19,5	-	9	7	8	11,62 ~ 11,78	2	2184-1
48091494	9/16	12	110	21,1	-	11	9	8	13,14 ~ 13,28	2	2184-1
48091501	5/8	11	110	23,1	-	12	9	8	14,61 ~ 14,76	2	2184-1
48091515	3/4	10	125	20,3	-	14	11	8	17,65 ~ 17,80	2	2184-1
48091526	7/8	9	140	22,6	-	18	14,5	8	20,66 ~ 20,84	2	2184-1
48091538	1	8	160	25,4	-	18	14,5	8	23,63 ~ 23,84	2	2184-1



# S-OIL-XPF

Threading | Forming taps | UNC



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Side through coolant

Threading | Forming taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC	
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min
<b>A</b>	<b>UNC</b>	<b>HSS-Co</b>	<b>V</b>	<b>ANSI 2BX</b>	<b>C/2,5</b>	<b>ANSI 2BX</b>	<b>DIN 2184-1</b>	<b>DIN 2184-1</b>

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48042471	1/4	20	80	13	30	7	5,5	5	5,66 ~ 5,76	1	2184-1
48042474	5/16	18	90	14	35	8	6,2	5	7,18 ~ 7,29	1	2184-1
48042479	3/8	16	100	11	39	10	8	8	8,66 ~ 8,78	1	2184-1
48042484	7/16	14	100	14	-	8	6,2	8	10,12 ~ 10,27	2	2184-1
48042489	1/2	13	110	20	-	9	7	8	11,62 ~ 11,78	2	2184-1
48042494	9/16	12	110	22	-	11	9	8	13,14 ~ 13,28	2	2184-1
48042501	5/8	11	110	14	-	12	9	8	14,61 ~ 14,76	2	2184-1
48042515	3/4	10	125	25,4	-	14	11	8	17,65 ~ 17,80	2	2184-1
48042526	7/8	9	140	24	-	18	14,5	8	20,66 ~ 20,84	2	2184-1
48042538	1	8	160	31,8	-	18	14,5	8	23,63 ~ 23,84	2	2184-1

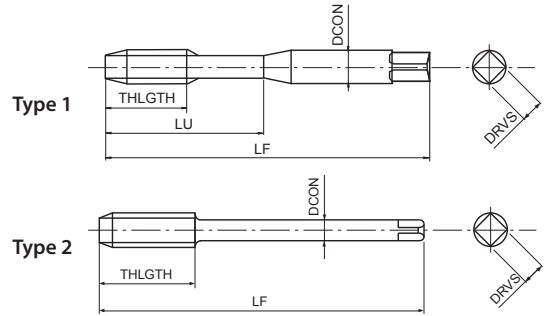
UNC

A



# A-POT

Threading | Cutting taps | UNF



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	m/min
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	

<b>A</b>	<b>UNF</b>	<b>PM</b>	<b>V</b>	<b>ANSI 2BX</b>	<b>B/4</b>	<b>DIN 2184-1</b>	<b>DIN 2184-1</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48145454	2	64	45	-	9	2,8	2,1	2	1	2184-1
48145456	3	56	50	-	9	2,8	2,1	2	1	2184-1
48145458	4	48	56	11	18	3,5	2,7	2	1	2184-1
48145460	5	44	56	11	18	3,5	2,7	3	1	2184-1
48145462	6	40	56	12	20	4	3	3	1	2184-1
48145465	8	36	63	13	21	4,5	3,4	3	1	2184-1
48145467	10	32	70	16	25	6	4,9	3	1	2184-1
48145469	12	28	80	17	30	6	4,9	3	1	2184-1
48145472	1/4	28	80	19	30	7	5,5	3	1	2184-1
48145476	5/16	24	90	22	35	8	6,2	3	1	2184-1
48145481	3/8	24	90	20	35	10	8	3	1	2184-1
48145486	7/16	20	100	24	-	8	6,2	3	2	2184-1
48145491	1/2	20	100	22	-	9	7	3	2	2184-1
48145496	9/16	18	100	22	-	11	9	3	2	2184-1
48145504	5/8	18	100	22	-	12	9	3	2	2184-1
48145517	3/4	16	110	25	-	14	11	3	2	2184-1
48145528	7/8	14	125	25	-	18	14,5	3	2	2184-1
48145539	1	12	140	28	-	18	14,5	3	2	2184-1

Threading | Cutting taps

UNF

A

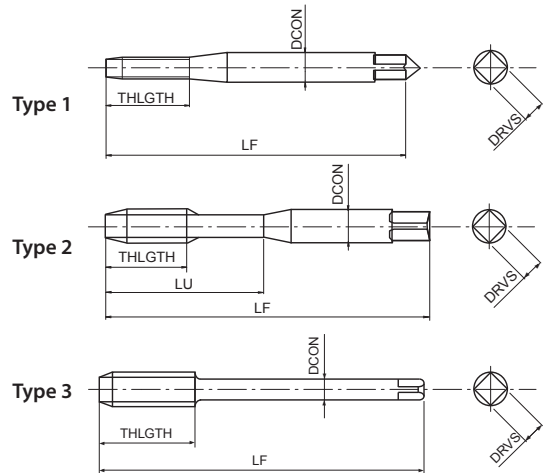


# VA-POT

Threading | Cutting taps | UNF



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels



<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GGG	
15-24	10-15	10-15	8-13	8-16	10-15	m/min

<b>UNF</b>	<b>HSSE</b>	<b>OX</b>	<b>ANSI 2B</b>	<b>B/4</b>		<b>DIN 2184-1</b>	<b>DIN 2184-1</b>
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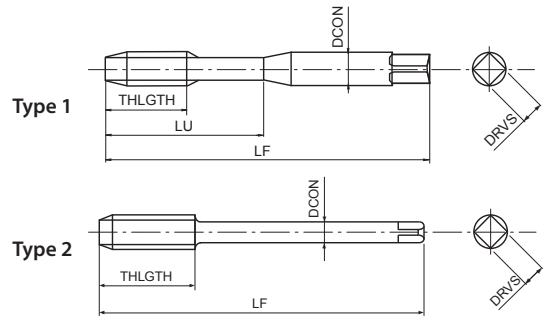
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
75146220	6	40	56	-	13	4	3	3	1	2184-1
75146730	10	32	70	-	25	6	4,9	3	2	2184-1
75147240	1/4	28	80	-	30	7	5,5	3	2	2184-1
75147640	5/16	24	90	-	35	8	6,2	3	2	2184-1
75148140	3/8	24	90	-	35	9	7	3	2	2184-1
75148650	7/16	20	100	20	-	8	6,2	3	3	2184-1
75149150	1/2	20	100	22	-	9	7	3	3	2184-1
75149650	9/16	18	100	22	-	11	9	3	3	2184-1
75150450	5/8	18	100	22	-	12	9	3	3	2184-1
75151750	3/4	16	110	25	-	14	11	3	3	2184-1
75152860	7/8	14	125	25	-	18	14,5	3	3	2184-1
75153960	1	12	125	25	-	18	14,5	3	3	2184-1

Threading | Cutting taps

UNF

# A-SFT

Threading | Cutting taps | UNF



- First choice in quality and performance
- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC		m/min
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20		

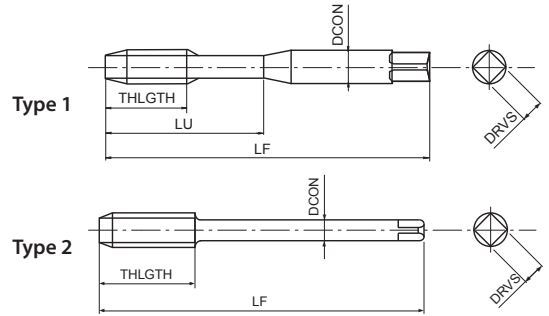
<b>A</b>	<b>UNF</b>	<b>PM</b>	<b>V</b>	<b>45°</b>	<b>ANSI 2BX</b>	<b>C/2,5</b>	<b>DIN 2184-1</b>	<b>DIN 2184-1</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48139454	2	64	45	3,6	11	2,8	2,1	2	1	2184-1
48139456	3	56	50	3,6	13	2,8	2,1	2	1	2184-1
48139458	4	48	56	5,1	18	3,5	2,7	2	1	2184-1
48139460	5	44	56	5,1	18	3,5	2,7	2	1	2184-1
48139462	6	40	56	6,4	20	4	3	2	1	2184-1
48139465	8	36	63	6,4	21	4,5	3,4	2	1	2184-1
48139467	10	32	70	8,5	25	6	4,9	2	1	2184-1
48139469	12	28	80	8,5	30	6	4,9	2	1	2184-1
48139472	1/4	28	80	10,2	30	7	5,5	2	1	2184-1
48139476	5/16	24	90	11,3	35	8	6,2	3	1	2184-1
48139481	3/8	24	90	12,7	35	10	8	3	1	2184-1
48139486	7/16	20	100	14,5	-	8	6,2	3	2	2184-1
48139491	1/2	20	100	15,6	-	9	7	3	2	2184-1
48139496	9/16	18	100	16,9	-	11	9	3	2	2184-1
48139504	5/8	18	100	18,5	-	12	9	3	2	2184-1
48139517	3/4	16	110	25,4	-	14	11	4	2	2184-1
48139528	7/8	14	125	28,2	-	18	14,5	4	2	2184-1
48139539	1	12	140	31,8	-	18	14,5	4	2	2184-1

UNF

# S-SFT

Threading | Cutting taps | UNF



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

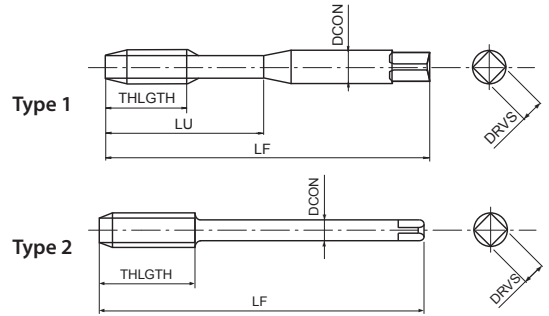
<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

<b>UNF</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ANSI 2B</b>	<b>C/2,5</b>	<b>DIN 2184-1</b>	<b>DIN 2184-1</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48223454	2	64	45	3,6	11	2,8	2,1	2	1	2184-1
48223456	3	56	50	3,6	13	2,8	2,1	2	1	2184-1
48223458	4	48	56	5,1	18	3,5	2,7	2	1	2184-1
48223460	5	44	56	5,1	18	3,5	2,7	2	1	2184-1
48223462	6	40	56	6,4	20	4	3	2	1	2184-1
48223465	8	36	63	6,4	21	4,5	3,4	2	1	2184-1
48223467	10	32	70	8,5	25	6	4,9	2	1	2184-1
48223469	12	28	80	8,5	30	6	4,9	2	1	2184-1
48223472	1/4	28	80	10,2	30	7	5,5	2	1	2184-1
48223476	5/16	24	90	11,3	35	8	6,2	3	1	2184-1
48223481	3/8	24	90	12,7	35	10	8	3	1	2184-1
48223486	7/16	20	100	14,5	-	8	6,2	3	2	2184-1
48223491	1/2	20	100	15,6	-	9	7	3	2	2184-1
48223496	9/16	18	100	16,9	-	11	9	3	2	2184-1
48223504	5/8	18	100	18,5	-	12	9	3	2	2184-1
48223517	3/4	16	110	25,4	-	14	11	4	2	2184-1
48223528	7/8	14	125	28,2	-	18	14,5	4	2	2184-1
48223539	1	12	140	31,8	-	18	14,5	4	2	2184-1

# VA-SFT

Threading | Cutting taps | UNF



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

<b>UNF</b>	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>ANSI 2B</b>	<b>C/2,5</b>	<b>DIN 2184-1</b>	<b>DIN 2184-1</b>
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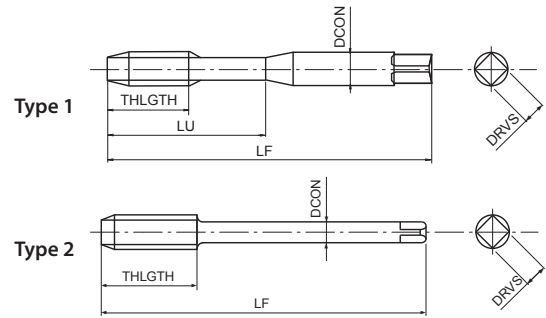
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
75246220	6	40	56	-	20	4	3	3	1	2184-1
75246730	10	32	70	-	25	6	4,9	3	1	2184-1
75247240	1/4	28	80	-	30	7	5,5	3	1	2184-1
75247640	5/16	24	90	-	35	8	6,2	3	1	2184-1
75248140	3/8	24	90	-	35	9	7	3	1	2184-1
75248650	7/16	20	100	15	-	8	6,2	4	2	2184-1
75249150	1/2	20	100	16	-	9	7	4	2	2184-1
75249650	9/16	18	100	17	-	11	9	4	2	2184-1
75250450	5/8	18	100	18	-	12	9	4	2	2184-1
75251750	3/4	16	110	21	-	14	11	4	2	2184-1
75252860	7/8	14	125	23	-	18	14,5	4	2	2184-1
75253960	1	12	125	25	-	18	14,5	5	2	2184-1



UNF

# VP-DC-MT

Threading | Cutting taps | UNF



- Powder metal straight flute cutting tap for through and blind holes
- Multilayer TiCN coating
- For cast iron and cast aluminium
- Synchro taps at cutting speeds > 30 m/min

<b>P</b>	<b>P</b>	<b>K</b>	<b>K</b>	<b>N</b>	<b>H</b>	<b>H</b>
C ≥ 0,45%	SCM	GG	GGG	AC, ADC	25-35 HRC	35-45 HRC
10-25	10-20	15-60	15-40	25-70	8-20	8-20

m/min

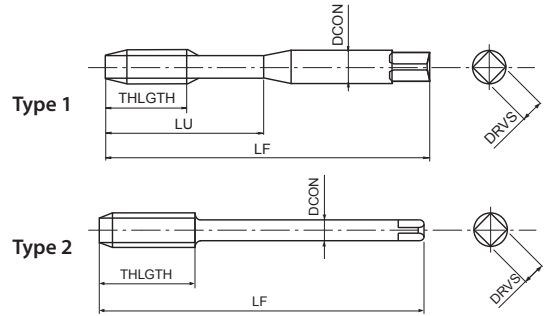
UNF	PM	V	ANSI 2BX	C/2,5			DIN 2184-1	DIN 2184-1
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48020454	2	64	45	9	-	2,8	2,1	3	1	2184-1
48020456	3	56	50	9	-	2,8	2,1	3	1	2184-1
48020458	4	48	56	8	18	3,5	2,7	3	1	2184-1
48020460	5	44	56	8	18	3,5	2,7	3	1	2184-1
48020462	6	40	56	10	20	4	3	3	1	2184-1
48020465	8	36	63	10	21	4,5	3,4	3	1	2184-1
48020467	10	32	70	13	25	6	4,9	3	1	2184-1
48020469	12	28	80	13	30	6	4,9	3	1	2184-1
48020472	1/4	28	80	16	30	7	5,5	3	1	2184-1
48020476	5/16	24	90	17	35	8	6,2	4	1	2184-1
48020481	3/8	24	90	20	35	10	8	4	1	2184-1
48020486	7/16	20	100	22	-	8	6,2	4	2	2184-1
48020491	1/2	20	100	24	-	9	7	4	2	2184-1
48020496	9/16	18	100	26	-	11	9	4	2	2184-1
48020504	5/8	18	100	28	-	12	9	4	2	2184-1
48020517	3/4	16	110	31	-	14	11	4	2	2184-1
48020528	7/8	14	125	23	-	18	14,5	5	2	2184-1
48020539	1	12	140	25	-	18	14,5	5	2	2184-1



# S-XPf

Threading | Forming taps | UNF



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium

Threading | Forming taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC		m/min
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20		

**A**

**UNF**

HSS-Co

**V**

**ANSI 2BX**

C/2,5

DIN 2184-1

DIN 2184-1

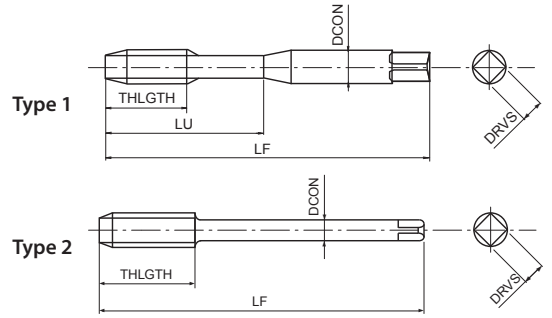
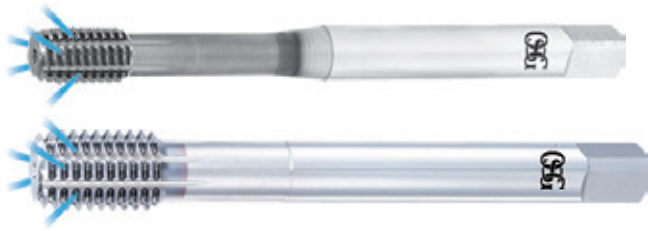
UNF

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48091462	6	40	56	-	20	4	3	4	3,19 ~ 3,26	1	2184-1
48091467	10	32	70	-	25	6	4,9	5	4,41 ~ 4,47	1	2184-1
48091472	1/4	28	80	-	30	7	5,5	5	5,87 ~ 5,94	1	2184-1
48091476	5/16	24	90	-	35	8	6,2	5	7,39 ~ 7,47	1	2184-1
48091481	3/8	24	90	-	35	9	7	8	8,98 ~ 9,06	1	2184-1
48091486	7/16	20	100	12,7	-	8	6,2	8	10,45 ~ 10,55	2	2184-1
48091491	1/2	20	100	12,7	-	9	7	8	12,04 ~ 12,14	2	2184-1
48091496	9/16	18	100	14,1	-	11	9	8	13,56 ~ 13,64	2	2184-1
48091504	5/8	18	100	14,1	-	12	9	8	15,15 ~ 15,23	2	2184-1
48091517	3/4	16	110	12,7	-	14	12	8	18,22 ~ 18,30	2	2184-1
48091528	7/8	14	125	14,5	-	18	14,5	8	21,27 ~ 21,38	2	2184-1
48091539	1	12	125	16,9	-	18	14,5	8	24,26 ~ 24,37	2	2184-1



# S-OIL-XPF

Threading | Forming taps | UNF



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Side through coolant

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC		
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20		m/min

<b>A</b>	<b>UNF</b>	<b>HSS-Co</b>	<b>V</b>	<b>ANSI 2BX</b>	<b>C/2,5</b>	<b>DIN 2184-1</b>	<b>DIN 2184-1</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48042472	1/4	28	80	9,1	30	7	5,5	5	5,87 ~ 5,94	1	2184-1
48042476	5/16	24	90	10,6	35	8	6,2	5	7,39 ~ 7,47	1	2184-1
48042481	3/8	24	90	10,6	35	10	8	8	8,98 ~ 9,06	1	2184-1
48042486	7/16	20	100	12,7	-	8	6,2	8	10,45 ~ 10,55	2	2184-1
48042491	1/2	20	100	12,7	-	9	7	8	12,04 ~ 12,14	2	2184-1
48042496	9/16	18	100	14,1	-	11	9	8	13,56 ~ 13,64	2	2184-1
48042504	5/8	18	100	14,1	-	12	9	8	15,15 ~ 15,23	2	2184-1
48042517	3/4	16	110	12,7	-	14	11	8	18,22 ~ 18,30	2	2184-1
48042528	7/8	14	125	14,5	-	18	14,5	8	21,27 ~ 21,38	2	2184-1
48042539	1	12	140	16,9	-	18	14,5	8	24,26 ~ 24,37	2	2184-1

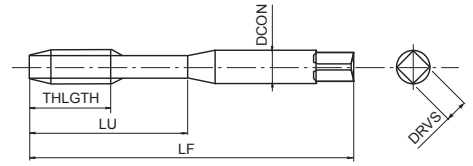






# VA-POT

Threading | Cutting taps | UNJC



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	
15-24	10-15	10-15	8-13	8-16	10-15	m/min
<b>UNJC</b>	<b>HSSE</b>	<b>OX</b>	<b>ANSI 3B</b>	<b>B/4</b>	<b>DIN 2184-1</b>	

EDP	TD	TP	LF	LU	DCON	DRVS	NOF	DIN
48002457	4	40	56	18	3,5	2,7	2	2184-1
48002461	6	32	56	20	4	3	3	2184-1
48002464	8	32	63	21	4,5	3,4	3	2184-1

UNJC











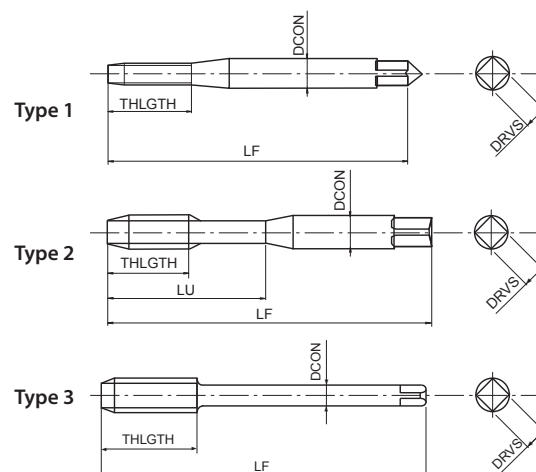


# CC-SFT

Threading | Cutting taps | UNJC



- HSSE spiral-flute cutting tap for blind holes
- CrN coating
- For general steels, stainless steels and aluminium
- Developed for rigid tapping on CNC machines



Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	
15-25	15-25	10-25	10-25	6-10	15-35	m/min

<b>UNJC</b>	<b>HSSE</b>	<b>CrN</b>	<b>45°</b>	<b>ANSI 3B</b>	<b>C/2,5</b>	<b>≥2D</b>	<b>DIN 2184-1</b>	<b>DIN 2184-1</b>
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48032457	4	40	56	-	11,4	3,5	2,7	2	1	2184-1
48032461	6	32	56	-	14	4	3	3	1	2184-1
48032464	8	32	63	-	16,7	4,5	3,4	3	1	2184-1
48032466	10	24	70	-	19,3	6	4,9	3	1	2184-1
48032471	1/4	20	80	-	25,4	7	5,5	3	1	2184-1
48032474	5/16	18	90	-	13	8	6,2	3	2	2184-1
48032479	3/8	16	100	-	15	9	7	3	2	2184-1
48032484	7/16	14	100	17	-	8	6,2	4	3	2184-1
48032489	1/2	13	110	18	-	9	7	4	3	2184-1
48032494	9/16	12	110	19	-	11	9	4	3	2184-1
48032501	5/8	11	110	21	-	12	9	4	3	2184-1
48032515	3/4	10	125	23	-	14	11	4	3	2184-1
48032526	7/8	9	140	26	-	18	14,5	4	3	2184-1
48032538	1	8	160	29	-	18	14,5	4	3	2184-1



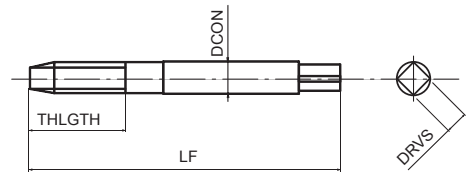
**UNJC**





# WHR-NI-SFT

Threading | Cutting taps | UNJC



- Powder metal low spiral-fluted cutting tap for blind holes
- HR coating
- For Nickel-based alloys including Inconel 718



1-3

m/min

UNJC

PM

HR

11°

ANSI  
3BX

C/2,5

DIN 2184-1

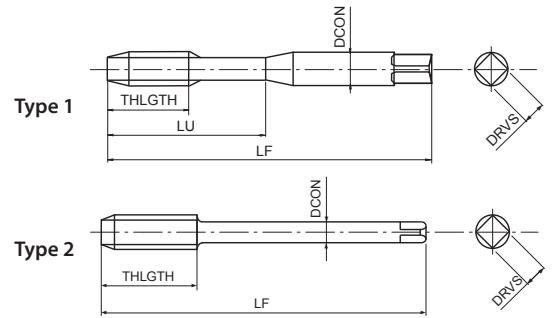
DIN 2184-1

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48078457	4	40	56	12	3,5	2,7	3	2184-1
48078461	6	32	56	14	4	3	3	2184-1
48078464	8	32	63	16	4,5	3,4	3	2184-1
48078466	10	24	70	18	6	4,9	3	2184-1
48078471	1/4	20	80	23	7	5,5	3	2184-1
48078474	5/16	18	90	15	8	6,2	3	2184-1
48078479	3/8	16	100	16	10	8	3	2184-1
48078484	7/16	14	100	19	8	6,2	3	2184-1
48078489	1/2	13	110	20	9	7	3	2184-1
48078501	5/8	11	110	24	12	9	4	2184-1
48078515	3/4	10	125	26	14	11	4	2184-1
48078526	7/8	9	140	29	18	14,5	4	2184-1
48078538	1	8	160	32	18	14,5	4	2184-1



# VA-POT

Threading | Cutting taps | UNJF



- HSSE spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GGG	m/min
15-24	10-15	10-15	8-13	8-16	10-15	

UNJF	HSSE	OX	ANSI 3B	B/4		DIN 2184-1	DIN 2184-1
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48002467	10	32	70	-	25	6	4,9	3	1	2184-1
48002472	1/4	28	80	-	30	7	5,5	3	1	2184-1
48002476	5/16	24	90	-	35	8	6,2	3	1	2184-1
48002481	3/8	24	90	-	35	9	7	3	1	2184-1
48002486	7/16	20	100	20	-	8	6,2	3	2	2184-1
48002491	1/2	20	100	22	-	9	7	3	2	2184-1



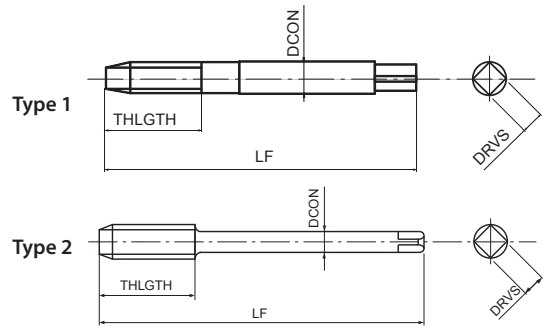






# WHR-NI-POT

Threading | Cutting taps | UNJF



- Powder metal spiral-point cutting tap for through holes
- HR coating
- For Nickel-based alloys including Inconel 718

Threading | Cutting taps



2-4

m/min

UNJF

PM

HR

ANSI  
3BX

B/5

DIN 2184-1

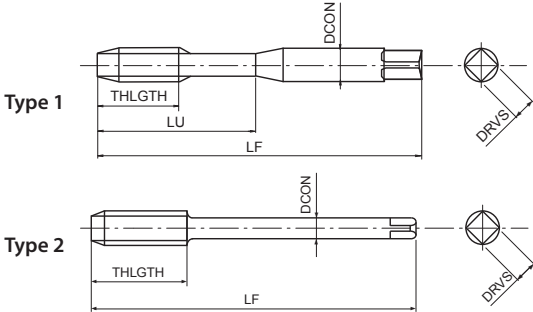
DIN 2184-1

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	Type	DIN
48079467	10	32	70	20	6	4,9	3	1	2184-1
48079472	1/4	28	80	25	7	5,5	3	1	2184-1
48079476	5/16	24	90	31	8	6,2	3	1	2184-1
48079481	3/8	24	90	35	10	8	3	1	2184-1
48079486	7/16	20	100	20	9	7	3	2	2184-1
48079491	1/2	20	100	22	10	8	3	2	2184-1
48079496	9/16	18	100	22	11	9	3	2	2184-1
48079504	5/8	18	100	22	12	9	3	2	2184-1
48079517	3/4	16	110	25	14	11	4	2	2184-1
48079528	7/8	14	125	25	18	14,5	4	2	2184-1

UNJF

# H-POT

Threading | Cutting taps | UNJF



- Powder metal spiral-point cutting tap for through holes
- Steam oxide treatment
- For hardened steels up to 45 HRC

<b>P</b>	<b>K</b>	<b>S</b>	<b>S</b>	<b>H</b>	<b>H</b>	
C ≥ 0,45%	GGG	Ti	Ni	25-35 HRC	35-45 HRC	
8-13	10-15	4-6	2-4	6-10	6-10	m/min
UNJF	PM	OX	ANSI 3B	B/5		
				DIN 2184-1	DIN 2184-1	

EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48010467	10	32	70	-	25	6	4,9	3	1	2184-1
48010472	1/4	28	80	-	30	7	5,5	3	1	2184-1
48010476	5/16	24	90	-	35	8	6,2	3	1	2184-1
48010481	3/8	24	90	-	35	9	7	3	1	2184-1
48010486	7/16	20	100	20	-	8	6,2	3	2	2184-1
48010491	1/2	20	100	22	-	9	7	3	2	2184-1

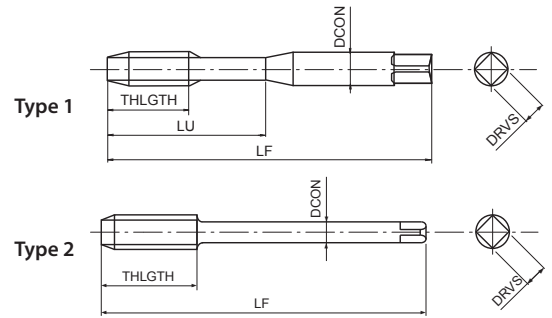
Threading | Cutting taps



UNJF

# VA-SFT

Threading | Cutting taps | UNJF



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

Threading | Cutting taps

P	P	P	P	M	K	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

UNJF	HSSE	OX	40°	ANSI 3B	C/2,5		DIN 2184-1	DIN 2184-1
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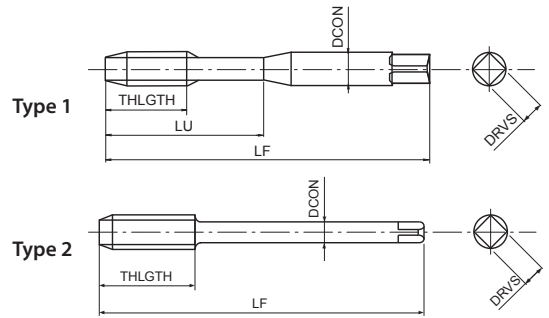
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48001467	10	32	70	-	25	6	4,9	3	1	2184-1
48001472	1/4	28	80	-	30	7	5,5	3	1	2184-1
48001476	5/16	24	90	-	35	8	6,2	3	1	2184-1
48001481	3/8	24	90	-	35	9	7	3	1	2184-1
48001486	7/16	20	100	15	-	8	6,2	4	2	2184-1
48001491	1/2	20	100	16	-	9	7	4	2	2184-1

UNJF



# CC-SFT

Threading | Cutting taps | UNJF



- HSSE spiral-flute cutting tap for blind holes
- CrN coating
- For general steels, stainless steels and aluminium
- Developed for rigid tapping on CNC machines

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	
15-25	15-25	10-25	10-25	6-10	15-35	m/min

<b>UNJF</b>	<b>HSSE</b>	<b>CrN</b>	<b>45°</b>	<b>ANSI 3B</b>	<b>C/2,5</b>	<b>≥2D</b>	<b>DIN 2184-1</b>	<b>DIN 2184-1</b>
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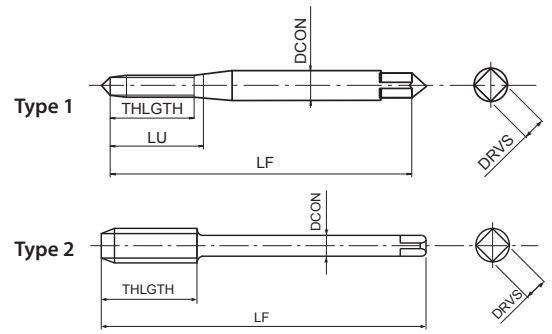
EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48032467	10	32	70	-	19,3	6	4,9	3	1	2184-1
48032472	1/4	28	80	-	25,4	7	5,5	3	1	2184-1
48032476	5/16	24	90	-	11	8	6,2	3	1	2184-1
48032481	3/8	24	90	-	12	9	7	3	1	2184-1
48032486	7/16	20	100	14	-	8	6,2	4	2	2184-1
48032491	1/2	20	100	15	-	9	7	4	2	2184-1
48032496	9/16	18	100	15	-	11	9	4	2	2184-1
48032504	5/8	18	100	17	-	12	9	4	2	2184-1
48032517	3/4	16	110	19	-	14	11	4	2	2184-1
48032528	7/8	14	125	21	-	18	14,5	4	2	2184-1
48032539	1	12	125	24	-	18	14,5	4	2	2184-1

Threading | Cutting taps

UNJF

# V-TI-SFT

Threading | Cutting taps | UNJF



- Powder metal low spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- For Titanium alloys

Threading | Cutting taps



3-5 m/min

UNJF
PM
V
10°
ANSI 3B
C/2,5
DIN 2184-1
DIN 2184-1

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	Type	DIN
48013467	10	32	70	25	6	4,9	3	1	2184-1
48013472	1/4	28	80	30	7	5,5	3	1	2184-1
48013476	5/16	24	90	35	8	6,2	3	1	2184-1
48013481	3/8	24	90	35	10	8	3	1	2184-1
48013486	7/16	20	100	15	8	6,2	3	2	2184-1
48013491	1/2	20	100	16	9	7	3	2	2184-1

UNJF

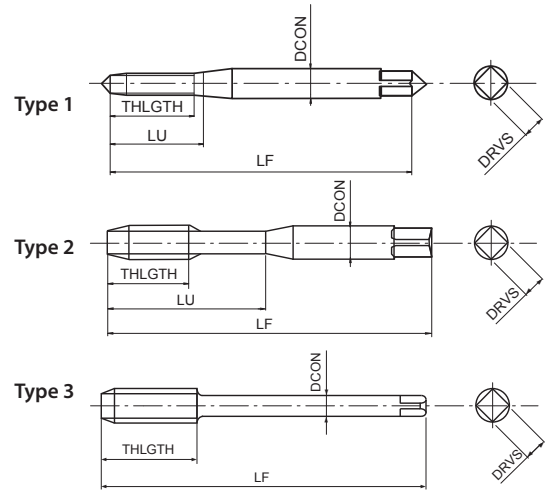


# WHR-NI-SFT

Threading | Cutting taps | UNJF



- Powder metal low spiral-fluted cutting tap for blind holes
- HR coating
- For Nickel-based alloys including Inconel 718



Threading | Cutting taps



1-3 m/min



EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48078467	10	32	70	18	21	6	4,9	3	1	2184-1
48078472	1/4	28	80	21	23	7	5,5	3	1	2184-1
48078476	5/16	24	90	-	35	8	6,2	3	2	2184-1
48078481	3/8	24	90	-	35	10	8	3	2	2184-1
48078486	7/16	20	100	15	-	8	6,2	3	3	2184-1
48078491	1/2	20	100	16	-	9	7	3	3	2184-1
48078496	9/16	18	100	17	-	11	9	3	3	2184-1
48078504	5/8	18	100	19	-	12	9	4	3	2184-1
48078517	3/4	16	110	21	-	14	11	4	3	2184-1
48078528	7/8	14	125	23	-	18	14,5	4	3	2184-1

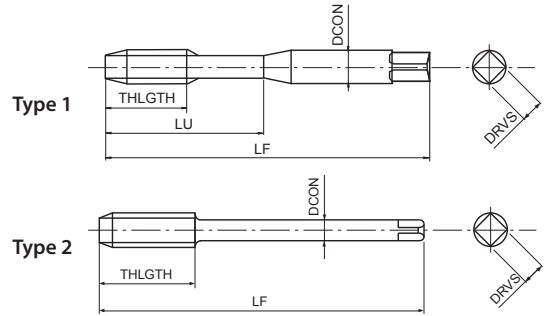


UNJF



# H-SFT

Threading | Cutting taps | UNJF



- Powder metal low spiral-fluted cutting tap for blind holes
- Steam oxide treatment
- For hardened steels up to 45 HRC

<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>K</b> GGG	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	m/min
7-12	7-12	7-12	3-5	1-3	4-8	4-8	

<b>UNJF</b>	<b>PM</b>	<b>OX</b>	<b>15°</b>	<b>ANSI 3B</b>	C/2,5	DIN 2184-1	DIN 2184-1
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EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	Type	DIN
48009467	10	32	70	-	25	6	4,9	3	1	2184-1
48009472	1/4	28	80	-	30	7	5,5	3	1	2184-1
48009476	5/16	24	90	-	35	8	6,2	3	1	2184-1
48009481	3/8	24	90	-	35	9	7	3	1	2184-1
48009486	7/16	20	100	15	-	8	6,2	3	2	2184-1
48009491	1/2	20	100	16	-	9	7	3	2	2184-1

Threading | Cutting taps

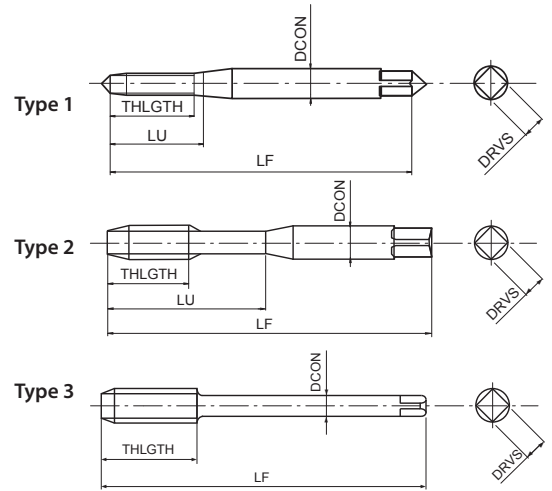
UNJF

# CC-HL-SFT NEW SIZES

Threading | Cutting taps | Helicoil EG-M



- HSSE spiral-flute cutting tap for blind holes
- CrN coating
- For general steels, stainless steels and aluminium
- Developed for rigid tapping on CNC machines, for thread insert



Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>N</b> Al	
15-25	15-25	10-25	10-25	6-10	15-35	m/min

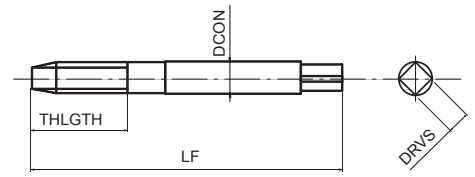
<b>EG M</b>	<b>HSSE</b>	<b>CrN</b>	<b>45°</b>	<b>ISO 2 6H</b>	<b>C/2,5</b>	<b>DIN 371</b>	<b>DIN 376</b>
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Helicoil EG-M

EDP	TD	TP	Cutter diameter EG	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48044138	3	0,5	3,65	56	4,5	15	4	3	3	3,2	1	371
48044144	4	0,7	4,9090	70	6,6	20	6	4,9	3	4,2	1	371
48044149	5	0,8	6,0390	80	7,2	25	6	4,9	3	5,2	1	371
48044155	6	1	7,299	90	9	35	8	6,2	3	6,3	2	371
48044161	8	1,25	9,624	100	12	39	10	8	3	8,4	2	371
48044169	10	1,5	11,949	110	14	46	12	9	4	10,4	2	371
48044179	12	1,75	14,273	110	16	-	11	9	4	12,5	3	376
48044202	<small>NEW</small> 16	2	18,598	125	20	-	14	11	4	16,6	3	376
48044228	<small>NEW</small> 20	2,5	23,248	160	25	-	18	14,5	4	20,7	3	376

# E-HL-POT

Threading | Cutting taps | Helicoil EG-MJ



- Powder metal spiral-point cutting tap for through holes
- Bright finish
- For Nickel-based alloys including Inconel 718
- For thread insert



Ni

2-4

m/min

EG MJ

PM

ISO 1 4H

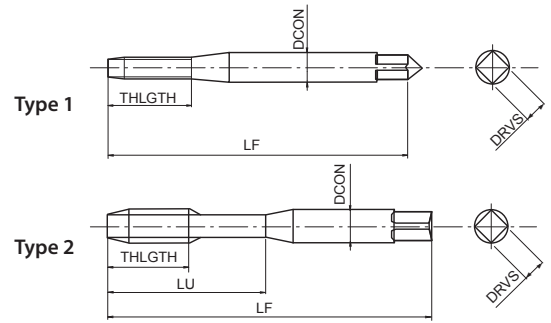


DIN 371

EDP	TD	TP	Cutter diameter EG	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48008125	2	0,4	2,52	50	9	2,8	2,1	2	2,1	371
48008133	2,5	0,45	3,0850	56	11	3,5	2,7	3	2,6	371
48008138	3	0,5	3,65	56	13	4	3	3	3,2	371
48008144	4	0,7	4,9090	70	17	6	4,9	3	4,2	371
48008149	5	0,8	6,0390	80	21	6	4,9	3	5,2	371
48008155	6	1	7,299	90	25	8	6,2	3	6,3	371
48008161	8	1,25	9,624	100	33	10	8	3	8,4	371
48008169	10	1,5	11,949	110	41	12	9	3	10,4	371

# H-HL-POT

Threading | Cutting taps | Helicoil EG-MJ



- Powder metal spiral-point cutting tap for through holes
- Steam oxide treatment
- For hardened steels up to 45 HRC
- For thread insert

Threading | Cutting taps

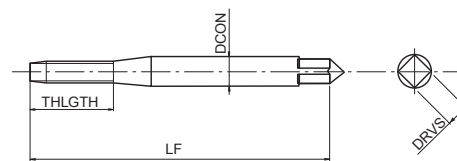
<b>P</b> C ≥ 0,45%	<b>K</b> GGG	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	
8-13	10-15	4-6	2-4	6-10	6-10	m/min
<b>EG</b> <b>MJ</b>	<b>PM</b>	<b>OX</b>	<b>ISO 1</b> <b>4H</b>	<b>B/5</b>		<b>DIN 371</b>

EDP	TD	TP	Cutter diameter EG	LF	LU	DCON	DRVS	NOF	PHD	Type	DIN
48006125	2	0,4	2,52	50	9	2,8	2,1	2	2,1	1	371
48006133	2,5	0,45	3,0850	56	18	3,5	2,7	3	2,6	2	371
48006138	3	0,5	3,65	56	20	4	3	3	3,2	2	371
48006144	4	0,7	4,9090	70	25	6	4,9	3	4,2	2	371
48006149	5	0,8	6,0390	80	30	6	4,9	3	5,2	2	371
48006155	6	1	7,299	90	35	8	6,2	3	6,3	2	371
48006161	8	1,25	9,624	100	39	10	8	3	8,4	2	371
48006169	10	1,5	11,949	110	46	12	9	3	10,4	2	371

Helicoil EG-MJ

# E-HL-SFT

Threading | Cutting taps | Helicoil EG-MJ



- Powder metal low spiral-fluted cutting tap for blind holes
- Bright finish
- For Nickel-based alloys including Inconel 718
- For thread insert



1-3

m/min

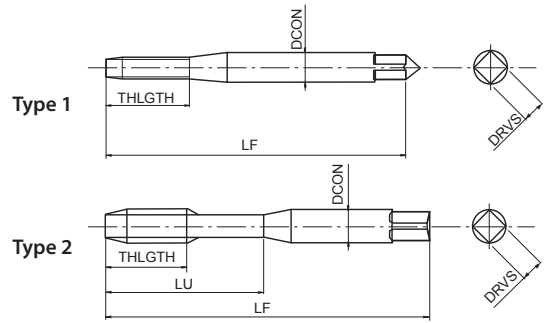


EDP	TD	TP	Cutter diameter EG	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48007125	2	0,4	2,52	50	9	2,8	2,1	2	2,1	371
48007133	2,5	0,45	3,0850	56	11	3,5	2,7	3	2,6	371
48007138	3	0,5	3,65	56	13	4	3	3	3,2	371
48007144	4	0,7	4,9090	70	17	6	4,9	3	4,2	371
48007149	5	0,8	6,0390	80	21	6	4,9	3	5,2	371
48007155	6	1	7,299	90	25	8	6,2	3	6,3	371
48007161	8	1,25	9,624	100	33	10	8	3	8,4	371
48007169	10	1,5	11,949	110	41	12	9	3	10,4	371



# H-HL-SFT

Threading | Cutting taps | Helicoil EG-MJ



- Powder metal low spiral-fluted cutting tap for blind holes
- Steam oxide treatment
- For hardened steels up to 45 HRC
- For thread insert

Threading | Cutting taps

<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>K</b> GGG	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	
7-12	7-12	7-12	3-5	1-3	4-8	4-8	m/min

<b>EG MJ</b>	<b>PM</b>	<b>OX</b>	<b>15°</b>	<b>ISO 1 4H</b>	<b>C/3</b>	<b>DIN 371</b>
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EDP	TD	TP	Cutter diameter EG	LF	LU	DCON	DRVS	NOF	PHD	Type	DIN
48005125	2	0,4	2,52	50	9	2,8	2,1	2	2,1	1	371
48005133	2,5	0,45	3,0850	56	18	3,5	2,7	3	2,6	2	371
48005138	3	0,5	3,65	56	20	4	3	3	3,2	2	371
48005144	4	0,7	4,9090	70	25	6	4,9	3	4,2	2	371
48005149	5	0,8	6,0390	80	30	6	4,9	3	5,2	2	371
48005155	6	1	7,299	90	35	8	6,2	3	6,3	2	371
48005161	8	1,25	9,624	100	39	10	8	3	8,4	2	371
48005169	10	1,5	11,949	110	46	12	9	3	10,4	2	371

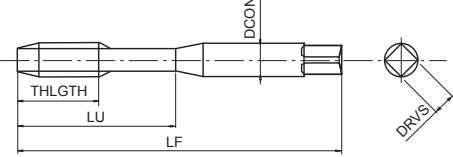


Helicoil EG-MJ



# H-HL-POT

Threading | Cutting taps | Helicoil EG-UNJC



- Powder metal spiral-point cutting tap for through holes
- Steam oxide treatment
- For hardened steels up to 45 HRC
- For thread insert

Threading | Cutting taps

<b>P</b> C ≥ 0,45%	<b>K</b> GGG	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	
8-13	10-15	4-6	2-4	6-10	6-10	m/min
<b>EG UNJC</b>	<b>PM</b>	<b>OX</b>	<b>ANSI 3B</b>	<b>B/5</b>	<b>DIN 2184-1</b>	

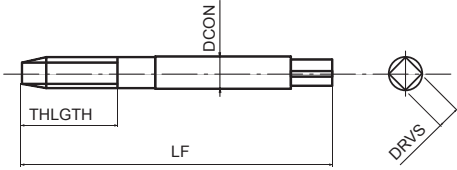
EDP	TD	TP	Cutter diameter EG	LF	LU	DCON	DRVS	NOF	PHD	DIN
48018457	4	40	3,67	56	20	4	3	3	3	2184-1
48018461	6	32	4,536	63	21	4,5	3,4	3	3,7	2184-1
48018464	8	32	5,197	70	25	6	4,9	3	4,4	2184-1

Helicoil EG-UNJC



# E-HL-SFT

Threading | Cutting taps | Helicoil EG-UNJC



- Powder metal low spiral-fluted cutting tap for blind holes
- Bright finish
- For Nickel-based alloys including Inconel 718
- For thread insert



1-3 m/min

EG UNJC
PM
10°
ANSI 3B
C/2,5
DIN 2184-1

EDP	TD	TP	Cutter diameter EG	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48015457	4	40	3,67	56	13	4	3	3	3	2184-1
48015461	6	32	4,536	63	18	4,5	3,4	3	3,7	2184-1
48015464	8	32	5,197	70	20	6	4,9	3	4,4	2184-1

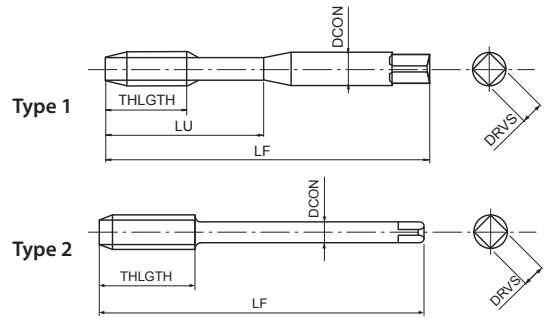






# H-HL-POT

Threading | Cutting taps | Helicoil EG-UNJF



- Powder metal spiral-point cutting tap for through holes
- Steam oxide treatment
- For hardened steels up to 45 HRC
- For thread insert

Threading | Cutting taps

<b>P</b> C ≥ 0,45%	<b>K</b> GGG	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>m/min</b>
8-13	10-15	4-6	2-4	6-10	6-10	

<b>EG UNJF</b>	<b>PM</b>	<b>OX</b>	<b>ANSI 3B</b>	<b>B/5</b>	<b>DIN 2184-1</b>
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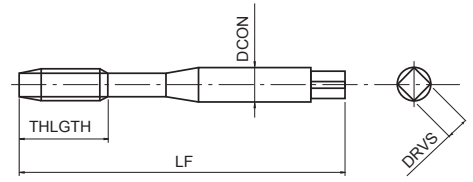
EDP	TD	TP	Cutter diameter EG	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48018467	10	32	5,857	80	-	30	7	5,5	3	5,1	1	2184-1
48018472	1/4	28	7,528	90	-	35	8	6,2	3	6,6	1	2184-1
48018476	5/16	24	9,312	90	-	35	9	7	3	8,3	1	2184-1
48018481	3/8	24	10,9	100	-	39	11	9	3	9,8	1	2184-1
48018486	7/16	20	12,762	100	22	-	9	7	3	11,5	2	2184-1
48018491	1/2	20	14,35	100	22	-	11	9	3	13,1	2	2184-1



Helicoil EG-UNJF

# CC-HL-SFT

Threading | Cutting taps | Helicoil EG-UNJF



- HSSE spiral-flute cutting tap for blind holes
- CrN coating
- For general steels, stainless steels and aluminium
- Developed for rigid tapping on CNC machines, for thread insert

<b>P</b> ●	<b>P</b> ●	<b>P</b> ●	<b>P</b> ○	<b>M</b> ●	<b>N</b> ●	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	
15-25	15-25	10-25	10-25	6-10	15-35	m/min

<b>EG UNJF</b>	<b>HSSE</b>	<b>CrN</b>	<b>45°</b>	<b>ANSI 3B</b>	<b>C/2,5</b>	<b>DIN 2184-1</b>
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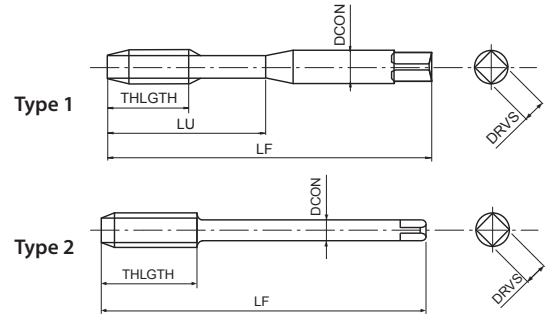
EDP	TD	TP	Cutter diameter EG	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48033467	10	32	5,857	80	25,4	7	5,5	3	5,1	2184-1
48033472	1/4	28	7,528	90	11	8	6,2	3	6,6	2184-1
48033476	5/16	24	9,312	90	12	9	7	3	8,3	2184-1
48033481	3/8	24	10,9	100	14	11	9	3	9,8	2184-1





# H-HL-SFT

Threading | Cutting taps | Helicoil EG-UNJF



- Powder metal low spiral-fluted cutting tap for blind holes
- Steam oxide treatment
- For hardened steels up to 45 HRC
- For thread insert

<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>K</b> GGG	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC		
7-12	7-12	7-12	3-5	1-3	4-8	4-8		m/min
<b>EG</b> UNJF	<b>PM</b>	<b>OX</b>	<b>15°</b>	<b>ANSI</b> 3B	<b>C/2,5</b>		<b>DIN 2184-1</b>	

EDP	TD	TP	Cutter diameter EG	LF	THLGTH	LU	DCON	DRVS	NOF	PHD	Type	DIN
48017467	10	32	5,857	80	-	30	7	5,5	3	5,1	1	2184-1
48017472	1/4	28	7,528	90	-	35	8	6,2	3	6,6	1	2184-1
48017476	5/16	24	9,312	90	-	35	9	7	3	8,3	1	2184-1
48017481	3/8	24	10,9	100	-	39	11	9	3	9,8	1	2184-1
48017486	7/16	20	12,762	100	15	-	9	7	3	11,5	2	2184-1
48017491	1/2	20	14,35	100	16	-	11	9	3	13,1	2	2184-1





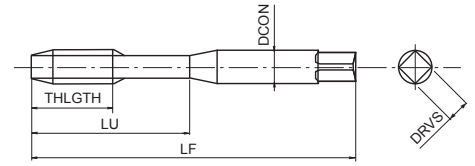






# A-POT

Threading | Cutting taps | BSF



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels

Threading | Cutting taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min



EDP	TD	TP	LF	THLGTH	LU	DCON	DRVS	NOF	DIN
48205731	1/4	26	80	19	30	7	5,5	3	2184-1
48205732	5/16	22	90	22	35	8	6,2	3	2184-1
48205733	3/8	20	100	24	39	10	8	3	2184-1
48205734	7/16	18	100	24	-	8	6,2	3	2184-1
48205735	1/2	16	100	22	-	9	7	3	2184-1
48205737	5/8	14	110	32	-	12	9	3	2184-1
48205739	3/4	12	125	34	-	14	11	3	2184-1
48205742	1	10	160	38	-	18	14,5	3	2184-1



BSF

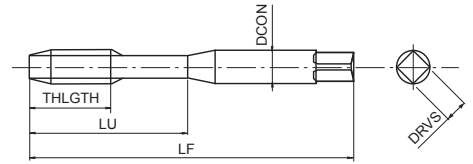






# A-POT

Threading | Cutting taps | BA



- First choice in quality and performance
- Powder metal spiral-point cutting tap for through holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels

Threading | Cutting taps

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

<b>A</b>	<b>BA</b> (BS93)	<b>PM</b>	<b>V</b>	<b>B/4</b>	
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EDP	TD	LF	THLGTH	LU	DCON	DRVS	NOF
48205910	0	66	19	30	6,3	5	3
48205911	1	62	17	26	5,6	4,5	3
48205912	2	58	16	25	5	4	3
48205913	3	53	13	21	4,5	3,55	3
48205914	4	50	13	20	3,55	2,8	3
48205915	5	48	11	18	3,15	2,5	3
48205916	6	44,5	9,5	-	2,8	2,24	2
48205917	7	44,5	9,5	-	2,8	2,24	2
48205918	8	44,5	9,5	-	2,8	2,24	2
48205919	9	41	8	-	2,5	2	2
48205920	10	41	8	-	2,5	2	2
48205921	11	41	8	-	2,5	2	2
48205922	12	40	7	-	2,5	2	2

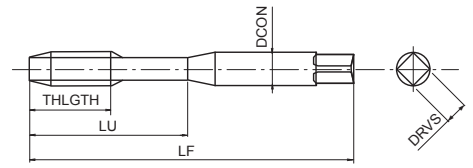


BA



# S-POT

Threading | Cutting taps | BA



- HSS-E spiral-point cutting tap for through holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

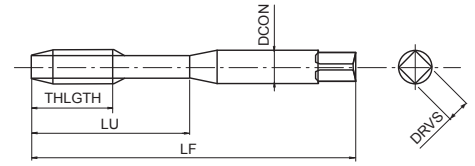
<b>P</b> (C < 0,2%)	<b>P</b> (0,25 < C < 0,4)	<b>P</b> (C ≥ 0,45%)	<b>P</b> (SCM)	<b>M</b> (INOX)	<b>K</b> (GGG)	
15-24	10-15	10-15	8-13	8-16	10-15	m/min



EDP	TD	LF	THLGTH	LU	DCON	DRVS	NOF
48272910	0	66	19	30	6,3	5	3
48272911	1	62	17	26	5,6	4,5	3
48272912	2	58	16	25	5	4	3
48272913	3	53	13	21	4,5	3,55	3
48272914	4	50	13	20	3,55	2,8	3
48272915	5	48	11	18	3,15	2,5	3
48272916	6	44,5	9,5	-	2,8	2,24	2
48272917	7	44,5	9,5	-	2,8	2,24	2
48272918	8	44,5	9,5	-	2,8	2,24	2
48272919	9	41	8	-	2,5	2	2
48272920	10	41	8	-	2,5	2	2
48272921	11	41	8	-	2,5	2	2
48272922	12	40	7	-	2,5	2	2

# A-SFT

Threading | Cutting taps | BA



- First choice in quality and performance
- Powder metal spiral-fluted cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels, aluminium, stainless steels

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>H</b>	
$C < 0,2\%$	$0,25 < C < 0,4$	$C \geq 0,45\%$	SCM	INOX	Al	AC, ADC	Ti	25-35 HRC	
15-60	15-60	10-60	8-30	8-20	15-35	15-35	5-10	8-20	m/min

<b>A</b>	<b>BA (BS93)</b>	<b>PM</b>	<b>V</b>	<b>45°</b>	<b>C/2,5</b>	
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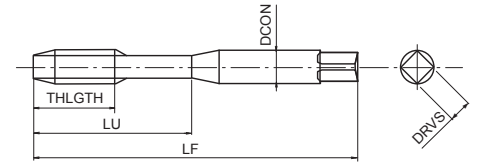
EDP	TD	LF	THLGTH	LU	DCON	DRVS	NOF
48139910	0	66	19	30	6,3	5	3
48139911	1	62	17	26	5,6	4,5	3
48139912	2	58	16	25	5	4	3
48139913	3	53	13	21	4,5	3,55	2
48139914	4	50	13	20	3,55	2,8	2
48139915	5	48	11	18	3,15	2,5	2
48139916	6	44,5	9,5	-	2,8	2,24	2
48139917	7	44,5	9,5	-	2,8	2,24	2
48139918	8	44,5	9,5	-	2,8	2,24	2
48139919	9	41	8	-	2,5	2	2
48139920	10	41	8	-	2,5	2	2
48139921	11	41	8	-	2,5	2	2
48139922	12	40	7	-	2,5	2	2

Threading | Cutting taps

BA

# S-SFT

## Threading | Cutting taps | BA



- HSSE spiral-flute cutting tap for blind holes
- Steam oxide treatment
- General purpose tapping in steels and stainless steels

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	
$C < 0,2\%$	$0,25 < C < 0,4$	$C \geq 0,45\%$	SCM	INOX	GGG	
10-15	8-14	8-14	7-11	7-12	7-14	m/min

<b>BA</b> (BS93)	<b>HSSE</b>	<b>OX</b>	<b>40°</b>	<b>C/2,5</b>	<b>3</b>
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EDP	TD	LF	THLGTH	LU	DCON	DRVS	NOF
48223910	0	66	19	30	6,3	5	3
48223911	1	62	17	26	5,6	4,5	3
48223912	2	58	16	25	5	4	3
48223913	3	53	13	21	4,5	3,55	2
48223914	4	50	13	20	3,55	2,8	2
48223915	5	48	11	18	3,15	2,5	2
48223916	6	44,5	9,5	-	2,8	2,24	2
48223917	7	44,5	9,5	-	2,8	2,24	2
48223918	8	44,5	9,5	-	2,8	2,24	2
48223919	9	41	8	-	2,5	2	2
48223920	10	41	8	-	2,5	2	2
48223921	11	41	8	-	2,5	2	2
48223922	12	40	7	-	2,5	2	2

Threading | Cutting taps



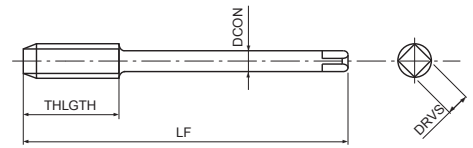
BA





# POT

Threading | Cutting taps | G (BSP)



- HSSE spiral-point cutting tap for through holes
- Bright finish
- For general purpose applications

Threading | Cutting taps

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ● AC, ADC	
12-20	8-12	8-12	8-12	8-12	15-25	15-20	m/min

<b>G</b>	<b>HSSE</b>	B/4		DIN 5156
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EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
63581900	1/8	28	90	16	7	5,5	3	5156
63582000	1/4	19	100	20	11	9	3	5156
63582100	3/8	19	100	22	12	9	4	5156
63582200	1/2	14	125	25	16	12	4	5156
63582300	5/8	14	125	25	18	14,5	4	5156
63582400	3/4	14	140	28	20	16	4	5156
63582500	7/8	14	150	28	22	18	4	5156
63582600	1	11	160	30	25	20	4	5156



G (BSP)











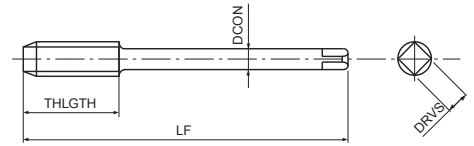






# VP-DC-MT

Threading | Cutting taps | G (BSP)



- Powder metal straight flute cutting tap for through and blind holes
- Multilayer TiCN coating
- For cast iron and cast aluminium
- Synchro taps at cutting speeds > 30 m/min

Threading | Cutting taps

<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ● GG	<b>K</b> ● GGG	<b>N</b> ● AC, ADC	<b>H</b> ○ 25-35 HRC	<b>H</b> ○ 35-45 HRC	
10-25	10-20	15-60	15-40	25-70	8-20	8-20	m/min

<b>G</b>	<b>PM</b>	<b>V</b>	C/2,5			<b>DIN 5156</b>
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EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48020837	1/16	28	90	11	6	4,9	4	5156
48020838	1/8	28	90	11	7	5,5	4	5156
48020839	1/4	19	100	16	11	9	4	5156
48020840	3/8	19	100	16	12	9	4	5156
48020841	1/2	14	125	22	16	12	5	5156
48020842	5/8	14	125	22	18	14,5	5	5156
48020843	3/4	14	140	22	20	16	5	5156
48020844	7/8	14	150	22	22	18	5	5156
48020845	1	11	160	28	25	20	6	5156
48020846	1 1/8	11	170	28	28	22	6	5156
48020847	1 1/4	11	170	28	32	24	6	5156
48020849	1 1/2	11	190	28	36	29	6	5156
48020850	1 3/4	11	190	28	40	32	6	5156
48020851	2	11	220	28	45	35	6	5156

G (BSP)





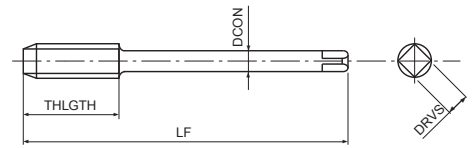






# S-OIL-XPF

Threading | Forming taps | G (BSP)



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- For general steels, stainless steels, aluminium
- Side through coolant

Threading | Forming taps

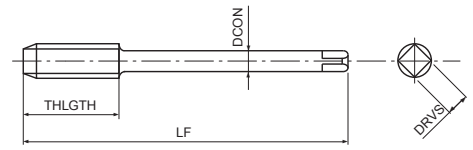
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	25-35 HRC	
15-40	15-40	15-30	15-30	8-20	20-50	20-40	5-20	m/min
<b>A</b>	<b>G</b>	<b>HSS-Co</b>	<b>V</b>					

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48042839	1/4	19	100	13	11	9	8	12,41 ~ 12,62	2189
48042840	3/8	19	100	13	12	9	8	15,92 ~ 16,12	2189
48042841	1/2	14	125	18	16	12	8	19,93 ~ 20,15	2189
48042842	5/8	14	125	18	18	14,5	8	21,89 ~ 22,11	2189
48042843	3/4	14	140	18	20	16	8	25,42 ~ 25,64	2189
48042844	7/8	14	150	18	22	18	8	29,18 ~ 29,40	2189
48042845	1	11	160	23	25	20	8	31,92 ~ 32,20	2189

G (BSP)

# S-XPF-GL

Threading | Forming taps | G (BSP)



- First choice in quality and performance
- HSE forming tap for through and blind holes
- Multilayer TiCN coating
- Without oil grooves for higher rigidity

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>H</b>
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	Al	AC, ADC	25-35 HRC

<b>A</b>	<b>G</b>	<b>HSS-Co</b>	<b>V</b>				<b>DIN 2189</b>
				C/2,5			

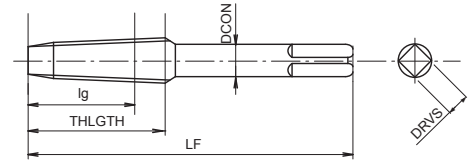
EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	PHD	DIN
48296838	1/8	28	90	9	7	5,5	0	9,24 ~ 9,35	2189
48296839	1/4	19	100	13	11	9	0	12,41 ~ 12,62	2189
48296840	3/8	19	100	13	12	9	0	15,92 ~ 16,12	2189
48296841	1/2	14	125	18	16	12	0	19,93 ~ 20,15	2189
48296842	5/8	14	125	18	18	14,5	0	21,89 ~ 22,11	2189
48296843	3/4	14	140	18	20	16	0	25,42 ~ 25,64	2189
48296844	7/8	14	150	18	22	18	0	29,18 ~ 29,40	2189
48296845	1	11	160	23	25	20	0	31,92 ~ 32,20	2189





# A-SFT RC

Threading | Cutting taps | RC (BSPT)



- First choice in quality and performance
- Powder metal spiral flute cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels and aluminium
- RC (BSPT) tapered 1:16

<b>P</b> ●	<b>P</b> ●	<b>P</b> ●	<b>P</b> ●	<b>N</b> ○	<b>N</b> ○	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	Al	AC, ADC	
5-10	5-10	5-10	5-10	5-10	10-15	m/min

<b>A</b>	<b>Rc (BSPT)</b>	<b>PM</b>	<b>V</b>	45°	C/2,5		<b>DIN 5156</b>
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EDP	TD	TP	LF	lg	THLGTH	DCON	DRVS	NOF	DIN
48302374	1/16	28	90	10,1	14	6	4,9	3	5156
48302384	1/8	28	90	10,1	15	7	5,5	3	5156
48302394	1/4	19	100	15	19	11	9	3	5156
48302404	3/8	19	100	15,4	21	12	9	4	5156
48302414	1/2	14	125	20,5	26	16	12	4	5156
48302434	3/4	14	140	21,8	28	20	16	4	5156
48302454	1	11	160	26	33	25	23	4	5156

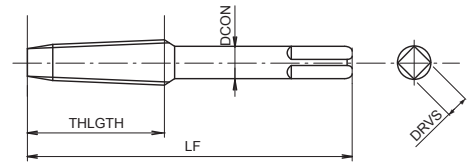
Threading | Cutting taps

RC (BSPT)



# A-TPT

Threading | Cutting taps | RC (BSPT)



- First choice in quality and performance
- Powder metal straight flute cutting tap for through and blind holes
- Multilayer TiCN coating
- High speed tapping in general steels and aluminium
- RC (BSPT) tapered 1:16

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>N</b> Al	<b>N</b> AC, ADC		
5-10	5-10	5-10	5-10	5-10	10-15		m/min

<b>A</b>	Rc (PT)	PM	V	C/2,5		DIN 5156
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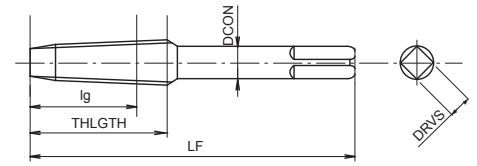
RC (BSPT)

EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
48212384	1/8	28	90	15	7	5,5	4	5156
48212394	1/4	19	100	19	11	9	4	5156
48212404	3/8	19	110	21	12	9	4	5156
48212414	1/2	14	125	26	16	12	4	5156
48212434	3/4	14	140	28	20	16	4	5156
48212454	1	11	160	33	25	20	4	5156



# A-SFT NPT

Threading | Cutting taps | NPT



- First choice in quality and performance
- Powder metal spiral flute cutting tap for blind holes
- Multilayer TiCN coating
- High speed tapping in general steels and aluminium
- NPT tapered 1:16

Threading | Cutting taps

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>N</b> Al	<b>N</b> AC, ADC	
5-10	5-10	5-10	5-10	5-10	10-15	m/min

<b>A</b>	<b>NPT</b>	<b>PM</b>	<b>V</b>	<b>45°</b>	<b>C/2,5</b>	<b>DIN 5156</b>
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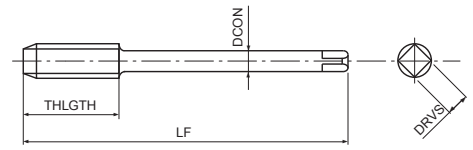
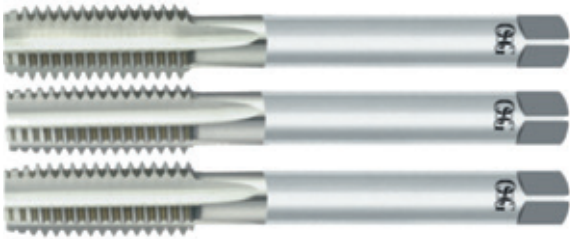
EDP	TD	TP	LF	lg	THLGTH	DCON	DRVS	NOF	DIN
48331500	1/16	27	90	12	18	6	4,9	3	5156
48331600	1/8	27	90	12,05	19	7	5,5	3	5156
48331700	1/4	18	100	17,45	28	11	9	3	5156
48331800	3/8	18	110	17,65	28	12	9	4	5156
48331900	1/2	14	125	22,85	35	16	12	4	5156
48331000	3/4	14	140	22,95	35	20	16	4	5156
48331100	1	11,5	160	27,4	45	25	20	4	5156

NPT









- HSS straight flute cutting tap for through & blind holes
- Bright finish
- For general steels, aluminium and cast iron
- Progressive thread, set of 3 taps with short shank
- 5, 3,5 and 2 pitch chamfer lead

<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	
7-12	6-9	7-12	10-20	10-15	m/min

<b>M</b>	<b>HSS</b>	<b>ISO 2 6H</b>			<b>DIN 352</b>
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EDP	TD	TP	LF	THLGTH	DCON	DRVS	NOF	DIN
10212566	2	0,4	36	8	2,8	2,1	3	352
10213866	3	0,5	40	11	3,5	2,7	3	352
10214066	3,5	0,6	45	12	4	3	3	352
10214466	4	0,7	45	13	4,5	3,4	3	352
10214966	5	0,8	50	16	6	4,9	3	352
10215566	6	1	56	19	6	4,9	3	352
10216166	8	1,25	63	22	6	4,9	4	352
10216966	10	1,5	70	24	7	5,5	4	352
10217966	12	1,75	75	28	9	7	4	352
10219166	14	2	80	30	11	9	4	352
10220266	16	2	80	32	12	9	4	352
10221466	18	2,5	95	34	14	11	4	352
10222866	20	2,5	95	34	16	12	4	352

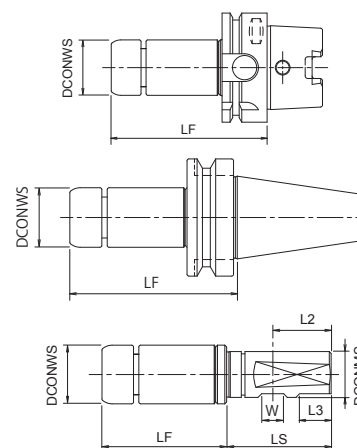


# SYNCHROMASTER

Threading | Holder | SynchroMaster



- Tap holder synchronized
- Improve the tool life
- For tapping sizes from M3 to M24
- HSK, BT and ST type for ER16 collet type, ST type for ER32 collet type



EDP	Designation	LF	LS	DCONWS	DCONMS	L2	L3
79912	HSK40ASMH1685	85	-	32	-	-	-
79913	HSK63ASMH1690	90	-	32	-	-	-
79910	BT30SMH1690	90	-	32	-	-	-
79911	BT40SMH1690	90	-	32	-	-	-
79924	ST20D-SMH16-68	68	51	32	20	25	-
79925	ST25D-SMH16-68	68	57	32	25	32	17
48329004	<b>NEW</b> ST20D-SMH32-87	87	51	50	20	25	-
48329002	<b>NEW</b> ST25D-SMH32-87	87	57	50	25	32	17

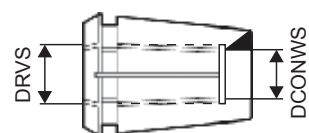
## Accessories and spare parts

Applicable	EDP	Designation	Specification
SMH16	79923	FKT-32L	Wrench
SMH16	79922	ERP-16T	Cap Nut
SMH32	79993	FKT-50L	Wrench
SMH32	79992	ERP-32T	Cap Nut



# SYNCHROMASTER Collet

Threading | Holder | SynchroMaster



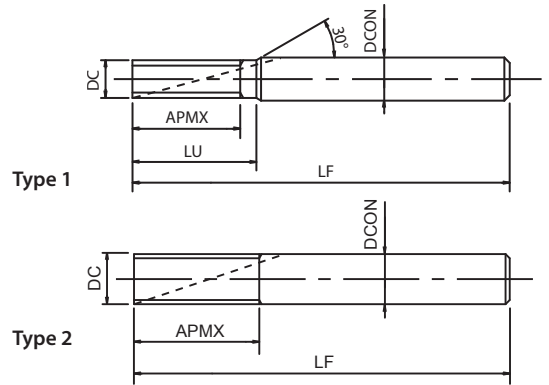
Threading | Holder

EDP	Designation	DCONWS	DRVS	DIN 371	DIN 376
79949	ER16GH3,52,7	3,5	2,7	M3	M5
79951	ER16GH4,53,4	4,5	3,4	M4	M6
79953	ER16GH64,9	6	4,9	M5 M6	M8
79919	ER16GH75,5	7	5,5	M7	M10
79955	ER16GH86,3	8	6,3	M8	M11
79956	ER16GH97,1	9	7,1	M9	M12
79970	ER32GH-7x5,5	7	5,5	M7	M10
48329007	ER32GH-8x6,3	8	6,3	M8	M11
48329008	ER32GH-9x7,1	9	7,1	M9	M12
79973	ER32GH-10x8	10	8	M10	-
79975	ER32GH-11x9	11	9	-	M14
79976	ER32GH-12x9	12	9	-	M16
79978	ER32GH-14x11,2	14	11,2	-	M18
79980	ER32GH-16x12	16	12	-	M20
48329014	ER32GH-18x14,5	18	14,5	-	M22 M24

SynchroMaster

# AT-1

Threading | Thread milling | Metric & Metric Fine



- First choice in quality and performance
- One pass thread mill
- EgiAs coating
- For all materials and hardened steels up to 45 HRC
- ThreadPro NC code generator software available

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	<b>K</b>	<b>N</b>	<b>N</b>	<b>H</b>	<b>H</b>	m/min
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GG	GGG	Al	AC, ADC	25-35 HRC	35-45 HRC	
80-160	80-160	80-160	60-120	60-120	80-160	60-120	80-160	100-300	80-200	80-200	

<b>A</b>	<b>M</b>	<b>MF</b>	<b>MJ</b>	<b>CARBIDE</b>	<b>EgiAs</b>	<b>9°~13°</b>	<b>h6</b>	<b>A. 400</b>
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EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	LU	DCON	NOF	Type
8331000	M6	0,75	4,5	75	13,5	16	6	4	1
8331001	M6	1	4,5	75	14	16	6	4	1
8331002	M8	0,5	5,7	75	17	-	6	4	2
8331003	M8	1	5,7	75	18	-	6	4	2
8331004	M8	1,25	5,7	75	18,75	-	6	4	2
8331005	M10	1	7,7	85	22	-	8	4	2
8331006	M10	1,25	7,7	85	22,5	-	8	4	2
8331007	M10	1,5	7,7	85	24	-	8	4	2
8331008	M12	1	9,7	100	26	-	10	5	2
8331009	M12	1,25	9,7	100	27,5	-	10	5	2
8331010	M12	1,5	9,7	100	27	-	10	5	2
8331011	M12	1,75	9,7	100	28	-	10	5	2
8331012	M14	0,5	11,7	120	29	-	12	5	2
8331013	M14	0,75	11,7	120	30	-	12	5	2
8331014	M14	1	11,7	120	30	-	12	5	2
8331015	M14	1,5	10,7	120	31,5	34,5	12	5	1
8331016	M14	2	9,7	100	32	-	10	5	2
8331017	M16	1	13,7	135	34	39	16	5	1
8331018	M16	1,5	13,7	135	36	39	16	5	1
8331019	M16	2	11,7	120	36	-	12	5	2
8331020	M18	2,5	11,7	120	42,5	-	12	5	2
8331021	M20	1,5	15,7	135	43,5	-	16	5	2
8331022	M20	2,5	13,7	135	45	50	16	5	1
8331023	M24	1,5	19,7	150	51	-	20	6	2
8331024	M24	2	19,7	150	52	-	20	6	2
8331025	M24	3	19,7	150	54	-	20	6	2

Threading | Thread milling

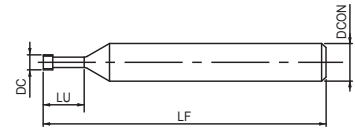
Metric & Metric Fine

# AT-2 NEW SIZES

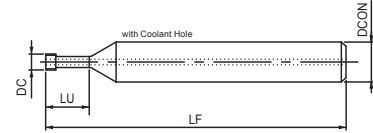
Threading | Thread milling | Metric



Type 1



Type 2



- First choice in quality and performance
- Thread milling without pre-drilled hole
- DUROREY coating
- For hardened steels up to 65 HRC and stainless steels
- ThreadPro NC code generator software available

Threading | Thread milling

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ○ INOX	<b>K</b> ○ GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>S</b> ● Ti	<b>S</b> ● Ni	<b>H</b> ● 25-45 HRC	<b>H</b> ● 45-55 HRC	<b>H</b> ● ~65 HRC	
35-55	80-160	80-160	60-120	35-100	35-100	35-100	35-100	35-100	35-55	35-55	35-75	35-65	35-55	m/min
0,01~0,07	0,01~0,07	0,01~0,07	0,01~0,07	0,01~0,07	0,01~0,07	0,01~0,07	0,01~0,07	0,01~0,07	0,01~0,07	0,01~0,07	0,01~0,07	0,01~0,07	0,01~0,07	mm/t
<b>A</b>	<b>M</b>	<b>CARBIDE</b>	<b>DUROREY</b>		<b>h6</b>	<b>LH</b>							 A. 401	

Metric

EDP	Minimum cutting bore diameter	Maximum cutting bore diameter	TP	DC	LF	LU	DCON	NOF	Type
8331200	M3	4,2	0,5	2,4	50	7,2	6	4	1
8331207	M3	4,2	0,5	2,4	50	8,7	6	4	1
8331201	M4	5,3	0,7	3,1	50	9,7	6	4	1
8331208	M4	5,3	0,7	3,1	50	11,7	6	4	1
8331202	M5	7	0,8	4	50	12	6	4	1
8331209	M5	7	0,8	4	50	14,5	6	4	1
8331203	M6	8	1	4,6	50	14,5	6	4	1
8331210	M6	8	1	4,6	50	17,5	6	4	1
8331204	M8	10,9	1,25	6,2	70	19,1	10	4	1
8331211	M8	10,9	1,25	6,2	70	23,1	10	4	1
8331205	M10	13,2	1,5	7,5	70	23,7	10	4	2
8331212	M10	13,2	1,5	7,5	70	28,7	10	4	2
8331206	M12	15,9	1,75	9	80	28,3	10	4	2
8331213	M12	15,9	1,75	9	80	34,3	10	4	2
8331240	M16	21,1	2	11,7	100	37	12	4	2
8331243 <small>NEW</small>	M16	21,1	2	11,7	100	45	12	4	2
8331241 <small>NEW</small>	M18	25,1	2,5	14	135	42,2	16	4	2
8331244 <small>NEW</small>	M18	25,1	2,5	14	135	51,2	16	4	2
8331242 <small>NEW</small>	M20	28,5	2,5	15,7	135	46,2	16	4	2
8331245 <small>NEW</small>	M20	28,5	2,5	15,7	135	56,2	16	4	2

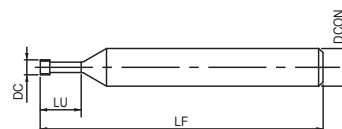


# AT-2 R-SPEC NEW

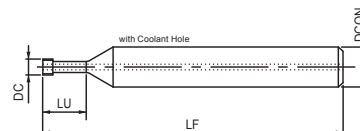
Threading | Thread milling | Metric



Type 1



Type 2



- First choice in quality and performance
- Thread milling without pre-drilled hole
- DLC-IGUSS coating
- For non-ferrous materials
- ThreadPro NC code generator software available

N 
N 
N

Al AC, ADC Cu m/min

A
M
CARBIDE
DLC-IGUSS
h6

LH

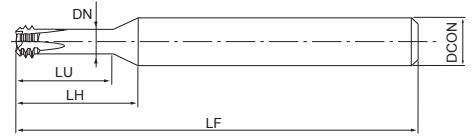
A. 404

EDP	Minimum cutting bore diameter	TP	DC	LF	LU	DCON	NOF	Type
8331220	M3	0,5	2,4	50	7,75	6	2	1
8331227	M3	0,5	2,4	50	9,25	6	2	1
8331221	M4	0,7	3,1	50	10,45	6	2	1
8331228	M4	0,7	3,1	50	12,45	6	2	1
8331222	M5	0,8	4	50	12,8	6	2	1
8331229	M5	0,8	4	50	15,3	6	2	1
8331223	M6	1	4,6	50	15,5	6	2	2
8331230	M6	1	4,6	50	18,5	6	2	2
8331224	M8	1,25	6,2	70	20,38	8	2	2
8331231	M8	1,25	6,2	70	24,38	8	2	2
8331225	M10	1,5	7,5	80	25,25	10	2	2
8331232	M10	1,5	7,5	80	30,25	10	2	2
8331226	M12	1,75	9	80	30,13	10	2	2
8331233	M12	1,75	9	80	36,13	10	2	2

Threading | Thread milling  
Metric

# WH-EM-PNC

Threading | Thread milling | Metric



- Thread milling without pre-drilled hole
- WXS coating
- For hardened steels up to 62 HRC and stainless steels

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ○ INOX	<b>K</b> ○ GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>S</b> ● Ti	<b>S</b> ● Ni	<b>H</b> ● 25-45 HRC	<b>H</b> ● 45-55 HRC	<b>H</b> ● ~65 HRC		
35-55	80-160	80-160	60-120	35-100	35-100	35-100	35-100	35-100	35-55	35-55	35-75	35-65	35-55	m/min	
0,01~0,03	0,01~0,03	0,01~0,03	0,01~0,03	0,01~0,03	0,01~0,1	0,01~0,05	0,01~0,05	0,01~0,1	0,01~0,03	0,01~0,03	0,01~0,03	0,01~0,03	0,01~0,03	mm/t	
<b>M</b>	<b>CARBIDE</b>	<b>WXS</b>	<b>h6</b>	<b>LH</b>											<b>A. 400</b>

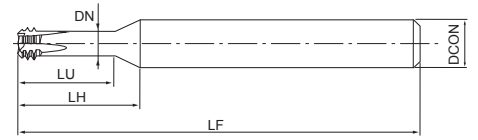
EDP	Minimum cutting bore diameter	TP	LF	LU	LH	DN	DCON	NOF
48347003	M3	0,5	50	7,5	12,3	1,7	6	4
48347004	M4	0,7	50	9,9	14,2	2,18	6	4
48347005	M5	0,8	50	12	15,5	2,97	6	4
48347006	M6	1	50	14,5	17,5	3,36	6	4
48347008	M8	1,25	70	19,2	24,1	4,66	10	4
48347010	M10	1,5	70	23,7	27,7	5,78	10	4
48347012	M12	1,75	80	28,4	31,4	6,92	10	4

Threading | Thread milling

Metric

# WHO-EM-PNC

Threading | Thread milling | Metric



- Thread milling without pre-drilled hole
- WXS coating
- For hardened steels up to 62 HRC and stainless steels
- Centre through coolant

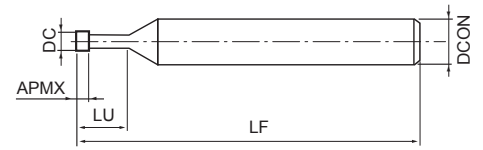
<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	<b>K</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>S</b>	<b>H</b>	<b>H</b>	<b>H</b>		
$C < 0,2\%$	$0,25 < C < 0,4$	$C \geq 0,45\%$	SCM	INOX	GG	GGG	Al	AC, ADC	Ti	Ni	25-45 HRC	45-55 HRC	~65 HRC		
35-55	80-160	80-160	60-120	35-100	35-100	35-100	35-100	35-100	35-55	35-55	35-75	35-65	35-55	m/min	
0,01~0,03	0,01~0,03	0,01~0,03	0,01~0,03	0,01~0,03	0,01~0,1	0,01~0,05	0,01~0,05	0,01~0,1	0,01~0,03	0,01~0,03	0,01~0,03	0,01~0,03	0,01~0,03	mm/t	
<b>M</b>	<b>CARBIDE</b>	<b>WXS</b>	<b>h6</b>		<b>LH</b>										<b>A. 401</b>

EDP	Minimum cutting bore diameter	TP	LF	LU	DN	DCON	NOF
48348003	M3	0,5	50	12,3	1,7	6	4
48348004	M4	0,7	50	14,2	2,18	6	4
48348005	M5	0,8	50	15,5	2,97	6	4
48348006	M6	1	50	17,5	3,36	6	4
48348008	M8	1,25	70	24,1	4,66	10	4
48348010	M10	1,5	70	27,7	5,78	10	4
48348012	M12	1,75	80	31,4	6,92	10	4
48348014	M14	2	90	37,9	6,62	12	4
48348016	M16	2	90	39,5	9,36	12	4

Threading | Thread milling  
Metric

# WX-ST-PNC-3P

Threading | Thread milling | Metric & Metric Fine



- Carbide thread milling cutter with 3 crest thread length
- WXS coating
- For all materials and hardened steels up to 50 HRC
- ThreadPro NC code generator software available

Threading | Thread milling

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	m/min
60-90	60-90	60-90	30-60	60-90	50-100	50-70	50-100	50-100	20-60	20-60	30-60	30-60	

<b>M</b>	<b>MF</b>	<b>MJ</b>	<b>CARBIDE</b>	<b>SC</b> D ≤ 1,3	<b>WXS</b> 1,5 ≤ D	<b>11°</b>	<b>h6</b>	<b>A. 400</b>
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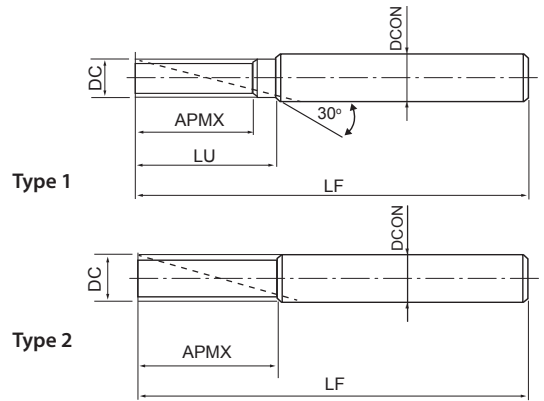
EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	LU	DCON	NOF
48216000	M1,8	0,35	1,3	40	1,05	5,4	3	3
48216001	M2	0,4	1,5	40	1,2	6	3	3
48216002	M2,5	0,45	1,9	40	1,35	7,5	6	3
48216003	M3	0,5	2,4	60	1,5	9,5	6	3
48216004	M4	0,7	3,1	60	2,1	12,7	6	3
48216005	M5	0,8	4	60	2,4	15,8	6	3
48216006	M6	1	4,5	60	3	20	6	4
48216007	M8	1,25	6	60	3,75	24	6	4
48216008	M10	1,5	7,5	80	4,5	33	8	4
48216009	M16	1,5	12	100	4,5	50	12	5
48216010	M20	1,5	16	100	4,5	50	16	5
48216011	M12	1,75	9,5	80	5,25	38	10	5
48216012	M16	2	12	100	6	50	12	5
48216013	M20	2	16	100	6	50	16	5
48216014	M20	2,5	16	100	7,5	50	16	5

Metric & Metric Fine



# WX-PNC

Threading | Thread milling | Metric & Metric Fine



- Carbide thread milling cutter
- WX coating
- For all materials
- ThreadPro NC code generator software available

Threading | Thread milling

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ○ INOX	<b>K</b> ○ GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>S</b> ● Ti	<b>S</b> ● Ni	<b>H</b> ○ 25-35 HRC	<b>H</b> ○ 35-45 HRC	m/min
50-75	50-75	40-70	15-30	20-40	50-100	50-65	50-70	65-130	20-60	20-60	15-30	15-30	

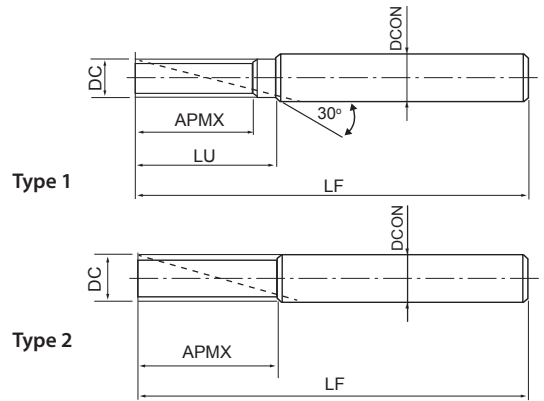
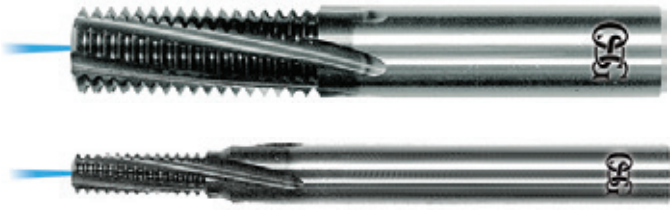
<b>M</b>	<b>MF</b>	<b>MJ</b>	<b>CARBIDE</b>	<b>WX</b>	<b>30°</b>	<b>h6</b>	<b>A. 405</b>
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Metric & Metric Fine

EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	LU	DCON	NOF	Type
3900001	M6	1	4,5	60	13	15	6	3	1
3900011	M8	1	6	65	17	-	6	3	2
3900012	M8	1,25	6	65	17,5	-	6	3	2
3900021	M10	1	7,5	70	21	26	8	3	1
1004470640	M10	1,25	7,5	70	21,3	26	8	3	1
3900023	M10	1,5	7,5	70	22,5	26	8	3	1
3900033	M12	1,5	9,5	85	25,5	28	10	4	1
3900032	M12	1,25	9,5	85	26,3	28	10	4	1
3900034	M12	1,75	9,5	85	26,3	28	10	4	1
3900042	M14	1	10	85	29	-	10	4	2
3900043	M14	1,5	10	85	30	-	10	4	2
3900044	M14	2	10	85	30	-	10	4	2
3900052	M16	1	12	95	33	-	12	4	2
3900054	M16	2	12	95	34	-	12	4	2
3900053	M16	1,5	12	95	34,5	-	12	4	2
3900073	M20	1,5	16	105	42	-	16	4	2
3900075	M20	2,5	16	105	42,5	-	16	4	2
3900083	M27	1,5	20	120	49,5	-	20	5	2
3900084	M27	2	20	120	50	-	20	5	2
3900086	M27	3	20	120	51	-	20	5	2

# WXO-ST-PNC

Threading | Thread milling | Metric & Metric Fine



- Carbide thread milling cutter with centre through coolant
- WX coating
- For all materials and hardened steels up to 45 HRC
- ThreadPro NC code generator software available

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ○ GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>H</b> ● 25-35 HRC	<b>H</b> ● 35-45 HRC	m/min
80-120	80-120	80-120	80-120	40-80	50-100	50-65	50-70	65-130	60-100	60-100	

<b>M</b>	<b>MF</b>	<b>MJ</b>	<b>CARBIDE</b>	<b>WX</b>	<b>11°</b>		<b>h6</b>	 A. 405
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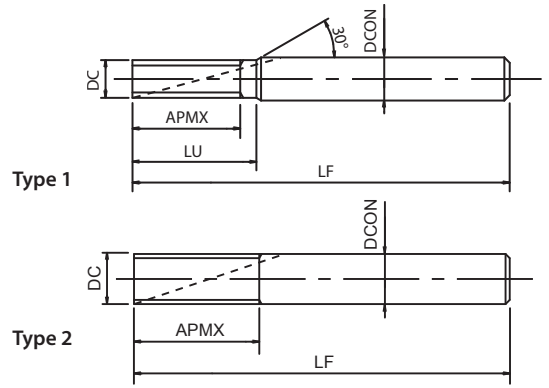
EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	LU	DCON	NOF	Type
8304700	M6	0,75	4,5	60	12,8	15	6	4	1
8304701	M6	1	4,5	60	13	15	6	4	1
8304710	M8	0,5	6	65	16,5	-	6	4	2
8304711	M8	1	6	65	17	-	6	4	2
8304712	M8	1,25	6	65	17,5	-	6	4	2
8304721	M10	1	7,5	70	21	26	8	4	1
8304723	M10	1,5	7,5	70	22,5	26	8	4	1
8304732	M12	1,25	9,5	85	26,3	28	10	5	1
8304733	M12	1,5	9,5	85	25,5	28	10	5	1
8304734	M12	1,75	9,5	85	26,3	28	10	5	1
8304740	M14	0,5	10	85	28,5	-	10	5	2
8304741	M14	0,75	10	85	29,3	-	10	5	2
8304742	M14	1	10	85	29	-	10	5	2
8304743	M14	1,5	10	85	30	-	10	5	2
8304744	M14	2	10	85	30	-	10	5	2
8304752	M16	1	12	95	33	-	12	5	2
8304753	M16	1,5	12	95	34,5	-	12	5	2
8304754	M16	2	12	95	34	-	12	5	2
8304773	M20	1,5	16	105	42	-	16	5	2
8304775	M20	2,5	16	105	42,5	-	16	5	2
8304783	M27	1,5	20	120	49,5	-	20	6	2
8304784	M27	2	20	120	50	-	20	6	2
8304786	M27	3	20	120	51	-	20	6	2

Threading | Thread milling

Metric & Metric Fine

# AT-1

Threading | Thread milling | UNC UNJC UNF UNJF



- First choice in quality and performance
- One pass thread mill
- EgiAs coating
- For all materials and hardened steels up to 45 HRC
- ThreadPro NC code generator software available

Threading | Thread milling

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	<b>K</b>	<b>N</b>	<b>N</b>	<b>H</b>	<b>H</b>	m/min
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GG	GGG	Al	AC, ADC	25-35 HRC	35-45 HRC	
80-160	80-160	80-160	60-120	60-120	80-160	60-120	80-160	100-300	80-200	80-200	

<b>A</b>	<b>UNC</b>	<b>UNJC</b>	<b>UNF</b>	<b>UNJF</b>	<b>CARBIDE</b>	<b>EgiAs</b>	<b>9° ~ 13°</b>	<b>h6</b>	<b>A. 400</b>
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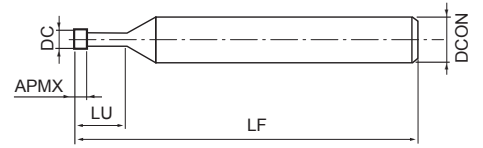
UNC UNJC UNF UNJF

EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	LU	DCON	NOF	Type
8331026	UN1/4	20	4,55	75	15,24	17,78	6	4	1
8331027	UN1/4	28	4,55	75	15,42	17,23	6	4	1
8331028	UN5/16	18	5,7	75	19,75	-	6	4	2
8331029	UN5/16	24	5,7	75	19,04	-	6	4	2
8331030	UN5/16	32	5,7	75	17,47	-	6	4	2
8331031	UN3/8	16	6,7	85	22,23	25,41	8	4	1
8331032	UN3/8	24	6,7	85	22,22	24,33	8	4	1
8331033	UN3/8	32	6,7	85	20,64	22,23	8	4	1
8331034	UN7/16	14	7,7	85	27,21	-	8	4	2
8331035	UN7/16	20	7,7	85	25,4	-	8	4	2
8331036	UN1/2	13	8,7	100	29,31	33,22	10	5	1
8331037	UN1/2	20	8,7	100	27,94	30,48	10	5	1
8331038	UN1/2	28	8,7	100	28,12	29,93	10	5	1
8331039	UN9/16	12	9,7	100	33,87	-	10	5	2
8331040	UN9/16	18	9,7	100	32,45	-	10	5	2
8331041	UN5/8	11	10,7	120	36,94	41,56	12	5	1
8331042	UN5/8	18	10,7	120	35,28	38,1	12	5	1
8331043	UN5/8	24	10,7	120	34,91	37,03	12	5	1
8331044	UN3/4	10	11,7	120	43,18	-	12	5	2
8331045	UN3/4	16	11,7	120	41,29	-	12	5	2
8331046	UN7/8	9	13,7	135	50,8	56,44	16	5	1
8331047	UN7/8	14	13,7	135	48,98	52,61	16	5	1
8331048	UN1	8	18,7	150	57,15	63,5	20	6	1
8331049	UN1	20	18,7	150	53,34	55,88	20	6	1



# AT-2 NEW

Threading | Thread milling | UNC UNF



- First choice in quality and performance
- Thread milling without pre-drilled hole
- DUROREY coating
- For hardened steels up to 65 HRC and stainless steels
- ThreadPro NC code generator software available

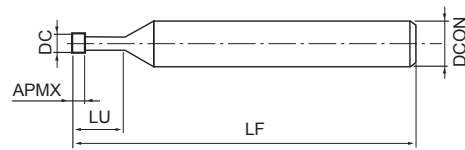
<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ○ INOX	<b>K</b> ○ GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>S</b> ● Ti	<b>S</b> ● Ni	<b>H</b> ● 25-45 HRC	<b>H</b> ● 45-55 HRC	<b>H</b> ● ~65 HRC	m/min
35-55 0,01~0,07	80-160 0,01~0,07	80-160 0,01~0,07	60-120 0,01~0,07	35-100 0,01~0,07	35-100 0,01~0,07	35-100 0,01~0,07	35-100 0,01~0,07	35-100 0,01~0,07	35-55 0,01~0,07	35-55 0,01~0,07	35-75 0,01~0,07	35-65 0,01~0,07	35-55 0,01~0,07	mm/t
<b>A</b>	UNC	UNJC	UNF	UNJF	CARBIDE	DUROREY	h6							 A. 401

EDP	Minimum cutting bore diameter	Maximum cutting bore diameter	TP	DC	LF	LU	DCON	NOF	Type
8331246	No 8	5,2	32	3,1	50	10,3	6	4	1
8331254	No 8	5,2	32	3,1	50	12,4	6	4	1
8331247	No 10	6,1	24	3,7	70	12,2	6	4	1
8331255	No 10	6,1	24	3,7	70	14,7	6	4	1
8331248	UN1/4	7,6	20	4,55	70	15,8	6	4	1
8331256	UN1/4	7,6	20	4,55	70	19	6	4	1
8331249	UN1/4	8	28	4,55	70	14,9	6	4	1
8331257	UN1/4	8	28	4,55	70	18,1	6	4	1
8331250	UN5/16	9,7	18	5,7	80	19,4	10	4	1
8331258	UN5/16	9,7	18	5,7	80	23,3	10	4	1
8331251	UN3/8	11,6	16	6,7	80	23	10	4	1
8331259	UN3/8	11,6	16	6,7	80	27,7	10	4	1
8331252	UN7/16	13,3	14	7,7	80	26,7	10	4	2
8331260	UN7/16	13,3	14	7,7	80	32,3	10	4	2
8331253	UN1/2	16,2	13	9,2	80	30,2	10	4	2
8331261	UN1/2	16,2	13	9,2	80	36,6	10	4	2

Threading | Thread milling  
UNC UNF

# WH-VM-PNC

Threading | Thread milling | UNC UNJC UNF UNJF



- Carbide thread milling cutter for small sizes
- WXS coating
- For all materials and hardened steels up to 50 HRC
- ThreadPro NC code generator software available

Threading | Thread milling

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ○ INOX	<b>K</b> ○ GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>S</b> ● Ti	<b>S</b> ● Ni	<b>H</b> ● 25-35 HRC	<b>H</b> ● 35-45 HRC	m/min
60-90	60-90	60-90	30-60	60-90	50-100	50-70	50-100	50-100	20-60	20-60	30-60	30-60	

UNC UNJC UNF UNJF CARBIDE WXS 11° h6
 A. 400

EDP	Minimum cutting bore diameter	Thread per flute	TP	DC	LF	APMX	LU	DCON	NOF
3900513	N8	3	32	3,2	40	2,4	9,1	6	3

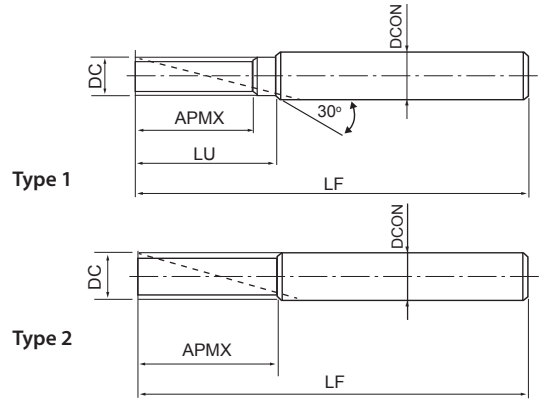
UNC UNJC UNF UNJF

# WX-PNC

Threading | Thread milling | UNC UNJC UNF UNJF



- Carbide thread milling cutter
- WX coating
- For all materials
- ThreadPro NC code generator software available



<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ○ INOX	<b>K</b> ○ GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>S</b> ● Ti	<b>S</b> ● Ni	<b>H</b> ○ 25-35 HRC	<b>H</b> ○ 35-45 HRC	m/min
50-75	50-75	40-70	15-30	20-40	50-100	50-65	50-70	65-130	20-60	20-60	15-30	15-30	

<b>UNC</b>	<b>UNJC</b>	<b>UNF</b>	<b>UNJF</b>	<b>CARBIDE</b>	<b>WX</b>	<b>30°</b>	<b>h6</b>	A. 405
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EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	LU	DCON	NOF	Type
3900350	UN1/4	20	4,55	60	10,2	11,4	6	3	1
3900351	UN1/4	28	4,55	60	10	10,9	6	3	1
3900355	UN5/16	18	6,2	65	12,7	14,1	8	3	1
3900356	UN5/16	24	6,2	65	12,7	14,1	8	3	1
3900360	UN3/8	16	7,6	65	14,3	-	8	3	2
3900361	UN3/8	24	7,6	65	14,8	-	8	3	2
3900365	UN7/16	14	8,8	75	18,1	19,9	10	3	1
3900366	UN7/16	20	8,8	75	17,8	19,1	10	3	1
3900370	UN1/2	13	9,4	75	19,5	21,5	10	4	1
3900371	UN1/2	20	9,4	75	19,1	20,4	10	4	1
3900375	UN9/16	12	10,9	85	23,3	25,4	12	4	1
3900380	UN9/16	18	11,4	85	22,6	24	12	4	1
3900390	UN7/8	12	18,9	110	33,9	36	20	4	1

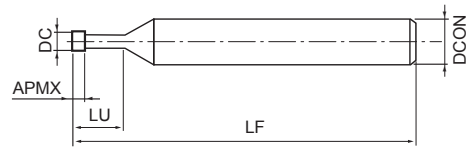
Threading | Thread milling

UNC UNJC UNF UNJF

A

# WX-ST-PNC-3P

Threading | Thread milling | G



- Carbide thread milling cutter with 3 crest thread length
- WXS coating
- For all materials and hardened steels up to 50 HRC
- ThreadPro NC code generator software available

Threading | Thread milling

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ○ INOX	<b>K</b> ○ GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>S</b> ● Ti	<b>S</b> ● Ni	<b>H</b> ● 25-35 HRC	<b>H</b> ● 35-45 HRC	m/min
60-90	60-90	60-90	30-60	60-90	50-100	50-70	50-100	50-100	20-60	20-60	30-60	30-60	

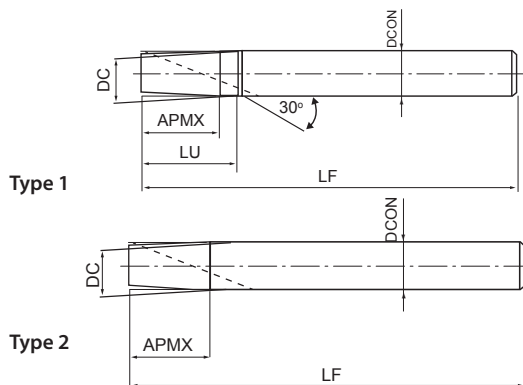
**G**    **CARBIDE**    **WXS**    **11°**    **h6**



EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	LU	DCON	NOF
48216100	G1/8 G1/16	28	5,9	64	2,72	19,5	8	4
48216101	G1/4 G3/8	19	10	80	4	30	10	5
48216102	G1/2 G7/8	14	12	100	5,44	37	12	5
48216103	G1 G2	11	16	100	6,93	48	16	5

# WX-PNC

Threading | Thread milling | G



- Carbide thread milling cutter
- WX coating
- For all materials
- ThreadPro NC code generator software available

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>M</b> ○ INOX	<b>K</b> ○ GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>S</b> ● Ti	<b>S</b> ● Ni	<b>H</b> ○ 25-35 HRC	<b>H</b> ○ 35-45 HRC	m/min
50-75	50-75	40-70	15-30	20-40	50-100	50-65	50-70	65-130	20-60	20-60	15-30	15-30	

G

CARBIDE

WX

30°

h6

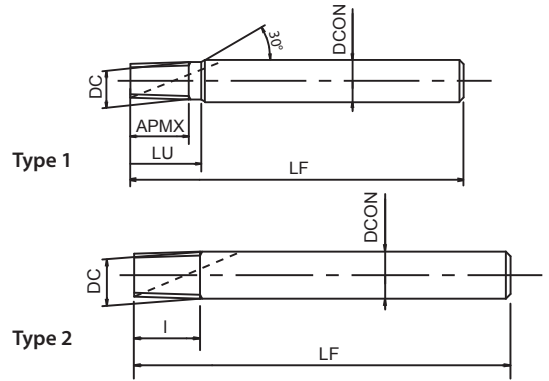
A. 405

EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	LU	DCON	NOF	Type
3900299	G1/16 G1/8	28	5,9	60	11,8	-	6	3	2
3900301	G1/8	28	7,5	65	14,5	15,4	8	3	1
3900311	G1/4 G3/8	19	10	75	20,1	-	10	4	2
3900312	G3/8	19	11	85	25,4	26,7	12	4	1



# AT-1

Threading | Thread milling | Rc (PT), R (PT)



- First choice in quality and performance
- One pass thread mill
- EgiAs coating
- For all materials and hardened steels up to 45 HRC
- ThreadPro NC code generator software available

Threading | Thread milling

<b>P</b> ●	<b>P</b> ●	<b>P</b> ●	<b>P</b> ●	<b>M</b> ●	<b>K</b> ○	<b>K</b> ○	<b>N</b> ○	<b>N</b> ●	<b>H</b> ●	<b>H</b> ●	m/min
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GG	GGG	Al	AC, ADC	25-35 HRC	35-45 HRC	
80-160	80-160	80-160	60-120	60-120	80-160	60-120	80-160	100-300	80-200	80-200	

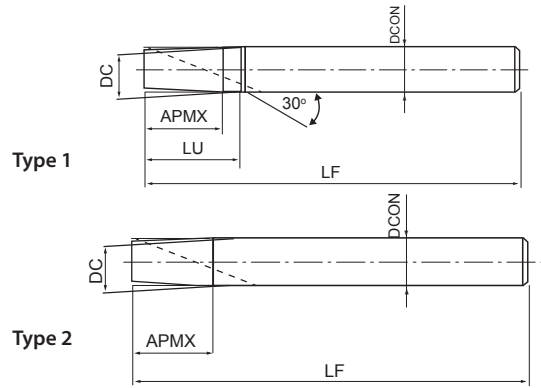
<b>A</b>	<b>Rc (PT)</b>	<b>R (PT)</b>	CARBIDE	EgiAs	9°~13°	h6
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EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	LU	DCON	NOF	Type
8331075	1/16	28	5,67	60	9,1	-	6	4	2
8331076	1/8	28	7,67	60	9,1	12,7	8	4	1
8331077	1/4-3/8	19	9,67	75	14,7	-	10	5	2
8331078	3/8	19	11,67	85	14,7	20	12	5	1
8331079	1/2-3/4	14	11,67	85	20	-	12	5	2
8331080	3/4	14	15,67	95	20	-	16	5	2
8331081	1-2	11	19,67	105	27,7	-	20	6	2

Rc (PT), R (PT)





- Carbide thread milling cutter
- WX coating
- For all materials
- ThreadPro NC code generator software available

Threading | Thread milling

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	<b>K</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>S</b>	<b>H</b>	<b>H</b>	<b>m/min</b>
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GG	GGG	Al	AC, ADC	Ti	Ni	25-35 HRC	35-45 HRC	
50-75	50-75	40-70	15-30	20-40	50-100	50-65	50-70	65-130	20-60	20-60	15-30	15-30	

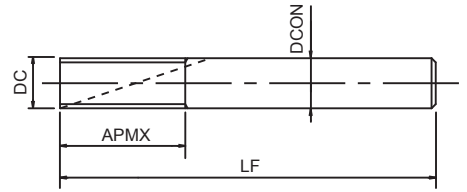
**Rc (PT)**   **R (PT)**   **CARBIDE**   **WX**   **30°**   **h6**
 A. 405

EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	LU	DCON	NOF	Type
3900201	1/8	28	7,5	60	9,1	12,7	8	3	1
3900211	1/4-3/8	19	10	75	14,7	-	10	4	2
3900214	1/2-3/4	14	12	85	20	-	12	4	2
3900218	1-2	11	20	95	27,7	-	20	5	2



# AT-1

## Threading | Thread milling | G



- First choice in quality and performance
- One pass thread mill
- EgiAs coating
- For all materials and hardened steels up to 45 HRC
- ThreadPro NC code generator software available

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	<b>K</b>	<b>N</b>	<b>N</b>	<b>H</b>	<b>H</b>	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GG	GGG	Al	AC, ADC	25-35 HRC	35-45 HRC	m/min
80-160	80-160	80-160	60-120	60-120	80-160	60-120	80-160	100-300	80-200	80-200	

<b>A</b>	<b>Rp (PS)</b>	<b>G (PF)</b>	CARBIDE	EgiAs	9°~13°	h6	A. 400
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EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	DCON	NOF	Type
8331082	1/16-1/8	28	5,67	60	11,8	6	4	3
8331083	1/8	28	7,67	65	14,5	8	4	3
8331084	1/4-3/8	19	9,67	80	20,1	10	5	3
8331085	3/8	19	11,67	100	25,4	12	5	3
8331086	1/2-7/8	14	11,67	100	32,7	12	5	3
8331087	3/4-7/8	14	15,67	115	39,9	16	5	3
8331088	1-2	11	19,67	130	50,8	20	6	3

Threading | Thread milling



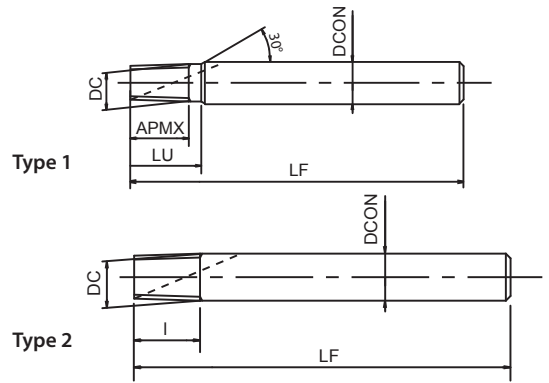
G

# AT-1

Threading | Thread milling | NPT



- First choice in quality and performance
- One pass thread mill
- EgiAs coating
- For all materials and hardened steels up to 45 HRC
- ThreadPro NC code generator software available



Threading | Thread milling

<b>P</b> C < 0,2% 80-160	<b>P</b> 0,25 < C < 0,4 80-160	<b>P</b> C ≥ 0,45% 80-160	<b>P</b> SCM 60-120	<b>M</b> INOX 60-120	<b>K</b> GG 80-160	<b>K</b> GGG 60-120	<b>N</b> AI 80-160	<b>N</b> AC, ADC 100-300	<b>H</b> 25-35 HRC 80-200	<b>H</b> 35-45 HRC 80-200	m/min
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**A** | **NPT** | **CARBIDE** | **EgiAs** | **9°~13°** | **h6**



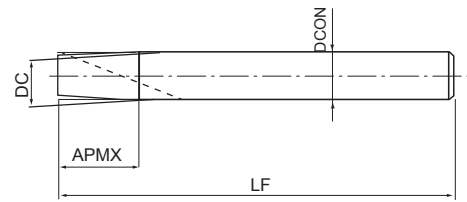
NPT

EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	LU	DCON	NOF	Type
8331089	1/16-1/8	27	5,67	60	10,35	-	6	4	2
8331090	1/8	27	7,67	60	10,35	-	8	4	2
8331091	1/4-3/8	18	9,67	75	15,52	-	10	5	2
8331092	3/8	18	11,67	85	15,52	-	12	5	2
8331093	1/2-3/4	14	15,67	95	19,96	-	16	5	2
8331094	1-2	11,5	18,72	105	24,3	28,7	20	6	1



# WX-PNC

Threading | Thread milling | NPT



- Carbide thread milling cutter
- WX coating
- For all materials
- ThreadPro NC code generator software available

Threading | Thread milling

P	P	P	P	M	K	K	N	N	S	S	H	H	
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GG	GGG	Al	AC, ADC	Ti	Ni	25-35 HRC	35-45 HRC	m/min
50-75	50-75	40-70	15-30	20-40	50-100	50-65	50-70	65-130	20-60	20-60	15-30	15-30	

**NPT**
**CARBIDE**
**WX**
**30°**
**h6**
A. 405

EDP	Minimum cutting bore diameter	TP	DC	LF	APMX	DCON	NOF
3900259	1/16-1/8	27	5,9	60	10,3	6	3
3900261	1/4-3/8	18	10	75	15,5	10	4
3900265	1/2-3/4	14	16	85	20	16	4
3900268	1-2	11,5	20	95	24,3	20	5

# E-DCT

Threading | Measuring | M MJ



- Diameter correction tool for thread mill
- Reduce the set up and machining time

M MJ ISO 2  
6H

For 6H

EDP	Thread size
G1609311	M(J)3 x 0,5
G1609312	M(J)4 x 0,7
G1609313	M(J)5 x 0,8
G1609314	M(J)6 x 1
G1609317	M(J)8 x 1,25
G1609322	M(J)10 x 1,5
G1609323	M(J)10 x 1,25
G1609325	M(J)12 x 1,75
G1609326	M(J)12 x 1,5
G1609327	M(J)12 x 1,25
G1609329	M(J)14 x 2
G1609330	M(J)14 x 1,5
G1609334	M(J)16 x 2
G1609335	M(J)16 x 1,5
G1609339	M(J)20 x 2,5
G1609340	M(J)20 x 1,5



# E-DCT

Threading | Measuring | UNJC UNJF



- Diameter correction tool for thread mill
- Reduce the set up and machining time

Threading | Measuring

UNJC

UNJF

For 3B

EDP	Thread size
G1609623	1/4 - 20 UN(J)C
G1609624	1/4 - 28 UN(J)F
G1609625	5/16 - 18 UN(J)C
G1609626	5/16 - 24 UN(J)F
G1609627	3/8 - 16 UN(J)C
G1609628	3/8 - 24 UN(J)F
G1609631	1/2 - 13 UN(J)C
G1609632	1/2 - 20 UN(J)F
G1609635	5/8 - 11 UN(J)C
G1609636	5/8 - 18 UN(J)F
G1609638	3/4 - 16 UN(J)F

For EG-3B Helicoil

EDP	Thread size
G1609723	1/4 - 20 EG-UN(J)C
G1609724	1/4 - 28 EG-UN(J)F
G1609726	5/16 - 24 EG-UN(J)F
G1609728	3/8 - 24 EG-UN(J)F
G1609731	1/2 - 13 EG-UN(J)C
G1609732	1/2 - 20 EG-UN(J)F
G1609736	5/8 - 18 EG-UN(J)F
G1609738	3/4 - 16 EG-UN(J)F

UNJC UNJF



- Diameter correction tool for thread mill
- Reduce the set up and machining time
- Measurable range 100% ~-50% tolerance of thread size 6H

EDP	Thread size	Measurable depth in blind hole (mm)	Sleeve diameter
9342000	M6 x 1 - 1,5D	9	13
9342001	M8 x 1,25 - 1,5D	12	13
9342002	M8 x 1 - 1,5D	12	13
9342003	M10 x 1,5 - 1,2D	12	15
9342004	M10 x 1 - 1,2D	12	15
9342005	M12 x 1,75 - 1,2D	14,4	17
9342006	M12 x 1,5 - 1,2D	14,4	17
9342007	M12 x 1,25 - 1,2D	14,4	17
9342008	M14 x 2 - 1,2D	16,8	19
9342009	M14 x 1,5 - 1,2D	16,8	19
9342010	M14 x 1 - 1,2D	16,8	19
9342011	M16 x 2 - 1D	16	21
9342012	M16 x 1,5 - 1D	16	21
9342013	M18 x 2,5 - 1D	18	23
9342014	M18 x 1,5 - 1D	18	23
9342015	M20 x 2,5 - 1D	20	25
9342016	M20 x 1,5 - 1D	20	25
9342017	M24 x 3 - 1D	24	29





















# CUTTING CONDITIONS

Threading | Thread mills | Cutting conditions

## AT-1

Work Material		Vc (m/min)	F (mm/tooth)
Low Tensile Strength Steel	C~0,25%	80~160	0,01~0,05
Medium Tensile Strength Steel	C~0,25% ~ 0,45%	80~160	0,01~0,05
High Tensile Strength Steel	C~0,45%	80~160	0,01~0,05
Alloy Steel	SCM	60~120	0,01~0,05
Hardened Steel	25~45 HRC	80~200	0,01~0,05
	45~55 HRC	-	-
	50~60 HRC	-	-
Stainless Steel	SUS	60~120	0,01~0,05
Tool Steel	SKD	-	-
Cast Steel	SC	60~120	0,01~0,05
Cast Iron	FC	80~160	0,01~0,05
Ductile Cast Iron	FCD	60~120	0,01~0,05
Copper	Cu	80~160	0,03~0,1
Brass	Bs	80~160	0,03~0,1
Brass Casting	BsC	80~160	0,03~0,1
Bronze	PB	80~160	0,03~0,1
Aluminium Rolled Steel	AL	80~160	0,03~0,1
Aluminium Alloy Casting	AC, ADC	100~300	0,05~0,2
Magnesium Alloy Casting	MC	100~300	0,05~0,2
Zinc Alloy Casting	ZDC	100~300	0,05~0,2
Titanium Alloy	Ti-6AL-4V	-	-
Nickel Alloy	Inconel®	-	-
Thermosetting plastic	-	80~160	0,03~0,1
Thermoplastic	-	80~160	0,03~0,1

1. The indicated speeds and feeds are for water-soluble oil.
2. Water-soluble oil is not suitable for tapping magnesium alloy.
3. Please adjust the cutting conditions depending on the rigidity of machine, tool holders, and workpiece clamping.
4. If the tapping length is long, or when machining a large-pitch thread, select a smaller feed rate and separate the machining process into a few segments.
5. If a machined parallel internal thread is tapered and prevents the go-gauge from going through, add a zero cut (finish machining).

## WH-VM-PNC/WX-ST-PNC-3P


Work Material		Vc (m/min)	F (mm/tooth)
Low Tensile Strength Steel	C~0,25%	60~90	0,02~0,08
Medium Tensile Strength Steel	C~0,25% ~ 0,45%	60~90	0,02~0,08
High Tensile Strength Steel	C~0,45%	60~90	0,02~0,08
Alloy Steel	SCM	30~60	0,01~0,03
Hardened Steel	25~45 HRC	30~60	0,01~0,03
	45~55 HRC	30~60	0,01~0,03
	50~60 HRC	-	-
Stainless Steel	SUS	60~90	0,02~0,08
Tool Steel	SKD	-	-
Cast Steel	SC	40~65	0,02~0,09
Cast Iron	FC	50~100	0,03~0,1
Ductile Cast Iron	FCD	50~70	0,03~0,1
Copper	Cu	-	-
Brass	Bs	-	-
Brass Casting	BsC	50~100	0,02~0,06
Bronze	PB	50~100	0,02~0,06
Aluminium Rolled Steel	AL	50~100	0,02~0,06
Aluminium Alloy Casting	AC, ADC	50~100	0,02~0,06
Magnesium Alloy Casting	MC	50~100	0,02~0,06
Zinc Alloy Casting	ZDC	50~100	0,02~0,06
Titanium Alloy	Ti-6AL-4V	20~60	0,01~0,03
Nickel Alloy	Inconel®	20~60	0,01~0,03
Thermosetting plastic	-	50~100	0,02~0,06
Thermoplastic	-	50~100	0,02~0,06




# CUTTING CONDITIONS

Threading | Thread mills | Cutting conditions

## AT-2 / WH(O)-EM-PNC

			Low Carbon Steel - Mild Steel ~C0,25%			Medium Carbon Steel - High Carbon Steel ~C0,25%			Alloy Steel SCM		
Recommended Coolant			Water-Soluble			Water-Soluble			Water-Soluble		
Vc (m/min)			35 ~ 55			80 ~ 160			60 ~ 120		
Thread	Thread Size	DC	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)
M	M 3 x0,5	2,4	5.968	48	0,01	10.610	85	0,01	7.958	64	0,01
	M 4 x0,7	3,1	4.621	62	0,015	8.214	111	0,015	6.161	83	0,015
	M 5 x0,8	4	3.581	49	0,017	6.366	87	0,017	4.775	65	0,017
	M 6 x1	4,6	3.114	58	0,02	5.536	103	0,02	4.152	78	0,02
	M 8 x1,25	6,2	2.310	62	0,03	4.107	111	0,03	3.080	83	0,03
	M 10 x1,5	7,5	1.910	67	0,035	3.395	119	0,035	2.546	89	0,035
	M 12 x1,75	9	1.592	72	0,045	2.829	127	0,045	2.122	95	0,045
	M 16 x2	11,7	1.224	72	0,055	2.176	129	0,055	1.632	96	0,055
	M 18 x2,5	14	1.023	55	0,06	1.819	97	0,06	1.364	73	0,06
	M 20 x2,5	15,7	912	51	0,065	1.622	91	0,065	1.216	68	0,065
U	No. 8 - 32UNC	3,1	4.621	47	0,01	8.214	84	0,01	6.161	63	0,01
	No. 10 - 24UNC	3,7	3.871	54	0,015	6.882	96	0,015	5.162	72	0,015
	1/4 - 20UNC	4,55	3.148	89	0,025	5.597	159	0,025	4.197	119	0,025
	1/4 - 28UNF	4,55	3.148	89	0,025	5.597	159	0,025	4.197	119	0,025
	5/16 - 18UNC	5,7	2.513	85	0,03	4.468	151	0,03	3.351	113	0,03
	3/8 - 16UNC	6,7	2.138	89	0,035	3.801	158	0,035	2.851	118	0,035
	7/16 - 14UNC	7,7	1.860	91	0,04	3.307	162	0,04	2.480	122	0,04
Rc (PT)	1/2 - 13UNC	9,2	1.557	77	0,045	2.768	137	0,045	2.076	103	0,045
	1/16 - 28	4,86	2.982	*1	0,025	5.302	*1	0,025	3.976	*1	0,025
	1/8 - 28	5,76	2.512	*1	0,03	4.465	*1	0,03	3.349	*1	0,03
	1/4 - 19	7,98	1.814	*1	0,04	3.225	*1	0,04	2.419	*1	0,04
	3/8 - 19	9,68	1.493	*1	0,045	2.654	*1	0,045	1.990	*1	0,045
	1/2 - 14	11,61	1.246	*1	0,055	2.215	*1	0,055	1.661	*1	0,055
	1 - 11	15,54	930	*1	0,065	1.654	*1	0,065	1.240	*1	0,065
NPT	1/16 - 27	4,86	2.984	*1	0,025	5.304	*1	0,025	3.978	*1	0,025
	1/8 - 27	5,76	2.513	*1	0,03	4.467	*1	0,03	3.350	*1	0,03
	1/4 - 18	7,98	1.815	*1	0,04	3.227	*1	0,04	2.420	*1	0,04
	3/8 - 18	9,68	1.493	*1	0,045	2.655	*1	0,045	1.991	*1	0,045
	1/2 - 14	11,61	1.246	*1	0,055	2.215	*1	0,055	1.661	*1	0,055
	1 - 11 1/2	15,54	930	*1	0,065	1.653	*1	0,065	1.240	*1	0,065

			Hardened Steel								
Recommended Coolant			25~45 HRC			45~50 HRC			50~65 HRC		
Vc (m/min)			35 ~ 75			35 ~ 65			35 ~ 55		
Thread	Thread Size	DC	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)
M	M 3 x0,5	2,4	5.968	48	0,01	5.968	48	0,01	5.968	48	0,01
	M 4 x0,7	3,1	4.621	62	0,015	4.621	62	0,015	4.621	62	0,015
	M 5 x0,8	4	3.581	49	0,017	3.581	49	0,017	3.581	49	0,017
	M 6 x1	4,6	3.114	58	0,02	3.114	58	0,02	3.114	58	0,02
	M 8 x1,25	6,2	2.310	62	0,03	2.310	62	0,03	2.310	62	0,03
	M 10 x1,5	7,5	1.910	67	0,035	1.910	67	0,035	1.910	67	0,035
	M 12 x1,75	9	1.592	72	0,045	1.592	72	0,045	1.592	72	0,045
	M 16 x2	11,7	1.224	72	0,055	1.224	72	0,055	1.224	72	0,055
	M 18 x2,5	14	1.023	55	0,06	1.023	55	0,06	1.023	55	0,06
	M 20 x2,5	15,7	912	51	0,065	912	51	0,065	912	51	0,065
U	No. 8 - 32UNC	3,1	4.621	47	0,01	4.621	47	0,01	4.621	47	0,01
	No. 10 - 24UNC	3,7	3.871	54	0,015	3.871	54	0,015	3.871	54	0,015
	1/4 - 20UNC	4,55	3.148	89	0,025	3.148	89	0,025	3.148	89	0,025
	1/4 - 28UNF	4,55	3.148	89	0,025	3.148	89	0,025	3.148	89	0,025
	5/16 - 18UNC	5,7	2.513	85	0,03	2.513	85	0,03	2.513	85	0,03
	3/8 - 16UNC	6,7	2.138	89	0,035	2.138	89	0,035	2.138	89	0,035
	7/16 - 14UNC	7,7	1.860	91	0,04	1.860	91	0,04	1.860	91	0,04
Rc (PT)	1/2 - 13UNC	9,2	1.557	77	0,045	1.557	77	0,045	1.557	77	0,045
	1/16 - 28	4,86	2.982	*1	0,025	2.982	*1	0,025	2.982	*1	0,025
	1/8 - 28	5,76	2.512	*1	0,03	2.512	*1	0,03	2.512	*1	0,03
	1/4 - 19	7,98	1.814	*1	0,04	1.814	*1	0,04	1.814	*1	0,04
	3/8 - 19	9,68	1.493	*1	0,045	1.493	*1	0,045	1.493	*1	0,045
	1/2 - 14	11,61	1.246	*1	0,055	1.246	*1	0,055	1.246	*1	0,055
	1 - 11	15,54	930	*1	0,065	930	*1	0,065	930	*1	0,065
NPT	1/16 - 27	4,86	2.984	*1	0,025	2.984	*1	0,025	2.984	*1	0,025
	1/8 - 27	5,76	2.513	*1	0,03	2.513	*1	0,03	2.513	*1	0,03
	1/4 - 18	7,98	1.815	*1	0,04	1.815	*1	0,04	1.815	*1	0,04
	3/8 - 18	9,68	1.493	*1	0,045	1.493	*1	0,045	1.493	*1	0,045
	1/2 - 14	11,61	1.246	*1	0,055	1.246	*1	0,055	1.246	*1	0,055
	1 - 11 1/2	15,54	930	*1	0,065	930	*1	0,065	930	*1	0,065

\* Values vary depending on the depth of hole to be machined.

1. This cutting condition table shows standard values. When machining, it is recommended to use the program created by the NC code generator software ThreadPro.
2. Please adjust the cutting conditions depending on the rigidity of machine, tool holders and workpiece clamping.
3. Tool vibrations should be kept at a minimum level for maximum accuracy.
4. When machining magnesium alloy materials, please use the coolant oil recommended by the coolant oil manufacturer. Please also properly dispose the cutting chips to prevent fire hazards.
5. Spindle rotation must be counterclockwise due to the left-hand cut configuration.


Threading | Thread mills


Cutting conditions

# CUTTING CONDITIONS

Threading | Thread mills | Cutting conditions

## AT-2 / WH(O)-EM-PNC

			Stainless Steel - Tool Steel SUS304 - SKD			Cast Steel - Cast Iron - Ductile Cast Iron SC - FC - FCD			Copper - Brass - Brass Casting - Bronze Cu - Bs - BsC - PB					
			Water-Soluble			Air-Blow			~20HRC			20HRC~		
Recommended Coolant			Water-Soluble			Air-Blow			Water-Soluble					
Vc (m/min)			35 ~ 100			35 ~ 100			35 ~ 100			35 ~ 75		
Thread	Thread Size	DC	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)
M	M 3 ×0,5	2,4	5.968	48	0,01	7.958	64	0,01	7.958	64	0,01	5.968	48	0,01
	M 4 ×0,7	3,1	4.621	62	0,015	6.161	83	0,015	6.161	83	0,015	4.621	62	0,015
	M 5 ×0,8	4	3.581	49	0,017	4.775	65	0,017	4.775	65	0,017	3.581	49	0,017
	M 6 ×1	4,6	3.114	58	0,02	4.152	78	0,02	4.152	78	0,02	3.114	58	0,02
	M 8 ×1,25	6,2	2.310	62	0,03	3.080	83	0,03	3.080	83	0,03	2.310	62	0,03
	M 10 ×1,5	7,5	1.910	67	0,035	2.546	89	0,035	2.546	89	0,035	1.910	67	0,035
	M 12 ×1,75	9	1.592	72	0,045	2.122	95	0,045	2.122	95	0,045	1.592	72	0,045
	M 16 ×2	11,7	1.224	72	0,055	1.632	96	0,055	1.632	96	0,055	1.224	72	0,055
	M 18 ×2,5	14	1.023	55	0,06	1.364	73	0,06	1.364	73	0,06	1.023	55	0,06
	M 20 ×2,5	15,7	912	51	0,065	1.216	68	0,065	1.216	68	0,065	912	51	0,065
U	No. 8 - 32UNC	3,1	4.621	47	0,01	6.161	63	0,01	6.161	63	0,01	4.621	47	0,01
	No. 10 - 24UNC	3,7	3.871	54	0,015	5.162	72	0,015	5.162	72	0,015	3.871	54	0,015
	1/4 - 20UNC	4,55	3.148	89	0,025	4.197	119	0,025	4.197	119	0,025	3.148	89	0,025
	1/4 - 28UNF	4,55	3.148	89	0,025	4.197	119	0,025	4.197	119	0,025	3.148	89	0,025
	5/16 - 18UNC	5,7	2.513	85	0,03	3.351	113	0,03	3.351	113	0,03	2.513	85	0,03
	3/8 - 16UNC	6,7	2.138	89	0,035	2.851	118	0,035	2.851	118	0,035	2.138	89	0,035
	7/16 - 14UNC	7,7	1.860	91	0,04	2.480	122	0,04	2.480	122	0,04	1.860	91	0,04
	1/2 - 13UNC	9,2	1.557	77	0,045	2.076	103	0,045	2.076	103	0,045	1.557	77	0,045
Rc (PT)	1/16 - 28	4,86	2.982	*1	0,025	3.976	*1	0,025	3.976	*1	0,025	2.982	*1	0,025
	1/8 - 28	5,76	2.512	*1	0,03	3.349	*1	0,03	3.349	*1	0,03	2.512	*1	0,03
	1/4 - 19	7,98	1.814	*1	0,04	2.419	*1	0,04	2.419	*1	0,04	1.814	*1	0,04
	3/8 - 19	9,68	1.493	*1	0,045	1.990	*1	0,045	1.990	*1	0,045	1.493	*1	0,045
	1/2 - 14	11,61	1.246	*1	0,055	1.661	*1	0,055	1.661	*1	0,055	1.246	*1	0,055
NPT	1 - 11	15,54	930	*1	0,065	1.240	*1	0,065	1.240	*1	0,065	930	*1	0,065
	1/16 - 27	4,86	2.984	*1	0,025	3.978	*1	0,025	3.978	*1	0,025	2.984	*1	0,025
	1/8 - 27	5,76	2.513	*1	0,03	3.350	*1	0,03	3.350	*1	0,03	2.513	*1	0,03
	1/4 - 18	7,98	1.815	*1	0,04	2.420	*1	0,04	2.420	*1	0,04	1.815	*1	0,04
	3/8 - 18	9,68	1.493	*1	0,045	1.991	*1	0,045	1.991	*1	0,045	1.493	*1	0,045
	1/2 - 14	11,61	1.246	*1	0,055	1.661	*1	0,055	1.661	*1	0,055	1.246	*1	0,055
	1 - 11 1/2	15,54	930	*1	0,065	1.240	*1	0,065	1.240	*1	0,065	930	*1	0,065

			Aluminium Rolled Steel - Aluminium Alloy Casting AL - AC _ ADC			Magnesium Alloy Casting - Zinc Alloy Casting MC - ZDC			Titanium Alloy Ti-6Al-4V		
			Water-Soluble			Water-Soluble			Water-Soluble		
Vc (m/min)			35 ~ 100			35 ~ 100			35 ~ 55		
Thread	Thread Size	DC	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)
M	M 3 ×0,5	2,4	10.610	85	0,01	7.958	64	0,01	5.968	48	0,01
	M 4 ×0,7	3,1	8.214	111	0,015	6.161	83	0,015	4.621	62	0,015
	M 5 ×0,8	4	6.366	87	0,017	4.775	65	0,017	3.581	49	0,017
	M 6 ×1	4,6	5.536	103	0,02	4.152	78	0,02	3.114	58	0,02
	M 8 ×1,25	6,2	4.107	111	0,03	3.080	83	0,03	2.310	62	0,03
	M 10 ×1,5	7,5	3.395	119	0,035	2.546	89	0,035	1.910	67	0,035
	M 12 ×1,75	9	2.829	127	0,045	2.122	95	0,045	1.592	72	0,045
	M 16 ×2	11,7	2.176	129	0,055	1.632	96	0,055	1.224	72	0,055
	M 18 ×2,5	14	1.819	97	0,06	1.364	73	0,06	1.023	55	0,06
	M 20 ×2,5	15,7	1.622	91	0,065	1.216	68	0,065	912	51	0,065
U	No. 8 - 32UNC	3,1	8.214	84	0,01	6.161	63	0,01	4.621	47	0,01
	No. 10 - 24UNC	3,7	6.882	96	0,015	5.162	72	0,015	3.871	54	0,015
	1/4 - 20UNC	4,55	5.597	159	0,025	4.197	119	0,025	3.148	89	0,025
	1/4 - 28UNF	4,55	5.597	159	0,025	4.197	119	0,025	3.148	89	0,025
	5/16 - 18UNC	5,7	4.468	151	0,03	3.351	113	0,03	2.513	85	0,03
	3/8 - 16UNC	6,7	3.801	158	0,035	2.851	118	0,035	2.138	89	0,035
	7/16 - 14UNC	7,7	3.307	162	0,04	2.480	122	0,04	1.860	91	0,04
	1/2 - 13UNC	9,2	2.768	137	0,045	2.076	103	0,045	1.557	77	0,045
Rc (PT)	1/16 - 28	4,86	5.302	*1	0,025	3.976	*1	0,025	2.982	*1	0,025
	1/8 - 28	5,76	4.465	*1	0,03	3.349	*1	0,03	2.512	*1	0,03
	1/4 - 19	7,98	3.225	*1	0,04	2.419	*1	0,04	1.814	*1	0,04
	3/8 - 19	9,68	2.654	*1	0,045	1.990	*1	0,045	1.493	*1	0,045
	1/2 - 14	11,61	2.215	*1	0,055	1.661	*1	0,055	1.246	*1	0,055
NPT	1 - 11	15,54	1.654	*1	0,065	1.240	*1	0,065	930	*1	0,065
	1/16 - 27	4,86	5.304	*1	0,025	3.978	*1	0,025	2.984	*1	0,025
	1/8 - 27	5,76	4.467	*1	0,03	3.350	*1	0,03	2.513	*1	0,03
	1/4 - 18	7,98	3.227	*1	0,04	2.420	*1	0,04	1.815	*1	0,04
	3/8 - 18	9,68	2.655	*1	0,045	1.991	*1	0,045	1.493	*1	0,045
	1/2 - 14	11,61	2.215	*1	0,055	1.661	*1	0,055	1.246	*1	0,055
	1 - 11 1/2	15,54	1.653	*1	0,065	1.240	*1	0,065	930	*1	0,065

\*1. Values vary depending on the depth of hole to be machined.


- This cutting condition table shows standard values. When machining, it is recommended to use the program created by the NC code generator software ThreadPro.
- Please adjust the cutting conditions depending on the rigidity of machine, tool holders, and workpiece clamping.
- Tool vibrations should be kept at a minimum level for maximum accuracy.
- When machining magnesium alloy materials, please use the coolant oil recommended by the coolant oil manufacturer. Please also properly dispose the cutting chips to prevent fire hazards.
- Spindle rotation must be counterclockwise due to the left-hand cut configuration.

\* For titanium alloys and Ni-based alloys, the above condition table applies only when using a water-soluble cutting fluid and processing with a thread length approximately 1xD or an oil hole compatible size (oil hole column: ○ mark).

# CUTTING CONDITIONS

Threading | Thread mills | Cutting conditions

## AT-2 / WH(O)-EM-PNC

			Ni-based Alloy - Inconel			Plastic		
			Water-Soluble			Water-Soluble		
Recommended Coolant			Water-Soluble			Water-Soluble		
Vc (m/min)			35 ~ 55			35 ~ 100		
Thread	Thread Size	DC	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)	Speed (min <sup>-1</sup> )	Feed (mm/min)	Feed per Tooth (mm/t)
M	M 3 x0,5	2,4	4.642	37	0,01	7.958	64	0,01
	M 4 x0,7	3,1	3.594	49	0,015	6.161	83	0,015
	M 5 x0,8	4	2.785	38	0,017	4.775	65	0,017
	M 6 x1	4,6	2.422	45	0,02	4.152	78	0,02
	M 8 x1,25	6,2	1.797	49	0,03	3.080	83	0,03
	M 10 x1,5	7,5	1.485	52	0,035	2.546	89	0,035
	M 12 x1,75	9	1.238	56	0,045	2.122	95	0,045
	M 16 x2	11,7	952	56	0,055	1.632	96	0,055
	M 18 x2,5	14	796	42	0,06	1.364	73	0,06
	M 20 x2,5	15,7	710	40	0,065	1.216	68	0,065
U	No. 8 - 32UNC	3,1	3.594	37	0,01	6.161	63	0,01
	No. 10 - 24UNC	3,7	3.011	42	0,015	5.162	72	0,015
	1/4 - 20UNC	4,55	2.449	69	0,025	4.197	119	0,025
	1/4 - 28UNF	4,55	2.449	69	0,025	4.197	119	0,025
	5/16 - 18UNC	5,7	1.955	66	0,03	3.351	113	0,03
	3/8 - 16UNC	6,7	1.663	69	0,035	2.851	118	0,035
	7/16 - 14UNC	7,7	1.447	71	0,04	2.480	122	0,04
	1/2 - 13UNC	9,2	1.211	60	0,045	2.076	103	0,045
	1/16 - 28	4,86	2.320	*1	0,025	3.976	*1	0,025
	1/8 - 28	5,76	1.954	*1	0,03	3.349	*1	0,03
Rc (PT)	1/4 - 19	7,98	1.411	*1	0,04	2.419	*1	0,04
	3/8 - 19	9,68	1.161	*1	0,045	1.990	*1	0,045
	1/2 - 14	11,61	969	*1	0,055	1.661	*1	0,055
	1 - 11	15,54	724	*1	0,065	1.240	*1	0,065
	1/16 - 27	4,86	2.321	*1	0,025	3.978	*1	0,025
NPT	1/8 - 27	5,76	1.954	*1	0,03	3.350	*1	0,03
	1/4 - 18	7,98	1.412	*1	0,04	2.420	*1	0,04
	3/8 - 18	9,68	1.161	*1	0,045	1.991	*1	0,045
	1/2 - 14	11,61	969	*1	0,055	1.661	*1	0,055
	1 - 11 1/2	15,54	723	*1	0,065	1.240	*1	0,065

\*1. Values vary depending on the depth of hole to be machined.

1. This cutting condition table shows standard values. When machining, it is recommended to use the program created by the NC code generator software ThreadPro.
2. Please adjust the cutting conditions depending on the rigidity of machine, tool holders, and workpiece clamping.
3. Tool vibrations should be kept at a minimum level for maximum accuracy.
4. When machining magnesium alloy materials, please use the coolant oil recommended by the coolant oil manufacturer. Please also properly dispose the cutting chips to prevent fire hazards.
5. Spindle rotation must be counterclockwise due to the left-hand cut configuration.

\* For titanium alloys and Ni-based alloys, the above condition table applies only when using a water-soluble cutting fluid and processing with a thread length approximately 1xD or an oil hole compatible size (oil hole column: ○ mark).

### Formula for calculating the feed rate of thread mill

$$V_f = \frac{f \times z \times n \times (D_m - D_c)}{D_m} \text{ (mm/min)}$$

$v_f$  Feed (mm/min)

$D_m$  Actual Dia. (mm)

$D_c$  Tool Dia. (mm)

Note Internal: –      External: +

$z$  Number of Flutes

$f$  Feed (mm/t)

$n$  Speed (min<sup>-1</sup>)

When programming a circular process, the feed rate at the tool center can be obtained by multiplying the linear cut feed rate with a coefficient. The formulas for calculating coefficients vary between external and internal thread cutting. The formula listed left are for calculating the tool feed rate for circular process, including calculating the coefficients to be used for multiplication with the linear-cut feed rate.

# CUTTING CONDITIONS

Threading | Thread mills | Cutting conditions

## AT-2 R-SPEC

		Aluminium Alloy Casting AC4C - ADC Water Soluble						Wrought Aluminium Alloy Magnesium Alloy A5052 - A7075 - AZ91 - AZ80A Water Soluble						Copper Alloy C1100 Water Soluble					
Vc		100~300m/min						100~300m/min						100~300m/min					
Type		2 X D Type			2,5 X D Type			2 X D Type			2,5 X D Type			2 X D Type			2,5 X D Type		
Thread Size	DC	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)	S (min <sup>-1</sup> )	F (mm/min.)	fz (mm/t)
M 3 X 0,5	2,4	13.263	1.592	0,3	13.263	1.592	0,3	13.263	159	0,03	13.263	159	0,03	13.263	159	0,03	13.263	159	0,03
M 4 X 0,7	3,1	14.375	1.941	0,3	14.375	1.941	0,3	14.375	194	0,03	14.375	194	0,03	14.375	194	0,03	14.375	194	0,03
M 5 X 0,8	4	15.915	1.910	0,3	12.732	1.528	0,3	15.915	255	0,04	12.732	204	0,04	15.915	255	0,04	12.732	204	0,04
M 6 X 1	4,6	15.224	2.842	0,4	11.072	2.067	0,4	15.224	284	0,04	11.072	207	0,04	15.224	284	0,04	11.072	207	0,04
M 8 X 1,25	6,2	12.322	2.218	0,4	8.214	1.479	0,4	12.322	277	0,05	8.214	185	0,05	12.322	277	0,05	8.214	185	0,05
M 10 X 1,5	7,5	10.186	2.037	0,4	6.791	1.358	0,4	10.186	255	0,05	6.791	170	0,05	10.186	255	0,05	6.791	170	0,05
M 12 X 1,75	9	8.488	1.698	0,4	5.659	1.132	0,4	8.488	212	0,05	5.659	141	0,05	8.488	212	0,05	5.659	141	0,05

1. AT-2 R-SPEC is only for milling internal threads.
2. This cutting condition table shows standard values. When machining, it is recommended to use the program created by the NC code generator software ThreadPro.
3. Please select "Single-feed" for the path type in ThreadPro. Please adjust the cutting conditions depending on the rigidity of machine, tool holders, and workpiece clamping.
4. Tool vibrations should be kept at a minimum level for maximum accuracy.
5. When machining magnesium alloy materials, please use the coolant oil recommended by the coolant oil manufacturer. Please also properly dispose the cutting chips to prevent fire hazards.
6. Spindle rotation must be counterclockwise due to the left-hand cut configuration.



**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.

# CUTTING CONDITIONS

Threading | Thread mills | Cutting conditions

## WXO-ST-PNC

Work Material		Vc (m/min)	F (mm/tooth)
Low Tensile Strength Steel	C~0,25%	80~120	0,04~0,1
Medium Tensile Strength Steel	C~0,25% ~ 0,45%	80~120	0,04~0,1
High Tensile Strength Steel	C~0,45%	80~120	0,04~0,1
Alloy Steel	SCM	80~120	0,02~0,08
Hardened Steel	25~45 HRC	60~100	0,02~0,08
	45~55 HRC	-	-
	50~60 HRC	-	-
Stainless Steel	SUS	40~80	0,02~0,06
Tool Steel	SKD	-	-
Cast Steel	SC	40~65	0,02~0,09
Cast Iron	FC	50~100	0,03~0,1
Ductile Cast Iron	FCD	50~65	0,03~0,1
Copper	Cu	65~130	0,03~0,1
Brass	Bs	65~130	0,03~0,1
Brass Casting	BsC	65~130	0,03~0,1
Bronze	PB	65~130	0,03~0,1
Aluminium Rolled Steel	AL	50~70	0,03~0,1
Aluminium Alloy Casting	AC, ADC	65~130	0,03~0,1
Magnesium Alloy Casting	MC	65~130	0,03~0,1
Zinc Alloy Casting	ZDC	65~130	0,03~0,1
Titanium Alloy	Ti-6AL-4V	20~60	0,02~0,06
Nickel Alloy	Inconel®	20~60	0,01~0,03
Thermosetting plastic	-	65~130	0,03~0,13
Thermoplastic	-	65~130	0,03~0,13

## WX-PNC

Work Material		Vc (m/min)	F (mm/tooth)
Low Tensile Strength Steel	C~0,25%	50~75	0,01~0,11
Medium Tensile Strength Steel	C~0,25% ~ 0,45%	40~70	0,01~0,11
High Tensile Strength Steel	C~0,45%	40~70	0,01~0,01
Alloy Steel	SCM	15~30	0,01~0,03
Hardened Steel	25~45 HRC	15~30	0,01~0,03
	45~55 HRC	-	-
	50~60 HRC	-	-
Stainless Steel	SUS	20~40	0,01~0,06
Tool Steel	SKD	-	-
Cast Steel	SC	40~65	0,02~0,09
Cast Iron	FC	50~100	0,03~0,1
Ductile Cast Iron	FCD	50~65	0,03~0,1
Copper	Cu	65~130	0,03~0,1
Brass	Bs	65~130	0,03~0,1
Brass Casting	BsC	65~130	0,03~0,1
Bronze	PB	65~130	0,03~0,1
Aluminium Rolled Steel	AL	50~70	0,03~0,1
Aluminium Alloy Casting	AC, ADC	65~130	0,03~0,1
Magnesium Alloy Casting	MC	65~130	0,03~0,1
Zinc Alloy Casting	ZDC	65~130	0,03~0,1
Titanium Alloy	Ti-6AL-4V	20~60	0,02~0,06
Nickel Alloy	Inconel®	20~60	0,01~0,03
Thermosetting plastic	-	65~130	0,03~0,13
Thermoplastic	-	65~130	0,03~0,13



# DRILLING








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# ICONS LEGEND

## Drilling | Icons legend

### Tool material

 <b>CARBIDE</b> Carbide	 <b>HSS-Co</b> HSS Cobalt (Co8)	 <b>XPM</b> High grade powder metallurgy HSS (XPM) (Co10+V5)
 <b>CPM</b> Powder Metallurgy HSS (PM-T15) (Co5 + V5)	 <b>SPH</b> Super premium HSS	 <b>HSSE</b> High vanadium HSS-E V3
 <b>HSS</b> HSS		

### Coating / surface treatment

 <b>FX</b> Multilayer coating TiAlN	 <b>WX</b> Multilayer composite TiAlN	 <b>CrN</b> Chromium nitride
 <b>SC</b> Smooth coating	 <b>TiN</b> Coating TiN	 <b>WDI</b> Multilayer coating WDI
 <b>TiAlN</b> Multilayer coating TiAlN	 <b>V</b> Multilayer coating TiCN	 <b>OX</b> Steam oxide
 <b>WXS</b> Multilayer coating WXS	 <b>WXL</b> Multilayer coating WXL	 <b>EgiAs</b> EgiAs coating
 <b>DIA</b> Diamond coating	 <b>IchAda</b> Ichada coating	

### Angle

 <b>30°</b> Helix angle
--


### Tool tolerance

 <b>h8</b> Tool tolerance	 <b>0-+0.005</b> Tool tolerance for reamer
--	---

### Shank

 <b>h7</b> Shank diameter tolerance	 <b>SHRINK FIT</b> Suitable for Shrink fit system	 Straight shank
 Tang	 Weldon	 Whistle notch

### Drilling depth

 <b>5D</b> Drilling depth <5D
--

### Coolant

 Internal coolant	 Coolant
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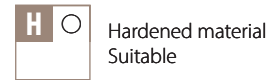
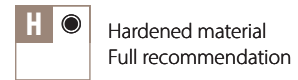
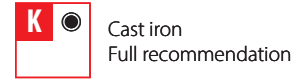
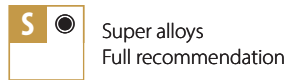
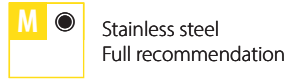
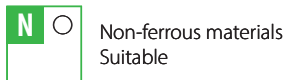
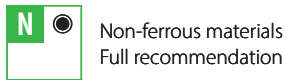
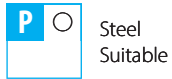
# ICONS LEGEND

## Drilling | Icons legend

### Point angle



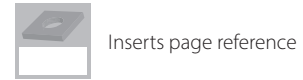
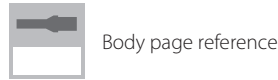
### Recommendation



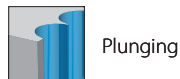
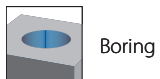
### A-Brand



### Page reference



### Application



### Product group symbol



# MATERIAL OVERVIEW

Drilling | Overview DIN ISO 513

Drilling | Material overview

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

CFRP	CFRP
Honeycomb	Honeycomb
Graphite	Graphite



# AD & ADO SERIES



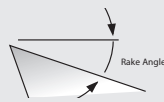
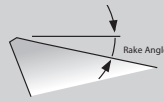
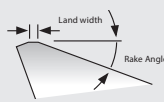
# GRADE & CHIPBREAKER

Indexable | Drilling

## Grades for drilling

Material	Grades	Coolant/ Dry	Coating	Hardness (HRA)	Surface main component	Surface coating thickness	Features
P	XP3425	Dry	PVD	91,8	Composite multilayer	7 µm	For steel. Thick film-coating, wear resistant, for PXD operation
	XP9020	Dry	PVD	91,9	TiAlN	3 µm	For steel and stainless steel. Wide range of application and areas, well-balanced wear resistance and defect resistance, for drilling operation
	XP9040	Dry	PVD	91,9	TiAlN	3 µm	For machining steel and stainless steel A grade for hole drilling. A tough carbide grade with an anti-chipping and wear-resistant coating
M	XP9020	Coolant	PVD	91,9	TiAlN	3 µm	For steel and stainless steel. Wide range of application and areas, well-balanced wear resistance and defect resistance, for drilling operation
	XP9040	Coolant	PVD	91,9	TiAlN	3 µm	For machining steel and stainless steel A grade for hole drilling. A tough carbide grade with an anti-chipping and wear-resistant coating
K	XP1010	Dry	PVD	91,4	TiAlN	6 µm	For cast iron. High rigidity of cutting edge is acquired by optimal land width and rake angle.
	XP1425	Dry	PVD	91,8	Composite multilayer	7 µm	For cast iron Fine grain hard metal with high strength and toughness, specifically for PXD operation
	XC9025	Dry	CVD	90,8	TiCN-Al <sub>2</sub> O <sub>3</sub>	6 µm	A grade for hole drilling in cast-iron. Tough, high-strength carbide grade with an anti-chipping and wear-resistant coating
N	CK110	Coolant	-	92	-	-	For aluminium alloys and non-ferrous material Sharp cutting edge with polish treatment
	CF225	Coolant	-	91,8	-	-	For non-ferrous materials High strength and tough non-coat fine grain hard metal for PXD operation

## Chipbreakers for drilling

Chipbreaker	Material	Cutting edge	Rake angle	Features
DN	N		10°	For drilling non-ferrous material: a chipbreaker with sharp cutting edge and polish treatment for excellent chip evacuation
DM	P M H		10°	For drilling various materials (steel, stainless steel, cast iron). A general-purpose chipbreaker with an ideal rake angle.
DR	K		9°	For drilling cast iron: a breaker with high rigidity acquired by optimal land width and rake angle.

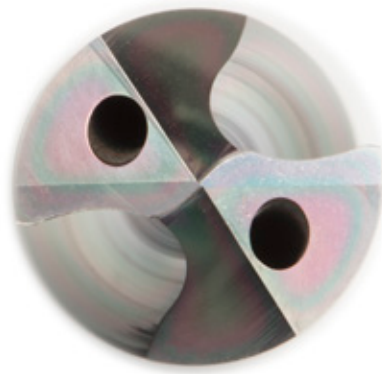
Chipbreaker & grade







# ALLOY STEELS



**A** EgiAs CARBIDE

## ADO Series

First choice in quality and performance

Carbide drill with internal coolant, EgiAs coating

Up to 50xD

For general purpose steels and cast iron

**715 sizes**

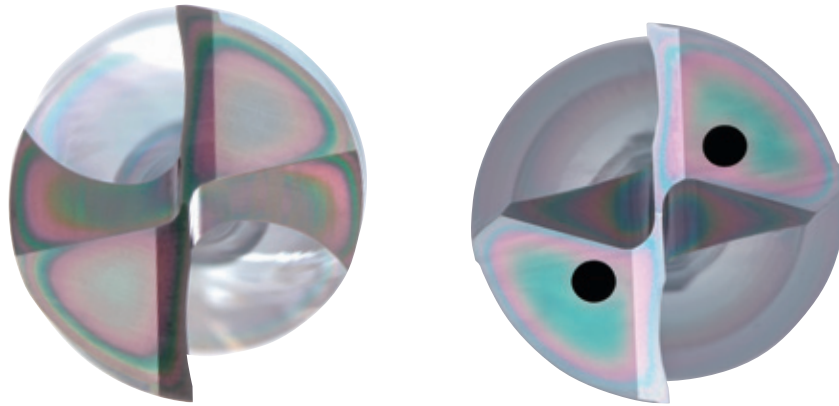


3D	5D	10D	15D	20D	25D	30D	40D	50D
B.482	B.484	B.493	B.495	B.497	B.499	B.501	B.502	B.503





# MULTI FUNCTION



## ADF Series

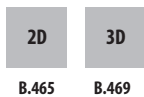
First choice in quality and performance

Carbide flat drill with EgiAs coating

Up to 3xD

For general purpose steel, **stainless steel** and **cast iron**

488 sizes





# VERSATILITY



A WXL CARBIDE

## ADO-SUS Series

First choice in quality and performance

Carbide drill with internal coolant, WXL coating

Up to 8xD

Designed for **stainless steel** and **titanium alloys** application

458 sizes



3D

B.475

5D

B.477

8D

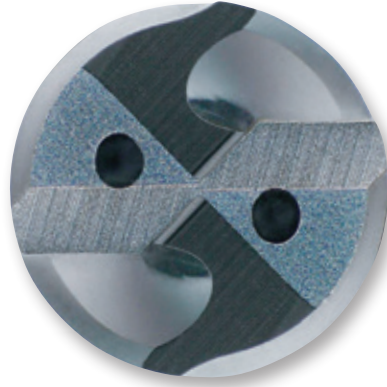
B.480







# MICRO



## ADO-MICRO Series

First choice in quality and performance

Micro carbide drill with internal coolant, IchAda coating

Up to 30xD

For general purpose steel and **stainless steel**

71 sizes



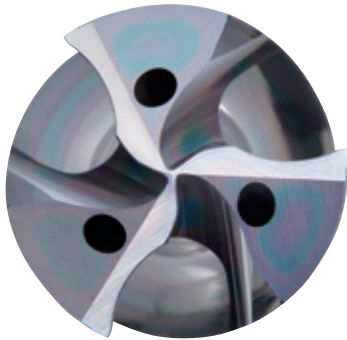
Product map



2D	5D	12D	15D	20D
B.454	B.455	B.456	B.457	B.458
25D	30D			
B.459	B.460			



# HIGH FEED / PRODUCTIVITY



## ADO-TRS Series

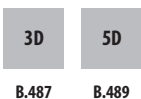
First choice in quality and performance

3 flute carbide drill with internal coolant, EgiAs coating

Up to 5xD

Allows **high feed 1.000mm/min** process in steel and cast iron

224 sizes



## TRS Series

First choice in quality and performance

3 flute carbide drill with internal coolant, WDI coating

10xD

Allows **high feed 1.000mm/min** process in steel and cast iron

11 sizes

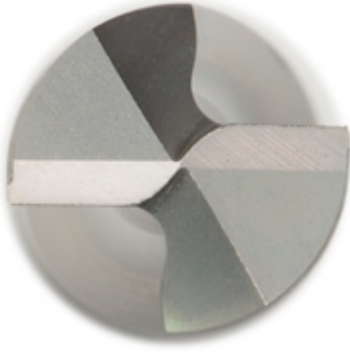


Product map





# HARDENED MATERIALS



**DUROREY** **CARBIDE**

## WH55

Carbide drill with DUROREY coating

Up to 5xD

For hardened material up to **55HRC**

36 sizes



**DUROREY** **CARBIDE**

## WHO55

Carbide drill with internal coolant, DUROREY coating

Up to 5xD

For hardened material up to **55HRC** including **Inconel**

54 sizes



**DUROREY** **CARBIDE**

## WH70

Carbide drill with DUROREY coating

Up to 3xD

With low helix for high rigidity, up to **70HRC** material

101 sizes



**5D**  
B.528

**5D**  
B.529

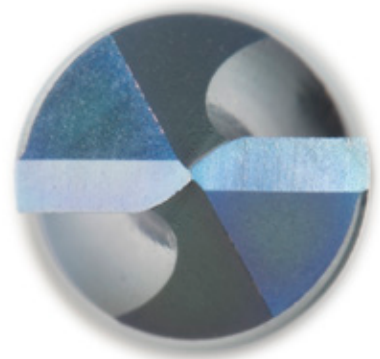
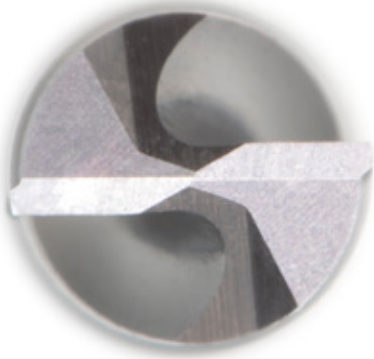
**3D**  
B.530

Product map





# IMPRESSIVE SIZE RANGE



WX CARBIDE

## WX-MS-GDS

Micro carbide drill with multilayer WX coating

Small sizes for **precision** operation

241 sizes



TiN HSSE

## EX-SUS Series

HSSE drill with TiN coating

Up to 5xD

For **stainless steel**, low carbon steel and cast aluminium

**635 sizes** from Ø 0,5-6 mm in 0,01 mm increments (EX-SUS-GDS)



WDI PM

## VPH-GDS

Powder metal drill with WDI coating

Up to 3xD

For cast iron, **exotic material** and **hardened steel**

126 sizes



5D  
B.461

3D 5D  
B.543 B.550

3D  
B.534

Product map





# NON STEP DEEP HOLE DRILLING



**A** EgiAs CARBIDE

## ADO Series

First choice in quality and performance

Carbide drill with internal coolant, EgiAs coating

Up to 50xD

For general purpose steels and cast iron

715 sizes



CARBIDE

## CAO Series

Carbide drill with internal coolant, bright finish

Up to 30xD

For aluminium and cast aluminium

27 sizes



WXL HSS-Co

## TDXL

HSS-Co drill with WXL coating

Up to 20xD

For steels, cast iron and cast aluminium

103 sizes



3D	5D	10D	15D	20D
B.482	B.484	B.493	B.495	B.497
25D	30D	40D	50D	
B.499	B.501	B.502	B.503	

15D	20D	30D
B.504	B.504	B.504

10D	15D	20D
B.564	B.566	B.567



















Product map










# SELECTION CHART

Drilling | Selection chart | By material


















## Micro drills

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	0.001 - 0.010	h6		<b>A</b>	ADO-MICRO-2D NEW	B.454	0,7 - 2	17
Carbide		2	135	-0.009 - 0	h6		<b>A</b>	ADO-MICRO-5D NEW	B.455	0,7 - 2	19
Carbide		2	135	-0.009 - 0	h6		<b>A</b>	ADO-MICRO-12D NEW	B.456	1 - 2	11
Carbide		2	135	-0.009 - 0	h6		<b>A</b>	ADO-MICRO-15D NEW	B.457	2	1
Carbide		2	135	-0.009 - 0	h6		<b>A</b>	ADO-MICRO-20D NEW	B.458	1 - 2	11
Carbide		2	135	-0.009 - 0	h6		<b>A</b>	ADO-MICRO-25D NEW	B.459	2	1
Carbide		2	135	-0.009 - 0	h6		<b>A</b>	ADO-MICRO-30D NEW	B.460	1 - 2	11
Carbide	-	2	130 - 140	0 - 0.01	h6			WX-MS-GDS	B.461	0,2 - 5	241
Carbide	-	2	120	0 - 0.008	h6			MRS-GDL	B.464	0,5 - 3	75

## Up to ≤2D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide	-	2	-	h8	h6		<b>A</b>	ADF-2D	B.465	0,2 - 20	242
Carbide	-	2	-	h8	h6		<b>A</b>	ADFLS-2D	B.468	3 - 20	64
Carbide	-	2	140	h8	h6		<b>A</b>	AD-2D	B.471	2 - 20	160
Indexable		2	-	-	-	-	-	P2D	B.626	12 - 63	77
Indexable		2	-	-	-	-	-	PDZ NEW	B.628	16 - 43	33

## Up to ≤3D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	h8	h6		<b>A</b>	ADO-3D	B.482	2 - 20	109
Carbide		2	140	h8	h6		<b>A</b>	ADO-SUS-3D	B.475	2 - 20	176
Carbide		2	-	h8	h6		<b>A</b>	ADFO-3D	B.469	3 - 20	160
Carbide	-	2	TRIPLE	0-0,02	h6			D-STAD	B.525	4 - 8	4
Carbide	-	2	-	0-0,02	h6			D-DAD	B.526	2,5 - 9,5	6
Carbide	-	2	-	0-0,02	h6			D-GDN90	B.527	2,5 - 9,5	6
Carbide		<b>3</b>	140	h8	h6		<b>A</b>	ADO-TRS-3D	B.487	3 - 20	112
Carbide	-	2	140	m7	h6			HYP-HP-3D	B.505	1 - 20	154
Carbide	-	2	140	h8	h6			HYP-HP-SC-3D NEW	B.507	6 - 14	7
Carbide		2	140	h8	h6			HYP-HPO-SC-3D NEW	B.516	6 - 14	6

Drilling | Selection chart

By material

# SELECTION CHART

Drilling | Selection chart | By material

Product series	Page	P				M	K			N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	ACADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC		
ADO-MICRO-2D NEW	B.454	●	●	●	●	●	●	●		○	○		○	○	○			
ADO-MICRO-5D NEW	B.455	●	●	●	●	●	●	●		○	○		○	○	○			
ADO-MICRO-12D NEW	B.456	●	●	●	●	●	●	●		○	○		○	○	○			
ADO-MICRO-15D NEW	B.457	●	●	●	●	●	●	●		○	○		○	○	○			
ADO-MICRO-20D NEW	B.458	●	●	●	●	●	●	●		○	○		○	○	○			
ADO-MICRO-25D NEW	B.459	●	●	●	●	●	●	●		○	○		○	○	○			
ADO-MICRO-30D NEW	B.460	●	●	●	●	●	●	●		○	○		○	○	○			
WX-MS-GDS	B.461	●	●	○	○	○	○		●	○	○							
MRS-GDL	B.464					●												

Product series	Page	P				M	K			N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	ACADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC		
ADF-2D NEW SIZES	B.465	●	●	●	●		●	●	○	○			●	○	○			
ADFLS-2D	B.465	○	○	○	○		○	○	○				○	○				
AD-2D NEW SIZES	B.471	●	●	●	●		○	●					●	○	○			
P2D NEW SIZES	B.626	●	●	●	●	●	●	●	●	●								
PDZ NEW	B.628	●	●	●	●	●	●	●	●	●								

Product series	Page	P				M	K			N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	ACADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC		
ADO-3D	B.482	●	●	●	●	○	●	●		○	○		●	○	○			
ADO-SUS-3D	B.475	●	●	●	●	●	●	●		○	●		●	○	○			
ADFO-3D	B.469	●	●	●	●	●	●	●	○	○			●	○	○			
D-STAD	B.525															●		
D-DAD	B.526															●		
D-GDN90	B.527															●		
ADO-TRS-3D	B.487	●	●	●	●	○	●	●			○		●	○	○			
HYP-HP-3D	B.505	○	●	●	●	○	●	●					●	○				
HYP-HP-SC-3D NEW	B.507	○	●	●	●	○	●	●					●	○				
HYP-HPO-SC-3D NEW	B.516	○	●	●	●	○	●	●					●	○				

Drilling | Selection chart



















By material





# SELECTION CHART

Drilling | Selection chart | By material



















## Up to ≤3D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	m7	h6			HYP-HPO-3D	B.510	3 - 20	136
Carbide		2	140	m7	HE			HYP-HPO-3D-HE	B.512	3 - 20	134
Carbide		2	140	m7	HB			HYP-HPO-3D-HB NEW	B.514	3 - 20	136
Carbide	-	2	120	h8	h6			WH70-DRL	B.530	2 - 12	101
HSSE	-	2	120-150	h8	h7			EX-SUS-GDS	B.543	0,5 - 20	<b>635</b>
HSSE	-	2	120-130	h8	h7			EX-GDS	B.556	1 - 13	193
HSSE	-	2	120-140	h8	h7			NEXUS-GDS	B.538	1 - 12	106
PM	-	2	130	h8	h7			VPH-GDS	B.533	0,5 - 13	126
Indexable		2	-	-	-	-		P3D	B.629	12 - 63	88
Top solid		2	140	-	-	-		PXD 3D	B.635	14 - 25,99	13
Indexable		2	-	-	-	-		PHP	B.637	14 - 40	40

## Up to ≤4D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide	-	2	140	h8	h6		<b>A</b>	AD-4D	B.473	2 - 20	149
Indexable		2	-	-	-	-		P4D	B.631	12 - 63	77

## Up to ≤5D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	h8	h6		<b>A</b>	ADO-5D	B.484	2 - 20	191
Carbide		2	140	h8	h6		<b>A</b>	ADO-SUS-5D	B.477	2 - 20	150
Carbide		<b>3</b>	140	h8	h6		<b>A</b>	ADO-TRS-5D	B.489	3 - 20	112
Carbide	-	2	140	m7	h6			HYP-HP-5D	B.508	1 - 20	154
Carbide		2	140	m7	h6			HYP-HPO-5D	B.517	1 - 20	156
Carbide		2	140	m7	HE			HYP-HPO-5D-HE	B.519	3 - 20	134
Carbide		2	140	m7	HB			HYP-HPO-5D-HB NEW	B.521	3 - 20	136
Carbide	-	2	140	h8	h6			WH55-5D	B.528	2 - 12	36
Carbide		2	140	h8	h6			WHO55-5D	B.529	3,3 - 12	54
Carbide	-	2	118	0/-0.013	h6	-		JOBBER DRILL	B.575	1 - 12,7	125

Drilling | Selection chart

By material



# SELECTION CHART

Drilling | Selection chart | By material

Product series	Page	P				M	K			N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	Al,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC		
HYP-HPO-3D	B.510	○	●	●	●	○	●	●					●	○				
HYP-HPO-3D-HE	B.512	○	●	●	●	○	●	●					●	○				
HYP-HPO-3D-HB NEW	B.514	○	●	●	●	○	●	●					●	○				
WH70-DRL	B.530																●	
EX-SUS-GDS	B.543	●	○			●			●	○								
EX-GDS	B.556	○	●	●	●		●	○		○		○	●	●				
NEXUS-GDS	B.538	●	○			●			●	●	●							
VPH-GDS	B.533	○	○	○	○		●	●			●	●	●	●	●			
P3D	B.629	●	●	●	●	●	●	●	●	●								
PXD 3D	B.635	●	●	●	●		●	●	●	●								
PHP	B.637	●	●	●	●	●	●	●	●	●	○	○						

Product series	Page	P				M	K			N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	Al,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC		
AD-4D	B.473	●	●	●	●		○	●					●	○				
P4D	B.631	●	●	●	●	●	●	●	●	●								

Product series	Page	P				M	K			N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	Al,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC		
ADO-5D	B.484	●	●	●	●	○	●	●		○	○		●	○	○			
ADO-SUS-5D	B.477	●	●	●	●	●	●	●		○	●		●	○	○			
ADO-TRS-5D	B.489	●	●	●	●	○	●	●					●					
HYP-HP-5D	B.508	○	●	●	●	○	●	●					●	○				
HYP-HPO-5D	B.517	○	●	●	●	○	●	●					●	○				
HYP-HPO-5D-HE	B.519	○	●	●	●	○	●	●					●	○				
HYP-HPO-5D-HB NEW	B.521	○	●	●	●	○	●	●					●	○				
WH55-5D	B.528													●	●	○		
WHO55-5D	B.529										●		●	●	○			
JOBBER DRILL	B.575	○	○	○	○		○	○	○	○			○					

Drilling | Selection chart
















By material





# SELECTION CHART

Drilling | Selection chart | By material








## Up to ≤5D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
HSSE	-	2	120-130	h8	h7			EX-SUS-GDR	B.550	2 - 20	485
HSSE	-	2	120-130	h8	h7			EX-GDR	B.559	2 - 32	249
HSSE	-	2	120-130	h8	h7			NEXUS-GDR	B.540	2 - 12	32
HSSE	-	2	120	h8	h7			V-SDR	B.541	2 - 13	111
HSS-Co		2	130	h8	h6-h7			V-HDO-GDR	B.562	6 - 32	96
SPH	-	2	120	h8	h7			VP-GDR	B.535	2 - 32	144
PM		2	120	h8	h6-h7			VP-HO-GDR	B.537	6 - 32	56
Indexable		2	-	-	-	-		P5D	B.633	12 - 63	77
Top solid		2	140	-	-	-		PXD 5D	B.636	14 - 25,99	13









## Pilot drills

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	160	h8	h6		<b>A</b>	ADO-PLT	B.492	3,03 - 12,03	15

## Up to ≤8D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	h8	h6		<b>A</b>	ADO-SUS-8D	B.480	2 - 12	101
Carbide		2	140	m7	h6			HYP-HPO-8D	B.523	3 - 20	134
HSS-Co	-	2	130	h8	h7			EX-GDXL-8D	B.568	11 - 13	21

## Up to ≤10D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	e8	h6		<b>A</b>	ADO-10D	B.493	2 - 12,5	101
Carbide		<b>3</b>	140	h8	h6		<b>A</b>	TRS-HO-10D	B.491	5 - 12	11
HSS-Co	-	2	120	h8	h7			TDXL-10D	B.564	1,6 - 12	103
HSS-Co	-	2	130	h8	h7			EX-GDXL-10D	B.569	3,6 - 13	89

Drilling | Selection chart

By material

# SELECTION CHART

Drilling | Selection chart | By material

Product series	Page	P				M	K			N		S		H				CFRP
		C <sub>1</sub> ≤0,2%	C <sub>2</sub> 0,25-0,4%	C <sub>3</sub> ≥0,45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC		
EX-SUS-GDR	B.550	●	○			●			●	○								
EX-GDR	B.559	○	●	●	●		●	○	○	○			○					
NEXUS-GDR	B.540	●	○			●			●	●	●							
V-SDR	B.541	●	●	○	●		○	○	○	○								
V-HDO-GDR	B.562	●	●	●	●	●	○	○	○	●	○	○	●					
VP-GDR	B.535	●	●	●	●		●	●	○	●	○	○	●					
VP-HO-GDR	B.537	●	●	●	●	●	●	●	○	●	○	○	●	○				
P5D	B.633	●	●	●	●	●	●	●	●	●								
PXD 5D	B.636	●	●	●	●		●	●	●	●								

Product series	Page	P				M	K			N		S		H				CFRP
		C <sub>1</sub> ≤0,2%	C <sub>2</sub> 0,25-0,4%	C <sub>3</sub> ≥0,45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC		
ADO-PLT	B.492	○	●	●	●	○	●	●					●	●				

Product series	Page	P				M	K			N		S		H				CFRP
		C <sub>1</sub> ≤0,2%	C <sub>2</sub> 0,25-0,4%	C <sub>3</sub> ≥0,45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC		
ADO-SUS-8D	B.480	●	●	●	●	●	●	●		○	●		●	○	○			
HYP-HPO-8D	B.523	○	●	●	●	○	●	●					●	○				
EX-GDXL-8D	B.568	○	●	●	●		●	●		○			○					

Product series	Page	P				M	K			N		S		H				CFRP
		C <sub>1</sub> ≤0,2%	C <sub>2</sub> 0,25-0,4%	C <sub>3</sub> ≥0,45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC		
ADO-10D	B.493	●	●	●	●	○	●	●					○					
TRS-HO-10D	B.491	●	●	●	●		●	●										
TDXL-10D	B.564	○	●	●	●		●	●		●								
EX-GDXL-10D	B.569	○	●	●	●		●	●		○			○					

Drilling | Selection chart








By material










# SELECTION CHART

Drilling | Selection chart | By material






## Up to ≤15D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	e8	h6		<b>A</b>	ADO-15D	B.495	2,5 - 12,5	93
Carbide		2	140	h8	h6	-		CAO-GDXL-15D	B.504	3 - 10	9
HSS-Co	-	2	120	h8	h7			TDXL-15D	B.566	1,6 - 12	68
HSS-Co	-	2	130	h8	h7			EX-GDXL-15D	B.570	2 - 13	104







## Up to ≤20D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	e8	h6		<b>A</b>	ADO-20D	B.497	2,5 - 12,5	93
Carbide		2	140	h8	h6	-		CAO-GDXL-20D	B.504	4 - 10	9
HSS-Co	-	2	120	h8	h7			TDXL-20D	B.567	1,6 - 12	48
HSS-Co	-	2	130	h8	h7			EX-GDXL-20D	B.572	2 - 10,9	72





## Up to ≤25D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	e8	h6		<b>A</b>	ADO-25D	B.499	2,5 - 12	92
HSS-Co	-	2	130	h8	h7			EX-GDXL-25D	B.573	3,3 - 8,1	36





## Up to ≤30D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	e8	h6		<b>A</b>	ADO-30D	B.501	2,5 - 10	72
Carbide		2	140	h8	h6	-		CAO-GDXL-30D	B.504	5 - 8	5
HSS-Co	-	2	130	h8	h7			EX-GDXL-30D	B.574	3 - 6,3	10

## Up to ≤40D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	e8	h6		<b>A</b>	ADO-40D NEW	B.502	3 - 10	6

## Up to ≤50D

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide		2	140	e8	h6		<b>A</b>	ADO-50D NEW	B.503	3 - 8	5

Drilling | Selection chart

By material

# SELECTION CHART

Drilling | Selection chart | By material

Product series	Page	P				M	K		N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	Al,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
ADO-15D	B.495	●	●	●	●	○	●	●					○				
CAO-GDXL-15D	B.504								○	●							
TDXL-15D	B.566	○	●	●	●		●	●		●							
EX-GDXL-15D	B.570	○	●	●	●		●	●		○			○				

Product series	Page	P				M	K		N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	Al,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
ADO-20D	B.497	●	●	●	●	○	●	●					○				
CAO-GDXL-20D	B.504								○	●							
TDXL-20D	B.522	○	●	●	●		●	●		●							
EX-GDXL-20D	B.572	○	●	●	●		●	●		○			○				

Product series	Page	P				M	K		N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	Al,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
ADO-25D	B.499	●	●	●	●	○	●	●					○				
EX-GDXL-25D	B.573	○	●	●	●		●	●		○			○				

Product series	Page	P				M	K		N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	Al,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
ADO-30D	B.501	●	●	●	●	○	●	●					○				
CAO-GDXL-30D	B.504								○	●							
EX-GDXL-30D	B.574	○	●	●	●		●	●		○			○				

Product series	Page	P				M	K		N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	Al,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
ADO-40D NEW	B.502	●	●	●	●	○	●	●					○				

Product series	Page	P				M	K		N		S		H				CFRP
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	Al,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
ADO-50D NEW	B.502	●	●	●	●	○	●	●					○				

Drilling | Selection chart










By material



# SELECTION CHART

Drilling | Selection chart | By material



## Spotting, Chamfering, Counterboring

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide	-	2	60 / 90 / 120 / 140	-	h7		<b>A</b>	AD-LDS	B.577	0,5 - 12	30
Carbide	-	2	90	-	h7		<b>A</b>	AD-LS-LDS	B.578	3 - 12	6
Carbide	-	2	90 / 120 / 142	-	h6	-		HYP-LDS	B.579	3 - 20	24
HSS	-	2	60 / 90 / 120	-	h7			TIN-NC-LDS	B.580	3 - 25	21
HSS	-	2	60 / 90 / 120	-	h7	-		NC-LDS	B.581	3 - 25	27
Indexable	-	-	60 / 90 / 118 / 120	-	-	-		HY-PRO-CARB	B.644	9 - 26,6	12
Indexable	-	-	-	-	-	-		PZAG BORE	B.640	54 - 82	7
Indexable	-	-	-	-	-	-		PZAG SS	B.639	14 - 48	11
Indexable		-	90 / 120	-	-	-		PLDS SS NEW	B.641	14,4 - 17,3	4
Indexable		-	90 / 120	-	-	-		PLDS SF NEW	B.642	14,4 - 17,3	2

## Drill for removing broken tap

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide	-	-	-	-	h7	-		EX-H-DRL	B.532	2 - 12	11

## Reamer

Tool material		Flutes	Point angle	Tolerance	Shank tolerance		A-Brand	Product series	Page	Size range Ø	No. of sizes
Carbide	-	4 / 6	-	0/+0.005	h6	-		CRM	B.582	0,3 - 13,05	<b>1276</b>

Drilling | Selection chart

By material

# SELECTION CHART

Drilling | Selection chart | By material

Product series	Page	P				M	K			N	S	H				CFRP	
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
AD-LDS	B.577	●	●	●	●	○	●	●	○	●	○	○	●	●			
AD-LS-LDS	B.578	●	●	●	●	○	●	●	○	●	○	○	●	●			
HYP-LDS	B.579	●	●	●	●		●	●		○	○	○	●	○			
TIN-NC-LDS	B.580	●	●	●	●	●	●	●		●	●		○				
NC-LDS	B.581	●	●	●	●	●	●	●		●	●		○				
HY-PRO-CARB	B.644	●	●			●	●	○	●				●				
PZAG BORE	B.640	●	●			●	●	●	○				○				
PZAG SS	B.639	●	●			●	●	●	○				○				
PLDS SS NEW	B.641	●	●			●	●	●	○				○				
PLDS SF NEW	B.642	●	●			●	●	●	○				○				

Product series	Page	P				M	K			N	S	H				CFRP	
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
EX-H-DRL	B.532																●

Product series	Page	P				M	K			N	S	H				CFRP	
		C: ≤0,2%	C: 0,25-0,4%	C: ≥0,45%	SCM	INOX	GG	GGG	Al	AC,ADC	Ti	Ni	25-35 HRC	35-45 HRC	45-50 HRC	50-70 HRC	
CRM	B.582	●	●	●	●		●	○	●	●			●	●	○		

Drilling | Selection chart



By material

# SELECTION CHART SIZE

Drilling | Selection chart | By size | Micro



- = All sizes available within interval
- ⊙ = Limited number of sizes available within interval

Product series	ADO-MICRO-2D NEW	ADO-MICRO-5D NEW	ADO-MICRO-12D NEW	ADO-MICRO-15D NEW	ADO-MICRO-20D NEW	ADO-MICRO-25D NEW	ADO-MICRO-30D NEW
<b>A-Brand</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>
<b>Total # of sizes</b>	17	19	11	1	11	1	11
<b>Diameter</b>	B.454	B.455	B.456	B.457	B.458	B.459	B.460
0,70	●	●					
0,75	●	●					
0,80	●	●					
0,85	●	●					
0,90	●	●					
0,95	●	●					
1,00	●	●	●		●		●
1,05							
1,10	●	●	●		●		●
1,15							
1,20	●	●	●		●		●
1,25							
1,30	●	●	●		●		●
1,35							
1,40	●	●	●		●		●
1,45							
1,50	●	●	●		●		●
1,55		●					
1,60	●	●	●		●		●
1,65							
1,70	●	●	●		●		●
1,75							
1,80	●	●	●		●		●
1,84		●					
1,85							
1,90	●	●	●		●		●
1,95							
2,00	●	●	●	●	●	●	●

Drilling | Selection chart | By size

Micro



# SELECTION CHART SIZE

Drilling | Selection chart | By size | Micro

- = All sizes available within interval
- = Limited number of sizes available within interval



Product series		WX-MS-GDS	EX-SUS-GDS	EX-SUS-GDR	VPH-GDS
Tool material		Carbide		HSS	
Incremental		0,01 mm incremental from Ø0,2 to Ø2		0,01 mm incremental from Ø2 to Ø6	
Total # of sizes		241 sizes		485 sizes	
Incremental step	Diameter	B.461	B.543	B.550	B.533
0,01	0,2 ~ 0,49	●			
0,01	0,50 ~ 0,59	●			
0,01	0,60 ~ 0,69	●			0,5
0,01	0,70 ~ 0,79	●			0,6
0,01	0,80 ~ 0,89	●			0,7
0,01	0,90 ~ 0,99	●			0,8
0,01	1,00 ~ 1,09	●			0,9
0,01	1,10 ~ 1,19	●			1,0
0,01	1,20 ~ 1,29	●			1,1
0,01	1,30 ~ 1,39	●			1,2
0,01	1,40 ~ 1,49	●			1,3
0,01	1,50 ~ 1,59	●			1,4
0,01	1,60 ~ 1,69	●			1,5
0,01	1,70 ~ 1,79	●			1,6
0,01	1,80 ~ 1,89	●			1,7
0,01	1,90 ~ 1,99	●			1,8
0,01	2,00 ~ 2,09	●			1,9
0,01	2,10 ~ 2,19	2,0 / 2,05		●	2,0
0,01	2,20 ~ 2,29	2,1 / 2,15		●	2,1
0,01	2,30 ~ 2,39	2,2 / 2,25		●	2,2
0,01	2,40 ~ 2,49	2,3 / 2,35		●	2,3
0,01	2,50 ~ 2,59	2,4 / 2,45		●	2,4
0,01	2,60 ~ 2,69	2,5 / 2,55		●	2,5
0,01	2,70 ~ 2,79	2,6 / 2,65		●	2,6
0,01	2,80 ~ 2,89	2,7 / 2,75		●	2,7
0,01	2,90 ~ 2,99	2,8 / 2,85		●	2,8
0,01	3,00 ~ 3,09	2,9 / 2,95		●	2,9
0,01	3,10 ~ 3,19	3,0 / 3,05		●	3,0
0,01	3,20 ~ 3,29	3,1 / 3,15		●	3,1
0,01	3,30 ~ 3,39	3,2 / 3,25		●	3,2
0,01	3,40 ~ 3,49	3,3 / 3,35		●	3,3
0,01	3,50 ~ 3,59	3,4 / 3,45		●	3,4
0,01	3,60 ~ 3,69	3,5 / 3,55		●	3,5
0,01	3,70 ~ 3,79	3,6 / 3,65		●	3,6
0,01	3,80 ~ 3,89	3,7 / 3,75		●	3,7
0,01	3,90 ~ 3,99	3,8 / 3,85		●	3,8
0,01	4,00 ~ 4,09	3,9 / 3,95		●	3,9
0,01	4,10 ~ 4,19	4,0 / 4,05		●	4,0
0,01	4,20 ~ 4,29	4,1 / 4,15		●	4,1
0,01	4,30 ~ 4,39	4,2 / 4,25		●	4,2
0,01	4,40 ~ 4,49	4,3 / 4,35		●	4,3
0,01	4,50 ~ 4,59	4,4 / 4,45		●	4,4
0,01	4,60 ~ 4,69	4,5 / 4,55		●	4,5
0,01	4,70 ~ 4,79	4,6 / 4,65		●	4,6
0,01	4,80 ~ 4,89	4,7 / 4,75		●	4,7
0,01	4,90 ~ 4,99	4,8 / 4,85		●	4,8
0,01	5,00 ~ 5,09	4,9 / 4,95		●	4,9
0,01	5,10 ~ 5,19	5		●	5,0
0,01	5,20 ~ 5,29			●	5,1
0,01	5,30 ~ 5,39			●	5,2
0,01	5,40 ~ 5,49			●	5,3
0,01	5,50 ~ 5,59			●	5,4
0,01	5,60 ~ 5,69			●	5,5
0,01	5,70 ~ 5,79			●	5,6
0,01	5,80 ~ 5,89			●	5,7
0,01	5,90 ~ 5,99			●	5,8
0,1	6,0 ~ 6,9			●	5,9
0,1	7,0 ~ 7,9			●	●
0,1	8,0 ~ 8,9			●	●
0,1	9,0 ~ 9,9			●	●
0,1	10,0 ~ 10,9			●	●
0,1	11,0 ~ 11,9			●	●
0,1	12,0 ~ 12,9			●	●
0,5	13			●	●
0,5	13,5 ~ 20			●	●
	1/8 - (3,17)		●	●	
	9/64 - (3,57)		●	●	
	5/32 - (3,97)		●	●	
	11/64 - (4,37)		●	●	
	3/16 - (4,76)		●	●	
	13/64 - (5,16)		●	●	
	7/32 - (5,56)		●	●	
	15/64 - (5,95)		●	●	
	31/64 - (12,3)		●	●	●
	1/2 - (12,7)		●	●	●

Drilling | Selection chart | By size



Micro

# SELECTION CHART SIZE

Drilling | Selection chart | By size | Carbide up to 5D



- = All sizes available within interval
- = Limited number of sizes available within interval

Product series		ADF-2D	ADFLS-2D NEW SIZES	AD-2D	ADFO-3D	ADO-3D	ADO-SUS-3D	D-STAD	D-DAD	D-GDN-90	ADO-TRS-3D	HYP-HP-3D	HYP-HPO-3D	HYP-HPO-3D-HE
A-Brand		A	A	A	A	A	A				A			
Total # of sizes		250	78	160	160	167	179	4	6	6	112	154	136	134
Incremental step	Diameter	B.465	B.468	B.471	B.469	B.482	B.475	B.525	B.526	B.527	B.487	B.505	B.510	B.512
0,05	0,2 ~ 0,95	●												
0,1	1,0 ~ 1,9	●												
0,1	2,0 ~ 2,9	●												
0,1	3,0 ~ 3,9	●	●	●	●	●	●		○	○	○	●	●	●
0,1	4,0 ~ 4,9	●	●	●	●	●	●	○	○	○	○	●	●	●
0,1	5,0 ~ 5,9	●	●	●	●	●	●				●	●	●	●
0,1	6,0 ~ 6,9	●	○	●	●	●	●	○	○	○	●	●	●	●
0,1	7,0 ~ 7,9	●	○	●	●	●	●				●	●	●	●
0,1	8,0 ~ 8,9	●	○	●	●	●	●	○	○	○	●	●	●	●
0,1	9,0 ~ 9,9	●	○	●	●	●	●				●	●	●	●
0,1	10,0 ~ 10,9	●	○	●	●	●	●				●	●	●	●
0,1	11,0 ~ 11,9	●	○	●	●	●	●				●	●	●	●
0,1	12,0 ~ 12,9	●	○	●	●	●	●				○	○	○	○
	13	●	●	●	●	●	●				●	●	●	●
	13,1	●		●	●	●	●							
	13,2	●		●	●	●	●							
	13,3	●		●	●	●	●				●			
	13,4	●		●	●	●	●							
	13,5	●	●	●	●	●	●				●	●	●	●
	13,6	●		●	●	●	●							
	13,7	●		●	●	●	●							
	13,8	●		●	●	●	●							
	13,9	●		●	●	●	●							
	14	●	●	●	●	●	●							
	14,1	●	●	●	●	●	●				●	●	●	●
	14,2	●		●	●	●	●							
	14,3	●		●	●	●	●				●			
	14,4	●		●	●	●	●							
	14,5	●	●	●	●	●	●				●	●	●	●
	14,6	●		●	●	●	●							
	14,7	●		●	●	●	●							
	14,8	●		●	●	●	●							
	14,9	●		●	●	●	●							
	15	●	●	●	●	●	●				●	●	●	●
	15,1	●		●	●	●	●							
	15,2	●		●	●	●	●				●			
	15,3	●		●	●	●	●							
	15,4	●	●	●	●	●	●				●	●	●	●
	15,5	●		●	●	●	●							
	15,6	●		●	●	●	●							
	15,7	●		●	●	●	●							
	15,8	●		●	●	●	●							
	15,9	●		●	●	●	●							
	16	●	●	●	●	●	●				●	●	●	●
	16,5	●	●	●	●	●	●				●	●	●	●
	16,7	●		●	●	●	●							
	17	●	●	●	●	●	●				●	●	●	●
	17,3	●		●	●	●	●							
	17,5	●	●	●	●	●	●				●	●	●	●
	18	●	●	●	●	●	●				●	●	●	●
	18,5	●	●	●	●	●	●				●	●	●	●
	18,7	●		●	●	●	●							
	19	●	●	●	●	●	●				●	●	●	●
	19,3	●		●	●	●	●							
	19,5	●	●	●	●	●	●				●	●	●	●
	20	●	●	●	●	●	●				●	●	●	●
	3/32 - (2,38)													
	7/64 - (2,78)	●		●										
	1/8 - (3,17)													
	9/64 - (3,57)											●	●	●
	5/32 - (3,97)											●	●	●
	11/64 - (4,37)											●	●	●
	3/16 - (4,76)											●	●	●
	13/64 - (5,16)											●	●	●
	7/32 - (5,56)											●	●	●
	15/64 - (5,95)											●	●	●
	1/4 - (6,35)											●	●	●
	17/64 - (6,75)											●	●	●
	9/32 - (7,14)											●	●	●
	19/64 - (7,54)											●	●	●
	5/16 - (7,94)			●								●	●	●
	21/64 - (8,33)											●	●	●
	11/32 - (8,73)											●	●	●
	23/64 - (9,13)											●	●	●
	3/8 - (9,52)											●	●	●
	25/64 - (9,92)											●	●	●
	13/32 - (10,32)											●	●	●
	27/64 - (10,72)											●	●	●
	7/16 - (11,11)											●	●	●
	29/64 - (11,51)											●	●	●
	15/32 - (11,91)											●	●	●
	31/64 - (12,3)											●	●	●
	1/2 - (12,7)	●					●					●	●	●
	9/16 - (14,29)	●										●	●	●

Drilling | Selection chart | By size

Carbide up to 5D

# SELECTION CHART SIZE

Drilling | Selection chart | By size | Carbide up to 5D



- = All sizes available within interval
- = Limited number of sizes available within interval

Product series		HYP-HPO-3D-HB NEW	WH70-DRL	AD-4D	ADO-5D	ADO-SUS-5D	ADO-TR5-5D	HYP-HP-5D	HYP-HPO-5D NEW SIZES	HYP-HPO-5D-HE	HYP-HPO-5D-HB NEW	WH55-5D	WH055-5D	JOBBER DRILL
<b>A-Brand</b>				<b>A</b>	<b>A</b>	<b>A</b>	<b>A</b>							
<b>Total # of sizes</b>		136	101	149	191	193	112	154	156	134	136	36	54	125
Incremental step	Diameter	B.514	B.530	B.473	B.484	B.477	B.489	B.508	B.517	B.519	B.521	B.528	B.529	B.575
0,05	0,2 ~ 0,95													
0,1	1,0 ~ 1,9													
0,1	2,0 ~ 2,9													
0,1	3,0 ~ 3,9	●	●	●	●	●	○	●	●	●	●	○	○	●
0,1	4,0 ~ 4,9	●	●	●	●	●	○	●	●	●	●	○	○	●
0,1	5,0 ~ 5,9	●	●	●	●	●	○	●	●	●	●	○	○	●
0,1	6,0 ~ 6,9	●	●	●	●	●	○	●	●	●	●	○	○	●
0,1	7,0 ~ 7,9	●	●	●	●	●	○	●	●	●	●	○	○	●
0,1	8,0 ~ 8,9	●	●	●	●	●	○	●	●	●	●	○	○	●
0,1	9,0 ~ 9,9	●	●	●	●	●	○	●	●	●	●	○	○	●
0,1	10,0 ~ 10,9	●	●	●	●	●	○	●	●	●	●	○	○	●
0,1	11,0 ~ 11,9	●	●	●	●	●	○	●	●	●	●	○	○	●
0,1	12,0 ~ 12,9	○	○	●	●	●	○	○	○	○	○	○	○	○
	13	●		●	●	●	●	●	●	●	●			
	13,1			●	●	●	●							
	13,2			●	●	●	●							
	13,3			●	●	●	●							
	13,4			●	●	●	●							
	13,5	●		●	●	●	●	●	●	●	●			
	13,6			●	●	●	●							
	13,7			●	●	●	●							
	13,8			●	●	●	●							
	13,9			●	●	●	●							
	14	●		●	●	●	●	●	●	●	●			
	14,1			●	●	●	●							
	14,2			●	●	●	●							
	14,3			●	●	●	●							
	14,4			●	●	●	●							
	14,5	●		●	●	●	●	●	●	●	●			
	14,6			●	●	●	●							
	14,7			●	●	●	●							
	14,8			●	●	●	●							
	14,9			●	●	●	●							
	15	●		●	●	●	●	●	●	●	●			
	15,1			●	●	●	●							
	15,2			●	●	●	●							
	15,3			●	●	●	●							
	15,4			●	●	●	●							
	15,5	●		●	●	●	●	●	●	●	●			
	15,6			●	●	●	●							
	15,7			●	●	●	●							
	15,8			●	●	●	●							
	15,9			●	●	●	●							
	16	●		●	●	●	●	●	●	●	●			
	16,5	●		●	●	●	●	●	●	●	●			
	16,7			●	●	●	●							
	17	●		●	●	●	●	●	●	●	●			
	17,3			●	●	●	●							
	17,5	●		●	●	●	●	●	●	●	●			
	18	●		●	●	●	●	●	●	●	●			
	18,5	●		●	●	●	●	●	●	●	●			
	18,7			●	●	●	●							
	19	●		●	●	●	●	●	●	●	●			
	19,3			●	●	●	●							
	19,5	●		●	●	●	●	●	●	●	●			
	20	●		●	●	●	●	●	●	●	●			
	3/32 - (2,38)				●	●								●
	7/64 - (2,78)				●	●								●
	1/8 - (3,17)	●						●	●	●	●			●
	9/64 - (3,57)	●						●	●	●	●			●
	5/32 - (3,97)	●						●	●	●	●			●
	11/64 - (4,37)	●						●	●	●	●			●
	3/16 - (4,76)	●						●	●	●	●			●
	13/64 - (5,16)	●						●	●	●	●			●
	7/32 - (5,56)	●						●	●	●	●			●
	15/64 - (5,95)	●						●	●	●	●			●
	1/4 - (6,35)	●						●	●	●	●			●
	17/64 - (6,75)	●						●	●	●	●			●
	9/32 - (7,14)	●						●	●	●	●			●
	19/64 - (7,54)	●						●	●	●	●			●
	5/16 - (7,94)	●						●	●	●	●			●
	21/64 - (8,33)	●						●	●	●	●			●
	11/32 - (8,73)	●						●	●	●	●			●
	23/64 - (9,13)	●						●	●	●	●			●
	3/8 - (9,52)	●						●	●	●	●			●
	25/64 - (9,92)	●						●	●	●	●			●
	13/32 - (10,32)	●						●	●	●	●			●
	27/64 - (10,72)	●						●	●	●	●			●
	7/16 - (11,11)	●						●	●	●	●			●
	29/64 - (11,51)	●						●	●	●	●			●
	15/32 - (11,91)	●						●	●	●	●			●
	31/64 - (12,3)	●						●	●	●	●			●
	1/2 - (12,7)	●		●	●	●		●	●	●	●			●
	9/16 - (14,29)	●						●	●	●	●			●

Drilling | Selection chart | By size



Carbide up to 5D

# SELECTION CHART SIZE

Drilling | Selection chart | By size | Carbide up to 5D | Tap pilot hole



- = All sizes available within interval
- ⊙ = Limited number of sizes available within interval

Product series		ADF-2D	AD-2D	ADO-SUS-3D	ADO-TR5-3D	HYP-HP-3D	HYP-HPO-3D	HYP-HPO-3D-HE	HYP-HPO-3D-HB NEW
A-Brand		A	A	A	A				
Total # of sizes		34	9	19	12	1	3	1	3
Incremental step	Diameter	B.465	B.471	B.475	B.487	B.505	B.510	B.512	B.514
	0,37	●							
	0,46	●							
	0,62	●							
	1,04	●							
	1,05	●							
	1,32	●							
	1,33	●							
	1,43	●							
	2,32	●							
	2,42	●							
	2,54	●							
	2,58	●							
	2,76	●	●						
	2,83			●					
	2,87			●					
	3,03	●							
	3,15	●		●					
	3,49								
	3,53	●							
	3,66	●	●		●				
	3,68	●	●						
	3,73			●					
	4,03	●							
	4,15								
	4,45			●					
	4,53	●							
	4,62	●	●						
	4,64	●	●						
	4,65			●			●		●
	5,03	●							
	5,52	●	●						
	5,54	●	●						
	5,55			●	●				●
	6,03	●					●		
	6,53	●							
	7,03	●							
	7,36		●						
	7,38		●						
	7,45			●	●				
	7,55			●					
	8,03	●							
	8,53	●							
	8,58								
	9,03	●							
	9,25			●	●				
	9,26								
	9,38				●				
	9,54			●					
	9,55			●					
	9,97								
	10,03	●							
	11,03	●							
	11,24								
	11,25				●				
	11,38				●				
	11,56								
	12,03	●							
	13,25				●				
	13,38				●				
	13,43			●					
	13,55			●					
	15,25								
	15,55			●					
	15,87					●	●	●	●
	16,1			●					
	17,25				●				
	17,55			●					
	17,8			●					
	18,1			●					
	19,25				●				
	19,55			●					

Drilling | Selection chart | By size | Carbide up to 5D

Tap pilot hole

# SELECTION CHART SIZE

Drilling | Selection chart | By size | Carbide up to 5D | Tap pilot hole



- = All sizes available within interval
- ⊙ = Limited number of sizes available within interval

Product series		ADO-5D	ADO-SUS-5D NEW SIZES	ADO-TRS-5D	HYP-HP-5D	HYP-HPO-5D	HYP-HPO-5D-HE	HYP-HPO-5D-HB NEW	WHO55-5D
A-Brand		A	A	A					
Total # of sizes		18	27	12	1	3	1	3	5
Incremental step	Diameter	B.484	B.477	B.489	B.508	B.517	B.519	B.521	B.529
	2,15		●						
	2,25		●						
	2,32								
	2,35		●						
	2,42								
	2,54								
	2,55		●						
	2,58								
	2,76	●	●						
	2,83		●						
	2,87		●						
	3,03								
	3,15	●	●						
	3,35		●						
	3,49								●
	3,53		●	●					
	3,66	●	●						
	3,68	●	●						
	3,73								
	4,03								
	4,15								●
	4,45		●						
	4,53								
	4,62	●							
	4,64	●	●						
	4,65								
	5,03					●		●	
	5,52	●	●						
	5,54	●	●						
	5,55			●		●		●	
	6,03								
	6,53								
	7,03								
	7,36	●	●						
	7,38	●	●	●					
	7,45		●	●					
	7,55		●	●					
	8,03								
	8,53								
	8,58								●
	9,03								
	9,25	●	●	●					
	9,26	●	●						
	9,38	●	●	●					
	9,54	●	●						
	9,55								
	9,97								●
	10,03								
	11,03								
	11,24	●	●						
	11,25			●					
	11,38	●	●	●					
	11,56								●
	12,03								
	13,25	●	●	●					
	13,38			●					
	13,43		●						
	13,55		●						
	15,25	●	●						
	15,55		●						
	15,87	●			●	●	●	●	
	17,55		●	●					
	19,25								
	19,55		●	●					

Drilling | Selection chart | By size | Carbide up to 5D



Tap pilot hole

# SELECTION CHART SIZE

Drilling | Selection chart | By size | Carbide up to 30D



- = All sizes available within interval
- = Limited number of sizes available within interval

Product series		ADO-SUS-8D	HYP-HPO-8D	ADO-10D	TRS-HO-10D	ADO-15D NEW SIZES	CAO-GDXL-15D	ADO-20D NEW SIZES	CAO-GDXL-20D	ADO-25D NEW	ADO-30D NEW SIZES	CAO-GDXL-30D	ADO-40D NEW	ADO-50D NEW
<b>A-Brand</b>		<b>A</b>		<b>A</b>	<b>A</b>	<b>A</b>		<b>A</b>		<b>A</b>	<b>A</b>		<b>A</b>	<b>A</b>
Total # of sizes		101	134	102	11	93	9	93	9	92	72	5	6	5
Incremental step	Diameter	B.480	B.523	B.493	B.491	B.495	B.504	B.497	B.504	B.499	B.501	B.504	B.502	B.503
	2,0	●		●										
0,1	2,1 ~ 2,9	●		●		○		○		○	○			
	3,0	●	●	●		●	●	●		●	●		●	●
0,1	3,1 ~ 3,9	●	●	●		●	●	●		●	●		●	●
	4,0	●	●	●		●	●	●		●	●		●	●
0,1	4,1 ~ 4,9	●	●	●		●	●	●	●	●	●		●	●
	5,0	●	●	●	●	●	●	●	●	●	●	●	●	●
0,1	5,1 ~ 5,9	●	●	●	○	●	●	●	●	●	●	○	●	●
	6,0	●	●	●	○	●	○	●	●	●	●	○	●	●
0,1	6,1 ~ 6,9	●	●	●	○	●	○	●	●	●	●	○	●	●
	7,0	●	●	●	○	●	○	●	●	●	●	○	●	●
0,1	7,1 ~ 7,9	●	●	●	○	●	○	●	●	●	●	○	●	●
	8,0	●	●	●	○	●	○	●	●	●	●	○	●	●
0,1	8,1 ~ 8,9	●	●	●	○	●	○	●	●	●	●	○	●	●
	9,0	●	●	●	○	●	○	●	●	●	●	○	●	●
0,1	9,1 ~ 9,9	●	●	●	○	●	○	●	●	●	●	○	●	●
	10,0	●	●	●	○	●	○	●	●	●	●	○	●	●
0,1	10,1 ~ 10,9	●	●	●	○	●	○	●	●	●	●	○	●	●
	11,0	●	●	●	○	●	○	●	●	●	●	○	●	●
0,1	11,1 ~ 11,9	●	●	●	○	●	○	●	●	●	●	○	●	●
	12,0	●	●	●	○	●	○	●	●	●	●	○	●	●
	12,5		●	●		●		●		●				
	13,0		●											
	13,5		●											
	14,0		●											
	14,5		●											
	15,0		●											
	15,5		●											
	16,0		●											
	16,5		●											
	17,0		●											
	17,5		●											
	18,0		●											
	18,5		●											
	19,0		●											
	19,5		●											
	20,0		●											
	1/8 - (3,17)		●											
	9/64 - (3,57)		●											
	5/32 - (3,97)		●											
	11/64 - (4,37)		●											
	3/16 - (4,76)		●											
	13/64 - (5,16)		●											
	7/32 - (5,56)		●											
	15/64 - (5,95)		●											
	1/4 - (6,35)		●											
	17/64 - (6,75)		●											
	9/32 - (7,14)		●											
	19/64 - (7,54)		●											
	5/16 - (7,94)		●											
	21/64 - (8,33)		●											
	11/32 - (8,73)		●											
	23/64 - (9,13)		●											
	3/8 - (9,52)		●											
	25/64 - (9,92)		●											
	13/32 - (10,32)		●											
	27/64 - (10,72)		●											
	7/16 - (11,11)		●											
	29/64 - (11,51)		●											
	15/32 - (11,91)		●											
	31/64 - (12,3)		●											
	1/2 - (12,7)		●											
	9/16 - (14,29)		●											
	5/8 - (15,87)		●											

Drilling | Selection chart | By size

Carbide up to 30D

# SELECTION CHART SIZE

Drilling | Selection chart | By size | Carbide up to 5D | Pilot drills

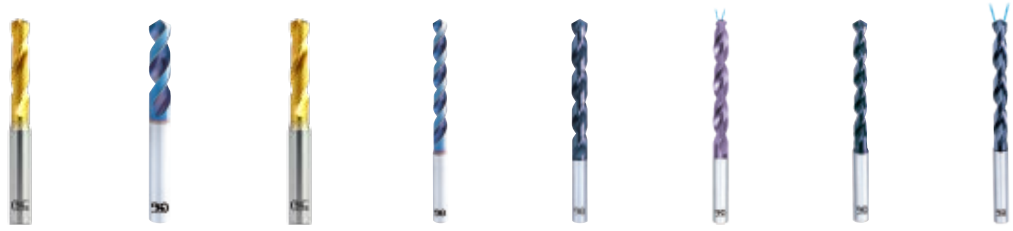


- = All sizes available within interval
- = Limited number of sizes available within interval

Product series		ADO-PLT					
<b>A-Brand</b>		<b>A</b>					
Total # of sizes		15					
Incremental step	Diameter	B.492					
	3,03	●					
	3,53	●					
	4,03	●					
	4,53	●					
	5,03	●					
	5,53	●					
	6,03	●					
	6,53	●					
	7,03	●					
	8,03	●					
	8,53	●					
	9,03	●					
	10,03	●					
	11,03	●					
	12,03	●					

# SELECTION CHART SIZE

Drilling | Selection chart | By size | HSS up to 5D



- = All sizes available within interval
- = Limited number of sizes available within interval

Product series		EX-GDS	NEXUS-GDS	EX-GDR	NEXUS-GDR	V-SDR	V-HDO-GDR	VP-GDR	VP-HO-GDR
Incremental		0,05 mm incremental from Ø1 to Ø6		0,05 mm incremental from Ø2 to Ø12					
Total # of sizes		193	106	249	32	111	96	144	56
Incremental step	Diameter	B.556	B.538	B.559	B.540	B.541	B.562	B.535	B.537
0,1	1,0 ~ 1,9	●	●	●	●	●		●	
	2,0	●	●			●			
0,1	2,1 ~ 2,9	●	●	●	○	●		●	
	3,0	●	●			●			
0,1	3,1 ~ 3,9	●	●	●	○	●		●	
	4,0	●	●			●			
0,1	4,1 ~ 4,9	●	●	●	○	●		●	
	5,0	●	●			●			
0,1	5,1 ~ 5,9	●	●	●	○	●		●	
	6,0	●	●			●	●		
0,1	6,1 ~ 6,9	●	●	●	○	●		●	○
	7,0	●	●			●			
0,1	7,1 ~ 7,9	●	○	●	○	●		●	○
	8,0	●	●			●			
0,1	8,1 ~ 8,9	●	●	●	○	●		●	○
	9,0	●	●			●			
0,1	9,1 ~ 9,9	●	○	●	○	●		●	○
	10,0	●	●			●			
0,1	10,1 ~ 10,9	●	○	●	○	●		●	○
	11,0	●	●			●			
0,1	11,1 ~ 11,9	●	○	●	○	●		●	○
	12,0	●	●			●			
0,1	12,1 ~ 12,9	●	○	●	○	●		●	○
	13,0	●				●			
	13,5						●		
	14,0						●		
	14,1							●	
	14,5							●	
	15,0						●	●	
	15,5							●	
	15,6							●	
	16,0						●	●	
	16,5							●	
	17,0						●	●	
	17,5						●	●	
	17,6							●	
	18,0						●	●	
	18,5							●	
	19,0						●	●	
	19,5							●	
	19,6							●	
	20,0						●	●	
	20,5							●	
	21,0						●	●	
	21,1							●	
	21,5						●	●	
	22,0							●	
	22,5						●	●	
	23,0							●	
	23,5						●	●	
	24,0							●	
	24,5						●	●	
	25,0							●	
	25,5						●	●	
	26,0							●	
	26,5						●	●	
	27,0							●	
	28,0						●	●	
	29,0							●	
	30,0						●	●	
	31,0							●	
	32,0			●			●	●	●
	5,95 - (15/64)	●		●					
	6,35 - (1/4)			●					
	6,75 - (17/64)			●					
	12,3 - (31/64)	●		●		●		●	
	12,7 - (1/2)	●		●		●		●	

Drilling | Selection chart | By size

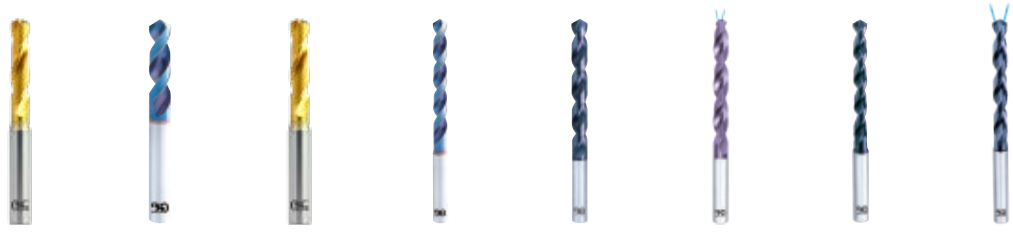
HSS up to 5D



# SELECTION CHART SIZE

Drilling | Selection chart | By size | HSS up to 5D | Tap pilot hole

- = All sizes available within interval
- = Limited number of sizes available within interval



Product series		EX-GDS	NEXUS-GDS	EX-GDR	NEXUS-GDR	V-SDR	V-HDO-GDR	VP-GDR	VP-HO-GDR
Incremental		0,05 mm incremental from Ø1 to Ø6		0,05 mm incremental from Ø2 to Ø12					
Total # of sizes		28	20	29					
Incremental step	Diameter	B.556	B.538	B.559	B.540	B.541	B.562	B.535	B.537
	1,81		●						
	1,83		●						
	2,11		●						
	2,13		●						
	2,28		●						
	2,38		●						
	2,76		●						
	2,78		●						
	3,25	●	●	●					
	3,65	●	●	●					
	3,67		●						
	4,15	●		●					
	4,45	●		●					
	4,59		●						
	4,63		●						
	4,65	●		●					
	5,48		●						
	5,55	●		●					
	6,55	●		●					
	6,65	●		●					
	7,34		●						
	7,35	●		●					
	7,38		●						
	7,45			●					
	7,55	●		●					
	7,65	●		●					
	8,35	●		●					
	8,55	●		●					
	8,65	●		●					
	9,18		●						
	9,24		●						
	9,25	●		●					
	9,34		●						
	9,35	●		●					
	9,36		●						
	9,45	●		●					
	9,55	●		●					
	9,65	●		●					
	9,95	●		●					
	10,25	●		●					
	10,35	●		●					
	10,55	●		●					
	10,65	●		●					
	10,95	●		●					
	11,25	●		●					
	11,35	●		●					
	11,55	●		●					

Drilling | Selection chart | By size | HSS up to 5D

Tap pilot hole



# SELECTION CHART SIZE

Drilling | Selection chart | By size | HSS up to 30D



- = All sizes available within interval
- = Limited number of sizes available within interval

Product series		EX-GDXL 8D	TDXL 10D	EX-GDXL 10D	TDXL 15D	EX-GDXL 15D	TDXL 20D	EX-GDXL 20D	EX-GDXL 25D	EX-GDXL 30D
<b>A-Brand</b>										
Total # of sizes		21	103	89	68	104	48	72	36	10
Incremental step	Diameter	B.568	B.565	B.569	B.566	B.570	B.567	B.572	B.573	B.574
	1,6		●		●		●			
	1,8		●		●		●			
	2,0		●		●		●			
0,1	2,1 ~ 2,9		●		●	●	●	●		
	3,0		●		●		●			
0,1	3,1 ~ 3,9		●	○	●	○	○	○	●	○
	4,0		●		●		●			
0,1	4,1 ~ 4,9		●	○	●	○	○	○		
	5,0		●		●		●			
0,1	5,1 ~ 5,9		●	○	●	○	○	○	●	○
	6,0		●		●		●		●	○
0,1	6,1 ~ 6,9		●	○	●	○	○	○	○	○
	7,0		●		●		●			
0,1	7,1 ~ 7,9		●	○	●	○	○	○	●	○
	8,0		●		●		●			
0,1	8,1 ~ 8,9		●	○	●	○	○	○	○	
	9,0		●		●		●			
0,1	9,1 ~ 9,9		●	○	●	○	○	○		
	10,0		●		●		●			
0,1	10,1 ~ 10,9		●	○	●	○	○	○		
	11,0	●	●		●		●			
0,1	11,1 ~ 11,9	●	●	○	●	○	○			
	12,0	●	●		●		●			
0,1	12,1 ~ 12,9	●	●	○	●	○	○			
	12,3 (31/64)	●		○		○				
	12,7 (1/2)	●		○		○				

Drilling | Selection chart | By size

HSS up to 30D

# SELECTION CHART SIZE

Drilling | Selection chart | By size | Indexables up to 5D



- = All sizes available within interval
- = Limited number of sizes available within interval

Product series		P2D	PDZ NEW	P3D	PXD 3D	PHP	P4D	P5D	PXD-5D	PZAG SS
<b>A-Brand</b>										
<b>Total # of sizes</b>		77	33	88	13	40	77	77	13	11
Incremental step	Diameter	B.626	B.628	B.629	B.635	B.637	B.631	B.633	B.636	B.639
	12	●		●			●	●		
	12,5	●		●			●	●		
	12,7			●						
	13	●		●			●	●		
	13,5	●		●			●	●		
	14	●		●			●	●		
	14,5	●		●	●	●	●	●	●	●
	15	●		●	●	●	●	●	●	
	15,5	●		●	●	●	●	●	●	
	16	●	●	●	●	●	●	●	●	
	16,5	●	●	●	●	●	●	●	●	
	17	●	●	●	●	●	●	●	●	
	17,5	●		●	●	●	●	●	●	●
	18	●	●	●	●	●	●	●	●	●
	18,5	●	●	●	●	●	●	●	●	
	19	●	●	●	●	●	●	●	●	
	19,5	●	●	●	●	●	●	●	●	
	20	●	●	●	●	●	●	●	●	●
	20,5	●		●	●	●	●	●	●	
	21	●	●	●	●	●	●	●	●	
	21,5	●		●	●	●	●	●	●	
	22	●	●	●	●	●	●	●	●	
	22,5	●		●	●	●	●	●	●	
	23	●	●	●	●	●	●	●	●	●
	23,5	●		●	●	●	●	●	●	
	24	●	●	●	●	●	●	●	●	
	24,5	●		●	●	●	●	●	●	
	25	●	●	●	●	●	●	●	●	
	25,5	●		●	●	●	●	●	●	
	26	●	●	●	●	●	●	●	●	●
	26,5	●		●	●	●	●	●	●	
	27	●	●	●	●	●	●	●	●	
	27,5	●		●	●	●	●	●	●	
	28	●	●	●	●	●	●	●	●	
	28,5	●	●	●	●	●	●	●	●	
	29	●	●	●	●	●	●	●	●	●
	29,5	●		●	●	●	●	●	●	
	30	●	●	●	●	●	●	●	●	
	30,5	●		●	●	●	●	●	●	
	31	●	●	●	●	●	●	●	●	
	31,5	●		●	●	●	●	●	●	
	32	●	●	●	●	●	●	●	●	●
	32,5	●		●	●	●	●	●	●	
	33	●	●	●	●	●	●	●	●	
	33,5	●		●	●	●	●	●	●	
	34	●	●	●	●	●	●	●	●	
	34,5	●		●	●	●	●	●	●	
	35	●	●	●	●	●	●	●	●	●
	35,5	●		●	●	●	●	●	●	
	36	●	●	●	●	●	●	●	●	
	37	●	●	●	●	●	●	●	●	
	37,5	●		●	●	●	●	●	●	
	38	●	●	●	●	●	●	●	●	
	39	●	●	●	●	●	●	●	●	●
	40	●	●	●	●	●	●	●	●	
	40,5	●		●	●	●	●	●	●	
	41	●	●	●	●	●	●	●	●	
	42	●	●	●	●	●	●	●	●	
	43	●	●	●	●	●	●	●	●	●
	44	●		●	●	●	●	●	●	
	45	●		●	●	●	●	●	●	
	46	●		●	●	●	●	●	●	
	47	●		●	●	●	●	●	●	
	48	●		●	●	●	●	●	●	●
	49	●		●	●	●	●	●	●	
	50	●		●	●	●	●	●	●	
	50,5	●		●	●	●	●	●	●	
	51	●		●	●	●	●	●	●	
	52	●		●	●	●	●	●	●	
	53	●		●	●	●	●	●	●	
	54	●		●	●	●	●	●	●	
	55	●		●	●	●	●	●	●	
	56	●		●	●	●	●	●	●	
	57	●		●	●	●	●	●	●	
	58	●		●	●	●	●	●	●	
	59	●		●	●	●	●	●	●	
	60	●		●	●	●	●	●	●	
	61	●		●	●	●	●	●	●	●
	62	●		●	●	●	●	●	●	
	63	●		●	●	●	●	●	●	

Drilling | Selection chart | By size

Indexables up to 5D

# INDEX

## Drilling

### Micro

#### Solid carbide



Product series		A-Brand	Features	Range	No. of sizes	Page
ADO-MICRO-2D NEW		<b>A</b>	Micro carbide drill with internal coolant, IchAda coating Small sizes for precision operation	0.7 - 2	17	B.454
ADO-MICRO-5D NEW		<b>A</b>	Micro carbide drill with internal coolant, IchAda coating Small sizes for precision operation	0.7 - 2	19	B.455
ADO-MICRO-12D NEW		<b>A</b>	Micro carbide drill with internal coolant, IchAda coating Small sizes for precision operation	1 - 2	11	B.456
ADO-MICRO-15D NEW		<b>A</b>	Micro carbide drill with internal coolant, IchAda coating Small sizes for precision operation	2	1	B.457
ADO-MICRO-20D NEW		<b>A</b>	Micro carbide drill with internal coolant, IchAda coating Small sizes for precision operation	1 - 2	11	B.458
ADO-MICRO-25D NEW		<b>A</b>	Micro carbide drill with internal coolant, IchAda coating Small sizes for precision operation	2	1	B.459
ADO-MICRO-30D NEW		<b>A</b>	Micro carbide drill with internal coolant, IchAda coating Small sizes for precision operation	1 - 2	11	B.460
WX-MS-GDS			Micro carbide drill with multilayer TiAlN coating Small sizes for precision operation	0,2 - 5	241	B.461
MRS-GDL			Micro carbide drill with SC coating For deep micro drilling in stainless steel	0,5 - 3	75	B.464

Drilling | Index

### ≤2D

#### Solid carbide



Product series		A-Brand	Features	Range	No. of sizes	Page
ADF-2D		<b>A</b>	Carbide drill with EgiAs coating Flat drilling application	0,2 - 20	250	B.465
ADFLS-2D		<b>A</b>	Carbide drill with EgiAs coating For deep reach flat drilling application	3 - 20	78	B.468
AD-2D		<b>A</b>	Carbide drill with EgiAs coating For general purpose steels and cast iron	2 - 20	160	B.471

### ≤3D

#### Solid carbide



Product series		A-Brand	Features	Range	No. of sizes	Page
ADO-3D		<b>A</b>	Carbide drill with internal coolant, EgiAs coating For general purpose steels and cast iron	2 - 20	167	B.482
ADO-SUS-3D		<b>A</b>	Carbide drill with internal coolant, WXL coating Designed for stainless steel and titanium alloys	2 - 20	179	B.475
ADFO-3D		<b>A</b>	Carbide drill with internal coolant, EgiAs coating Flat drilling application	3 - 20	160	B.469

# INDEX

## Drilling




### ≤3D

#### Solid carbide

	Product series	 A-Brand	Features	Range	No. of sizes	Page
	D-STAD	 DIA	Triple angle carbide drill with diamond coating For CFRP	4 - 8	4	B.525
	D-DAD	 DIA	Double angle drill For CFRP	2,5 - 9,5	6	B.526
	D-GDN90	 DIA	Diamond coated 90° point angle drill For CFRP	2,5 - 9,5	6	B.527
	ADO-TRS-3D	 EgiAs	<b>A</b> 3 flute carbide drill with internal coolant, EgiAs coating Allows high feed 1.000mm/min process in steel and cast iron	3 - 20	112	B.487
	HYP-HP-3D	 EgiAs	Carbide drill with EgiAs coating General purpose	1 - 20	154	B.505
	HYP-HPO-3D	 EgiAs	Carbide drill with internal coolant, EgiAs coating General purpose	3 - 20	136	B.510
	HYP-HPO-3D-HE	 EgiAs	Carbide drill with internal coolant, EgiAs coating With Whistle Notch shank for general purpose	3 - 20	134	B.512
	HYP-HPO-3D-HB NEW	 EgiAs	Carbide drill with internal coolant, EgiAs coating With Weldon shank for general purpose	3 - 20	136	B.514
	HYP-HP-SC-3D NEW	 EgiAs	Carbide step drill with EgiAs coating General purpose, for tap drill holes.	6 - 14	7	B.507
	HYP-HPO-SC-3D NEW	 EgiAs	Carbide step drill with internal coolant, EgiAs coating General purpose, for tap drill holes.	6 - 14	6	B.516
	WH70-DRL	 DUOREY	Carbide drill with DUOREY coating With low helix for high rigidity, up to 70HRC material	2 - 12	101	B.530








### ≤4D

#### Solid carbide

	Product series	 A-Brand	Features	Range	No. of sizes	Page
	AD-4D	 EgiAs	<b>A</b> Carbide drill with EgiAs coating For general purpose steels and cast iron	2 - 20	149	B.473

### ≤5D

#### Solid carbide

	Product series	 A-Brand	Features	Range	No. of sizes	Page
	ADO-5D	 EgiAs	<b>A</b> Carbide drill with internal coolant, EgiAs coating For general purpose steels and cast iron	2 - 20	191	B.484
	ADO-SUS-5D	 WXL	<b>A</b> Carbide drill with internal coolant, WXL coating Designed for stainless steel and titanium alloys	2 - 20	198	B.477
	ADO-TRS-5D	 EgiAs	<b>A</b> 3 flute carbide drill with internal coolant, EgiAs coating Allows high feed 1.000mm/min process in steel and cast iron	3 - 20	112	B.489

















# INDEX

## Drilling




### ≤5D

#### Solid carbide

	Product series		A-Brand	Features	Range	No. of sizes	Page
	HYP-HP-5D			Carbide drill with EgiAs coating General purpose	1 - 20	154	B.508
	HYP-HPO-5D			Carbide drill with internal coolant, EgiAs coating General purpose	1 - 20	156	B.517
	HYP-HPO-5D-HE			Carbide drill with internal coolant, EgiAs coating With Whistle Notch shank for general purpose	3 - 20	134	B.519
	HYP-HPO-5D-HB NEW			Carbide drill with internal coolant, EgiAs coating With Weldon shank for general purpose	3 - 20	136	B.521
	WH55-5D			Carbide drill with DUREY coating For hardened material up to 55HRC	2 - 12	36	B.528
	WHO55-5D			Carbide drill with internal coolant, DUREY coating For hardened material up to 55HRC including Inconel	3,3 - 12	54	B.529
	JOBBER DRILL			Carbide drill bright finish General purpose	1 - 12,7	125	B.575






### Pilot

#### Solid carbide

	Product series		A-Brand	Features	Range	No. of sizes	Page
	ADO-PLT		<b>A</b>	Carbide pilot drill with internal coolant, EgiAs coating For general purpose steels and cast iron	3,03 - 12,03	15	B.492






### ≤8D

#### Solid carbide

	Product series		A-Brand	Features	Range	No. of sizes	Page
	ADO-SUS-8D		<b>A</b>	Carbide drill with internal coolant, WXL coating Designed for stainless steel and titanium alloys	2 - 12	101	B.480
	HYP-HPO-8D			Carbide drill with internal coolant, EgiAs coating General purpose	3 - 20	134	B.523

### ≤10D

#### Solid carbide

	Product series		A-Brand	Features	Range	No. of sizes	Page
	ADO-10D		<b>A</b>	Carbide drill with internal coolant, EgiAs coating For general purpose steels and cast iron Double margin	2 - 12,5	102	B.493
	TRS-HO-10D		<b>A</b>	3 flute carbide drill with internal coolant, WDI coating Allows high feed 1.000mm/min process in steel and cast iron	5 - 12	11	B.491



# INDEX

## Drilling

### ≤15D

#### Solid carbide



Product series		A-Brand	Features	Range	No. of sizes	Page
ADO-15D	EgiAs	A	Carbide drill with internal coolant, EgiAs coating For general purpose steels and cast iron Double margin	2,5 - 12,5	93	B.495
CAO-GDXL			Carbide drill with internal coolant, bright finish For aluminium and cast aluminium	3 - 10	9	B.504

### ≤20D

#### Solid carbide



Product series		A-Brand	Features	Range	No. of sizes	Page
ADO-20D	EgiAs	A	Carbide drill with internal coolant, EgiAs coating For general purpose steels and cast iron Double margin	2,5 - 12,5	93	B.497
CAO-GDXL			Carbide drill with internal coolant, bright finish For aluminium and cast aluminium	4 - 10	9	B.504

### ≤30D

#### Solid carbide



Product series		A-Brand	Features	Range	No. of sizes	Page
ADO-25D NEW	EgiAs	A	Carbide drill with internal coolant, EgiAs coating For general purpose steels and cast iron Double margin	2,5 - 12,5	92	B.499
ADO-30D	EgiAs	A	Carbide drill with internal coolant, EgiAs coating For general purpose steels and cast iron Double margin	2,5 - 10	72	B.501
CAO-GDXL			Carbide drill with internal coolant, bright finish For aluminium and cast aluminium	5 - 8	5	B.504

### ≤40D

#### Solid carbide



Product series		A-Brand	Features	Range	No. of sizes	Page
ADO-40D NEW	EgiAs	A	Carbide drill with internal coolant, EgiAs coating For general purpose steels and cast iron Double margin	3 - 10	6	B.502

### ≤50D

#### Solid carbide



Product series		A-Brand	Features	Range	No. of sizes	Page
ADO-50D NEW	EgiAs	A	Carbide drill with internal coolant, EgiAs coating For general purpose steels and cast iron Double margin	3 - 8	5	B.503







# INDEX

## Drilling

### ≤3D

HSS









Product series		A-Brand	Features	Range	No. of sizes	Page
EX-SUS-GDS	 TiN		HSSE drill with TiN coating For stainless steel, low carbon steel and cast aluminium From Ø 0,5 - 6 mm in 0,01 mm increments	0,5 - 20	635	B.543
EX-GDS	 TiN		HSSE drill with TiN coating General purpose	1 - 13	193	B.556
NEXUS-GDS	 WDI		HSSE drill with WDI coating For stainless steel and non-ferrous materials	1 - 12	106	B.538

### ≤5D

HSS





Product series		A-Brand	Features	Range	No. of sizes	Page
EX-SUS-GDR	 TiN		HSSE drill with TiN coating For stainless steel, low carbon steel and cast aluminium From Ø 2 - 6 mm in 0,01 mm increments	2 - 20	485	B.550
EX-GDR	 TiN		HSSE drill with TiN coating General purpose	2 - 32	249	B.559
NEXUS-GDR	 WDI		HSSE drill with WDI coating For stainless steel and non-ferrous materials	2 - 12	32	B.540
V-SDR	 V		HSSE drill with TiCN coating General purpose	2 - 13	111	B.541
V-HDO-GDR	 V		HSS-Co drill with internal coolant, TiCN coating General purpose	6 - 32	96	B.562

Drilling | Index

### ≤8D

HSS






Product series		A-Brand	Features	Range	No. of sizes	Page
EX-GDXL-8D	 TiN		HSS-Co drill with TiN coating For general purpose steels and cast iron	11 - 13	21	B.568

### ≤10D

HSS



Product series		A-Brand	Features	Range	No. of sizes	Page
TDXL-10D	 WXL		HSS-Co drill with WXL coating For steels, cast iron and cast aluminium	1,6 - 12	103	B.564
EX-GDXL-10D	 TiN		HSS-Co drill with TiN coating For general purpose steels and cast iron	3,6 - 13	89	B.569




# INDEX

## Drilling

### ≤15D

HSS




Product series		A-Brand	Features	Range	No. of sizes	Page
TDXL-15D	WXL		HSS-Co drill with WXL coating For steels, cast iron and cast aluminium	1,6 - 12	68	B.566
EX-GDXL-15D	TiN		HSS-Co drill with TiN coating For general purpose steels and cast iron	2 - 13	104	B.570

### ≤20D

HSS




Product series		A-Brand	Features	Range	No. of sizes	Page
TDXL-20D	WXL		HSS-Co drill with WXL coating For steels, cast iron and cast aluminium	1,6 - 12	48	B.567
EX-GDXL-20D	TiN		HSS-Co drill with TiN coating For general purpose steels and cast iron	2 - 10,9	72	B.572

### ≤25D

HSS




Product series		A-Brand	Features	Range	No. of sizes	Page
EX-GDXL-25D	TiN		HSS-Co drill with TiN coating For general purpose steels and cast iron	3,3 - 8,1	36	B.573

### ≤30D

HSS



Product series		A-Brand	Features	Range	No. of sizes	Page
EX-GDXL-30D	TiN		HSS-Co drill with TiN coating For general purpose steels and cast iron	3 - 6,3	10	B.574





# INDEX

## Drilling

### ≤3D

#### Powder metal






Product series		A-Brand	Features	Range	No. of sizes	Page
VPH-GDS		WDI	Powder metal drill with WDI coating For cast iron, exotic material and hardened steel	0,5 - 13	126	B.533

### ≤5D

#### Powder metal




Product series		A-Brand	Features	Range	No. of sizes	Page
VP-GDR		V	Powder metal drill with TiCN coating For steel, cast iron and non-ferrous material	2 - 32	144	B.535
VP-HO-GDR		V	Powder metal drill with internal coolant, TiCN coating For steel, cast iron, exotic and non-ferrous material	6 - 32	56	B.537

### ≤2D

#### Indexable




Product series		A-Brand	Features	Range	No. of sizes	Page
P2D			Indexable drill with internal coolant 3 different insert grades available	12 - 63	77	B.626
PDZ NEW			Indexable flat drill with internal coolant	16 - 43	33	B.628

### ≤3D

#### Indexable




Product series		A-Brand	Features	Range	No. of sizes	Page
P3D			Indexable drill with internal coolant 3 different insert grades available	12 - 63	88	B.629
PXD-3D			Exchangeable head drill with internal coolant 3 different solid carbide head types based on work material	14 - 25,99	13	B.635
PHP			Indexable drill with internal coolant 2 different insert grades available	14 - 40	40	B.637

### ≤4D

#### Indexable



Product series		A-Brand	Features	Range	No. of sizes	Page
P4D			Indexable drill with internal coolant 3 different insert grades available	12 - 63	77	B.631



# INDEX

## Drilling

### ≤5D

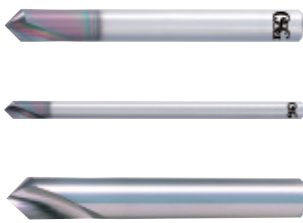
#### Indexable



Product series		A-Brand	Features	Range	No. of sizes	Page
P5D			Indexable drill with internal coolant 3 different insert grades available	12 - 63	77	B.633
PXD-5D			Exchangeable head drill with internal coolant 3 different solid carbide head types based on work material	14 - 25,99	13	B.636

## Spot/Chamfer/Centring

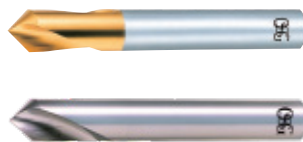
#### Carbide



Product series		A-Brand	Features	Range	No. of sizes	Page
AD-LDS	EgiAs	A	Carbide drill with EgiAs coating Carbide starter drill	3 - 12	30	B.577
AD-LS-LDS	EgiAs	A	Carbide drill with EgiAs coating Carbide long shank starter drill	3 - 12	6	B.578
HYP-LDS			Carbide drill for centring and chamfering, bright finish For steels and cast iron With 90°, 120° or 142° point angle	3 - 20	24	B.579

## Spot/Chamfer

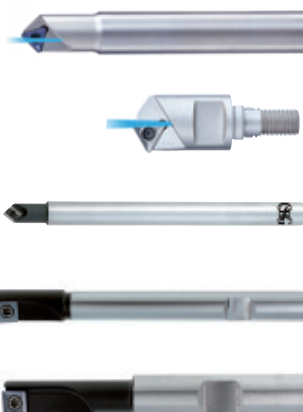
#### HSS



Product series		A-Brand	Features	Range	No. of sizes	Page
TiN-NC-LDS	TiN		HSS drill for centering and chamfering with TiN coating For steels and cast iron With 60°, 90° or 120° point angle	3 - 25	21	B.580
NC-LDS			HSS drill for centering and chamfering, bright finish For steels and cast iron With 90°, 120° or 130° point angle	3 - 25	27	B.581

## Spot/Chamfer

#### Indexable



Product series		A-Brand	Features	Range	No. of sizes	Page
PLDS SS NEW			Indexable multi purpose centering and chamfering tool Straight shank type With 90° or 120° point angle	14,4-17,3	4	B.641
PLDS SF NEW			Indexable multi purpose centering and chamfering tool Screw fit type With 90° or 120° point angle	14,4-17,3	2	B.642
HY-PRO-CARB			Indexable multi purpose centering and chamfering tool	9 - 29,4	12	B.644
HY-PRO-CARB NEW			Boring tool For boring pre-drilled and precast holes Steel shank, Weldon flat, DIN 1835B	9,8 - 21,8	13	B.649
HY-PRO-CARB NEW			Counterbore mono To produce counterbores for cap screws, hex screwheads, ejectors, spot facing, gasket seats etc Straight shank with Weldon flat, DIN 1835B	8 - 20	13	B.650



# INDEX

## Drilling

### Spot/Chamfer

#### Indexable



Product series		A-Brand	Features	Range	No. of sizes	Page
HY-PRO-CARB NEW			Counterbore mono To produce counterbores for cap screws, hex screwheads, ejectors, spot facing, gasket seats etc. Straight shank with Weldon flat, DIN 1835B With internal coolant supply	10 - 30	21	B.651
HY-PRO-CARB NEW			Counterbore multi To produce counterbores for cap screws, hex screwheads, ejectors, spot facing, gasket seats etc. Straight shank with Weldon flat, DIN 1835B With internal coolant supply	15 - 40	11	B.652
HY-PRO-CARB NEW			Chamfering and face milling For chamfering, countersinking, facing, etc. Straight shank with Weldon flat, DIN 1835B	13 - 40	10	B.653

### Others



Product series		A-Brand	Features	Range	No. of sizes	Page
EX-H-DRL			Carbide drill for removing broken taps, bright finish For hardened material up to 70HRC	2 - 12	11	B.532

### Carbide Reamers



Product series		A-Brand	Features	Range	No. of sizes	Page
CRM			Carbide straight reamer, bright finish From Ø 0,3 - 13,05 mm in 0,01 mm increments	0,3 - 13,05	1276	B.582

### Counterboring



Product series		A-Brand	Features	Range	No. of sizes	Page
PZAG BORE NEW			Counterboring cutter Bore type	54 - 82	7	B.640
PZAG SS NEW			Counterboring cutter straight shank Cylindrical type	14 - 48	11	B.639



# ISO 13399 LEGEND

Drilling | ISO 13399 Legend

ISO code	Description
ae	Maximum depth plunging
AN	Clearance angle major
APMX	Depth of cut maximum
b	Keyway depth
CBDP	Connection bore depth
CRKS	Connection retention knob thread size
DC	Cutting diameter
DC_INCH	Cutting diameter Inch size
DCN	Cutting diameter minimum
DCON	Connection diameter
DCSFMS	Contact surface diameter machine side
DCX	Cutting diameter maximum
IC	Inscribed circle diameter
KAPR	Tool cutting edge angle
KWW	Keyway width
L	Cutting edge length
LCF	Length chip flute
LF	Functional length
LH	Head length
LPR	Protruding length
LS	Shank length
LU	Usable length
OAL	Overall length
PHD	Premachined hole diameter
PL	Point length
RE	Corner radius
S	Insert thickness
SIG	Point angle
TCL	Tap chamfer length
W1	Insert width
ZEFP	Peripheral effective cutting edge count

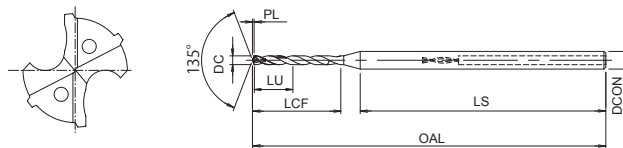
Drilling | ISO 13399 Legend





# ADO-MICRO-5D NEW

Drilling | Solid carbide | Micro drills



- First choice in quality and performance
- Micro carbide drill with internal coolant, IchAda coating
- Double margin, up to 5xD
- For general purpose steels and cast iron
- 19 sizes

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>IchAda</b>	<b>±30°</b>	0~-0.009	<b>SHRINK FIT</b>	<b>135°</b>	<b>B.596</b>
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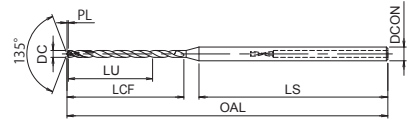
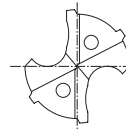
EDP	DC	LU	LCF	OAL	DCON	LS	PL	EDP	DC	LU	LCF	OAL	DCON	LS	PL
8732018	0,7	3,5	7	47	3	35,7	0,1								
8732019	0,75	3,8	7,5	47	3	35,3	0,2								
8732020	0,8	4	8	50	3	37,9	0,2								
8732021	0,85	4,3	8,5	50	3	37,5	0,2								
8732022	0,9	4,5	9	50	3	37,1	0,2								
8732023	0,95	4,8	9,5	50	3	36,7	0,2								
8732024	1	5	10	55	3	40,8	0,2								
8732025	1,1	5,5	11	55	3	40	0,2								
8732026	1,2	6	12	60	3	44,1	0,2								
8732027	1,3	6,5	13	60	3	43,3	0,3								
8732028	1,4	7	14	60	3	42,5	0,3								
8732029	1,5	7,5	15	60	3	41,7	0,3								
48337155	1,55	7,8	15,5	60	3	41,3	0,3								
8732030	1,6	8	16	60	3	40,9	0,3								
8732031	1,7	8,5	17	60	3	40,1	0,4								
8732032	1,8	9	18	65	3	44,3	0,4								
48337184	1,84	9,2	18,4	65	3	43,9	0,4								
8732033	1,9	9,5	19	65	3	43,4	0,4								
8732034	2	10	20	65	3	42,6	0,4								

Drilling | Solid carbide  
Micro drills



# ADO-MICRO-12D NEW

Drilling | Solid carbide | Micro drills



- First choice in quality and performance
- Micro carbide drill with internal coolant, IchAda coating
- Double margin, up to 12xD
- For general purpose steels and cast iron
- 11 sizes

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	<b>K</b>	<b>N</b>	<b>S</b>	<b>H</b>	<b>H</b>	<b>H</b>
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GG	GGG	AC, ADC	Ti	25-35 HRC	35-45 HRC	45-52 HRC

<b>A</b>	<b>CARBIDE</b>	<b>IchAda</b>	<b>±30°</b>	<b>0~-0.009</b>	<b>SHRINK FIT</b>	<b>135°</b>	<b>B.596</b>
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Drilling | Solid carbide

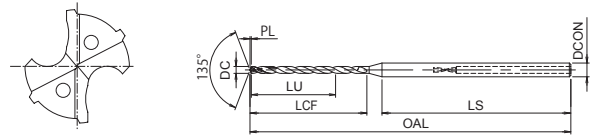
Micro drills

EDP	DC	LU	LCF	OAL	DCON	LS	PL	EDP	DC	LU	LCF	OAL	DCON	LS	PL
8732035	1	12	17	60	3	38,8	0,2								
8732036	1,1	13,2	18,7	65	3	42,3	0,2								
8732037	1,2	14,4	20,4	65	3	40,7	0,2								
8732038	1,3	15,6	22,1	65	3	39,2	0,3								
8732039	1,4	16,8	23,8	70	3	42,7	0,3								
8732040	1,5	18	25,5	70	3	41,2	0,3								
8732041	1,6	19,2	27,2	70	3	39,7	0,3								
8732042	1,7	20,4	28,9	73	3	41,2	0,4								
8732043	1,8	21,6	30,6	73	3	39,7	0,4								
8732044	1,9	22,8	32,3	73	3	38,1	0,4								
8732045	2	24	34	77	3	40,6	0,4								



# ADO-MICRO-15D NEW

Drilling | Solid carbide | Micro drills



- First choice in quality and performance
- Micro carbide drill with internal coolant, IchAda coating
- Double margin, up to 15xD
- For general purpose steels and cast iron



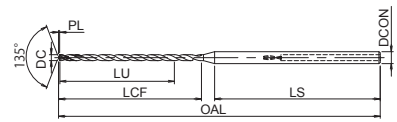
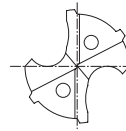
EDP	DC	LU	LCF	OAL	DCON	LS	PL		EDP	DC	LU	LCF	OAL	DCON	LS	PL
48337120	2	30	40	77	3	34,6	0,4									

Drilling | Solid carbide  
Micro drills



# ADO-MICRO-20D NEW

Drilling | Solid carbide | Micro drills



- First choice in quality and performance
- Micro carbide drill with internal coolant, IchAda coating
- Double margin, up to 20xD
- For general purpose steels and cast iron

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>IchAda</b>	<b>±30°</b>	<b>0~-0.009</b>	<b>SHRINK FIT</b>	<b>135°</b>	<b>B.596</b>
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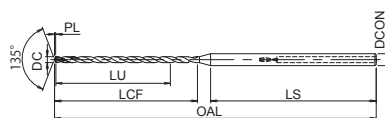
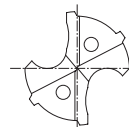
Drilling | Solid carbide

Micro drills

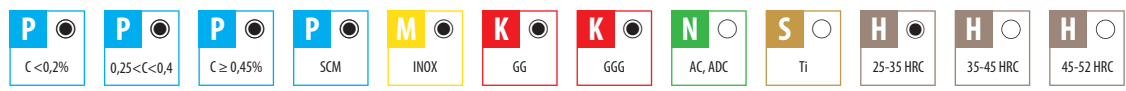
EDP	DC	LU	LCF	OAL	DCON	LS	PL	EDP	DC	LU	LCF	OAL	DCON	LS	PL
8732046	1	20	24	68	3	39,8	0,2								
8732047	1,1	22	26,4	75	3	44,6	0,2								
8732048	1,2	24	28,8	75	3	42,3	0,2								
8732049	1,3	26	31,2	75	3	40,1	0,3								
8732050	1,4	28	33,6	81	3	43,9	0,3								
8732051	1,5	30	36	81	3	41,7	0,3								
8732052	1,6	32	38,4	81	3	39,5	0,3								
8732053	1,7	34	40,8	88	3	44,3	0,4								
8732054	1,8	36	43,2	88	3	42,1	0,4								
8732055	1,9	38	45,6	88	3	39,8	0,4								
8732056	2	40	48	95	3	44,6	0,4								

# ADO-MICRO-25D NEW

Drilling | Solid carbide | Micro drills



- First choice in quality and performance
- Micro carbide drill with internal coolant, IchAda coating
- Double margin, up to 25xD
- For general purpose steels and cast iron



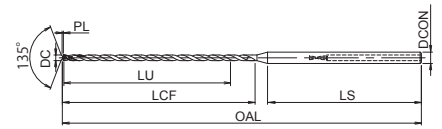
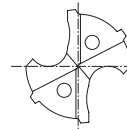
EDP	DC	LU	LCF	OAL	DCON	LS	PL
48337320	2	50	58	105	3	44,6	0,4

EDP	DC	LU	LCF	OAL	DCON	LS	PL



# ADO-MICRO-30D NEW

Drilling | Solid carbide | Micro drills



- First choice in quality and performance
- Micro carbide drill with internal coolant, IchAda coating
- Double margin, up to 30xD
- For general purpose steels and cast iron
- 11 sizes



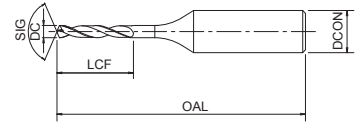
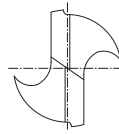
Drilling | Solid carbide

Micro drills

EDP	DC	LU	LCF	OAL	DCON	LS	PL	EDP	DC	LU	LCF	OAL	DCON	LS	PL
8732057	1	30	34	77	3	38,8	0,2								
8732058	1,1	33	37,4	86	3	44,6	0,2								
8732059	1,2	36	40,8	86	3	41,3	0,2								
8732060	1,3	39	44,2	86	3	38,1	0,3								
8732061	1,4	42	47,6	95	3	43,9	0,3								
8732062	1,5	45	51	95	3	40,7	0,3								
8732063	1,6	48	54,4	101	3	43,5	0,3								
8732064	1,7	51	57,8	101	3	40,3	0,4								
8732065	1,8	54	61,2	107	3	43,1	0,4								
8732066	1,9	57	64,6	107	3	39,8	0,4								
8732067	2	60	68	112	3	41,6	0,4								

# WX-MS-GDS

Drilling | Solid carbide | Micro drills



- Micro carbide drill with multilayer TiAlN coating
- Small sizes for precision operation
- 241 sizes



EDP	DC	LCF	OAL	DCON
3300020	0,2	1,5	38	3
3300021	0,21	1,5	38	3
3300022	0,22	1,5	38	3
3300023	0,23	1,5	38	3
3300024	0,24	1,5	38	3
3300025	0,25	1,5	38	3
3300026	0,26	1,5	38	3
3300027	0,27	1,5	38	3
3300028	0,28	1,5	38	3
3300029	0,29	1,5	38	3
3300030	0,3	1,5	38	3
3300031	0,31	2	38	3
3300032	0,32	2	38	3
3300033	0,33	2	38	3
3300034	0,34	2	38	3
3300035	0,35	2	38	3
3300036	0,36	2	38	3
3300037	0,37	2	38	3
3300038	0,38	2	38	3
3300039	0,39	2,5	38	3
3300040	0,4	2,5	38	3
3300041	0,41	2,5	38	3
3300042	0,42	2,5	38	3
3300043	0,43	2,5	38	3
3300044	0,44	2,5	38	3
3300045	0,45	2,5	38	3
3300046	0,46	2,5	38	3
3300047	0,47	2,5	38	3
3300048	0,48	2,5	38	3
3300049	0,49	3	38	3
3300050	0,5	3	38	3
3300051	0,51	3	38	3
3300052	0,52	3	38	3
3300053	0,53	3	38	3
3300054	0,54	3,5	38	3
3300055	0,55	3,5	38	3
3300056	0,56	3,5	38	3
3300057	0,57	3,5	38	3
3300058	0,58	3,5	38	3
3300059	0,59	3,5	38	3
3300060	0,6	3,5	38	3
3300061	0,61	4	38	3
3300062	0,62	4	38	3
3300063	0,63	4	38	3
3300064	0,64	4	38	3
3300065	0,65	4	38	3

EDP	DC	LCF	OAL	DCON
3300066	0,66	4	38	3
3300067	0,67	4	38	3
3300068	0,68	4,5	38	3
3300069	0,69	4,5	38	3
3300070	0,7	4,5	38	3
3300071	0,71	4,5	38	3
3300072	0,72	4,5	38	3
3300073	0,73	4,5	38	3
3300074	0,74	4,5	38	3
3300075	0,75	4,5	38	3
3300076	0,76	5	38	3
3300077	0,77	5	38	3
3300078	0,78	5	38	3
3300079	0,79	5	38	3
3300080	0,8	5	38	3
3300081	0,81	5	38	3
3300082	0,82	5	38	3
3300083	0,83	5	38	3
3300084	0,84	5	38	3
3300085	0,85	5	38	3
3300086	0,86	5,5	38	3
3300087	0,87	5,5	38	3
3300088	0,88	5,5	38	3
3300089	0,89	5,5	38	3
3300090	0,9	5,5	38	3
3300091	0,91	5,5	38	3
3300092	0,92	5,5	38	3
3300093	0,93	5,5	38	3
3300094	0,94	5,5	38	3
3300095	0,95	5,5	38	3
3300096	0,96	6	38	3
3300097	0,97	6	38	3
3300098	0,98	6	38	3
3300099	0,99	6	38	3
3300100	1	6	38	3
3300101	1,01	6	38	3
3300102	1,02	6	38	3
3300103	1,03	6	38	3
3300104	1,04	6	38	3
3300105	1,05	6	38	3
3300106	1,06	6	38	3
3300107	1,07	7	42	3
3300108	1,08	7	42	3
3300109	1,09	7	42	3
3300110	1,1	7	42	3
3300111	1,11	7	42	3

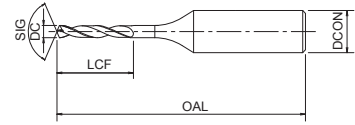
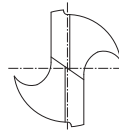
Drilling | Solid carbide

Micro drills



# WX-MS-GDS

Drilling | Solid carbide | Micro drills



- Micro carbide drill with multilayer TiAlN coating
- Small sizes for precision operation
- 241 sizes

<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti
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<b>CARBIDE</b>	<b>WX</b>	<b>26°~32°</b>	<b>SHRINK FIT</b>	$D \geq 2,36$ <b>130°</b>	$2 \leq 2,35$ <b>140°</b>	<b>0~-0.01</b>
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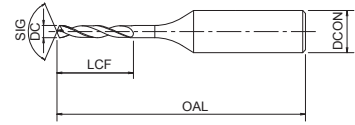
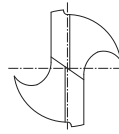
Drilling | Solid carbide

Micro drills

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
3300112	1,12	7	42	3	3300158	1,58	10	42	3
3300113	1,13	7	42	3	3300159	1,59	10	42	3
3300114	1,14	7	42	3	3300160	1,6	10	42	3
3300115	1,15	7	42	3	3300161	1,61	10	42	3
3300116	1,16	7	42	3	3300162	1,62	10	42	3
3300117	1,17	7	42	3	3300163	1,63	10	42	3
3300118	1,18	7	42	3	3300164	1,64	10	42	3
3300119	1,19	8	42	3	3300165	1,65	10	42	3
3300120	1,2	8	42	3	3300166	1,66	10	42	3
3300121	1,21	8	42	3	3300167	1,67	10	42	3
3300122	1,22	8	42	3	3300168	1,68	10	42	3
3300123	1,23	8	42	3	3300169	1,69	10	42	3
3300124	1,24	8	42	3	3300170	1,7	10	42	3
3300125	1,25	8	42	3	3300171	1,71	11	42	3
3300126	1,26	8	42	3	3300172	1,72	11	42	3
3300127	1,27	8	42	3	3300173	1,73	11	42	3
3300128	1,28	8	42	3	3300174	1,74	11	42	3
3300129	1,29	8	42	3	3300175	1,75	11	42	3
3300130	1,3	8	42	3	3300176	1,76	11	42	3
3300131	1,31	8	42	3	3300177	1,77	11	42	3
3300132	1,32	8	42	3	3300178	1,78	11	42	3
3300133	1,33	9	42	3	3300179	1,79	11	42	3
3300134	1,34	9	42	3	3300180	1,8	11	42	3
3300135	1,35	9	42	3	3300181	1,81	11	42	3
3300136	1,36	9	42	3	3300182	1,82	11	42	3
3300137	1,37	9	42	3	3300183	1,83	11	42	3
3300138	1,38	9	42	3	3300184	1,84	11	42	3
3300139	1,39	9	42	3	3300185	1,85	11	42	3
3300140	1,4	9	42	3	3300186	1,86	11	42	3
3300141	1,41	9	42	3	3300187	1,87	11	42	3
3300142	1,42	9	42	3	3300188	1,88	11	42	3
3300143	1,43	9	42	3	3300189	1,89	11	42	3
3300144	1,44	9	42	3	3300190	1,9	11	42	3
3300145	1,45	9	42	3	3300191	1,91	12	50	3
3300146	1,46	9	42	3	3300192	1,92	12	50	3
3300147	1,47	9	42	3	3300193	1,93	12	50	3
3300148	1,48	9	42	3	3300194	1,94	12	50	3
3300149	1,49	9	42	3	3300195	1,95	12	50	3
3300150	1,5	9	42	3	3300196	1,96	12	50	3
3300151	1,51	10	42	3	3300197	1,97	12	50	3
3300152	1,52	10	42	3	3300198	1,98	12	50	3
3300153	1,53	10	42	3	3300199	1,99	12	50	3
3300154	1,54	10	42	3	3300200	2	12	50	3
3300155	1,55	10	42	3	3300205	2,05	12	50	3
3300156	1,56	10	42	3	3300210	2,1	12	50	3
3300157	1,57	10	42	3	3300215	2,15	13	50	3

# WX-MS-GDS

Drilling | Solid carbide | Micro drills



- Micro carbide drill with multilayer TiAlN coating
- Small sizes for precision operation
- 241 sizes



EDP	DC	LCF	OAL	DCON
3300220	2,2	13	50	3
3300225	2,25	13	50	3
3300230	2,3	13	50	3
3300235	2,35	13	50	3
3300240	2,4	14	50	3
3300245	2,45	14	50	3
3300250	2,5	14	50	3
3300255	2,55	14	50	3
3300260	2,6	14	50	3
3300265	2,65	14	50	3
3300270	2,7	16	50	3
3300275	2,75	16	50	3
3300280	2,8	16	50	3
3300285	2,85	16	50	3
3300290	2,9	16	50	3
3300295	2,95	16	50	3
3300300	3	16	50	3
3300305	3,05	18	56	4
3300310	3,1	18	56	4
3300315	3,15	18	56	4
3300320	3,2	18	56	4
3300325	3,25	18	56	4
3300330	3,3	18	56	4
3300335	3,35	18	56	4
3300340	3,4	20	56	4
3300345	3,45	20	56	4
3300350	3,5	20	56	4
3300355	3,55	20	56	4
3300360	3,6	20	56	4
3300365	3,65	20	56	4
3300370	3,7	20	56	4
3300375	3,75	20	56	4
3300380	3,8	22	56	4
3300385	3,85	22	56	4
3300390	3,9	22	56	4
3300395	3,95	22	56	4
3300400	4	22	56	4
3300405	4,05	22	64	5
3300410	4,1	22	64	5
3300415	4,15	22	64	5
3300420	4,2	22	64	5
3300425	4,25	22	64	5
3300430	4,3	24	64	5
3300435	4,35	24	64	5
3300440	4,4	24	64	5
3300445	4,45	24	64	5

EDP	DC	LCF	OAL	DCON
3300450	4,5	24	64	5
3300455	4,55	24	64	5
3300460	4,6	24	64	5
3300465	4,65	24	64	5
3300470	4,7	24	64	5
3300475	4,75	24	64	5
3300480	4,8	26	64	5
3300485	4,85	26	64	5
3300490	4,9	26	64	5
3300495	4,95	26	64	5
3300500	5	26	64	5

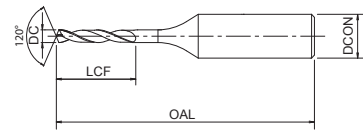
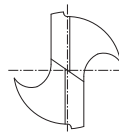
Drilling | Solid carbide

Micro drills



# MRS-GDL

Drilling | Solid carbide | Micro drills



- Micro carbide drill with SC coating
- For deep micro drilling in stainless steel
- 75 sizes



CARBIDE SC 30° SHRINK FIT 120° 0~-0.008



Drilling | Solid carbide

Micro drills

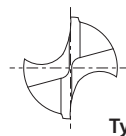
EDP	DC	LCF	OAL	DCON
8577050	0,5	6	42	3
8577054	0,54	6,6	42	3
8577055	0,55	6,6	42	3
8577056	0,56	7,2	42	3
8577060	0,6	7,2	42	3
8577063	0,63	7,8	46	3
8577064	0,64	7,8	46	3
8577065	0,65	7,8	46	3
8577070	0,7	8,4	46	3
8577071	0,71	9	46	3
8577072	0,72	9	46	3
8577073	0,73	9	46	3
8577074	0,74	9	46	3
8577075	0,75	9	46	3
8577080	0,8	9,6	46	3
8577081	0,81	10,2	46	3
8577082	0,82	10,2	46	3
8577090	0,9	10,8	46	3
8577091	0,91	11,4	46	3
8577092	0,92	11,4	46	3
8577100	1	12	46	3
8577110	1,1	13,2	50	3
8577111	1,11	13,8	50	3
8577112	1,12	13,8	50	3
8577115	1,15	13,8	50	3
8577120	1,2	14,4	50	3
8577127	1,27	15,6	50	3
8577128	1,28	15,6	50	3
8577129	1,29	15,6	50	3
8577130	1,3	15,6	50	3
8577140	1,4	16,8	54	3
8577145	1,45	17,4	54	3
8577146	1,46	18	54	3
8577147	1,47	18	54	3
8577150	1,5	18	54	3
8577151	1,51	18,6	54	3
8577152	1,52	18,6	54	3
8577153	1,53	18,6	54	3
8577155	1,55	18,6	54	3
8577156	1,56	19,2	54	3
8577157	1,57	19,2	54	3
8577160	1,6	19,2	54	3
8577170	1,7	20,4	58	3
8577180	1,8	21,6	58	3
8577181	1,81	22,2	58	3
8577182	1,82	22,2	58	3

EDP	DC	LCF	OAL	DCON
8577183	1,83	22,2	58	3
8577190	1,9	22,8	58	3
8577198	1,98	24	58	3
8577199	1,99	24	58	3
8577200	2	24	58	3
8577210	2,1	25,2	62	3
8577212	2,12	25,8	62	3
8577213	2,13	25,8	62	3
8577214	2,14	25,8	62	3
8577220	2,2	26,4	62	3
8577229	2,29	27,6	62	3
8577230	2,3	27,6	62	3
8577231	2,31	28,2	62	3
8577239	2,39	28,8	62	3
8577240	2,4	28,8	62	3
8577241	2,41	29,4	66	3
8577242	2,42	29,4	66	3
8577250	2,5	30	66	3
8577255	2,55	30,6	66	3
8577256	2,56	31,2	66	3
8577257	2,57	31,2	66	3
8577260	2,6	31,2	66	3
8577270	2,7	32,4	66	3
8577277	2,77	33,6	66	3
8577278	2,78	33,6	66	3
8577279	2,79	33,6	66	3
8577280	2,8	33,6	66	3
8577290	2,9	34,8	66	3
8577300	3	36	66	3

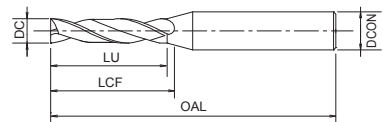


# ADF-2D NEW SIZES

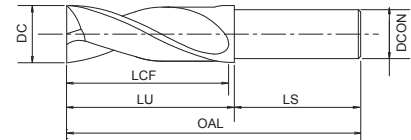
Drilling | Solid carbide | Flat drills



Type 1



Type 2



- First choice in quality and performance
- Carbide drill with EgiAs coating
- Up to 2xD
- Flat drilling application
- 250 sizes



EDP	DC	LU	LCF	OAL	DCON	Type
3330020	0,2	0,6	0,7	40	3	1
3330025	0,25	0,8	0,9	40	3	1
3330030	0,3	0,9	1	40	3	1
3330035	0,35	1,1	1,2	40	3	1
48315037	0,37	1,2	1,4	40	3	1
3330040	0,4	1,2	1,3	40	3	1
3330045	0,45	1,4	1,5	40	3	1
48315046	0,46	1,5	1,7	40	3	1
3330050	0,5	1,7	1,9	40	3	1
3330055	0,55	1,9	2,1	40	3	1
3330060	0,6	2	2,2	40	3	1
48315062	0,62	2,1	2,3	40	3	1
3330065	0,65	2,2	2,4	40	3	1
3330070	0,7	2,4	2,6	40	3	1
3330071	0,71	2,4	2,6	40	3	1
3330072	0,72	2,4	2,6	40	3	1
3330074	0,74	2,5	2,7	40	3	1
3330075	0,75	2,6	2,8	40	3	1
3330080	0,8	2,7	2,9	40	3	1
3330081	0,81	2,8	3	40	3	1
3330085	0,85	2,9	3,1	40	3	1
3330089	0,89	3	3,2	40	3	1
3330090	0,9	3,1	3,3	40	3	1
3330091	0,91	3,1	3,3	40	3	1
3330092	0,92	3,1	3,3	40	3	1
3330095	0,95	3,2	3,4	40	3	1
3330100	1	4	4,3	45	3	1
48315104	1,04	4,5	4,2	45	3	1
48315105	1,05	4,5	4,2	45	3	1
3330109	1,09	4,4	4,7	45	3	1
3330110	1,1	4,4	4,7	45	3	1
3330111	1,11	4,4	4,7	45	3	1
3330112	1,12	4,5	4,8	45	3	1
48315115	1,15	4,6	4,9	45	3	1
3330120	1,2	5	5,1	45	3	1
3330125	1,25	5	5,3	45	3	1
3330126	1,26	5,1	5,3	45	3	1
3330127	1,27	5,1	5,4	45	3	1
3330128	1,28	5,2	5,4	45	3	1
3330129	1,29	5,2	5,5	45	3	1
3330130	1,3	5,2	5,5	45	3	1
48315132	1,32	5,6	5,3	45	3	1
48315133	1,33	5,6	5,3	45	3	1
3330135	1,35	5,4	5,7	45	3	1
3330140	1,4	5,6	5,9	45	3	1
48315143	1,43	6	5,7	45	3	1

EDP	DC	LU	LCF	OAL	DCON	Type
3330144	1,44	5,8	6,1	45	3	1
3330145	1,45	5,8	6,1	45	3	1
3330146	1,46	5,8	6,1	45	3	1
3330147	1,47	5,9	6,2	45	3	1
3330148	1,48	5,9	6,2	45	3	1
3330150	1,5	6	6,3	45	3	1
48315152	1,52	6,1	6,4	45	3	1
3330153	1,53	6,1	6,4	45	3	1
3330154	1,54	6,2	6,5	45	3	1
3330155	1,55	6,2	6,5	45	3	1
3330156	1,56	6,2	6,5	45	3	1
3330157	1,57	6,3	6,6	45	3	1
3330158	1,58	6,3	6,6	45	3	1
3330160	1,6	6,4	6,7	45	3	1
48315165	1,65	6,6	6,9	45	3	1
48315167	1,67	6,7	7	45	3	1
48315168	1,68	6,7	7	45	3	1
3330170	1,7	6,8	7,1	45	3	1
3330175	1,75	7	7,3	45	3	1
3330180	1,8	7,2	7,5	45	3	1
3330182	1,82	7,3	7,6	45	3	1
3330183	1,83	7,3	7,6	45	3	1
3330184	1,84	7,4	7,7	45	3	1
3330185	1,85	7,4	7,7	45	3	1
3330186	1,86	7,4	7,7	45	3	1
3330190	1,9	7,6	7,9	45	3	1
3330195	1,95	7,8	8,1	45	3	1
48315199	1,99	8	8,3	45	3	1
3330200	2	10	10,3	50	4	1
3330210	2,1	10	10,5	50	4	1
3330220	2,2	10,6	11	50	4	1
3330230	2,3	10,8	11	50	4	1
3330232	2,32	10,9	11	50	4	1
3330240	2,4	11	12	50	4	1
3330242	2,42	11,1	12	50	4	1
3330250	2,5	11,2	12	50	4	1
3330254	2,54	11,3	12	50	4	1
3330258	2,58	11,4	12	50	4	1
3330260	2,6	11,4	13	50	4	1
3330270	2,7	11,6	13	50	4	1
3330276	2,76	11,7	14	50	4	1
3330278	2,78	11,7	14	50	4	1
3330280	2,8	11,8	14	50	4	1
3330290	2,9	11,9	14	50	4	1
3330300	3	11,4	15	55	6	1
3330303	3,03	11,5	15	55	6	1

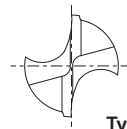
Drilling | Solid carbide

Flat drills

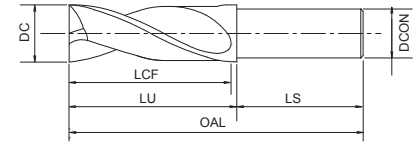
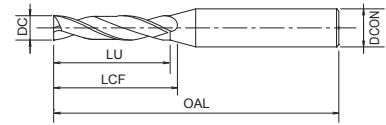


# ADF-2D

Drilling | Solid carbide | Flat drills



Type 1



Type 2

- First choice in quality and performance
- Carbide drill with EgiAs coating
- Up to 2xD
- Flat drilling application
- 250 sizes



Drilling | Solid carbide

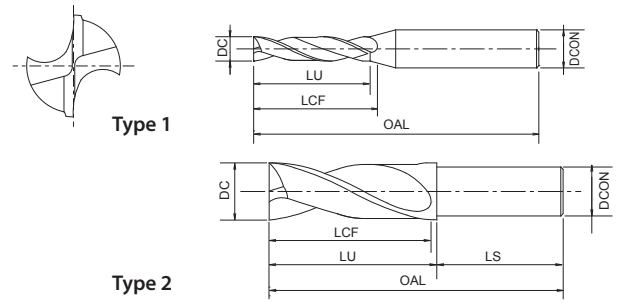
Flat drills

EDP	DC	LU	LCF	OAL	DCON	Type
3330310	3,1	11,6	15	55	6	1
3330315	3,15	11,7	15	55	6	1
3330320	3,2	11,8	15	55	6	1
3330330	3,3	12	15	55	6	1
3330340	3,4	12,1	16	55	6	1
3330350	3,5	12,3	16	55	6	1
3330353	3,53	12,4	16	55	6	1
3330360	3,6	12,5	16	55	6	1
3330366	3,66	12,6	16	55	6	1
3330368	3,68	12,7	16	55	6	1
3330370	3,7	12,7	16	55	6	1
3330380	3,8	12,9	19	60	6	1
3330390	3,9	13,1	19	60	6	1
3330400	4	13,3	19	60	6	1
3330403	4,03	13,3	19	60	6	1
3330410	4,1	13,5	19	60	6	1
3330420	4,2	13,6	21	60	6	1
3330430	4,3	13,8	21	60	6	1
3330440	4,4	14	21	60	6	1
3330450	4,5	14,2	21	60	6	1
3330453	4,53	14,3	21	60	6	1
3330460	4,6	14,4	21	60	6	1
3330462	4,62	14,4	21	60	6	1
3330464	4,64	14,5	21	60	6	1
3330470	4,7	14,6	21	60	6	1
3330480	4,8	14,8	24,8	65	6	1
3330490	4,9	14,9	24,9	65	6	1
3330500	5	15	25,1	65	6	1
3330503	5,03	15	25,2	65	6	1
3330510	5,1	15	25,3	65	6	1
3330520	5,2	15	25,5	65	6	1
3330530	5,3	15	25,7	65	6	1
3330540	5,4	15,1	27	65	6	1
3330550	5,5	15,2	27	65	6	1
3330552	5,52	15,2	27	65	6	1
3330554	5,54	15,2	27	65	6	1
3330560	5,6	15,3	27	65	6	1
3330570	5,7	15,4	27	65	6	1
3330580	5,8	15,5	27	65	6	1
3330590	5,9	15,6	27	65	6	1
3330600	6	15,7	27	65	6	2
3330603	6,03	15,7	30	70	6	2
3330610	6,1	15,8	30	70	6	2
3330620	6,2	15,9	30	70	6	2
3330630	6,3	16	30	70	6	2
3330640	6,4	16,1	30	70	6	2

EDP	DC	LU	LCF	OAL	DCON	Type
3330650	6,5	16,2	30	70	6	2
3330653	6,53	16,2	30	70	6	2
3330660	6,6	16,3	30	70	6	2
3330670	6,7	16,4	30	70	6	2
3330680	6,8	16,5	30	70	6	2
3330690	6,9	16,6	30	70	6	2
3330700	7	16,7	30	70	6	2
3330703	7,03	16,7	34	75	6	2
3330710	7,1	16,8	34	75	6	2
3330720	7,2	16,9	34	75	6	2
3330730	7,3	17	34	75	6	2
3330740	7,4	17,1	34	75	6	2
3330750	7,5	17,2	34	75	6	2
3330760	7,6	17,3	34	75	6	2
3330770	7,7	17,4	34	75	6	2
3330780	7,8	17,5	34	75	6	2
3330790	7,9	17,6	34	75	6	2
3330800	8	17,7	34	75	8	2
3330803	8,03	17,7	38	80	8	2
3330810	8,1	17,8	38	80	8	2
3330820	8,2	17,9	38	80	8	2
3330830	8,3	18	38	80	8	2
3330840	8,4	18,1	38	80	8	2
3330850	8,5	18,2	38	80	8	2
3330853	8,53	18,2	38	80	8	2
3330860	8,6	18,3	38	80	8	2
3330870	8,7	18,4	38	80	8	2
3330880	8,8	18,5	38	80	8	2
3330890	8,9	18,6	38	80	8	2
3330900	9	18,7	38	80	8	2
3330903	9,03	18,7	42	85	8	2
3330910	9,1	18,8	42	85	8	2
3330920	9,2	18,9	42	85	8	2
3330930	9,3	19	42	85	8	2
3330940	9,4	19,1	42	85	8	2
3330950	9,5	19,2	42	85	8	2
3330960	9,6	19,3	42	85	8	2
3330970	9,7	19,4	42	85	8	2
3330980	9,8	19,5	42	85	8	2
3330990	9,9	19,6	42	85	8	2
3331000	10	19,7	42	85	10	2
3331003	10,03	19,7	46	90	10	2
3331010	10,1	19,8	46	90	10	2
3331020	10,2	19,9	46	90	10	2
3331030	10,3	20	46	90	10	2
3331040	10,4	20,1	46	90	10	2

# ADF-2D

Drilling | Solid carbide | Flat drills



- First choice in quality and performance
- Carbide drill with EgiAs coating
- Up to 2xD
- Flat drilling application
- 250 sizes



EDP	DC	LU	LCF	OAL	DCON	Type
3331050	10,5	48	46	90	10	2
3331060	10,6	48	46	90	10	2
3331070	10,7	48	46	90	10	2
3331080	10,8	48	46	90	10	2
3331090	10,9	48	46	90	10	2
3331100	11	48	46	90	10	2
3331103	11,03	52	50	95	10	2
3331110	11,1	52	50	95	10	2
3331120	11,2	52	50	95	10	2
3331130	11,3	52	50	95	10	2
3331140	11,4	52	50	95	10	2
3331150	11,5	52	50	95	10	2
3331160	11,6	52	50	95	10	2
3331170	11,7	52	50	95	10	2
3331180	11,8	52	50	95	10	2
3331190	11,9	52	50	95	10	2
3331200	12	52	50	95	12	2
3331203	12,03	58	56	100	12	2
3331210	12,1	58	56	100	12	2
3331220	12,2	58	56	100	12	2
3331230	12,3	58	56	100	12	2
3331240	12,4	58	56	100	12	2
3331250	12,5	58	56	100	12	2
3331260	12,6	58	56	100	12	2
3331270	12,7	58	56	100	12	2
3331280	12,8	58	56	100	12	2
3331290	12,9	58	56	100	12	2
3331300	13	58	56	100	12	2
3331310	13,1	62	60	105	12	2
3331320	13,2	62	60	105	12	2
3331330	13,3	62	60	105	12	2
3331340	13,4	62	60	105	12	2
3331350	13,5	62	60	105	12	2
3331360	13,6	62	60	105	12	2
3331370	13,7	62	60	105	12	2
3331380	13,8	62	60	105	12	2
3331390	13,9	62	60	105	12	2
3331400	14	62	60	105	12	2
3331410	14,1	66	64	110	12	2
3331420	14,2	66	64	110	12	2
3331430	14,3	66	64	110	12	2
3331440	14,4	66	64	110	12	2
3331450	14,5	66	64	110	12	2
3331460	14,6	66	64	110	12	2
3331470	14,7	66	64	110	12	2
3331480	14,8	66	64	110	12	2

EDP	DC	LU	LCF	OAL	DCON	Type
3331490	14,9	66	64	110	12	2
3331500	15	66	64	110	12	2
3331510	15,1	70	68	115	12	2
3331520	15,2	70	68	115	12	2
3331530	15,3	70	68	115	12	2
3331540	15,4	70	68	115	12	2
3331550	15,5	70	68	115	12	2
3331560	15,6	70	68	115	12	2
3331570	15,7	70	68	115	12	2
3331580	15,8	70	68	115	12	2
3331590	15,9	70	68	115	12	2
3331600	16	70	68	115	16	2
3331650	16,5	76	74	125	16	2
3331700	17	76	74	125	16	2
3331750	17,5	80	78	130	16	2
3331800	18	80	78	130	16	2
3331850	18,5	86	84	135	16	2
3331900	19	86	84	135	16	2
3331950	19,5	90	88	140	16	2
3332000	20	90	88	140	20	2

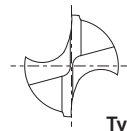
Drilling | Solid carbide

Flat drills

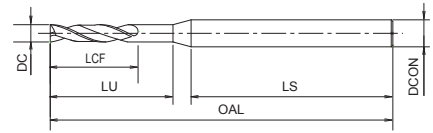


# ADFLS-2D

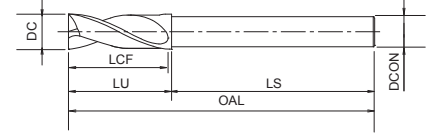
Drilling | Solid carbide | Flat drills



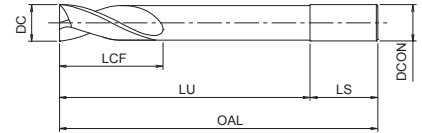
Type 1



Type 2



Type 3



- First choice in quality and performance
- Carbide drill with EgiAs coating
- Up to 2xD
- For deep reach flat drilling application
- 78 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ○ GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>H</b> ○ 25-35 HRC	<b>H</b> ○ 35-45 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>EgiAs</b>	<b>20°</b>	<b>h8</b>	<b>SHRINK FIT</b>
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Drilling | Solid carbide

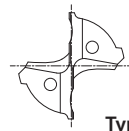
Flat drills

EDP	DC	LU	LCF	OAL	DCON	Type
3332300	3	30	15	100	6	1
3332310	3,1	31	15	100	6	1
3332320	3,2	32	15	100	6	1
3332330	3,3	33	15	100	6	1
3332340	3,4	34	16	100	6	1
3332350	3,5	35	16	100	6	1
3332360	3,6	36	16	100	6	1
3332370	3,7	37	16	100	6	1
3332380	3,8	38	19	100	6	1
3332390	3,9	39	19	100	6	1
3332400	4	40	19	100	6	1
3332410	4,1	41	19	100	6	1
3332420	4,2	42	21	100	6	1
3332430	4,3	43	21	100	6	1
3332440	4,4	44	21	100	6	1
3332450	4,5	45	21	100	6	1
3332460	4,6	46	21	100	6	1
3332470	4,7	47	21	100	6	1
3332480	4,8	48	24	100	6	1
3332490	4,9	49	24	100	6	1
3332500	5	50	24	110	6	1
3332510	5,1	51	24	110	6	1
3332520	5,2	52	24	110	6	1
3332530	5,3	53	24	110	6	1
3332540	5,4	54	27	110	6	1
3332550	5,5	55	27	110	6	1
3332560	5,6	56	27	110	6	1
3332570	5,7	57	27	110	6	1
3332580	5,8	58	27	110	6	1
3332590	5,9	59	27	110	6	1
3332600	6	29	27	110	6	2
3334060	6	60	27	110	6	3
3332650	6,5	32	30	120	6	2
3332680	6,8	32	30	120	6	2
3332690	6,9	32	30	120	6	2
3332700	7	32	30	120	6	2
3332740	7,4	36	34	130	6	2
3332750	7,5	36	34	130	6	2
3332780	7,8	36	34	130	6	2
3332800	8	36	34	130	8	2
3334080	8	80	34	130	8	3
3332850	8,5	40	38	140	8	2
3332860	8,6	40	38	140	8	2
3332880	8,8	40	38	140	8	2
3332900	9	40	38	140	8	2
3332920	9,2	44	42	150	8	2

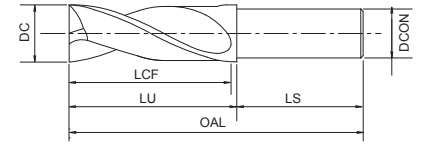
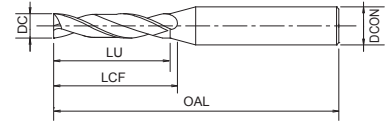
EDP	DC	LU	LCF	OAL	DCON	Type
3332950	9,5	44	42	150	8	2
3332980	9,8	44	42	150	8	2
3333000	10	44	42	150	10	2
3334100	10	100	42	150	10	3
3333030	10,3	48	46	160	10	2
3333040	10,4	48	46	160	10	2
3333050	10,5	48	46	160	10	2
3333080	10,8	48	46	160	10	2
3333100	11	48	46	160	10	2
3333110	11,1	52	50	170	10	2
3333150	11,5	52	50	170	10	2
3333180	11,8	52	50	170	10	2
3333200	12	52	50	170	12	2
3334120	12	120	50	170	12	3
3333250	12,5	58	56	180	12	2
3333300	13	58	56	180	12	2
3333350	13,5	62	60	190	12	2
3333400	14	62	60	190	12	2
3333450	14,5	66	64	200	12	2
3333500	15	66	64	200	12	2
3333550	15,5	70	68	210	12	2
3333600	16	70	68	210	16	2
3334160	16	160	68	210	16	3
3333650	16,5	76	74	220	16	2
3333700	17	76	74	220	16	2
3333750	17,5	80	78	230	16	2
3333800	18	80	78	230	16	2
3333850	18,5	86	84	240	16	2
3333900	19	86	84	240	16	2
3333950	19,5	90	88	250	16	2
3334000	20	90	88	250	20	2
3334200	20	200	88	250	20	3

# ADFO-3D

Drilling | Solid carbide | Flat drills



Type 1



Type 2

- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Up to 3xD
- Flat drilling application
- 160 sizes



EDP	DC	LU	LCF	OAL	DCON	Type
3334300	3	15	16	55	4	1
3334301	3,03	15	16	55	4	1
3334302	3,1	15	16	55	4	1
3334303	3,15	15	16	55	4	1
3334304	3,2	15	16	55	4	1
3334305	3,3	15	16	55	4	1
3334306	3,4	16	17	55	4	1
3334307	3,5	16	17	55	4	1
3334308	3,53	16	17	55	4	1
3334309	3,6	16	17	55	4	1
3334310	3,66	16	17	55	4	1
3334311	3,68	16	17	55	4	1
3334312	3,7	16	17	55	4	1
3334313	3,8	19	20	60	4	1
3334314	3,9	19	20	60	4	1
3334315	4	19	20	60	4	2
3334316	4,03	21	22	60	6	1
3334317	4,1	21	22	60	6	1
3334318	4,2	21	22	60	6	1
3334319	4,3	21	22	60	6	1
3334320	4,4	21	22	60	6	1
3334321	4,5	21	22	60	6	1
3334322	4,53	21	21	60	6	1
3334323	4,6	21	21	60	6	1
3334324	4,62	21	21	60	6	1
3334325	4,64	21	21	60	6	1
3334326	4,7	21	21	60	6	1
3334327	4,8	24	24	65	6	1
3334328	4,9	24	24	65	6	1
3334329	5	24	24	65	6	1
3334330	5,03	24	24	65	6	1
3334331	5,1	24	24	65	6	1
3334332	5,2	24	24	65	6	1
3334333	5,3	24	24	65	6	1
3334334	5,4	27	27	65	6	1
3334335	5,5	27	27	65	6	1
3334336	5,52	27	27	65	6	1
3334337	5,54	27	27	65	6	1
3334338	5,6	27	27	65	6	1
3334339	5,7	27	27	65	6	1
3334340	5,8	27	27	65	6	1
3334341	5,9	27	27	65	6	1
3334342	6	27	27	65	6	2
3334343	6,03	30	30	70	8	1
3334344	6,1	30	30	70	8	1
3334345	6,2	30	31	70	8	1

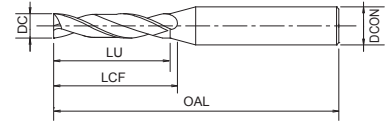
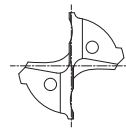
EDP	DC	LU	LCF	OAL	DCON	Type
3334346	6,3	30	31	70	8	1
3334347	6,4	30	31	70	8	1
3334348	6,5	30	31	70	8	1
3334349	6,53	30	31	70	8	1
3334350	6,6	30	31	70	8	1
3334351	6,7	30	31	70	8	1
3334352	6,8	30	31	70	8	1
3334353	6,9	30	31	70	8	1
3334354	7	30	31	70	8	1
3334355	7,03	30	31	70	8	1
3334356	7,1	34	35	75	8	1
3334357	7,2	34	35	75	8	1
3334358	7,3	34	35	75	8	1
3334359	7,4	34	35	75	8	1
3334360	7,5	34	35	75	8	1
3334361	7,6	34	35	75	8	1
3334362	7,7	34	35	75	8	1
3334363	7,8	34	35	75	8	1
3334364	7,9	34	35	75	8	1
3334365	8	34	35	75	8	2
3334366	8,03	38	39	80	10	1
3334367	8,1	38	39	80	10	1
3334368	8,2	38	39	80	10	1
3334369	8,3	38	39	80	10	1
3334370	8,4	38	39	80	10	1
3334371	8,5	38	39	80	10	1
3334372	8,53	38	39	80	10	1
3334373	8,6	38	39	80	10	1
3334374	8,7	38	39	80	10	1
3334375	8,8	38	39	80	10	1
3334376	8,9	38	39	80	10	1
3334377	9	38	39	80	10	1
3334378	9,03	38	39	80	10	1
3334379	9,1	42	43	85	10	1
3334380	9,2	42	43	85	10	1
3334381	9,3	42	43	85	10	1
3334382	9,4	42	43	85	10	1
3334383	9,5	42	43	85	10	1
3334384	9,6	42	43	85	10	1
3334385	9,7	42	43	85	10	1
3334386	9,8	42	43	85	10	1
3334387	9,9	42	43	85	10	1
3334388	10	42	43	85	10	2
3334389	10,03	46	47	90	12	1
3334390	10,1	46	47	90	12	1
3334391	10,2	46	47	90	12	1

Drilling | Solid carbide

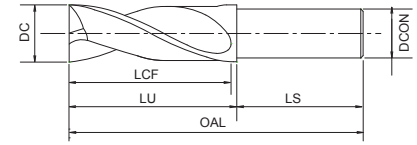
Flat drills

# ADFO-3D

Drilling | Solid carbide | Flat drills



Type 1



Type 2

- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Up to 3xD
- Flat drilling application
- 160 sizes



Drilling | Solid carbide

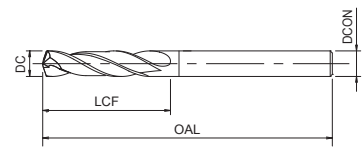
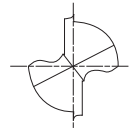
Flat drills

EDP	DC	LU	LCF	OAL	DCON	Type
3334392	10,3	46	47	90	12	1
3334393	10,4	46	47	90	12	1
3334394	10,5	46	47	90	12	1
3334395	10,6	46	47	90	12	1
3334396	10,7	46	47	90	12	1
3334397	10,8	46	47	90	12	1
3334398	10,9	46	47	90	12	1
3334399	11	46	47	90	12	1
3334400	11,03	46	47	90	12	1
3334401	11,1	50	51	95	12	1
3334402	11,2	50	51	95	12	1
3334403	11,3	50	51	95	12	1
3334404	11,4	50	51	95	12	1
3334405	11,5	50	51	95	12	1
3334406	11,6	50	51	95	12	1
3334407	11,7	50	51	95	12	1
3334408	11,8	50	51	95	12	1
3334409	11,9	50	51	95	12	1
3334410	12	50	51	95	12	2
3334411	12,03	56	57	100	14	1
3334412	12,1	56	57	100	14	1
3334413	12,2	56	57	100	14	1
3334414	12,3	56	57	100	14	1
3334415	12,4	56	57	100	14	1
3334416	12,5	56	57	100	14	1
3334417	12,6	56	57	100	14	1
3334418	12,7	56	57	100	14	1
3334419	12,8	56	57	100	14	1
3334420	12,9	56	57	100	14	1
3334421	13	56	57	100	14	1
3334422	13,1	60	61	105	14	1
3334423	13,2	60	61	105	14	1
3334424	13,3	60	61	105	14	1
3334425	13,4	60	61	105	14	1
3334426	13,5	60	61	105	14	1
3334427	13,6	60	61	105	14	1
3334428	13,7	60	61	105	14	1
3334429	13,8	60	61	105	14	1
3334430	13,9	60	61	105	14	1
3334431	14	60	61	105	14	2
3334432	14,1	64	65	110	16	1
3334433	14,2	64	65	110	16	1
3334434	14,3	64	65	110	16	1
3334435	14,4	64	65	110	16	1
3334436	14,5	64	65	110	16	1
3334437	14,6	65	65	110	16	1

EDP	DC	LU	LCF	OAL	DCON	Type
3334438	14,7	65	65	110	16	1
3334439	14,8	65	65	110	16	1
3334440	14,9	65	65	110	16	1
3334441	15	65	65	110	16	1
3334442	15,1	69	69	115	16	1
3334443	15,2	69	69	115	16	1
3334444	15,3	69	69	115	16	1
3334445	15,4	69	69	115	16	1
3334446	15,5	69	69	115	16	1
3334447	15,6	69	69	115	16	1
3334448	15,7	69	69	115	16	1
3334449	15,8	69	69	115	16	1
3334450	15,9	69	69	115	16	1
3334451	16	69	69	115	16	2
3334452	16,5	75	75	125	18	1
3334453	17	75	75	125	18	1
3334454	17,5	79	79	130	18	1
3334455	18	79	79	130	18	2
3334456	18,5	85	85	135	20	1
3334457	19	85	85	135	20	1
3334458	19,5	88	89	140	20	1
3334459	20	88	89	140	20	2

# AD-2D

Drilling | Solid carbide | 2xD



- First choice in quality and performance
- Carbide drill with EgiAs coating
- Up to 2xD
- For general purpose steels and cast iron
- 160 sizes

Material compatibility icons: P (C < 0,2%), P (0,25 < C < 0,4), P (C ≥ 0,45%), P (SCM), K (GG), K (GGG), H (25-35 HRC), H (35-45 HRC), H (45-52 HRC).

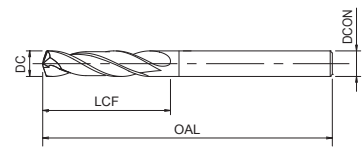
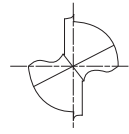
Product features icons: A (brand), CARBIDE, EgiAs coating, 30° angle, SHRINK FIT, 140° angle, h8 fit, and a speedometer icon labeled B.600.

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8670200	2	14	62	4	8670580	5,8	28	66	6
8670210	2,1	14	62	4	8670590	5,9	28	66	6
8670220	2,2	14	62	4	8670600	6	28	66	6
8670230	2,3	14	62	4	8670610	6,1	34	79	8
8670240	2,4	14	62	4	8670620	6,2	34	79	8
8670250	2,5	14	62	4	8670630	6,3	34	79	8
8670260	2,6	14	62	4	8670640	6,4	34	79	8
8670270	2,7	14	62	4	8670650	6,5	34	79	8
8670276	2,76	14	62	4	8670660	6,6	34	79	8
8670278	2,78	14	62	4	8670670	6,7	34	79	8
8670280	2,8	14	62	4	8670680	6,8	34	79	8
8670290	2,9	14	62	4	8670690	6,9	34	79	8
8670300	3	20	66	4	8670700	7	34	79	8
8670310	3,1	20	66	4	8670710	7,1	41	79	8
8670320	3,2	20	66	4	8670720	7,2	41	79	8
8670330	3,3	20	66	4	8670730	7,3	41	79	8
8670340	3,4	20	66	4	8670736	7,36	41	79	8
8670350	3,5	20	66	4	8670738	7,38	41	79	8
8670360	3,6	20	66	4	8670740	7,4	41	79	8
8670366	3,66	20	66	4	8670750	7,5	41	79	8
8670368	3,68	20	66	4	8670754	7,54	41	79	8
8670370	3,7	20	66	4	8670760	7,6	41	79	8
8670380	3,8	24	66	4	8670770	7,7	41	79	8
8670390	3,9	24	66	4	8670780	7,8	41	79	8
8670400	4	24	66	4	8670790	7,9	41	79	8
8670410	4,1	24	66	6	8670800	8	41	79	8
8670420	4,2	24	66	6	8670810	8,1	47	89	10
8670430	4,3	24	66	6	8670820	8,2	47	89	10
8670440	4,4	24	66	6	8670830	8,3	47	89	10
8670450	4,5	24	66	6	8670840	8,4	47	89	10
8670460	4,6	24	66	6	8670850	8,5	47	89	10
8670462	4,62	24	66	6	8670860	8,6	47	89	10
8670464	4,64	24	66	6	8670870	8,7	47	89	10
8670470	4,7	24	66	6	8670880	8,8	47	89	10
8670480	4,8	28	66	6	8670890	8,9	47	89	10
8670490	4,9	28	66	6	8670900	9	47	89	10
8670500	5	28	66	6	8670910	9,1	47	89	10
8670510	5,1	28	66	6	8670920	9,2	47	89	10
8670520	5,2	28	66	6	8670930	9,3	47	89	10
8670530	5,3	28	66	6	8670940	9,4	47	89	10
8670540	5,4	28	66	6	8670950	9,5	47	89	10
8670550	5,5	28	66	6	8670960	9,6	47	89	10
8670552	5,52	28	66	6	8670970	9,7	47	89	10
8670554	5,54	28	66	6	8670980	9,8	47	89	10
8670560	5,6	28	66	6	8670990	9,9	47	89	10
8670570	5,7	28	66	6	8671000	10	47	89	10

Drilling | Solid carbide  
2xD

# AD-2D

Drilling | Solid carbide | 2xD



- First choice in quality and performance
- Carbide drill with EgiAs coating
- Up to 2xD
- For general purpose steels and cast iron
- 160 sizes

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>K</b> GG	<b>K</b> GGG	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>	<b>140°</b>	<b>h8</b>	<b>B.600</b>
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Drilling | Solid carbide

2xD

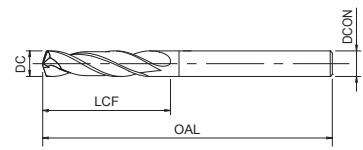
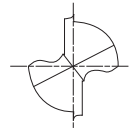
EDP	DC	LCF	OAL	DCON
8671010	10,1	55	102	12
8671020	10,2	55	102	12
8671030	10,3	55	102	12
8671040	10,4	55	102	12
8671050	10,5	55	102	12
8671060	10,6	55	102	12
8671070	10,7	55	102	12
8671080	10,8	55	102	12
8671090	10,9	55	102	12
8671100	11	55	102	12
8671110	11,1	55	102	12
8671120	11,2	55	102	12
8671130	11,3	55	102	12
8671140	11,4	55	102	12
8671150	11,5	55	102	12
8671160	11,6	55	102	12
8671170	11,7	55	102	12
8671180	11,8	55	102	12
8671190	11,9	55	102	12
8671200	12	55	102	12
8671210	12,1	60	107	14
8671220	12,2	60	107	14
8671230	12,3	60	107	14
8671240	12,4	60	107	14
8671250	12,5	60	107	14
8671260	12,6	60	107	14
8671270	12,7	60	107	14
8671280	12,8	60	107	14
8671290	12,9	60	107	14
8671300	13	60	107	14
8671310	13,1	60	107	14
8671320	13,2	60	107	14
8671330	13,3	60	107	14
8671340	13,4	60	107	14
8671350	13,5	60	107	14
8671360	13,6	60	107	14
8671370	13,7	60	107	14
8671380	13,8	60	107	14
8671390	13,9	60	107	14
8671400	14	60	107	14
8671410	14,1	65	115	16
8671420	14,2	65	115	16
8671430	14,3	65	115	16
8671440	14,4	65	115	16
8671450	14,5	65	115	16
8671460	14,6	65	115	16

EDP	DC	LCF	OAL	DCON
8671470	14,7	65	115	16
8671480	14,8	65	115	16
8671490	14,9	65	115	16
8671500	15	65	115	16
8671510	15,1	65	115	16
8671520	15,2	65	115	16
8671530	15,3	65	115	16
8671540	15,4	65	115	16
8671550	15,5	65	115	16
8671560	15,6	65	115	16
8671570	15,7	65	115	16
8671580	15,8	65	115	16
8671590	15,9	65	115	16
8671600	16	65	115	16
8671650	16,5	73	123	18
8671700	17	73	123	18
8671750	17,5	73	123	18
8671800	18	73	123	18
8671850	18,5	79	131	20
8671900	19	79	131	20
8671950	19,5	79	131	20
8672000	20	79	131	20



# AD-4D

Drilling | Solid carbide | 4xD



- First choice in quality and performance
- Carbide drill with EgiAs coating
- Up to 4xD
- For general purpose steels and cast iron
- 149 sizes



EDP	DC	LCF	OAL	DCON
8672200	2	20	66	4
8672210	2,1	20	66	4
8672220	2,2	20	66	4
8672230	2,3	20	66	4
8672240	2,4	20	66	4
8672250	2,5	20	66	4
8672260	2,6	20	66	4
8672270	2,7	20	66	4
8672280	2,8	20	66	4
8672290	2,9	20	66	4
8672300	3	28	74	4
8672310	3,1	28	74	4
8672320	3,2	28	74	4
8672330	3,3	28	74	4
8672340	3,4	28	74	4
8672350	3,5	28	74	4
8672360	3,6	28	74	4
8672370	3,7	28	74	4
8672380	3,8	36	74	4
8672390	3,9	36	74	4
8672400	4	36	74	4
8672410	4,1	36	74	6
8672420	4,2	36	74	6
8672430	4,3	36	74	6
8672440	4,4	36	74	6
8672450	4,5	36	74	6
8672460	4,6	36	74	6
8672470	4,7	36	74	6
8672480	4,8	44	82	6
8672490	4,9	44	82	6
8672500	5	44	82	6
8672510	5,1	44	82	6
8672520	5,2	44	82	6
8672530	5,3	44	82	6
8672540	5,4	44	82	6
8672550	5,5	44	82	6
8672560	5,6	44	82	6
8672570	5,7	44	82	6
8672580	5,8	44	82	6
8672590	5,9	44	82	6
8672600	6	44	82	6
8672610	6,1	53	91	8
8672620	6,2	53	91	8
8672630	6,3	53	91	8
8672640	6,4	53	91	8
8672650	6,5	53	91	8

EDP	DC	LCF	OAL	DCON
8672660	6,6	53	91	8
8672670	6,7	53	91	8
8672680	6,8	53	91	8
8672690	6,9	53	91	8
8672700	7	53	91	8
8672710	7,1	53	91	8
8672720	7,2	53	91	8
8672730	7,3	53	91	8
8672740	7,4	53	91	8
8672750	7,5	53	91	8
8672760	7,6	53	91	8
8672770	7,7	53	91	8
8672780	7,8	53	91	8
8672790	7,9	53	91	8
8672800	8	53	91	8
8672810	8,1	61	103	10
8672820	8,2	61	103	10
8672830	8,3	61	103	10
8672840	8,4	61	103	10
8672850	8,5	61	103	10
8672860	8,6	61	103	10
8672870	8,7	61	103	10
8672880	8,8	61	103	10
8672890	8,9	61	103	10
8672900	9	61	103	10
8672910	9,1	61	103	10
8672920	9,2	61	103	10
8672930	9,3	61	103	10
8672940	9,4	61	103	10
8672950	9,5	61	103	10
8672960	9,6	61	103	10
8672970	9,7	61	103	10
8672980	9,8	61	103	10
8672990	9,9	61	103	10
8673000	10	61	103	10
8673010	10,1	71	118	12
8673020	10,2	71	118	12
8673030	10,3	71	118	12
8673040	10,4	71	118	12
8673050	10,5	71	118	12
8673060	10,6	71	118	12
8673070	10,7	71	118	12
8673080	10,8	71	118	12
8673090	10,9	71	118	12
8673100	11	71	118	12
8673110	11,1	71	118	12

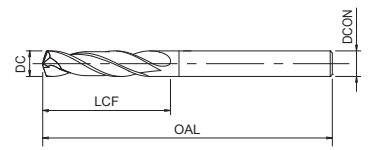
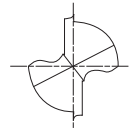
Drilling | Solid carbide



4xD

# AD-4D

Drilling | Solid carbide | 4xD



- First choice in quality and performance
- Carbide drill with EgiAs coating
- Up to 4xD
- For general purpose steels and cast iron
- 149 sizes



Drilling | Solid carbide

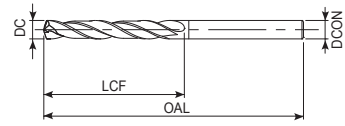
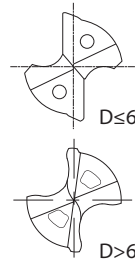
4xD

B

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8673120	11,2	71	118	12	8673580	15,8	83	133	16
8673130	11,3	71	118	12	8673590	15,9	83	133	16
8673140	11,4	71	118	12	8673600	16	83	133	16
8673150	11,5	71	118	12	8673650	16,5	93	143	18
8673160	11,6	71	118	12	8673700	17	93	143	18
8673170	11,7	71	118	12	8673750	17,5	93	143	18
8673180	11,8	71	118	12	8673800	18	93	143	18
8673190	11,9	71	118	12	8673850	18,5	101	153	20
8673200	12	71	118	12	8673900	19	101	153	20
8673210	12,1	77	124	14	8673950	19,5	101	153	20
8673220	12,2	77	124	14	8674000	20	101	153	20
8673230	12,3	77	124	14					
8673240	12,4	77	124	14					
8673250	12,5	77	124	14					
8673260	12,6	77	124	14					
8673270	12,7	77	124	14					
8673280	12,8	77	124	14					
8673290	12,9	77	124	14					
8673300	13	77	124	14					
8673310	13,1	77	124	14					
8673320	13,2	77	124	14					
8673330	13,3	77	124	14					
8673340	13,4	77	124	14					
8673350	13,5	77	124	14					
8673360	13,6	77	124	14					
8673370	13,7	77	124	14					
8673380	13,8	77	124	14					
8673390	13,9	77	124	14					
8673400	14	77	124	14					
8673410	14,1	83	133	16					
8673420	14,2	83	133	16					
8673430	14,3	83	133	16					
8673440	14,4	83	133	16					
8673450	14,5	83	133	16					
8673460	14,6	83	133	16					
8673470	14,7	83	133	16					
8673480	14,8	83	133	16					
8673490	14,9	83	133	16					
8673500	15	83	133	16					
8673510	15,1	83	133	16					
8673520	15,2	83	133	16					
8673530	15,3	83	133	16					
8673540	15,4	83	133	16					
8673550	15,5	83	133	16					
8673560	15,6	83	133	16					
8673570	15,7	83	133	16					

# ADO-SUS-3D NEW SIZES

Drilling | Solid carbide | 3xD



- First choice in quality and performance
- Carbide drill with internal coolant, WXL coating
- Up to 3xD
- Designed for stainless steel and titanium alloys
- 179 sizes

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>WXL</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>140°</b>	<b>h8</b>	<b>B.601</b>
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EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8665200	2	12	66	3	8680555	5,55	28	82	6
8665210	2,1	13	66	3	8665560	5,6	28	82	6
8665220	2,2	14	66	3	8665570	5,7	29	82	6
8665230	2,3	14	66	3	8665580	5,8	29	82	6
8665240	2,4	15	66	3	8665590	5,9	30	82	6
8665250	2,5	15	66	3	8665600	6	30	82	6
8665260	2,6	16	66	3	8680610	6,1	31	88	8
8665270	2,7	17	66	3	8680620	6,2	31	88	8
8665280	2,8	17	66	3	8680630	6,3	32	88	8
8665283	2,83	17	66	3	8680640	6,4	32	88	8
8665287	2,87	18	66	3	8680650	6,5	33	88	8
8665290	2,9	18	66	3	8680660	6,6	33	88	8
8665300	3	18	66	3	8680670	6,7	34	88	8
8665310	3,1	19	74	4	8680680	6,8	34	88	8
8665315	3,15	19	74	4	8680690	6,9	35	88	8
8665320	3,2	20	74	4	8680700	7	35	88	8
8665326	3,26	20	74	4	8665710	7,1	36	94	8
8665330	3,3	20	74	4	8665720	7,2	36	94	8
8665340	3,4	21	74	4	8665725	7,25	37	94	8
8665350	3,5	21	74	4	8665730	7,3	37	94	8
8665360	3,6	22	74	4	8665740	7,4	37	94	8
8665370	3,7	23	74	4	8680745	7,45	38	94	8
8665373	3,73	23	74	4	8665750	7,5	38	94	8
8665375	3,75	23	74	4	8680755	7,55	38	94	8
8665380	3,8	23	74	4	8665760	7,6	38	94	8
8665390	3,9	24	74	4	8665770	7,7	39	94	8
8665400	4	24	74	4	8665775	7,75	39	94	8
8680410	4,1	25	80	6	8665780	7,8	39	94	8
8680420	4,2	26	80	6	8665790	7,9	40	94	8
8680430	4,3	26	80	6	8665800	8	40	94	8
8680440	4,4	27	80	6	8680810	8,1	41	101	10
8680445	4,45	27	80	6	8680820	8,2	41	101	10
8680450	4,5	27	80	6	8680830	8,3	42	101	10
8680460	4,6	28	80	6	8680840	8,4	42	101	10
8680465	4,65	28	80	6	8680850	8,5	43	101	10
8680470	4,7	29	80	6	8680860	8,6	43	101	10
8680480	4,8	29	80	6	8680870	8,7	44	101	10
8665485	4,85	29	80	6	8680880	8,8	44	101	10
8680490	4,9	30	80	6	8680890	8,9	45	101	10
8680500	5	25	80	6	8680900	9	45	101	10
8665510	5,1	26	82	6	8665910	9,1	46	106	10
8665520	5,2	26	82	6	8665920	9,2	46	106	10
8665525	5,25	27	82	6	8665925	9,25	47	106	10
8665530	5,3	27	82	6	8665930	9,3	47	106	10
8665540	5,4	27	82	6	8665940	9,4	47	106	10
8665550	5,5	28	82	6	8665950	9,5	48	106	10

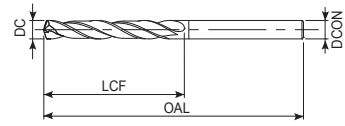
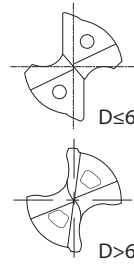
Drilling | Solid carbide 3xD



3xD

# ADO-SUS-3D NEW SIZES

Drilling | Solid carbide | 3xD



- First choice in quality and performance
- Carbide drill with internal coolant, WXL coating
- Up to 3xD
- Designed for stainless steel and titanium alloys
- 179 sizes

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>WXL</b>	<b>30°</b>	<b>SHRINK FIT</b>	<b>140°</b>	<b>h8</b>	<b>B.601</b>
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Drilling | Solid carbide

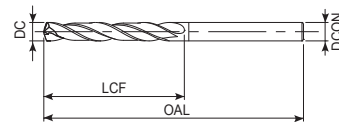
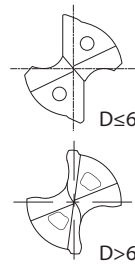
3xD

B

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8680955	9,55	48	106	10	8666380	13,8	69	134	14
8665960	9,6	48	106	10	8666390	13,9	70	134	14
8665970	9,7	49	106	10	8666400	14	70	134	14
8665975	9,75	49	106	10	8681410	14,1	71	140	16
8665980	9,8	49	106	10	8681420	14,2	71	140	16
8665990	9,9	50	106	10	8681430	14,3	72	140	16
8666000	10	50	106	10	8681440	14,4	72	140	16
8681010	10,1	51	113	12	8681450	14,5	73	140	16
8681020	10,2	51	113	12	8681460	14,6	73	140	16
8681030	10,3	52	113	12	8681470	14,7	74	140	16
8681040	10,4	52	113	12	8681480	14,8	74	140	16
8681050	10,5	53	113	12	8681490	14,9	75	140	16
8681060	10,6	53	113	12	8681500	15	75	140	16
8681070	10,7	54	113	12	8666510	15,1	76	145	16
8681080	10,8	54	113	12	8666520	15,2	76	145	16
8681090	10,9	55	113	12	8666530	15,3	77	145	16
8681100	11	55	113	12	8666540	15,4	77	145	16
8666110	11,1	56	120	12	8666550	15,5	78	145	16
8666120	11,2	56	120	12	8681555	15,55	78	145	16
8666130	11,3	57	120	12	8666560	15,6	78	145	16
8666140	11,4	57	120	12	8666570	15,7	79	145	16
8666150	11,5	58	120	12	8666580	15,8	79	145	16
8666160	11,6	58	120	12	8666590	15,9	80	145	16
8666170	11,7	59	120	12	8666600	16	80	145	16
8666180	11,8	59	120	12	48350161	16,1	80	145	18
8666190	11,9	60	120	12	8681650	16,5	83	150	18
8666200	12	60	120	12	8681670	16,7	84	150	18
8681210	12,1	61	128	14	8681700	17	85	150	18
8681220	12,2	61	128	14	8681730	17,3	87	155	18
8681230	12,3	62	128	14	8666750	17,5	88	155	18
8681240	12,4	62	128	14	8681755	17,55	88	155	18
8681250	12,5	63	128	14	48350178	17,8	90	155	18
8681260	12,6	63	128	14	8666800	18	90	155	18
8681270	12,7	64	128	14	48350181	18,1	90	155	20
8681280	12,8	64	128	14	8681850	18,5	93	160	20
8681290	12,9	65	128	14	8681870	18,7	94	160	20
8681300	13	65	128	14	8681900	19	95	160	20
8666310	13,1	66	134	14	8681930	19,3	97	165	20
8666320	13,2	67	134	14	8666950	19,5	98	165	20
8666330	13,3	68	134	14	8681955	19,55	98	165	20
8666340	13,4	67	134	14	8667000	20	100	165	20
8681343	13,43	68	134	14					
8666350	13,5	68	134	14					
8681355	13,55	68	134	14					
8666360	13,6	68	134	14					
8666370	13,7	69	134	14					

# ADO-SUS-5D NEW SIZES

Drilling | Solid carbide | 5xD



- First choice in quality and performance
- Carbide drill with internal coolant, WXL coating
- Up to 5xD
- Designed for stainless steel and titanium alloys
- 198 sizes



EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8667200	2	18	70	3	8682490	4,9	45	95	6
8667210	2,1	19	70	3	8682500	5	45	95	6
48349215	2,15	20	70	3	8667510	5,1	41	100	6
8667220	2,2	20	70	3	8667520	5,2	42	100	6
48349225	2,25	21	70	3	8667530	5,3	43	100	6
8667230	2,3	21	70	3	8667540	5,4	44	100	6
48349235	2,35	22	70	3	8667550	5,5	44	100	6
8667240	2,4	22	70	3	8667552	5,52	45	100	6
8667250	2,5	23	70	3	8667554	5,54	45	100	6
48349255	2,55	24	70	3	8667560	5,6	45	100	6
8667260	2,6	24	78	3	8667570	5,7	46	100	6
8667270	2,7	25	78	3	8667580	5,8	47	100	6
8667276	2,76	25	78	3	8667590	5,9	48	100	6
8667278	2,78	26	78	3	8667600	6	48	100	6
8667280	2,8	26	78	3	8682610	6,1	49	109	8
8667283	2,83	26	78	3	8682620	6,2	50	109	8
8667287	2,87	26	78	3	8682630	6,3	51	109	8
8667290	2,9	27	78	3	8682640	6,4	52	109	8
8667300	3	27	78	3	8682650	6,5	52	109	8
8667310	3,1	28	86	4	8682660	6,6	53	109	8
8667315	3,15	29	86	4	8682670	6,7	54	109	8
8667320	3,2	29	86	4	8682680	6,8	55	109	8
8667326	3,26	29	86	4	8682690	6,9	56	109	8
8667330	3,3	30	86	4	8682700	7	56	109	8
48349335	3,35	31	86	4	8667710	7,1	57	118	8
8667340	3,4	31	86	4	8667720	7,2	58	118	8
8667350	3,5	32	86	4	8667725	7,25	58	118	8
8667360	3,6	33	86	4	8667730	7,3	59	118	8
8667366	3,66	33	86	4	8667736	7,36	59	118	8
8667368	3,68	34	86	4	8667738	7,38	60	118	8
8667370	3,7	34	86	4	8667740	7,4	60	118	8
8667373	3,73	34	86	4	8682745	7,45	60	118	8
8667375	3,75	34	86	4	8667750	7,5	60	118	8
8667380	3,8	35	86	4	8667752	7,52	61	118	8
8667390	3,9	36	86	4	8667754	7,54	61	118	8
8667400	4	36	86	4	8667760	7,6	61	118	8
8682410	4,1	37	95	6	8667770	7,7	62	118	8
8682420	4,2	38	95	6	8667775	7,75	62	118	8
8682430	4,3	39	95	6	8667780	7,8	63	118	8
8682440	4,4	40	95	6	8667790	7,9	64	118	8
8682445	4,45	41	95	6	8667800	8	64	118	8
8682450	4,5	41	95	6	8682810	8,1	65	128	10
8682460	4,6	42	95	6	8682820	8,2	66	128	10
8682464	4,64	42	95	6	8682830	8,3	67	128	10
8682470	4,7	43	95	6	8682840	8,4	68	128	10
8682480	4,8	44	95	6	8682850	8,5	68	128	10

Drilling | Solid carbide  
5xD

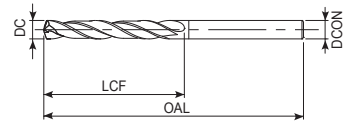
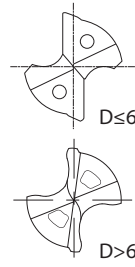


5xD

B

# ADO-SUS-5D NEW SIZES

Drilling | Solid carbide | 5xD



- First choice in quality and performance
- Carbide drill with internal coolant, WXL coating
- Up to 5xD
- Designed for stainless steel and titanium alloys
- 198 sizes



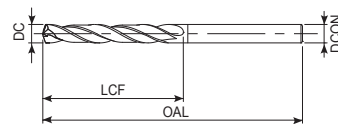
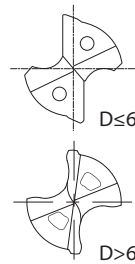
Drilling | Solid carbide

5xD

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8682860	8,6	69	128	10	8668200	12	96	156	12
8682870	8,7	70	128	10	8683210	12,1	97	167	14
8682880	8,8	71	128	10	8683220	12,2	98	167	14
8682890	8,9	72	128	10	8683230	12,3	99	167	14
8682900	9	72	128	10	8683240	12,4	100	167	14
8667910	9,1	73	136	10	8683250	12,5	100	167	14
8667920	9,2	74	136	10	8683260	12,6	101	167	14
8667924	9,24	74	136	10	8683270	12,7	102	167	14
8667925	9,25	74	136	10	8683280	12,8	103	167	14
8667926	9,26	75	136	10	8683290	12,9	104	167	14
8667930	9,3	75	136	10	8683300	13	104	167	14
8667936	9,36	75	136	10	8668310	13,1	105	176	14
8667938	9,38	76	136	10	8668320	13,2	106	176	14
8667940	9,4	76	136	10	8668325	13,25	106	176	14
8667950	9,5	76	136	10	8668330	13,3	107	176	14
8667952	9,52	77	136	10	8668340	13,4	108	176	14
8667954	9,54	77	136	10	8683343	13,43	108	176	14
8667960	9,6	77	136	10	8668350	13,5	108	176	14
8667970	9,7	78	136	10	8683355	13,55	109	176	14
8667975	9,75	78	136	10	8668360	13,6	109	176	14
8667980	9,8	79	136	10	8668370	13,7	110	176	14
8667990	9,9	80	136	10	8668380	13,8	111	176	14
8668000	10	80	136	10	8668390	13,9	112	176	14
8683010	10,1	81	146	12	8668400	14	112	176	14
8683020	10,2	82	146	12	8683410	14,1	113	185	16
8683030	10,3	83	146	12	8683420	14,2	114	185	16
8683040	10,4	84	146	12	8683430	14,3	115	185	16
8683050	10,5	84	146	12	8683440	14,4	116	185	16
8683060	10,6	85	146	12	8683450	14,5	116	185	16
8683070	10,7	86	146	12	8683460	14,6	117	185	16
8683080	10,8	87	146	12	8683470	14,7	118	185	16
8683090	10,9	88	146	12	8683480	14,8	119	185	16
8683100	11	88	146	12	8683490	14,9	120	185	16
8668110	11,1	89	156	12	8683500	15	120	185	16
8668120	11,2	90	156	12	8668510	15,1	121	193	16
8668122	11,22	90	156	12	8668520	15,2	122	193	16
8668124	11,24	90	156	12	8668525	15,25	122	193	16
8668130	11,3	91	156	12	8668530	15,3	123	193	16
8668136	11,36	91	156	12	8668540	15,4	124	193	16
8668138	11,38	92	156	12	8668550	15,5	124	193	16
8668140	11,4	92	156	12	8683555	15,55	125	193	16
8668150	11,5	92	156	12	8668560	15,6	125	193	16
8668160	11,6	93	156	12	8668570	15,7	126	193	16
8668170	11,7	94	156	12	8668580	15,8	127	193	16
8668180	11,8	95	156	12	8668590	15,9	128	193	16
8668190	11,9	96	156	12	8668600	16	128	193	16

# ADO-SUS-5D NEW SIZES

Drilling | Solid carbide | 5xD



- First choice in quality and performance
- Carbide drill with internal coolant, WXL coating
- Up to 5xD
- Designed for stainless steel and titanium alloys
- 198 sizes

Material compatibility icons:

- P** C < 0,2%
- P** 0,25 < C < 0,4
- P** C ≥ 0,45%
- P** SCM
- M** INOX
- K** GG
- K** GGG
- N** AC, ADC
- S** Ti
- H** 25-35 HRC
- H** 35-45 HRC
- H** 45-52 HRC

Performance and coating icons:

- A**
- CARBIDE**
- WXL**
- 30°**
- SHRINK FIT**
- 140°**
- h8**
- B.601**

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8683650	16,5	113	184	18					
8683670	16,7	117	184	18					
8683700	17	114	184	18					
8683730	17,3	122	191	18					
8668750	17,5	123	191	18					
8683755	17,55	123	191	18					
8668800	18	126	191	18					
8683850	18,5	130	198	20					
8683870	18,7	131	198	20					
8683900	19	133	198	20					
8683930	19,3	136	205	20					
8668950	19,5	137	205	20					
8683955	19,55	137	205	20					
8669000	20	140	205	20					

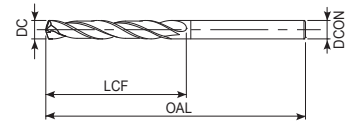
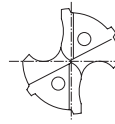
Drilling | Solid carbide



5xD

# ADO-SUS-8D

Drilling | Solid carbide | 8xD



- First choice in quality and performance
- Carbide drill with internal coolant, WXL coating
- Up to 8xD
- Designed for stainless steel and titanium alloys
- 101 sizes

<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>WXL</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>135°</b>	<b>h8</b>	<b>B.601</b>
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Drilling | Solid carbide

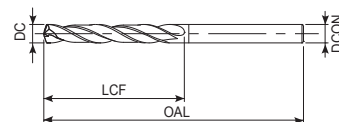
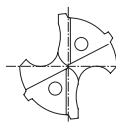
8xD

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8686200	2	22	75	3	8684660	6,6	73	125	8
8686210	2,1	24	75	3	8684670	6,7	74	125	8
8686220	2,2	25	75	3	8684680	6,8	75	125	8
8686230	2,3	26	75	3	8684690	6,9	76	125	8
8686240	2,4	27	75	3	8684700	7	77	125	8
8686250	2,5	28	75	3	8684710	7,1	78	140	8
8686260	2,6	29	80	3	8684720	7,2	79	140	8
8686270	2,7	30	80	3	8684730	7,3	80	140	8
8686280	2,8	31	80	3	8684740	7,4	81	140	8
8686290	2,9	32	80	3	8684750	7,5	83	140	8
8686300	3	33	80	3	8684760	7,6	84	140	8
8684310	3,1	34	95	4	8684770	7,7	85	140	8
8684320	3,2	35	95	4	8684780	7,8	86	140	8
8684330	3,3	36	95	4	8684790	7,9	87	140	8
8684340	3,4	37	95	4	8684800	8	88	140	8
8684350	3,5	39	95	4	8684810	8,1	89	150	10
8684360	3,6	40	95	4	8684820	8,2	90	150	10
8684370	3,7	41	95	4	8684830	8,3	91	150	10
8684380	3,8	42	95	4	8684840	8,4	92	150	10
8684390	3,9	43	95	4	8684850	8,5	94	150	10
8684400	4	44	95	4	8684860	8,6	95	150	10
8684410	4,1	45	105	6	8684870	8,7	96	150	10
8684420	4,2	46	105	6	8684880	8,8	97	150	10
8684430	4,3	47	105	6	8684890	8,9	98	150	10
8684440	4,4	48	105	6	8684900	9	99	150	10
8684450	4,5	50	105	6	8684910	9,1	100	160	10
8684460	4,6	51	105	6	8684920	9,2	101	160	10
8684470	4,7	52	105	6	8684930	9,3	102	160	10
8684480	4,8	53	105	6	8684940	9,4	103	160	10
8684490	4,9	54	105	6	8684950	9,5	105	160	10
8684500	5	55	105	6	8684960	9,6	106	160	10
8684510	5,1	56	115	6	8684970	9,7	107	160	10
8684520	5,2	57	115	6	8684980	9,8	108	160	10
8684530	5,3	58	115	6	8684990	9,9	109	160	10
8684540	5,4	59	115	6	8685000	10	110	160	10
8684550	5,5	61	115	6	8685010	10,1	111	182	12
8684560	5,6	62	115	6	8685020	10,2	112	182	12
8684570	5,7	63	115	6	8685030	10,3	113	182	12
8684580	5,8	64	115	6	8685040	10,4	114	182	12
8684590	5,9	65	115	6	8685050	10,5	116	182	12
8684600	6	66	115	6	8685060	10,6	117	182	12
8684610	6,1	67	125	8	8685070	10,7	118	182	12
8684620	6,2	68	125	8	8685080	10,8	119	182	12
8684630	6,3	69	125	8	8685090	10,9	120	182	12
8684640	6,4	70	125	8	8685100	11	121	182	12
8684650	6,5	72	125	8	8685110	11,1	122	194	12



# ADO-SUS-8D

Drilling | Solid carbide | 8xD



- First choice in quality and performance
- Carbide drill with internal coolant, WXL coating
- Up to 8xD
- Designed for stainless steel and titanium alloys
- 101 sizes

Material compatibility icons:

- P** C < 0,2%
- P** 0,25 < C < 0,4
- P** C ≥ 0,45%
- P** SCM
- M** INOX
- K** GG
- K** GGG
- N** AC, ADC
- S** Ti
- H** 25-35 HRC
- H** 35-45 HRC
- H** 45-52 HRC

Technical specifications icons:

- A** (Red)
- CARBIDE**
- WXL**
- 30°**
- SHRINK FIT**
- 135°**
- h8**
- B.601** (Gauge icon)

EDP	DC	LCF	OAL	DCON
8685120	11,2	123	194	12
8685130	11,3	124	194	12
8685140	11,4	125	194	12
8685150	11,5	127	194	12
8685160	11,6	128	194	12
8685170	11,7	129	194	12
8685180	11,8	130	194	12
8685190	11,9	131	194	12
8685200	12	132	194	12

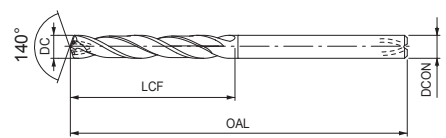
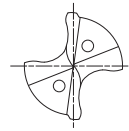
EDP	DC	LCF	OAL	DCON

Drilling | Solid carbide  
8xD



# ADO-3D

Drilling | Solid carbide | 3xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Up to 3xD
- For general purpose steels and cast iron
- 167 sizes

<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>140°</b>	<b>h8</b>	<b>B.601</b>
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Drilling | Solid carbide



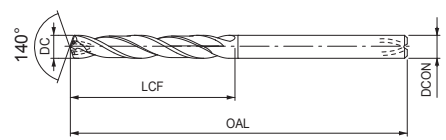
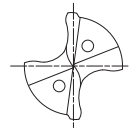
3xD

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8690200	2	12	66	3	8690525	5,25	27	82	6
8690210	2,1	13	66	3	8690530	5,3	27	82	6
8690220	2,2	14	66	3	8690540	5,4	27	82	6
8690230	2,3	14	66	3	8690550	5,5	28	82	6
8690240	2,4	15	66	3	8690560	5,6	28	82	6
8690250	2,5	15	66	3	8690570	5,7	29	82	6
8690260	2,6	16	66	3	8690580	5,8	29	82	6
8690265	2,65	16	66	3	8690590	5,9	30	82	6
8690270	2,7	17	66	3	8690600	6	30	82	6
8690280	2,8	17	66	3	8700610	6,1	31	88	8
8690290	2,9	18	66	3	8700620	6,2	31	88	8
8690300	3	18	66	3	8700630	6,3	32	88	8
8690310	3,1	19	74	4	8700640	6,4	32	88	8
8690315	3,15	19	74	4	8700650	6,5	33	88	8
8690320	3,2	20	74	4	8700660	6,6	33	88	8
8690330	3,3	20	74	4	8700670	6,7	34	88	8
8690340	3,4	21	74	4	8700680	6,8	34	88	8
8690350	3,5	21	74	4	8700690	6,9	35	88	8
8690360	3,6	22	74	4	8700700	7	35	88	8
8690370	3,7	23	74	4	8690710	7,1	36	94	8
8690375	3,75	23	74	4	8690720	7,2	36	94	8
8690380	3,8	23	74	4	8690725	7,25	37	94	8
8690390	3,9	24	74	4	8690730	7,3	37	94	8
8690400	4	24	74	4	8690740	7,4	37	94	8
8690410	4,1	25	80	5	8690750	7,5	38	94	8
8700410	4,1	25	80	6	8690760	7,6	38	94	8
8690420	4,2	26	80	5	8690770	7,7	39	94	8
8700420	4,2	26	80	6	8690775	7,75	39	94	8
8690430	4,3	26	80	5	8690780	7,8	39	94	8
8700430	4,3	26	80	6	8690790	7,9	40	94	8
8690440	4,4	27	80	5	8690800	8	40	94	8
8700440	4,4	27	80	6	8700810	8,1	41	101	10
8690450	4,5	27	80	5	8700820	8,2	41	101	10
8700450	4,5	27	80	6	8700830	8,3	42	101	10
8690460	4,6	28	80	5	8700840	8,4	42	101	10
8700460	4,6	28	80	6	8700850	8,5	43	101	10
8690470	4,7	29	80	5	8700860	8,6	43	101	10
8700470	4,7	29	80	6	8700870	8,7	43	101	10
8690480	4,8	29	80	5	8700880	8,8	44	101	10
8700480	4,8	29	80	6	8700890	8,9	45	101	10
8690490	4,9	30	80	5	8700900	9	45	101	10
8700490	4,9	30	80	6	8690910	9,1	46	106	10
8690500	5	25	80	5	8690920	9,2	46	106	10
8700500	5	25	80	6	8690925	9,25	47	106	10
8690510	5,1	26	82	6	8690930	9,3	47	106	10
8690520	5,2	26	82	6	8690940	9,4	47	106	10

**B**

# ADO-3D

Drilling | Solid carbide | 3xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Up to 3xD
- For general purpose steels and cast iron
- 167 sizes

<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>140°</b>	<b>h8</b>	<b>B.601</b>
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EDP	DC	LCF	OAL	DCON
8690950	9,5	48	106	10
8690960	9,6	48	106	10
8690970	9,7	49	106	10
8690975	9,75	49	106	10
8690980	9,8	49	106	10
8690990	9,9	50	106	10
8691000	10	50	106	10
8701010	10,1	51	113	12
8701020	10,2	51	113	12
8701030	10,3	52	113	12
8701040	10,4	52	113	12
8701050	10,5	53	113	12
8701060	10,6	53	113	12
8701070	10,7	54	113	12
8701080	10,8	54	113	12
8701090	10,9	55	113	12
8701100	11	55	113	12
8691110	11,1	56	120	12
8691120	11,2	56	120	12
8691130	11,3	57	120	12
8691140	11,4	57	120	12
8691150	11,5	58	120	12
8691160	11,6	58	120	12
8691170	11,7	59	120	12
8691180	11,8	59	120	12
8691190	11,9	60	120	12
8691200	12	60	120	12
8701210	12,1	61	128	14
8701220	12,2	61	128	14
8701230	12,3	62	128	14
8701240	12,4	62	128	14
8701250	12,5	63	128	14
8701260	12,6	63	128	14
8701270	12,7	64	128	14
8701280	12,8	64	128	14
8701290	12,9	65	128	14
8701300	13	65	128	14
8691310	13,1	66	134	14
8691320	13,2	66	134	14
8691330	13,3	67	134	14
8691340	13,4	67	134	14
8691350	13,5	68	134	14
8691360	13,6	68	134	14
8691370	13,7	69	134	14
8691380	13,8	69	134	14
8691390	13,9	70	134	14

EDP	DC	LCF	OAL	DCON
8691400	14	70	134	14
8701410	14,1	71	140	16
8701420	14,2	71	140	16
8701430	14,3	72	140	16
8701440	14,4	72	140	16
8701450	14,5	73	140	16
8701460	14,6	73	140	16
8701470	14,7	74	140	16
8701480	14,8	74	140	16
8701490	14,9	75	140	16
8701500	15	75	140	16
8691510	15,1	76	145	16
8691520	15,2	76	145	16
8691530	15,3	77	145	16
8691540	15,4	77	145	16
8691550	15,5	78	145	16
8691560	15,6	78	145	16
8691570	15,7	79	145	16
8691580	15,8	79	145	16
8691590	15,9	80	145	16
8691600	16	80	145	16
8701650	16,5	83	150	18
8701700	17	85	150	18
8691750	17,5	88	155	18
8691800	18	90	155	18
8701850	18,5	93	160	20
8701900	19	95	160	20
8691950	19,5	98	165	20
8692000	20	100	165	20

Drilling | Solid carbide

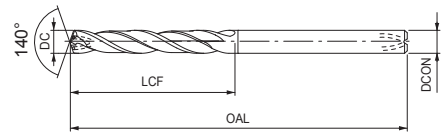
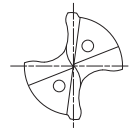


3xD

**B**

# ADO-5D

Drilling | Solid carbide | 5xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Up to 5xD
- For general purpose steels and cast iron
- 191 sizes

<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>140°</b>	<b>h8</b>	<b>B.601</b>
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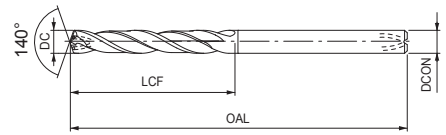
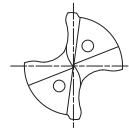
Drilling | Solid carbide

5xD

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8692200	2	18	70	3	8692490	4,9	45	95	5
8692210	2,1	19	70	3	8702490	4,9	45	95	6
8692220	2,2	20	70	3	8692500	5	45	95	5
8692230	2,3	21	70	3	8702500	5	45	95	6
8692240	2,4	22	70	3	8692510	5,1	41	100	6
8692250	2,5	23	70	3	8692520	5,2	42	100	6
8692260	2,6	24	78	3	8692525	5,25	42	100	6
8692265	2,65	24	78	3	8692530	5,3	43	100	6
8692270	2,7	25	78	3	8692540	5,4	44	100	6
8692276	2,76	25	78	3	8692550	5,5	44	100	6
8692278	2,78	26	78	3	8692552	5,52	45	100	6
8692280	2,8	26	78	3	8692554	5,54	45	100	6
8692290	2,9	27	78	3	8692560	5,6	45	100	6
8692300	3	27	78	3	8692570	5,7	46	100	6
8692310	3,1	28	86	4	8692580	5,8	47	100	6
8692315	3,15	29	86	4	8692590	5,9	48	100	6
8692320	3,2	29	86	4	8692600	6	48	100	6
8692330	3,3	30	86	4	8702610	6,1	49	109	8
8692340	3,4	31	86	4	8702620	6,2	50	109	8
8692350	3,5	32	86	4	8702630	6,3	51	109	8
8692360	3,6	33	86	4	8702640	6,4	52	109	8
8692366	3,66	33	86	4	8702650	6,5	52	109	8
8692368	3,68	34	86	4	8702660	6,6	53	109	8
8692370	3,7	34	86	4	8702670	6,7	54	109	8
8692375	3,75	34	86	4	8702680	6,8	55	109	8
8692380	3,8	35	86	4	8702690	6,9	56	109	8
8692390	3,9	36	86	4	8702700	7	56	109	8
8692400	4	36	86	4	8692710	7,1	57	118	8
8692410	4,1	37	95	5	8692720	7,2	58	118	8
8702410	4,1	37	95	6	8692725	7,25	58	118	8
8692420	4,2	38	95	5	8692730	7,3	59	118	8
8702420	4,2	38	95	6	8692736	7,36	59	118	8
8692430	4,3	39	95	5	8692738	7,38	60	118	8
8702430	4,3	39	95	6	8692740	7,4	60	118	8
8692440	4,4	40	95	5	8692750	7,5	60	118	8
8702440	4,4	40	95	6	8692752	7,52	61	118	8
8692450	4,5	41	95	5	8692754	7,54	61	118	8
8702450	4,5	41	95	6	8692760	7,6	61	118	8
8692460	4,6	42	95	5	8692770	7,7	62	118	8
8702460	4,6	42	95	6	8692775	7,75	62	118	8
8692462	4,62	42	95	5	8692780	7,8	63	118	8
8692464	4,64	42	95	5	8692790	7,9	64	118	8
8692470	4,7	43	95	5	8692800	8	64	118	8
8702470	4,7	43	95	6	8702810	8,1	65	128	10
8692480	4,8	44	95	5	8702820	8,2	66	128	10
8702480	4,8	44	95	6	8702830	8,3	67	128	10

# ADO-5D

Drilling | Solid carbide | 5xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Up to 5xD
- For general purpose steels and cast iron
- 191 sizes

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	<b>S</b> Ti	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>140°</b>	<b>h8</b>		<b>B.601</b>
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EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8702840	8,4	68	128	10	8693180	11,8	95	156	12
8702850	8,5	68	128	10	8693190	11,9	96	156	12
8702860	8,6	69	128	10	8693200	12	96	156	12
8702870	8,7	70	128	10	8703210	12,1	97	167	14
8702880	8,8	71	128	10	8703220	12,2	98	167	14
8702890	8,9	72	128	10	8703230	12,3	99	167	14
8702900	9	72	128	10	8703240	12,4	100	167	14
8692910	9,1	73	136	10	8703250	12,5	100	167	14
8692920	9,2	74	136	10	8703260	12,6	101	167	14
8692924	9,24	74	136	10	8703270	12,7	102	167	14
8692925	9,25	74	136	10	8703280	12,8	103	167	14
8692926	9,26	75	136	10	8703290	12,9	104	167	14
8692930	9,3	75	136	10	8703300	13	104	167	14
8692936	9,36	75	136	10	8693310	13,1	105	176	14
8692938	9,38	76	136	10	8693320	13,2	106	176	14
8692940	9,4	76	136	10	8693325	13,25	106	176	14
8692950	9,5	76	136	10	8693330	13,3	107	176	14
8692952	9,52	77	136	10	8693340	13,4	108	176	14
8692954	9,54	77	136	10	8693350	13,5	108	176	14
8692960	9,6	77	136	10	8693360	13,6	109	176	14
8692970	9,7	78	136	10	8693370	13,7	110	176	14
8692975	9,75	78	136	10	8693380	13,8	111	176	14
8692980	9,8	79	136	10	8693390	13,9	112	176	14
8692990	9,9	80	136	10	8693400	14	112	176	14
8693000	10	80	136	10	8703410	14,1	113	185	16
8703010	10,1	81	146	12	8703420	14,2	114	185	16
8703020	10,2	82	146	12	8703430	14,3	115	185	16
8703030	10,3	83	146	12	8703440	14,4	116	185	16
8703040	10,4	84	146	12	8703450	14,5	116	185	16
8703050	10,5	84	146	12	8703460	14,6	117	185	16
8703060	10,6	85	146	12	8703470	14,7	118	185	16
8703070	10,7	86	146	12	8703480	14,8	119	185	16
8703080	10,8	87	146	12	8703490	14,9	120	185	16
8703090	10,9	88	146	12	8703500	15	120	185	16
8703100	11	88	146	12	8693510	15,1	121	193	16
8693110	11,1	89	156	12	8693520	15,2	122	193	16
8693120	11,2	90	156	12	8693525	15,25	122	193	16
8693122	11,22	90	156	12	8693530	15,3	123	193	16
8693124	11,24	90	156	12	8693540	15,4	124	193	16
8693130	11,3	91	156	12	8693550	15,5	124	193	16
8693136	11,36	91	156	12	8693560	15,6	125	193	16
8693138	11,38	92	156	12	8693570	15,7	126	193	16
8693140	11,4	92	156	12	8693580	15,8	127	193	16
8693150	11,5	92	156	12	8693590	15,9	128	193	16
8693160	11,6	93	156	12	8693600	16	128	193	16
8693170	11,7	94	156	12	8703650	16,5	132	201	18

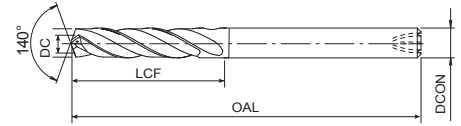
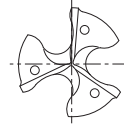
Drilling | Solid carbide 5xD

**B**



# ADO-TRS-3D

Drilling | Solid carbide | 3xD



- First choice in quality and performance
- 3 flute carbide drill with internal coolant, EgiAs coating
- Up to 3xD
- Allows high feed 1.000mm/min process in steel and cast iron
- 112 sizes

<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>S</b> Ti	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>140°</b>	<b>h8</b>	<b>B.602</b>
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EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8720300	3	18	66	3	8720850	8,5	43	101	10
8720330	3,3	20	74	4	8720860	8,6	43	101	10
8720350	3,5	21	74	4	8720870	8,7	44	101	10
8720366	3,66	22	74	4	8720880	8,8	44	101	10
8720400	4	24	74	4	8720890	8,9	45	101	10
8720420	4,2	26	80	6	8720900	9	45	101	10
8720450	4,5	27	80	6	8720910	9,1	46	106	10
8720460	4,6	28	80	6	8720920	9,2	46	106	10
8720500	5	25	80	6	8720925	9,25	47	106	10
8720510	5,1	26	82	6	8720930	9,3	47	106	10
8720520	5,2	26	82	6	8720938	9,38	47	106	10
8720530	5,3	27	82	6	8720940	9,4	47	106	10
8720540	5,4	27	82	6	8720950	9,5	48	106	10
8720550	5,5	28	82	6	8720960	9,6	48	106	10
48323555	5,55	28	82	6	8720970	9,7	49	106	10
8720560	5,6	28	82	6	8720980	9,8	49	106	10
8720570	5,7	29	82	6	8720990	9,9	50	106	10
8720580	5,8	29	82	6	8721000	10	50	106	10
8720590	5,9	30	82	6	8721010	10,1	51	113	12
8720600	6	30	82	6	8721020	10,2	51	113	12
8720610	6,1	31	88	8	8721030	10,3	52	113	12
8720620	6,2	31	88	8	8721040	10,4	52	113	12
8720630	6,3	32	88	8	8721050	10,5	53	113	12
8720640	6,4	32	88	8	8721060	10,6	53	113	12
8720650	6,5	33	88	8	8721070	10,7	54	113	12
8720660	6,6	33	88	8	8721080	10,8	54	113	12
8720670	6,7	34	88	8	8721090	10,9	55	113	12
8720680	6,8	34	88	8	8721100	11	55	113	12
8720690	6,9	35	88	8	8721110	11,1	56	120	12
8720700	7	35	88	8	8721120	11,2	56	120	12
8720710	7,1	36	94	8	8721125	11,25	57	120	12
8720720	7,2	36	94	8	8721130	11,3	57	120	12
8720730	7,3	37	94	8	8721138	11,38	57	120	12
8720738	7,38	37	94	8	8721140	11,4	57	120	12
8720740	7,4	37	94	8	8721150	11,5	58	120	12
48323745	7,45	38	94	8	8721160	11,6	58	120	12
8720750	7,5	38	94	8	8721170	11,7	59	120	12
8720760	7,6	38	94	8	8721180	11,8	59	120	12
8720770	7,7	39	94	8	8721190	11,9	60	120	12
8720780	7,8	39	94	8	8721200	12	60	120	12
8720790	7,9	40	94	8	8721250	12,5	63	128	14
8720800	8	40	94	8	8721300	13	65	128	14
8720810	8,1	41	101	10	8721325	13,25	67	134	14
8720820	8,2	41	101	10	8721330	13,3	67	134	14
8720830	8,3	42	101	10	8721338	13,38	67	134	14
8720840	8,4	42	101	10	8721350	13,5	68	134	14

Drilling | Solid carbide



3xD

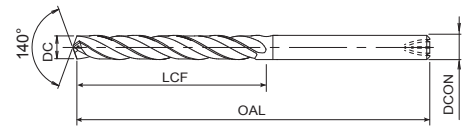
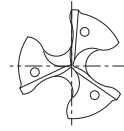
**B**





# ADO-TRS-5D

Drilling | Solid carbide | 5xD



- First choice in quality and performance
- 3 flute carbide drill with internal coolant, EgiAs coating
- Up to 5xD
- Allows high feed 1.000mm/min process in steel and cast iron
- 112 sizes



EDP	DC	LCF	OAL	DCON
8722300	3	27	78	3
8722330	3,3	30	86	4
8722350	3,5	32	86	4
8722366	3,66	33	86	4
8722400	4	36	86	4
8722420	4,2	38	95	6
8722450	4,5	41	95	6
8722460	4,6	42	95	6
8722500	5	45	95	6
8722510	5,1	41	100	6
8722520	5,2	42	100	6
8722530	5,3	43	100	6
8722540	5,4	44	100	6
8722550	5,5	44	100	6
48324555	5,55	45	100	6
8722560	5,6	45	100	6
8722570	5,7	46	100	6
8722580	5,8	47	100	6
8722590	5,9	48	100	6
8722600	6	48	100	6
8722610	6,1	49	109	8
8722620	6,2	50	109	8
8722630	6,3	51	109	8
8722640	6,4	52	109	8
8722650	6,5	52	109	8
8722660	6,6	53	109	8
8722670	6,7	54	109	8
8722680	6,8	55	109	8
8722690	6,9	56	109	8
8722700	7	56	109	8
8722710	7,1	57	118	8
8722720	7,2	58	118	8
8722730	7,3	59	118	8
8722738	7,38	60	118	8
8722740	7,4	60	118	8
48324745	7,45	60	118	8
8722750	7,5	60	118	8
8722760	7,6	61	118	8
8722770	7,7	62	118	8
8722780	7,8	63	118	8
8722790	7,9	64	118	8
8722800	8	64	118	8
8722810	8,1	65	128	10
8722820	8,2	66	128	10
8722830	8,3	67	128	10
8722840	8,4	68	128	10

EDP	DC	LCF	OAL	DCON
8722850	8,5	68	128	10
8722860	8,6	69	128	10
8722870	8,7	70	128	10
8722880	8,8	71	128	10
8722890	8,9	72	128	10
8722900	9	72	128	10
8722910	9,1	73	136	10
8722920	9,2	74	136	10
8722925	9,25	74	136	10
8722930	9,3	75	136	10
8722938	9,38	76	136	10
8722940	9,4	76	136	10
8722950	9,5	76	136	10
8722960	9,6	77	136	10
8722970	9,7	78	136	10
8722980	9,8	79	136	10
8722990	9,9	80	136	10
8723000	10	80	136	10
8723010	10,1	81	146	12
8723020	10,2	82	146	12
8723030	10,3	83	146	12
8723040	10,4	84	146	12
8723050	10,5	84	146	12
8723060	10,6	85	146	12
8723070	10,7	86	146	12
8723080	10,8	87	146	12
8723090	10,9	88	146	12
8723100	11	88	146	12
8723110	11,1	89	156	12
8723120	11,2	90	156	12
8723125	11,25	90	156	12
8723130	11,3	91	156	12
8723138	11,38	92	156	12
8723140	11,4	92	156	12
8723150	11,5	92	156	12
8723160	11,6	93	156	12
8723170	11,7	94	156	12
8723180	11,8	95	156	12
8723190	11,9	96	156	12
8723200	12	96	156	12
8723250	12,5	100	167	14
8723300	13	104	167	14
8723325	13,25	106	176	14
8723330	13,3	107	176	14
8723338	13,38	108	176	14
8723350	13,5	108	176	14

Drilling | Solid carbide



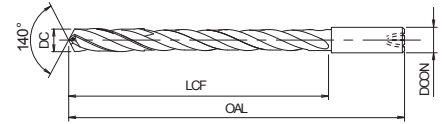
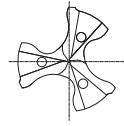
5xD

B

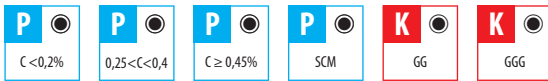


# TRS-HO-10D

Drilling | Solid carbide | 10xD



- First choice in quality and performance
- 3 flute carbide drill with internal coolant, WDI coating
- Up to 10xD
- Allows high feed 1.000mm/min process in steel and cast iron
- 11 sizes



EDP	DC	LCF	OAL	DCON
48159050	5	65	115	6
8664055	5,5	78	128	6
8664060	6	78	128	6
48159065	6,5	87	140	8
48159070	7	90	140	8
8664075	7,5	100	155	8
8664080	8	105	155	8
48159085	8,5	110	165	10
48159090	9	115	165	10
8664100	10	130	190	10
8664120	12	155	215	12

EDP	DC	LCF	OAL	DCON

Drilling | Solid carbide 10xD





# ADO-10D

Drilling | Solid carbide | 10xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Double margin, up to 10xD
- For general purpose steels and cast iron
- 102 sizes



EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8696200	2	26	75	3	8710660	6,6	87	140	8
8696210	2,1	33	75	3	8710670	6,7	87	140	8
8696220	2,2	33	75	3	8710680	6,8	90	140	8
8696230	2,3	33	75	3	8710690	6,9	90	140	8
8696240	2,4	33	75	3	8710700	7	90	140	8
8696250	2,5	33	75	3	8710710	7,1	100	155	8
8696260	2,6	40	90	3	8710720	7,2	100	155	8
8696270	2,7	40	90	3	8710730	7,3	100	155	8
8696280	2,8	40	90	3	8710740	7,4	100	155	8
8696290	2,9	40	90	3	8696750	7,5	100	155	8
8696300	3	40	90	3	8710760	7,6	105	155	8
8696310	3,1	45	100	4	8710770	7,7	105	155	8
8696320	3,2	45	100	4	8710780	7,8	105	155	8
8696330	3,3	45	100	4	8710790	7,9	105	155	8
8696340	3,4	50	100	4	8696800	8	105	155	8
8696350	3,5	50	100	4	8710810	8,1	110	165	10
8696360	3,6	50	100	4	8710820	8,2	110	165	10
8696370	3,7	50	100	4	8710830	8,3	110	165	10
8696380	3,8	50	100	4	8710840	8,4	110	165	10
8696390	3,9	50	100	4	8710850	8,5	110	165	10
8696400	4	50	100	4	8710860	8,6	115	165	10
8710410	4,1	55	115	6	8710870	8,7	115	165	10
8710420	4,2	55	115	6	8710880	8,8	115	165	10
8710430	4,3	60	115	6	8710890	8,9	115	165	10
8710440	4,4	60	115	6	8710900	9	115	165	10
8710450	4,5	60	115	6	8710910	9,1	125	190	10
8710460	4,6	60	115	6	8710920	9,2	125	190	10
8710470	4,7	65	115	6	8710930	9,3	125	190	10
8710480	4,8	65	115	6	8710940	9,4	125	190	10
8710490	4,9	65	115	6	8696950	9,5	125	190	10
8710500	5	65	115	6	8710960	9,6	130	190	10
8710510	5,1	70	128	6	8710970	9,7	130	190	10
8710520	5,2	70	128	6	8710980	9,8	130	190	10
8710530	5,3	70	128	6	8710990	9,9	130	190	10
8710540	5,4	78	128	6	8697000	10	130	190	10
8696550	5,5	78	128	6	8711010	10,1	140	205	12
8710560	5,6	78	128	6	8711020	10,2	140	205	12
8710570	5,7	78	128	6	8711030	10,3	140	205	12
8710580	5,8	78	128	6	8711040	10,4	140	205	12
8710590	5,9	78	128	6	8711050	10,5	140	205	12
8696600	6	78	128	6	8711060	10,6	140	205	12
8710610	6,1	87	140	8	8711070	10,7	140	205	12
8710620	6,2	87	140	8	8711080	10,8	145	205	12
8710630	6,3	87	140	8	8711090	10,9	145	205	12
8710640	6,4	87	140	8	8711100	11	145	205	12
8710650	6,5	87	140	8	8711110	11,1	155	215	12

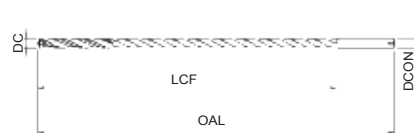
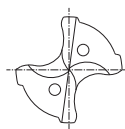
Drilling | Solid carbide

10xD

**B**

# ADO-10D

Drilling | Solid carbide | 10xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Double margin, up to 10xD
- For general purpose steels and cast iron
- 102 sizes



EDP	DC	LCF	OAL	DCON
8711120	11,2	155	215	12
8711130	11,3	155	215	12
8711140	11,4	155	215	12
8711150	11,5	155	215	12
8711160	11,6	155	215	12
8711170	11,7	155	215	12
8711180	11,8	155	215	12
8711190	11,9	155	215	12
8697200	12	155	215	12
8711250	12,5	155	215	14

EDP	DC	LCF	OAL	DCON

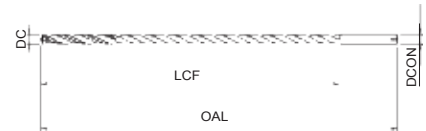
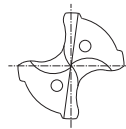
Drilling | Solid carbide

10xD

B

# ADO-15D NEW SIZES

Drilling | Solid carbide | 15xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Double margin, up to 15xD
- For general purpose steels and cast iron
- 93 sizes



EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
48338125 <small>NEW</small>	2,5	45	96	3	8698750	7,5	135	195	8
8698300	3	55	105	3	8712760	7,6	145	195	8
8698310	3,1	60	125	4	8712770	7,7	145	195	8
8698320	3,2	60	125	4	8712780	7,8	145	195	8
8698330	3,3	60	125	4	8712790	7,9	145	195	8
8698340	3,4	65	125	4	8698800	8	145	195	8
8698350	3,5	65	125	4	8712810	8,1	155	210	10
8698360	3,6	65	125	4	8712820	8,2	155	210	10
8698370	3,7	65	125	4	8712830	8,3	155	210	10
8698380	3,8	75	125	4	8712840	8,4	155	210	10
8698390	3,9	75	125	4	8712850	8,5	155	210	10
8698400	4	75	125	4	8712860	8,6	160	210	10
8712410	4,1	75	140	6	8712870	8,7	160	210	10
8712420	4,2	75	140	6	8712880	8,8	160	210	10
8712430	4,3	85	140	6	8712890	8,9	160	210	10
8712440	4,4	85	140	6	8712900	9	160	210	10
8712450	4,5	85	140	6	8712910	9,1	170	240	10
8712460	4,6	85	140	6	8712920	9,2	170	240	10
8712470	4,7	85	140	6	8712930	9,3	170	240	10
8712480	4,8	90	140	6	8712940	9,4	170	240	10
8712490	4,9	90	140	6	8698950	9,5	170	240	10
8712500	5	90	140	6	8712960	9,6	180	240	10
8712510	5,1	95	160	6	8712970	9,7	180	240	10
8712520	5,2	95	160	6	8712980	9,8	180	240	10
8712530	5,3	95	160	6	8712990	9,9	180	240	10
8712540	5,4	110	160	6	8699000	10	180	240	10
8698550	5,5	110	160	6	8713010	10,1	190	260	12
8712560	5,6	110	160	6	8713020	10,2	190	260	12
8712570	5,7	110	160	6	8713030	10,3	190	260	12
8712580	5,8	110	160	6	8713040	10,4	190	260	12
8712590	5,9	110	160	6	8713050	10,5	190	260	12
8698600	6	110	160	6	8713060	10,6	190	260	12
8712610	6,1	120	175	8	8713070	10,7	200	260	12
8712620	6,2	120	175	8	8713080	10,8	200	260	12
8712630	6,3	120	175	8	8713090	10,9	200	260	12
8712640	6,4	120	175	8	8713100	11	200	260	12
8712650	6,5	120	175	8	8713110	11,1	210	280	12
8712660	6,6	120	175	8	8713120	11,2	210	280	12
8712670	6,7	120	175	8	8713130	11,3	210	280	12
8712680	6,8	125	175	8	8713140	11,4	210	280	12
8712690	6,9	125	175	8	8713150	11,5	210	280	12
8712700	7	125	175	8	8713160	11,6	210	280	12
8712710	7,1	135	195	8	8713170	11,7	210	280	12
8712720	7,2	135	195	8	8713180	11,8	210	280	12
8712730	7,3	135	195	8	8713190	11,9	215	280	12
8712740	7,4	135	195	8	8699200	12	215	280	12

Drilling | Solid carbide

15xD



**B**





# ADO-20D NEW SIZES

Drilling | Solid carbide | 20xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Double margin, up to 20xD
- For general purpose steels and cast iron
- 93 sizes



EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
48338225 <small>NEW</small>	2,5	58	109	3	8706750	7,5	170	230	8
8706300	3	70	120	3	8714760	7,6	180	230	8
8706310	3,1	80	140	4	8714770	7,7	180	230	8
8706320	3,2	80	140	4	8714780	7,8	180	230	8
8706330	3,3	80	140	4	8714790	7,9	180	230	8
8706340	3,4	85	140	4	8706800	8	180	230	8
8706350	3,5	85	140	4	8714810	8,1	195	260	10
8706360	3,6	85	140	4	8714820	8,2	195	260	10
8706370	3,7	85	140	4	8714830	8,3	195	260	10
8706380	3,8	90	140	4	8714840	8,4	195	260	10
8706390	3,9	90	140	4	8714850	8,5	195	260	10
8706400	4	90	140	4	8714860	8,6	210	260	10
8714410	4,1	100	165	6	8714870	8,7	210	260	10
8714420	4,2	100	165	6	8714880	8,8	210	260	10
8714430	4,3	110	165	6	8714890	8,9	210	260	10
8714440	4,4	110	165	6	8714900	9	210	260	10
8714450	4,5	110	165	6	8714910	9,1	220	290	10
8714460	4,6	110	165	6	8714920	9,2	220	290	10
8714470	4,7	110	165	6	8714930	9,3	220	290	10
8714480	4,8	115	165	6	8714940	9,4	220	290	10
8714490	4,9	115	165	6	8706950	9,5	220	290	10
8714500	5	115	165	6	8714960	9,6	230	290	10
8714510	5,1	120	190	6	8714970	9,7	230	290	10
8714520	5,2	120	190	6	8714980	9,8	230	290	10
8714530	5,3	120	190	6	8714990	9,9	230	290	10
8714540	5,4	140	190	6	8707000	10	230	290	10
8706550	5,5	140	190	6	8715010	10,1	250	310	12
8714560	5,6	140	190	6	8715020	10,2	250	310	12
8714570	5,7	140	190	6	8715030	10,3	250	310	12
8714580	5,8	140	190	6	8715040	10,4	250	310	12
8714590	5,9	140	190	6	8715050	10,5	250	310	12
8706600	6	140	190	6	8715060	10,6	250	310	12
8714610	6,1	155	210	8	8715070	10,7	250	310	12
8714620	6,2	155	210	8	8715080	10,8	250	310	12
8714630	6,3	155	210	8	8715090	10,9	250	310	12
8714640	6,4	155	210	8	8715100	11	250	310	12
8714650	6,5	155	210	8	8715110	11,1	270	330	12
8714660	6,6	155	210	8	8715120	11,2	270	330	12
8714670	6,7	155	210	8	8715130	11,3	270	330	12
8714680	6,8	160	210	8	8715140	11,4	270	330	12
8714690	6,9	160	210	8	8715150	11,5	270	330	12
8714700	7	160	210	8	8715160	11,6	270	330	12
8714710	7,1	170	230	8	8715170	11,7	270	330	12
8714720	7,2	170	230	8	8715180	11,8	270	330	12
8714730	7,3	170	230	8	8715190	11,9	270	330	12
8714740	7,4	170	230	8	8707200	12	270	330	12

Drilling | Solid carbide  
20xD



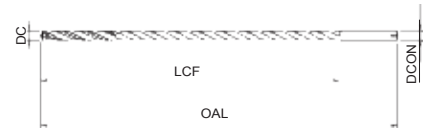
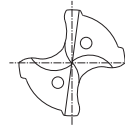
20xD

**B**



# ADO-25D NEW

Drilling | Solid carbide | 25xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Double margin, up to 25xD
- For general purpose steels and cast iron
- 92 sizes

<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>H</b> 25-35 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>140°</b>	<b>e8</b>	<b>B.603</b>
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EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
48338325	2,5	70	121	3	8724750	7,5	210	275	8
8726300	3	85	135	3	8724760	7,6	225	275	8
8724310	3,1	95	165	4	8724770	7,7	225	275	8
8724320	3,2	95	165	4	8724780	7,8	225	275	8
8724330	3,3	95	165	4	8724790	7,9	225	275	8
8724340	3,4	105	165	4	8724800	8	225	275	8
8724350	3,5	105	165	4	8724810	8,1	240	305	10
8724360	3,6	105	165	4	8724820	8,2	240	305	10
8724370	3,7	105	165	4	8724830	8,3	240	305	10
8724380	3,8	115	165	4	8724840	8,4	240	305	10
8724390	3,9	115	165	4	8724850	8,5	240	305	10
8724400	4	115	165	4	8724860	8,6	255	305	10
8724410	4,1	120	190	6	8724870	8,7	255	305	10
8724420	4,2	120	190	6	8724880	8,8	255	305	10
8724430	4,3	135	190	6	8724890	8,9	255	305	10
8724440	4,4	135	190	6	8724900	9	255	305	10
8724450	4,5	135	190	6	8724910	9,1	270	340	10
8724460	4,6	135	190	6	8724920	9,2	270	340	10
8724470	4,7	135	190	6	8724930	9,3	270	340	10
8724480	4,8	140	190	6	8724940	9,4	270	340	10
8724490	4,9	140	190	6	8724950	9,5	270	340	10
8724500	5	140	190	6	8724960	9,6	280	340	10
8724510	5,1	150	220	6	8724970	9,7	280	340	10
8724520	5,2	150	220	6	8724980	9,8	280	340	10
8724530	5,3	150	220	6	8724990	9,9	280	340	10
8724540	5,4	170	220	6	8725000	10	280	340	10
8724550	5,5	170	220	6	8725010	10,1	310	370	12
8724560	5,6	170	220	6	8725020	10,2	310	370	12
8724570	5,7	170	220	6	8725030	10,3	310	370	12
8724580	5,8	170	220	6	8725040	10,4	310	370	12
8724590	5,9	170	220	6	8725050	10,5	310	370	12
8724600	6	170	220	6	8725060	10,6	310	370	12
8724610	6,1	190	250	8	8725070	10,7	310	370	12
8724620	6,2	190	250	8	8725080	10,8	310	370	12
8724630	6,3	190	250	8	8725090	10,9	310	370	12
8724640	6,4	190	250	8	8725100	11	310	370	12
8724650	6,5	190	250	8	8725110	11,1	340	400	12
8724660	6,6	190	250	8	8725120	11,2	340	400	12
8724670	6,7	190	250	8	8725130	11,3	340	400	12
8724680	6,8	200	250	8	8725140	11,4	340	400	12
8724690	6,9	200	250	8	8725150	11,5	340	400	12
8724700	7	200	250	8	8725160	11,6	340	400	12
8724710	7,1	210	275	8	8725170	11,7	340	400	12
8724720	7,2	210	275	8	8725180	11,8	340	400	12
8724730	7,3	210	275	8					
8724740	7,4	210	275	8					

Drilling | Solid carbide

25xD

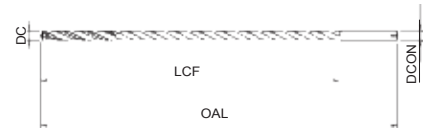
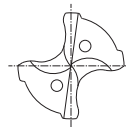


**B**



# ADO-30D NEW SIZES

Drilling | Solid carbide | 30xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Double margin, up to 30xD
- For general purpose steels and cast iron
- 72 sizes



EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
48338425 <small>NEW</small>	2,5	83	134	3	8708750	7,5	250	315	8
8708300	3	100	150	3	8716760	7,6	265	315	8
8708310	3,1	102	185	4	8716770	7,7	265	315	8
8708320	3,2	105	185	4	8716780	7,8	265	315	8
8708330	3,3	109	185	4	8716790	7,9	265	315	8
8708340	3,4	112	185	4	8708800	8	265	315	8
8708350	3,5	116	185	4	8716810	8,1	280	350	10
8708360	3,6	116	185	4	8716820	8,2	280	350	10
8708370	3,7	116	185	4	8716830	8,3	280	350	10
8708380	3,8	132	185	4	8716840	8,4	280	350	10
8708390	3,9	132	185	4	8716850	8,5	280	350	10
8708400	4	132	185	4	8716860	8,6	300	350	10
8716410	4,1	140	215	6	8716870	8,7	300	350	10
8716420	4,2	140	215	6	8716880	8,8	300	350	10
8716430	4,3	150	215	6	8716890	8,9	300	350	10
8716440	4,4	150	215	6	8716900	9	300	350	10
8716450	4,5	150	215	6	8716910	9,1	315	390	10
8716460	4,6	150	215	6	8716920	9,2	315	390	10
8716470	4,7	150	215	6	8716930	9,3	315	390	10
8716480	4,8	165	215	6	8716940	9,4	315	390	10
8716490	4,9	165	215	6	8708950	9,5	315	390	10
8716500	5	165	215	6	8716960	9,6	330	390	10
8716510	5,1	180	250	6	8716970	9,7	330	390	10
8716520	5,2	180	250	6	8716980	9,8	330	390	10
8716530	5,3	180	250	6	8716990	9,9	330	390	10
8716540	5,4	200	250	6	8709000	10	330	390	10
8708550	5,5	200	250	6					
8716560	5,6	200	250	6					
8716570	5,7	200	250	6					
8716580	5,8	200	250	6					
8716590	5,9	200	250	6					
8708600	6	200	250	6					
8716610	6,1	215	280	8					
8716620	6,2	215	280	8					
8716630	6,3	215	280	8					
8716640	6,4	215	280	8					
8716650	6,5	215	280	8					
8716660	6,6	215	280	8					
8716670	6,7	215	280	8					
8716680	6,8	230	280	8					
8716690	6,9	230	280	8					
8716700	7	230	280	8					
8716710	7,1	250	315	8					
8716720	7,2	250	315	8					
8716730	7,3	250	315	8					
8716740	7,4	250	315	8					

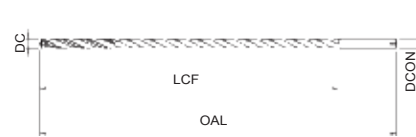
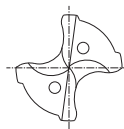
Drilling | Solid carbide

30xD



# ADO-40D NEW

Drilling | Solid carbide | 40xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Double margin, up to 40xD
- For general purpose steels and cast iron
- 6 sizes

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	<b>K</b>	<b>H</b>
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	INOX	GG	GGG	25-35 HRC

<b>A</b>	CARBIDE	EgiAs	±25°	SHRINK FIT		140°	e8	
								B.603

Drilling | Solid carbide

40xD

	EDP	DC	LU	LCF	OAL	DCON	LS	PL	EDP	DC	LU	LCF	OAL	DCON	LS	PL
	8717300	3	120	129	179	3	49	0,5								
	8717400	4	160	172	222	4	49	0,7								
	8717500	5	200	215	265	5	49	0,9								
	8717600	6	240	258	308	6	49	1,1								
	8717800	8	320	344	394	8	49	1,5								
	8718000	10	400	430	490	10	59	1,8								

# ADO-50D NEW

Drilling | Solid carbide | 50xD



- First choice in quality and performance
- Carbide drill with internal coolant, EgiAs coating
- Double margin, up to 50xD
- For general purpose steels and cast iron
- 5 sizes



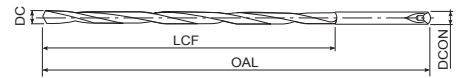
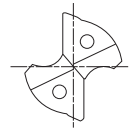
EDP	DC	LU	LCF	OAL	DCON	LS	PL	EDP	DC	LU	LCF	OAL	DCON	LS	PL
8718300	3	150	159	209	3	49	0,5								
8718400	4	200	212	262	4	49	0,7								
8718500	5	250	265	315	5	49	0,9								
8718600	6	300	318	368	6	49	1,1								
8718800	8	400	424	474	8	49	1,5								

Drilling | Solid carbide  
50xD



# CAO-GDXL

Drilling | Solid carbide | 15xD / 20xD / 30xD



- Carbide drill with internal coolant, bright finish
- Up to 15xD, 20xD and 30xD
- For aluminium and cast aluminium
- 11 sizes



CARBIDE
30°
SHRINK FIT
130°
h8



Drilling | Solid carbide

15xD / 20xD / 30xD

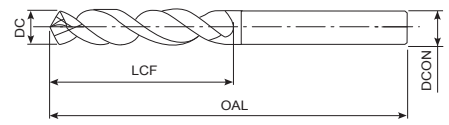
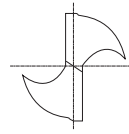
EDP	DC	LCF	OAL	DCON	ULDR
8567130	3	55	105	3	15
8567140	4	75	125	4	15
8567150	5	90	140	5	15
8567160	6	110	160	6	15
8567165	6,5	120	175	7	15
8567170	7	125	175	7	15
8567180	8	145	195	8	15
8567190	9	160	210	9	15
8567200	10	180	240	10	15
8567340	4	90	140	4	20
8567345	4,5	110	165	5	20
8567350	5	115	165	5	20
8567355	5,5	140	190	6	20
8567360	6	140	190	6	20
8567370	7	160	210	7	20
8567380	8	180	230	8	20
8567390	9	210	260	9	20
8567400	10	230	290	10	20
8567450	5	165	215	5	30
8567455	5,5	200	250	6	30
8567460	6	200	250	6	30
8567470	7	230	280	7	30
8567480	8	265	315	8	30

EDP	DC	LCF	OAL	DCON	ULDR



# HYP-HP-3D

Drilling | Solid carbide | 3xD



- Carbide drill with EgiAs coating
- Up to 3xD
- General purpose
- 154 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>	<b>140°</b>	<b>m7</b>
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 <b>B.604</b>
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EDP	DC	DC Inch	LCF	OAL	DCON
30200100	1	-	7	35	3
30200110	1,1	-	7	35	3
30200120	1,2	-	8	35	3
30200130	1,3	-	8	35	3
30200140	1,4	-	9	35	3
30200150	1,5	-	9	40	3
30200160	1,6	-	10	40	3
30200170	1,7	-	10	40	3
30200180	1,8	-	11	40	3
30200190	1,9	-	11	40	3
30200200	2	-	13	45	3
30200210	2,1	-	13	45	3
30200220	2,2	-	13	45	3
30200230	2,3	-	13	45	3
30200240	2,4	-	15	45	3
30200250	2,5	-	15	50	3
30200260	2,6	-	15	50	3
30200270	2,7	-	17	50	3
30200280	2,8	-	17	50	3
30200290	2,9	-	17	50	3
30200300	3	-	20	62	6
30200310	3,1	-	20	62	6
30200317	3,17	1/8	20	62	6
30200320	3,2	-	20	62	6
30200330	3,3	-	20	62	6
30200340	3,4	-	20	62	6
30200350	3,5	-	20	62	6
30200357	3,57	9/64	20	62	6
30200360	3,6	-	20	62	6
30200370	3,7	-	20	62	6
30200380	3,8	-	24	66	6
30200390	3,9	-	24	66	6
30200397	3,97	5/32	24	66	6
30200400	4	-	24	66	6
30200410	4,1	-	24	66	6
30200420	4,2	-	24	66	6
30200430	4,3	-	24	66	6
30200437	4,37	11/64	24	66	6
30200440	4,4	-	24	66	6
30200450	4,5	-	24	66	6
30200460	4,6	-	24	66	6
30200470	4,7	-	24	66	6
30200476	4,76	3/16	24	66	6
30200480	4,8	-	28	66	6
30200490	4,9	-	28	66	6
30200500	5	-	28	66	6

EDP	DC	DC Inch	LCF	OAL	DCON
30200510	5,1	-	28	66	6
30200516	5,16	13/64	28	66	6
30200520	5,2	-	28	66	6
30200530	5,3	-	28	66	6
30200540	5,4	-	28	66	6
30200550	5,5	-	28	66	6
30200556	5,56	7/32	28	66	6
30200560	5,6	-	28	66	6
30200570	5,7	-	28	66	6
30200580	5,8	-	28	66	6
30200590	5,9	-	28	66	6
30200595	5,95	15/64	28	66	6
30200600	6	-	28	66	6
30200610	6,1	-	34	79	8
30200620	6,2	-	34	79	8
30200630	6,3	-	34	79	8
30200635	6,35	1/4	34	79	8
30200640	6,4	-	34	79	8
30200650	6,5	-	34	79	8
30200660	6,6	-	34	79	8
30200670	6,7	-	34	79	8
30200675	6,75	17/64	34	79	8
30200680	6,8	-	34	79	8
30200690	6,9	-	34	79	8
30200700	7	-	34	79	8
30200710	7,1	-	41	79	8
30200714	7,14	9/32	41	79	8
30200720	7,2	-	41	79	8
30200730	7,3	-	41	79	8
30200740	7,4	-	41	79	8
30200750	7,5	-	41	79	8
30200754	7,54	19/64	41	79	8
30200760	7,6	-	41	79	8
30200770	7,7	-	41	79	8
30200780	7,8	-	41	79	8
30200790	7,9	-	41	79	8
30200794	7,94	5/16	41	79	8
30200800	8	-	41	79	8
30200810	8,1	-	47	89	10
30200820	8,2	-	47	89	10
30200830	8,3	-	47	89	10
30200833	8,33	21/64	47	89	10
30200840	8,4	-	47	89	10
30200850	8,5	-	47	89	10
30200860	8,6	-	47	89	10
30200870	8,7	-	47	89	10

Drilling | Solid carbide

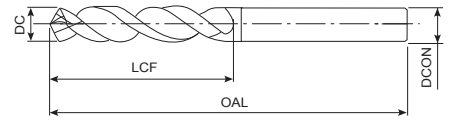
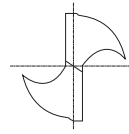


3xD

**B**

# HYP-HP-3D

Drilling | Solid carbide | 3xD



- Carbide drill with EgiAs coating
- Up to 3xD
- General purpose
- 154 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>	<b>140°</b>	<b>m7</b>
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Drilling | Solid carbide

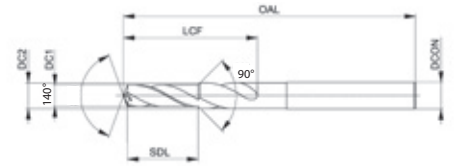
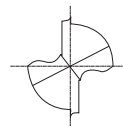
3xD

EDP	DC	DC Inch	LCF	OAL	DCON
30200873	8,73	11/32	47	89	10
30200880	8,8	-	47	89	10
30200890	8,9	-	47	89	10
30200900	9	-	47	89	10
30200910	9,1	-	47	89	10
30200913	9,13	23/64	47	89	10
30200920	9,2	-	47	89	10
30200930	9,3	-	47	89	10
30200940	9,4	-	47	89	10
30200950	9,5	-	47	89	10
30200952	9,52	3/8	47	89	10
30200960	9,6	-	47	89	10
30200970	9,7	-	47	89	10
30200980	9,8	-	47	89	10
30200990	9,9	-	47	89	10
30200992	9,92	25/64	47	89	10
30201000	10	-	47	89	10
30201010	10,1	-	55	102	12
30201020	10,2	-	55	102	12
30201030	10,3	-	55	102	12
30201032	10,32	13/32	55	102	12
30201040	10,4	-	55	102	12
30201050	10,5	-	55	102	12
30201060	10,6	-	55	102	12
30201070	10,7	-	55	102	12
30201072	10,72	27/64	55	102	12
30201080	10,8	-	55	102	12
30201090	10,9	-	55	102	12
30201100	11	-	55	102	12
30201110	11,1	-	55	102	12
30201111	11,11	7/16	55	102	12
30201120	11,2	-	55	102	12
30201130	11,3	-	55	102	12
30201140	11,4	-	55	102	12
30201150	11,5	-	55	102	12
30201151	11,51	29/64	55	102	12
30201160	11,6	-	55	102	12
30201170	11,7	-	55	102	12
30201180	11,8	-	55	102	12
30201190	11,9	-	55	102	12
30201191	11,91	15/32	55	102	12
30201200	12	-	55	102	12
30201230	12,3	31/64	60	107	14
30201250	12,5	-	60	107	14
30201270	12,7	1/2	60	107	14
30201300	13	-	60	107	14

EDP	DC	DC Inch	LCF	OAL	DCON
30201350	13,5	-	60	107	14
30201400	14	-	60	107	14
30201429	14,29	9/16	65	115	16
30201450	14,5	-	65	115	16
30201500	15	-	65	115	16
30201550	15,5	-	65	115	16
30201587	15,87	5/8	65	115	16
30201600	16	-	65	115	16
30201650	16,5	-	73	123	18
30201700	17	-	73	123	18
30201750	17,5	-	73	123	18
30201800	18	-	73	123	18
30201850	18,5	-	79	131	20
30201900	19	-	79	131	20
30201950	19,5	-	79	131	20
30202000	20	-	79	131	20

# HYP-HP-SC-3D NEW

Drilling | Solid carbide | 3xD



- Carbide step drill with EgiAs coating
- 3xD step length
- General purpose
- For tap drill holes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>	<b>140°</b>	<b>h8</b>	<b>B.604</b>
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EDP	For threading	DC1	DC2	DCON	SDL	LCF	OAL
EP0201138	M3x0,5	2,5	6	6	9	13	66
EP0201144	M4x0,7	3,3	6	6	12	16	66
EP0201149	M5x0,8	4,2	6	6	15	18	66
EP0201155	M6x1	5	8	8	18	23	79
EP0201161	M8x1,25	6,8	10	10	24	29	89
EP0201169	M10x1,5	8,5	12	12	30	35	89
EP0201179	M12x1,75	10,2	14	14	36	41	112

EDP	For threading	DC1	DC2	DCON	SDL	LCF	OAL

Drilling | Solid carbide

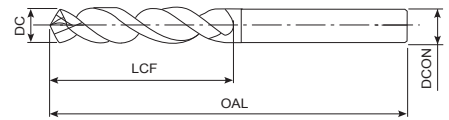
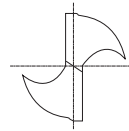


3xD

B

# HYP-HP-5D

Drilling | Solid carbide | 5xD



- Carbide drill with EgiAs coating
- Up to 5xD
- General purpose
- 154 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>	<b>140°</b>	<b>m7</b>
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Drilling | Solid carbide

5xD

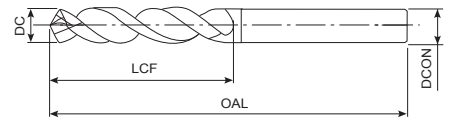
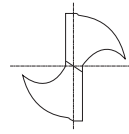
EDP	DC	DC Inch	LCF	OAL	DCON
31200100	1	-	9	38	3
31200110	1,1	-	9	38	3
31200120	1,2	-	11	38	3
31200130	1,3	-	11	38	3
31200140	1,4	-	12	38	3
31200150	1,5	-	12	45	3
31200160	1,6	-	14	45	3
31200170	1,7	-	14	45	3
31200180	1,8	-	16	45	3
31200190	1,9	-	16	45	3
31200200	2	-	18	52	3
31200210	2,1	-	18	52	3
31200220	2,2	-	20	52	3
31200230	2,3	-	20	52	3
31200240	2,4	-	22	52	3
31200250	2,5	-	22	56	3
31200260	2,6	-	22	56	3
31200270	2,7	-	23	56	3
31200280	2,8	-	23	56	3
31200290	2,9	-	23	56	3
31200300	3	-	28	66	6
31200310	3,1	-	28	66	6
31200317	3,17	1/8	28	66	6
31200320	3,2	-	28	66	6
31200330	3,3	-	28	66	6
31200340	3,4	-	28	66	6
31200350	3,5	-	28	66	6
31200357	3,57	9/64	28	66	6
31200360	3,6	-	28	66	6
31200370	3,7	-	28	66	6
31200380	3,8	-	36	74	6
31200390	3,9	-	36	74	6
31200397	3,97	5/32	36	74	6
31200400	4	-	36	74	6
31200410	4,1	-	36	74	6
31200420	4,2	-	36	74	6
31200430	4,3	-	36	74	6
31200437	4,37	11/64	36	74	6
31200440	4,4	-	36	74	6
31200450	4,5	-	36	74	6
31200460	4,6	-	36	74	6
31200470	4,7	-	36	74	6
31200476	4,76	3/16	44	82	6
31200480	4,8	-	44	82	6
31200490	4,9	-	44	82	6
31200500	5	-	44	82	6

EDP	DC	DC Inch	LCF	OAL	DCON
31200510	5,1	-	44	82	6
31200516	5,16	13/64	44	82	6
31200520	5,2	-	44	82	6
31200530	5,3	-	44	82	6
31200540	5,4	-	44	82	6
31200550	5,5	-	44	82	6
31200556	5,56	7/32	44	82	6
31200560	5,6	-	44	82	6
31200570	5,7	-	44	82	6
31200580	5,8	-	44	82	6
31200590	5,9	-	44	82	6
31200595	5,95	15/64	44	82	6
31200600	6	-	44	82	6
31200610	6,1	-	53	91	8
31200620	6,2	-	53	91	8
31200630	6,3	-	53	91	8
31200635	6,35	1/4	53	91	8
31200640	6,4	-	53	91	8
31200650	6,5	-	53	91	8
31200660	6,6	-	53	91	8
31200670	6,7	-	53	91	8
31200675	6,75	17/64	53	91	8
31200680	6,8	-	53	91	8
31200690	6,9	-	53	91	8
31200700	7	-	53	91	8
31200710	7,1	-	53	91	8
31200714	7,14	9/32	53	91	8
31200720	7,2	-	53	91	8
31200730	7,3	-	53	91	8
31200740	7,4	-	53	91	8
31200750	7,5	-	53	91	8
31200754	7,54	19/64	53	91	8
31200760	7,6	-	53	91	8
31200770	7,7	-	53	91	8
31200780	7,8	-	53	91	8
31200790	7,9	-	53	91	8
31200794	7,94	5/16	53	91	8
31200800	8	-	53	91	8
31200810	8,1	-	61	103	10
31200820	8,2	-	61	103	10
31200830	8,3	-	61	103	10
31200833	8,33	21/64	61	103	10
31200840	8,4	-	61	103	10
31200850	8,5	-	61	103	10
31200860	8,6	-	61	103	10
31200870	8,7	-	61	103	10

**B**

# HYP-HP-5D

Drilling | Solid carbide | 5xD



- Carbide drill with EgiAs coating
- Up to 5xD
- General purpose
- 154 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>	<b>140°</b>	<b>m7</b>
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	<b>B.604</b>
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EDP	DC	DC Inch	LCF	OAL	DCON
31200873	8,73	11/32	61	103	10
31200880	8,8	-	61	103	10
31200890	8,9	-	61	103	10
31200900	9	-	61	103	10
31200910	9,1	-	61	103	10
31200913	9,13	23/64	61	103	10
31200920	9,2	-	61	103	10
31200930	9,3	-	61	103	10
31200940	9,4	-	61	103	10
31200950	9,5	-	61	103	10
31200952	9,52	3/8	61	103	10
31200960	9,6	-	61	103	10
31200970	9,7	-	61	103	10
31200980	9,8	-	61	103	10
31200990	9,9	-	61	103	10
31200992	9,92	25/64	61	103	10
31201000	10	-	61	103	10
31201010	10,1	-	71	118	12
31201020	10,2	-	71	118	12
31201030	10,3	-	71	118	12
31201032	10,32	13/32	71	118	12
31201040	10,4	-	71	118	12
31201050	10,5	-	71	118	12
31201060	10,6	-	71	118	12
31201070	10,7	-	71	118	12
31201072	10,72	27/64	71	118	12
31201080	10,8	-	71	118	12
31201090	10,9	-	71	118	12
31201100	11	-	71	118	12
31201110	11,1	-	71	118	12
31201111	11,11	7/16	71	118	12
31201120	11,2	-	71	118	12
31201130	11,3	-	71	118	12
31201140	11,4	-	71	118	12
31201150	11,5	-	71	118	12
31201151	11,51	29/64	71	118	12
31201160	11,6	-	71	118	12
31201170	11,7	-	71	118	12
31201180	11,8	-	71	118	12
31201190	11,9	-	71	118	12
31201191	11,91	15/32	71	118	12
31201200	12	-	71	118	12
31201230	12,3	31/64	77	124	14
31201250	12,5	-	77	124	14
31201270	12,7	1/2	77	124	14
31201300	13	-	77	124	14

EDP	DC	DC Inch	LCF	OAL	DCON
31201350	13,5	-	77	124	14
31201400	14	-	77	124	14
31201429	14,29	9/16	83	133	16
31201450	14,5	-	83	133	16
31201500	15	-	83	133	16
31201550	15,5	-	83	133	16
31201587	15,87	5/8	83	133	16
31201600	16	-	83	133	16
31201650	16,5	-	93	143	18
31201700	17	-	93	143	18
31201750	17,5	-	93	143	18
31201800	18	-	93	143	18
31201850	18,5	-	101	153	20
31201900	19	-	101	153	20
31201950	19,5	-	101	153	20
31202000	20	-	101	153	20

Drilling | Solid carbide

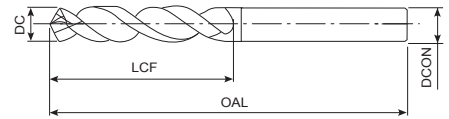
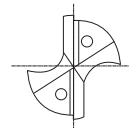


5xD

**B**

# HYP-HPO-3D

Drilling | Solid carbide | 3xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 3xD
- General purpose
- 136 sizes



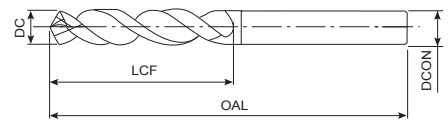
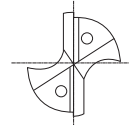
Drilling | Solid carbide

3xD

EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
30210300	3	-	20	62	6	30210650	6,5	-	34	79	8
30210310	3,1	-	20	62	6	30210660	6,6	-	34	79	8
30210317	3,17	1/8	20	62	6	30210670	6,7	-	34	79	8
30210320	3,2	-	20	62	6	30210675	6,75	17/64	34	79	8
30210330	3,3	-	20	62	6	30210680	6,8	-	34	79	8
30210340	3,4	-	20	62	6	30210690	6,9	-	34	79	8
30210350	3,5	-	20	62	6	30210700	7	-	34	79	8
30210357	3,57	9/64	20	62	6	30210710	7,1	-	41	79	8
30210360	3,6	-	20	62	6	30210714	7,14	9/32	41	79	8
30210370	3,7	-	20	62	6	30210720	7,2	-	41	79	8
30210380	3,8	-	24	66	6	30210730	7,3	-	41	79	8
30210390	3,9	-	24	66	6	30210740	7,4	-	41	79	8
30210397	3,97	5/32	24	66	6	30210750	7,5	-	41	79	8
30210400	4	-	24	66	6	30210754	7,54	19/64	41	79	8
30210410	4,1	-	24	66	6	30210760	7,6	-	41	79	8
30210420	4,2	-	24	66	6	30210770	7,7	-	41	79	8
30210430	4,3	-	24	66	6	30210780	7,8	-	41	79	8
30210437	4,37	11/64	24	66	6	30210790	7,9	-	41	79	8
30210440	4,4	-	24	66	6	30210794	7,94	5/16	41	79	8
30210450	4,5	-	24	66	6	30210800	8	-	41	79	8
30210460	4,6	-	24	66	6	30210810	8,1	-	47	89	10
30210465	4,65	-	24	66	6	30210820	8,2	-	47	89	10
30210470	4,7	-	24	66	6	30210830	8,3	-	47	89	10
30210476	4,76	3/16	24	66	6	30210833	8,33	21/64	47	89	10
30210480	4,8	-	28	66	6	30210840	8,4	-	47	89	10
30210490	4,9	-	28	66	6	30210850	8,5	-	47	89	10
30210500	5	-	28	66	6	30210860	8,6	-	47	89	10
30210510	5,1	-	28	66	6	30210870	8,7	-	47	89	10
30210516	5,16	13/64	28	66	6	30210873	8,73	11/32	47	89	10
30210520	5,2	-	28	66	6	30210880	8,8	-	47	89	10
30210530	5,3	-	28	66	6	30210890	8,9	-	47	89	10
30210540	5,4	-	28	66	6	30210900	9	-	47	89	10
30210550	5,5	-	28	66	6	30210910	9,1	-	47	89	10
30210555	5,55	-	28	66	6	30210913	9,13	23/64	47	89	10
30210556	5,56	7/32	28	66	6	30210920	9,2	-	47	89	10
30210560	5,6	-	28	66	6	30210930	9,3	-	47	89	10
30210570	5,7	-	28	66	6	30210940	9,4	-	47	89	10
30210580	5,8	-	28	66	6	30210950	9,5	-	47	89	10
30210590	5,9	-	28	66	6	30210952	9,52	3/8	47	89	10
30210595	5,95	15/64	28	66	6	30210960	9,6	-	47	89	10
30210600	6	-	28	66	6	30210970	9,7	-	47	89	10
30210610	6,1	-	34	79	8	30210980	9,8	-	47	89	10
30210620	6,2	-	34	79	8	30210990	9,9	-	47	89	10
30210630	6,3	-	34	79	8	30210992	9,92	25/64	47	89	10
30210635	6,35	1/4	34	79	8	30211000	10	-	47	89	10
30210640	6,4	-	34	79	8	30211010	10,1	-	55	102	12

# HYP-HPO-3D

Drilling | Solid carbide | 3xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 3xD
- General purpose
- 136 sizes

Material compatibility icons:

- P  $C < 0,2\%$
- P  $0,25 < C < 0,4$
- P  $C \geq 0,45\%$
- P SCM
- M INOX
- K GG
- K GGG
- H 25-35 HRC
- H 35-45 HRC

Product features icons:

- HYPRO
- CARBIDE
- EgiAs
- 30°
- SHRINK FIT
- 140°
- m7
- B.604

EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
30211020	10,2	-	55	102	12						
30211030	10,3	-	55	102	12						
30211032	10,32	13/32	55	102	12						
30211040	10,4	-	55	102	12						
30211050	10,5	-	55	102	12						
30211060	10,6	-	55	102	12						
30211070	10,7	-	55	102	12						
30211072	10,72	27/64	55	102	12						
30211080	10,8	-	55	102	12						
30211090	10,9	-	55	102	12						
30211100	11	-	55	102	12						
30211110	11,1	-	55	102	12						
30211111	11,11	7/16	55	102	12						
30211120	11,2	-	55	102	12						
30211130	11,3	-	55	102	12						
30211140	11,4	-	55	102	12						
30211150	11,5	-	55	102	12						
30211151	11,51	29/64	55	102	12						
30211160	11,6	-	55	102	12						
30211170	11,7	-	55	102	12						
30211180	11,8	-	55	102	12						
30211190	11,9	-	55	102	12						
30211191	11,91	15/32	55	102	12						
30211200	12	-	55	102	12						
30211230	12,3	31/64	60	107	14						
30211250	12,5	-	60	107	14						
30211270	12,7	1/2	60	107	14						
30211300	13	-	60	107	14						
30211350	13,5	-	60	107	14						
30211400	14	-	60	107	14						
30211429	14,29	9/16	65	115	16						
30211450	14,5	-	65	115	16						
30211500	15	-	65	115	16						
30211550	15,5	-	65	115	16						
30211587	15,87	5/8	65	115	16						
30211600	16	-	65	115	16						
30211650	16,5	-	73	123	18						
30211700	17	-	73	123	18						
30211750	17,5	-	73	123	18						
30211800	18	-	73	123	18						
30211850	18,5	-	79	131	20						
30211900	19	-	79	131	20						
30211950	19,5	-	79	131	20						
30212000	20	-	79	131	20						

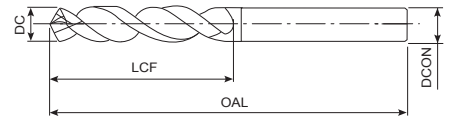
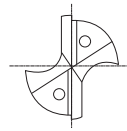
Drilling | Solid carbide

3xD

**B**

# HYP-HPO-3D-HE

Drilling | Solid carbide | 3xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 3xD
- With Whistle Notch shank for general purpose
- 134 sizes



Drilling | Solid carbide

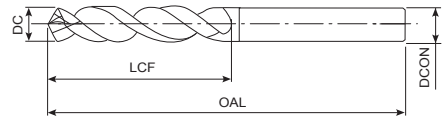
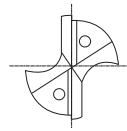
3xD

EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
30210300-HE	3	-	20	62	6	30210670-HE	6,7	-	34	79	8
30210310-HE	3,1	-	20	62	6	30210675-HE	6,75	17/64	34	79	8
30210317-HE	3,17	1/8	20	62	6	30210680-HE	6,8	-	34	79	8
30210320-HE	3,2	-	20	62	6	30210690-HE	6,9	-	34	79	8
30210330-HE	3,3	-	20	62	6	30210700-HE	7	-	34	79	8
30210340-HE	3,4	-	20	62	6	30210710-HE	7,1	-	41	79	8
30210350-HE	3,5	-	20	62	6	30210714-HE	7,14	9/32	41	79	8
30210357-HE	3,57	9/64	20	62	6	30210720-HE	7,2	-	41	79	8
30210360-HE	3,6	-	20	62	6	30210730-HE	7,3	-	41	79	8
30210370-HE	3,7	-	20	62	6	30210740-HE	7,4	-	41	79	8
30210380-HE	3,8	-	24	66	6	30210750-HE	7,5	-	41	79	8
30210390-HE	3,9	-	24	66	6	30210754-HE	7,54	19/64	41	79	8
30210397-HE	3,97	5/32	24	66	6	30210760-HE	7,6	-	41	79	8
30210400-HE	4	-	24	66	6	30210770-HE	7,7	-	41	79	8
30210410-HE	4,1	-	24	66	6	30210780-HE	7,8	-	41	79	8
30210420-HE	4,2	-	24	66	6	30210790-HE	7,9	-	41	79	8
30210430-HE	4,3	-	24	66	6	30210794-HE	7,94	5/16	41	79	8
30210437-HE	4,37	11/64	24	66	6	30210800-HE	8	-	41	79	8
30210440-HE	4,4	-	24	66	6	30210810-HE	8,1	-	47	89	10
30210450-HE	4,5	-	24	66	6	30210820-HE	8,2	-	47	89	10
30210460-HE	4,6	-	24	66	6	30210830-HE	8,3	-	47	89	10
30210470-HE	4,7	-	24	66	6	30210833-HE	8,33	21/64	47	89	10
30210476-HE	4,76	3/16	24	66	6	30210840-HE	8,4	-	47	89	10
30210480-HE	4,8	-	28	66	6	30210850-HE	8,5	-	47	89	10
30210490-HE	4,9	-	28	66	6	30210860-HE	8,6	-	47	89	10
30210500-HE	5	-	28	66	6	30210870-HE	8,7	-	47	89	10
30210510-HE	5,1	-	28	66	6	30210873-HE	8,73	11/32	47	89	10
30210516-HE	5,16	13/64	28	66	6	30210880-HE	8,8	-	47	89	10
30210520-HE	5,2	-	28	66	6	30210890-HE	8,9	-	47	89	10
30210530-HE	5,3	-	28	66	6	30210900-HE	9	-	47	89	10
30210540-HE	5,4	-	28	66	6	30210910-HE	9,1	-	47	89	10
30210550-HE	5,5	-	28	66	6	30210913-HE	9,13	23/64	47	89	10
30210556-HE	5,56	7/32	28	66	6	30210920-HE	9,2	-	47	89	10
30210560-HE	5,6	-	28	66	6	30210930-HE	9,3	-	47	89	10
30210570-HE	5,7	-	28	66	6	30210940-HE	9,4	-	47	89	10
30210580-HE	5,8	-	28	66	6	30210950-HE	9,5	-	47	89	10
30210590-HE	5,9	-	28	66	6	30210952-HE	9,52	3/8	47	89	10
30210595-HE	5,95	15/64	28	66	6	30210960-HE	9,6	-	47	89	10
30210600-HE	6	-	28	66	6	30210970-HE	9,7	-	47	89	10
30210610-HE	6,1	-	34	79	8	30210980-HE	9,8	-	47	89	10
30210620-HE	6,2	-	34	79	8	30210990-HE	9,9	-	47	89	10
30210630-HE	6,3	-	34	79	8	30210992-HE	9,92	25/64	47	89	10
30210635-HE	6,35	1/4	34	79	8	30211000-HE	10	-	47	89	10
30210640-HE	6,4	-	34	79	8	30211010-HE	10,1	-	47	89	12
30210650-HE	6,5	-	34	79	8	30211020-HE	10,2	-	55	102	12
30210660-HE	6,6	-	34	79	8	30211030-HE	10,3	-	55	102	12



# HYP-HPO-3D-HE

Drilling | Solid carbide | 3xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 3xD
- With Whistle Notch shank for general purpose
- 134 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	CARBIDE							
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EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
30211032-HE	10,32	13/32	55	102	12						
30211040-HE	10,4	-	55	102	12						
30211050-HE	10,5	-	55	102	12						
30211060-HE	10,6	-	55	102	12						
30211070-HE	10,7	-	55	102	12						
30211072-HE	10,72	27/64	55	102	12						
30211080-HE	10,8	-	55	102	12						
30211090-HE	10,9	-	55	102	12						
30211100-HE	11	-	55	102	12						
30211110-HE	11,1	-	55	102	12						
30211111-HE	11,11	7/16	55	102	12						
30211120-HE	11,2	-	55	102	12						
30211130-HE	11,3	-	55	102	12						
30211140-HE	11,4	-	55	102	12						
30211150-HE	11,5	-	55	102	12						
30211151-HE	11,51	29/64	55	102	12						
30211160-HE	11,6	-	55	102	12						
30211170-HE	11,7	-	55	102	12						
30211180-HE	11,8	-	55	102	12						
30211190-HE	11,9	-	55	102	12						
30211191-HE	11,91	15/32	55	102	12						
30211200-HE	12	-	55	102	12						
30211230-HE	12,3	31/64	60	107	14						
30211250-HE	12,5	-	60	107	14						
30211270-HE	12,7	1/2	60	107	14						
30211300-HE	13	-	60	107	14						
30211350-HE	13,5	-	60	107	14						
30211400-HE	14	-	60	107	14						
30211429-HE	14,29	9/16	65	115	16						
30211450-HE	14,5	-	65	115	16						
30211500-HE	15	-	65	115	16						
30211550-HE	15,5	-	65	115	16						
30211587-HE	15,87	5/8	65	115	16						
30211600-HE	16	-	65	115	16						
30211650-HE	16,5	-	73	123	18						
30211700-HE	17	-	73	123	18						
30211750-HE	17,5	-	73	123	18						
30211800-HE	18	-	73	123	18						
30211850-HE	18,5	-	79	131	20						
30211900-HE	19	-	79	131	20						
30211950-HE	19,5	-	79	131	20						
30212000-HE	20	-	79	131	20						

Drilling | Solid carbide

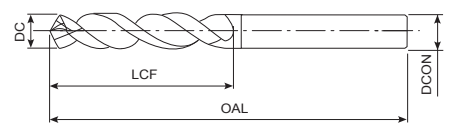
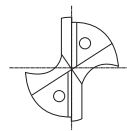


3xD

B

# HYP-HPO-3D-HB NEW

Drilling | Solid carbide | 3xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 3xD
- With Weldon shank for general purpose
- 136 sizes



Drilling | Solid carbide

3xD

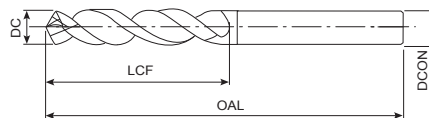
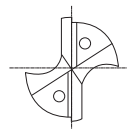
EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
30210300-HB	3	-	20	62	6	30210650-HB	6,5	-	34	79	8
30210310-HB	3,1	-	20	62	6	30210660-HB	6,6	-	34	79	8
30210317-HB	3,17	1/8	20	62	6	30210670-HB	6,7	-	34	79	8
30210320-HB	3,2	-	20	62	6	30210675-HB	6,75	17/64	34	79	8
30210330-HB	3,3	-	20	62	6	30210680-HB	6,8	-	34	79	8
30210340-HB	3,4	-	20	62	6	30210690-HB	6,9	-	34	79	8
30210350-HB	3,5	-	20	62	6	30210700-HB	7	-	34	79	8
30210357-HB	3,57	9/64	20	62	6	30210710-HB	7,1	-	41	79	8
30210360-HB	3,6	-	20	62	6	30210714-HB	7,14	9/32	41	79	8
30210370-HB	3,7	-	20	62	6	30210720-HB	7,2	-	41	79	8
30210380-HB	3,8	-	24	66	6	30210730-HB	7,3	-	41	79	8
30210390-HB	3,9	-	24	66	6	30210740-HB	7,4	-	41	79	8
30210397-HB	3,97	5/32	24	66	6	30210750-HB	7,5	-	41	79	8
30210400-HB	4	-	24	66	6	30210754-HB	7,54	19/64	41	79	8
30210410-HB	4,1	-	24	66	6	30210760-HB	7,6	-	41	79	8
30210420-HB	4,2	-	24	66	6	30210770-HB	7,7	-	41	79	8
30210430-HB	4,3	-	24	66	6	30210780-HB	7,8	-	41	79	8
30210437-HB	4,37	11/64	24	66	6	30210790-HB	7,9	-	41	79	8
30210440-HB	4,4	-	24	66	6	30210794-HB	7,94	5/16	41	79	8
30210450-HB	4,5	-	24	66	6	30210800-HB	8	-	41	79	8
30210460-HB	4,6	-	24	66	6	30210810-HB	8,1	-	47	89	10
30210465-HB	4,65	-	24	66	6	30210820-HB	8,2	-	47	89	10
30210470-HB	4,7	-	24	66	6	30210830-HB	8,3	-	47	89	10
30210476-HB	4,76	3/16	24	66	6	30210833-HB	8,33	21/64	47	89	10
30210480-HB	4,8	-	28	66	6	30210840-HB	8,4	-	47	89	10
30210490-HB	4,9	-	28	66	6	30210850-HB	8,5	-	47	89	10
30210500-HB	5	-	28	66	6	30210860-HB	8,6	-	47	89	10
30210510-HB	5,1	-	28	66	6	30210870-HB	8,7	-	47	89	10
30210516-HB	5,16	13/64	28	66	6	30210873-HB	8,73	11/32	47	89	10
30210520-HB	5,2	-	28	66	6	30210880-HB	8,8	-	47	89	10
30210530-HB	5,3	-	28	66	6	30210890-HB	8,9	-	47	89	10
30210540-HB	5,4	-	28	66	6	30210900-HB	9	-	47	89	10
30210550-HB	5,5	-	28	66	6	30210910-HB	9,1	-	47	89	10
30210555-HB	5,55	-	28	66	6	30210913-HB	9,13	23/64	47	89	10
30210556-HB	5,56	7/32	28	66	6	30210920-HB	9,2	-	47	89	10
30210560-HB	5,6	-	28	66	6	30210930-HB	9,3	-	47	89	10
30210570-HB	5,7	-	28	66	6	30210940-HB	9,4	-	47	89	10
30210580-HB	5,8	-	28	66	6	30210950-HB	9,5	-	47	89	10
30210590-HB	5,9	-	28	66	6	30210952-HB	9,52	3/8	47	89	10
30210595-HB	5,95	15/64	28	66	6	30210960-HB	9,6	-	47	89	10
30210600-HB	6	-	28	66	6	30210970-HB	9,7	-	47	89	10
30210610-HB	6,1	-	34	79	8	30210980-HB	9,8	-	47	89	10
30210620-HB	6,2	-	34	79	8	30210990-HB	9,9	-	47	89	10
30210630-HB	6,3	-	34	79	8	30210992-HB	9,92	25/64	47	89	10
30210635-HB	6,35	1/4	34	79	8	30211000-HB	10	-	47	89	10
30210640-HB	6,4	-	34	79	8	30211010-HB	10,1	-	55	102	12





# HYP-HPO-5D NEW SIZES

Drilling | Solid carbide | 5xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 5xD
- General purpose
- 156 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>140°</b>	<b>m7</b>	 <b>B.604</b>
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EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
30220100	1	-	8	55	3	30220500	5	-	44	82	6
30220110	1,1	-	12	55	3	30220510	5,1	-	44	82	6
30220120	1,2	-	12	55	3	30220516	5,16	13/64	44	82	6
30220130	1,3	-	12	55	3	30220520	5,2	-	44	82	6
30220140	1,4	-	12	55	3	30220530	5,3	-	44	82	6
30220150	1,5	-	16	55	3	30220540	5,4	-	44	82	6
30220160	1,6	-	16	55	3	30220550	5,5	-	44	82	6
30220170	1,7	-	16	55	3	30220555	5,55	-	44	82	6
30220180	1,8	-	16	55	3	30220556	5,56	7/32	44	82	6
30220190	1,9	-	16	55	3	30220560	5,6	-	44	82	6
30220200	2	-	21	57	4	30220570	5,7	-	44	82	6
30220210	2,1	-	21	57	4	30220580	5,8	-	44	82	6
30220220	2,2	-	21	57	4	30220590	5,9	-	44	82	6
30220230	2,3	-	21	57	4	30220595	5,95	15/54	44	82	6
30220240	2,4	-	21	57	4	30220600	6	-	44	82	6
30220250	2,5	-	21	57	4	30220610	6,1	-	53	91	8
30220260	2,6	-	21	57	4	30220620	6,2	-	53	91	8
30220270	2,7	-	21	57	4	30220630	6,3	-	53	91	8
30220280	2,8	-	21	57	4	30220635	6,35	1/4	53	91	8
30220290	2,9	-	21	57	4	30220640	6,4	-	53	91	8
30220300	3	-	28	66	6	30220650	6,5	-	53	91	8
30220310	3,1	-	28	66	6	30220660	6,6	-	53	91	8
30220317	3,17	1/8	28	66	6	30220670	6,7	-	53	91	8
30220320	3,2	-	28	66	6	30220675	6,75	17/64	53	91	8
30220330	3,3	-	28	66	6	30220680	6,8	-	53	91	8
30220340	3,4	-	28	66	6	30220690	6,9	-	53	91	8
30220350	3,5	-	28	66	6	30220700	7	-	53	91	8
30220357	3,57	9/64	28	66	6	30220710	7,1	-	53	91	8
30220360	3,6	-	28	66	6	30220714	7,14	9/32	53	91	8
30220370	3,7	-	28	66	6	30220720	7,2	-	53	91	8
30220380	3,8	-	36	74	6	30220730	7,3	-	53	91	8
30220390	3,9	-	36	74	6	30220740	7,4	-	53	91	8
30220397	3,97	5/32	36	74	6	30220750	7,5	-	53	91	8
30220400	4	-	36	74	6	30220754	7,54	19/64	53	91	8
30220410	4,1	-	36	74	6	30220760	7,6	-	53	91	8
30220420	4,2	-	36	74	6	30220770	7,7	-	53	91	8
30220430	4,3	-	36	74	6	30220780	7,8	-	53	91	8
30220437	4,37	11/64	36	74	6	30220790	7,9	-	53	91	8
30220440	4,4	-	36	74	6	30220794	7,94	5/16	53	91	8
30220450	4,5	-	36	74	6	30220800	8	-	53	91	8
30220460	4,6	-	36	74	6	30220810	8,1	-	61	103	10
30220465	4,65	-	36	74	6	30220820	8,2	-	61	103	10
30220470	4,7	-	36	74	6	30220830	8,3	-	61	103	10
30220476	4,76	3/16	44	82	6	30220833	8,33	21/64	61	103	10
30220480	4,8	-	44	82	6	30220840	8,4	-	61	103	10
30220490	4,9	-	44	82	6	30220850	8,5	-	61	103	10

Drilling | Solid carbide

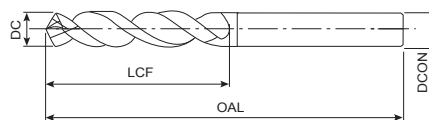
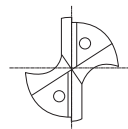


5xD

**B**

# HYP-HPO-5D NEW SIZES

Drilling | Solid carbide | 5xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 5xD
- General purpose
- 156 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>140°</b>	<b>m7</b>	 <b>B.604</b>
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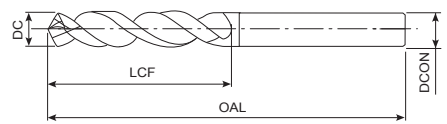
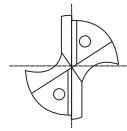
EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
30220860	8,6	-	61	103	10	30221270	12,7	1/2	77	124	14
30220870	8,7	-	61	103	10	30221300	13	-	77	124	14
30220873	8,73	11/32	61	103	10	30221350	13,5	-	77	124	14
30220880	8,8	-	61	103	10	30221400	14	-	77	124	14
30220890	8,9	-	61	103	10	30221429	14,29	9/16	83	133	16
30220900	9	-	61	103	10	30221450	14,5	-	83	133	16
30220910	9,1	-	61	103	10	30221500	15	-	83	133	16
30220913	9,13	23/64	61	103	10	30221550	15,5	-	83	133	16
30220920	9,2	-	61	103	10	30221587	15,87	5/8	83	133	16
30220930	9,3	-	61	103	10	30221600	16	-	83	133	16
30220940	9,4	-	61	103	10	30221650	16,5	-	93	143	18
30220950	9,5	-	61	103	10	30221700	17	-	93	143	18
30220952	9,52	3/8	61	103	10	30221750	17,5	-	93	143	18
30220960	9,6	-	61	103	10	30221800	18	-	93	143	18
30220970	9,7	-	61	103	10	30221850	18,5	-	101	153	20
30220980	9,8	-	61	103	10	30221900	19	-	101	153	20
30220990	9,9	-	61	103	10	30221950	19,5	-	101	153	20
30220992	9,92	25/64	61	103	10	30222000	20	-	101	153	20
30221000	10	-	61	103	10						
30221010	10,1	-	71	118	12						
30221020	10,2	-	71	118	12						
30221030	10,3	-	71	118	12						
30221032	10,32	13/32	71	118	12						
30221040	10,4	-	71	118	12						
30221050	10,5	-	71	118	12						
30221060	10,6	-	71	118	12						
30221070	10,7	-	71	118	12						
30221072	10,72	27/64	71	118	12						
30221080	10,8	-	71	118	12						
30221090	10,9	-	71	118	12						
30221100	11	-	71	118	12						
30221110	11,1	-	71	118	12						
30221111	11,11	7/16	71	118	12						
30221120	11,2	-	71	118	12						
30221130	11,3	-	71	118	12						
30221140	11,4	-	71	118	12						
30221150	11,5	-	71	118	12						
30221151	11,51	29/64	71	118	12						
30221160	11,6	-	71	118	12						
30221170	11,7	-	71	118	12						
30221180	11,8	-	71	118	12						
30221190	11,9	-	71	118	12						
30221191	11,91	15/32	71	118	12						
30221200	12	-	71	118	12						
30221230	12,3	31/64	77	124	14						
30221250	12,5	-	77	124	14						

Drilling | Solid carbide

5xD

# HYP-HPO-5D-HE

Drilling | Solid carbide | 5xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 5xD
- With Whistle Notch shank for general purpose
- 134 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>			<b>140°</b>		 <b>B.604</b>
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EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
30220300-HE	3	-	28	66	6	30220670-HE	6,7	-	53	91	8
30220310-HE	3,1	-	28	66	6	30220675-HE	6,75	17/64	53	91	8
30220317-HE	3,17	1/8	28	66	6	30220680-HE	6,8	-	53	91	8
30220320-HE	3,2	-	28	66	6	30220690-HE	6,9	-	53	91	8
30220330-HE	3,3	-	28	66	6	30220700-HE	7	-	53	91	8
30220340-HE	3,4	-	28	66	6	30220710-HE	7,1	-	53	91	8
30220350-HE	3,5	-	28	66	6	30220714-HE	7,14	9/32	53	91	8
30220357-HE	3,57	9/64	28	66	6	30220720-HE	7,2	-	53	91	8
30220360-HE	3,6	-	28	66	6	30220730-HE	7,3	-	53	91	8
30220370-HE	3,7	-	28	66	6	30220740-HE	7,4	-	53	91	8
30220380-HE	3,8	-	36	74	6	30220750-HE	7,5	-	53	91	8
30220390-HE	3,9	-	36	74	6	30220754-HE	7,54	19/64	53	91	8
30220397-HE	3,97	5/32	36	74	6	30220760-HE	7,6	-	53	91	8
30220400-HE	4	-	36	74	6	30220770-HE	7,7	-	53	91	8
30220410-HE	4,1	-	36	74	6	30220780-HE	7,8	-	53	91	8
30220420-HE	4,2	-	36	74	6	30220790-HE	7,9	-	53	91	8
30220430-HE	4,3	-	36	74	6	30220794-HE	7,94	5/16	53	91	8
30220437-HE	4,37	11/64	36	74	6	30220800-HE	8	-	53	91	8
30220440-HE	4,4	-	36	74	6	30220810-HE	8,1	-	61	103	10
30220450-HE	4,5	-	36	74	6	30220820-HE	8,2	-	61	103	10
30220460-HE	4,6	-	36	74	6	30220830-HE	8,3	-	61	103	10
30220470-HE	4,7	-	36	74	6	30220833-HE	8,33	21/64	61	103	10
30220476-HE	4,76	3/16	44	82	6	30220840-HE	8,4	-	61	103	10
30220480-HE	4,8	-	44	82	6	30220850-HE	8,5	-	61	103	10
30220490-HE	4,9	-	44	82	6	30220860-HE	8,6	-	61	103	10
30220500-HE	5	-	44	82	6	30220870-HE	8,7	-	61	103	10
30220510-HE	5,1	-	44	82	6	30220873-HE	8,73	11/32	61	103	10
30220516-HE	5,16	13/64	44	82	6	30220880-HE	8,8	-	61	103	10
30220520-HE	5,2	-	44	82	6	30220890-HE	8,9	-	61	103	10
30220530-HE	5,3	-	44	82	6	30220900-HE	9	-	61	103	10
30220540-HE	5,4	-	44	82	6	30220910-HE	9,1	-	61	103	10
30220550-HE	5,5	-	44	82	6	30220913-HE	9,13	23/64	61	103	10
30220556-HE	5,56	7/32	44	82	6	30220920-HE	9,2	-	61	103	10
30220560-HE	5,6	-	44	82	6	30220930-HE	9,3	-	61	103	10
30220570-HE	5,7	-	44	82	6	30220940-HE	9,4	-	61	103	10
30220580-HE	5,8	-	44	82	6	30220950-HE	9,5	-	61	103	10
30220590-HE	5,9	-	44	82	6	30220952-HE	9,52	3/8	61	103	10
30220595-HE	5,95	15/64	44	82	6	30220960-HE	9,6	-	61	103	10
30220600-HE	6	-	44	82	6	30220970-HE	9,7	-	61	103	10
30220610-HE	6,1	-	53	91	8	30220980-HE	9,8	-	61	103	10
30220620-HE	6,2	-	53	91	8	30220990-HE	9,9	-	61	103	10
30220630-HE	6,3	-	53	91	8	30220992-HE	9,92	25/64	61	103	10
30220635-HE	6,35	1/4	53	91	8	30221000-HE	10	-	61	103	10
30220640-HE	6,4	-	53	91	8	30221010-HE	10,1	-	71	118	12
30220650-HE	6,5	-	53	91	8	30221020-HE	10,2	-	71	118	12
30220660-HE	6,6	-	53	91	8	30221030-HE	10,3	-	71	118	12

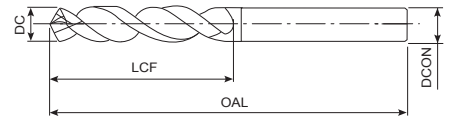
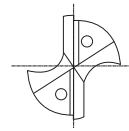
Drilling | Solid carbide

5xD



# HYP-HPO-5D-HE

Drilling | Solid carbide | 5xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 5xD
- With Whistle Notch shank for general purpose
- 134 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>			<b>140°</b>	<b>m7</b>	 B.604
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Drilling | Solid carbide

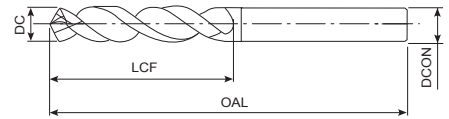
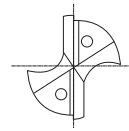
5xD

EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
30221032-HE	10,32	13/32	71	118	12						
30221040-HE	10,4	-	71	118	12						
30221050-HE	10,5	-	71	118	12						
30221060-HE	10,6	-	71	118	12						
30221070-HE	10,7	-	71	118	12						
30221072-HE	10,72	27/64	71	118	12						
30221080-HE	10,8	-	71	118	12						
30221090-HE	10,9	-	71	118	12						
30221100-HE	11	-	71	118	12						
30221110-HE	11,1	-	71	118	12						
30221111-HE	11,11	7/16	71	118	12						
30221120-HE	11,2	-	71	118	12						
30221130-HE	11,3	-	71	118	12						
30221140-HE	11,4	-	71	118	12						
30221150-HE	11,5	-	71	118	12						
30221151-HE	11,51	29/64	71	118	12						
30221160-HE	11,6	-	71	118	12						
30221170-HE	11,7	-	71	118	12						
30221180-HE	11,8	-	71	118	12						
30221190-HE	11,9	-	71	118	12						
30221191-HE	11,91	15/32	71	118	12						
30221200-HE	12	-	71	118	12						
30221230-HE	12,3	31/64	77	124	14						
30221250-HE	12,5	-	77	124	14						
30221270-HE	12,7	1/2	77	124	14						
30221300-HE	13	-	77	124	14						
30221350-HE	13,5	-	77	124	14						
30221400-HE	14	-	77	124	14						
30221429-HE	14,29	9/16	83	133	16						
30221450-HE	14,5	-	83	133	16						
30221500-HE	15	-	83	133	16						
30221550-HE	15,5	-	83	133	16						
30221587-HE	15,87	5/8	83	133	16						
30221600-HE	16	-	83	133	16						
30221650-HE	16,5	-	93	143	18						
30221700-HE	17	-	93	143	18						
30221750-HE	17,5	-	93	143	18						
30221800-HE	18	-	93	143	18						
30221850-HE	18,5	-	101	153	20						
30221900-HE	19	-	101	153	20						
30221950-HE	19,5	-	101	153	20						
30222000-HE	20	-	101	153	20						



# HYP-HPO-5D-HB NEW

Drilling | Solid carbide | 5xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 5xD
- With Weldon shank for general purpose
- 136 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>		<b>140°</b>	<b>m7</b>	 <b>B.604</b>
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EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
30220300-HB	3	-	28	66	6	30220650-HB	6,5	-	53	91	8
30220310-HB	3,1	-	28	66	6	30220660-HB	6,6	-	53	91	8
30220317-HB	3,17	1/8	28	66	6	30220670-HB	6,7	-	53	91	8
30220320-HB	3,2	-	28	66	6	30220675-HB	6,75	17/64	53	91	8
30220330-HB	3,3	-	28	66	6	30220680-HB	6,8	-	53	91	8
30220340-HB	3,4	-	28	66	6	30220690-HB	6,9	-	53	91	8
30220350-HB	3,5	-	28	66	6	30220700-HB	7	-	53	91	8
30220357-HB	3,57	9/64	28	66	6	30220710-HB	7,1	-	53	91	8
30220360-HB	3,6	-	28	66	6	30220714-HB	7,14	9/32	53	91	8
30220370-HB	3,7	-	28	66	6	30220720-HB	7,2	-	53	91	8
30220380-HB	3,8	-	36	74	6	30220730-HB	7,3	-	53	91	8
30220390-HB	3,9	-	36	74	6	30220740-HB	7,4	-	53	91	8
30220397-HB	3,97	5/32	36	74	6	30220750-HB	7,5	-	53	91	8
30220400-HB	4	-	36	74	6	30220754-HB	7,54	19/64	53	91	8
30220410-HB	4,1	-	36	74	6	30220760-HB	7,6	-	53	91	8
30220420-HB	4,2	-	36	74	6	30220770-HB	7,7	-	53	91	8
30220430-HB	4,3	-	36	74	6	30220780-HB	7,8	-	53	91	8
30220437-HB	4,37	11/64	36	74	6	30220790-HB	7,9	-	53	91	8
30220440-HB	4,4	-	36	74	6	30220794-HB	7,94	5/16	53	91	8
30220450-HB	4,5	-	36	74	6	30220800-HB	8	-	53	91	8
30220460-HB	4,6	-	36	74	6	30220810-HB	8,1	-	61	103	10
30220465-HB	4,65	-	36	74	6	30220820-HB	8,2	-	61	103	10
30220470-HB	4,7	-	36	74	6	30220830-HB	8,3	-	61	103	10
30220476-HB	4,76	3/16	44	82	6	30220833-HB	8,33	21/64	61	103	10
30220480-HB	4,8	-	44	82	6	30220840-HB	8,4	-	61	103	10
30220490-HB	4,9	-	44	82	6	30220850-HB	8,5	-	61	103	10
30220500-HB	5	-	44	82	6	30220860-HB	8,6	-	61	103	10
30220510-HB	5,1	-	44	82	6	30220870-HB	8,7	-	61	103	10
30220516-HB	5,16	13/64	44	82	6	30220873-HB	8,73	11/32	61	103	10
30220520-HB	5,2	-	44	82	6	30220880-HB	8,8	-	61	103	10
30220530-HB	5,3	-	44	82	6	30220890-HB	8,9	-	61	103	10
30220540-HB	5,4	-	44	82	6	30220900-HB	9	-	61	103	10
30220550-HB	5,5	-	44	82	6	30220910-HB	9,1	-	61	103	10
30220555-HB	5,55	-	44	82	6	30220913-HB	9,13	23/64	61	103	10
30220556-HB	5,56	7/32	44	82	6	30220920-HB	9,2	-	61	103	10
30220560-HB	5,6	-	44	82	6	30220930-HB	9,3	-	61	103	10
30220570-HB	5,7	-	44	82	6	30220940-HB	9,4	-	61	103	10
30220580-HB	5,8	-	44	82	6	30220950-HB	9,5	-	61	103	10
30220590-HB	5,9	-	44	82	6	30220952-HB	9,52	3/8	61	103	10
30220595-HB	5,95	15/54	44	82	6	30220960-HB	9,6	-	61	103	10
30220600-HB	6	-	44	82	6	30220970-HB	9,7	-	61	103	10
30220610-HB	6,1	-	53	91	8	30220980-HB	9,8	-	61	103	10
30220620-HB	6,2	-	53	91	8	30220990-HB	9,9	-	61	103	10
30220630-HB	6,3	-	53	91	8	30220992-HB	9,92	25/64	61	103	10
30220635-HB	6,35	1/4	53	91	8	30221000-HB	10	-	61	103	10
30220640-HB	6,4	-	53	91	8	30221010-HB	10,1	-	71	118	12

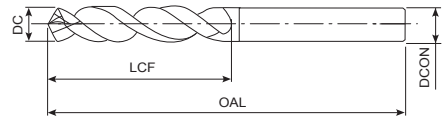
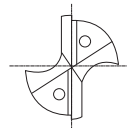
Drilling | Solid carbide

5xD



# HYP-HPO-5D-HB NEW

Drilling | Solid carbide | 5xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 5xD
- With Weldon shank for general purpose
- 136 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>		<b>140°</b>	<b>m7</b>	 B.604
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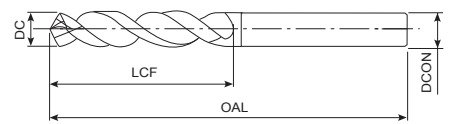
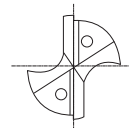
Drilling | Solid carbide

5xD

EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
30221020-HB	10,2	-	71	118	12						
30221030-HB	10,3	-	71	118	12						
30221032-HB	10,32	13/32	71	118	12						
30221040-HB	10,4	-	71	118	12						
30221050-HB	10,5	-	71	118	12						
30221060-HB	10,6	-	71	118	12						
30221070-HB	10,7	-	71	118	12						
30221072-HB	10,72	27/64	71	118	12						
30221080-HB	10,8	-	71	118	12						
30221090-HB	10,9	-	71	118	12						
30221100-HB	11	-	71	118	12						
30221110-HB	11,1	-	71	118	12						
30221111-HB	11,11	7/16	71	118	12						
30221120-HB	11,2	-	71	118	12						
30221130-HB	11,3	-	71	118	12						
30221140-HB	11,4	-	71	118	12						
30221150-HB	11,5	-	71	118	12						
30221151-HB	11,51	29/64	71	118	12						
30221160-HB	11,6	-	71	118	12						
30221170-HB	11,7	-	71	118	12						
30221180-HB	11,8	-	71	118	12						
30221190-HB	11,9	-	71	118	12						
30221191-HB	11,91	15/32	71	118	12						
30221200-HB	12	-	71	118	12						
30221230-HB	12,3	31/64	77	124	14						
30221250-HB	12,5	-	77	124	14						
30221270-HB	12,7	1/2	77	124	14						
30221300-HB	13	-	77	124	14						
30221350-HB	13,5	-	77	124	14						
30221400-HB	14	-	77	124	14						
30221429-HB	14,29	9/16	83	133	16						
30221450-HB	14,5	-	83	133	16						
30221500-HB	15	-	83	133	16						
30221550-HB	15,5	-	83	133	16						
30221587-HB	15,87	5/8	83	133	16						
30221600-HB	16	-	83	133	16						
30221650-HB	16,5	-	93	143	18						
30221700-HB	17	-	93	143	18						
30221750-HB	17,5	-	93	143	18						
30221800-HB	18	-	93	143	18						
30221850-HB	18,5	-	101	153	20						
30221900-HB	19	-	101	153	20						
30221950-HB	19,5	-	101	153	20						
30222000-HB	20	-	101	153	20						

# HYP-HPO-8D

Drilling | Solid carbide | 8xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 8xD
- General purpose
- 134 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>140°</b>	<b>m7</b>	 <b>B.604</b>
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EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
32210300	3	-	34	72	4	32210670	6,7	-	66	106	8
32210310	3,1	-	43	81	4	32210675	6,75	17/64	66	106	8
32210317	3,17	1/8	43	81	4	32210680	6,8	-	66	106	8
32210320	3,2	-	43	81	4	32210690	6,9	-	76	116	8
32210330	3,3	-	43	81	4	32210700	7	-	76	116	8
32210340	3,4	-	43	81	4	32210710	7,1	-	76	116	8
32210350	3,5	-	43	81	4	32210714	7,14	9/32	76	116	8
32210357	3,57	9/64	43	81	4	32210720	7,2	-	76	116	8
32210360	3,6	-	43	81	4	32210730	7,3	-	76	116	8
32210370	3,7	-	43	81	4	32210740	7,4	-	76	116	8
32210380	3,8	-	43	81	4	32210750	7,5	-	76	116	8
32210390	3,9	-	43	81	4	32210754	7,54	19/64	76	116	8
32210397	3,97	5/32	43	81	4	32210760	7,6	-	76	116	8
32210400	4	-	43	81	4	32210770	7,7	-	76	116	8
32210410	4,1	-	50	90	6	32210780	7,8	-	76	116	8
32210420	4,2	-	50	90	6	32210790	7,9	-	76	116	8
32210430	4,3	-	50	90	6	32210794	7,94	5/16	76	116	8
32210437	4,37	11/64	50	90	6	32210800	8	-	76	116	8
32210440	4,4	-	50	90	6	32210810	8,1	-	87	131	10
32210450	4,5	-	50	90	6	32210820	8,2	-	87	131	10
32210460	4,6	-	50	90	6	32210830	8,3	-	87	131	10
32210470	4,7	-	50	90	6	32210833	8,33	21/64	87	131	10
32210476	4,76	3/16	50	90	6	32210840	8,4	-	87	131	10
32210480	4,8	-	50	90	6	32210850	8,5	-	87	131	10
32210490	4,9	-	50	90	6	32210860	8,6	-	87	131	10
32210500	5	-	50	90	6	32210870	8,7	-	87	131	10
32210510	5,1	-	57	97	6	32210873	8,73	11/32	87	131	10
32210516	5,16	13/64	57	97	6	32210880	8,8	-	87	131	10
32210520	5,2	-	57	97	6	32210890	8,9	-	87	131	10
32210530	5,3	-	57	97	6	32210900	9	-	87	131	10
32210540	5,4	-	57	97	6	32210910	9,1	-	95	139	10
32210550	5,5	-	57	97	6	32210913	9,13	23/64	95	139	10
32210556	5,56	7/32	57	97	6	32210920	9,2	-	95	139	10
32210560	5,6	-	57	97	6	32210930	9,3	-	95	139	10
32210570	5,7	-	57	97	6	32210940	9,4	-	95	139	10
32210580	5,8	-	57	97	6	32210950	9,5	-	95	139	10
32210590	5,9	-	57	97	6	32210952	9,52	3/8	95	139	10
32210595	5,95	15/64	57	97	6	32210960	9,6	-	95	139	10
32210600	6	-	57	97	6	32210970	9,7	-	95	139	10
32210610	6,1	-	66	106	8	32210980	9,8	-	95	139	10
32210620	6,2	-	66	106	8	32210990	9,9	-	95	139	10
32210630	6,3	-	66	106	8	32210992	9,92	25/64	95	139	10
32210635	6,35	1/4	66	106	8	32211000	10	-	95	139	10
32210640	6,4	-	66	106	8	32211010	10,1	-	106	155	12
32210650	6,5	-	66	106	8	32211020	10,2	-	106	155	12
32210660	6,6	-	66	106	8	32211030	10,3	-	106	155	12

Drilling | Solid carbide

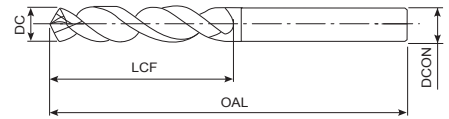
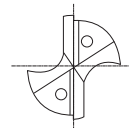


8xD

**B**

# HYP-HPO-8D

Drilling | Solid carbide | 8xD



- Carbide drill with internal coolant, EgiAs coating
- Up to 8xD
- General purpose
- 134 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>M</b> ○ INOX	<b>K</b> ● GG	<b>K</b> ● GGG	<b>H</b> ● 25-35 HRC	<b>H</b> ○ 35-45 HRC
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	<b>CARBIDE</b>	<b>EgiAs</b>	<b>30°</b>	<b>SHRINK FIT</b>		<b>140°</b>	<b>m7</b>	 B.604
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Drilling | Solid carbide

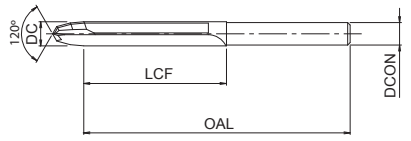
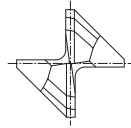


8xD

EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
32211032	10,32	13/32	106	155	12						
32211040	10,4	-	106	155	12						
32211050	10,5	-	106	155	12						
32211060	10,6	-	106	155	12						
32211070	10,7	-	106	155	12						
32211072	10,72	27/64	106	155	12						
32211080	10,8	-	106	155	12						
32211090	10,9	-	106	155	12						
32211100	11	-	106	155	12						
32211110	11,1	-	114	163	12						
32211111	11,11	7/16	114	163	12						
32211120	11,2	-	114	163	12						
32211130	11,3	-	114	163	12						
32211140	11,4	-	114	163	12						
32211150	11,5	-	114	163	12						
32211151	11,51	29/64	114	163	12						
32211160	11,6	-	114	163	12						
32211170	11,7	-	114	163	12						
32211180	11,8	-	114	163	12						
32211190	11,9	-	114	163	12						
32211191	11,91	15/32	114	163	12						
32211200	12	-	114	163	12						
32211230	12,3	31/64	133	182	14						
32211250	12,5	-	133	182	14						
32211270	12,7	1/2	133	182	14						
32211300	13	-	133	182	14						
32211350	13,5	-	133	182	14						
32211400	14	-	133	182	14						
32211429	14,29	9/16	152	204	16						
32211450	14,5	-	152	204	16						
32211500	15	-	152	204	16						
32211550	15,5	-	152	204	16						
32211587	15,87	5/8	152	204	16						
32211600	16	-	152	204	16						
32211650	16,5	-	171	223	18						
32211700	17	-	171	223	18						
32211750	17,5	-	171	223	18						
32211800	18	-	171	223	18						
32211850	18,5	-	190	244	20						
32211900	19	-	190	244	20						
32211950	19,5	-	190	244	20						
32212000	20	-	190	244	20						

# D-STAD

Drilling | Solid carbide | 3xD



- Triple angle carbide drill with diamond coating
- Up to 3xD
- For CFRP
- 4 sizes



CARBIDE **DIA** **SHRINK FIT** 0~-0.02



EDP	DC	LCF	OAL	DCON
48154001	4	30	80	4
48154002	6	40	90	6
48154004	6,35	38	88	6,35
48154003	8	50	100	8

EDP	DC	LCF	OAL	DCON

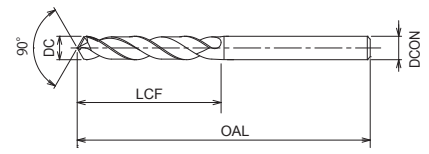
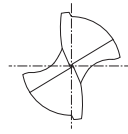
Drilling | Solid carbide 3xD





# D-GDN90

Drilling | Solid carbide



- Diamond coated 90° point angle drill.
- For CFRP
- 6 sizes



CARBIDE

DIA

SHRINK  
FIT

0~-0.02

40°

B.612

EDP	DC	LCF	OAL	DCON
8809151	2,5	15	50	2,5
8809152	3,27	20	76	3,27
8809153	4,1	25	80	4,1
8809154	4,8	29	80	4,8
8809155	6,3	38	94	6,3
8809156	9,5	57	115	9,5

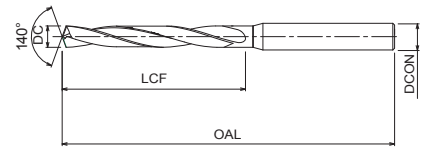
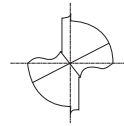
EDP	DC	LCF	OAL	DCON

Drilling | Solid carbide



# WH55-5D

Drilling | Solid carbide | 5xD



- Carbide drill with DUOREY coating
- Up to 5xD
- For hardened material up to 55HRC
- 36 sizes



Drilling | Solid carbide

5xD

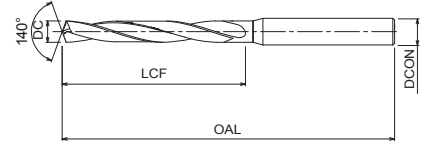
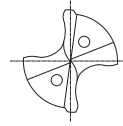
EDP	DC	LCF	OAL	DCON
3312200	2	18	68	4
3312250	2,5	23	73	4
3312280	2,8	27	73	4
3312300	3	29	78	6
3312330	3,3	32	78	6
3312350	3,5	32	78	6
3312380	3,8	36	78	6
3312400	4	36	78	6
3312420	4,2	38	88	6
3312450	4,5	41	88	6
3312480	4,8	45	88	6
3312500	5	45	88	6
3312510	5,1	42	92	6
3312550	5,5	44	92	6
3312580	5,8	48	92	6
3312600	6	48	92	6
3312650	6,5	52	102	8
3312680	6,8	56	102	8
3312700	7	56	102	8
3312750	7,5	60	118	8
3312780	7,8	64	118	8
3312800	8	64	118	8
3312850	8,5	68	128	10
3312870	8,7	70	128	10
3312880	8,8	72	128	10
3312900	9	72	128	10
3312950	9,5	76	136	10
3312980	9,8	80	136	10
3313000	10	80	136	10
3313030	10,3	84	146	12
3313050	10,5	84	146	12
3313080	10,8	88	146	12
3313100	11	88	146	12
3313150	11,5	92	156	12
3313180	11,8	96	156	12
3313200	12	96	156	12

EDP	DC	LCF	OAL	DCON



# WHO55-5D

Drilling | Solid carbide | 5xD



- Carbide drill with internal coolant, DUREOREY coating
- Up to 5xD
- For hardened material up to 55HRC including Inconel
- 54 sizes

<b>S</b> Ni	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC	<b>H</b> 52-62 HRC
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<b>CARBIDE</b>	<b>DUREOREY</b>	<b>12°~20°</b>	<b>SHRINK FIT</b>	<b>140°</b>	<b>h8</b>
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<b>B.605</b>
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EDP	DC	LCF	OAL	DCON
3316330	3,3	32	78	6
3316340	3,4	32	78	6
3316349	3,49	32	78	6
3316350	3,5	32	78	6
3316360	3,6	34	78	6
3316370	3,7	34	78	6
3316380	3,8	36	78	6
3316390	3,9	36	78	6
3316400	4	36	78	6
3316410	4,1	38	88	6
3316415	4,15	38	88	6
3316420	4,2	38	88	6
3316430	4,3	41	88	6
3316440	4,4	41	88	6
3316450	4,5	41	88	6
3316460	4,6	43	88	6
3316470	4,7	43	88	6
3316480	4,8	45	88	6
3316490	4,9	45	88	6
3316500	5	45	88	6
3316510	5,1	42	92	6
3316520	5,2	42	92	6
3316530	5,3	44	92	6
3316540	5,4	44	92	6
3316550	5,5	44	92	6
3316556	5,56	46	92	6
3316560	5,6	46	92	6
3316570	5,7	46	92	6
3316580	5,8	48	92	6
3316590	5,9	48	92	6
3316600	6	48	92	6
3316650	6,5	52	102	8
3316680	6,8	56	102	8
3316700	7	56	102	8
3316750	7,5	60	118	8
3316780	7,8	64	118	8
3316800	8	64	118	8
3316850	8,5	68	128	10
3316858	8,58	70	128	10
3316870	8,7	70	128	10
3316880	8,8	72	128	10
3316900	9	72	128	10
3316950	9,5	76	136	10
3316980	9,8	80	136	10
3316997	9,97	80	136	10
3317000	10	80	136	10

EDP	DC	LCF	OAL	DCON
3317030	10,3	84	146	12
3317050	10,5	84	146	12
3317080	10,8	88	146	12
3317100	11	88	146	12
3317150	11,5	92	156	12
3317156	11,56	94	156	12
3317180	11,8	96	156	12
3317200	12	96	156	12

Drilling | Solid carbide

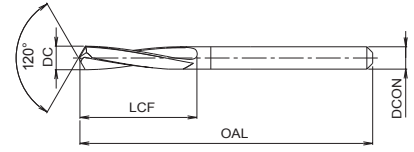
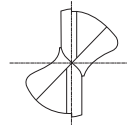


5xD

**B**

# WH70-DRL

Drilling | Solid carbide | 3xD



- Carbide drill with DUOREY coating
- Up to 3xD
- With low helix for high rigidity, up to 70HRC material
- 101 sizes



CARBIDE
DUOREY
12°
SHRINK FIT
120°
h8



Drilling | Solid carbide

3xD

EDP	DC	LCF	OAL	DCON
3318200	2	12	42	3
3318210	2,1	12	42	3
3318220	2,2	13	43	3
3318230	2,3	13	43	3
3318240	2,4	14	44	3
3318250	2,5	14	44	3
3318260	2,6	14	44	3
3318270	2,7	16	46	3
3318280	2,8	16	46	3
3318290	2,9	16	46	3
3318300	3	16	46	3
3318310	3,1	18	48	4
3318320	3,2	18	48	4
3318330	3,3	18	48	4
3318340	3,4	20	50	4
3318350	3,5	20	50	4
3318360	3,6	20	50	4
3318370	3,7	20	50	4
3318380	3,8	22	52	4
3318390	3,9	22	52	4
3318400	4	22	52	4
3318410	4,1	25	68	5
3318420	4,2	25	68	5
3318430	4,3	28	68	5
3318440	4,4	28	68	5
3318450	4,5	28	68	5
3318460	4,6	28	68	5
3318470	4,7	28	68	5
3318480	4,8	32	68	5
3318490	4,9	32	68	5
3318500	5	32	68	5
3318510	5,1	32	74	6
3318520	5,2	32	74	6
3318530	5,3	32	74	6
3318540	5,4	35	74	6
3318550	5,5	35	74	6
3318560	5,6	35	74	6
3318570	5,7	35	74	6
3318580	5,8	35	74	6
3318590	5,9	35	74	6
3318600	6	35	74	6
3318610	6,1	40	83	7
3318620	6,2	40	83	7
3318630	6,3	40	83	7
3318640	6,4	40	83	7
3318650	6,5	40	83	7

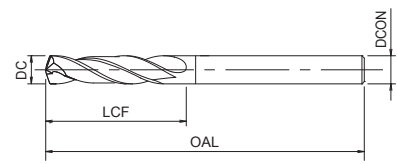
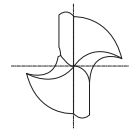
EDP	DC	LCF	OAL	DCON
3318660	6,6	40	83	7
3318670	6,7	40	83	7
3318680	6,8	45	83	7
3318690	6,9	45	83	7
3318700	7	45	83	7
3318710	7,1	45	94	8
3318720	7,2	45	94	8
3318730	7,3	45	94	8
3318740	7,4	45	94	8
3318750	7,5	45	94	8
3318760	7,6	50	94	8
3318770	7,7	50	94	8
3318780	7,8	50	94	8
3318790	7,9	50	94	8
3318800	8	50	94	8
3318810	8,1	50	101	9
3318820	8,2	50	101	9
3318830	8,3	50	101	9
3318840	8,4	50	101	9
3318850	8,5	50	101	9
3318860	8,6	57	101	9
3318870	8,7	57	101	9
3318880	8,8	57	101	9
3318890	8,9	57	101	9
3318900	9	57	101	9
3318910	9,1	57	106	10
3318920	9,2	57	106	10
3318930	9,3	57	106	10
3318940	9,4	57	106	10
3318950	9,5	57	106	10
3318960	9,6	63	106	10
3318970	9,7	63	106	10
3318980	9,8	63	106	10
3318990	9,9	63	106	10
3319000	10	63	106	10
3319010	10,1	63	113	11
3319020	10,2	63	113	11
3319030	10,3	63	113	11
3319040	10,4	63	113	11
3319050	10,5	63	113	11
3319060	10,6	63	113	11
3319070	10,7	71	113	11
3319080	10,8	71	113	11
3319090	10,9	71	113	11
3319100	11	71	113	11
3319110	11,1	71	120	12





# VPH-GDS

Drilling | Powder metal | 3xD



- Powder metal drill with WDI coating
- Up to 3xD
- For cast iron, exotic material and hardened steel
- 126 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ○ 0,25 < C < 0,4	<b>P</b> ○ C ≥ 0,45%	<b>P</b> ○ SCM	<b>K</b> ● GG	<b>K</b> ● GGG	<b>S</b> ● Ti	<b>S</b> ● Ni	<b>H</b> ● 25-35 HRC	<b>H</b> ● 35-45 HRC	<b>H</b> ● 45-52 HRC
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<b>XPM</b>	<b>WDI</b>	<b>30°</b>	<b>h7</b>	<b>130°</b>	<b>h8</b>
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EDP	DC	LCF	OAL	DCON
8599005	0,5	3	38	3
8599006	0,6	3,5	38	3
8599007	0,7	4,5	38	3
8599008	0,8	5	38	3
8599009	0,9	5,5	38	3
8599010	1	6	38	3
8599011	1,1	7	39	3
8599012	1,2	8	40	3
8599013	1,3	8	40	3
8599014	1,4	9	41	3
8599015	1,5	9	41	3
8599016	1,6	10	42	3
8599017	1,7	10	42	3
8599018	1,8	11	43	3
8599019	1,9	11	43	3
8599020	2	12	44	3
8599021	2,1	12	44	3
8599022	2,2	13	45	3
8599023	2,3	13	45	3
8599024	2,4	14	46	3
8599025	2,5	14	46	3
8599026	2,6	14	46	3
8599027	2,7	16	48	3
8599028	2,8	16	48	3
8599029	2,9	16	48	3
8599030	3	16	48	3
8599031	3,1	18	50	3
8599032	3,2	18	50	3
8599033	3,3	18	50	4
8599034	3,4	20	52	4
8599035	3,5	20	52	4
8599036	3,6	20	52	4
8599037	3,7	20	52	4
8599038	3,8	22	54	4
8599039	3,9	22	54	4
8599040	4	22	54	4
8599041	4,1	22	66	6
8599042	4,2	22	66	6
8599043	4,3	24	68	6
8599044	4,4	24	68	6
8599045	4,5	24	68	6
8599046	4,6	24	68	6
8599047	4,7	24	68	6
8599048	4,8	26	70	6
8599049	4,9	26	70	6
8599050	5	26	70	6

EDP	DC	LCF	OAL	DCON
8599051	5,1	26	70	6
8599052	5,2	26	70	6
8599053	5,3	26	70	6
8599054	5,4	28	72	6
8599055	5,5	28	72	6
8599056	5,6	28	72	6
8599057	5,7	28	72	6
8599058	5,8	28	72	6
8599059	5,9	28	72	6
8599060	6	28	72	6
8599061	6,1	31	75	8
8599062	6,2	31	75	8
8599063	6,3	31	75	8
8599064	6,4	31	75	8
8599065	6,5	31	75	8
8599066	6,6	31	75	8
8599067	6,7	31	75	8
8599068	6,8	34	78	8
8599069	6,9	34	78	8
8599070	7	34	78	8
8599071	7,1	34	78	8
8599072	7,2	34	78	8
8599073	7,3	34	78	8
8599074	7,4	34	78	8
8599075	7,5	34	78	8
8599076	7,6	37	81	8
8599077	7,7	37	81	8
8599078	7,8	37	81	8
8599079	7,9	37	81	8
8599080	8	37	81	8
8599081	8,1	37	87	10
8599082	8,2	37	87	10
8599083	8,3	37	87	10
8599084	8,4	37	87	10
8599085	8,5	37	87	10
8599086	8,6	40	90	10
8599087	8,7	40	90	10
8599088	8,8	40	90	10
8599089	8,9	40	90	10
8599090	9	40	90	10
8599091	9,1	40	90	10
8599092	9,2	40	90	10
8599093	9,3	40	90	10
8599094	9,4	40	90	10
8599095	9,5	40	90	10
8599096	9,6	43	93	10

Drilling | Powder metal



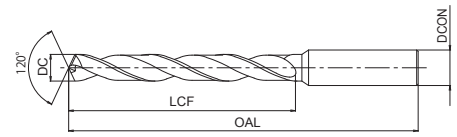
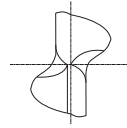
3xD

**B**



# VP-GDR

Drilling | Powder metal | 5xD



- Powder metal drill with TiCN coating
- Up to 5xD
- For steel, cast iron and non-ferrous material
- 144 sizes

<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>K</b> GG	<b>K</b> GGG	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC
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<b>SPH</b>	<b>V</b>	<b>40°</b>	<b>h7</b>	<b>120°</b>	<b>h8</b>
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<b>B.606</b>
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EDP	DC	LCF	OAL	DCON
8593020	2	24	56	3
8593021	2,1	24	56	3
8593022	2,2	27	59	3
8593023	2,3	27	59	3
8593024	2,4	30	62	3
8593025	2,5	30	62	3
8593026	2,6	30	62	3
8593027	2,7	33	65	3
8593028	2,8	33	65	3
8593029	2,9	33	65	3
8593030	3	33	65	3
8593031	3,1	36	68	4
8593032	3,2	36	68	4
8593033	3,3	36	68	4
8593034	3,4	39	71	4
8593035	3,5	39	71	4
8593036	3,6	39	71	4
8593037	3,7	39	71	4
8593038	3,8	43	75	4
8593039	3,9	43	75	4
8593040	4	43	75	4
8593041	4,1	43	87	6
8593042	4,2	43	87	6
8593043	4,3	47	91	6
8593044	4,4	47	91	6
8593045	4,5	47	91	6
8593046	4,6	47	91	6
8593047	4,7	47	91	6
8593048	4,8	52	96	6
8593049	4,9	52	96	6
8593050	5	52	96	6
8593051	5,1	52	96	6
8593052	5,2	52	96	6
8593053	5,3	52	96	6
8593054	5,4	57	101	6
8593055	5,5	57	101	6
8593056	5,6	57	101	6
8593057	5,7	57	101	6
8593058	5,8	57	101	6
8593059	5,9	57	101	6
8593060	6	57	101	6
8593061	6,1	63	107	8
8593062	6,2	63	107	8
8593063	6,3	63	107	8
8593064	6,4	63	107	8
8593065	6,5	63	107	8

EDP	DC	LCF	OAL	DCON
8593066	6,6	63	107	8
8593067	6,7	63	107	8
8593068	6,8	69	113	8
8593069	6,9	69	113	8
8593070	7	69	113	8
8593071	7,1	69	113	8
8593072	7,2	69	113	8
8593073	7,3	69	113	8
8593074	7,4	69	113	8
8593075	7,5	69	113	8
8593076	7,6	75	119	8
8593077	7,7	75	119	8
8593078	7,8	75	119	8
8593079	7,9	75	119	8
8593080	8	75	119	8
8593081	8,1	75	125	10
8593082	8,2	75	125	10
8593083	8,3	75	125	10
8593084	8,4	75	125	10
8593085	8,5	75	125	10
8593086	8,6	81	131	10
8593087	8,7	81	131	10
8593088	8,8	81	131	10
8593089	8,9	81	131	10
8593090	9	81	131	10
8593091	9,1	81	131	10
8593092	9,2	81	131	10
8593093	9,3	81	131	10
8593094	9,4	81	131	10
8593095	9,5	81	131	10
8593096	9,6	87	137	10
8593097	9,7	87	137	10
8593098	9,8	87	137	10
8593099	9,9	87	137	10
8593100	10	87	137	10
8593101	10,1	87	144	12
8593102	10,2	87	144	12
8593103	10,3	87	144	12
8593104	10,4	87	144	12
8593105	10,5	87	144	12
8593106	10,6	87	144	12
8593107	10,7	94	151	12
8593108	10,8	94	151	12
8593109	10,9	94	151	12

Drilling | Powder metal



5xD

**B**

# VP-GDR

Drilling | Powder metal | 5xD



- Powder metal drill with TiCN coating
- Up to 5xD
- For steel, cast iron and non-ferrous material
- 144 sizes



Drilling | Powder metal

5xD

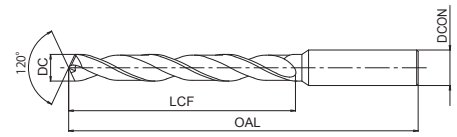
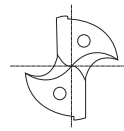
B

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8593110	11	94	151	12	8593260	26	145	225	32
8593111	11,1	94	151	12	8593265	26,5	145	225	32
8593112	11,2	94	151	12	8593270	27	150	230	32
8593113	11,3	94	151	12	8593280	28	150	230	32
8593114	11,4	94	151	12	8593290	29	155	235	32
8593115	11,5	94	151	12	8593300	30	155	235	32
8593116	11,6	94	151	12	8593310	31	160	240	32
8593117	11,7	94	151	12	8593320	32	165	245	32
8593118	11,8	94	151	12					
8593119	11,9	101	158	12					
8593120	12	101	158	12					
8593121	12,1	101	158	12					
8593122	12,2	101	158	12					
8593123	12,3	101	158	12					
8593124	12,4	101	158	12					
8593125	12,5	101	158	12					
8593126	12,6	101	158	12					
8593127	12,7	101	158	12					
8593128	12,8	101	158	12					
8593129	12,9	101	158	12					
8593130	13	101	158	12					
8593135	13,5	106	166	16					
8593140	14	106	166	16					
8593145	14,5	109	169	16					
8593150	15	109	169	16					
8593155	15,5	112	172	16					
8593160	16	112	172	16					
8593165	16,5	115	181	20					
8593170	17	115	181	20					
8593175	17,5	118	184	20					
8593180	18	118	184	20					
8593185	18,5	122	188	20					
8593190	19	122	188	20					
8593195	19,5	125	191	20					
8593200	20	125	191	20					
8593205	20,5	128	204	25					
8593210	21	128	204	25					
8593215	21,5	132	208	25					
8593220	22	132	208	25					
8593225	22,5	136	212	25					
8593230	23	136	212	25					
8593235	23,5	136	212	25					
8593240	24	140	216	25					
8593245	24,5	140	216	25					
8593250	25	140	216	25					
8593255	25,5	145	225	32					



# VP-HO-GDR

Drilling | Powder metal | 5xD



- Powder metal drill with internal coolant, TiCN coating
- Up to 5xD
- For steel, cast iron, exotic and non-ferrous material
- 56 sizes

<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>M</b> INOX	<b>K</b> GG	<b>K</b> GGG	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti	<b>S</b> Ni	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC
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<b>CPM</b>	<b>V</b>	<b>30°</b>	<b>h6</b> $D > 12$	<b>h7</b> $D \leq 12$	<b>D ≤ 12</b>	<b>D &gt; 12</b>		<b>120°</b>	<b>h8</b>	<b>B.607</b>
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EDP	DC	LCF	OAL	DCON
8593560	6	57	101	6
8593565	6,5	63	107	6
8593568	6,8	69	113	7
8593570	7	69	113	7
8593575	7,5	69	113	8
8593580	8	75	119	8
8593585	8,5	75	125	9
8593586	8,6	81	131	9
8593590	9	81	131	9
8593595	9,5	81	131	10
8593600	10	87	137	10
8593603	10,3	87	144	11
8593605	10,5	87	144	11
8593610	11	94	151	11
8593615	11,5	94	151	12
8593620	12	101	158	12
8593625	12,5	101	161	16
8593630	13	101	161	16
8593635	13,5	106	166	16
8593640	14	106	166	16
8593641	14,1	109	169	16
8593645	14,5	109	169	16
8593650	15	109	169	16
8593655	15,5	112	172	16
8593656	15,6	112	172	16
8593660	16	112	172	16
8593665	16,5	115	181	20
8593670	17	115	181	20
8593675	17,5	118	184	20
8593676	17,6	118	184	20
8593680	18	118	184	20
8593685	18,5	122	188	20
8593690	19	122	188	20
8593695	19,5	125	191	20
8593696	19,6	125	191	20
8593700	20	125	191	20
8593705	20,5	128	204	25
8593710	21	128	204	25
8593711	21,1	128	204	25
8593715	21,5	132	208	25
8593720	22	132	208	25
8593725	22,5	136	212	25
8593730	23	136	212	25
8593735	23,5	136	212	25
8593740	24	140	216	25
8593745	24,5	140	216	25

EDP	DC	LCF	OAL	DCON
8593750	25	140	216	25
8593755	25,5	145	225	32
8593760	26	145	225	32
8593765	26,5	145	225	32
8593770	27	150	230	32
8593780	28	150	230	32
8593790	29	155	235	32
8593800	30	155	235	32
8593810	31	160	240	32
8593820	32	165	245	32

Drilling | Powder metal

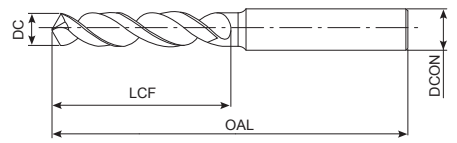
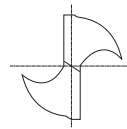


5xD

**B**

# NEXUS-GDS

Drilling | HSS | 3xD



- HSE drill with WDI coating
- Up to 3xD
- For stainless steel and non-ferrous materials
- 106 sizes

<b>P</b>	<b>P</b>	<b>M</b>	<b>N</b>	<b>N</b>	<b>S</b>
C < 0,2%	0,25 < C < 0,4	INOX	Al	AC, ADC	Ti

<b>HSSE</b>	<b>WDI</b>	<b>35° ~ 40°</b>	<b>D &lt; 2</b> <b>140°</b>	<b>2 ≤ D ≤ 4</b> <b>130°</b>	<b>D &gt; 4</b> <b>120°</b>	<b>h8</b>
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Drilling | HSS

3xD

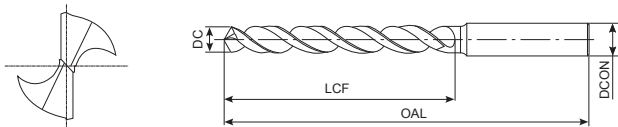
EDP	DC	LCF	OAL	DCON
8650100	1	6	38	3
8650110	1,1	7	39	3
8650120	1,2	8	40	3
8650130	1,3	8	40	3
8650140	1,4	9	41	3
8650150	1,5	9	41	3
8650160	1,6	10	42	3
8650170	1,7	10	42	3
8650180	1,8	11	43	3
8650181	1,81	11	43	3
8650183	1,83	11	43	3
8650190	1,9	11	43	3
8650200	2	12	44	3
8650210	2,1	12	44	3
8650211	2,11	12	44	3
8650213	2,13	13	45	3
8650220	2,2	13	45	3
8650228	2,28	13	45	3
8650230	2,3	13	45	3
8650238	2,38	14	46	3
8650240	2,4	14	46	3
8650250	2,5	14	46	3
8650260	2,6	14	46	3
8650270	2,7	16	48	3
8650276	2,76	16	48	3
8650278	2,78	16	48	3
8650280	2,8	16	48	3
8650290	2,9	16	48	3
8650300	3	16	48	3
8650310	3,1	18	50	4
8650320	3,2	18	50	4
8650325	3,25	18	50	4
8650330	3,3	18	50	4
8650340	3,4	20	52	4
8650350	3,5	20	52	4
8650360	3,6	20	52	4
8650365	3,65	20	52	4
8650367	3,67	20	52	4
8650370	3,7	20	52	4
8650380	3,8	22	54	4
8650390	3,9	22	54	4
8650400	4	22	54	4
8650410	4,1	22	66	6
8650420	4,2	22	66	6
8650430	4,3	24	68	6
8650440	4,4	24	68	6

EDP	DC	LCF	OAL	DCON
8650450	4,5	24	68	6
8650459	4,59	24	68	6
8650460	4,6	24	68	6
8650463	4,63	24	68	6
8650470	4,7	24	68	6
8650480	4,8	26	70	6
8650490	4,9	26	70	6
8650500	5	26	70	6
8650510	5,1	26	70	6
8650520	5,2	26	70	6
8650530	5,3	26	70	6
8650540	5,4	28	72	6
8650548	5,48	28	72	6
8650550	5,5	28	72	6
8650560	5,6	28	72	6
8650570	5,7	28	72	6
8650580	5,8	28	72	6
8650590	5,9	28	72	6
8650600	6	28	72	6
8650610	6,1	31	75	8
8650620	6,2	31	75	8
8650630	6,3	31	75	8
8650640	6,4	31	75	8
8650650	6,5	31	75	8
8650660	6,6	31	75	8
8650680	6,8	34	78	8
8650690	6,9	34	78	8
8650700	7	34	78	8
8650734	7,34	34	78	8
8650738	7,38	34	78	8
8650740	7,4	34	78	8
8650750	7,5	34	78	8
8650780	7,8	37	81	8
8650790	7,9	37	81	8
8650800	8	37	81	8
8650810	8,1	37	87	10
8650820	8,2	37	87	10
8650830	8,3	37	87	10
8650840	8,4	37	87	10
8650850	8,5	37	87	10
8650860	8,6	40	90	10
8650870	8,7	40	90	10
8650880	8,8	40	90	10
8650900	9	40	90	10
8650918	9,18	40	90	10
8650920	9,2	40	90	10



# NEXUS-GDR

Drilling | HSS | 5xD



- HSE drill with WDI coating
- Up to 5xD
- For stainless steel and non-ferrous materials
- 32 sizes

<b>P</b> C <0,2%	<b>P</b> 0,25 < C <0,4	<b>M</b> INOX	<b>N</b> Al	<b>N</b> AC, ADC	<b>S</b> Ti
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<b>HSSE</b>	<b>WDI</b>	<b>35° ~ 40°</b>	<b>D &gt; 4 120°</b>	<b>D ≤ 4 130°</b>	<b>h8</b>
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**B.607**

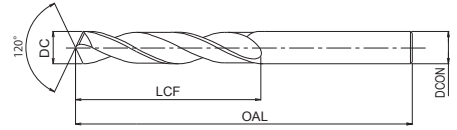
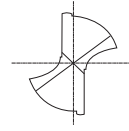
Drilling | HSS

5xD

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8655200	2	24	56	3					
8655230	2,3	27	59	3					
8655250	2,5	30	62	3					
8655260	2,6	30	62	3					
8655280	2,8	33	65	3					
8655300	3	33	65	3					
8655330	3,3	36	68	4					
8655340	3,4	39	71	4					
8655350	3,5	39	71	4					
8655400	4	43	75	4					
8655420	4,2	43	87	6					
8655430	4,3	47	91	6					
8655450	4,5	47	91	6					
8655500	5	52	96	6					
8655510	5,1	52	96	6					
8655520	5,2	52	96	6					
8655550	5,5	57	101	6					
8655600	6	57	101	6					
8655680	6,8	69	113	8					
8655690	6,9	69	113	8					
8655700	7	69	113	8					
8655800	8	75	119	8					
8655850	8,5	75	125	10					
8655860	8,6	81	131	10					
8655880	8,8	81	131	10					
8655900	9	81	131	10					
8656000	10	87	137	10					
8656030	10,3	87	144	12					
8656040	10,4	87	144	12					
8656050	10,5	87	144	12					
8656100	11	94	151	12					
8656200	12	101	158	12					

# V-SDR

Drilling | HSS | 5xD



- HSSE drill with TiCN coating
- Up to 5xD
- General purpose
- 111 sizes

<b>P</b> $C < 0,2\%$	<b>P</b> $0,25 < C < 0,4$	<b>P</b> $C \geq 0,45\%$	<b>P</b> SCM	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AI	<b>N</b> AC, ADC
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<b>HSSE</b>	<b>V</b>	$28^\circ \sim 38^\circ$	$120^\circ$	<b>DIN 338</b>
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EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8594020	2	24	49	2	8594066	6,6	63	101	6,6
8594021	2,1	24	49	2,1	8594067	6,7	63	109	6,7
8594022	2,2	27	53	2,2	8594068	6,8	69	109	6,8
8594023	2,3	27	53	2,3	8594069	6,9	69	109	6,9
8594024	2,4	30	57	2,4	8594070	7	69	109	7
8594025	2,5	30	57	2,5	8594071	7,1	69	109	7,1
8594026	2,6	30	57	2,6	8594072	7,2	69	109	7,2
8594027	2,7	33	61	2,7	8594073	7,3	69	109	7,3
8594028	2,8	33	61	2,8	8594074	7,4	69	109	7,4
8594029	2,9	33	61	2,9	8594075	7,5	69	109	7,5
8594030	3	33	61	3	8594076	7,6	75	117	7,6
8594031	3,1	36	65	3,1	8594077	7,7	75	117	7,7
8594032	3,2	36	65	3,2	8594078	7,8	75	117	7,8
8594033	3,3	36	65	3,3	8594079	7,9	75	117	7,9
8594034	3,4	39	70	3,4	8594080	8	75	117	8
8594035	3,5	39	70	3,5	8594081	8,1	75	117	8,1
8594036	3,6	39	70	3,6	8594082	8,2	75	117	8,2
8594037	3,7	39	70	3,7	8594083	8,3	75	117	8,3
8594038	3,8	43	75	3,8	8594084	8,4	75	117	8,4
8594039	3,9	43	75	3,9	8594085	8,5	75	117	8,5
8594040	4	43	75	4	8594086	8,6	81	125	8,6
8594041	4,1	43	75	4,1	8594087	8,7	81	125	8,7
8594042	4,2	43	75	4,2	8594088	8,8	81	125	8,8
8594043	4,3	47	80	4,3	8594089	8,9	81	125	8,9
8594044	4,4	47	80	4,4	8594090	9	81	125	9
8594045	4,5	47	80	4,5	8594091	9,1	81	125	9,1
8594046	4,6	47	80	4,6	8594092	9,2	81	125	9,2
8594047	4,7	47	80	4,7	8594093	9,3	81	125	9,3
8594048	4,8	52	86	4,8	8594094	9,4	81	125	9,4
8594049	4,9	52	86	4,9	8594095	9,5	81	125	9,5
8594050	5	52	86	5	8594096	9,6	87	133	9,6
8594051	5,1	52	86	5,1	8594097	9,7	87	133	9,7
8594052	5,2	52	86	5,2	8594098	9,8	87	133	9,8
8594053	5,3	52	86	5,3	8594099	9,9	87	133	9,9
8594054	5,4	57	93	5,4	8594100	10	87	133	10
8594055	5,5	57	93	5,5	8594101	10,1	87	133	10,1
8594056	5,6	57	93	5,6	8594102	10,2	87	133	10,2
8594057	5,7	57	93	5,7	8594103	10,3	87	133	10,3
8594058	5,8	57	93	5,8	8594104	10,4	87	133	10,4
8594059	5,9	57	93	5,9	8594105	10,5	87	133	10,5
8594060	6	57	93	6	8594106	10,6	87	133	10,6
8594061	6,1	63	101	6,1	8594107	10,7	94	142	10,7
8594062	6,2	63	101	6,2	8594108	10,8	94	142	10,8
8594063	6,3	63	101	6,3	8594109	10,9	94	142	10,9
8594064	6,4	63	101	6,4	8594110	11	94	142	11
8594065	6,5	63	101	6,5	8594111	11,1	94	142	11,1

Drilling | HSS

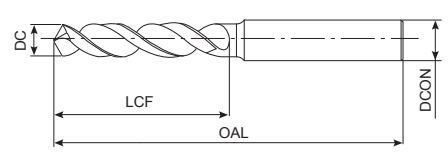
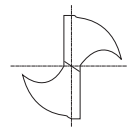
5xD

B



# EX-SUS-GDS

Drilling | HSS | 3xD



- First choice in quality and performance
- HSSE drill with TiN coating
- Up to 3xD
- For stainless steel, low carbon steel and cast aluminium
- 635 sizes - from Ø 0,5 - 6 mm in 0,01 mm increments

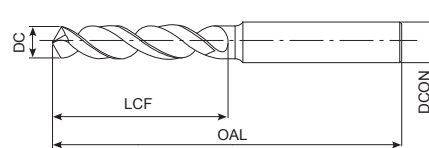
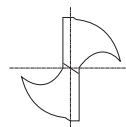


EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
61505	0,5	3	38	3	8595096	0,96	6	38	3
8595051	0,51	3	38	3	8595097	0,97	6	38	3
8595052	0,52	3	38	3	8595098	0,98	6	38	3
8595053	0,53	3	38	3	8595099	0,99	6	38	3
8595054	0,54	3,5	38	3	61510	1	6	38	3
8595055	0,55	3,5	38	3	8595101	1,01	6	38	3
8595056	0,56	3,5	38	3	8595102	1,02	6	38	3
8595057	0,57	3,5	38	3	8595103	1,03	6	38	3
8595058	0,58	3,5	38	3	8595104	1,04	6	38	3
8595059	0,59	3,5	38	3	8595105	1,05	6	38	3
61506	0,6	3,5	38	3	8595106	1,06	6	38	3
8595061	0,61	4	38	3	8595107	1,07	7	39	3
8595062	0,62	4	38	3	8595108	1,08	7	39	3
8595063	0,63	4	38	3	8595109	1,09	7	39	3
8595064	0,64	4	38	3	61511	1,1	7	39	3
8595065	0,65	4	38	3	8595111	1,11	7	39	3
8595066	0,66	4	38	3	8595112	1,12	7	39	3
8595067	0,67	4	38	3	8595113	1,13	7	39	3
8595068	0,68	4,5	38	3	8595114	1,14	7	39	3
8595069	0,69	4,5	38	3	8595115	1,15	7	39	3
61507	0,7	4,5	38	3	8595116	1,16	7	39	3
8595071	0,71	4,5	38	3	8595117	1,17	7	39	3
8595072	0,72	4,5	38	3	8595118	1,18	7	39	3
8595073	0,73	4,5	38	3	8595119	1,19	8	40	3
8595074	0,74	4,5	38	3	61512	1,2	8	40	3
8595075	0,75	4,5	38	3	8595121	1,21	8	40	3
8595076	0,76	5	38	3	8595122	1,22	8	40	3
8595077	0,77	5	38	3	8595123	1,23	8	40	3
8595078	0,78	5	38	3	8595124	1,24	8	40	3
8595079	0,79	5	38	3	8595125	1,25	8	40	3
61508	0,8	5	38	3	8595126	1,26	8	40	3
8595081	0,81	5	38	3	8595127	1,27	8	40	3
8595082	0,82	5	38	3	8595128	1,28	8	40	3
8595083	0,83	5	38	3	8595129	1,29	8	40	3
8595084	0,84	5	38	3	61513	1,3	8	40	3
8595085	0,85	5	38	3	8595131	1,31	8	40	3
8595086	0,86	5,5	38	3	8595132	1,32	8	40	3
8595087	0,87	5,5	38	3	8595133	1,33	8	41	3
8595088	0,88	5,5	38	3	8595134	1,34	8	41	3
8595089	0,89	5,5	38	3	8595135	1,35	8	41	3
61509	0,9	5,5	38	3	8595136	1,36	8	41	3
8595091	0,91	5,5	38	3	8595137	1,37	9	41	3
8595092	0,92	5,5	38	3	8595138	1,38	9	41	3
8595093	0,93	5,5	38	3	8595139	1,39	9	41	3
8595094	0,94	5,5	38	3	61514	1,4	9	41	3
8595095	0,95	6	38	3	8595141	1,41	9	41	3

Drilling | HSS  
3xD

# EX-SUS-GDS

Drilling | HSS | 3xD



- First choice in quality and performance
- HSSE drill with TiN coating
- Up to 3xD
- For stainless steel, low carbon steel and cast aluminium
- 635 sizes - from Ø 0,5 - 6 mm in 0,01 mm increments



Drilling | HSS

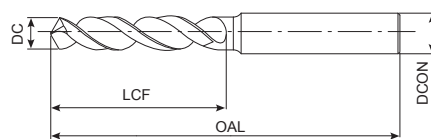
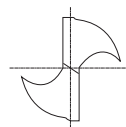
3xD

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8595142	1,42	9	41	3	8595188	1,88	11	43	3
8595143	1,43	9	41	3	8595189	1,89	11	43	3
8595144	1,44	9	41	3	61519	1,9	11	43	3
8595145	1,45	9	41	3	8595191	1,91	12	44	3
8595146	1,46	9	41	3	8595192	1,92	12	44	3
8595147	1,47	9	41	3	8595193	1,93	12	44	3
8595148	1,48	9	41	3	8595194	1,94	12	44	3
8595149	1,49	9	41	3	8595195	1,95	12	44	3
61515	1,5	9	41	3	8595196	1,96	12	44	3
8595151	1,51	10	42	3	8595197	1,97	12	44	3
8595152	1,52	10	42	3	8595198	1,98	12	44	3
8595153	1,53	10	42	3	8595199	1,99	12	44	3
8595154	1,54	10	42	3	61520	2	12	44	3
8595155	1,55	10	42	3	8595201	2,01	12	44	3
8595156	1,56	10	42	3	8595202	2,02	12	44	3
8595157	1,57	10	42	3	8595203	2,03	12	44	3
8595158	1,58	10	42	3	8595204	2,04	12	44	3
8595159	1,59	10	42	3	8595205	2,05	12	44	3
61516	1,6	10	42	3	8595206	2,06	12	44	3
8595161	1,61	10	42	3	8595207	2,07	12	44	3
8595162	1,62	10	42	3	8595208	2,08	12	44	3
8595163	1,63	10	42	3	8595209	2,09	12	44	3
8595164	1,64	10	42	3	61521	2,1	12	44	3
8595165	1,65	10	42	3	8595211	2,11	12	44	3
8595166	1,66	10	42	3	8595212	2,12	12	44	3
8595167	1,67	10	42	3	8595213	2,13	13	45	3
8595168	1,68	10	42	3	8595214	2,14	13	45	3
8595169	1,69	10	42	3	8595215	2,15	13	45	3
61517	1,7	10	42	3	8595216	2,16	13	45	3
8595171	1,71	11	43	3	8595217	2,17	13	45	3
8595172	1,72	11	43	3	8595218	2,18	13	45	3
8595173	1,73	11	43	3	8595219	2,19	13	45	3
8595174	1,74	11	43	3	61522	2,2	13	45	3
8595175	1,75	11	43	3	8595221	2,21	13	45	3
8595176	1,76	11	43	3	8595222	2,22	13	45	3
8595177	1,77	11	43	3	8595223	2,23	13	45	3
8595178	1,78	11	43	3	8595224	2,24	13	45	3
8595179	1,79	11	43	3	8595225	2,25	13	45	3
61518	1,8	11	43	3	8595226	2,26	13	45	3
8595181	1,81	11	43	3	8595227	2,27	13	45	3
8595182	1,82	11	43	3	8595228	2,28	13	45	3
8595183	1,83	11	43	3	8595229	2,29	13	45	3
8595184	1,84	11	43	3	61523	2,3	13	45	3
8595185	1,85	11	43	3	8595231	2,31	13	45	3
8595186	1,86	11	43	3	8595232	2,32	13	45	3
8595187	1,87	11	43	3	8595233	2,33	13	45	3



# EX-SUS-GDS

Drilling | HSS | 3xD



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- Up to 3xD
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EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8595234	2,34	13	45	3	61528	2,8	16	48	3
8595235	2,35	13	45	3	8595281	2,81	16	48	3
8595236	2,36	13	45	3	8595282	2,82	16	48	3
8595237	2,37	14	46	3	8595283	2,83	16	48	3
8595238	2,38	14	46	3	8595284	2,84	16	48	3
8595239	2,39	14	46	3	8595285	2,85	16	48	3
61524	2,4	14	46	3	8595286	2,86	16	48	3
8595241	2,41	14	46	3	8595287	2,87	16	48	3
8595242	2,42	14	46	3	8595288	2,88	16	48	3
8595243	2,43	14	46	3	8595289	2,89	16	48	3
8595244	2,44	14	46	3	61529	2,9	16	48	3
8595245	2,45	14	46	3	8595291	2,91	16	48	3
8595246	2,46	14	46	3	8595292	2,92	16	48	3
8595247	2,47	14	46	3	8595293	2,93	16	48	3
8595248	2,48	14	46	3	8595294	2,94	16	48	3
8595249	2,49	14	46	3	8595295	2,95	16	48	3
61525	2,5	14	46	3	8595296	2,96	16	48	3
8595251	2,51	14	46	3	8595297	2,97	16	48	3
8595252	2,52	14	46	3	8595298	2,98	16	48	3
8595253	2,53	14	46	3	8595299	2,99	16	48	3
8595254	2,54	14	46	3	61530	3	16	48	3
8595255	2,55	14	46	3	8595301	3,01	18	50	4
8595256	2,56	14	46	3	8595302	3,02	18	50	4
8595257	2,57	14	46	3	8595303	3,03	18	50	4
8595258	2,58	14	46	3	8595304	3,04	18	50	4
8595259	2,59	14	46	3	8595305	3,05	18	50	4
61526	2,6	14	46	3	8595306	3,06	18	50	4
8595261	2,61	14	46	3	8595307	3,07	18	50	4
8595262	2,62	14	46	3	8595308	3,08	18	50	4
8595263	2,63	14	46	3	8595309	3,09	18	50	4
8595264	2,64	14	46	3	61531	3,1	18	50	4
8595265	2,65	14	46	3	8595311	3,11	18	50	4
8595266	2,66	16	48	3	8595312	3,12	18	50	4
8595267	2,67	16	48	3	8595313	3,13	18	50	4
8595268	2,68	16	48	3	8595314	3,14	18	50	4
8595269	2,69	16	48	3	8595315	3,15	18	50	4
61527	2,7	16	48	3	8595316	3,16	18	50	4
8595271	2,71	16	48	3	8595317	3,17	18	50	4
8595272	2,72	16	48	3	8595318	3,18	18	50	4
8595273	2,73	16	48	3	8595319	3,19	18	50	4
8595274	2,74	16	48	3	61532	3,2	18	50	4
8595275	2,75	16	48	3	8595321	3,21	18	50	4
8595276	2,76	16	48	3	8595322	3,22	18	50	4
8595277	2,77	16	48	3	8595323	3,23	18	50	4
8595278	2,78	16	48	3	8595324	3,24	18	50	4
8595279	2,79	16	48	3	8595325	3,25	18	50	4

Drilling | HSS

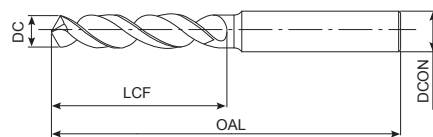
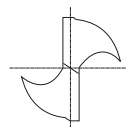


3xD

B

# EX-SUS-GDS

Drilling | HSS | 3xD



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EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8595326	3,26	18	50	4	8595372	3,72	20	52	4
8595327	3,27	18	50	4	8595373	3,73	20	52	4
8595328	3,28	18	50	4	8595374	3,74	20	52	4
8595329	3,29	18	50	4	8595375	3,75	20	52	4
61533	3,3	18	50	4	8595376	3,76	22	54	4
8595331	3,31	18	50	4	8595377	3,77	22	54	4
8595332	3,32	18	50	4	8595378	3,78	22	54	4
8595333	3,33	18	50	4	8595379	3,79	22	54	4
8595334	3,34	18	50	4	61538	3,8	22	54	4
8595335	3,35	18	50	4	8595381	3,81	22	54	4
8595336	3,36	20	52	4	8595382	3,82	22	54	4
8595337	3,37	20	52	4	8595383	3,83	22	54	4
8595338	3,38	20	52	4	8595384	3,84	22	54	4
8595339	3,39	20	52	4	8595385	3,85	22	54	4
61534	3,4	20	52	4	8595386	3,86	22	54	4
8595341	3,41	20	52	4	8595387	3,87	22	54	4
8595342	3,42	20	52	4	8595388	3,88	22	54	4
8595343	3,43	20	52	4	8595389	3,89	22	54	4
8595344	3,44	20	52	4	61539	3,9	22	54	4
8595345	3,45	20	52	4	8595391	3,91	22	54	4
8595346	3,46	20	52	4	8595392	3,92	22	54	4
8595347	3,47	20	52	4	8595393	3,93	22	54	4
8595348	3,48	20	52	4	8595394	3,94	22	54	4
8595349	3,49	20	52	4	8595395	3,95	22	54	4
61535	3,5	20	52	4	8595396	3,96	22	54	4
8595351	3,51	20	52	4	8595397	3,97	22	54	4
8595352	3,52	20	52	4	8595398	3,98	22	54	4
8595353	3,53	20	52	4	8595399	3,99	22	54	4
8595354	3,54	20	52	4	61540	4	22	54	4
8595355	3,55	20	52	4	8595401	4,01	22	66	6
8595356	3,56	20	52	4	8595402	4,02	22	66	6
8595357	3,57	20	52	4	8595403	4,03	22	66	6
8595358	3,58	20	52	4	8595404	4,04	22	66	6
8595359	3,59	20	52	4	8595405	4,05	22	66	6
61536	3,6	20	52	4	8595406	4,06	22	66	6
8595361	3,61	20	52	4	8595407	4,07	22	66	6
8595362	3,62	20	52	4	8595408	4,08	22	66	6
8595363	3,63	20	52	4	8595409	4,09	22	66	6
8595364	3,64	20	52	4	61541	4,1	22	66	6
8595365	3,65	20	52	4	8595411	4,11	22	66	6
8595366	3,66	20	52	4	8595412	4,12	22	66	6
8595367	3,67	20	52	4	8595413	4,13	22	66	6
8595368	3,68	20	52	4	8595414	4,14	22	66	6
8595369	3,69	20	52	4	8595415	4,15	22	66	6
61537	3,7	20	52	4	8595416	4,16	22	66	6
8595371	3,71	20	52	4	8595417	4,17	22	66	6

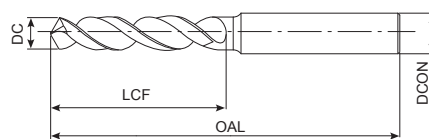
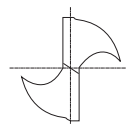
Drilling | HSS

3xD

B

# EX-SUS-GDS

Drilling | HSS | 3xD



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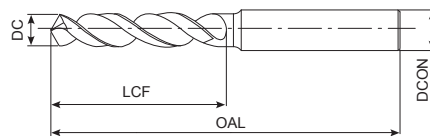
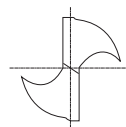
EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8595418	4,18	22	66	6	8595464	4,64	24	68	6
8595419	4,19	22	66	6	8595465	4,65	24	68	6
61542	4,2	22	66	6	8595466	4,66	24	68	6
8595421	4,21	22	66	6	8595467	4,67	24	68	6
8595422	4,22	22	66	6	8595468	4,68	24	68	6
8595423	4,23	22	66	6	8595469	4,69	24	68	6
8595424	4,24	22	66	6	61547	4,7	24	68	6
8595425	4,25	22	66	6	8595471	4,71	24	68	6
8595426	4,26	24	68	6	8595472	4,72	24	68	6
8595427	4,27	24	68	6	8595473	4,73	24	68	6
8595428	4,28	24	68	6	8595474	4,74	24	68	6
8595429	4,29	24	68	6	8595475	4,75	24	68	6
61543	4,3	24	68	6	8595476	4,76	26	70	6
8595431	4,31	24	68	6	8595477	4,77	26	70	6
8595432	4,32	24	68	6	8595478	4,78	26	70	6
8595433	4,33	24	68	6	8595479	4,79	26	70	6
8595434	4,34	24	68	6	61548	4,8	26	70	6
8595435	4,35	24	68	6	8595481	4,81	26	70	6
8595436	4,36	24	68	6	8595482	4,82	26	70	6
8595437	4,37	24	68	6	8595483	4,83	26	70	6
8595438	4,38	24	68	6	8595484	4,84	26	70	6
8595439	4,39	24	68	6	8595485	4,85	26	70	6
61544	4,4	24	68	6	8595486	4,86	26	70	6
8595441	4,41	24	68	6	8595487	4,87	26	70	6
8595442	4,42	24	68	6	8595488	4,88	26	70	6
8595443	4,43	24	68	6	8595489	4,89	26	70	6
8595444	4,44	24	68	6	61549	4,9	26	70	6
8595445	4,45	24	68	6	8595491	4,91	26	70	6
8595446	4,46	24	68	6	8595492	4,92	26	70	6
8595447	4,47	24	68	6	8595493	4,93	26	70	6
8595448	4,48	24	68	6	8595494	4,94	26	70	6
8595449	4,49	24	68	6	8595495	4,95	26	70	6
61545	4,5	24	68	6	8595496	4,96	26	70	6
8595451	4,51	24	68	6	8595497	4,97	26	70	6
8595452	4,52	24	68	6	8595498	4,98	26	70	6
8595453	4,53	24	68	6	8595499	4,99	26	70	6
8595454	4,54	24	68	6	61550	5	26	70	6
8595455	4,55	24	68	6	8595501	5,01	26	70	6
8595456	4,56	24	68	6	8595502	5,02	26	70	6
8595457	4,57	24	68	6	8595503	5,03	26	70	6
8595458	4,58	24	68	6	8595504	5,04	26	70	6
8595459	4,59	24	68	6	8595505	5,05	26	70	6
61546	4,6	24	68	6	8595506	5,06	26	70	6
8595461	4,61	24	68	6	8595507	5,07	26	70	6
8595462	4,62	24	68	6	8595508	5,08	26	70	6
8595463	4,63	24	68	6	8595509	5,09	26	70	6

Drilling | HSS  
3xD

**B**

# EX-SUS-GDS

Drilling | HSS | 3xD



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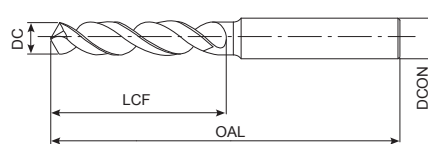
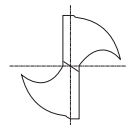
Drilling | HSS

3xD

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
61551	5,1	26	70	6	8595556	5,56	28	72	6
8595511	5,11	26	70	6	8595557	5,57	28	72	6
8595512	5,12	26	70	6	8595558	5,58	28	72	6
8595513	5,13	26	70	6	8595559	5,59	28	72	6
8595514	5,14	26	70	6	61556	5,6	28	72	6
8595515	5,15	26	70	6	8595561	5,61	28	72	6
8595516	5,16	26	70	6	8595562	5,62	28	72	6
8595517	5,17	26	70	6	8595563	5,63	28	72	6
8595518	5,18	26	70	6	8595564	5,64	28	72	6
8595519	5,19	26	70	6	8595565	5,65	28	72	6
61552	5,2	26	70	6	8595566	5,66	28	72	6
8595521	5,21	26	70	6	8595567	5,67	28	72	6
8595522	5,22	26	70	6	8595568	5,68	28	72	6
8595523	5,23	26	70	6	8595569	5,69	28	72	6
8595524	5,24	26	70	6	61557	5,7	28	72	6
8595525	5,25	26	70	6	8595571	5,71	28	72	6
8595526	5,26	26	70	6	8595572	5,72	28	72	6
8595527	5,27	26	70	6	8595573	5,73	28	72	6
8595528	5,28	26	70	6	8595574	5,74	28	72	6
8595529	5,29	26	70	6	8595575	5,75	28	72	6
61553	5,3	26	70	6	8595576	5,76	28	72	6
8595531	5,31	28	72	6	8595577	5,77	28	72	6
8595532	5,32	28	72	6	8595578	5,78	28	72	6
8595533	5,33	28	72	6	8595579	5,79	28	72	6
8595534	5,34	28	72	6	61558	5,8	28	72	6
8595535	5,35	28	72	6	8595581	5,81	28	72	6
8595536	5,36	28	72	6	8595582	5,82	28	72	6
8595537	5,37	28	72	6	8595583	5,83	28	72	6
8595538	5,38	28	72	6	8595584	5,84	28	72	6
8595539	5,39	28	72	6	8595585	5,85	28	72	6
61554	5,4	28	72	6	8595586	5,86	28	72	6
8595541	5,41	28	72	6	8595587	5,87	28	72	6
8595542	5,42	28	72	6	8595588	5,88	28	72	6
8595543	5,43	28	72	6	8595589	5,89	28	72	6
8595544	5,44	28	72	6	61559	5,9	28	72	6
8595545	5,45	28	72	6	8595591	5,91	28	72	6
8595546	5,46	28	72	6	8595592	5,92	28	72	6
8595547	5,47	28	72	6	8595593	5,93	28	72	6
8595548	5,48	28	72	6	8595594	5,94	28	72	6
8595549	5,49	28	72	6	8595595	5,95	28	72	6
61555	5,5	28	72	6	8595596	5,96	28	72	6
8595551	5,51	28	72	6	8595597	5,97	28	72	6
8595552	5,52	28	72	6	8595598	5,98	28	72	6
8595553	5,53	28	72	6	8595599	5,99	28	72	6
8595554	5,54	28	72	6	61560	6	28	72	6
8595555	5,55	28	72	6	61561	6,1	31	75	8

# EX-SUS-GDS

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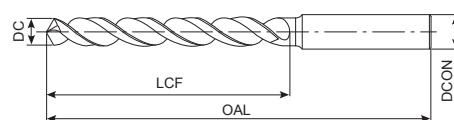
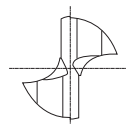


EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
61562	6,2	31	75	8	61608	10,8	47	104	12
61563	6,3	31	75	8	61609	10,9	47	104	12
61564	6,4	31	75	8	61610	11	47	104	12
61565	6,5	31	75	8	61611	11,1	47	104	12
61566	6,6	31	75	8	61612	11,2	47	104	12
61567	6,7	31	75	8	61613	11,3	47	104	12
61568	6,8	34	78	8	61614	11,4	47	104	12
61569	6,9	34	78	8	61615	11,5	47	104	12
61570	7	34	78	8	61616	11,6	47	104	12
61571	7,1	34	78	8	61617	11,7	47	104	12
61572	7,2	34	78	8	61618	11,8	47	104	12
61573	7,3	34	78	8	61619	11,9	51	108	12
61574	7,4	34	78	8	61620	12	51	108	12
61575	7,5	34	78	8	43011210	12,1	51	108	16
61576	7,6	37	81	8	43011220	12,2	51	108	16
61577	7,7	37	81	8	43011230	12,3	51	108	16
61578	7,8	37	81	8	43011240	12,4	51	108	16
61579	7,9	37	81	8	43011250	12,5	51	108	16
61580	8	37	81	8	43011260	12,6	51	108	16
61581	8,1	37	87	10	43011270	12,7	51	108	16
61582	8,2	37	87	10	43011280	12,8	51	108	16
61583	8,3	37	87	10	43011290	12,9	51	108	16
61584	8,4	37	87	10	43011300	13	51	108	16
61585	8,5	37	87	10	43011350	13,5	54	114	16
61586	8,6	40	90	10	43011400	14	54	114	16
61587	8,7	40	90	10	43011450	14,5	56	116	16
61588	8,8	40	90	10	43011500	15	56	116	16
61589	8,9	40	90	10	43011550	15,5	58	118	16
61590	9	40	90	10	43011600	16	58	118	16
61591	9,1	40	90	10	43011650	16,5	60	126	20
61592	9,2	40	90	10	43011700	17	60	126	20
61593	9,3	40	90	10	43011750	17,5	62	128	20
61594	9,4	40	90	10	43011800	18	62	128	20
61595	9,5	40	90	10	43011850	18,5	64	130	20
61596	9,6	43	93	10	43011900	19	64	130	20
61597	9,7	43	93	10	43011950	19,5	66	132	20
61598	9,8	43	93	10	43012000	20	66	132	20
61599	9,9	43	93	10					
61600	10	43	93	10					
61601	10,1	43	100	12					
61602	10,2	43	100	12					
61603	10,3	43	100	12					
61604	10,4	43	100	12					
61605	10,5	43	100	12					
61606	10,6	43	100	12					
61607	10,7	47	104	12					

Drilling | HSS  
3xD

# EX-SUS-GDR

Drilling | HSS | 5xD



- First choice in quality and performance
- HSE drill with TiN coating
- Up to 5xD
- For stainless steel, low carbon steel and cast aluminium
- 485 sizes - from Ø 2 - 6 mm in 0,01 mm increments



Drilling | HSS

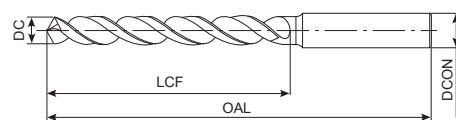
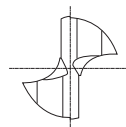
5xD

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
62520	2	24	56	3	8597246	2,46	30	62	3
8597201	2,01	24	56	3	8597247	2,47	30	62	3
8597202	2,02	24	56	3	8597248	2,48	30	62	3
8597203	2,03	24	56	3	8597249	2,49	30	62	3
8597204	2,04	24	56	3	62525	2,5	30	62	3
8597205	2,05	24	56	3	8597251	2,51	30	62	3
8597206	2,06	24	56	3	8597252	2,52	30	62	3
8597207	2,07	24	56	3	8597253	2,53	30	62	3
8597208	2,08	24	56	3	8597254	2,54	30	62	3
8597209	2,09	24	56	3	8597255	2,55	30	62	3
62521	2,1	24	56	3	8597256	2,56	30	62	3
8597211	2,11	24	56	3	8597257	2,57	30	62	3
8597212	2,12	24	56	3	8597258	2,58	30	62	3
8597213	2,13	27	59	3	8597259	2,59	30	62	3
8597214	2,14	27	59	3	62526	2,6	30	62	3
8597215	2,15	27	59	3	8597261	2,61	30	62	3
8597216	2,16	27	59	3	8597262	2,62	30	62	3
8597217	2,17	27	59	3	8597263	2,63	30	62	3
8597218	2,18	27	59	3	8597264	2,64	30	62	3
8597219	2,19	27	59	3	8597265	2,65	30	62	3
62522	2,2	27	59	3	8597266	2,66	33	65	3
8597221	2,21	27	59	3	8597267	2,67	33	65	3
8597222	2,22	27	59	3	8597268	2,68	33	65	3
8597223	2,23	27	59	3	8597269	2,69	33	65	3
8597224	2,24	27	59	3	62527	2,7	33	65	3
8597225	2,25	27	59	3	8597271	2,71	33	65	3
8597226	2,26	27	59	3	8597272	2,72	33	65	3
8597227	2,27	27	59	3	8597273	2,73	33	65	3
8597228	2,28	27	59	3	8597274	2,74	33	65	3
8597229	2,29	27	59	3	8597275	2,75	33	65	3
62523	2,3	27	59	3	8597276	2,76	33	65	3
8597231	2,31	27	59	3	8597277	2,77	33	65	3
8597232	2,32	27	59	3	8597278	2,78	33	65	3
8597233	2,33	27	59	3	8597279	2,79	33	65	3
8597234	2,34	27	59	3	62528	2,8	33	65	3
8597235	2,35	27	59	3	8597281	2,81	33	65	3
8597236	2,36	27	59	3	8597282	2,82	33	65	3
8597237	2,37	30	62	3	8597283	2,83	33	65	3
8597238	2,38	30	62	3	8597284	2,84	33	65	3
8597239	2,39	30	62	3	8597285	2,85	33	65	3
62524	2,4	30	62	3	8597286	2,86	33	65	3
8597241	2,41	30	62	3	8597287	2,87	33	65	3
8597242	2,42	30	62	3	8597288	2,88	33	65	3
8597243	2,43	30	62	3	8597289	2,89	33	65	3
8597244	2,44	30	62	3	62529	2,9	33	65	3
8597245	2,45	30	62	3	8597291	2,91	33	65	3

B

# EX-SUS-GDR

Drilling | HSS | 5xD



- First choice in quality and performance
- HSSE drill with TiN coating
- Up to 5xD
- For stainless steel, low carbon steel and cast aluminium
- 485 sizes - from Ø 2 - 6 mm in 0,01 mm increments

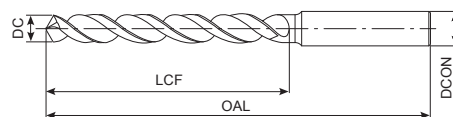
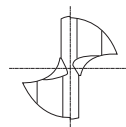


EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8597292	2,92	33	65	3	8597338	3,38	39	71	4
8597293	2,93	33	65	3	8597339	3,39	39	71	4
8597294	2,94	33	65	3	62534	3,4	39	71	4
8597295	2,95	33	65	3	8597341	3,41	39	71	4
8597296	2,96	33	65	3	8597342	3,42	39	71	4
8597297	2,97	33	65	3	8597343	3,43	39	71	4
8597298	2,98	33	65	3	8597344	3,44	39	71	4
8597299	2,99	33	65	3	8597345	3,45	39	71	4
62530	3	33	65	3	8597346	3,46	39	71	4
8597301	3,01	36	68	4	8597347	3,47	39	71	4
8597302	3,02	36	68	4	8597348	3,48	39	71	4
8597303	3,03	36	68	4	8597349	3,49	39	71	4
8597304	3,04	36	68	4	62535	3,5	39	71	4
8597305	3,05	36	68	4	8597351	3,51	39	71	4
8597306	3,06	36	68	4	8597352	3,52	39	71	4
8597307	3,07	36	68	4	8597353	3,53	39	71	4
8597308	3,08	36	68	4	8597354	3,54	39	71	4
8597309	3,09	36	68	4	8597355	3,55	39	71	4
62531	3,1	36	68	4	8597356	3,56	39	71	4
8597311	3,11	36	68	4	8597357	3,57	39	71	4
8597312	3,12	36	68	4	8597358	3,58	39	71	4
8597313	3,13	36	68	4	8597359	3,59	39	71	4
8597314	3,14	36	68	4	62536	3,6	39	71	4
8597315	3,15	36	68	4	8597361	3,61	39	71	4
8597316	3,16	36	68	4	8597362	3,62	39	71	4
8597317	3,17	36	68	4	8597363	3,63	39	71	4
8597318	3,18	36	68	4	8597364	3,64	39	71	4
8597319	3,19	36	68	4	8597365	3,65	39	71	4
62532	3,2	36	68	4	8597366	3,66	39	71	4
8597321	3,21	36	68	4	8597367	3,67	39	71	4
8597322	3,22	36	68	4	8597368	3,68	39	71	4
8597323	3,23	36	68	4	8597369	3,69	39	71	4
8597324	3,24	36	68	4	62537	3,7	39	71	4
8597325	3,25	36	68	4	8597371	3,71	39	71	4
8597326	3,26	36	68	4	8597372	3,72	39	71	4
8597327	3,27	36	68	4	8597373	3,73	39	71	4
8597328	3,28	36	68	4	8597374	3,74	39	71	4
8597329	3,29	36	68	4	8597375	3,75	39	71	4
62533	3,3	36	68	4	8597376	3,76	43	75	4
8597331	3,31	36	68	4	8597377	3,77	43	75	4
8597332	3,32	36	68	4	8597378	3,78	43	75	4
8597333	3,33	36	68	4	8597379	3,79	43	75	4
8597334	3,34	36	68	4	62538	3,8	43	75	4
8597335	3,35	36	68	4	8597381	3,81	43	75	4
8597336	3,36	39	71	4	8597382	3,82	43	75	4
8597337	3,37	39	71	4	8597383	3,83	43	75	4

Drilling | HSS  
5xD

# EX-SUS-GDR

Drilling | HSS | 5xD



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Drilling | HSS

5xD

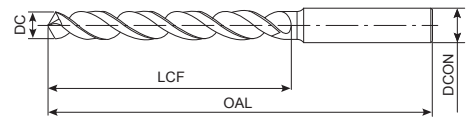
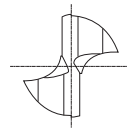
B

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8597384	3,84	43	75	4	62543	4,3	47	91	6
8597385	3,85	43	75	4	8597431	4,31	47	91	6
8597386	3,86	43	75	4	8597432	4,32	47	91	6
8597387	3,87	43	75	4	8597433	4,33	47	91	6
8597388	3,88	43	75	4	8597434	4,34	47	91	6
8597389	3,89	43	75	4	8597435	4,35	47	91	6
62539	3,9	43	75	4	8597436	4,36	47	91	6
8597391	3,91	43	75	4	8597437	4,37	47	91	6
8597392	3,92	43	75	4	8597438	4,38	47	91	6
8597393	3,93	43	75	4	8597439	4,39	47	91	6
8597394	3,94	43	75	4	62544	4,4	47	91	6
8597395	3,95	43	75	4	8597441	4,41	47	91	6
8597396	3,96	43	75	4	8597442	4,42	47	91	6
8597397	3,97	43	75	4	8597443	4,43	47	91	6
8597398	3,98	43	75	4	8597444	4,44	47	91	6
8597399	3,99	43	75	4	8597445	4,45	47	91	6
62540	4	43	75	4	8597446	4,46	47	91	6
8597401	4,01	43	87	6	8597447	4,47	47	91	6
8597402	4,02	43	87	6	8597448	4,48	47	91	6
8597403	4,03	43	87	6	8597449	4,49	47	91	6
8597404	4,04	43	87	6	62545	4,5	47	91	6
8597405	4,05	43	87	6	8597451	4,51	47	91	6
8597406	4,06	43	87	6	8597452	4,52	47	91	6
8597407	4,07	43	87	6	8597453	4,53	47	91	6
8597408	4,08	43	87	6	8597454	4,54	47	91	6
8597409	4,09	43	87	6	8597455	4,55	47	91	6
62541	4,1	43	87	6	8597456	4,56	47	91	6
8597411	4,11	43	87	6	8597457	4,57	47	91	6
8597412	4,12	43	87	6	8597458	4,58	47	91	6
8597413	4,13	43	87	6	8597459	4,59	47	91	6
8597414	4,14	43	87	6	62546	4,6	47	91	6
8597415	4,15	43	87	6	8597461	4,61	47	91	6
8597416	4,16	43	87	6	8597462	4,62	47	91	6
8597417	4,17	43	87	6	8597463	4,63	47	91	6
8597418	4,18	43	87	6	8597464	4,64	47	91	6
8597419	4,19	43	87	6	8597465	4,65	47	91	6
62542	4,2	43	87	6	8597466	4,66	47	91	6
8597421	4,21	43	87	6	8597467	4,67	47	91	6
8597422	4,22	43	87	6	8597468	4,68	47	91	6
8597423	4,23	43	87	6	8597469	4,69	47	91	6
8597424	4,24	43	87	6	62547	4,7	47	91	6
8597425	4,25	43	87	6	8597471	4,71	47	91	6
8597426	4,26	47	91	6	8597472	4,72	47	91	6
8597427	4,27	47	91	6	8597473	4,73	47	91	6
8597428	4,28	47	91	6	8597474	4,74	47	91	6
8597429	4,29	47	91	6	8597475	4,75	47	91	6



# EX-SUS-GDR

Drilling | HSS | 5xD



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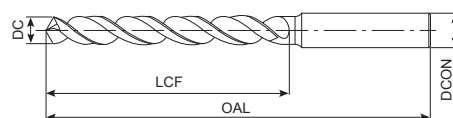
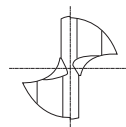


EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8597476	4,76	52	96	6	8597522	5,22	52	96	6
8597477	4,77	52	96	6	8597523	5,23	52	96	6
8597478	4,78	52	96	6	8597524	5,24	52	96	6
8597479	4,79	52	96	6	8597525	5,25	52	96	6
62548	4,8	52	96	6	8597526	5,26	52	96	6
8597481	4,81	52	96	6	8597527	5,27	52	96	6
8597482	4,82	52	96	6	8597528	5,28	52	96	6
8597483	4,83	52	96	6	8597529	5,29	52	96	6
8597484	4,84	52	96	6	62553	5,3	52	96	6
8597485	4,85	52	96	6	8597531	5,31	57	101	6
8597486	4,86	52	96	6	8597532	5,32	57	101	6
8597487	4,87	52	96	6	8597533	5,33	57	101	6
8597488	4,88	52	96	6	8597534	5,34	57	101	6
8597489	4,89	52	96	6	8597535	5,35	57	101	6
62549	4,9	52	96	6	8597536	5,36	57	101	6
8597491	4,91	52	96	6	8597537	5,37	57	101	6
8597492	4,92	52	96	6	8597538	5,38	57	101	6
8597493	4,93	52	96	6	8597539	5,39	57	101	6
8597494	4,94	52	96	6	62554	5,4	57	101	6
8597495	4,95	52	96	6	8597541	5,41	57	101	6
8597496	4,96	52	96	6	8597542	5,42	57	101	6
8597497	4,97	52	96	6	8597543	5,43	57	101	6
8597498	4,98	52	96	6	8597544	5,44	57	101	6
8597499	4,99	52	96	6	8597545	5,45	57	101	6
62550	5	52	96	6	8597546	5,46	57	101	6
8597501	5,01	52	96	6	8597547	5,47	57	101	6
8597502	5,02	52	96	6	8597548	5,48	57	101	6
8597503	5,03	52	96	6	8597549	5,49	57	101	6
8597504	5,04	52	96	6	62555	5,5	57	101	6
8597505	5,05	52	96	6	8597551	5,51	57	101	6
8597506	5,06	52	96	6	8597552	5,52	57	101	6
8597507	5,07	52	96	6	8597553	5,53	57	101	6
8597508	5,08	52	96	6	8597554	5,54	57	101	6
8597509	5,09	52	96	6	8597555	5,55	57	101	6
62551	5,1	52	96	6	8597556	5,56	57	101	6
8597511	5,11	52	96	6	8597557	5,57	57	101	6
8597512	5,12	52	96	6	8597558	5,58	57	101	6
8597513	5,13	52	96	6	8597559	5,59	57	101	6
8597514	5,14	52	96	6	62556	5,6	57	101	6
8597515	5,15	52	96	6	8597561	5,61	57	101	6
8597516	5,16	52	96	6	8597562	5,62	57	101	6
8597517	5,17	52	96	6	8597563	5,63	57	101	6
8597518	5,18	52	96	6	8597564	5,64	57	101	6
8597519	5,19	52	96	6	8597565	5,65	57	101	6
62552	5,2	52	96	6	8597566	5,66	57	101	6
8597521	5,21	52	96	6	8597567	5,67	57	101	6

Drilling | HSS  
5xD

# EX-SUS-GDR

Drilling | HSS | 5xD



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Drilling | HSS

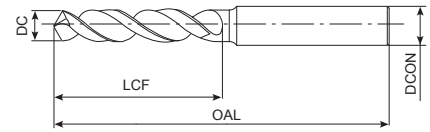
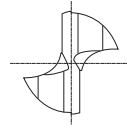
5xD

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8597568	5,68	57	101	6	62574	7,4	69	113	8
8597569	5,69	57	101	6	62575	7,5	69	113	8
62557	5,7	57	101	6	62576	7,6	75	119	8
8597571	5,71	57	101	6	62577	7,7	75	119	8
8597572	5,72	57	101	6	62578	7,8	75	119	8
8597573	5,73	57	101	6	62579	7,9	75	119	8
8597574	5,74	57	101	6	62580	8	75	119	8
8597575	5,75	57	101	6	62581	8,1	75	125	10
8597576	5,76	57	101	6	62582	8,2	75	125	10
8597577	5,77	57	101	6	62583	8,3	75	125	10
8597578	5,78	57	101	6	62584	8,4	75	125	10
8597579	5,79	57	101	6	62585	8,5	75	125	10
62558	5,8	57	101	6	62586	8,6	81	131	10
8597581	5,81	57	101	6	62587	8,7	81	131	10
8597582	5,82	57	101	6	62588	8,8	81	131	10
8597583	5,83	57	101	6	62589	8,9	81	131	10
8597584	5,84	57	101	6	62590	9	81	131	10
8597585	5,85	57	101	6	62591	9,1	81	131	10
8597586	5,86	57	101	6	62592	9,2	81	131	10
8597587	5,87	57	101	6	62593	9,3	81	131	10
8597588	5,88	57	101	6	62594	9,4	81	131	10
8597589	5,89	57	101	6	62595	9,5	81	131	10
62559	5,9	57	101	6	62596	9,6	87	137	10
8597591	5,91	57	101	6	62597	9,7	87	137	10
8597592	5,92	57	101	6	62598	9,8	87	137	10
8597593	5,93	57	101	6	62599	9,9	87	137	10
8597594	5,94	57	101	6	62600	10	87	137	10
8597595	5,95	57	101	6	62601	10,1	87	144	12
8597596	5,96	57	101	6	62602	10,2	87	144	12
8597597	5,97	57	101	6	62603	10,3	87	144	12
8597598	5,98	57	101	6	62604	10,4	87	144	12
8597599	5,99	57	101	6	62605	10,5	87	144	12
62560	6	57	101	6	62606	10,6	87	144	12
62561	6,1	63	107	8	62607	10,7	94	151	12
62562	6,2	63	107	8	62608	10,8	94	151	12
62563	6,3	63	107	8	62609	10,9	94	151	12
62564	6,4	63	107	8	62610	11	94	151	12
62565	6,5	63	107	8	62611	11,1	94	151	12
62566	6,6	63	107	8	62612	11,2	94	151	12
62567	6,7	63	107	8	62613	11,3	94	151	12
62568	6,8	69	113	8	62614	11,4	94	151	12
62569	6,9	69	113	8	62615	11,5	94	151	12
62570	7	69	113	8	62616	11,6	94	151	12
62571	7,1	69	113	8	62617	11,7	94	151	12
62572	7,2	69	113	8	62618	11,8	94	151	12
62573	7,3	69	113	8	62619	11,9	101	158	12



# EX-GDS

Drilling | HSS | 3xD



- HSS-E drill with TiN coating
- Up to 3xD
- General purpose
- 193 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>K</b> ● GG	<b>K</b> ○ GGG	<b>N</b> ○ AC, ADC	<b>S</b> ○ Ni	<b>H</b> ● 25-35 HRC	<b>H</b> ● 35-45 HRC
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HSS-Co	TiN	25°	h7	h8
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Drilling | HSS

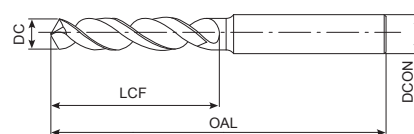
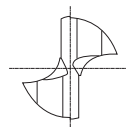
3xD

EDP	DC	LCF	OAL	DCON
60010	1	6	38	3
60410	1,05	6	38	3
60011	1,1	7	39	3
60411	1,15	7	39	3
60012	1,2	8	40	3
60412	1,25	8	40	3
60013	1,3	8	40	3
60413	1,35	9	41	3
60014	1,4	9	41	3
60414	1,45	9	41	3
60015	1,5	9	41	3
60415	1,55	10	42	3
60016	1,6	10	42	3
60416	1,65	10	42	3
60017	1,7	10	42	3
60417	1,75	11	43	3
60018	1,8	11	43	3
60418	1,85	11	43	3
60019	1,9	11	43	3
60419	1,95	12	44	3
60020	2	12	44	3
60420	2,05	12	44	3
60021	2,1	12	44	3
60421	2,15	13	45	3
60022	2,2	13	45	3
60422	2,25	13	45	3
60023	2,3	13	45	3
60423	2,35	13	45	3
60024	2,4	14	46	3
60424	2,45	14	46	3
60025	2,5	14	46	3
60425	2,55	14	46	3
60026	2,6	14	46	3
60426	2,65	14	46	3
60027	2,7	16	48	3
60427	2,75	16	48	3
60028	2,8	16	48	3
60428	2,85	16	48	3
60029	2,9	16	48	3
60429	2,95	16	48	3
60030	3	16	48	3
60430	3,05	18	50	4
60031	3,1	18	50	4
60431	3,15	18	50	4
60032	3,2	18	50	4
60432	3,25	18	50	4

EDP	DC	LCF	OAL	DCON
60033	3,3	18	50	4
60433	3,35	18	50	4
60034	3,4	20	52	4
60434	3,45	20	52	4
60035	3,5	20	52	4
60435	3,55	20	52	4
60036	3,6	20	52	4
60436	3,65	20	52	4
60037	3,7	20	52	4
60437	3,75	20	52	4
60038	3,8	22	54	4
60438	3,85	22	54	4
60039	3,9	22	54	4
60439	3,95	22	54	4
60040	4	22	54	4
60440	4,05	22	66	6
60041	4,1	22	66	6
60441	4,15	22	66	6
60042	4,2	22	66	6
60442	4,25	22	66	6
60043	4,3	24	68	6
60443	4,35	24	68	6
60044	4,4	24	68	6
60444	4,45	24	68	6
60045	4,5	24	68	6
60445	4,55	24	68	6
60046	4,6	24	68	6
60446	4,65	24	68	6
60047	4,7	24	68	6
60447	4,75	24	68	6
60048	4,8	26	70	6
60448	4,85	26	70	6
60049	4,9	26	70	6
60449	4,95	26	70	6
60050	5	26	70	6
60450	5,05	26	70	6
60051	5,1	26	70	6
60451	5,15	26	70	6
60052	5,2	26	70	6
60452	5,25	26	70	6
60053	5,3	26	70	6
60453	5,35	28	72	6
60054	5,4	28	72	6
60454	5,45	28	72	6
60055	5,5	28	72	6
60455	5,55	28	72	6

# EX-GDS

Drilling | HSS | 3xD



- HSSE drill with TiN coating
- Up to 3xD
- General purpose
- 193 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>K</b> ● GG	<b>K</b> ○ GGG	<b>N</b> ○ AC, ADC	<b>S</b> ○ Ni	<b>H</b> ● 25-35 HRC	<b>H</b> ● 35-45 HRC
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<b>HSS-Co</b>	<b>TiN</b>	<b>25°</b>	<b>h7</b>	<b>h8</b>
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EDP	DC	LCF	OAL	DCON
60056	5,6	28	72	6
60456	5,65	28	72	6
60057	5,7	28	72	6
60457	5,75	28	72	6
60058	5,8	28	72	6
60458	5,85	28	72	6
60059	5,9	28	72	6
60459	5,95	28	72	6
60060	6	28	72	6
60061	6,1	31	75	8
60062	6,2	31	75	8
60063	6,3	31	75	8
60064	6,4	31	75	8
60065	6,5	31	75	8
60465	6,55	31	75	8
60066	6,6	31	75	8
60466	6,65	31	75	8
60067	6,7	31	75	8
60068	6,8	34	78	8
60069	6,9	34	78	8
60070	7	34	78	8
60071	7,1	34	78	8
60072	7,2	34	78	8
60073	7,3	34	78	8
60473	7,35	34	78	8
60074	7,4	34	78	8
60075	7,5	34	78	8
60475	7,55	37	81	8
60076	7,6	37	81	8
60476	7,65	37	81	8
60077	7,7	37	81	8
60078	7,8	37	81	8
60079	7,9	37	81	8
60080	8	37	81	8
60081	8,1	37	87	10
60082	8,2	37	87	10
60083	8,3	37	87	10
60483	8,35	37	87	10
60084	8,4	37	87	10
60085	8,5	37	87	10
60485	8,55	40	90	10
60086	8,6	40	90	10
60486	8,65	40	90	10
60087	8,7	40	90	10
60088	8,8	40	90	10
60089	8,9	40	90	10

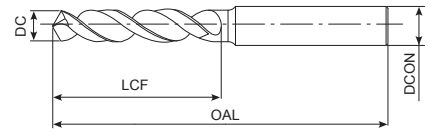
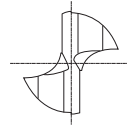
EDP	DC	LCF	OAL	DCON
60090	9	40	90	10
60091	9,1	40	90	10
60092	9,2	40	90	10
60492	9,25	40	90	10
60093	9,3	40	90	10
60493	9,35	40	90	10
60094	9,4	40	90	10
60494	9,45	40	90	10
60095	9,5	40	90	10
60495	9,55	43	93	10
60096	9,6	43	93	10
60496	9,65	43	93	10
60097	9,7	43	93	10
60098	9,8	43	93	10
60099	9,9	43	93	10
60499	9,95	43	93	10
60100	10	43	93	10
60101	10,1	43	100	12
60102	10,2	43	100	12
62002	10,25	43	100	12
60103	10,3	43	100	12
62003	10,35	43	100	12
60104	10,4	43	100	12
60105	10,5	43	100	12
62005	10,55	43	100	12
60106	10,6	43	100	12
62006	10,65	47	104	12
60107	10,7	47	104	12
60108	10,8	47	104	12
60109	10,9	47	104	12
62009	10,95	47	104	12
60110	11	47	104	12
60111	11,1	47	104	12
60112	11,2	47	104	12
62012	11,25	47	104	12
60113	11,3	47	104	12
62013	11,35	47	104	12
60114	11,4	47	104	12
60115	11,5	47	104	12
62015	11,55	47	104	12
60116	11,6	47	104	12
60117	11,7	47	104	12
60118	11,8	47	104	12
60119	11,9	51	108	12
60120	12	51	108	12
60121	12,1	51	108	12

Drilling | HSS  
3xD



# EX-GDS

Drilling | HSS | 3xD



- HSE drill with TiN coating
- Up to 3xD
- General purpose
- 193 sizes

P	P	P	P	K	K	N	S	H	H
$C < 0,2\%$	$0,25 < C < 0,4$	$C \geq 0,45\%$	SCM	GG	GGG	AC, ADC	Ni	25-35 HRC	35-45 HRC

HSS-Co	TiN	25°	h7	h8
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Drilling | HSS



3xD

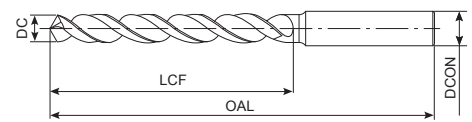
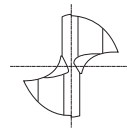
EDP	DC	LCF	OAL	DCON
60122	12,2	51	108	12
60123	12,3	51	108	12
60124	12,4	51	108	12
60125	12,5	51	108	12
60126	12,6	51	108	12
60127	12,7	51	108	12
60128	12,8	51	108	12
60129	12,9	51	108	12
60130	13	51	108	12

EDP	DC	LCF	OAL	DCON

B

# EX-GDR

Drilling | HSS | 5xD



- HSSE drill with TiN coating
- Up to 5xD
- General purpose
- 249 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>K</b> ● GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>H</b> ○ 25-35 HRC
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HSS-Co	TiN	30°	h7 D > 13	h7 D ≤ 13	h8
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B.609
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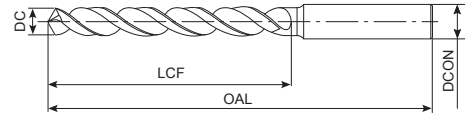
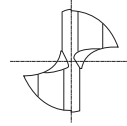
EDP	DC	LCF	OAL	DCON
60520	2	24	56	3
62120	2,05	24	56	3
60521	2,1	24	56	3
62121	2,15	27	59	3
60522	2,2	27	59	3
62122	2,25	27	59	3
60523	2,3	27	59	3
62123	2,35	27	59	3
60524	2,4	30	62	3
62124	2,45	30	62	3
60525	2,5	30	62	3
62125	2,55	30	62	3
60526	2,6	30	62	3
62126	2,65	30	62	3
60527	2,7	33	65	3
62127	2,75	33	65	3
60528	2,8	33	65	3
62128	2,85	33	65	3
60529	2,9	33	65	3
62129	2,95	33	65	3
60530	3	33	65	3
62130	3,05	36	68	4
60531	3,1	36	68	4
62131	3,15	36	68	4
60532	3,2	36	68	4
62132	3,25	36	68	4
60533	3,3	36	68	4
62133	3,35	36	68	4
60534	3,4	39	71	4
62134	3,45	39	71	4
60535	3,5	39	71	4
62135	3,55	39	71	4
60536	3,6	39	71	4
62136	3,65	39	71	4
60537	3,7	39	71	4
62137	3,75	39	71	4
60538	3,8	43	75	4
62138	3,85	43	75	4
60539	3,9	43	75	4
62139	3,95	43	75	4
60540	4	43	75	4
62140	4,05	43	87	6
60541	4,1	43	87	6
62141	4,15	43	87	6
60542	4,2	43	87	6
62142	4,25	43	87	6

EDP	DC	LCF	OAL	DCON
60543	4,3	47	91	6
62143	4,35	47	91	6
60544	4,4	47	91	6
62144	4,45	47	91	6
60545	4,5	47	91	6
62145	4,55	47	91	6
60546	4,6	47	91	6
62146	4,65	47	91	6
60547	4,7	47	91	6
62147	4,75	47	91	6
60548	4,8	52	96	6
62148	4,85	52	96	6
60549	4,9	52	96	6
62149	4,95	52	96	6
60550	5	52	96	6
62150	5,05	52	96	6
60551	5,1	52	96	6
62151	5,15	52	96	6
60552	5,2	52	96	6
62152	5,25	52	96	6
60553	5,3	52	96	6
62153	5,35	57	101	6
60554	5,4	57	101	6
62154	5,45	57	101	6
60555	5,5	57	101	6
62155	5,55	57	101	6
60556	5,6	57	101	6
62156	5,65	57	101	6
60557	5,7	57	101	6
62157	5,75	57	101	6
60558	5,8	57	101	6
62158	5,85	57	101	6
60559	5,9	57	101	6
62159	5,95	57	101	6
60560	6	57	101	6
62160	6,05	63	107	8
60561	6,1	63	107	8
62161	6,15	63	107	8
60562	6,2	63	107	8
62162	6,25	63	107	8
60563	6,3	63	107	8
62163	6,35	63	107	8
60564	6,4	63	107	8
62164	6,45	63	107	8
60565	6,5	63	107	8
62165	6,55	63	107	8

Drilling | HSS  
5xD

# EX-GDR

Drilling | HSS | 5xD



- HSS-E drill with TiN coating
- Up to 5xD
- General purpose
- 249 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>K</b> ● GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>H</b> ○ 25-35 HRC
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HSS-Co	TiN	30°	h7 D > 13	h7 D ≤ 13	h8
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Drilling | HSS

5xD

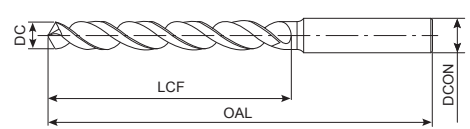
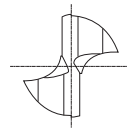
EDP	DC	LCF	OAL	DCON
60566	6,6	63	107	8
62166	6,65	63	107	8
60567	6,7	63	107	8
62167	6,75	69	113	8
60568	6,8	69	113	8
62168	6,85	69	113	8
60569	6,9	69	113	8
62169	6,95	69	113	8
60570	7	69	113	8
62170	7,05	69	113	8
60571	7,1	69	113	8
62171	7,15	69	113	8
60572	7,2	69	113	8
62172	7,25	69	113	8
60573	7,3	69	113	8
62173	7,35	69	113	8
60574	7,4	69	113	8
62174	7,45	69	113	8
60575	7,5	69	113	8
62175	7,55	75	119	8
60576	7,6	75	119	8
62176	7,65	75	119	8
60577	7,7	75	119	8
62177	7,75	75	119	8
60578	7,8	75	119	8
62178	7,85	75	119	8
60579	7,9	75	119	8
62179	7,95	75	119	8
60580	8	75	119	8
62180	8,05	75	125	10
60581	8,1	75	125	10
62181	8,15	75	125	10
60582	8,2	75	125	10
62182	8,25	75	125	10
60583	8,3	75	125	10
62183	8,35	75	125	10
60584	8,4	75	125	10
62184	8,45	75	125	10
60585	8,5	75	125	10
62185	8,55	81	131	10
60586	8,6	81	131	10
62186	8,65	81	131	10
60587	8,7	81	131	10
62187	8,75	81	131	10
60588	8,8	81	131	10
62188	8,85	81	131	10

EDP	DC	LCF	OAL	DCON
60589	8,9	81	131	10
62189	8,95	81	131	10
60590	9	81	131	10
62190	9,05	81	131	10
60591	9,1	81	131	10
62191	9,15	81	131	10
60592	9,2	81	131	10
62192	9,25	81	131	10
60593	9,3	81	131	10
62193	9,35	81	131	10
60594	9,4	81	131	10
62194	9,45	81	131	10
60595	9,5	81	131	10
62195	9,55	87	137	10
60596	9,6	87	137	10
62196	9,65	87	137	10
60597	9,7	87	137	10
62197	9,75	87	137	10
60598	9,8	87	137	10
62198	9,85	87	137	10
60599	9,9	87	137	10
62199	9,95	87	137	10
60600	10	87	137	10
62200	10,05	87	144	12
60601	10,1	87	144	12
62201	10,15	87	144	12
60602	10,2	87	144	12
62202	10,25	87	144	12
60603	10,3	87	144	12
62203	10,35	87	144	12
60604	10,4	87	144	12
62204	10,45	87	144	12
60605	10,5	87	144	12
62205	10,55	87	144	12
60606	10,6	87	144	12
62206	10,65	94	151	12
60607	10,7	94	151	12
62207	10,75	94	151	12
60608	10,8	94	151	12
62208	10,85	94	151	12
60609	10,9	94	151	12
62209	10,95	94	151	12
60610	11	94	151	12
62210	11,05	94	151	12
60611	11,1	94	151	12
62211	11,15	94	151	12



# EX-GDR

Drilling | HSS | 5xD



- HSSE drill with TiN coating
- Up to 5xD
- General purpose
- 249 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>K</b> ● GG	<b>K</b> ○ GGG	<b>N</b> ○ Al	<b>N</b> ○ AC, ADC	<b>H</b> ○ 25-35 HRC
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HSS-Co	TiN	30°	h7 D > 13	h7 D ≤ 13	h8
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EDP	DC	LCF	OAL	DCON
60612	11,2	94	151	12
62212	11,25	94	151	12
60613	11,3	94	151	12
62213	11,35	94	151	12
60614	11,4	94	151	12
62214	11,45	94	151	12
60615	11,5	94	151	12
62215	11,55	94	151	12
60616	11,6	94	151	12
62216	11,65	94	151	12
60617	11,7	94	151	12
62217	11,75	94	151	12
60618	11,8	94	151	12
62218	11,85	101	158	12
60619	11,9	101	158	12
62219	11,95	101	158	12
60620	12	101	158	12
60621	12,1	101	158	12
60622	12,2	101	158	12
60623	12,3	101	158	12
60624	12,4	101	158	12
60625	12,5	101	158	12
60626	12,6	101	158	12
60627	12,7	101	158	12
60628	12,8	101	158	12
60629	12,9	101	158	12
60630	13	101	158	12
60635	13,5	90	150	16
60640	14	90	150	16
60641	14,1	95	155	16
60645	14,5	95	155	16
60650	15	95	161	20
60655	15,5	100	166	20
60656	15,6	100	166	20
60660	16	100	166	20
60665	16,5	106	172	20
60670	17	106	172	20
60675	17,5	112	178	20
60676	17,6	112	178	20
60680	18	112	178	20
60685	18,5	118	184	20
60690	19	118	194	25
60695	19,5	125	201	25
60696	19,6	125	201	25
60700	20	125	201	25
60705	20,5	128	204	25

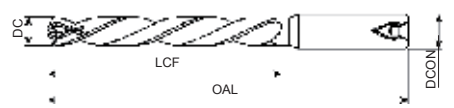
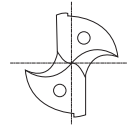
EDP	DC	LCF	OAL	DCON
60710	21	128	204	25
60711	21,1	128	204	25
60715	21,5	132	208	25
60720	22	132	208	25
60725	22,5	136	212	25
60730	23	136	212	25
60735	23,5	136	212	25
60740	24	140	220	32
60745	24,5	140	220	32
60750	25	140	220	32
60755	25,5	145	225	32
60760	26	145	225	32
60765	26,5	145	225	32
60770	27	150	230	32
60780	28	150	230	32
60790	29	155	235	32
60800	30	155	235	32
60810	31	160	241	32
60820	32	165	245	32

Drilling | HSS  
5xD



# V-HDO-GDR

Drilling | HSS | 5xD



- HSS-Co drill with internal coolant, TiCN coating
- Up to 5xD
- General purpose
- 96 sizes



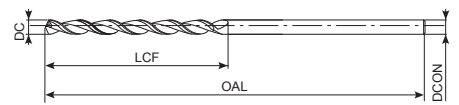
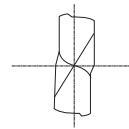
Drilling | HSS  
5xD

EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
43040600	6	57	101	6	43041060	10,6	87	144	11
43040610	6,1	63	107	6	43041070	10,7	94	151	11
43040620	6,2	63	107	6	43041080	10,8	94	151	11
43040630	6,3	63	107	6	43041090	10,9	94	151	11
43040640	6,4	63	107	6	43041100	11	94	151	11
43040650	6,5	63	107	6	43041110	11,1	94	151	12
43040660	6,6	63	107	7	43041120	11,2	94	151	12
43040670	6,7	63	107	7	43041130	11,3	94	151	12
43040680	6,8	69	113	7	43041140	11,4	94	151	12
43040690	6,9	69	113	7	43041150	11,5	94	151	12
43040700	7	69	113	7	43041160	11,6	94	151	12
43040710	7,1	69	113	8	43041170	11,7	94	151	12
43040720	7,2	69	113	8	43041180	11,8	94	151	12
43040730	7,3	69	113	8	43041190	11,9	101	158	12
43040740	7,4	69	113	8	43041200	12	101	158	12
43040750	7,5	69	113	8	43041250	12,5	80	140	16
43040760	7,6	75	119	8	43041300	13	85	145	16
43040770	7,7	75	119	8	43041350	13,5	90	150	16
43040780	7,8	75	119	8	43041400	14	90	150	16
43040790	7,9	75	119	8	43041450	14,5	95	155	16
43040800	8	75	119	8	43041500	15	95	161	20
43040810	8,1	75	125	9	43041550	15,5	100	166	20
43040820	8,2	75	125	9	43041600	16	100	166	20
43040830	8,3	75	125	9	43041650	16,5	106	172	20
43040840	8,4	75	125	9	43041700	17	106	172	20
43040850	8,5	75	125	9	43041750	17,5	112	178	20
43040860	8,6	81	131	9	43041800	18	112	178	20
43040870	8,7	81	131	9	43041850	18,5	118	184	20
43040880	8,8	81	131	9	43041900	19	118	194	25
43040890	8,9	81	131	9	43041950	19,5	125	201	25
43040900	9	81	131	9	43042000	20	125	201	25
43040910	9,1	81	131	10	43042050	20,5	128	204	25
43040920	9,2	81	131	10	43042100	21	128	204	25
43040930	9,3	81	131	10	43042150	21,5	132	208	25
43040940	9,4	81	131	10	43042200	22	132	208	25
43040950	9,5	81	131	10	43042250	22,5	136	212	25
43040960	9,6	87	137	10	43042300	23	136	212	25
43040970	9,7	87	137	10	43042350	23,5	136	212	25
43040980	9,8	87	137	10	43042400	24	140	220	32
43040990	9,9	87	137	10	43042450	24,5	140	220	32
43041000	10	87	137	10	43042500	25	140	220	32
43041010	10,1	87	144	11	43042550	25,5	145	225	32
43041020	10,2	87	144	11	43042600	26	145	225	32
43041030	10,3	87	144	11	43042650	26,5	145	225	32
43041040	10,4	87	144	11	43042700	27	150	230	32
43041050	10,5	87	144	11	43042800	28	150	230	32



# TDXL-10D

Drilling | HSS | 10xD



- HSS-Co drill with WXL coating
- Up to 10xD
- For steels, cast iron and cast aluminium
- 103 sizes



Drilling | HSS

10xD

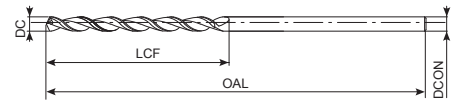
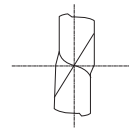
EDP	DC	LCF	OAL	DCON
8622816	1,6	26	70	1,6
8622818	1,8	26	75	1,8
8622820	2	26	75	2
8622821	2,1	33	75	2,1
8622822	2,2	33	75	2,2
8622823	2,3	33	75	2,3
8622824	2,4	33	75	2,4
8622825	2,5	33	75	2,5
8622826	2,6	40	90	2,6
8622827	2,7	40	90	2,7
8622828	2,8	40	90	2,8
8622829	2,9	40	90	2,9
8622830	3	40	90	3
8622831	3,1	45	100	3,1
8622832	3,2	45	100	3,2
8622833	3,3	45	100	3,3
8622834	3,4	50	100	3,4
8622835	3,5	50	100	3,5
8622836	3,6	50	100	3,6
8622837	3,7	50	100	3,7
8622838	3,8	50	100	3,8
8622839	3,9	50	100	3,9
8622840	4	50	100	4
8622841	4,1	55	115	4,1
8622842	4,2	55	115	4,2
8622843	4,3	60	115	4,3
8622844	4,4	60	115	4,4
8622845	4,5	60	115	4,5
8622846	4,6	60	115	4,6
8622847	4,7	60	115	4,7
8622848	4,8	65	115	4,8
8622849	4,9	65	115	4,9
8622850	5	65	115	5
8622851	5,1	70	128	5,1
8622852	5,2	70	128	5,2
8622853	5,3	70	128	5,3
8622854	5,4	78	128	5,4
8622855	5,5	78	128	5,5
8622856	5,6	78	128	5,6
8622857	5,7	78	128	5,7
8622858	5,8	78	128	5,8
8622859	5,9	78	128	5,9
8622860	6	78	128	6
8622861	6,1	87	140	6,1
8622862	6,2	87	140	6,2
8622863	6,3	87	140	6,3

EDP	DC	LCF	OAL	DCON
8622864	6,4	87	140	6,4
8622865	6,5	87	140	6,5
8622866	6,6	87	140	6,6
8622867	6,7	87	140	6,7
8622868	6,8	90	140	6,8
8622869	6,9	90	140	6,9
8622870	7	90	140	7
8622871	7,1	100	155	7,1
8622872	7,2	100	155	7,2
8622873	7,3	100	155	7,3
8622874	7,4	100	155	7,4
8622875	7,5	100	155	7,5
8622876	7,6	105	155	7,6
8622877	7,7	105	155	7,7
8622878	7,8	105	155	7,8
8622879	7,9	105	155	7,9
8622880	8	105	155	8
8622881	8,1	110	165	8,1
8622882	8,2	110	165	8,2
8622883	8,3	110	165	8,3
8622884	8,4	110	165	8,4
8622885	8,5	110	165	8,5
8622886	8,6	115	165	8,6
8622887	8,7	115	165	8,7
8622888	8,8	115	165	8,8
8622889	8,9	115	165	8,9
8622890	9	115	165	9
8622891	9,1	125	190	9,1
8622892	9,2	125	190	9,2
8622893	9,3	125	190	9,3
8622894	9,4	125	190	9,4
8622895	9,5	125	190	9,5
8622896	9,6	130	190	9,6
8622897	9,7	130	190	9,7
8622898	9,8	130	190	9,8
8622899	9,9	130	190	9,9
8622900	10	130	190	10
8622901	10,1	140	205	10,1
8622902	10,2	140	205	10,2
8622903	10,3	140	205	10,3
8622904	10,4	140	205	10,4
8622905	10,5	140	205	10,5
8622906	10,6	145	205	10,6
8622907	10,7	145	205	10,7
8622908	10,8	145	205	10,8
8622909	10,9	145	205	10,9



# TDXL-15D

Drilling | HSS | 15xD



- HSS-Co drill with WXL coating
- Up to 15xD
- For steels, cast iron and cast aluminium
- 68 sizes



Drilling | HSS

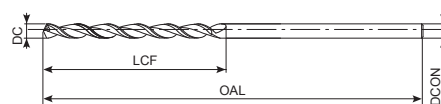
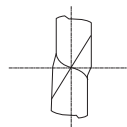
15xD

EDP	DC	LCF	OAL	DCON
8623016	1,6	30	70	1,6
8623018	1,8	34	75	1,8
8623020	2	36	80	2
8623021	2,1	38	80	2,1
8623022	2,2	40	80	2,2
8623023	2,3	42	85	2,3
8623024	2,4	44	85	2,4
8623025	2,5	46	85	2,5
8623026	2,6	48	100	2,6
8623027	2,7	50	100	2,7
8623028	2,8	50	100	2,8
8623029	2,9	54	105	2,9
8623030	3	54	105	3
8623031	3,1	56	110	3,1
8623032	3,2	58	110	3,2
8623033	3,3	60	110	3,3
8623034	3,4	62	115	3,4
8623035	3,5	64	115	3,5
8623036	3,6	66	115	3,6
8623037	3,7	68	120	3,7
8623038	3,8	70	120	3,8
8623039	3,9	70	120	3,9
8623040	4	72	120	4
8623041	4,1	74	135	4,1
8623042	4,2	76	135	4,2
8623043	4,3	78	140	4,3
8623044	4,4	80	140	4,4
8623045	4,5	82	140	4,5
8623046	4,6	84	145	4,6
8623047	4,7	86	145	4,7
8623048	4,8	86	145	4,8
8623049	4,9	88	150	4,9
8623050	5	90	150	5
8623051	5,1	92	150	5,1
8623052	5,2	94	155	5,2
8623053	5,3	96	155	5,3
8623054	5,4	98	155	5,4
8623055	5,5	100	155	5,5
8623056	5,6	102	160	5,6
8623057	5,7	104	165	5,7
8623058	5,8	106	165	5,8
8623060	6	108	170	6
8623062	6,2	112	170	6,2
8623063	6,3	114	175	6,3
8623065	6,5	118	200	6,5
8623066	6,6	120	200	6,6

EDP	DC	LCF	OAL	DCON
8623068	6,8	124	200	6,8
8623069	6,9	126	200	6,9
8623070	7	126	200	7
8623071	7,1	128	200	7,1
8623075	7,5	136	205	7,5
8623080	8	144	215	8
8623081	8,1	146	215	8,1
8623082	8,2	148	220	8,2
8623085	8,5	154	225	8,5
8623086	8,6	156	225	8,6
8623088	8,8	160	230	8,8
8623090	9	162	230	9
8623093	9,3	168	240	9,3
8623095	9,5	172	240	9,5
8623097	9,7	176	245	9,7
8623098	9,8	178	245	9,8
8623100	10	180	250	10
8623105	10,5	190	270	10,5
8623110	11	200	280	11
8623115	11,5	208	290	11,5
8623118	11,8	214	295	11,8
8623120	12	216	300	12

# TDXL-20D

Drilling | HSS | 20xD



- HSS-Co drill with WXL coating
- Up to 20xD
- For steels, cast iron and cast aluminium
- 48 sizes



EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8623216	1,6	38	85	1,6	8623310	11	254	350	11
8623218	1,8	42	85	1,8	8623320	12	276	350	12
8623220	2	46	85	2					
8623221	2,1	50	90	2,1					
8623222	2,2	52	90	2,2					
8623223	2,3	54	95	2,3					
8623224	2,4	56	95	2,4					
8623225	2,5	58	100	2,5					
8623226	2,6	60	110	2,6					
8623227	2,7	64	115	2,7					
8623228	2,8	66	115	2,8					
8623229	2,9	68	120	2,9					
8623230	3	70	120	3					
8623231	3,1	72	125	3,1					
8623232	3,2	74	125	3,2					
8623233	3,3	76	125	3,3					
8623234	3,4	80	130	3,4					
8623235	3,5	82	130	3,5					
8623237	3,7	86	135	3,7					
8623238	3,8	88	140	3,8					
8623240	4	92	140	4					
8623241	4,1	96	155	4,1					
8623242	4,2	98	155	4,2					
8623243	4,3	100	160	4,3					
8623245	4,5	104	165	4,5					
8623246	4,6	106	165	4,6					
8623248	4,8	112	170	4,8					
8623250	5	116	175	5					
8623251	5,1	118	180	5,1					
8623252	5,2	120	180	5,2					
8623255	5,5	128	185	5,5					
8623257	5,7	132	190	5,7					
8623258	5,8	134	200	5,8					
8623260	6	138	200	6					
8623263	6,3	146	200	6,3					
8623265	6,5	150	225	6,5					
8623268	6,8	158	225	6,8					
8623269	6,9	160	230	6,9					
8623270	7	162	230	7					
8623275	7,5	174	245	7,5					
8623280	8	184	255	8					
8623281	8,1	188	255	8,1					
8623282	8,2	190	260	8,2					
8623285	8,5	196	265	8,5					
8623290	9	208	275	9					
8623300	10	230	300	10					

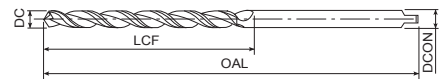
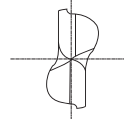
Drilling | HSS  
20xD



B

# EX-GDXL-8D

Drilling | HSS | 8xD



- HSS-Co drill with TiN coating
- Up to 8xD
- For general purpose steels and cast iron
- 21 sizes



Drilling | HSS

8xD

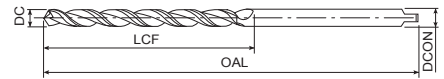
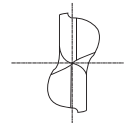
EDP	DC	LCF	OAL	DCON
8592110	11	120	200	11
8592111	11,1	120	200	11,1
8592112	11,2	120	200	11,2
8592113	11,3	120	200	11,3
8592114	11,4	120	200	11,4
8592115	11,5	120	200	11,5
8592116	11,6	120	200	11,6
8592117	11,7	120	200	11,7
8592118	11,8	120	200	11,8
8592119	11,9	120	200	11,9
8592120	12	120	200	12
8592121	12,1	120	200	12,1
8592122	12,2	120	200	12,2
8592123	12,3	120	200	12,3
8592124	12,4	120	200	12,4
8592125	12,5	120	200	12,5
8592126	12,6	120	200	12,6
8592127	12,7	120	200	12,7
8592128	12,8	120	200	12,8
8592129	12,9	120	200	12,9
8592130	13	120	200	13

EDP	DC	LCF	OAL	DCON



# EX-GDXL-10D

Drilling | HSS | 10xD



- HSS-Co drill with TiN coating
- Up to 10xD
- For general purpose steels and cast iron
- 89 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>K</b> ● GG	<b>K</b> ● GGG	<b>N</b> ○ AC, ADC	<b>H</b> ○ 25-35 HRC
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HSS-Co	TiN	38°		130°	h8
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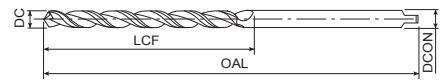
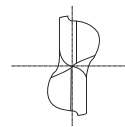
 B.610
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EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8591036	3,6	55	100	3,6	8592088	8,8	115	200	8,8
8591037	3,7	55	100	3,7	8592089	8,9	115	200	8,9
8591038	3,8	55	100	3,8	8592090	9	115	200	9
8591039	3,9	55	100	3,9	8592091	9,1	115	200	9,1
8591040	4	60	100	4	8592092	9,2	115	200	9,2
8591041	4,1	60	100	4,1	8592093	9,3	115	200	9,3
8591042	4,2	60	100	4,2	8592094	9,4	115	200	9,4
8591043	4,3	60	100	4,3	8592095	9,5	115	200	9,5
8591044	4,4	60	100	4,4	8592096	9,6	115	200	9,6
8591045	4,5	60	100	4,5	8592097	9,7	115	200	9,7
8591046	4,6	60	100	4,6	8592098	9,8	115	200	9,8
8591553	5,3	85	150	5,3	8592099	9,9	115	200	9,9
8591554	5,4	85	150	5,4	8592100	10	120	200	10
8591555	5,5	85	150	5,5	8592101	10,1	120	200	10,1
8591556	5,6	85	150	5,6	8592102	10,2	120	200	10,2
8591557	5,7	85	150	5,7	8592103	10,3	120	200	10,3
8591558	5,8	85	150	5,8	8592104	10,4	120	200	10,4
8591559	5,9	85	150	5,9	8592105	10,5	120	200	10,5
8591560	6	90	150	6	8592106	10,6	120	200	10,6
8591561	6,1	90	150	6,1	8592107	10,7	120	200	10,7
8591562	6,2	90	150	6,2	8592108	10,8	120	200	10,8
8591563	6,3	90	150	6,3	8592109	10,9	120	200	10,9
8591564	6,4	90	150	6,4	8604110	11	160	250	11
8591565	6,5	90	150	6,5	8604111	11,1	160	250	11,1
8591566	6,6	90	150	6,6	8604112	11,2	160	250	11,2
8591567	6,7	90	150	6,7	8604113	11,3	160	250	11,3
8591568	6,8	90	150	6,8	8604114	11,4	160	250	11,4
8591569	6,9	90	150	6,9	8604115	11,5	160	250	11,5
8591570	7	90	150	7	8604116	11,6	160	250	11,6
8591571	7,1	90	150	7,1	8604117	11,7	160	250	11,7
8591572	7,2	90	150	7,2	8604118	11,8	160	250	11,8
8591573	7,3	90	150	7,3	8604119	11,9	160	250	11,9
8591574	7,4	90	150	7,4	8604120	12	160	250	12
8591575	7,5	90	150	7,5	8604121	12,1	160	250	12,1
8592076	7,6	110	200	7,6	8604122	12,2	160	250	12,2
8592077	7,7	110	200	7,7	8604123	12,3	160	250	12,3
8592078	7,8	110	200	7,8	8604124	12,4	160	250	12,4
8592079	7,9	110	200	7,9	8604125	12,5	160	250	12,5
8592080	8	115	200	8	8604126	12,6	160	250	12,6
8592081	8,1	115	200	8,1	8604127	12,7	160	250	12,7
8592082	8,2	115	200	8,2	8604128	12,8	160	250	12,8
8592083	8,3	115	200	8,3	8604129	12,9	160	250	12,9
8592084	8,4	115	200	8,4	8604130	13	160	250	13
8592085	8,5	115	200	8,5					
8592086	8,6	115	200	8,6					
8592087	8,7	115	200	8,7					

Drilling | HSS  
10xD

# EX-GDXL-15D

Drilling | HSS | 15xD



- HSS-Co drill with TiN coating
- Up to 15xD
- For general purpose steels and cast iron
- 104 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>K</b> ● GG	<b>K</b> ● GGG	<b>N</b> ○ AC, ADC	<b>H</b> ○ 25-35 HRC
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HSS-Co	TiN	38°		130°	h8
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EDP	DC	LCF	OAL	DCON	EDP	DC	LCF	OAL	DCON
8590520	2	40	100	2	8592067	6,7	110	200	6,7
8590521	2,1	40	100	2,1	8592068	6,8	110	200	6,8
8590522	2,2	40	100	2,2	8592069	6,9	110	200	6,9
8590523	2,3	40	100	2,3	8592070	7	110	200	7
8590524	2,4	40	100	2,4	8592071	7,1	110	200	7,1
8591025	2,5	50	100	2,5	8592072	7,2	110	200	7,2
8591026	2,6	50	100	2,6	8592073	7,3	110	200	7,3
8591027	2,7	50	100	2,7	8592074	7,4	110	200	7,4
8591028	2,8	50	100	2,8	8592075	7,5	110	200	7,5
8591029	2,9	50	100	2,9	8604082	8,2	160	250	8,2
8591030	3	55	100	3	8604083	8,3	160	250	8,3
8591031	3,1	55	100	3,1	8604084	8,4	160	250	8,4
8591032	3,2	55	100	3,2	8604085	8,5	160	250	8,5
8591033	3,3	55	100	3,3	8604086	8,6	160	250	8,6
8591034	3,4	55	100	3,4	8604087	8,7	160	250	8,7
8591035	3,5	55	100	3,5	8604088	8,8	160	250	8,8
8591537	3,7	75	150	3,7	8604089	8,9	160	250	8,9
8591538	3,8	75	150	3,8	8604090	9	160	250	9
8591539	3,9	75	150	3,9	8604091	9,1	160	250	9,1
8591540	4	80	150	4	8604092	9,2	160	250	9,2
8591541	4,1	80	150	4,1	8604093	9,3	160	250	9,3
8591542	4,2	80	150	4,2	8604094	9,4	160	250	9,4
8591543	4,3	80	150	4,3	8604095	9,5	160	250	9,5
8591544	4,4	80	150	4,4	8604096	9,6	160	250	9,6
8591545	4,5	80	150	4,5	8604097	9,7	160	250	9,7
8591546	4,6	80	150	4,6	8604098	9,8	160	250	9,8
8591547	4,7	80	150	4,7	8604099	9,9	160	250	9,9
8591548	4,8	80	150	4,8	8604100	10	160	250	10
8591549	4,9	80	150	4,9	8604101	10,1	160	250	10,1
8591550	5	85	150	5	8604102	10,2	160	250	10,2
8591551	5,1	85	150	5,1	8604103	10,3	160	250	10,3
8591552	5,2	85	150	5,2	8604104	10,4	160	250	10,4
8592053	5,3	105	200	5,3	8604105	10,5	160	250	10,5
8592054	5,4	105	200	5,4	8604106	10,6	160	250	10,6
8592055	5,5	105	200	5,5	8604107	10,7	160	250	10,7
8592056	5,6	105	200	5,6	8604108	10,8	160	250	10,8
8592057	5,7	105	200	5,7	8604109	10,9	160	250	10,9
8592058	5,8	105	200	5,8	8604310	11	200	300	11
8592059	5,9	105	200	5,9	8604311	11,1	200	300	11,1
8592060	6	110	200	6	8604312	11,2	200	300	11,2
8592061	6,1	110	200	6,1	8604313	11,3	200	300	11,3
8592062	6,2	110	200	6,2	8604314	11,4	200	300	11,4
8592063	6,3	110	200	6,3	8604315	11,5	200	300	11,5
8592064	6,4	110	200	6,4	8604316	11,6	200	300	11,6
8592065	6,5	110	200	6,5	8604317	11,7	200	300	11,7
8592066	6,6	110	200	6,6	8604318	11,8	200	300	11,8

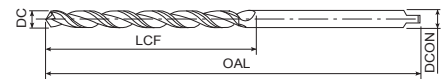
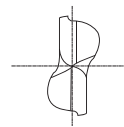
Drilling | HSS

15xD



# EX-GDXL-20D

Drilling | HSS | 20xD



- HSS-Co drill with TiN coating
- Up to 20xD
- For general purpose steels and cast iron
- 72 sizes

<b>P</b> ○ C < 0,2%	<b>P</b> ● 0,25 < C < 0,4	<b>P</b> ● C ≥ 0,45%	<b>P</b> ● SCM	<b>K</b> ● GG	<b>K</b> ● GGG	<b>N</b> ○ AC, ADC	<b>H</b> ○ 25-35 HRC
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HSS-Co	TiN	38°		130°	h8
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 B.610
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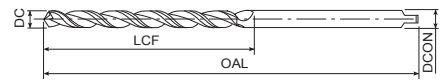
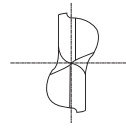
Drilling | HSS  
20xD

EDP	DC	LCF	OAL	DCON
8591020	2	50	100	2
8591021	2,1	50	100	2,1
8591022	2,2	50	100	2,2
8591023	2,3	50	100	2,3
8591024	2,4	50	100	2,4
8591530	3	75	150	3
8591531	3,1	75	150	3,1
8591532	3,2	75	150	3,2
8591533	3,3	75	150	3,3
8591534	3,4	75	150	3,4
8591535	3,5	75	150	3,5
8591536	3,6	75	150	3,6
8592040	4	100	200	4
8592041	4,1	100	200	4,1
8592042	4,2	100	200	4,2
8592043	4,3	100	200	4,3
8592044	4,4	100	200	4,4
8592045	4,5	100	200	4,5
8592046	4,6	100	200	4,6
8592047	4,7	100	200	4,7
8592048	4,8	100	200	4,8
8592049	4,9	100	200	4,9
8592050	5	105	200	5
8592051	5,1	105	200	5,1
8592052	5,2	105	200	5,2
8604063	6,3	160	250	6,3
8604064	6,4	160	250	6,4
8604065	6,5	160	250	6,5
8604066	6,6	160	250	6,6
8604067	6,7	160	250	6,7
8604068	6,8	160	250	6,8
8604069	6,9	160	250	6,9
8604070	7	160	250	7
8604071	7,1	160	250	7,1
8604072	7,2	160	250	7,2
8604073	7,3	160	250	7,3
8604074	7,4	160	250	7,4
8604075	7,5	160	250	7,5
8604076	7,6	160	250	7,6
8604077	7,7	160	250	7,7
8604078	7,8	160	250	7,8
8604079	7,9	160	250	7,9
8604080	8	160	250	8
8604081	8,1	160	250	8,1
8604282	8,2	200	300	8,2
8604283	8,3	200	300	8,3

EDP	DC	LCF	OAL	DCON
8604284	8,4	200	300	8,4
8604285	8,5	200	300	8,5
8604286	8,6	200	300	8,6
8604287	8,7	200	300	8,7
8604288	8,8	200	300	8,8
8604289	8,9	200	300	8,9
8604290	9	200	300	9
8604291	9,1	200	300	9,1
8604292	9,2	200	300	9,2
8604293	9,3	200	300	9,3
8604294	9,4	200	300	9,4
8604295	9,5	200	300	9,5
8604296	9,6	200	300	9,6
8604297	9,7	200	300	9,7
8604298	9,8	200	300	9,8
8604299	9,9	200	300	9,9
8604300	10	200	300	10
8604301	10,1	200	300	10,1
8604302	10,2	200	300	10,2
8604303	10,3	200	300	10,3
8604304	10,4	200	300	10,4
8604305	10,5	200	300	10,5
8604306	10,6	200	300	10,6
8604307	10,7	200	300	10,7
8604308	10,8	200	300	10,8
8604309	10,9	200	300	10,9

# EX-GDXL-25D

Drilling | HSS | 25xD



- HSS-Co drill with TiN coating
- Up to 25xD
- For general purpose steels and cast iron
- 36 sizes

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>K</b> GG	<b>K</b> GGG	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC
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<b>HSS-Co</b>	<b>TiN</b>	<b>38°</b>		<b>130°</b>	<b>h8</b>	<b>B.610</b>
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EDP	DC	LCF	OAL	DCON
8592033	3,3	100	200	3,3
8592034	3,4	100	200	3,4
8592035	3,5	100	200	3,5
8592036	3,6	100	200	3,6
8592037	3,7	100	200	3,7
8592038	3,8	100	200	3,8
8592039	3,9	100	200	3,9
8592550	5	130	250	5
8604053	5,3	160	250	5,3
8604054	5,4	160	250	5,4
8604055	5,5	160	250	5,5
8604056	5,6	160	250	5,6
8604057	5,7	160	250	5,7
8604058	5,8	160	250	5,8
8604059	5,9	160	250	5,9
8604060	6	160	250	6
8604061	6,1	160	250	6,1
8604062	6,2	160	250	6,2
8604264	6,4	200	300	6,4
8604265	6,5	200	300	6,5
8604266	6,6	200	300	6,6
8604267	6,7	200	300	6,7
8604268	6,8	200	300	6,8
8604269	6,9	200	300	6,9
8604270	7	200	300	7
8604271	7,1	200	300	7,1
8604272	7,2	200	300	7,2
8604273	7,3	200	300	7,3
8604274	7,4	200	300	7,4
8604275	7,5	200	300	7,5
8604276	7,6	200	300	7,6
8604277	7,7	200	300	7,7
8604278	7,8	200	300	7,8
8604279	7,9	200	300	7,9
8604280	8	200	300	8
8604281	8,1	200	300	8,1

EDP	DC	LCF	OAL	DCON

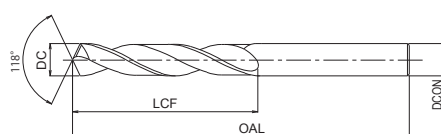
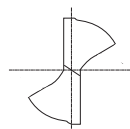
Drilling | HSS  
25xD





# JOBBER DRILL

Drilling | Solid carbide | 5xD



- Carbide drill bright finish
- Up to 5xD
- General purpose
- 125 sizes



EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
71150100	1	-	15,9	38,1	1	71150490	4,9	-	41,3	69,9	4,9
71150110	1,1	-	19,1	38,1	1,1	71150500	5	-	44,5	76,2	5
71150120	1,2	-	19,1	38,1	1,2	71150510	5,1	-	44,5	76,2	5,1
71150130	1,3	-	19,1	38,1	1,3	71150520	5,2	-	44,5	76,2	5,2
71150140	1,4	-	19,1	38,1	1,4	71150530	5,3	-	44,5	76,2	5,3
71150150	1,5	-	19,1	38,1	1,5	71150540	5,4	-	44,5	76,2	5,4
71150160	1,6	-	19,1	38,1	1,6	71150550	5,5	-	44,5	76,2	5,5
71150170	1,7	-	19,1	38,1	1,7	71150560	5,6	-	44,5	76,2	5,6
71150180	1,8	-	22,2	44,5	1,8	71150570	5,7	-	44,5	76,2	5,7
71150190	1,9	-	22,2	44,5	1,9	71150580	5,8	-	44,5	76,2	5,8
71150200	2	-	22,2	44,5	2	71150590	5,9	-	50,8	82,6	5,9
71150210	2,1	-	22,2	44,5	2,1	71150600	6	-	50,8	82,6	6
71150220	2,2	-	25,4	50,8	2,2	71150610	6,1	-	50,8	82,6	6,1
71150230	2,3	-	25,4	50,8	2,3	71150620	6,2	-	50,8	82,6	6,2
71150238	2,38	3/32	25,4	50,8	2,38	71150630	6,3	-	50,8	82,6	6,3
71150240	2,4	-	25,4	50,8	2,4	71150635	6,35	1/4	50,8	82,6	6,35
71150250	2,5	-	25,4	50,8	2,5	71150640	6,4	-	50,8	82,6	6,4
71150260	2,6	-	31,8	57,2	2,6	71150650	6,5	-	50,8	82,6	6,5
71150270	2,7	-	31,8	57,2	2,7	71150660	6,6	-	54	88,9	6,6
71150278	2,78	7/64	31,8	57,2	2,78	71150670	6,7	-	54	88,9	6,7
71150280	2,8	-	31,8	57,2	2,8	71150680	6,8	-	54	88,9	6,8
71150290	2,9	-	31,8	57,2	2,9	71150690	6,9	-	54	88,9	6,9
71150300	3	-	31,8	57,2	3	71150700	7	-	54	88,9	7
71150310	3,1	-	31,8	57,2	3,1	71150710	7,1	-	54	88,9	7,1
71150317	3,17	1/8	31,8	57,2	3,17	71150714	7,14	9/32	54	88,9	7,14
71150320	3,2	-	31,8	57,2	3,2	71150720	7,2	-	54	88,9	7,2
71150330	3,3	-	31,8	57,2	3,3	71150730	7,3	-	54	88,9	7,3
71150340	3,4	-	34,9	63,5	3,4	71150740	7,4	-	54	88,9	7,4
71150350	3,5	-	34,9	63,5	3,5	71150750	7,5	-	60,3	95,3	7,5
71150357	3,57	9/64	34,9	63,5	3,57	71150760	7,6	-	60,3	95,3	7,6
71150360	3,6	-	34,9	63,5	3,6	71150770	7,7	-	60,3	95,3	7,7
71150370	3,7	-	34,9	63,5	3,7	71150780	7,8	-	60,3	95,3	7,8
71150380	3,8	-	34,9	63,5	3,8	71150790	7,9	-	60,3	95,3	7,9
71150390	3,9	-	34,9	63,5	3,9	71150794	7,94	5/16	60,3	95,3	7,94
71150397	3,97	5/32	34,9	63,5	3,97	71150800	8	-	60,3	95,3	8
71150400	4	-	34,9	63,5	4	71150810	8,1	-	60,3	95,3	8,1
71150410	4,1	-	34,9	63,5	4,1	71150820	8,2	-	60,3	95,3	8,2
71150420	4,2	-	41,3	69,9	4,2	71150830	8,3	-	36,5	101,6	8,3
71150430	4,3	-	41,3	69,9	4,3	71150840	8,4	-	36,5	101,6	8,4
71150437	4,37	11/64	41,3	69,9	4,37	71150850	8,5	-	36,5	101,6	8,5
71150440	4,4	-	41,3	69,9	4,4	71150860	8,6	-	36,5	101,6	8,6
71150450	4,5	-	41,3	69,9	4,5	71150870	8,7	-	36,5	101,6	8,7
71150460	4,6	-	41,3	69,9	4,6	71150873	8,73	11/32	36,5	101,6	8,73
71150470	4,7	-	41,3	69,9	4,7	71150880	8,8	-	36,5	101,6	8,8
71150476	4,76	3/16	41,3	69,9	4,76	71150890	8,9	-	36,5	101,6	8,9
71150480	4,8	-	41,3	69,9	4,8	71150900	9	-	36,5	101,6	9

Drilling | Solid carbide

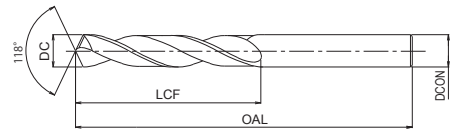
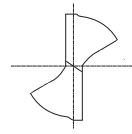


5xD

B

# JOBBER DRILL

Drilling | Solid carbide | 5xD



- Carbide drill bright finish
- Up to 5xD
- General purpose
- 125 sizes



Drilling | Solid carbide



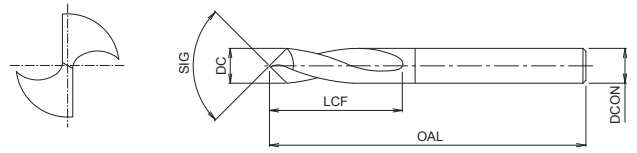
5xD

EDP	DC	DC Inch	LCF	OAL	DCON	EDP	DC	DC Inch	LCF	OAL	DCON
71150910	9,1	-	36,5	101,6	9,1						
71150920	9,2	-	69,9	108	9,2						
71150930	9,3	-	69,9	108	9,3						
71150940	9,4	-	69,9	108	9,4						
71150950	9,5	-	69,9	108	9,5						
71150960	9,6	-	69,9	108	9,6						
71150970	9,7	-	73	114,3	9,7						
71150980	9,8	-	73	114,3	9,8						
71150990	9,9	-	73	114,3	9,9						
71151000	10	-	73	114,3	10						
71151010	10,1	-	73	114,3	10,1						
71151020	10,2	-	73	114,3	10,2						
71151030	10,3	-	73	114,3	10,3						
71151040	10,4	-	73	114,3	10,4						
71151050	10,5	-	73	114,3	10,5						
71151060	10,6	-	73	114,3	10,6						
71151070	10,7	-	73	114,3	10,7						
71151080	10,8	-	73	114,3	10,8						
71151090	10,9	-	73	114,3	10,9						
71151100	11	-	73	114,3	11						
71151110	11,1	-	73	114,3	11,1						
71151111	11,11	7/16	73	114,3	11,11						
71151120	11,2	-	76,2	120,7	11,2						
71151130	11,3	-	76,2	120,7	11,3						
71151140	11,4	-	76,2	120,7	11,4						
71151150	11,5	-	76,2	120,7	11,5						
71151160	11,6	-	76,2	120,7	11,6						
71151170	11,7	-	76,2	120,7	11,7						
71151180	11,8	-	76,2	120,7	11,8						
71151190	11,9	-	76,2	120,7	11,9						
71151191	11,91	15/32	76,2	120,7	11,91						
71151200	12	-	76,2	120,7	12						
71151270	12,7	1/2	76,2	120,7	12,7						



# AD-LDS

Drilling | Solid carbide | Centring



- Carbide drill with EgiAs coating
- Carbide starter drill
- 30 sizes

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>M</b>	<b>K</b>	<b>K</b>	<b>N</b>	<b>N</b>	<b>S</b>	<b>S</b>	<b>H</b>	<b>H</b>
$C < 0,2\%$	$0,25 < C < 0,4$	$C \geq 0,45\%$	SCM	INOX	GG	GGG	Al	AC, ADC	Ti	Ni	25-35 HRC	35-45 HRC

<b>A</b>	<b>CARBIDE</b>	<b>EgiAs</b>	<b>WXL</b>	<b>h7</b>	<b>12°</b>	<b>25°</b>	<b>60°</b>	<b>90°</b>	<b>120°</b>	<b>140°</b>	<b>B.613</b>
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EDP	DC	SIG	LCF	OAL	DCON	Minimum drill hole	EDP	DC	SIG	LCF	OAL	DCON	Minimum drill hole
8688930	0,5	90	1	38	3	0,25							
8688963	0,5	140	1	38	3	-							
8688931	1	90	1,8	38	3	0,4							
8688964	1	140	1,8	38	3	-							
8688932	2	90	2,5	38	3	1							
8688965	2	140	2,5	38	3	-							
8688951	3	60	9	48	3	1,2							
8688933	3	90	9	48	3	1,2							
8688957	3	120	9	48	3	-							
8688966	3	140	9	48	3	-							
8688952	4	60	12	54	4	1,5							
8688934	4	90	12	54	4	1,5							
8688958	4	120	12	54	4	-							
8688967	4	140	12	54	4	-							
8688953	6	60	15	72	6	1,9							
8688935	6	90	15	72	6	1,9							
8688959	6	120	15	72	6	-							
8688968	6	140	15	72	6	-							
8688954	8	60	20	81	8	2,1							
8688936	8	90	20	81	8	2,1							
8688960	8	120	20	81	8	-							
8688969	8	140	20	81	8	-							
8688955	10	60	24	93	10	2,5							
8688937	10	90	24	93	10	2,5							
8688961	10	120	24	93	10	-							
8688970	10	140	24	93	10	-							
8688956	12	60	28	108	12	2,5							
8688938	12	90	28	108	12	2,5							
8688962	12	120	28	108	12	-							
8688971	12	140	28	108	12	-							

Drilling | Solid carbide

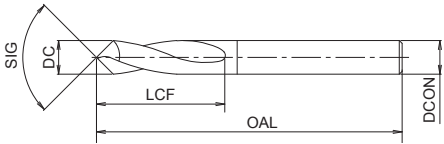
Centring





# HYP-LDS

## Drilling | Spotting & Chamfering



- Carbide drill for centring and chamfering , bright finish
- With 90°, 120° or 142° point angle
- For steels and cast iron
- 24 sizes

<b>P</b>	<b>P</b>	<b>P</b>	<b>P</b>	<b>K</b>	<b>K</b>	<b>N</b>	<b>S</b>	<b>S</b>	<b>H</b>	<b>H</b>
C < 0,2%	0,25 < C < 0,4	C ≥ 0,45%	SCM	GG	GGG	AC, ADC	Ti	Ni	25-35 HRC	35-45 HRC

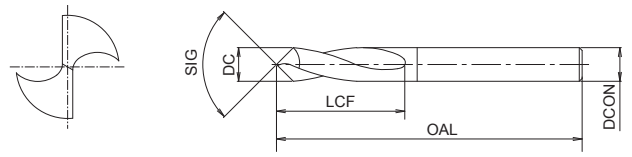
	<b>CARBIDE</b>						
		<b>20°</b>	<b>h6</b>	<b>90°</b>	<b>120°</b>	<b>142°</b>	<b>B.611</b>

EDP	DC	SIG	LCF	OAL	DCON	EDP	DC	SIG	LCF	OAL	DCON
20900300	3	90	8	35	3						
21200300	3	120	8	35	3						
21420300	3	142	8	35	3						
20900400	4	90	10	40	4						
21200400	4	120	10	40	4						
21420400	4	142	10	40	4						
20900600	6	90	16	50	6						
21200600	6	120	16	50	6						
21420600	6	142	16	50	6						
20900800	8	90	23	60	8						
21200800	8	120	23	60	8						
21420800	8	142	23	60	8						
20901000	10	90	24	70	10						
21201000	10	120	24	70	10						
21421000	10	142	24	70	10						
20901200	12	90	25	70	12						
21201200	12	120	25	70	12						
21421200	12	142	25	70	12						
20901600	16	90	30	80	16						
21201600	16	120	30	80	16						
21421600	16	142	30	80	16						
20902000	20	90	35	100	20						
21202000	20	120	35	100	20						
21422000	20	142	35	100	20						



# TiN-NC-LDS

Drilling | Spotting & Chamfering



- HSS drill for centring and chamfering with TiN coating
- With 60°, 90° or 120° point angle
- For steels and cast iron
- 21 sizes



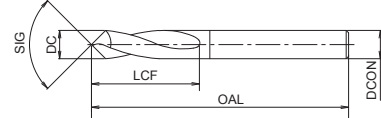
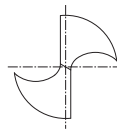
Drilling | Spotting & Chamfering

EDP	DC	SIG	LCF	OAL	DCON	Minimum drill hole
63703	3	60	11	48	3	1,5
63603	3	90	11	48	3	1,1
63653	3	120	11	48	3	-
63704	4	60	15	54	4	1,7
63604	4	90	15	54	4	1,3
63654	4	120	15	54	4	-
63706	6	60	20	72	6	1,9
63606	6	90	20	72	6	1,5
63656	6	120	20	72	6	-
63708	8	60	26	81	8	1,9
63608	8	90	26	81	8	1,6
63658	8	120	26	81	8	-
63710	10	60	30	93	10	2,1
63610	10	90	30	93	10	2,1
63660	10	120	30	93	10	-
63712	12	60	36	108	12	2,1
63612	12	90	36	108	12	2,1
63662	12	120	36	108	12	-
63616	16	90	41	118	16	3
63618	20	90	53	132	20	3
63620	25	90	60	151	25	3

EDP	DC	SIG	LCF	OAL	DCON	Minimum drill hole

# NC-LDS

## Drilling | Spotting & Chamfering



- HSS drill for centring and chamfering, bright finish
- With 90°, 120° or 130° point angle
- For steels and cast iron
- 27 sizes

P C < 0,2%

P 0,25 < C < 0,4

P C ≥ 0,45%

P SCM

M INOX

K GG

K GGG

N AC, ADC

S Ti

H 25-35 HRC

HSS

20°

h7

90°

120°

130°

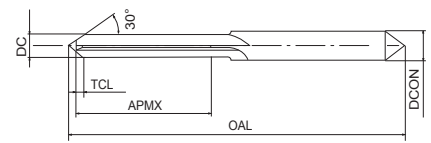
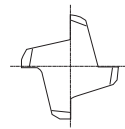
B.611

EDP	DC	SIG	LCF	OAL	DCON	Minimum drill hole
62903	3	90	11	48	3	1,1
62923	3	120	11	48	3	-
62943	3	130	11	48	3	-
62904	4	90	15	54	4	1,3
62924	4	120	15	54	4	-
62944	4	130	15	54	4	-
62906	6	90	20	72	6	1,5
62926	6	120	20	72	6	-
62946	6	130	20	72	6	-
62908	8	90	26	81	8	1,6
62928	8	120	26	81	8	-
62948	8	130	26	81	8	-
62910	10	90	30	93	10	2,1
62930	10	120	30	93	10	-
62950	10	130	30	93	10	-
62912	12	90	36	108	12	2,1
62932	12	120	36	108	12	-
62952	12	130	36	108	12	-
62916	16	90	41	118	16	3
62936	16	120	41	118	16	-
62956	16	130	41	118	16	-
62918	20	90	53	132	20	3
62938	20	120	53	132	20	-
62958	20	130	53	132	20	-
62920	25	90	60	151	25	3
62940	25	120	60	151	25	-
62960	25	130	60	151	25	-

EDP	DC	SIG	LCF	OAL	DCON	Minimum drill hole

Drilling | Spotting & Chamfering





Type 1

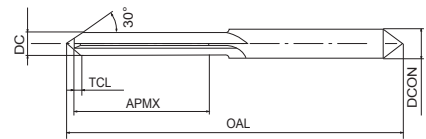
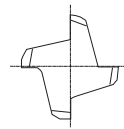
- First choice in quality and performance
- Carbide straight reamer, bright finish
- From Ø 0,3 - 13,05 mm in 0,01 mm increments
- 1276 sizes



Carbide reamers

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900030	0,3	50	4	0,1	2	4	1
8900031	0,31	50	4	0,1	2	4	1
8900032	0,32	50	4	0,1	2	4	1
8900033	0,33	50	4	0,1	2	4	1
8900034	0,34	50	4	0,1	2	4	1
8900035	0,35	50	4	0,1	2	4	1
8900036	0,36	50	4	0,1	2	4	1
8900037	0,37	50	4	0,1	2	4	1
8900038	0,38	50	4	0,1	2	4	1
8900039	0,39	50	4	0,1	2	4	1
8900040	0,4	50	4	0,1	2	4	1
8900041	0,41	50	4	0,1	2	4	1
8900042	0,42	50	4	0,1	2	4	1
8900043	0,43	50	4	0,1	2	4	1
8900044	0,44	50	4	0,1	2	4	1
8900045	0,45	50	4	0,1	2	4	1
8900046	0,46	50	4	0,1	2	4	1
8900047	0,47	50	4	0,1	2	4	1
8900048	0,48	50	5	0,1	2	4	1
8900049	0,49	50	5	0,1	2	4	1
8900050	0,5	50	5	0,1	2	4	1
8900051	0,51	50	5	0,1	2	4	1
8900052	0,52	50	5	0,1	2	4	1
8900053	0,53	50	5	0,1	2	4	1
8900054	0,54	50	6	0,1	2	4	1
8900055	0,55	50	6	0,1	2	4	1
8900056	0,56	50	6	0,1	2	4	1
8900057	0,57	50	6	0,1	2	4	1
8900058	0,58	50	6	0,1	2	4	1
8900059	0,59	50	6	0,1	2	4	1
8900060	0,6	50	6	0,1	2	4	1
8900061	0,61	50	8	0,1	2	4	1
8900062	0,62	50	8	0,1	2	4	1
8900063	0,63	50	8	0,1	2	4	1
8900064	0,64	50	8	0,1	2	4	1
8900065	0,65	50	8	0,1	2	4	1
8900066	0,66	50	8	0,1	2	4	1
8900067	0,67	50	8	0,1	2	4	1
8900068	0,68	50	10	0,1	2	4	1
8900069	0,69	50	10	0,1	2	4	1
8900070	0,7	50	10	0,1	2	4	1
8900071	0,71	50	10	0,1	2	4	1
8900072	0,72	50	10	0,1	2	4	1
8900073	0,73	50	10	0,1	2	4	1
8900074	0,74	50	10	0,1	2	4	1
8900075	0,75	50	10	0,1	2	4	1

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900076	0,76	50	12	0,1	2	4	1
8900077	0,77	50	12	0,1	2	4	1
8900078	0,78	50	12	0,1	2	4	1
8900079	0,79	50	12	0,1	2	4	1
8900080	0,8	50	12	0,1	2	4	1
8900081	0,81	50	12	0,2	2	4	1
8900082	0,82	50	12	0,2	2	4	1
8900083	0,83	50	12	0,2	2	4	1
8900084	0,84	50	12	0,2	2	4	1
8900085	0,85	50	12	0,2	2	4	1
8900086	0,86	50	12	0,2	2	4	1
8900087	0,87	50	12	0,2	2	4	1
8900088	0,88	50	12	0,2	2	4	1
8900089	0,89	50	12	0,2	2	4	1
8900090	0,9	50	12	0,2	2	4	1
8900091	0,91	50	12	0,2	2	4	1
8900092	0,92	50	12	0,2	2	4	1
8900093	0,93	50	12	0,2	2	4	1
8900094	0,94	50	12	0,2	2	4	1
8900095	0,95	50	12	0,2	2	4	1
8900096	0,96	50	14	0,2	2	4	1
8900097	0,97	50	14	0,2	2	4	1
8900098	0,98	50	14	0,2	2	4	1
8900099	0,99	50	14	0,2	2	4	1
890100	1	50	14	0,2	2	4	1
890101	1,01	50	14	0,2	2	4	1
890102	1,02	50	14	0,2	2	4	1
890103	1,03	50	14	0,2	2	4	1
890104	1,04	50	14	0,2	2	4	1
890105	1,05	50	14	0,2	2	4	1
890106	1,06	50	14	0,2	2	4	1
890107	1,07	50	14	0,2	2	4	1
890108	1,08	50	14	0,2	2	4	1
890109	1,09	50	14	0,2	2	4	1
890110	1,1	50	14	0,2	2	4	1
890111	1,11	50	14	0,2	2	4	1
890112	1,12	50	14	0,2	2	4	1
890113	1,13	50	14	0,2	2	4	1
890114	1,14	50	14	0,2	2	4	1
890115	1,15	50	14	0,2	2	4	1
890116	1,16	50	14	0,2	2	4	1
890117	1,17	50	14	0,2	2	4	1
890118	1,18	50	14	0,2	2	4	1
890119	1,19	50	16	0,2	2	4	1
890120	1,2	50	16	0,2	2	4	1
890121	1,21	50	16	0,2	2	4	1



Type 1

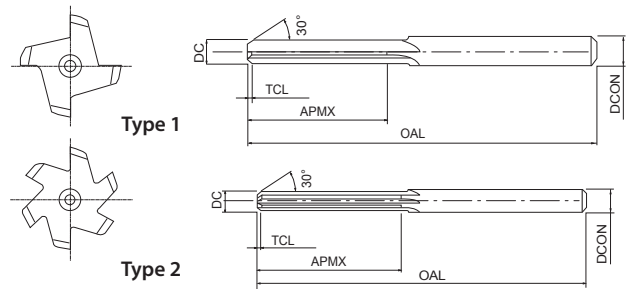
- First choice in quality and performance
- Carbide straight reamer, bright finish
- From Ø 0,3 - 13,05 mm in 0,01 mm increments
- 1276 sizes



EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900122	1,22	50	16	0,2	2	4	1
8900123	1,23	50	16	0,2	2	4	1
8900124	1,24	50	16	0,2	2	4	1
8900125	1,25	50	16	0,2	2	4	1
8900126	1,26	50	16	0,3	2	4	1
8900127	1,27	50	16	0,3	2	4	1
8900128	1,28	50	16	0,3	2	4	1
8900129	1,29	50	16	0,3	2	4	1
8900130	1,3	50	16	0,3	2	4	1
8900131	1,31	50	16	0,3	2	4	1
8900132	1,32	50	16	0,3	2	4	1
8900133	1,33	50	16	0,3	2	4	1
8900134	1,34	50	16	0,3	2	4	1
8900135	1,35	50	16	0,3	2	4	1
8900136	1,36	50	16	0,3	2	4	1
8900137	1,37	50	16	0,3	2	4	1
8900138	1,38	50	16	0,3	2	4	1
8900139	1,39	50	16	0,3	2	4	1
8900140	1,4	50	16	0,3	2	4	1
8900141	1,41	50	16	0,3	2	4	1
8900142	1,42	50	16	0,3	2	4	1
8900143	1,43	50	16	0,3	2	4	1
8900144	1,44	50	16	0,3	2	4	1
8900145	1,45	50	16	0,3	2	4	1
8900146	1,46	50	16	0,3	2	4	1
8900147	1,47	50	16	0,3	2	4	1
8900148	1,48	50	16	0,3	2	4	1
8900149	1,49	50	16	0,3	2	4	1
8900150	1,5	50	16	0,3	2	4	1
8900151	1,51	50	18	0,3	2	4	1
8900152	1,52	50	18	0,3	2	4	1
8900153	1,53	50	18	0,3	2	4	1
8900154	1,54	50	18	0,3	2	4	1
8900155	1,55	50	18	0,3	2	4	1
8900156	1,56	50	18	0,3	2	4	1
8900157	1,57	50	18	0,3	2	4	1
8900158	1,58	50	18	0,3	2	4	1
8900159	1,59	50	18	0,3	2	4	1
8900160	1,6	50	18	0,3	2	4	1
8900161	1,61	50	18	0,4	2	4	1
8900162	1,62	50	18	0,4	2	4	1
8900163	1,63	50	18	0,4	2	4	1
8900164	1,64	50	18	0,4	2	4	1
8900165	1,65	50	18	0,4	2	4	1
8900166	1,66	50	18	0,4	2	4	1
8900167	1,67	50	18	0,4	2	4	1

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900168	1,68	50	18	0,4	2	4	1
8900169	1,69	50	18	0,4	2	4	1
8900170	1,7	50	18	0,4	2	4	1
8900171	1,71	50	18	0,4	2	4	1
8900172	1,72	50	18	0,4	2	4	1
8900173	1,73	50	18	0,4	2	4	1
8900174	1,74	50	18	0,4	2	4	1
8900175	1,75	50	18	0,4	2	4	1
8900176	1,76	50	18	0,4	2	4	1
8900177	1,77	50	18	0,4	2	4	1
8900178	1,78	50	18	0,4	2	4	1
8900179	1,79	50	18	0,4	2	4	1
8900180	1,8	50	18	0,4	2	4	1
8900181	1,81	50	18	0,4	2	4	1
8900182	1,82	50	18	0,4	2	4	1
8900183	1,83	50	18	0,4	2	4	1
8900184	1,84	50	18	0,4	2	4	1
8900185	1,85	50	18	0,4	2	4	1
8900186	1,86	50	18	0,4	2	4	1
8900187	1,87	50	18	0,4	2	4	1
8900188	1,88	50	18	0,4	2	4	1
8900189	1,89	50	18	0,4	2	4	1
8900190	1,9	50	18	0,4	2	4	1
8900191	1,91	50	20	0,4	2	4	1
8900192	1,92	50	20	0,4	2	4	1
8900193	1,93	50	20	0,4	2	4	1
8900194	1,94	50	20	0,4	2	4	1
8900195	1,95	50	20	0,4	2	4	1
8900196	1,96	50	20	0,4	2	4	1
8900197	1,97	50	20	0,4	2	4	1
8900198	1,98	50	20	0,4	2	4	1
8900199	1,99	50	20	0,4	2	4	1
8900200	2	50	20	0,4	2	4	1
8900201	2,01	50	20	0,5	2,5	4	1
8900202	2,02	50	20	0,5	2,5	4	1
8900203	2,03	50	20	0,5	2,5	4	1
8900204	2,04	50	20	0,5	2,5	4	1
8900205	2,05	50	20	0,5	2,5	4	1
8900206	2,06	50	20	0,5	2,5	4	1
8900207	2,07	50	20	0,5	2,5	4	1
8900208	2,08	50	20	0,5	2,5	4	1
8900209	2,09	50	20	0,5	2,5	4	1
8900210	2,1	50	20	0,5	2,5	4	1
8900211	2,11	50	20	0,5	2,5	4	1
8900212	2,12	50	20	0,5	2,5	4	1
8900213	2,13	50	20	0,5	2,5	4	1



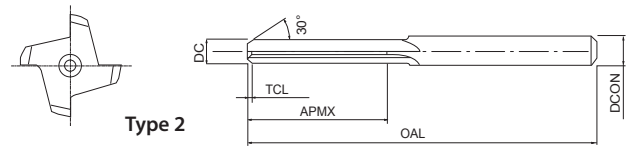


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- 1276 sizes



EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type	EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900214	2,14	50	20	0,5	2,5	4	1	8900260	2,6	60	22	0,6	3	4	1
8900215	2,15	50	20	0,5	2,5	4	1	8900261	2,61	60	22	0,6	3	4	1
8900216	2,16	50	20	0,5	2,5	4	1	8900262	2,62	60	22	0,6	3	4	1
8900217	2,17	50	20	0,5	2,5	4	1	8900263	2,63	60	22	0,6	3	4	1
8900218	2,18	50	20	0,5	2,5	4	1	8900264	2,64	60	22	0,6	3	4	1
8900219	2,19	50	20	0,5	2,5	4	1	8900265	2,65	60	22	0,6	3	4	1
8900220	2,2	50	20	0,5	2,5	4	1	8900266	2,66	60	22	0,6	3	4	1
8900221	2,21	50	20	0,5	2,5	4	1	8900267	2,67	60	22	0,6	3	4	1
8900222	2,22	50	20	0,5	2,5	4	1	8900268	2,68	60	22	0,6	3	4	1
8900223	2,23	50	20	0,5	2,5	4	1	8900269	2,69	60	22	0,6	3	4	1
8900224	2,24	50	20	0,5	2,5	4	1	8900270	2,7	60	22	0,6	3	4	1
8900225	2,25	50	20	0,5	2,5	4	1	8900271	2,71	60	22	0,6	3	4	1
8900226	2,26	50	20	0,5	2,5	4	1	8900272	2,72	60	22	0,6	3	4	1
8900227	2,27	50	20	0,5	2,5	4	1	8900273	2,73	60	22	0,6	3	4	1
8900228	2,28	50	20	0,5	2,5	4	1	8900274	2,74	60	22	0,6	3	4	1
8900229	2,29	50	20	0,5	2,5	4	1	8900275	2,75	60	22	0,6	3	4	1
8900230	2,3	50	20	0,5	2,5	4	1	8900276	2,76	60	22	0,6	3	4	1
8900231	2,31	50	20	0,5	2,5	4	1	8900277	2,77	60	22	0,6	3	4	1
8900232	2,32	50	20	0,5	2,5	4	1	8900278	2,78	60	22	0,6	3	4	1
8900233	2,33	50	20	0,5	2,5	4	1	8900279	2,79	60	22	0,6	3	4	1
8900234	2,34	50	20	0,5	2,5	4	1	8900280	2,8	60	22	0,6	3	4	1
8900235	2,35	50	20	0,5	2,5	4	1	8900281	2,81	60	25	0,6	3	4	1
8900236	2,36	50	20	0,5	2,5	4	1	8900282	2,82	60	25	0,6	3	4	1
8900237	2,37	50	22	0,5	2,5	4	1	8900283	2,83	60	25	0,6	3	4	1
8900238	2,38	50	22	0,5	2,5	4	1	8900284	2,84	60	25	0,6	3	4	1
8900239	2,39	50	22	0,5	2,5	4	1	8900285	2,85	60	25	0,6	3	4	1
8900240	2,4	50	22	0,5	2,5	4	1	8900286	2,86	60	25	0,6	3	4	1
8900241	2,41	50	22	0,5	2,5	4	1	8900287	2,87	60	25	0,6	3	4	1
8900242	2,42	50	22	0,5	2,5	4	1	8900288	2,88	60	25	0,6	3	4	1
8900243	2,43	50	22	0,5	2,5	4	1	8900289	2,89	60	25	0,6	3	4	1
8900244	2,44	50	22	0,5	2,5	4	1	8900290	2,9	60	25	0,6	3	4	1
8900245	2,45	50	22	0,5	2,5	4	1	8900291	2,91	60	25	0,6	3	4	1
8900246	2,46	50	22	0,5	2,5	4	1	8900292	2,92	60	25	0,6	3	4	1
8900247	2,47	50	22	0,5	2,5	4	1	8900293	2,93	60	25	0,6	3	4	1
8900248	2,48	50	22	0,5	2,5	4	1	8900294	2,94	60	25	0,6	3	4	1
8900249	2,49	50	22	0,5	2,5	4	1	8900295	2,95	60	25	0,6	3	4	1
8900250	2,5	50	22	0,5	2,5	4	1	8900296	2,96	60	25	0,6	3	4	1
8900251	2,51	60	22	0,6	3	4	1	8900297	2,97	60	25	0,6	3	4	1
8900252	2,52	60	22	0,6	3	4	1	8900298	2,98	60	25	0,6	3	4	1
8900253	2,53	60	22	0,6	3	4	1	8900299	2,99	60	25	0,6	3	4	1
8900254	2,54	60	22	0,6	3	4	1	8900300	3	60	25	0,6	3	4	1
8900255	2,55	60	22	0,6	3	4	1	8900301	3,01	60	28	0,6	3,5	4	2
8900256	2,56	60	22	0,6	3	4	1	8900302	3,02	60	28	0,6	3,5	4	2
8900257	2,57	60	22	0,6	3	4	1	8900303	3,03	60	28	0,6	3,5	4	2
8900258	2,58	60	22	0,6	3	4	1	8900304	3,04	60	28	0,6	3,5	4	2
8900259	2,59	60	22	0,6	3	4	1	8900305	3,05	60	28	0,6	3,5	4	2



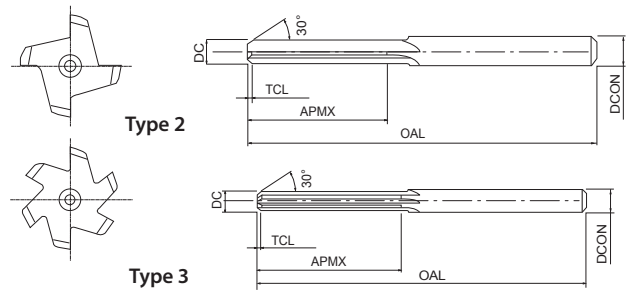


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EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type	EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900306	3,06	60	28	0,6	3,5	4	2	8900352	3,52	70	28	0,8	4	4	2
8900307	3,07	60	28	0,6	3,5	4	2	8900353	3,53	70	28	0,8	4	4	2
8900308	3,08	60	28	0,6	3,5	4	2	8900354	3,54	70	28	0,8	4	4	2
8900309	3,09	60	28	0,6	3,5	4	2	8900355	3,55	70	28	0,8	4	4	2
8900310	3,1	60	28	0,6	3,5	4	2	8900356	3,56	70	28	0,8	4	4	2
8900311	3,11	60	28	0,6	3,5	4	2	8900357	3,57	70	28	0,8	4	4	2
8900312	3,12	60	28	0,6	3,5	4	2	8900358	3,58	70	28	0,8	4	4	2
8900313	3,13	60	28	0,6	3,5	4	2	8900359	3,59	70	28	0,8	4	4	2
8900314	3,14	60	28	0,6	3,5	4	2	8900360	3,6	70	28	0,8	4	4	2
8900315	3,15	60	28	0,6	3,5	4	2	8900361	3,61	70	28	0,8	4	4	2
8900316	3,16	60	28	0,8	3,5	4	2	8900362	3,62	70	28	0,8	4	4	2
8900317	3,17	60	28	0,8	3,5	4	2	8900363	3,63	70	28	0,8	4	4	2
8900318	3,18	60	28	0,8	3,5	4	2	8900364	3,64	70	28	0,8	4	4	2
8900319	3,19	60	28	0,8	3,5	4	2	8900365	3,65	70	28	0,8	4	4	2
8900320	3,2	60	28	0,8	3,5	4	2	8900366	3,66	70	28	0,8	4	4	2
8900321	3,21	60	28	0,8	3,5	4	2	8900367	3,67	70	28	0,8	4	4	2
8900322	3,22	60	28	0,8	3,5	4	2	8900368	3,68	70	28	0,8	4	4	2
8900323	3,23	60	28	0,8	3,5	4	2	8900369	3,69	70	28	0,8	4	4	2
8900324	3,24	60	28	0,8	3,5	4	2	8900370	3,7	70	28	0,8	4	4	2
8900325	3,25	60	28	0,8	3,5	4	2	8900371	3,71	70	28	0,8	4	4	2
8900326	3,26	60	28	0,8	3,5	4	2	8900372	3,72	70	28	0,8	4	4	2
8900327	3,27	60	28	0,8	3,5	4	2	8900373	3,73	70	28	0,8	4	4	2
8900328	3,28	60	28	0,8	3,5	4	2	8900374	3,74	70	28	0,8	4	4	2
8900329	3,29	60	28	0,8	3,5	4	2	8900375	3,75	70	28	0,8	4	4	2
8900330	3,3	60	28	0,8	3,5	4	2	8900376	3,76	70	28	0,8	4	4	2
8900331	3,31	60	28	0,8	3,5	4	2	8900377	3,77	70	28	0,8	4	4	2
8900332	3,32	60	28	0,8	3,5	4	2	8900378	3,78	70	28	0,8	4	4	2
8900333	3,33	60	28	0,8	3,5	4	2	8900379	3,79	70	28	0,8	4	4	2
8900334	3,34	60	28	0,8	3,5	4	2	8900380	3,8	70	28	0,8	4	4	2
8900335	3,35	60	28	0,8	3,5	4	2	8900381	3,81	70	28	0,8	4	4	2
8900336	3,36	60	28	0,8	3,5	4	2	8900382	3,82	70	28	0,8	4	4	2
8900337	3,37	60	28	0,8	3,5	4	2	8900383	3,83	70	28	0,8	4	4	2
8900338	3,38	60	28	0,8	3,5	4	2	8900384	3,84	70	28	0,8	4	4	2
8900339	3,39	60	28	0,8	3,5	4	2	8900385	3,85	70	28	0,8	4	4	2
8900340	3,4	60	28	0,8	3,5	4	2	8900386	3,86	70	28	0,8	4	4	2
8900341	3,41	60	28	0,8	3,5	4	2	8900387	3,87	70	28	0,8	4	4	2
8900342	3,42	60	28	0,8	3,5	4	2	8900388	3,88	70	28	0,8	4	4	2
8900343	3,43	60	28	0,8	3,5	4	2	8900389	3,89	70	28	0,8	4	4	2
8900344	3,44	60	28	0,8	3,5	4	2	8900390	3,9	70	28	0,8	4	4	2
8900345	3,45	60	28	0,8	3,5	4	2	8900391	3,91	70	28	0,8	4	4	2
8900346	3,46	60	28	0,8	3,5	4	2	8900392	3,92	70	28	0,8	4	4	2
8900347	3,47	60	28	0,8	3,5	4	2	8900393	3,93	70	28	0,8	4	4	2
8900348	3,48	60	28	0,8	3,5	4	2	8900394	3,94	70	28	0,8	4	4	2
8900349	3,49	60	28	0,8	3,5	4	2	8900395	3,95	70	28	0,8	4	4	2
8900350	3,5	60	28	0,8	3,5	4	2	8900396	3,96	70	28	0,8	4	4	2
8900351	3,51	70	28	0,8	4	4	2	8900397	3,97	70	28	0,8	4	4	2





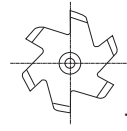
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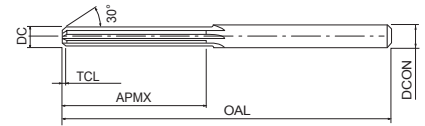
Carbide reamers

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900398	3,98	70	28	0,8	4	4	2
8900399	3,99	70	28	0,8	4	4	2
8900400	4	70	28	0,8	4	4	2
8900401	4,01	70	28	0,8	4,5	6	3
8900402	4,02	70	28	0,8	4,5	6	3
8900403	4,03	70	28	0,8	4,5	6	3
8900404	4,04	70	28	0,8	4,5	6	3
8900405	4,05	70	28	0,8	4,5	6	3
8900406	4,06	70	28	0,8	4,5	6	3
8900407	4,07	70	28	0,8	4,5	6	3
8900408	4,08	70	28	0,8	4,5	6	3
8900409	4,09	70	28	0,8	4,5	6	3
8900410	4,1	70	28	0,8	4,5	6	3
8900411	4,11	70	28	0,8	4,5	6	3
8900412	4,12	70	28	0,8	4,5	6	3
8900413	4,13	70	28	0,8	4,5	6	3
8900414	4,14	70	28	0,8	4,5	6	3
8900415	4,15	70	28	0,8	4,5	6	3
8900416	4,16	70	28	0,8	4,5	6	3
8900417	4,17	70	28	0,8	4,5	6	3
8900418	4,18	70	28	0,8	4,5	6	3
8900419	4,19	70	28	0,8	4,5	6	3
8900420	4,2	70	28	0,8	4,5	6	3
8900421	4,21	70	28	0,8	4,5	6	3
8900422	4,22	70	28	0,8	4,5	6	3
8900423	4,23	70	28	0,8	4,5	6	3
8900424	4,24	70	28	0,8	4,5	6	3
8900425	4,25	70	28	0,8	4,5	6	3
8900426	4,26	70	28	0,8	4,5	6	3
8900427	4,27	70	28	0,8	4,5	6	3
8900428	4,28	70	28	0,8	4,5	6	3
8900429	4,29	70	28	0,8	4,5	6	3
8900430	4,3	70	28	0,8	4,5	6	3
8900431	4,31	70	28	0,8	4,5	6	3
8900432	4,32	70	28	0,8	4,5	6	3
8900433	4,33	70	28	0,8	4,5	6	3
8900434	4,34	70	28	0,8	4,5	6	3
8900435	4,35	70	28	0,8	4,5	6	3
8900436	4,36	70	28	0,8	4,5	6	3
8900437	4,37	70	28	0,8	4,5	6	3
8900438	4,38	70	28	0,8	4,5	6	3
8900439	4,39	70	28	0,8	4,5	6	3
8900440	4,4	70	28	0,8	4,5	6	3
8900441	4,41	70	28	0,8	4,5	6	3
8900442	4,42	70	28	0,8	4,5	6	3
8900443	4,43	70	28	0,8	4,5	6	3

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900444	4,44	70	28	0,8	4,5	6	3
8900445	4,45	70	28	0,8	4,5	6	3
8900446	4,46	70	28	0,8	4,5	6	3
8900447	4,47	70	28	0,8	4,5	6	3
8900448	4,48	70	28	0,8	4,5	6	3
8900449	4,49	70	28	0,8	4,5	6	3
8900450	4,5	70	28	0,8	4,5	6	3
8900451	4,51	80	28	0,8	5	6	3
8900452	4,52	80	28	0,8	5	6	3
8900453	4,53	80	28	0,8	5	6	3
8900454	4,54	80	28	0,8	5	6	3
8900455	4,55	80	28	0,8	5	6	3
8900456	4,56	80	28	0,8	5	6	3
8900457	4,57	80	28	0,8	5	6	3
8900458	4,58	80	28	0,8	5	6	3
8900459	4,59	80	28	0,8	5	6	3
8900460	4,6	80	28	0,8	5	6	3
8900461	4,61	80	28	0,8	5	6	3
8900462	4,62	80	28	0,8	5	6	3
8900463	4,63	80	28	0,8	5	6	3
8900464	4,64	80	28	0,8	5	6	3
8900465	4,65	80	28	0,8	5	6	3
8900466	4,66	80	28	0,8	5	6	3
8900467	4,67	80	28	0,8	5	6	3
8900468	4,68	80	28	0,8	5	6	3
8900469	4,69	80	28	0,8	5	6	3
8900470	4,7	80	28	0,8	5	6	3
8900471	4,71	80	28	0,8	5	6	3
8900472	4,72	80	28	0,8	5	6	3
8900473	4,73	80	28	0,8	5	6	3
8900474	4,74	80	28	0,8	5	6	3
8900475	4,75	80	28	0,8	5	6	3
8900476	4,76	80	32	0,8	5	6	3
8900477	4,77	80	32	0,8	5	6	3
8900478	4,78	80	32	0,8	5	6	3
8900479	4,79	80	32	0,8	5	6	3
8900480	4,8	80	32	0,8	5	6	3
8900481	4,81	80	32	0,8	5	6	3
8900482	4,82	80	32	0,8	5	6	3
8900483	4,83	80	32	0,8	5	6	3
8900484	4,84	80	32	0,8	5	6	3
8900485	4,85	80	32	0,8	5	6	3
8900486	4,86	80	32	0,8	5	6	3
8900487	4,87	80	32	0,8	5	6	3
8900488	4,88	80	32	0,8	5	6	3
8900489	4,89	80	32	0,8	5	6	3



Type 3



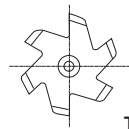
- First choice in quality and performance
- Carbide straight reamer, bright finish
- From Ø 0,3 - 13,05 mm in 0,01 mm increments
- 1276 sizes



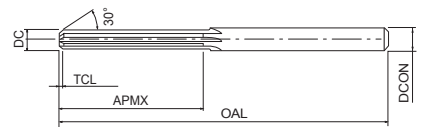
EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900490	4,9	80	32	0,8	5	6	3
8900491	4,91	80	32	0,8	5	6	3
8900492	4,92	80	32	0,8	5	6	3
8900493	4,93	80	32	0,8	5	6	3
8900494	4,94	80	32	0,8	5	6	3
8900495	4,95	80	32	0,8	5	6	3
8900496	4,96	80	32	0,8	5	6	3
8900497	4,97	80	32	0,8	5	6	3
8900498	4,98	80	32	0,8	5	6	3
8900499	4,99	80	32	0,8	5	6	3
8900500	5	80	32	0,8	5	6	3
8900501	5,01	80	32	0,8	5,5	6	3
8900502	5,02	80	32	0,8	5,5	6	3
8900503	5,03	80	32	0,8	5,5	6	3
8900504	5,04	80	32	0,8	5,5	6	3
8900505	5,05	80	32	0,8	5,5	6	3
8900506	5,06	80	32	0,8	5,5	6	3
8900507	5,07	80	32	0,8	5,5	6	3
8900508	5,08	80	32	0,8	5,5	6	3
8900509	5,09	80	32	0,8	5,5	6	3
8900510	5,1	80	32	0,8	5,5	6	3
8900511	5,11	80	32	0,8	5,5	6	3
8900512	5,12	80	32	0,8	5,5	6	3
8900513	5,13	80	32	0,8	5,5	6	3
8900514	5,14	80	32	0,8	5,5	6	3
8900515	5,15	80	32	0,8	5,5	6	3
8900516	5,16	80	32	0,8	5,5	6	3
8900517	5,17	80	32	0,8	5,5	6	3
8900518	5,18	80	32	0,8	5,5	6	3
8900519	5,19	80	32	0,8	5,5	6	3
8900520	5,2	80	32	0,8	5,5	6	3
8900521	5,21	80	32	0,8	5,5	6	3
8900522	5,22	80	32	0,8	5,5	6	3
8900523	5,23	80	32	0,8	5,5	6	3
8900524	5,24	80	32	0,8	5,5	6	3
8900525	5,25	80	32	0,8	5,5	6	3
8900526	5,26	80	32	0,8	5,5	6	3
8900527	5,27	80	32	0,8	5,5	6	3
8900528	5,28	80	32	0,8	5,5	6	3
8900529	5,29	80	32	0,8	5,5	6	3
8900530	5,3	80	32	0,8	5,5	6	3
8900531	5,31	80	32	0,8	5,5	6	3
8900532	5,32	80	32	0,8	5,5	6	3
8900533	5,33	80	32	0,8	5,5	6	3
8900534	5,34	80	32	0,8	5,5	6	3
8900535	5,35	80	32	0,8	5,5	6	3

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900536	5,36	80	32	0,8	5,5	6	3
8900537	5,37	80	32	0,8	5,5	6	3
8900538	5,38	80	32	0,8	5,5	6	3
8900539	5,39	80	32	0,8	5,5	6	3
8900540	5,4	80	32	0,8	5,5	6	3
8900541	5,41	80	32	0,8	5,5	6	3
8900542	5,42	80	32	0,8	5,5	6	3
8900543	5,43	80	32	0,8	5,5	6	3
8900544	5,44	80	32	0,8	5,5	6	3
8900545	5,45	80	32	0,8	5,5	6	3
8900546	5,46	80	32	0,8	5,5	6	3
8900547	5,47	80	32	0,8	5,5	6	3
8900548	5,48	80	32	0,8	5,5	6	3
8900549	5,49	80	32	0,8	5,5	6	3
8900550	5,5	80	32	0,8	5,5	6	3
8900551	5,51	80	32	0,8	6	6	3
8900552	5,52	80	32	0,8	6	6	3
8900553	5,53	80	32	0,8	6	6	3
8900554	5,54	80	32	0,8	6	6	3
8900555	5,55	80	32	0,8	6	6	3
8900556	5,56	80	32	0,8	6	6	3
8900557	5,57	80	32	0,8	6	6	3
8900558	5,58	80	32	0,8	6	6	3
8900559	5,59	80	32	0,8	6	6	3
8900560	5,6	80	32	0,8	6	6	3
8900561	5,61	80	32	0,8	6	6	3
8900562	5,62	80	32	0,8	6	6	3
8900563	5,63	80	32	0,8	6	6	3
8900564	5,64	80	32	0,8	6	6	3
8900565	5,65	80	32	0,8	6	6	3
8900566	5,66	80	32	0,8	6	6	3
8900567	5,67	80	32	0,8	6	6	3
8900568	5,68	80	32	0,8	6	6	3
8900569	5,69	80	32	0,8	6	6	3
8900570	5,7	80	32	0,8	6	6	3
8900571	5,71	80	32	0,8	6	6	3
8900572	5,72	80	32	0,8	6	6	3
8900573	5,73	80	32	0,8	6	6	3
8900574	5,74	80	32	0,8	6	6	3
8900575	5,75	80	32	0,8	6	6	3
8900576	5,76	80	32	0,8	6	6	3
8900577	5,77	80	32	0,8	6	6	3
8900578	5,78	80	32	0,8	6	6	3
8900579	5,79	80	32	0,8	6	6	3
8900580	5,8	80	32	0,8	6	6	3
8900581	5,81	80	32	0,8	6	6	3





Type 3



- First choice in quality and performance
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- From Ø 0,3 - 13,05 mm in 0,01 mm increments
- 1276 sizes

<b>P</b> C < 0,2%	<b>P</b> 0,25 < C < 0,4	<b>P</b> C ≥ 0,45%	<b>P</b> SCM	<b>K</b> GG	<b>N</b> Al	<b>N</b> AC, ADC	<b>H</b> 25-35 HRC	<b>H</b> 35-45 HRC	<b>H</b> 45-52 HRC
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**CARBIDE**

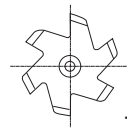
0~+0.005

**h6**

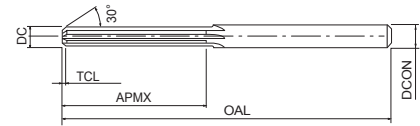
**B.614**

Carbide reamers

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type	EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900582	5,82	80	32	0,8	6	6	3	8900628	6,28	80	35	0,8	7	6	3
8900583	5,83	80	32	0,8	6	6	3	8900629	6,29	80	35	0,8	7	6	3
8900584	5,84	80	32	0,8	6	6	3	8900630	6,3	80	35	0,8	7	6	3
8900585	5,85	80	32	0,8	6	6	3	8900631	6,31	80	35	0,8	7	6	3
8900586	5,86	80	32	0,8	6	6	3	8900632	6,32	80	35	0,8	7	6	3
8900587	5,87	80	32	0,8	6	6	3	8900633	6,33	80	35	0,8	7	6	3
8900588	5,88	80	32	0,8	6	6	3	8900634	6,34	80	35	0,8	7	6	3
8900589	5,89	80	32	0,8	6	6	3	8900635	6,35	80	35	0,8	7	6	3
8900590	5,9	80	32	0,8	6	6	3	8900636	6,36	80	35	0,8	7	6	3
8900591	5,91	80	32	0,8	6	6	3	8900637	6,37	80	35	0,8	7	6	3
8900592	5,92	80	32	0,8	6	6	3	8900638	6,38	80	35	0,8	7	6	3
8900593	5,93	80	32	0,8	6	6	3	8900639	6,39	80	35	0,8	7	6	3
8900594	5,94	80	32	0,8	6	6	3	8900640	6,4	80	35	0,8	7	6	3
8900595	5,95	80	32	0,8	6	6	3	8900641	6,41	80	35	0,8	7	6	3
8900596	5,96	80	32	0,8	6	6	3	8900642	6,42	80	35	0,8	7	6	3
8900597	5,97	80	32	0,8	6	6	3	8900643	6,43	80	35	0,8	7	6	3
8900598	5,98	80	32	0,8	6	6	3	8900644	6,44	80	35	0,8	7	6	3
8900599	5,99	80	32	0,8	6	6	3	8900645	6,45	80	35	0,8	7	6	3
8900600	6	80	32	0,8	6	6	3	8900646	6,46	80	35	0,8	7	6	3
8900601	6,01	80	35	0,8	7	6	3	8900647	6,47	80	35	0,8	7	6	3
8900602	6,02	80	35	0,8	7	6	3	8900648	6,48	80	35	0,8	7	6	3
8900603	6,03	80	35	0,8	7	6	3	8900649	6,49	80	35	0,8	7	6	3
8900604	6,04	80	35	0,8	7	6	3	8900650	6,5	80	35	0,8	7	6	3
8900605	6,05	80	35	0,8	7	6	3	8900651	6,51	80	35	0,8	7	6	3
8900606	6,06	80	35	0,8	7	6	3	8900652	6,52	80	35	0,8	7	6	3
8900607	6,07	80	35	0,8	7	6	3	8900653	6,53	80	35	0,8	7	6	3
8900608	6,08	80	35	0,8	7	6	3	8900654	6,54	80	35	0,8	7	6	3
8900609	6,09	80	35	0,8	7	6	3	8900655	6,55	80	35	0,8	7	6	3
8900610	6,1	80	35	0,8	7	6	3	8900656	6,56	80	35	0,8	7	6	3
8900611	6,11	80	35	0,8	7	6	3	8900657	6,57	80	35	0,8	7	6	3
8900612	6,12	80	35	0,8	7	6	3	8900658	6,58	80	35	0,8	7	6	3
8900613	6,13	80	35	0,8	7	6	3	8900659	6,59	80	35	0,8	7	6	3
8900614	6,14	80	35	0,8	7	6	3	8900660	6,6	80	35	0,8	7	6	3
8900615	6,15	80	35	0,8	7	6	3	8900661	6,61	80	35	0,8	7	6	3
8900616	6,16	80	35	0,8	7	6	3	8900662	6,62	80	35	0,8	7	6	3
8900617	6,17	80	35	0,8	7	6	3	8900663	6,63	80	35	0,8	7	6	3
8900618	6,18	80	35	0,8	7	6	3	8900664	6,64	80	35	0,8	7	6	3
8900619	6,19	80	35	0,8	7	6	3	8900665	6,65	80	35	0,8	7	6	3
8900620	6,2	80	35	0,8	7	6	3	8900666	6,66	80	35	0,8	7	6	3
8900621	6,21	80	35	0,8	7	6	3	8900667	6,67	80	35	0,8	7	6	3
8900622	6,22	80	35	0,8	7	6	3	8900668	6,68	80	35	0,8	7	6	3
8900623	6,23	80	35	0,8	7	6	3	8900669	6,69	80	35	0,8	7	6	3
8900624	6,24	80	35	0,8	7	6	3	8900670	6,7	80	35	0,8	7	6	3
8900625	6,25	80	35	0,8	7	6	3	8900671	6,71	80	35	0,8	7	6	3
8900626	6,26	80	35	0,8	7	6	3	8900672	6,72	80	35	0,8	7	6	3
8900627	6,27	80	35	0,8	7	6	3	8900673	6,73	80	35	0,8	7	6	3



Type 3

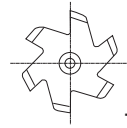


- First choice in quality and performance
- Carbide straight reamer, bright finish
- From Ø 0,3 - 13,05 mm in 0,01 mm increments
- 1276 sizes

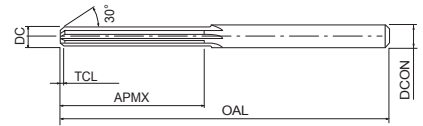


EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type	EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
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8900675	6,75	80	35	0,8	7	6	3	8900721	7,21	90	35	0,8	8	6	3
8900676	6,76	80	35	0,8	7	6	3	8900722	7,22	90	35	0,8	8	6	3
8900677	6,77	80	35	0,8	7	6	3	8900723	7,23	90	35	0,8	8	6	3
8900678	6,78	80	35	0,8	7	6	3	8900724	7,24	90	35	0,8	8	6	3
8900679	6,79	80	35	0,8	7	6	3	8900725	7,25	90	35	0,8	8	6	3
8900680	6,8	80	35	0,8	7	6	3	8900726	7,26	90	35	0,8	8	6	3
8900681	6,81	80	35	0,8	7	6	3	8900727	7,27	90	35	0,8	8	6	3
8900682	6,82	80	35	0,8	7	6	3	8900728	7,28	90	35	0,8	8	6	3
8900683	6,83	80	35	0,8	7	6	3	8900729	7,29	90	35	0,8	8	6	3
8900684	6,84	80	35	0,8	7	6	3	8900730	7,3	90	35	0,8	8	6	3
8900685	6,85	80	35	0,8	7	6	3	8900731	7,31	90	35	0,8	8	6	3
8900686	6,86	80	35	0,8	7	6	3	8900732	7,32	90	35	0,8	8	6	3
8900687	6,87	80	35	0,8	7	6	3	8900733	7,33	90	35	0,8	8	6	3
8900688	6,88	80	35	0,8	7	6	3	8900734	7,34	90	35	0,8	8	6	3
8900689	6,89	80	35	0,8	7	6	3	8900735	7,35	90	35	0,8	8	6	3
8900690	6,9	80	35	0,8	7	6	3	8900736	7,36	90	35	0,8	8	6	3
8900691	6,91	80	35	0,8	7	6	3	8900737	7,37	90	35	0,8	8	6	3
8900692	6,92	80	35	0,8	7	6	3	8900738	7,38	90	35	0,8	8	6	3
8900693	6,93	80	35	0,8	7	6	3	8900739	7,39	90	35	0,8	8	6	3
8900694	6,94	80	35	0,8	7	6	3	8900740	7,4	90	35	0,8	8	6	3
8900695	6,95	80	35	0,8	7	6	3	8900741	7,41	90	35	0,8	8	6	3
8900696	6,96	80	35	0,8	7	6	3	8900742	7,42	90	35	0,8	8	6	3
8900697	6,97	80	35	0,8	7	6	3	8900743	7,43	90	35	0,8	8	6	3
8900698	6,98	80	35	0,8	7	6	3	8900744	7,44	90	35	0,8	8	6	3
8900699	6,99	80	35	0,8	7	6	3	8900745	7,45	90	35	0,8	8	6	3
8900700	7	80	35	0,8	7	6	3	8900746	7,46	90	35	0,8	8	6	3
8900701	7,01	90	35	0,8	8	6	3	8900747	7,47	90	35	0,8	8	6	3
8900702	7,02	90	35	0,8	8	6	3	8900748	7,48	90	35	0,8	8	6	3
8900703	7,03	90	35	0,8	8	6	3	8900749	7,49	90	35	0,8	8	6	3
8900704	7,04	90	35	0,8	8	6	3	8900750	7,5	90	35	0,8	8	6	3
8900705	7,05	90	35	0,8	8	6	3	8900751	7,51	90	40	0,8	8	6	3
8900706	7,06	90	35	0,8	8	6	3	8900752	7,52	90	40	0,8	8	6	3
8900707	7,07	90	35	0,8	8	6	3	8900753	7,53	90	40	0,8	8	6	3
8900708	7,08	90	35	0,8	8	6	3	8900754	7,54	90	40	0,8	8	6	3
8900709	7,09	90	35	0,8	8	6	3	8900755	7,55	90	40	0,8	8	6	3
8900710	7,1	90	35	0,8	8	6	3	8900756	7,56	90	40	0,8	8	6	3
8900711	7,11	90	35	0,8	8	6	3	8900757	7,57	90	40	0,8	8	6	3
8900712	7,12	90	35	0,8	8	6	3	8900758	7,58	90	40	0,8	8	6	3
8900713	7,13	90	35	0,8	8	6	3	8900759	7,59	90	40	0,8	8	6	3
8900714	7,14	90	35	0,8	8	6	3	8900760	7,6	90	40	0,8	8	6	3
8900715	7,15	90	35	0,8	8	6	3	8900761	7,61	90	40	0,8	8	6	3
8900716	7,16	90	35	0,8	8	6	3	8900762	7,62	90	40	0,8	8	6	3
8900717	7,17	90	35	0,8	8	6	3	8900763	7,63	90	40	0,8	8	6	3
8900718	7,18	90	35	0,8	8	6	3	8900764	7,64	90	40	0,8	8	6	3
8900719	7,19	90	35	0,8	8	6	3	8900765	7,65	90	40	0,8	8	6	3





Type 3



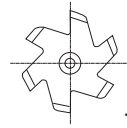
- First choice in quality and performance
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- From Ø 0,3 - 13,05 mm in 0,01 mm increments
- 1276 sizes



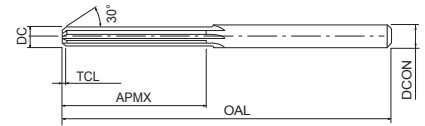
Carbide reamers

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type	EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900766	7,66	90	40	0,8	8	6	3	8900812	8,12	90	40	1	9	6	3
8900767	7,67	90	40	0,8	8	6	3	8900813	8,13	90	40	1	9	6	3
8900768	7,68	90	40	0,8	8	6	3	8900814	8,14	90	40	1	9	6	3
8900769	7,69	90	40	0,8	8	6	3	8900815	8,15	90	40	1	9	6	3
8900770	7,7	90	40	0,8	8	6	3	8900816	8,16	90	40	1	9	6	3
8900771	7,71	90	40	0,8	8	6	3	8900817	8,17	90	40	1	9	6	3
8900772	7,72	90	40	0,8	8	6	3	8900818	8,18	90	40	1	9	6	3
8900773	7,73	90	40	0,8	8	6	3	8900819	8,19	90	40	1	9	6	3
8900774	7,74	90	40	0,8	8	6	3	8900820	8,2	90	40	1	9	6	3
8900775	7,75	90	40	0,8	8	6	3	8900821	8,21	90	40	1	9	6	3
8900776	7,76	90	40	0,8	8	6	3	8900822	8,22	90	40	1	9	6	3
8900777	7,77	90	40	0,8	8	6	3	8900823	8,23	90	40	1	9	6	3
8900778	7,78	90	40	0,8	8	6	3	8900824	8,24	90	40	1	9	6	3
8900779	7,79	90	40	0,8	8	6	3	8900825	8,25	90	40	1	9	6	3
8900780	7,8	90	40	0,8	8	6	3	8900826	8,26	90	40	1	9	6	3
8900781	7,81	90	40	0,8	8	6	3	8900827	8,27	90	40	1	9	6	3
8900782	7,82	90	40	0,8	8	6	3	8900828	8,28	90	40	1	9	6	3
8900783	7,83	90	40	0,8	8	6	3	8900829	8,29	90	40	1	9	6	3
8900784	7,84	90	40	0,8	8	6	3	8900830	8,3	90	40	1	9	6	3
8900785	7,85	90	40	0,8	8	6	3	8900831	8,31	90	40	1	9	6	3
8900786	7,86	90	40	0,8	8	6	3	8900832	8,32	90	40	1	9	6	3
8900787	7,87	90	40	0,8	8	6	3	8900833	8,33	90	40	1	9	6	3
8900788	7,88	90	40	0,8	8	6	3	8900834	8,34	90	40	1	9	6	3
8900789	7,89	90	40	0,8	8	6	3	8900835	8,35	90	40	1	9	6	3
8900790	7,9	90	40	0,8	8	6	3	8900836	8,36	90	40	1	9	6	3
8900791	7,91	90	40	0,8	8	6	3	8900837	8,37	90	40	1	9	6	3
8900792	7,92	90	40	0,8	8	6	3	8900838	8,38	90	40	1	9	6	3
8900793	7,93	90	40	0,8	8	6	3	8900839	8,39	90	40	1	9	6	3
8900794	7,94	90	40	0,8	8	6	3	8900840	8,4	90	40	1	9	6	3
8900795	7,95	90	40	0,8	8	6	3	8900841	8,41	90	40	1	9	6	3
8900796	7,96	90	40	0,8	8	6	3	8900842	8,42	90	40	1	9	6	3
8900797	7,97	90	40	0,8	8	6	3	8900843	8,43	90	40	1	9	6	3
8900798	7,98	90	40	0,8	8	6	3	8900844	8,44	90	40	1	9	6	3
8900799	7,99	90	40	0,8	8	6	3	8900845	8,45	90	40	1	9	6	3
8900800	8	90	40	0,8	8	6	3	8900846	8,46	90	40	1	9	6	3
8900801	8,01	90	40	1	9	6	3	8900847	8,47	90	40	1	9	6	3
8900802	8,02	90	40	1	9	6	3	8900848	8,48	90	40	1	9	6	3
8900803	8,03	90	40	1	9	6	3	8900849	8,49	90	40	1	9	6	3
8900804	8,04	90	40	1	9	6	3	8900850	8,5	90	40	1	9	6	3
8900805	8,05	90	40	1	9	6	3	8900851	8,51	90	40	1	9	6	3
8900806	8,06	90	40	1	9	6	3	8900852	8,52	90	40	1	9	6	3
8900807	8,07	90	40	1	9	6	3	8900853	8,53	90	40	1	9	6	3
8900808	8,08	90	40	1	9	6	3	8900854	8,54	90	40	1	9	6	3
8900809	8,09	90	40	1	9	6	3	8900855	8,55	90	40	1	9	6	3
8900810	8,1	90	40	1	9	6	3	8900856	8,56	90	40	1	9	6	3
8900811	8,11	90	40	1	9	6	3	8900857	8,57	90	40	1	9	6	3

## Carbide reamers



Type 3



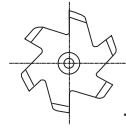
- First choice in quality and performance
- Carbide straight reamer, bright finish
- From Ø 0,3 - 13,05 mm in 0,01 mm increments
- 1276 sizes



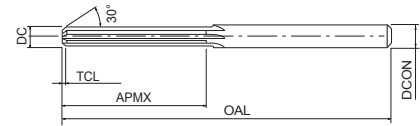
EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900858	8,58	90	40	1	9	6	3
8900859	8,59	90	40	1	9	6	3
8900860	8,6	90	40	1	9	6	3
8900861	8,61	90	40	1	9	6	3
8900862	8,62	90	40	1	9	6	3
8900863	8,63	90	40	1	9	6	3
8900864	8,64	90	40	1	9	6	3
8900865	8,65	90	40	1	9	6	3
8900866	8,66	90	40	1	9	6	3
8900867	8,67	90	40	1	9	6	3
8900868	8,68	90	40	1	9	6	3
8900869	8,69	90	40	1	9	6	3
8900870	8,7	90	40	1	9	6	3
8900871	8,71	90	40	1	9	6	3
8900872	8,72	90	40	1	9	6	3
8900873	8,73	90	40	1	9	6	3
8900874	8,74	90	40	1	9	6	3
8900875	8,75	90	40	1	9	6	3
8900876	8,76	90	40	1	9	6	3
8900877	8,77	90	40	1	9	6	3
8900878	8,78	90	40	1	9	6	3
8900879	8,79	90	40	1	9	6	3
8900880	8,8	90	40	1	9	6	3
8900881	8,81	90	40	1	9	6	3
8900882	8,82	90	40	1	9	6	3
8900883	8,83	90	40	1	9	6	3
8900884	8,84	90	40	1	9	6	3
8900885	8,85	90	40	1	9	6	3
8900886	8,86	90	40	1	9	6	3
8900887	8,87	90	40	1	9	6	3
8900888	8,88	90	40	1	9	6	3
8900889	8,89	90	40	1	9	6	3
8900890	8,9	90	40	1	9	6	3
8900891	8,91	90	40	1	9	6	3
8900892	8,92	90	40	1	9	6	3
8900893	8,93	90	40	1	9	6	3
8900894	8,94	90	40	1	9	6	3
8900895	8,95	90	40	1	9	6	3
8900896	8,96	90	40	1	9	6	3
8900897	8,97	90	40	1	9	6	3
8900898	8,98	90	40	1	9	6	3
8900899	8,99	90	40	1	9	6	3
8900900	9	90	40	1	9	6	3
8900901	9,01	100	40	1	10	6	3
8900902	9,02	100	40	1	10	6	3
8900903	9,03	100	40	1	10	6	3

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900904	9,04	100	40	1	10	6	3
8900905	9,05	100	40	1	10	6	3
8900906	9,06	100	40	1	10	6	3
8900907	9,07	100	40	1	10	6	3
8900908	9,08	100	40	1	10	6	3
8900909	9,09	100	40	1	10	6	3
8900910	9,1	100	40	1	10	6	3
8900911	9,11	100	40	1	10	6	3
8900912	9,12	100	40	1	10	6	3
8900913	9,13	100	40	1	10	6	3
8900914	9,14	100	40	1	10	6	3
8900915	9,15	100	40	1	10	6	3
8900916	9,16	100	40	1	10	6	3
8900917	9,17	100	40	1	10	6	3
8900918	9,18	100	40	1	10	6	3
8900919	9,19	100	40	1	10	6	3
8900920	9,2	100	40	1	10	6	3
8900921	9,21	100	40	1	10	6	3
8900922	9,22	100	40	1	10	6	3
8900923	9,23	100	40	1	10	6	3
8900924	9,24	100	40	1	10	6	3
8900925	9,25	100	40	1	10	6	3
8900926	9,26	100	40	1	10	6	3
8900927	9,27	100	40	1	10	6	3
8900928	9,28	100	40	1	10	6	3
8900929	9,29	100	40	1	10	6	3
8900930	9,3	100	40	1	10	6	3
8900931	9,31	100	40	1	10	6	3
8900932	9,32	100	40	1	10	6	3
8900933	9,33	100	40	1	10	6	3
8900934	9,34	100	40	1	10	6	3
8900935	9,35	100	40	1	10	6	3
8900936	9,36	100	40	1	10	6	3
8900937	9,37	100	40	1	10	6	3
8900938	9,38	100	40	1	10	6	3
8900939	9,39	100	40	1	10	6	3
8900940	9,4	100	40	1	10	6	3
8900941	9,41	100	40	1	10	6	3
8900942	9,42	100	40	1	10	6	3
8900943	9,43	100	40	1	10	6	3
8900944	9,44	100	40	1	10	6	3
8900945	9,45	100	40	1	10	6	3
8900946	9,46	100	40	1	10	6	3
8900947	9,47	100	40	1	10	6	3
8900948	9,48	100	40	1	10	6	3
8900949	9,49	100	40	1	10	6	3





Type 3



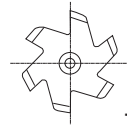
- First choice in quality and performance
- Carbide straight reamer, bright finish
- From  $\text{Ø} 0,3 - 13,05 \text{ mm}$  in  $0,01 \text{ mm}$  increments
- 1276 sizes



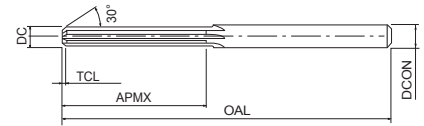
EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900950	9,5	100	40	1	10	6	3
8900951	9,51	100	45	1	10	6	3
8900952	9,52	100	45	1	10	6	3
8900953	9,53	100	45	1	10	6	3
8900954	9,54	100	45	1	10	6	3
8900955	9,55	100	45	1	10	6	3
8900956	9,56	100	45	1	10	6	3
8900957	9,57	100	45	1	10	6	3
8900958	9,58	100	45	1	10	6	3
8900959	9,59	100	45	1	10	6	3
8900960	9,6	100	45	1	10	6	3
8900961	9,61	100	45	1	10	6	3
8900962	9,62	100	45	1	10	6	3
8900963	9,63	100	45	1	10	6	3
8900964	9,64	100	45	1	10	6	3
8900965	9,65	100	45	1	10	6	3
8900966	9,66	100	45	1	10	6	3
8900967	9,67	100	45	1	10	6	3
8900968	9,68	100	45	1	10	6	3
8900969	9,69	100	45	1	10	6	3
8900970	9,7	100	45	1	10	6	3
8900971	9,71	100	45	1	10	6	3
8900972	9,72	100	45	1	10	6	3
8900973	9,73	100	45	1	10	6	3
8900974	9,74	100	45	1	10	6	3
8900975	9,75	100	45	1	10	6	3
8900976	9,76	100	45	1	10	6	3
8900977	9,77	100	45	1	10	6	3
8900978	9,78	100	45	1	10	6	3
8900979	9,79	100	45	1	10	6	3
8900980	9,8	100	45	1	10	6	3
8900981	9,81	100	45	1	10	6	3
8900982	9,82	100	45	1	10	6	3
8900983	9,83	100	45	1	10	6	3
8900984	9,84	100	45	1	10	6	3
8900985	9,85	100	45	1	10	6	3
8900986	9,86	100	45	1	10	6	3
8900987	9,87	100	45	1	10	6	3
8900988	9,88	100	45	1	10	6	3
8900989	9,89	100	45	1	10	6	3
8900990	9,9	100	45	1	10	6	3
8900991	9,91	100	45	1	10	6	3
8900992	9,92	100	45	1	10	6	3
8900993	9,93	100	45	1	10	6	3
8900994	9,94	100	45	1	10	6	3
8900995	9,95	100	45	1	10	6	3

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8900996	9,96	100	45	1	10	6	3
8900997	9,97	100	45	1	10	6	3
8900998	9,98	100	45	1	10	6	3
8900999	9,99	100	45	1	10	6	3
8901000	10	100	45	1	10	6	3
8901001	10,01	100	45	1	11	6	3
8901002	10,02	100	45	1	11	6	3
8901003	10,03	100	45	1	11	6	3
8901004	10,04	100	45	1	11	6	3
8901005	10,05	100	45	1	11	6	3
8901006	10,06	100	45	1	11	6	3
8901007	10,07	100	45	1	11	6	3
8901008	10,08	100	45	1	11	6	3
8901009	10,09	100	45	1	11	6	3
8901010	10,1	100	45	1	11	6	3
8901011	10,11	100	45	1	11	6	3
8901012	10,12	100	45	1	11	6	3
8901013	10,13	100	45	1	11	6	3
8901014	10,14	100	45	1	11	6	3
8901015	10,15	100	45	1	11	6	3
8901016	10,16	100	45	1	11	6	3
8901017	10,17	100	45	1	11	6	3
8901018	10,18	100	45	1	11	6	3
8901019	10,19	100	45	1	11	6	3
8901020	10,2	100	45	1	11	6	3
8901021	10,21	100	45	1	11	6	3
8901022	10,22	100	45	1	11	6	3
8901023	10,23	100	45	1	11	6	3
8901024	10,24	100	45	1	11	6	3
8901025	10,25	100	45	1	11	6	3
8901026	10,26	100	45	1	11	6	3
8901027	10,27	100	45	1	11	6	3
8901028	10,28	100	45	1	11	6	3
8901029	10,29	100	45	1	11	6	3
8901030	10,3	100	45	1	11	6	3
8901031	10,31	100	45	1	11	6	3
8901032	10,32	100	45	1	11	6	3
8901033	10,33	100	45	1	11	6	3
8901034	10,34	100	45	1	11	6	3
8901035	10,35	100	45	1	11	6	3
8901036	10,36	100	45	1	11	6	3
8901037	10,37	100	45	1	11	6	3
8901038	10,38	100	45	1	11	6	3
8901039	10,39	100	45	1	11	6	3
8901040	10,4	100	45	1	11	6	3
8901041	10,41	100	45	1	11	6	3





Type 3



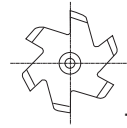
- First choice in quality and performance
- Carbide straight reamer, bright finish
- From Ø 0,3 - 13,05 mm in 0,01 mm increments
- 1276 sizes



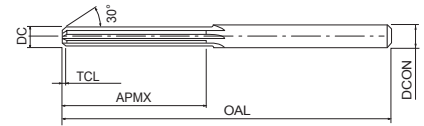
EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8901042	10,42	100	45	1	11	6	3
8901043	10,43	100	45	1	11	6	3
8901044	10,44	100	45	1	11	6	3
8901045	10,45	100	45	1	11	6	3
8901046	10,46	100	45	1	11	6	3
8901047	10,47	100	45	1	11	6	3
8901048	10,48	100	45	1	11	6	3
8901049	10,49	100	45	1	11	6	3
8901050	10,5	100	45	1	11	6	3
8901051	10,51	100	45	1	11	6	3
8901052	10,52	100	45	1	11	6	3
8901053	10,53	100	45	1	11	6	3
8901054	10,54	100	45	1	11	6	3
8901055	10,55	100	45	1	11	6	3
8901056	10,56	100	45	1	11	6	3
8901057	10,57	100	45	1	11	6	3
8901058	10,58	100	45	1	11	6	3
8901059	10,59	100	45	1	11	6	3
8901060	10,6	100	45	1	11	6	3
8901061	10,61	100	45	1	11	6	3
8901062	10,62	100	45	1	11	6	3
8901063	10,63	100	45	1	11	6	3
8901064	10,64	100	45	1	11	6	3
8901065	10,65	100	45	1	11	6	3
8901066	10,66	100	45	1	11	6	3
8901067	10,67	100	45	1	11	6	3
8901068	10,68	100	45	1	11	6	3
8901069	10,69	100	45	1	11	6	3
8901070	10,7	100	45	1	11	6	3
8901071	10,71	100	45	1	11	6	3
8901072	10,72	100	45	1	11	6	3
8901073	10,73	100	45	1	11	6	3
8901074	10,74	100	45	1	11	6	3
8901075	10,75	100	45	1	11	6	3
8901076	10,76	100	45	1	11	6	3
8901077	10,77	100	45	1	11	6	3
8901078	10,78	100	45	1	11	6	3
8901079	10,79	100	45	1	11	6	3
8901080	10,8	100	45	1	11	6	3
8901081	10,81	100	45	1	11	6	3
8901082	10,82	100	45	1	11	6	3
8901083	10,83	100	45	1	11	6	3
8901084	10,84	100	45	1	11	6	3
8901085	10,85	100	45	1	11	6	3
8901086	10,86	100	45	1	11	6	3
8901087	10,87	100	45	1	11	6	3

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8901088	10,88	100	45	1	11	6	3
8901089	10,89	100	45	1	11	6	3
8901090	10,9	100	45	1	11	6	3
8901091	10,91	100	45	1	11	6	3
8901092	10,92	100	45	1	11	6	3
8901093	10,93	100	45	1	11	6	3
8901094	10,94	100	45	1	11	6	3
8901095	10,95	100	45	1	11	6	3
8901096	10,96	100	45	1	11	6	3
8901097	10,97	100	45	1	11	6	3
8901098	10,98	100	45	1	11	6	3
8901099	10,99	100	45	1	11	6	3
8901100	11	100	45	1	11	6	3
8901101	11,01	110	45	1	12	6	3
8901102	11,02	110	45	1	12	6	3
8901103	11,03	110	45	1	12	6	3
8901104	11,04	110	45	1	12	6	3
8901105	11,05	110	45	1	12	6	3
8901106	11,06	110	45	1	12	6	3
8901107	11,07	110	45	1	12	6	3
8901108	11,08	110	45	1	12	6	3
8901109	11,09	110	45	1	12	6	3
8901110	11,1	110	45	1	12	6	3
8901111	11,11	110	45	1	12	6	3
8901112	11,12	110	45	1	12	6	3
8901113	11,13	110	45	1	12	6	3
8901114	11,14	110	45	1	12	6	3
8901115	11,15	110	45	1	12	6	3
8901116	11,16	110	45	1	12	6	3
8901117	11,17	110	45	1	12	6	3
8901118	11,18	110	45	1	12	6	3
8901119	11,19	110	45	1	12	6	3
8901120	11,2	110	45	1	12	6	3
8901121	11,21	110	45	1	12	6	3
8901122	11,22	110	45	1	12	6	3
8901123	11,23	110	45	1	12	6	3
8901124	11,24	110	45	1	12	6	3
8901125	11,25	110	45	1	12	6	3
8901126	11,26	110	45	1	12	6	3
8901127	11,27	110	45	1	12	6	3
8901128	11,28	110	45	1	12	6	3
8901129	11,29	110	45	1	12	6	3
8901130	11,3	110	45	1	12	6	3
8901131	11,31	110	45	1	12	6	3
8901132	11,32	110	45	1	12	6	3
8901133	11,33	110	45	1	12	6	3





Type 3

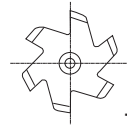


- First choice in quality and performance
- Carbide straight reamer, bright finish
- From Ø 0,3 - 13,05 mm in 0,01 mm increments
- 1276 sizes

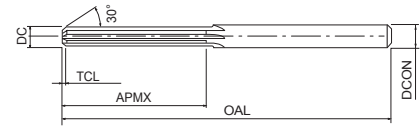


EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8901134	11,34	110	45	1	12	6	3
8901135	11,35	110	45	1	12	6	3
8901136	11,36	110	45	1	12	6	3
8901137	11,37	110	45	1	12	6	3
8901138	11,38	110	45	1	12	6	3
8901139	11,39	110	45	1	12	6	3
8901140	11,4	110	45	1	12	6	3
8901141	11,41	110	45	1	12	6	3
8901142	11,42	110	45	1	12	6	3
8901143	11,43	110	45	1	12	6	3
8901144	11,44	110	45	1	12	6	3
8901145	11,45	110	45	1	12	6	3
8901146	11,46	110	45	1	12	6	3
8901147	11,47	110	45	1	12	6	3
8901148	11,48	110	45	1	12	6	3
8901149	11,49	110	45	1	12	6	3
8901150	11,5	110	45	1	12	6	3
8901151	11,51	110	45	1	12	6	3
8901152	11,52	110	45	1	12	6	3
8901153	11,53	110	45	1	12	6	3
8901154	11,54	110	45	1	12	6	3
8901155	11,55	110	45	1	12	6	3
8901156	11,56	110	45	1	12	6	3
8901157	11,57	110	45	1	12	6	3
8901158	11,58	110	45	1	12	6	3
8901159	11,59	110	45	1	12	6	3
8901160	11,6	110	45	1	12	6	3
8901161	11,61	110	45	1	12	6	3
8901162	11,62	110	45	1	12	6	3
8901163	11,63	110	45	1	12	6	3
8901164	11,64	110	45	1	12	6	3
8901165	11,65	110	45	1	12	6	3
8901166	11,66	110	45	1	12	6	3
8901167	11,67	110	45	1	12	6	3
8901168	11,68	110	45	1	12	6	3
8901169	11,69	110	45	1	12	6	3
8901170	11,7	110	45	1	12	6	3
8901171	11,71	110	45	1	12	6	3
8901172	11,72	110	45	1	12	6	3
8901173	11,73	110	45	1	12	6	3
8901174	11,74	110	45	1	12	6	3
8901175	11,75	110	45	1	12	6	3
8901176	11,76	110	45	1	12	6	3
8901177	11,77	110	45	1	12	6	3
8901178	11,78	110	45	1	12	6	3
8901179	11,79	110	45	1	12	6	3

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8901180	11,8	110	45	1	12	6	3
8901181	11,81	110	50	1	12	6	3
8901182	11,82	110	50	1	12	6	3
8901183	11,83	110	50	1	12	6	3
8901184	11,84	110	50	1	12	6	3
8901185	11,85	110	50	1	12	6	3
8901186	11,86	110	50	1	12	6	3
8901187	11,87	110	50	1	12	6	3
8901188	11,88	110	50	1	12	6	3
8901189	11,89	110	50	1	12	6	3
8901190	11,9	110	50	1	12	6	3
8901191	11,91	110	50	1	12	6	3
8901192	11,92	110	50	1	12	6	3
8901193	11,93	110	50	1	12	6	3
8901194	11,94	110	50	1	12	6	3
8901195	11,95	110	50	1	12	6	3
8901196	11,96	110	50	1	12	6	3
8901197	11,97	110	50	1	12	6	3
8901198	11,98	110	50	1	12	6	3
8901199	11,99	110	50	1	12	6	3
8901200	12	110	50	1	12	6	3
8901201	12,01	110	50	1	13	6	3
8901202	12,02	110	50	1	13	6	3
8901203	12,03	110	50	1	13	6	3
8901204	12,04	110	50	1	13	6	3
8901205	12,05	110	50	1	13	6	3
8901206	12,06	110	50	1	13	6	3
8901207	12,07	110	50	1	13	6	3
8901208	12,08	110	50	1	13	6	3
8901209	12,09	110	50	1	13	6	3
8901210	12,1	110	50	1	13	6	3
8901211	12,11	110	50	1	13	6	3
8901212	12,12	110	50	1	13	6	3
8901213	12,13	110	50	1	13	6	3
8901214	12,14	110	50	1	13	6	3
8901215	12,15	110	50	1	13	6	3
8901216	12,16	110	50	1	13	6	3
8901217	12,17	110	50	1	13	6	3
8901218	12,18	110	50	1	13	6	3
8901219	12,19	110	50	1	13	6	3
8901220	12,2	110	50	1	13	6	3
8901221	12,21	110	50	1	13	6	3
8901222	12,22	110	50	1	13	6	3
8901223	12,23	110	50	1	13	6	3
8901224	12,24	110	50	1	13	6	3
8901225	12,25	110	50	1	13	6	3



Type 3



- First choice in quality and performance
- Carbide straight reamer, bright finish
- From Ø 0,3 - 13,05 mm in 0,01 mm increments
- 1276 sizes



EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8901226	12,26	110	50	1	13	6	3
8901227	12,27	110	50	1	13	6	3
8901228	12,28	110	50	1	13	6	3
8901229	12,29	110	50	1	13	6	3
8901230	12,3	110	50	1	13	6	3
8901231	12,31	110	50	1	13	6	3
8901232	12,32	110	50	1	13	6	3
8901233	12,33	110	50	1	13	6	3
8901234	12,34	110	50	1	13	6	3
8901235	12,35	110	50	1	13	6	3
8901236	12,36	110	50	1	13	6	3
8901237	12,37	110	50	1	13	6	3
8901238	12,38	110	50	1	13	6	3
8901239	12,39	110	50	1	13	6	3
8901240	12,4	110	50	1	13	6	3
8901241	12,41	110	50	1	13	6	3
8901242	12,42	110	50	1	13	6	3
8901243	12,43	110	50	1	13	6	3
8901244	12,44	110	50	1	13	6	3
8901245	12,45	110	50	1	13	6	3
8901246	12,46	110	50	1	13	6	3
8901247	12,47	110	50	1	13	6	3
8901248	12,48	110	50	1	13	6	3
8901249	12,49	110	50	1	13	6	3
8901250	12,5	110	50	1	13	6	3
8901251	12,51	110	50	1	13	6	3
8901252	12,52	110	50	1	13	6	3
8901253	12,53	110	50	1	13	6	3
8901254	12,54	110	50	1	13	6	3
8901255	12,55	110	50	1	13	6	3
8901256	12,56	110	50	1	13	6	3
8901257	12,57	110	50	1	13	6	3
8901258	12,58	110	50	1	13	6	3
8901259	12,59	110	50	1	13	6	3
8901260	12,6	110	50	1	13	6	3
8901261	12,61	110	50	1	13	6	3
8901262	12,62	110	50	1	13	6	3
8901263	12,63	110	50	1	13	6	3
8901264	12,64	110	50	1	13	6	3
8901265	12,65	110	50	1	13	6	3
8901266	12,66	110	50	1	13	6	3
8901267	12,67	110	50	1	13	6	3
8901268	12,68	110	50	1	13	6	3
8901269	12,69	110	50	1	13	6	3
8901270	12,7	110	50	1	13	6	3
8901271	12,71	110	50	1	13	6	3

EDP	DC	OAL	APMX	TCL	DCON	ZEFP	Type
8901272	12,72	110	50	1	13	6	3
8901273	12,73	110	50	1	13	6	3
8901274	12,74	110	50	1	13	6	3
8901275	12,75	110	50	1	13	6	3
8901276	12,76	110	50	1	13	6	3
8901277	12,77	110	50	1	13	6	3
8901278	12,78	110	50	1	13	6	3
8901279	12,79	110	50	1	13	6	3
8901280	12,8	110	50	1	13	6	3
8901281	12,81	110	50	1	13	6	3
8901282	12,82	110	50	1	13	6	3
8901283	12,83	110	50	1	13	6	3
8901284	12,84	110	50	1	13	6	3
8901285	12,85	110	50	1	13	6	3
8901286	12,86	110	50	1	13	6	3
8901287	12,87	110	50	1	13	6	3
8901288	12,88	110	50	1	13	6	3
8901289	12,89	110	50	1	13	6	3
8901290	12,9	110	50	1	13	6	3
8901291	12,91	110	50	1	13	6	3
8901292	12,92	110	50	1	13	6	3
8901293	12,93	110	50	1	13	6	3
8901294	12,94	110	50	1	13	6	3
8901295	12,95	110	50	1	13	6	3
8901296	12,96	110	50	1	13	6	3
8901297	12,97	110	50	1	13	6	3
8901298	12,98	110	50	1	13	6	3
8901299	12,99	110	50	1	13	6	3
8901300	13	110	50	1	13	6	3
8901301	13,01	110	50	1	14	6	3
8901302	13,02	110	50	1	14	6	3
8901303	13,03	110	50	1	14	6	3
8901304	13,04	110	50	1	14	6	3
8901305	13,05	110	50	1	14	6	3



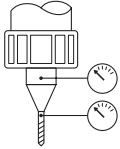
# CUTTING CONDITIONS

Drilling | Solid | Cutting conditions

## ADO-MICRO 2D/5D

Vc	Mild Steel - Low Carbon Steel SS400 - S10C ~150HB ~500 N/mm <sup>2</sup>		Carbon Steel S35C - S50C ~210HB ~710 N/mm <sup>2</sup>		Alloy Steel SCM - SCr - sncm 710 ~900 N/mm <sup>2</sup>		Alloy Steel SCM - SCr - sncm 710 ~900 N/mm <sup>2</sup>		Austenitic Stainless Steel SUS303 - SUS304 SUS316 - SUS316L		Special Alloy Steel SUJ2 - SUS440	
	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
20~40~60m/min												
0,7	18.200	0,007 ~ 0,021	18.200	0,007 ~ 0,021	18.200	0,014 ~ 0,028	13.600	0,014 ~ 0,028	13.600	0,007 ~ 0,021	15.900	0,007 ~ 0,021
1	12.700	0,01 ~ 0,03	12.700	0,01 ~ 0,03	12.700	0,02 ~ 0,04	9.500	0,02 ~ 0,04	9.500	0,01 ~ 0,03	11.100	0,01 ~ 0,03
1,5	8.500	0,015 ~ 0,045	8.500	0,015 ~ 0,045	8.500	0,03 ~ 0,06	6.400	0,03 ~ 0,06	6.400	0,015 ~ 0,045	7.400	0,015 ~ 0,045
2	6.400	0,02 ~ 0,06	6.400	0,02 ~ 0,06	6.400	0,04 ~ 0,08	4.800	0,04 ~ 0,08	4.800	0,02 ~ 0,06	5.600	0,02 ~ 0,06

Vc	Cast Iron FC250 ~350N/mm <sup>2</sup>		Ductile Cast Iron FCD450 - FCD600 400 ~600 N/mm <sup>2</sup>		Aluminium Alloy AC4C - ADC		Aluminium A5052 - A7075		Titanium Alloy		Heat Resistant Alloy Inconel 718	
	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
20~50~60m/min												
0,7	22.700	0,014 ~ 0,028	18.200	0,014 ~ 0,028	22.700	0,014 ~ 0,042	18.200	0,007 ~ 0,021	22.700	0,011 ~ 0,018	4.500	0,004 ~ 0,014
1	15.900	0,02 ~ 0,04	12.700	0,02 ~ 0,04	15.900	0,02 ~ 0,06	12.700	0,01 ~ 0,03	15.900	0,015 ~ 0,025	3.200	0,005 ~ 0,02
1,5	10.600	0,03 ~ 0,06	8.500	0,03 ~ 0,06	10.600	0,03 ~ 0,09	8.500	0,015 ~ 0,045	10.600	0,023 ~ 0,038	2.100	0,008 ~ 0,03
2	8.000	0,04 ~ 0,08	6.400	0,04 ~ 0,08	8.000	0,04 ~ 0,12	6.400	0,02 ~ 0,06	8.000	0,03 ~ 0,05	1.600	0,01 ~ 0,04

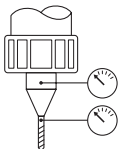


1. This cutting condition chart is based on the usage of water-soluble coolant and internal oil supply.
2. Please use quality water-soluble coolant with a dilution factor of approximately 20 times.
3. Please use a precision filter (approximation of 3µm to 5µm) to prevent the oil holes from clogging.
4. 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 oil used.
5. 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.
6. For work material with poor chip evacuation characteristic, please perform step drilling as required.
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.

## ADO-MICRO 12D/15D/20D/25D/30D

Vc	Mild Steel - Low Carbon Steel SS400 - S10C ~150HB ~500 N/mm <sup>2</sup>		Carbon Steel S35C - S50C ~210HB ~710 N/mm <sup>2</sup>		Alloy Steel SCM - SCr - sncm 710 ~900 N/mm <sup>2</sup>		Alloy Steel SCM - SCr - sncm 710 ~900 N/mm <sup>2</sup>		Austenitic Stainless Steel SUS303 - SUS304 SUS316 - SUS316L		Special Alloy Steel SUJ2 - SUS440	
	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
20~40~60m/min												
1	12.700	0,01 ~ 0,03	12.700	0,01 ~ 0,03	12.700	0,02 ~ 0,04	9.500	0,02 ~ 0,04	9.500	0,01 ~ 0,03	11.100	0,01 ~ 0,03
1,5	8.500	0,015 ~ 0,045	8.500	0,015 ~ 0,045	8.500	0,03 ~ 0,06	6.400	0,03 ~ 0,06	6.400	0,015 ~ 0,045	7.400	0,015 ~ 0,045
2	6.400	0,02 ~ 0,06	6.400	0,02 ~ 0,06	6.400	0,04 ~ 0,08	4.800	0,04 ~ 0,08	4.800	0,02 ~ 0,06	5.600	0,02 ~ 0,06

Vc	Cast Iron FC250 ~350N/mm <sup>2</sup>		Ductile Cast Iron FCD450 - FCD600 400 ~600 N/mm <sup>2</sup>		Aluminium Alloy AC4C - ADC		Aluminium A5052 - A7075		Titanium Alloy		Heat Resistant Alloy Inconel 718	
	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
20~50~60m/min												
1	15.900	0,02 ~ 0,04	12.700	0,02 ~ 0,04	15.900	0,02 ~ 0,06	12.700	0,01 ~ 0,03	15.900	0,015 ~ 0,025	3.200	0,005 ~ 0,02
1,5	10.600	0,03 ~ 0,06	8.500	0,03 ~ 0,06	10.600	0,03 ~ 0,09	8.500	0,015 ~ 0,045	10.600	0,023 ~ 0,038	2.100	0,008 ~ 0,03
2	8.000	0,04 ~ 0,08	6.400	0,04 ~ 0,08	8.000	0,04 ~ 0,12	6.400	0,02 ~ 0,06	8.000	0,03 ~ 0,05	1.600	0,01 ~ 0,04



1. This cutting condition chart is based on the usage of water-soluble coolant and internal oil supply.
2. Please use quality water-soluble coolant with a dilution factor of approximately 20 times.
3. Please use a precision filter (approximation of 3µm to 5µm) to prevent the oil holes from clogging.
4. 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 oil used.
5. 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.
6. For work material with poor chip evacuation characteristic, please perform step drilling as required.
7. From 12D type included, please use a 2D type drill to prepare a pilot hole prior to processing.
8. 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.

Drilling | Solid

Cutting conditions

# CUTTING CONDITIONS

Drilling | Solid | Cutting conditions

## WX-MS-GDS

Vc	Carbon Steel Ck15 • Ck50 ~900 N/mm <sup>2</sup>		SCM SCM440 ~1060 N/mm <sup>2</sup>		Special Alloy SUJ2 • SUS 440		Kovart FE-NI-CO		Cu C1020 • C26		Al A5052 • 7075		AC AC4C • ADC	
	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)
20 ~ 80 m/min			20 ~ 56 m/min		20 ~ 36 m/min		20 ~ 45 m/min		20 ~ 45 m/min		32 ~ 80 m/min		32 ~ 63 m/min	
0,2	25.000	0,002	25.000	0,002	25.000	0,002	25.000	0,002	25.000	0,002	25.000	0,004	25.000	0,002
0,3	20.000	0,003	20.000	0,003	20.000	0,003	20.000	0,003	20.000	0,003	20.000	0,007	20.000	0,003
0,5	15.000	0,007	14.000	0,007	13.000	0,007	13.000	0,007	13.000	0,007	15.000	0,015	15.000	0,007
1	12.000	0,02	11.000	0,02	10.000	0,02	6.400	0,01	6.400	0,01	12.000	0,03	12.000	0,01
1,5	10.000	0,02~0,04	8.400	0,02~0,04	6.800	0,03~0,05	4.800	0,012~0,03	4.800	0,012~0,03	10.000	0,03~0,08	10.000	0,012~0,030
2	8.000	0,03~0,05	6.500	0,03~0,05	5.000	0,04~0,06	4.000	0,016~0,04	4.000	0,016~0,04	8.000	0,04~0,1	8.000	0,016~0,04
3	5.500	0,07~0,07	4.500	0,04~0,07	3.400	0,06~0,09	3.000	0,024~0,06	3.000	0,024~0,06	6.500	0,06~0,15	6.500	0,024~0,06
4	4.000	0,06~0,10	3.200	0,06~0,10	2.500	0,08~0,12	2.500	0,03~0,08	2.500	0,03~0,08	5.000	0,08~0,20	5.000	0,03~0,08
5	3.200	0,07~0,12	2.600	0,07~0,12	2.000	0,10~0,15	2.000	0,04~0,10	2.000	0,04~0,10	4.200	0,10~0,25	4.000	0,04~0,10

## MRS-GDL

Vc	Martensitic Stainless Steel SUS420J2 • SUS440C		Austenitic Stainless Steel SUS303 • SUS304 • SUS316 • SUS316L		Ferritic Stainless Steel SUS430 • SUS430F		Precipitation Hardening Stainless Steel SUS630	
	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)	S (min <sup>-1</sup> )	F (mm/rev)
20 ~ 50 m/min			15 ~ 40 m/min		20 ~ 50 m/min		15 ~ 40 m/min	
0,5	12.700 ~ 31.800	0,005 ~ 0,015	9.500 ~ 25.400	0,005 ~ 0,015	12.700 ~ 31.800	0,005 ~ 0,015	9.500 ~ 25.400	0,005 ~ 0,015
1	6.300 ~ 15.900	0,010 ~ 0,030	4.700 ~ 12.700	0,010 ~ 0,030	6.300 ~ 15.900	0,010 ~ 0,030	4.700 ~ 12.700	0,010 ~ 0,030
1,5	4.200 ~ 10.600	0,015 ~ 0,045	3.100 ~ 8.400	0,015 ~ 0,045	4.200 ~ 10.600	0,015 ~ 0,045	3.100 ~ 8.400	0,015 ~ 0,045
2	3.180 ~ 7.900	0,020 ~ 0,060	2.300 ~ 6.300	0,020 ~ 0,060	3.180 ~ 7.900	0,020 ~ 0,060	2.300 ~ 6.300	0,020 ~ 0,060
2,5	2.500 ~ 6.300	0,025 ~ 0,075	1.900 ~ 5.000	0,025 ~ 0,075	2.500 ~ 6.300	0,025 ~ 0,075	1.900 ~ 5.000	0,025 ~ 0,075
3	2.100 ~ 5.300	0,030 ~ 0,090	1.500 ~ 4.200	0,030 ~ 0,090	2.100 ~ 5.300	0,030 ~ 0,090	1.500 ~ 4.200	0,030 ~ 0,090



# CUTTING CONDITIONS

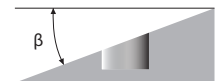
Drilling | Solid | Cutting conditions

## ADF-2D

Vc	Low Carbon Steel - Alloy Steel (C<0.3%) S5400 · SCM ~710N/mm <sup>2</sup>		Carbon Steel S35C · S50C ~210HB ~710N/mm <sup>2</sup>		Alloy Steel SCM · SCr · SNCM 28~35HRC 900~1,100N/mm <sup>2</sup>		Plastic Mold Steel NAK80 ~40HRC		Stainless Steel SUS304 480 ~ 800N/mm <sup>2</sup>	
	30~100m/min		30~100m/min		30~90m/min		20~40m/min		10~30m/min	
∅	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)
0,2	40.000	0,001 ~ 0,006	40.000	0,001 ~ 0,006	40.000	0,001 ~ 0,006	40.000	0,001 ~ 0,004	40.000	0,001 ~ 0,004
0,5	28.700	0,003 ~ 0,015	28.700	0,003 ~ 0,015	25.500	0,003 ~ 0,015	19.000	0,003 ~ 0,01	15.900	0,003 ~ 0,01
1	17.500	0,005 ~ 0,03	17.500	0,005 ~ 0,03	15.900	0,005 ~ 0,03	9.550	0,005 ~ 0,02	8.000	0,005 ~ 0,02
1,5	13.800	0,008 ~ 0,045	13.800	0,008 ~ 0,045	12.700	0,008 ~ 0,045	6.350	0,008 ~ 0,03	5.300	0,008 ~ 0,03
2	12.700	0,01 ~ 0,06	12.700	0,01 ~ 0,06	9.550	0,01 ~ 0,06	4.750	0,01 ~ 0,04	-	-
3	8.500	0,015 ~ 0,09	8.500	0,015 ~ 0,09	6.350	0,015 ~ 0,09	3.200	0,015 ~ 0,06	-	-
4	6.350	0,02 ~ 0,12	6.350	0,02 ~ 0,12	4.750	0,02 ~ 0,12	2.400	0,02 ~ 0,08	-	-
6	4.250	0,03 ~ 0,18	4.250	0,03 ~ 0,18	3.200	0,03 ~ 0,18	1.600	0,03 ~ 0,12	-	-
8	3.200	0,04 ~ 0,24	3.200	0,04 ~ 0,24	2.400	0,04 ~ 0,24	1.200	0,04 ~ 0,16	-	-
10	2.550	0,05 ~ 0,3	2.550	0,05 ~ 0,3	1.900	0,05 ~ 0,3	950	0,05 ~ 0,2	-	-
12	2.100	0,06 ~ 0,3	2.100	0,06 ~ 0,3	1.600	0,06 ~ 0,3	800	0,06 ~ 0,24	-	-
14	1.800	0,07 ~ 0,35	1.800	0,07 ~ 0,35	1.350	0,07 ~ 0,35	700	0,07 ~ 0,28	-	-
16	1.600	0,08 ~ 0,36	1.600	0,08 ~ 0,36	1.200	0,08 ~ 0,36	600	0,08 ~ 0,32	-	-
18	1.400	0,09 ~ 0,38	1.400	0,09 ~ 0,38	1.050	0,09 ~ 0,38	550	0,09 ~ 0,36	-	-
20	1.250	0,1 ~ 0,4	1.250	0,1 ~ 0,4	950	0,1 ~ 0,4	500	0,1 ~ 0,4	-	-

Vc	Special Alloy Steel - Hardened Steel - Prehardened Steel FC250 ~45HRC		Cast Iron FC250 ~350N/mm <sup>2</sup>		Ductile Cast Iron FCD600 400 ~ 600N/mm <sup>2</sup>		Aluminium A5052 · A7075 ~350N/mm <sup>2</sup>		Aluminium Alloy AC4C · ADC 400~600N/mm <sup>2</sup>	
	20~30m/min		30~120m/min		30~80m/min		30~200m/min		30~200m/min	
∅	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)
0,2	40.000	0,001 ~ 0,004	40.000	0,001 ~ 0,006	40.000	0,001 ~ 0,006	40.000	0,001 ~ 0,006	40.000	0,001 ~ 0,006
0,5	15.900	0,003 ~ 0,01	32.000	0,003 ~ 0,015	25.000	0,003 ~ 0,015	35.000	0,003 ~ 0,015	35.000	0,003 ~ 0,015
1	7.950	0,005 ~ 0,02	22.500	0,005 ~ 0,03	15.900	0,005 ~ 0,03	30.000	0,005 ~ 0,03	30.000	0,005 ~ 0,03
1,5	5.300	0,008 ~ 0,03	17.000	0,008 ~ 0,045	11.500	0,008 ~ 0,045	25.000	0,008 ~ 0,045	25.000	0,008 ~ 0,045
2	4.000	0,01 ~ 0,03	14.300	0,01 ~ 0,06	10.350	0,01 ~ 0,06	22.300	0,01 ~ 0,06	22.300	0,01 ~ 0,06
3	2.650	0,015 ~ 0,045	9.550	0,015 ~ 0,09	6.900	0,015 ~ 0,09	14.850	0,015 ~ 0,09	14.850	0,015 ~ 0,09
4	2.000	0,02 ~ 0,06	7.150	0,02 ~ 0,12	5.150	0,02 ~ 0,12	11.150	0,02 ~ 0,12	11.150	0,02 ~ 0,12
6	1.350	0,03 ~ 0,09	4.750	0,03 ~ 0,18	3.450	0,03 ~ 0,18	7.450	0,03 ~ 0,18	7.450	0,03 ~ 0,18
8	1.000	0,04 ~ 0,12	3.600	0,04 ~ 0,24	2.600	0,04 ~ 0,24	5.550	0,04 ~ 0,24	5.550	0,04 ~ 0,24
10	800	0,05 ~ 0,15	2.850	0,05 ~ 0,3	2.050	0,05 ~ 0,3	4.450	0,05 ~ 0,3	4.450	0,05 ~ 0,3
12	650	0,06 ~ 0,18	2.400	0,06 ~ 0,3	1.700	0,06 ~ 0,3	3.700	0,06 ~ 0,36	3.700	0,06 ~ 0,36
14	550	0,07 ~ 0,21	2.050	0,07 ~ 0,35	1.500	0,07 ~ 0,35	3.200	0,07 ~ 0,42	3.200	0,07 ~ 0,42
16	500	0,08 ~ 0,24	1.800	0,08 ~ 0,36	1.300	0,08 ~ 0,36	2.800	0,08 ~ 0,48	2.800	0,08 ~ 0,48
18	450	0,09 ~ 0,27	1.600	0,09 ~ 0,38	1.150	0,09 ~ 0,38	2.500	0,09 ~ 0,54	2.500	0,09 ~ 0,54
20	400	0,1 ~ 0,3	1.450	0,1 ~ 0,4	1.050	0,1 ~ 0,4	2.250	0,1 ~ 0,6	2.250	0,1 ~ 0,6

- Water-soluble coolant may be applied as noted in the above table only under the premise that the work surface has been flattened by milling.
- When using non-water soluble oil or water-emulsifiable (over 20 times dilution), reduce cutting speed by 30%.
- Use a rigid and precise machine and holder.
- Please minimize tool hang over as much as possible during machining.
- Adjust the rotational speed and the feed rate in accordance with conditions such as the machining shape, machine rigidity, or work holding.
- Please set up the drill so that the runout of the cutting edge is under 0.01 mm.
- When machining an inclined plane, adjust the rotational speed and the feed rate in accordance with the angle of the incline ( $\beta$ ).
  - When the machining incline angle( $\beta$ ) is less than 30°, please reduce the feed to 40~60%.
  - When the machining incline angle( $\beta$ ) is over 30°, please reduce the speed to 60~80%, the feed to 20~40%.
- Please use step drilling in pilot holes to improve cutting chip separation.
- If it is necessary to ensure the locating precision of the hole to be machined, adjust the rotational speed and the feed rate as indicated above (in accordance with the machining precision requirement).



Drilling | Solid

Cutting conditions

# CUTTING CONDITIONS

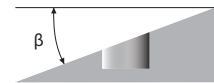
Drilling | Solid | Cutting conditions

## ADFO-3D

Vc	Low Carbon Steel - Alloy Steel (C<0.3%) S5400 · SCM ~710N/mm <sup>2</sup>		Carbon Steel S35C · S50C ~210HB ~710N/mm <sup>2</sup>		Alloy Steel SCM · SCr · SNCM 28~35HRC 900~1,100N/mm <sup>2</sup>		Plastic Mold Steel NAK80 ~40HRC		Stainless Steel SUS304 480~800N/mm <sup>2</sup>	
	80~120m/min		80~120m/min		50~90m/min		20~40m/min		40~60m/min	
Ø	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)
3	10.600	0,045 ~ 0,09	10.600	0,045 ~ 0,09	7.450	0,045 ~ 0,09	3.200	0,045 ~ 0,09	5.300	0,045 ~ 0,09
4	8.000	0,045 ~ 0,12	8.000	0,045 ~ 0,12	5.550	0,045 ~ 0,12	2.400	0,045 ~ 0,12	4.000	0,045 ~ 0,12
6	5.300	0,06 ~ 0,18	5.300	0,06 ~ 0,18	3.700	0,06 ~ 0,18	1.600	0,06 ~ 0,18	2.650	0,06 ~ 0,18
8	4.000	0,08 ~ 0,24	4.000	0,08 ~ 0,24	2.800	0,08 ~ 0,24	1.200	0,08 ~ 0,24	2.000	0,08 ~ 0,24
10	3.200	0,10 ~ 0,30	3.200	0,10 ~ 0,30	2.250	0,10 ~ 0,30	950	0,10 ~ 0,30	1.600	0,10 ~ 0,30
12	2.650	0,12 ~ 0,36	2.650	0,12 ~ 0,36	1.850	0,12 ~ 0,36	800	0,12 ~ 0,36	1.350	0,12 ~ 0,36
14	2.250	0,14 ~ 0,42	2.250	0,14 ~ 0,42	1.600	0,14 ~ 0,42	700	0,14 ~ 0,42	1.150	0,14 ~ 0,42
16	2.000	0,16 ~ 0,48	2.000	0,16 ~ 0,48	1.400	0,16 ~ 0,48	600	0,16 ~ 0,48	1.000	0,16 ~ 0,48
18	1.750	0,18 ~ 0,54	1.750	0,18 ~ 0,54	1.250	0,18 ~ 0,54	550	0,18 ~ 0,54	900	0,18 ~ 0,54
20	1.600	0,20 ~ 0,60	1.600	0,20 ~ 0,60	1.100	0,20 ~ 0,60	500	0,20 ~ 0,60	800	0,20 ~ 0,60

Vc	Cast Iron FC250 ~350N/mm <sup>2</sup>		Ductile Cast Iron FCD600 400~600N/mm <sup>2</sup>		Aluminium A5052 · A7075 ~350N/mm <sup>2</sup>		Aluminium Alloy AC4C · ADC 400~600N/mm <sup>2</sup>	
	80~120m/min		60~100m/min		120~200m/min		120~200m/min	
Ø	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)
3	10.600	0,045 ~ 0,09	8.500	0,045 ~ 0,09	17.000	0,045 ~ 0,09	17.000	0,045 ~ 0,09
4	8.000	0,045 ~ 0,12	6.350	0,045 ~ 0,12	12.750	0,045 ~ 0,12	12.750	0,045 ~ 0,12
6	5.300	0,06 ~ 0,18	4.250	0,06 ~ 0,18	8.500	0,06 ~ 0,18	8.500	0,06 ~ 0,18
8	4.000	0,08 ~ 0,24	3.200	0,08 ~ 0,24	6.350	0,08 ~ 0,24	6.350	0,08 ~ 0,24
10	3.200	0,10 ~ 0,30	2.550	0,10 ~ 0,30	5.100	0,10 ~ 0,30	5.100	0,10 ~ 0,30
12	2.650	0,12 ~ 0,36	2.100	0,12 ~ 0,36	4.250	0,12 ~ 0,36	4.250	0,12 ~ 0,36
14	2.250	0,14 ~ 0,42	1.800	0,14 ~ 0,42	3.650	0,14 ~ 0,42	3.650	0,14 ~ 0,42
16	2.000	0,16 ~ 0,48	1.600	0,16 ~ 0,48	3.200	0,16 ~ 0,48	3.200	0,16 ~ 0,48
18	1.750	0,18 ~ 0,54	1.400	0,18 ~ 0,54	2.850	0,18 ~ 0,54	2.850	0,18 ~ 0,54
20	1.600	0,20 ~ 0,60	1.250	0,20 ~ 0,60	2.550	0,20 ~ 0,60	2.550	0,20 ~ 0,60

- Water-soluble coolant may be applied as noted in the above table only under the premise that the work surface has been flattened by milling.
- Use a rigid and precise machine and holder.
- Please minimize overhang length as much as possible during machining.
- Adjust the rotational speed and the feed in accordance with conditions such as the machining shape, machine rigidity, or work holding.
- Please set up the drill so that the runout of the cutting edge is under 0.02 mm.
- Please select a cutting fluid that is most suitable for the work material with minimal smoke formation.
- In the case of dry machining, please use air blow to remove chips to prevent clogging. Please do not machine stainless steel dry.
- When machining an inclined plane, adjust the rotational speed and the feed in accordance with the angle of the incline (β).  
When the machining incline angle (β) is less than 30°, please reduce the feed to 40-60%.  
When the machining incline angle (β) is over 30°, please reduce the speed to 60-80%, the feed to 20-40%.
- Please use step drilling in pilot holes to improve cutting chip separation.
- If it is necessary to ensure the locating precision of the hole to be machined, adjust the rotational speed and the feed as indicated above (in accordance with the machining precision requirement).
- 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 CONDITIONS

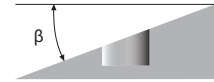
Drilling | Solid | Cutting conditions

## ADFLS-2D

Vc	Low Carbon Steel - Alloy Steel (C<0.3%) SS400 · SCM ~710N/mm <sup>2</sup>		Carbon Steel S35C · S50C ~210HB ~710N/mm <sup>2</sup>		Alloy Steel SCM · SCr · SNCM 28~35HRC 900~1,100N/mm <sup>2</sup>		Plastic Mold Steel NAK80 ~40HRC		Special Alloy Steel-Hardened Steel-Pre-hardened steel SKD61 ~50HRC	
	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)
3	8.500	0,045 ~ 0,075	8.500	0,045 ~ 0,075	6.350	0,045 ~ 0,075	3.200	0,045 ~ 0,06	2.650	0,03 ~ 0,06
4	6.350	0,06 ~ 0,1	6.350	0,06 ~ 0,1	4.750	0,06 ~ 0,1	2.400	0,06 ~ 0,08	2.000	0,04 ~ 0,08
6	4.250	0,09 ~ 0,15	4.250	0,09 ~ 0,15	3.200	0,09 ~ 0,15	1.600	0,09 ~ 0,12	1.350	0,06 ~ 0,12
8	3.200	0,12 ~ 0,2	3.200	0,12 ~ 0,2	2.400	0,12 ~ 0,2	1.200	0,12 ~ 0,16	1.000	0,08 ~ 0,16
10	2.550	0,15 ~ 0,25	2.550	0,15 ~ 0,25	1.900	0,15 ~ 0,25	950	0,15 ~ 0,2	800	0,1 ~ 0,2
12	2.100	0,18 ~ 0,3	2.100	0,18 ~ 0,3	1.600	0,18 ~ 0,3	800	0,18 ~ 0,24	650	0,12 ~ 0,24
14	1.800	0,21 ~ 0,35	1.800	0,21 ~ 0,35	900	0,21 ~ 0,35	700	0,21 ~ 0,28	550	0,14 ~ 0,28
16	1.600	0,24 ~ 0,4	1.600	0,24 ~ 0,4	800	0,24 ~ 0,4	600	0,24 ~ 0,32	500	0,16 ~ 0,32
18	1.400	0,27 ~ 0,45	1.400	0,27 ~ 0,45	700	0,27 ~ 0,45	550	0,27 ~ 0,36	450	0,18 ~ 0,36
20	1.250	0,3 ~ 0,5	1.250	0,3 ~ 0,5	650	0,3 ~ 0,5	500	0,3 ~ 0,4	400	0,2 ~ 0,4

Vc	Cast Iron FC250 ~350N/mm <sup>2</sup>		Ductile Cast Iron FCD600 400~600N/mm <sup>2</sup>		Aluminium A5052 · A7075 ~350N/mm <sup>2</sup>		Aluminium Alloy AC4C · ADC 400~600N/mm <sup>2</sup>	
	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)	Speed (min <sup>-1</sup> )	Feed Rate (mm/rev.)
3	9.550	0,06 ~ 0,09	6.900	0,06 ~ 0,09	14.850	0,015 ~ 0,09	14.850	0,015 ~ 0,09
4	7.150	0,08 ~ 0,12	5.150	0,08 ~ 0,12	11.150	0,02 ~ 0,12	11.150	0,02 ~ 0,12
6	4.750	0,12 ~ 0,18	3.450	0,12 ~ 0,18	7.450	0,03 ~ 0,18	7.450	0,03 ~ 0,18
8	3.600	0,16 ~ 0,24	2.600	0,16 ~ 0,24	5.550	0,04 ~ 0,24	5.550	0,04 ~ 0,24
10	2.850	0,2 ~ 0,3	2.050	0,2 ~ 0,3	4.450	0,05 ~ 0,3	4.450	0,05 ~ 0,3
12	2.400	0,24 ~ 0,36	1.700	0,24 ~ 0,36	3.700	0,06 ~ 0,36	3.700	0,06 ~ 0,36
14	2.050	0,28 ~ 0,42	1.500	0,28 ~ 0,42	3.200	0,07 ~ 0,42	3.200	0,07 ~ 0,42
16	1.800	0,32 ~ 0,48	1.300	0,32 ~ 0,48	2.800	0,08 ~ 0,48	2.800	0,08 ~ 0,48
18	1.600	0,36 ~ 0,54	1.150	0,36 ~ 0,54	2.500	0,09 ~ 0,54	2.500	0,09 ~ 0,54
20	1.450	0,4 ~ 0,6	1.050	0,4 ~ 0,6	2.250	0,1 ~ 0,6	2.250	0,1 ~ 0,6

- To process flat surfaces, prior Centre-drilling with a larger diameter is required.
- Water-soluble coolant may be applied as noted in the above table only under the premise that the work surface has been flattened by milling.
- When using non-water soluble oil or water-emulsifiable (over 20 times dilution), reduce cutting speed by 30%.
- Use a rigid and precise machine and holder.
- Please minimize tool hang over as much as possible during machining.
- Adjust the rotational speed and the feed rate in accordance with conditions such as the machining shape, machine rigidity, or work holding.
- Please set up the drill so that the runout of the cutting edge is under 0.01 mm.
- When machining an inclined plane, adjust the rotational speed and the feed rate in accordance with the angle of the incline (β).
  - When the machining incline angle(β) is less than 30°, please reduce the feed to 40~60%.
  - When the machining incline angle(β) is over 30°, please reduce the speed to 60~80%, the feed to 20~40%.
- Please use step drilling in pilot holes to improve cutting chip separation.
- If it is necessary to ensure the locating precision of the hole to be machined, adjust the rotational speed and the feed rate as indicated above (in accordance with the machining precision requirement).



## AD-2D/AD-4D

Standard drilling

Vc	C<0,35% (C<0,35%) St40 · SCM ~710 N/mm <sup>2</sup>		C≥0,35% (C≥0,35%) CK50 ~1060 N/mm <sup>2</sup>		Special Alloy SUJ2		SUS Serie SUS300 Serie SUS400		Hardened Steel				GG GG25 ~350 N/mm <sup>2</sup>		GGG GGG40 ~500 N/mm <sup>2</sup>	
	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	SKD61 43 HRC		43 ~ 48 HRC		S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
2	11.000	0,06~0,08	11.000	0,06~0,08	9.000	0,06~0,08	4.700	0,06~0,08	7.600	0,06~0,08	6.000	0,06~0,08	12.000	0,06~0,08	10.000	0,06~0,08
3	8.000	0,09~0,12	8.000	0,09~0,12	6.000	0,09~0,12	3.200	0,09~0,12	5.000	0,09~0,12	4.000	0,09~0,12	8.000	0,09~0,12	6.900	0,09~0,12
4	6.300	0,10~0,15	6.300	0,10~0,15	4.750	0,10~0,15	2.400	0,10~0,15	3.800	0,10~0,15	3.000	0,10~0,15	6.300	0,10~0,15	5.200	0,10~0,15
5	5.000	0,12~0,18	5.000	0,12~0,18	3.800	0,12~0,18	1.900	0,12~0,18	3.000	0,12~0,18	2.450	0,12~0,18	5.000	0,12~0,18	4.100	0,12~0,18
6	4.200	0,14~0,20	4.200	0,14~0,20	3.200	0,14~0,20	1.600	0,14~0,20	2.550	0,14~0,20	2.050	0,14~0,20	4.200	0,14~0,20	3.450	0,14~0,20
8	3.200	0,16~0,24	3.200	0,16~0,24	2.400	0,16~0,24	1.200	0,16~0,24	1.900	0,16~0,24	1.550	0,16~0,24	3.200	0,16~0,24	2.600	0,16~0,24
10	2.550	0,18~0,27	2.550	0,18~0,27	1.900	0,18~0,27	950	0,18~0,27	1.550	0,18~0,27	1.250	0,18~0,27	2.600	0,18~0,27	2.100	0,18~0,27
12	2.100	0,20~0,30	2.100	0,20~0,30	1.600	0,20~0,30	800	0,20~0,30	1.300	0,20~0,30	1.050	0,20~0,30	2.200	0,20~0,30	1.750	0,20~0,30
14	1.800	0,22~0,35	1.800	0,22~0,35	1.350	0,22~0,35	700	0,22~0,35	1.100	0,22~0,35	880	0,22~0,35	1.800	0,22~0,35	1.500	0,22~0,35
16	1.600	0,25~0,36	1.600	0,25~0,36	1.200	0,25~0,36	600	0,25~0,36	950	0,25~0,36	770	0,25~0,36	1.600	0,25~0,36	1.300	0,25~0,36
18	1.400	0,28~0,38	1.400	0,28~0,38	1.050	0,28~0,38	530	0,28~0,38	850	0,28~0,38	680	0,28~0,38	1.400	0,28~0,38	1.200	0,28~0,38
20	1.300	0,30~0,40	1.300	0,30~0,40	960	0,30~0,40	480	0,30~0,40	760	0,30~0,40	610	0,30~0,40	1.300	0,30~0,40	1.050	0,30~0,40

Drilling | Solid

Cutting conditions







# CUTTING CONDITIONS

Drilling | Solid | Cutting conditions

## ADO-TRS-3D/5D

		Mild Steel - Low Carbon Steel SS400 - S10C ~150HB ~500 N/mm <sup>2</sup>		Carbon Steel S35C - S50C ~210HB ~710 N/mm <sup>2</sup>		Alloy Steel SCM - SCr - SNCM 710 ~900 N/mm <sup>2</sup>		
Vc	80 ~ 120 m/min			80 ~ 120 m/min			60 ~ 100 m/min	
Ø	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
3	10.000	0,11 ~ 0,15	10.000	0,11 ~ 0,15	8.500	0,11 ~ 0,15		
4	8.000	0,14 ~ 0,2	8.000	0,14 ~ 0,2	6.400	0,14 ~ 0,2		
5	6.400	0,18 ~ 0,25	6.400	0,18 ~ 0,25	5.100	0,18 ~ 0,25		
6	5.300	0,21 ~ 0,3	5.300	0,21 ~ 0,3	4.200	0,21 ~ 0,3		
7	4.500	0,25 ~ 0,35	4.500	0,25 ~ 0,35	3.600	0,25 ~ 0,35		
8	4.000	0,28 ~ 0,4	4.000	0,28 ~ 0,4	3.200	0,28 ~ 0,4		
9	3.500	0,32 ~ 0,45	3.500	0,32 ~ 0,45	2.800	0,32 ~ 0,45		
10	3.200	0,35 ~ 0,5	3.200	0,35 ~ 0,5	2.500	0,35 ~ 0,5		
11	2.900	0,39 ~ 0,55	2.900	0,39 ~ 0,55	2.300	0,39 ~ 0,55		
12	2.700	0,42 ~ 0,6	2.700	0,42 ~ 0,6	2.100	0,42 ~ 0,6		
13	2.400	0,46 ~ 0,65	2.400	0,46 ~ 0,65	2.000	0,46 ~ 0,65		
14	2.300	0,49 ~ 0,7	2.300	0,49 ~ 0,7	1.800	0,49 ~ 0,7		
15	2.100	0,53 ~ 0,75	2.100	0,53 ~ 0,75	1.700	0,53 ~ 0,75		
16	2.000	0,56 ~ 0,8	2.000	0,56 ~ 0,8	1.600	0,56 ~ 0,8		
17	1.900	0,6 ~ 0,85	1.900	0,6 ~ 0,85	1.500	0,6 ~ 0,85		
18	1.800	0,63 ~ 0,9	1.800	0,63 ~ 0,9	1.400	0,63 ~ 0,9		
19	1.700	0,67 ~ 0,9	1.700	0,67 ~ 0,9	1.300	0,67 ~ 0,9		
20	1.600	0,7 ~ 0,9	1.600	0,7 ~ 0,9	1.300	0,7 ~ 0,9		

		Alloy Steel SCM - SCr - SNCM 900 ~1.100 N/mm <sup>2</sup>		Cast Iron FC250 ~350N/mm <sup>2</sup>		Ductile Cast Iron FCD450 - FCD600 400 ~600 N/mm <sup>2</sup>		
Vc	60 ~ 90 m/min			80 ~ 120 m/min			60 ~ 100 m/min	
Ø	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
3	8.000	0,11 ~ 0,15	10.000	0,11 ~ 0,18	8.500	0,11 ~ 0,15		
4	6.000	0,14 ~ 0,2	8.000	0,14 ~ 0,24	6.400	0,14 ~ 0,2		
5	4.800	0,18 ~ 0,25	6.400	0,18 ~ 0,3	5.100	0,18 ~ 0,25		
6	4.000	0,21 ~ 0,3	5.300	0,21 ~ 0,36	4.200	0,21 ~ 0,3		
7	3.400	0,25 ~ 0,35	4.500	0,25 ~ 0,42	3.600	0,25 ~ 0,35		
8	3.000	0,28 ~ 0,4	4.000	0,28 ~ 0,48	3.200	0,28 ~ 0,4		
9	2.700	0,32 ~ 0,45	3.500	0,32 ~ 0,54	2.800	0,32 ~ 0,45		
10	2.400	0,35 ~ 0,5	3.200	0,35 ~ 0,6	2.500	0,35 ~ 0,5		
11	2.200	0,39 ~ 0,55	2.900	0,39 ~ 0,66	2.300	0,39 ~ 0,55		
12	2.000	0,42 ~ 0,6	2.700	0,42 ~ 0,72	2.100	0,42 ~ 0,6		
13	1.800	0,46 ~ 0,65	2.400	0,46 ~ 0,78	2.000	0,46 ~ 0,65		
14	1.700	0,49 ~ 0,7	2.300	0,49 ~ 0,84	1.800	0,49 ~ 0,7		
15	1.600	0,53 ~ 0,70	2.100	0,53 ~ 0,75	1.700	0,53 ~ 0,7		
16	1.500	0,56 ~ 0,72	2.000	0,56 ~ 0,8	1.600	0,56 ~ 0,72		
17	1.400	0,6 ~ 0,77	1.900	0,6 ~ 0,85	1.500	0,6 ~ 0,77		
18	1.300	0,63 ~ 0,81	1.800	0,63 ~ 0,9	1.400	0,63 ~ 0,81		
19	1.300	0,67 ~ 0,86	1.700	0,67 ~ 0,95	1.300	0,67 ~ 0,86		
20	1.200	0,7 ~ 0,9	1.600	0,7 ~ 1	1.300	0,7 ~ 0,9		

- The indicated speeds and feeds are for drilling with water-soluble coolant.
- Water-soluble high density coolant (less than 20 times dilution) is recommended.
- When using non-water-soluble or water-soluble coolant (over 20 times dilution), reduce cutting speed by 30%.
- Equip the drill with a scratch- and dust-free collet and minimize drill deflection to less than 0.02mm.
- Fasten the work material to reduce the possibility of work deformation, deflection of machined surface, or vibration.
- A clogged oil hole can lead to breakage. Make sure that a filter is attached to the oil feeder.

# CUTTING CONDITIONS

Drilling | Solid | Cutting conditions

## ADO-10D/15D/20D/30D

Vc	Mild Steel - Low Carbon Steel SS400 · S10C ~150HB ~500 N/mm <sup>2</sup>		Carbon Steel S35C · S50C ~210HB ~710 N/mm <sup>2</sup>		Alloys Steel SCM · SCr · SNCM 16~28HRC 710~900 N/mm <sup>2</sup>		Cast Iron FC250 ~350 N/mm <sup>2</sup>		Ductile Cast Iron FCD450 · FCD600 400~600 N/mm <sup>2</sup>		Stainless Steel SUS400 400 ~ 800 N/mm <sup>2</sup>	
	∅	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )
3	7.500	0,06 ~ 0,12	7.500	0,06 ~ 0,12	7.500	0,06 ~ 0,12	7.500	0,06 ~ 0,12	7.500	0,06 ~ 0,12	5.300	0,06 ~ 0,12
4	6.400	0,08 ~ 0,16	6.400	0,08 ~ 0,16	6.400	0,08 ~ 0,16	6.400	0,08 ~ 0,16	5.600	0,08 ~ 0,16	5.000	0,08 ~ 0,16
5	5.800	0,10 ~ 0,20	5.800	0,10 ~ 0,20	5.800	0,10 ~ 0,20	5.800	0,10 ~ 0,20	4.500	0,10 ~ 0,20	4.500	0,10 ~ 0,20
6	4.800	0,12 ~ 0,24	4.800	0,12 ~ 0,24	4.800	0,12 ~ 0,24	4.800	0,12 ~ 0,24	3.800	0,12 ~ 0,24	3.800	0,12 ~ 0,24
8	3.600	0,16 ~ 0,28	3.600	0,16 ~ 0,28	3.600	0,16 ~ 0,28	3.600	0,16 ~ 0,28	2.800	0,16 ~ 0,28	2.800	0,16 ~ 0,28
10	2.900	0,20 ~ 0,35	2.900	0,20 ~ 0,35	2.900	0,20 ~ 0,35	2.900	0,20 ~ 0,35	2.300	0,20 ~ 0,35	2.300	0,20 ~ 0,35
12	2.400	0,24 ~ 0,42	2.400	0,24 ~ 0,42	2.400	0,24 ~ 0,42	2.400	0,24 ~ 0,42	1.900	0,24 ~ 0,42	1.900	0,24 ~ 0,42

## ADO-40D/50D

Vc	Mild Steel - Low Carbon Steel SS400 · S10C ~150HB ~500 N/mm <sup>2</sup>		Carbon Steel S35C · S50C ~210HB ~710 N/mm <sup>2</sup>		Alloy Steel SCM · SCr · sncm 16~28HRC 710 ~ 900 N/mm <sup>2</sup>		Alloy Steel (C ≥ 0,3%) SCM440 28~35HRC 900~1,060N/mm <sup>2</sup>	
	∅	S (min <sup>-1</sup> )	f (mm/rev.)	S (min <sup>-1</sup> )	f (mm/rev.)	S (min <sup>-1</sup> )	f (mm/rev.)	S (min <sup>-1</sup> )
3	7.500	0,06 ~ 0,12	7.500	0,06 ~ 0,12	6.400	0,06 ~ 0,12	5.300	0,06 ~ 0,11
4	5.600	0,08 ~ 0,16	5.600	0,08 ~ 0,16	4.800	0,08 ~ 0,16	4.000	0,08 ~ 0,14
5	4.500	0,1 ~ 0,2	4.500	0,1 ~ 0,2	3.800	0,1 ~ 0,2	3.200	0,1 ~ 0,17
6	3.700	0,12 ~ 0,24	3.700	0,12 ~ 0,24	3.200	0,12 ~ 0,24	2.700	0,12 ~ 0,21
8	2.800	0,16 ~ 0,28	2.800	0,16 ~ 0,28	2.400	0,16 ~ 0,28	2.000	0,16 ~ 0,24
10	2.300	0,2 ~ 0,35	2.300	0,2 ~ 0,35	1.900	0,2 ~ 0,35	1.600	0,2 ~ 0,3

Vc	Cast Iron FC250 ~350N/mm <sup>2</sup>		Ductile Cast Iron FCD450 - FCD600 400 ~ 600 N/mm <sup>2</sup>		Stainless Steel SUS300/400 480 ~ 800 N/mm <sup>2</sup>	
	∅	S (min <sup>-1</sup> )	f (mm/rev.)	S (min <sup>-1</sup> )	f (mm/rev.)	S (min <sup>-1</sup> )
3	7.500	0,06 ~ 0,12	6.400	0,06 ~ 0,12	5.300	0,06 ~ 0,12
4	5.600	0,08 ~ 0,16	4.800	0,08 ~ 0,16	4.000	0,08 ~ 0,16
5	4.500	0,1 ~ 0,2	3.800	0,1 ~ 0,2	3.200	0,1 ~ 0,2
6	3.700	0,12 ~ 0,24	3.200	0,12 ~ 0,24	2.700	0,12 ~ 0,24
8	2.800	0,16 ~ 0,28	2.400	0,16 ~ 0,28	2.000	0,16 ~ 0,28
10	2.300	0,2 ~ 0,35	1.900	0,2 ~ 0,35	1.600	0,2 ~ 0,35

- The indicated speeds and feeds are for drilling with water-soluble coolant or MQL (mist drilling in stainless steels is not recommended).
- Water-soluble high density coolant (20-30 times dilution) is recommended.
- When using non-water-soluble coolant, set the cutting speed between 70-100% of the lowest limit.
- Make a pilot hole before using in accordance with the recommended operation.
- A clogged oil hole can lead to breakage. Make sure that a filter is attached to the oil feeder.
- Peck drilling of 1D - 2D is strongly recommended.

\*If it is difficult to process or if the straightness of the hole needed to be improved, use the coolant-through carbide drill ADO-20/30D after drilling a pilot hole, then process with the ADO-40/50D. When processing with 3 tools, the ADO-40/50D may be used at a more aggressive cutting condition than those listed above.

## CAO-GDXL

Standard drilling

Vc	AC ADC · AC		AI A20... · A70...		AI A50... · A60...		Cu C1020 · C1100		Cu CrCu	
	∅	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )
3	12.800	0,09~0,15	10.700	0,09~0,15	12.800	0,06~0,12	12.800	0,06~0,12	10.700	0,05~0,09
4	9.600	0,12~0,20	8.000	0,12~0,20	9.600	0,08~0,16	9.600	0,08~0,16	8.000	0,06~0,10
5	7.700	0,15~0,25	6.400	0,15~0,25	7.700	0,10~0,20	7.700	0,10~0,20	6.400	0,06~0,10
6	6.400	0,18~0,30	5.400	0,18~0,30	6.400	0,12~0,20	6.400	0,12~0,20	5.400	0,06~0,10
8	4.800	0,20~0,40	4.000	0,20~0,40	4.800	0,12~0,25	4.800	0,12~0,25	4.000	0,08~0,15
10	3.900	0,25~0,50	3.200	0,25~0,50	3.900	0,15~0,25	3.900	0,15~0,25	3.200	0,08~0,15

Drilling | Solid


Cutting conditions


# CUTTING CONDITIONS

Drilling | Solid | Cutting conditions

## HYP-HP-3D/HYP-HPO-3D/-HE/-HB


Standard drilling


	Steel			Cu	A5052 /A7075	Al < 13% Si < 130 HB
	< 700 N/mm <sup>2</sup>	< 850 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>			
Vc	100 ~ 150 m/min	80 ~ 120 m/min	70 ~ 110 m/min	50 ~ 90 m/min	60 ~ 110 m/min	120 ~ 220 m/min
Ø	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)
3	0,09~0,12	0,09~0,12	0,09~0,12	0,02~0,03	0,09~0,20	0,09~0,28
4	0,10~0,15	0,10~0,15	0,10~0,15	0,02~0,04	0,10~0,24	0,10~0,38
5	0,12~0,18	0,12~0,18	0,12~0,18	0,03~0,05	0,12~0,28	0,12~0,40
6	0,14~0,20	0,14~0,20	0,14~0,20	0,03~0,06	0,14~0,34	0,14~0,48
8	0,16~0,24	0,16~0,24	0,16~0,24	0,04~0,08	0,16~0,38	0,16~0,53
10	0,18~0,27	0,18~0,27	0,18~0,27	0,05~0,10	0,18~0,45	0,18~0,63
12	0,20~0,30	0,20~0,30	0,20~0,30	0,06~0,12	0,20~0,53	0,20~0,75
14	0,22~0,35	0,22~0,35	0,22~0,35	0,08~0,16	0,22~0,57	0,22~0,81
16	0,25~0,36	0,25~0,36	0,25~0,36	0,10~0,18	0,25~0,61	0,25~0,85
18	0,28~0,38	0,28~0,38	0,28~0,38	0,12~0,20	0,28~0,63	0,28~0,90
20	0,30~0,40	0,30~0,40	0,30~0,40	0,20~0,28	0,28~0,68	0,30~0,98

	GG (G)		SUS	High-Alloy Steel	Special Alloys	Hardened Steel
	< 180 HB	< 300 HB	< 820 HB	< 1200 N/mm <sup>2</sup>	< 30 HRC	< 60 HRC
Vc	150 ~ 200 m/min	100 ~ 150 m/min	40 ~ 50 m/min	50 ~ 60 m/min	15 ~ 25 m/min	15 ~ 25 m/min
Ø	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)
3	0,12~0,15	0,12~0,15	0,09~0,12	0,07~0,11	0,05~0,09	0,03~0,05
4	0,13~0,18	0,13~0,18	0,10~0,15	0,08~0,13	0,06~0,10	0,04~0,06
5	0,15~0,22	0,15~0,22	0,12~0,18	0,10~0,15	0,08~0,12	0,05~0,07
6	0,18~0,25	0,18~0,25	0,14~0,20	0,12~0,18	0,09~0,15	0,05~0,07
8	0,20~0,30	0,20~0,30	0,16~0,24	0,14~0,22	0,12~0,20	0,06~0,08
10	0,23~0,33	0,23~0,33	0,18~0,27	0,15~0,25	0,13~0,23	0,07~0,10
12	0,25~0,38	0,25~0,38	0,20~0,30	0,17~0,26	0,14~0,24	0,09~0,12
14	0,30~0,43	0,30~0,43	0,22~0,35	0,18~0,30	0,15~0,26	0,10~0,13
16	0,35~0,50	0,35~0,50	0,25~0,36	0,20~0,32	0,16~0,26	0,10~0,13
18	0,38~0,55	0,38~0,55	0,28~0,38	0,23~0,33	0,18~0,28	0,12~0,16
20	0,40~0,63	0,40~0,63	0,30~0,40	0,25~0,35	0,20~0,30	0,14~0,18

## HYP-HP-5D/HYP-HPO-5D/-HE/-HB/HYP-HPO-8D

Standard drilling

	Steel			Cu	A5052 /A7075	Al < 13% Si < 130 HB
	< 700 N/mm <sup>2</sup>	< 850 N/mm <sup>2</sup>	< 1000 N/mm <sup>2</sup>			
Vc	100 ~ 150 m/min	80 ~ 120 m/min	70 ~ 110 m/min	50 ~ 90 m/min	60 ~ 110 m/min	120 ~ 220 m/min
Ø	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)
3	0,09~0,12	0,09~0,12	0,09~0,12	0,02~0,03	0,09~0,20	0,09~0,28
4	0,10~0,15	0,10~0,15	0,10~0,15	0,02~0,04	0,10~0,24	0,10~0,38
5	0,12~0,18	0,12~0,18	0,12~0,18	0,03~0,05	0,12~0,28	0,12~0,40
6	0,14~0,20	0,14~0,20	0,14~0,20	0,03~0,06	0,14~0,34	0,14~0,48
8	0,16~0,24	0,16~0,24	0,16~0,24	0,04~0,08	0,16~0,38	0,16~0,53
10	0,18~0,27	0,18~0,27	0,18~0,27	0,05~0,10	0,18~0,45	0,18~0,63
12	0,20~0,30	0,20~0,30	0,20~0,30	0,06~0,12	0,20~0,53	0,20~0,75
14	0,22~0,35	0,22~0,35	0,22~0,35	0,08~0,16	0,22~0,57	0,22~0,81
16	0,25~0,36	0,25~0,36	0,25~0,36	0,10~0,18	0,25~0,61	0,25~0,85
18	0,28~0,38	0,28~0,38	0,28~0,38	0,12~0,20	0,28~0,63	0,28~0,90
20	0,30~0,40	0,30~0,40	0,30~0,40	0,20~0,28	0,28~0,68	0,30~0,98

	GG (G)		SUS	High-Alloy Steel	Special Alloys	Hardened Steel
	< 180 HB	< 300 HB	< 820 HB	< 1200 N/mm <sup>2</sup>	< 30 HRC	< 60 HRC
Vc	150 ~ 200 m/min	100 ~ 150 m/min	40 ~ 50 m/min	50 ~ 60 m/min	15 ~ 25 m/min	15 ~ 25 m/min
Ø	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)	F (mm/rev.)
3	0,12~0,15	0,12~0,15	0,09~0,12	0,07~0,11	0,05~0,09	0,03~0,05
4	0,13~0,18	0,13~0,18	0,10~0,15	0,08~0,13	0,06~0,10	0,04~0,06
5	0,15~0,22	0,15~0,22	0,12~0,18	0,10~0,15	0,08~0,12	0,05~0,07
6	0,18~0,25	0,18~0,25	0,14~0,20	0,12~0,18	0,09~0,15	0,05~0,07
8	0,20~0,30	0,20~0,30	0,16~0,24	0,14~0,22	0,12~0,20	0,06~0,08
10	0,23~0,33	0,23~0,33	0,18~0,27	0,15~0,25	0,13~0,23	0,07~0,10
12	0,25~0,38	0,25~0,38	0,20~0,30	0,17~0,26	0,14~0,24	0,09~0,12
14	0,30~0,43	0,30~0,43	0,22~0,35	0,18~0,30	0,15~0,26	0,10~0,13
16	0,35~0,50	0,35~0,50	0,25~0,36	0,20~0,32	0,16~0,26	0,10~0,13
18	0,38~0,55	0,38~0,55	0,28~0,38	0,23~0,33	0,18~0,28	0,12~0,16
20	0,40~0,63	0,40~0,63	0,30~0,40	0,25~0,35	0,20~0,30	0,14~0,18

Drilling | Solid

Cutting conditions

# CUTTING CONDITIONS

Drilling | Solid | Cutting conditions

## D-STAD

CFRP		
Vc	50 ~ 100 m/min	
Ø	RPM	F (mm/rev.)
4	4.000 ~ 8.000	0,03 ~ 0,05
6	2.600 ~ 5.300	0,04 ~ 0,075
6,35	2.500 ~ 5.000	0,04 ~ 0,075
8	2.000 ~ 4.000	0,05 ~ 0,08

## WH55-5D

Ø	SKD61 Special Alloy Steel • Hardened Steel • Pre-hardened steel 40 ~ 45 HRC		DAC55, DH31S, SKD61, SKD11, STAVAX			
	30 ~ 50 m/min		45 ~ 50 HRC		50 ~ 56 HRC	
Vc	30 ~ 50 m/min		20 ~ 30 m/min		20 ~ 30 m/min	
Ø	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
2	6.400	0,02 ~ 0,04	4.000	0,02 ~ 0,04	4.000	0,02 ~ 0,04
3	4.200	0,03 ~ 0,06	2.700	0,03 ~ 0,06	2.700	0,03 ~ 0,06
4	3.200	0,04 ~ 0,08	2.000	0,04 ~ 0,08	2.000	0,04 ~ 0,08
5	2.500	0,05 ~ 0,10	1.600	0,05 ~ 0,10	1.600	0,05 ~ 0,10
6	2.100	0,06 ~ 0,12	1.300	0,06 ~ 0,12	1.300	0,06 ~ 0,12
7	1.800	0,07 ~ 0,14	1.100	0,07 ~ 0,14	1.100	0,07 ~ 0,14
8	1.600	0,08 ~ 0,16	1.000	0,08 ~ 0,16	1.000	0,08 ~ 0,16
9	1.400	0,09 ~ 0,18	900	0,09 ~ 0,18	900	0,09 ~ 0,18
10	1.300	0,10 ~ 0,20	800	0,10 ~ 0,20	800	0,10 ~ 0,20
11	1.150	0,11 ~ 0,22	720	0,11 ~ 0,22	720	0,11 ~ 0,22
12	1.100	0,12 ~ 0,24	700	0,12 ~ 0,24	700	0,12 ~ 0,24

## WH055-5D

Ø	SKD61 Special Alloy Steel • Hardened Steel • Pre-hardened steel 40 ~ 45 HRC		DAC55, DH31S, SKD61, SKD11, STAVAX				Inconel 38 ~ 43 HRC	
	30 ~ 50 m/min		45 ~ 50 HRC		50 ~ 56 HRC		38 ~ 43 HRC	
Vc	30 ~ 50 m/min		20 ~ 30 m/min		20 ~ 30 m/min		10 ~ 30 m/min	
Ø	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
3,3	3.900	0,033 ~ 0,066	2.400	0,033 ~ 0,066	2.400	0,033 ~ 0,066	1.900	0,033 ~ 0,066
4	3.200	0,04 ~ 0,08	2.000	0,04 ~ 0,08	2.000	0,04 ~ 0,08	1.600	0,04 ~ 0,08
5	2.500	0,05 ~ 0,10	1.600	0,05 ~ 0,10	1.600	0,05 ~ 0,10	1.300	0,05 ~ 0,10
6	2.100	0,06 ~ 0,12	1.300	0,06 ~ 0,12	1.300	0,06 ~ 0,12	1.100	0,06 ~ 0,12
7	1.800	0,07 ~ 0,14	1.100	0,07 ~ 0,14	1.100	0,07 ~ 0,14	900	0,07 ~ 0,14
8	1.600	0,08 ~ 0,16	1.000	0,08 ~ 0,16	1.000	0,08 ~ 0,16	800	0,08 ~ 0,16
9	1.400	0,09 ~ 0,18	900	0,09 ~ 0,18	900	0,09 ~ 0,18	700	0,09 ~ 0,18
10	1.300	0,10 ~ 0,20	800	0,10 ~ 0,20	800	0,10 ~ 0,20	600	0,10 ~ 0,20
11	1.150	0,11 ~ 0,22	720	0,11 ~ 0,22	720	0,11 ~ 0,22	600	0,11 ~ 0,22
12	1.100	0,12 ~ 0,24	700	0,12 ~ 0,24	700	0,12 ~ 0,24	500	0,12 ~ 0,24

## WH70-DRL

Ø	SKD11 • SKT • SUS440 55 ~ 60HRC		SKH • SKD11 • SKS 60 ~ 70HRC	
	10 ~ 16 m/min		8 ~ 13 m/min	
Vc	10 ~ 16 m/min		8 ~ 13 m/min	
Ø	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
2	2.000	~ 0,04	1.900	~ 0,04
3	1.330	~ 0,04	1.250	~ 0,04
4	1.000	~ 0,04	950	~ 0,04
5	800	~ 0,04	750	~ 0,04
6	670	~ 0,04	630	~ 0,04
8	500	~ 0,04	480	~ 0,04
10	400	~ 0,04	380	~ 0,04
12	330	~ 0,04	320	~ 0,04
14,1	280	~ 0,04	270	~ 0,04
16,1	250	~ 0,04	240	~ 0,04
17,6	235	~ 0,04	190	~ 0,04
18,6	220	~ 0,04	180	~ 0,04

Drilling | Solid  
Cutting conditions







# CUTTING CONDITIONS


Drilling | Solid | Cutting conditions

## VP-HO-GDR

	C≤0,2% ~500 N/mm <sup>2</sup>		Carbon Steel CK50 500~710 N/mm <sup>2</sup>		SCM 100Cr6 710~900 N/mm <sup>2</sup>		SUS SUS300 SUS400		Special Alloy				35~45 HRC 34~43 HRC 1060~ 1400 N/mm <sup>2</sup>		GG GG25 ~350 N/mm <sup>2</sup>		AC GG25 AC4C·ADC	
	Vc									SKD61 ~28 HRC ~900 N/mm <sup>2</sup>		SKD11 28~34 HRC 900~1060 N/mm <sup>2</sup>						
Ø		S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )
6	3.000	0,13~0,19	1.900	0,13~0,19	1.500	0,13~0,19	1.100	0,13~0,19	850	0,13~0,19	660	0,13~0,19	630	0,08~0,15	2.500	0,19~0,26	5.300	0,34~0,48
8	2.300	0,17~0,24	1.400	0,17~0,24	1.100	0,17~0,24	830	0,17~0,24	640	0,17~0,24	450	0,17~0,24	470	0,13~0,20	1.900	0,21~0,30	4.000	0,38~0,53
10	1.800	0,20~0,28	1.100	0,20~0,28	950	0,20~0,28	660	0,20~0,28	500	0,20~0,28	400	0,20~0,28	380	0,16~0,24	1.500	0,25~0,36	3.200	0,45~0,63
12	1.500	0,24~0,34	950	0,24~0,34	800	0,24~0,34	550	0,24~0,34	420	0,24~0,34	330	0,24~0,34	320	0,19~0,28	1.250	0,30~0,34	2.700	0,53~0,75
13	1.400	0,26~0,36	900	0,26~0,36	750	0,26~0,36	510	0,26~0,36	400	0,26~0,36	300	0,26~0,36	290	0,20~0,30	1.200	0,31~0,42	2.500	0,56~0,79
14	1.350	0,28~0,39	820	0,28~0,39	700	0,28~0,39	470	0,28~0,39	360	0,28~0,39	280	0,28~0,39	270	0,20~0,32	1.100	0,32~0,44	2.300	0,57~0,81
16	1.200	0,30~0,43	720	0,30~0,43	600	0,30~0,43	420	0,30~0,43	320	0,30~0,43	250	0,30~0,43	240	0,22~0,32	1.000	0,34~0,46	2.000	0,61~0,85
18	1.100	0,34~0,49	650	0,34~0,49	550	0,34~0,49	370	0,34~0,49	280	0,34~0,49	220	0,34~0,49	210	0,24~0,40	900	0,36~0,50	1.800	0,63~0,90
20	950	0,36~0,50	580	0,36~0,50	480	0,36~0,50	330	0,36~0,50	260	0,36~0,50	200	0,36~0,50	190	0,27~0,45	800	0,40~0,56	1.600	0,68~0,98
22	850	0,40~0,55	520	0,40~0,55	450	0,40~0,55	300	0,40~0,55	230	0,40~0,55	180	0,40~0,55	170	0,28~0,48	700	0,42~0,59	1.500	0,73~1,06
24	800	0,41~0,60	480	0,41~0,60	400	0,41~0,60	280	0,41~0,60	210	0,41~0,60	170	0,41~0,60	160	0,29~0,52	650	0,46~0,65	1.350	0,77~1,13
26	750	0,42~0,65	450	0,42~0,65	370	0,42~0,65	250	0,42~0,65	200	0,42~0,65	150	0,42~0,65	150	0,30~0,56	600	0,47~0,68	1.250	0,81~1,20
28	700	0,45~0,70	410	0,45~0,70	350	0,45~0,70	240	0,45~0,70	180	0,45~0,70	140	0,45~0,70	140	0,31~0,59	550	0,50~0,73	1.150	0,84~1,26
30	650	0,48~0,75	400	0,48~0,75	320	0,48~0,75	220	0,48~0,75	170	0,48~0,75	130	0,48~0,75	130	0,32~0,63	500	0,54~0,78	1.100	0,87~1,32
32	600	0,51~0,80	360	0,51~0,80	300	0,51~0,80	200	0,51~0,80	160	0,51~0,80	120	0,51~0,80	120	0,32~0,67	480	0,58~0,83	1.000	0,90~1,38

## NEXUS-GDS/NEXUS-GDR

	SUS									
	AUSTENITIC SUS304 - 200		AUSTENITIC SUS304 - 200		MARTENSITIC SUS420 - 440		FERRITIC SUS430 - 405		PRECIPITATION SUS630 - 631	
Vc	12 ~ 15 m/min		15 ~ 25 m/min		15 ~ 25 m/min		15 ~ 30 m/min		10 ~ 20 m/min	
Ø	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
1	4.460	0,01~0,018	6.370	0,02~0,04	6.370	0,01~0,02	7.000	0,01~0,03	4.770	0,01~0,03
2	2.230	0,02~0,036	3.180	0,05~0,07	3.180	0,02~0,04	3.500	0,03~0,05	2.390	0,03~0,05
3	1.490	0,03~0,054	2.120	0,06~0,09	2.120	0,03~0,06	2.330	0,04~0,06	1.590	0,04~0,06
4	1.030	0,04~0,08	1.590	0,08~0,12	1.590	0,04~0,08	1.750	0,06~0,08	1.190	0,06~0,08
5	830	0,05~0,10	1.270	0,10~0,15	1.270	0,05~0,10	1.400	0,08~0,10	950	0,08~0,10
6	690	0,06~0,12	1.060	0,12~0,18	1.060	0,06~0,12	1.170	0,09~0,12	800	0,09~0,12
8	480	0,08~0,16	800	0,16~0,24	800	0,08~0,16	880	0,12~0,16	600	0,12~0,16
10	380	0,10~0,20	640	0,20~0,28	640	0,10~0,20	700	0,15~0,20	480	0,15~0,20
12	320	0,12~0,24	530	0,24~0,34	530	0,12~0,24	580	0,18~0,24	400	0,18~0,24

	Al A5052 - 7075		AC AC4C - ADC		Cu C1020 - 2600		C≤0,2% S15C - S5400 ~500 N/mm <sup>2</sup>	
	Vc	32 ~ 63 m/min		63 ~ 100 m/min		40 ~ 60 m/min		40 ~ 60 m/min
Ø	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
1	15.000	0,02~0,06	25.000	0,02~0,06	15.920	0,01~0,03	15.920	0,02~0,05
2	8.000	0,04~0,12	10.000	0,04~0,12	7.960	0,04~0,06	7.960	0,06~0,09
3	5.300	0,06~0,18	6.700	0,06~0,18	5.310	0,06~0,09	5.310	0,10~0,13
4	4.000	0,08~0,24	6.400	0,08~0,24	3.980	0,08~0,11	3.980	0,11~0,15
5	3.200	0,10~0,30	5.000	0,10~0,30	3.180	0,10~0,13	3.180	0,12~0,18
6	2.700	0,12~0,36	4.200	0,12~0,36	2.650	0,12~0,15	2.650	0,13~0,19
8	2.000	0,16~0,45	3.200	0,16~0,45	1.990	0,16~0,20	1.990	0,17~0,24
10	1.600	0,20~0,55	2.500	0,20~0,55	1.590	0,20~0,25	1.590	0,20~0,28
12	1.350	0,24~0,66	2.100	0,24~0,66	1.330	0,24~0,30	1.330	0,24~0,34

Drilling depth	≤4D	≤5D	≤6D
Coefficient for reducing speed	x0,9	x0,8	x0,8
D= drill dia			

Drilling | Solid

Cutting conditions

B

# CUTTING CONDITIONS

Drilling | Solid | Cutting conditions

## V-SDR

Vc	C≤0,2% CK15 • St40 ~500 N/mm <sup>2</sup>		Carbon Steel CK45 • CK50 500 ~ 710 N/mm <sup>2</sup>		SCM SCM • SNC • SNCM 710 ~ 900 N/mm <sup>2</sup>		Special Steel SKD61 35 HRC		Special Steel SKD11		GG GG25 ~350 N/mm <sup>2</sup>		AC AC4C • ADC	
	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
22 ~ 40 m/min			16 ~ 30 m/min		12 ~ 25 m/min		8 ~ 16 m/min		6 ~ 12 m/min		22 ~ 40 m/min		50 ~ 100 m/min	
2	5.700	0,02~0,08	4.000	0,02~0,08	3.500	0,02~0,08	1.900	0,02~0,08	1.600	0,02~0,08	5.700	0,07~0,10	10.000	0,07~0,10
3	3.850	0,03~0,10	2.800	0,03~0,10	2.400	0,03~0,10	1.320	0,03~0,10	1.060	0,03~0,10	3.850	0,11~0,14	10.000	0,11~0,14
4	2.900	0,04~0,13	2.100	0,04~0,13	1.800	0,04~0,13	950	0,04~0,13	800	0,04~0,13	2.900	0,12~0,17	7.500	0,12~0,17
5	2.260	0,05~0,15	1.600	0,05~0,15	1.400	0,05~0,15	750	0,05~0,15	630	0,05~0,15	2.260	0,14~0,20	6.300	0,14~0,20
6	1.900	0,06~0,17	1.320	0,06~0,17	1.180	0,06~0,17	630	0,06~0,17	530	0,06~0,17	1.900	0,17~0,24	5.000	0,17~0,24
8	1.400	0,08~0,21	1.000	0,08~0,21	900	0,08~0,21	480	0,08~0,21	400	0,08~0,21	1.400	0,19~0,28	4.000	0,19~0,28
10	1.120	0,10~0,22	800	0,10~0,22	710	0,10~0,22	380	0,10~0,22	320	0,10~0,22	1.120	0,22~0,33	3.150	0,22~0,33
12	950	0,12~0,27	670	0,12~0,27	600	0,12~0,27	320	0,12~0,27	270	0,12~0,27	950	0,26~0,38	2.650	0,26~0,38
13	880	0,13~0,29	620	0,13~0,29	550	0,13~0,29	300	0,13~0,29	250	0,13~0,29	880	0,27~0,39	2.450	0,27~0,39

## EX-SUS-GDS/EX-SUS-GDR

Vc	SUS								Al A5052 - 7075		AC AC4C - ADC		Cu C1020 - 2600		C≤0,2% CK15 - St40 ~500 N/mm <sup>2</sup>	
	Austenitic SUS304 SUS200		Martensitic SUS420 SUS440		Ferritic SUS430 SUS405		Precipitation SUS630 SUS631		S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
13 ~ 18 m/min		15 ~ 20 m/min		15 ~ 20 m/min		8 ~ 12 m/min		32 ~ 63 m/min		63 ~ 100 m/min		25 ~ 50 m/min		32 ~ 40 m/min		
1	4.800	0,02~0,04	5.550	0,02~0,04	5.550	0,01~0,03	3.200	0,01~0,03	15.000	0,02~0,06	25.000	0,02~0,06	12.000	0,01~0,03	10.000	0,02~0,05
2	2.400	0,05~0,07	2.850	0,05~0,07	2.850	0,03~0,05	1.600	0,03~0,05	8.000	0,04~0,12	10.000	0,04~0,12	5.100	0,04~0,06	5.700	0,06~0,09
3	1.600	0,06~0,09	1.900	0,06~0,09	1.900	0,04~0,06	1.100	0,04~0,06	5.300	0,06~0,18	6.700	0,06~0,18	3.400	0,06~0,09	3.850	0,10~0,13
4	1.200	0,08~0,12	1.450	0,08~0,12	1.450	0,06~0,08	800	0,06~0,08	4.000	0,08~0,24	6.400	0,08~0,24	2.550	0,08~0,11	2.900	0,11~0,15
5	950	0,10~0,15	1.150	0,12~0,15	1.150	0,08~0,10	650	0,08~0,10	3.200	0,10~0,30	5.000	0,10~0,30	2.050	0,10~0,13	2.260	0,12~0,18
6	800	0,12~0,18	950	0,15~0,18	950	0,09~0,12	550	0,09~0,12	2.700	0,12~0,36	4.200	0,12~0,36	1.700	0,12~0,15	1.900	0,13~0,19
8	600	0,16~0,24	720	0,20~0,24	720	0,12~0,16	400	0,12~0,16	2.000	0,16~0,45	3.200	0,16~0,45	1.250	0,16~0,20	1.400	0,17~0,24
10	480	0,20~0,28	570	0,25~0,30	570	0,15~0,20	320	0,15~0,20	1.600	0,20~0,55	2.500	0,20~0,55	1.000	0,20~0,25	1.120	0,20~0,28
12	400	0,24~0,34	480	0,30~0,36	480	0,18~0,24	280	0,18~0,24	1.350	0,24~0,66	2.100	0,24~0,66	850	0,24~0,30	950	0,24~0,34
13	370	0,26~0,36	440	0,32~0,40	440	0,20~0,26	250	0,20~0,26	1.250	0,25~0,72	2.000	0,25~0,72	780	0,26~0,32	880	0,26~0,36
14	340	0,28~0,39	410	0,35~0,45	410	0,21~0,30	225	0,21~0,30	1.140	0,27~0,74	1.850	0,27~0,74	730	0,26~0,34	820	0,27~0,39
15	320	0,29~0,40	380	0,36~0,48	380	0,22~0,31	210	0,22~0,31	1.060	0,29~0,80	1.700	0,29~0,80	680	0,26~0,36	760	0,28~0,42
16	300	0,30~0,43	355	0,37~0,50	355	0,23~0,32	200	0,23~0,32	1.000	0,30~0,83	1.600	0,30~0,83	640	0,27~0,37	720	0,29~0,43
17	280	0,31~0,45	335	0,38~0,52	335	0,24~0,34	185	0,24~0,34	940	0,31~0,88	1.500	0,31~0,88	600	0,28~0,39	675	0,30~0,46
18	265	0,32~0,47	320	0,39~0,54	320	0,25~0,36	175	0,25~0,36	885	0,32~0,94	1.450	0,32~0,94	570	0,29~0,41	640	0,32~0,49
19	250	0,33~0,48	300	0,40~0,55	300	0,25~0,38	170	0,25~0,38	840	0,34~0,97	1.350	0,34~0,97	540	0,30~0,43	600	0,33~0,51
20	240	0,34~0,50	285	0,40~0,56	285	0,26~0,40	160	0,26~0,40	800	0,36~1,00	1.300	0,36~1,00	510	0,30~0,44	570	0,34~0,52

Drilling | Solid

Cutting conditions







# CUTTING CONDITIONS

Drilling | Solid | Cutting conditions

## HYP-LDS

Vc	C≤0,2% St40 ~ 500 N/mm <sup>2</sup>		Carbon Steel CK45 500 ~ 710 N/mm <sup>2</sup>		SCM SCM440 710 ~ 900 N/mm <sup>2</sup>		Special Steel SKD61 28 HRC		Special Steel SKD11 34 HRC		GG GG25 ~ 350 N/mm <sup>2</sup>		AC AC4D	
	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
3	7.500	0,04~0,08	5.500	0,04~0,08	4.500	0,04~0,08	2.500	0,04~0,08	2.000	0,04~0,08	8.000	0,05~0,09	12.000	0,10~0,22
4	5.700	0,05~0,10	4.100	0,05~0,10	3.300	0,05~0,10	1.900	0,05~0,10	1.500	0,05~0,10	6.500	0,07~0,12	9.500	0,12~0,25
6	3.800	0,06~0,12	2.700	0,06~0,12	2.300	0,06~0,12	1.250	0,06~0,12	1.000	0,06~0,12	4.300	0,12~0,18	6.400	0,14~0,28
8	2.800	0,08~0,15	2.000	0,08~0,15	1.700	0,08~0,15	950	0,08~0,15	750	0,08~0,15	3.200	0,13~0,20	4.800	0,18~0,32
10	2.300	0,10~0,18	1.700	0,10~0,18	1.400	0,10~0,18	750	0,10~0,18	600	0,10~0,18	2.600	0,17~0,25	3.800	0,22~0,36
12	1.900	0,12~0,21	1.400	0,12~0,21	1.200	0,12~0,21	650	0,12~0,21	500	0,12~0,21	2.200	0,21~0,30	3.200	0,25~0,40
16	1.400	0,16~0,28	1.000	0,16~0,28	900	0,16~0,28	500	0,16~0,28	380	0,16~0,28	1.600	0,24~0,32	2.400	0,32~0,48
20	1.150	0,20~0,34	820	0,20~0,34	700	0,20~0,34	400	0,20~0,34	300	0,20~0,34	1.300	0,26~0,40	1.900	0,40~0,60
25	900	0,25~0,45	650	0,25~0,45	560	0,25~0,45	300	0,25~0,45	250	0,25~0,45	1.000	0,30~0,50	1.500	0,50~0,75

## TIN-NC-LDS/NC-LDS

Vc	C≤0,2% St40		Carbon Steel CK45		SCM SCM440		Special Steel SKD61 35 HRC		Special Steel SKD11 34 HRC		GG GG25 ~ 350 N/mm <sup>2</sup>		SUS SUS304		AC AC4D	
	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)	S (min <sup>-1</sup> )	F (mm/rev.)
3	3.850	0,04~0,08	2.800	0,04~0,08	2.400	0,04~0,08	1.220	0,04~0,08	1.060	0,04~0,08	3.100	0,04~0,09	1.060	0,04~0,08	8.000	0,10~0,22
4	2.900	0,05~0,10	2.100	0,05~0,10	1.800	0,05~0,10	910	0,05~0,10	800	0,05~0,10	2.400	0,05~0,12	800	0,05~0,10	6.000	0,12~0,25
6	1.900	0,06~0,12	1.320	0,06~0,12	1.180	0,06~0,12	610	0,06~0,12	530	0,06~0,12	1.600	0,06~0,18	530	0,06~0,12	4.000	0,14~0,28
8	1.400	0,08~0,15	1.000	0,08~0,15	900	0,08~0,15	450	0,08~0,15	400	0,08~0,15	1.200	0,08~0,20	400	0,08~0,15	3.000	0,18~0,32
10	1.120	0,10~0,18	800	0,10~0,18	710	0,10~0,18	360	0,10~0,18	320	0,10~0,18	950	0,10~0,25	320	0,10~0,18	2.400	0,22~0,36
12	950	0,12~0,21	670	0,12~0,21	600	0,12~0,21	300	0,12~0,21	270	0,12~0,21	800	0,12~0,30	270	0,12~0,21	2.000	0,25~0,40
16	720	0,16~0,28	520	0,16~0,28	450	0,16~0,28	220	0,16~0,28	200	0,16~0,28	600	0,16~0,32	200	0,16~0,28	1.500	0,32~0,48
20	560	0,20~0,34	400	0,20~0,34	360	0,20~0,34	180	0,20~0,34	160	0,20~0,34	480	0,20~0,40	160	0,20~0,34	1.200	0,40~0,60
25	450	0,25~0,45	320	0,25~0,45	290	0,25~0,45	150	0,25~0,45	130	0,25~0,45	380	0,25~0,50	130	0,25~0,45	960	0,50~0,75

## HY-PRO-CARB

Centre drilling & Grooving

	C≤0,2% NK2020	SUS NK2020	Die steels NK2020	GG NK1010	AI NK1010
(rev./min)	3.000	2.000	3.000	3.200	4.000
F (mm/min)	80	50	50	200	150

Chamfering

	C≤0,2% NK2020	SUS NK2020	Die steels NK2020	GG NK1010	AI NK1010
(rev./min)	3.000	2.500	3.000	3.000	4.000
F (mm/min)	200	150	150	200	300

# CUTTING CONDITIONS

Drilling | Solid | Cutting conditions

## D-DAD

CFRP		
Vc	60 ~ 120 m/min	
Ø	Speed (min <sup>-1</sup> )	F (mm/rev.)
2,5	11.000	0,03 ~ 0,05
3,27	8.700	0,03 ~ 0,05
4,10	7.000	0,03 ~ 0,05
4,86	6.000	0,03 ~ 0,05
6,37	4.500	0,05 ~ 0,10
9,55	3.000	0,05 ~ 0,10

1. Although coolant is not required, please take adequate measurement against dust (use a vacuum system).
2. The machinability of CFRP varies based on resin type, resin content and clamping method. For thin laminates, reduce feed rate near hole penetration according to the above recommended cutting conditions.
3. Reduce cutting speed accordingly when machining thick laminates.
4. Cutting speed up to 200m/min is possible when drilling with approved coolant fluid.

## D-GDN90

CFRP		
Vc	60 ~ 120 m/min	
Ø	Speed (min <sup>-1</sup> )	F (mm/rev.)
2,5	11.000	0,03 ~ 0,05
3,27	8.700	0,03 ~ 0,05
4,10	7.000	0,03 ~ 0,05
4,86	6.000	0,03 ~ 0,05
6,37	4.500	0,05 ~ 0,10
9,55	3.000	0,05 ~ 0,10

1. Although coolant is not required, please take adequate measurement against dust (use a vacuum system).
2. The machinability of CFRP varies based on resin type, resin content and clamping method. For thin laminates, reduce feed rate near hole penetration according to the above recommended cutting conditions.
3. Reduce cutting speed accordingly when machining thick laminates.
4. Cutting speed up to 200m/min is possible when drilling with approved coolant fluid.

Drilling | Solid

Cutting conditions



# CUTTING CONDITIONS

Drilling | Solid | Cutting conditions

## CRM

Vc	Low Carbon Steel S15C • S5400 AISI1015		Carbon Steel S45C • S50C AISI1045 • 1050		Alloy Steel SCM • SNC • SNCM		Alluminium Alloy A7075 • ADC DIN ALZnMgCu1.5D	
	12 ~ 20 m/min		10 ~ 16 m/min		8 ~ 12 m/min		15 ~ 30 m/min	
Ø	F (mm/rev.)	Removal Amount (mm)	F (mm/rev.)	Removal Amount (mm)	F (mm/rev.)	Removal Amount (mm)	F (mm/rev.)	Removal Amount (mm)
0,3	0,002~0,005	0,03~0,08	0,002~0,005	0,03~0,08	0,002~0,005	0,03~0,08	0,002~0,005	0,03~0,08
0,5	0,004~0,01	0,05~0,10	0,004~0,01	0,05~0,10	0,004~0,01	0,05~0,10	0,004~0,01	0,05~0,10
1	0,008~0,015	0,05~0,10	0,008~0,015	0,05~0,10	0,008~0,015	0,05~0,10	0,008~0,015	0,05~0,10
2	0,018~0,03	0,05~0,15	0,018~0,03	0,05~0,15	0,018~0,03	0,05~0,15	0,018~0,03	0,05~0,15
3	0,028~0,045	0,10~0,20	0,028~0,045	0,10~0,20	0,028~0,045	0,10~0,20	0,028~0,045	0,10~0,20
4	0,04~0,06	0,10~0,20	0,04~0,06	0,10~0,20	0,04~0,06	0,10~0,20	0,04~0,06	0,10~0,20
5	0,05~0,09	0,10~0,20	0,05~0,09	0,10~0,20	0,05~0,09	0,10~0,20	0,06~0,09	0,10~0,20
6	0,06~0,12	0,10~0,20	0,06~0,12	0,10~0,20	0,06~0,12	0,10~0,20	0,07~0,13	0,10~0,20
8	0,08~0,15	0,10~0,20	0,08~0,15	0,10~0,20	0,08~0,15	0,10~0,20	0,08~0,18	0,10~0,20
10	0,10~0,20	0,10~0,20	0,10~0,20	0,10~0,20	0,10~0,20	0,10~0,20	0,10~0,23	0,10~0,30
12	0,12~0,22	0,10~0,20	0,12~0,22	0,10~0,20	0,12~0,22	0,10~0,20	0,12~0,28	0,10~0,30
13	0,13~0,23	0,10~0,20	0,13~0,23	0,10~0,20	0,13~0,23	0,10~0,20	0,13~0,30	0,10~0,30

Vc	Hardened Steel SKT • SKD				GG FC250		Copper C1100 DIN ECu57	
	~40HRC		~50 HRC		8 ~ 16 m/min		10 ~ 25 m/min	
Ø	F (mm/rev.)	Removal Amount (mm)	F (mm/rev.)	Removal Amount (mm)	F (mm/rev.)	Removal Amount (mm)	F (mm/rev.)	Removal Amount (mm)
0,3	0,001~0,004	0,03~0,08	-	-	0,002~0,005	0,03~0,08	0,002~0,005	0,03~0,08
0,5	0,003~0,009	0,05~0,10	-	-	0,004~0,01	0,05~0,10	0,004~0,01	0,05~0,10
1	0,007~0,014	0,05~0,10	-	-	0,008~0,015	0,05~0,10	0,008~0,015	0,05~0,10
2	0,015~0,027	0,05~0,15	-	-	0,018~0,03	0,05~0,15	0,018~0,03	0,05~0,15
3	0,023~0,04	0,10~0,20	0,012~0,03	0,03~0,08	0,028~0,045	0,10~0,20	0,028~0,045	0,10~0,20
4	0,032~0,052	0,10~0,20	0,015~0,035	0,03~0,08	0,04~0,06	0,10~0,20	0,04~0,06	0,10~0,20
5	0,04~0,08	0,10~0,20	0,02~0,05	0,03~0,08	0,05~0,09	0,10~0,20	0,05~0,09	0,10~0,20
6	0,05~0,10	0,10~0,20	0,025~0,055	0,03~0,08	0,06~0,12	0,10~0,20	0,06~0,12	0,10~0,20
8	0,06~0,13	0,10~0,20	0,03~0,075	0,03~0,08	0,08~0,15	0,10~0,20	0,08~0,15	0,10~0,20
10	0,08~0,18	0,10~0,20	0,04~0,08	0,03~0,08	0,10~0,20	0,10~0,20	0,10~0,20	0,10~0,20
12	0,10~0,20	0,10~0,20	0,04~0,09	0,03~0,08	0,12~0,23	0,10~0,20	0,12~0,23	0,10~0,20
13	0,10~0,21	0,10~0,20	0,04~0,10	0,03~0,08	0,13~0,25	0,10~0,20	0,13~0,25	0,10~0,20

Drilling | Solid

Cutting conditions



# CUTTING CONDITIONS

Drilling | Indexables | Cutting conditions

## PXD

Vc	Mild Steel Low Carbon Steel SS400 - S10C ~150HB ~500N/mm <sup>2</sup>			Carbon Steel S35C - S50C ~210HB ~710N/mm <sup>2</sup>			Alloy Steel SCM - SCr - SNCM 16 ~ 30HRC 710 ~ 950N/mm <sup>2</sup>			Cast Iron FC250 ~350N/mm <sup>2</sup>			Ductile Cast Iron FCD450 - FCD600 400 ~ 600N/mm <sup>2</sup>			Aluminium Alloy Casting AC4C • ADC																																					
	80 ~ 120 m/min									80 ~ 120 m/min									60 ~ 120 m/min									80 ~ 120 m/min									60 ~ 100 m/min									80 ~ 180 m/min							
Ø	S (min <sup>-1</sup> )		F (mm/rev)		S (min <sup>-1</sup> )		F (mm/rev)		S (min <sup>-1</sup> )		F (mm/rev)		S (min <sup>-1</sup> )		F (mm/rev)		S (min <sup>-1</sup> )		F (mm/rev)		S (min <sup>-1</sup> )		F (mm/rev)																														
14	2.300	0,21	0,35	2.300	0,21	0,35	2.000	0,21	0,35	2.300	0,21	0,35	1.800	0,21	0,35	3.000	0,28	0,42																																			
15	2.100	0,23	0,38	2.100	0,23	0,38	1.900	0,23	0,38	2.100	0,23	0,38	1.700	0,23	0,38	2.800	0,3	0,45																																			
16	2.000	0,24	0,4	2.000	0,24	0,4	1.800	0,24	0,4	2.000	0,24	0,4	1.600	0,24	0,4	2.600	0,32	0,48																																			
17	1.900	0,26	0,43	1.900	0,26	0,43	1.700	0,26	0,43	1.900	0,26	0,43	1.500	0,26	0,43	2.400	0,34	0,51																																			
18	1.800	0,27	0,45	1.800	0,27	0,45	1.600	0,27	0,45	1.800	0,27	0,45	1.400	0,27	0,45	2.300	0,36	0,54																																			
19	1.700	0,29	0,48	1.700	0,29	0,48	1.500	0,29	0,48	1.700	0,29	0,48	1.300	0,29	0,48	2.200	0,38	0,57																																			
20	1.600	0,3	0,5	1.600	0,3	0,5	1.400	0,3	0,5	1.600	0,3	0,5	1.300	0,3	0,5	2.100	0,4	0,6																																			
21	1.500	0,32	0,53	1.500	0,32	0,53	1.400	0,32	0,53	1.500	0,32	0,53	1.200	0,32	0,53	2.000	0,42	0,63																																			
22	1.400	0,33	0,55	1.400	0,33	0,55	1.300	0,33	0,55	1.400	0,33	0,55	1.200	0,33	0,55	1.900	0,44	0,66																																			
23	1.400	0,35	0,58	1.400	0,35	0,58	1.200	0,35	0,58	1.400	0,35	0,58	1.100	0,35	0,58	1.800	0,46	0,69																																			
24	1.300	0,36	0,6	1.300	0,36	0,6	1.200	0,36	0,6	1.300	0,36	0,6	1.100	0,36	0,6	1.700	0,48	0,72																																			
25	1.300	0,38	0,63	1.300	0,38	0,63	1.100	0,38	0,63	1.300	0,38	0,63	1.000	0,38	0,63	1.700	0,5	0,75																																			

1. The indicated speeds and feeds are for water soluble oil.
2. Suitable cutting fluid is water soluble high density oil (less than 20 times dilution).
3. Fasten the work material to reduce the possibility of work deformation, deflection of machined surface, or vibration.
4. A clogged oil hole can lead to a breakage. Make sure that a filter is attached to the oil feeder.

## PHP

Work Material	Tensile Strength/ Hardness	Drilling speed Vc (m/min)	Feed Rate (mm/rev)			
			Ø14~Ø20.5	Ø21~Ø28	Ø29~Ø34	Ø35~Ø40
<b>P</b> Mild Steel-Carbon Steel (SS400-S10C)	~180HB	200 (150 ~ 250)	0,09 (0,06 ~ 0,13)	0,13 (0,10 ~ 0,18)	0,18 (0,13 ~ 0,21)	0,25 (0,20 ~ 0,27)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	160 (100 ~ 220)	0,09(0,06 ~ 0,13)	0,13 (0,10 ~ 0,18)	0,18 (0,13 ~ 0,21)
<b>M</b> Die steel (SKD11-SKD61)	~280HB	140 (80 ~ 180)	0,08 (0,05 ~ 0,12)	0,12 (0,06 ~ 0,15)	0,14 (0,09 ~ 0,18)	0,15 (0,10 ~ 0,20)
<b>K</b> Cast Iron (FC250)	~350N/mm <sup>2</sup>	150 (100 ~ 180)	0,09 (0,06 ~ 0,13)	0,13 (0,10 ~ 0,18)	0,18 (0,13 ~ 0,21)	0,25 (0,20 ~ 0,27)
<b>N</b> Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	130 (80 ~ 150)	0,09 (0,06 ~ 0,13)	0,12 (0,08 ~ 0,16)	0,16 (0,1 ~ 0,20)	0,20 (0,15 ~ 0,25)
<b>S</b> Alluminium Alloy	~13%Si	220 (100 ~ 800)	0,09 (0,06 ~ 0,20)	0,13 (0,10 ~ 0,25)	0,18 (0,13 ~ 0,30)	0,25 (0,20 ~ 0,35)
<b>S</b> Heat Resistant Aluminium Alloy(Wet) (Inconel 718)	-	30 (15 ~ 50)	0,04 (0,02 ~ 0,06)	0,06 (0,03 ~ 0,10)	0,08 (0,04 ~ 0,12)	0,10 (0,06 ~ 0,14)
	Titanium Alloy (Wet) (Ti-6Al-4V)	-	60 (30 ~ 100)	0,06 (0,04 ~ 0,08)	0,08 (0,06 ~ 0,12)	0,10 (0,08 ~ 0,15)

1. The indicated speeds and feeds are for water soluble oil.
2. Suitable cutting fluid is water soluble high density oil (less than 20 times dilution).
3. Using non-water soluble oil is not recommended.
4. These conditions are for drilling depth less than 3 times the drill diameter.
5. Inserts should be attached to the holder tightly in a very neat condition.
6. Fasten the work material to reduce the possibility of work deformation, deflection of machined surface, or vibration.
7. A clogged oil hole can lead to a breakage. Make sure that a filter is attached to the oil feeder.

Drilling | Indexables

Cutting conditions



# CUTTING CONDITIONS

Drilling | Indexables | Cutting conditions

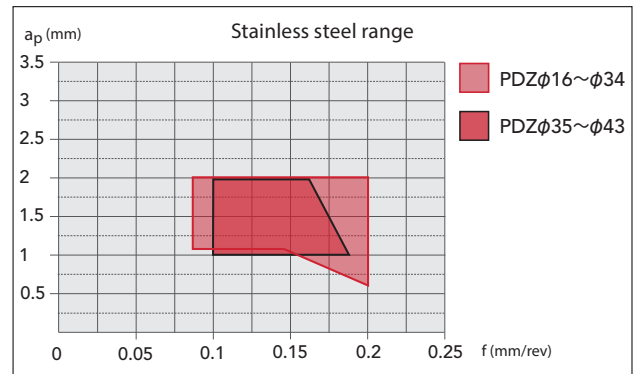
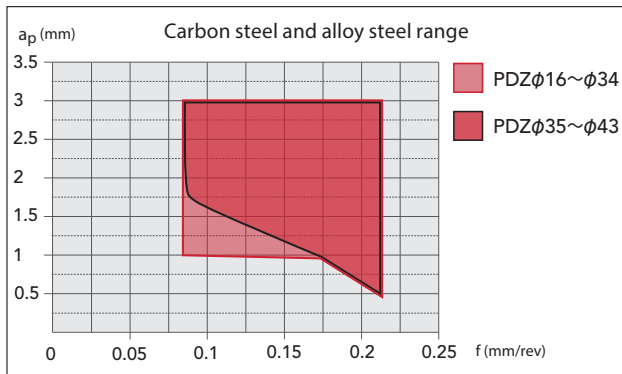
## PDZ

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

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

## Turning

Cutting Conditions of Internal / External Turning



Also supports small diameter drilling

## ADF

Carbide Flat Drill

### Lineup

- ADF-2D ø0,2 ~ ø20
- ADFO-3D ø3 ~ ø20
- ADFLS-2D ø3 ~ ø20
- ADF-NC ø2 ~ ø12
- ADFO-NC ø3 ~ ø10



# CUTTING CONDITIONS

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## PLDS

### Centering and Chamfering Cutter

	Work Material	Tensile Strength / Hardness	Vc (m/min) Cutting Speed	(min <sup>-1</sup> ) S	(mm/rev) Feed Rate	
					Centering	Countersinking (Side Feed)
<b>P</b>	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	80 (60~120)	1.500 ~ 3.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	80 (60~120)	1.500 ~ 3.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
	Die Steel (SKD11-SKD61)	~280HB	80 (60~120)	1.500 ~ 3.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
<b>M</b>	Stainless Steel (Coolant) (SUS304-SUS420)	~250HB	80 (60~120)	1.500 ~ 2.500	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
<b>K</b>	Cast Iron (FC250)	~350N/mm <sup>2</sup>	100 (60~140)	1.500 ~ 3.500	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	100 (60~140)	1.500 ~ 3.500	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
<b>N</b>	Aluminium Alloys	~13%Si	150 (100~200)	2.500 ~ 5.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
<b>S</b>	Heat Resistant Alloys (Wet) (Inconel 718)	–	35 (25~60)	600 ~ 1.500	0,04 (0,03 ~ 0,06)	0,08 (0,05 ~ 0,12)
	Titanium Alloy (Wet) (Ti-6Al-4V)	–	40 (30~100)	700 ~ 2.500	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
<b>H</b>	Pre-hardened Steel (NAK80)	40~43HRC	80 (60~100)	1.500 ~ 3.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)
	Steel for Die Casting (DAC-MAGIC, DH31)	43~48HRC	60 (50~80)	1.200 ~ 2.000	0,06 (0,03 ~ 0,08)	0,08 (0,05 ~ 0,12)

1. The above cutting conditions are to be used as general guidelines. Adjustments may be necessary depending on actual cutting condition.
2. Inserts should be attached to the holder tightly in a very neat condition.
3. Fasten the work material to reduce the possibility of work deformation, deflection of machined surface, or vibration.
4. For the feed of V slotting, use 80% of the countersinking (side feed) shown in the above table.

Drilling | Indexables

## Standard centering depth (H)

	<p>SIG = 90°                      Hmin = 0,25                      DCN = Ø 2,5 (minimum machined hole diameter)</p> <p><b>H = (C-DCN) / 2 + Hmin</b></p> <p>H = Centering depth                      C = Countersink diameter</p> <p>Example:                      When SIG=90°C=φ10 (Countersink diameter)                      The value of H will be 4 mm instead of 5 mm.</p>	<p>SIG = 120°                      Hmin = 0,1                      DCN = Ø 2,4 (minimum machined hole diameter)</p> <p><b>H = (C-DCN) / 3,46 + Hmin</b></p> <p>H = Centering depth                      C = Countersink diameter</p>
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Cutting conditions

# CUTTING CONDITIONS

Drilling | Indexables | Cutting conditions

## Recommendations for 49030 series

49030	Projection	
	6 x d	3 x d
	Steel shank $f_z \sim 0,1$	Steel shank $f_z \sim 0,1$
Working Material	Vc m/min.	Vc m/min.
Free Cutting Steels General Purpose Steels Case hardening Steels unalloyed, C < 0,2%	50 - 60	150 - 250
Free Cutting Steels General Purpose Steels Tempering Steels alloyed, C < 0,45%	50 - 60	150 - 250
Tempering Steels Tool Steels alloyed, C < 0,8%	50 - 60	150 - 200
Highly Alloyed Steels Tool Steels for Cold / Hot Forming C > 0,8%	50 - 60	150 - 200
Stainless Steels, martensitic Stainless Castings	50 - 60	150 - 200
Stainless Steels, austenitic	50 - 60	150 - 200
High Temperature Alloys on Ni + Co Basis	40 - 60	40 - 90
Titanium Alloys	40 - 60	40 - 90
Grey Cast Iron	50 - 60	150 - 200
Malleable and Nodular Castings	50 - 60	150 - 200
Aluminium	50 - 60	150 - 200
Copper / Brass Bronze	50 - 60	150 - 200

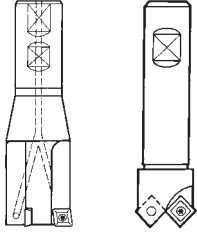


# CUTTING CONDITIONS

Drilling | Indexables | Cutting conditions

## Recommendations

For cutting speeds  $V_c$  m/min. and feeds per tooth  $f_z$  mm for Milling-, Boring- and Chamfering Tools with indexable carbide and Cermet Inserts

Tool:			
Type:	49037 49038 49039	49100	
Inserts	MPHT MPHW MPMT*	MCHT MCMT*	MBHT MBHW MBMT*
Dimensions	060202 060204*	09T304 09T308*	120404 120408*
$f_z$ :	0,03–0,1 0,03–0,12*	0,05–0,15 0,05–0,25*	0,05–0,15 0,05–0,25*

Working Material	Type	PMK92	CH1	KM22	CT50 CT53	CH1	CT50
		Vc m/min.					
Free Cutting Steel General Purpose Steels Case hardening Steels unalloyed, C < 0,2%	HB 150–200 < 600 mm <sup>2</sup>	180–350	–	–	300–500	–	300–500
Free Cutting Steel General Purpose Steels Tempering Steels unalloyed, C < 0,45%	HB 175–225 < 800 mm <sup>2</sup>	160–300	–	–	250–400	–	250–400
Tempering Steels Tool Steels alloyed, C < 0,8%	HB 200–300 < 1000 mm <sup>2</sup>	140–220	–	–	200–350	–	200–350
Highly Alloyed Steels Tool Steels for Cold / Hot Forming C > 0,8%	HB 200–300 < 1000 mm <sup>2</sup>	90–150	–	–	180–250	–	180–250
Stainless Steels, austenitic	HB 140–190 < 700 mm <sup>2</sup>	–	100–180	150–300	150–300	100–180	150–300
Stainless Steels, martensitic Stainless Cas- tings	HB 175–245 < 1000 mm <sup>2</sup>	90–180	–	–	150–240	–	150–240
High Temperature Alloys on Ni + Cr Basis	HB 200–400 < 1200 mm <sup>2</sup>	–	15–60	15–70	15–70	15–60	15–70
Titanium Alloys	HB 215–500 < 1000 mm <sup>2</sup>	–	40–60	40–70	–	40–60	15–70
Grey Cast Iron	HB < 200	180–300	160–200	180–300	250–400	160–200	250–400
Malleable and Nodular Castings	HB > 200	170–280	150–190	170–280	250–400	150–190	250–400
Aluminium	HB < 160	–	300–1000	300–1000	–	300–1000	300–1000
Copper / Brass Bronze	HB < 120	–	180–200	180–270	–	190–240	200–300

\* in function of stability of tool and workpiece



# CUTTING CONDITIONS

Drilling | Indexables | Cutting conditions

## P2D & P3D

	Work Material	Tensile Strength/Hardness	Vc (m/min)	Feed Rate (mm/rev)							
				ø12~ø14.5	ø15~ø16.5	ø17~ø18.5	ø19~ø20.5	ø21~ø24.5	ø25~ø28.5	ø29~ø33.5	ø34~ø63
P	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	200 (150~250)	0.06 (0.04~0.08)	0.06 (0.04~0.1)	0.06 (0.04~0.1)	0.07 (0.04~0.1)	0.08 (0.04~0.12)	0.08 (0.04~0.12)	0.1 (0.05~0.15)	0.1 (0.05~0.18)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	150 (100~220)	0.08 (0.04~0.12)	0.08 (0.04~0.14)	0.09 (0.04~0.16)	0.1 (0.04~0.18)	0.14 (0.04~0.2)	0.18 (0.06~0.25)	0.2 (0.08~0.3)	0.2 (0.08~0.35)
	Die steel (SKD11-SKD61)	~280HB	120 (80~180)	0.06 (0.04~0.1)	0.06 (0.04~0.1)	0.07 (0.04~0.1)	0.08 (0.04~0.12)	0.12 (0.04~0.15)	0.14 (0.06~0.2)	0.18 (0.08~0.25)	0.18 (0.08~0.25)
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	130 (80~180)	0.07 (0.04~0.1)	0.07 (0.04~0.1)	0.08 (0.04~0.1)	0.09 (0.04~0.12)	0.1 (0.04~0.15)	0.13 (0.06~0.2)	0.15 (0.08~0.25)	0.15 (0.08~0.25)
K	Cast Iron (FC250)	~350N/mm <sup>2</sup>	200 (150~280)	0.08 (0.04~0.14)	0.08 (0.04~0.14)	0.1 (0.04~0.16)	0.12 (0.04~0.2)	0.16 (0.08~0.25)	0.2 (0.06~0.3)	0.2 (0.08~0.3)	0.2 (0.08~0.35)
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	160 (100~220)	0.08 (0.04~0.1)	0.08 (0.04~0.12)	0.09 (0.04~0.14)	0.1 (0.04~0.18)	0.14 (0.04~0.2)	0.18 (0.06~0.25)	0.18 (0.08~0.25)	0.18 (0.08~0.25)
N	Aluminium Alloy	~13%Si	200 (100~800)	0.08 (0.04~0.12)	0.08 (0.04~0.12)	0.1 (0.04~0.16)	0.12 (0.04~0.2)	0.16 (0.04~0.25)	0.2 (0.06~0.3)	0.2 (0.08~0.3)	0.2 (0.08~0.3)
S	Heat Resistant Aluminium Alloy(Wet) (Inconel 718)	-	30 (15~50)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.05 (0.03~0.06)	0.05 (0.03~0.06)	0.06 (0.04~0.08)	0.08 (0.06~0.1)	0.1 (0.06~0.12)	0.1 (0.06~0.12)
	Titanium Alloy (Wet) (Ti-6Al-4V)	-	60 (30~100)	0.05 (0.04~0.08)	0.05 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.08 (0.04~0.15)	0.1 (0.06~0.2)	0.14 (0.08~0.2)	0.14 (0.08~0.2)
H	Pre-hardened Steel NAK80	40~43HRC	100 (60~120)	0.06 (0.04~0.1)	0.06 (0.04~0.1)	0.06 (0.04~0.12)	0.07 (0.04~0.12)	0.08 (0.04~0.12)	0.1 (0.06~0.15)	0.1 (0.06~0.15)	0.1 (0.06~0.15)
	Hardened Steel SKD11	50~55HRC	60 (40~80)	0.05 (0.04~0.08)	0.05 (0.04~0.08)	0.05 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.08 (0.04~0.1)	0.08 (0.04~0.1)	0.08 (0.04~0.1)

## P4D

	Work Material	Tensile Strength/Hardness	Vc (m/min)	Feed Rate (mm/rev)							
				ø12~ø14.5	ø15~ø16.5	ø17~ø18.5	ø19~ø20.5	ø21~ø24.5	ø25~ø28.5	ø29~ø33.5	ø34~ø63
P	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	200 (150~250)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.07 (0.04~0.1)	0.08 (0.04~0.12)	0.08 (0.04~0.12)	0.1 (0.05~0.15)	0.1 (0.05~0.18)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	150 (100~220)	0.07 (0.04~0.1)	0.08 (0.04~0.14)	0.08 (0.04~0.16)	0.09 (0.04~0.18)	0.12 (0.04~0.15)	0.18 (0.06~0.25)	0.2 (0.08~0.25)	0.2 (0.08~0.3)
	Die steel (SKD11-SKD61)	~280HB	120 (80~180)	0.06 (0.04~0.08)	0.06 (0.04~0.1)	0.07 (0.04~0.1)	0.08 (0.04~0.12)	0.1 (0.04~0.13)	0.14 (0.06~0.2)	0.18 (0.08~0.25)	0.18 (0.08~0.25)
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	130 (80~180)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.07 (0.04~0.1)	0.08 (0.04~0.1)	0.08 (0.04~0.1)	0.13 (0.06~0.2)	0.15 (0.08~0.2)	0.15 (0.08~0.2)
K	Cast Iron (FC250)	~350N/mm <sup>2</sup>	200 (150~280)	0.08 (0.04~0.12)	0.08 (0.04~0.14)	0.09 (0.04~0.16)	0.1 (0.04~0.2)	0.12 (0.04~0.15)	0.2 (0.06~0.3)	0.2 (0.08~0.3)	0.2 (0.08~0.3)
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	160 (100~220)	0.08 (0.04~0.1)	0.08 (0.04~0.1)	0.08 (0.04~0.12)	0.09 (0.04~0.15)	0.12 (0.04~0.15)	0.15 (0.06~0.25)	0.18 (0.08~0.25)	0.18 (0.08~0.25)
N	Aluminium Alloy	~13%Si	200 (100~800)	0.07 (0.04~0.12)	0.07 (0.04~0.12)	0.09 (0.04~0.12)	0.12 (0.04~0.2)	0.14 (0.04~0.2)	0.2 (0.06~0.3)	0.2 (0.08~0.3)	0.2 (0.08~0.3)
S	Heat Resistant Aluminium Alloy(Wet) (Inconel 718)	-	30 (15~50)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.05 (0.04~0.08)	0.07 (0.06~0.1)	0.08 (0.06~0.12)	0.08 (0.06~0.12)
	Titanium Alloy (Wet) (Ti-6Al-4V)	-	60 (30~100)	0.05 (0.04~0.08)	0.05 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.08 (0.04~0.1)	0.1 (0.06~0.2)	0.14 (0.08~0.2)	0.14 (0.08~0.2)
H	Pre-hardened Steel NAK80	40~43HRC	100 (60~120)	0.06 (0.04~0.1)	0.06 (0.04~0.1)	0.06 (0.04~0.1)	0.06 (0.04~0.1)	0.08 (0.04~0.12)	0.08 (0.06~0.12)	0.1 (0.06~0.13)	0.1 (0.06~0.13)
	Hardened Steel SKD11	50~55HRC	60 (40~80)	0.05 (0.04~0.08)	0.05 (0.04~0.08)	0.05 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.08 (0.04~0.1)	0.08 (0.04~0.1)	0.08 (0.04~0.1)

PHP instructions also valid for P2D

## P5D

	Work Material	Tensile Strength/Hardness	Vc (m/min)	Feed Rate (mm/rev)							
				ø12~ø14.5	ø15~ø16.5	ø17~ø18.5	ø19~ø20.5	ø21~ø24.5	ø25~ø28.5	ø29~ø33.5	ø34~ø63
P	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	200 (150~250)	0.05 (0.04~0.08)	0.05 (0.04~0.08)	0.06 (0.04~0.08)	0.07 (0.04~0.1)	0.08 (0.04~0.12)	0.08 (0.04~0.12)	0.1 (0.05~0.15)	0.1 (0.05~0.18)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	150 (100~220)	0.06 (0.04~0.09)	0.06 (0.04~0.09)	0.08 (0.04~0.12)	0.08 (0.04~0.14)	0.12 (0.04~0.15)	0.15 (0.06~0.2)	0.18 (0.08~0.2)	0.18 (0.08~0.25)
	Die steel (SKD11-SKD61)	~280HB	120 (80~180)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.07 (0.04~0.1)	0.1 (0.04~0.13)	0.12 (0.06~0.15)	0.15 (0.08~0.18)	0.16 (0.08~0.22)
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	130 (80~180)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.07 (0.04~0.09)	0.08 (0.04~0.1)	0.1 (0.06~0.15)	0.12 (0.06~0.18)	0.12 (0.06~0.2)
K	Cast Iron (FC250)	~350N/mm <sup>2</sup>	200 (150~280)	0.06 (0.04~0.1)	0.06 (0.04~0.1)	0.08 (0.04~0.12)	0.08 (0.04~0.13)	0.12 (0.04~0.15)	0.15 (0.06~0.2)	0.18 (0.08~0.2)	0.18 (0.08~0.25)
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	160 (100~220)	0.06 (0.04~0.09)	0.06 (0.04~0.09)	0.08 (0.04~0.12)	0.08 (0.04~0.12)	0.1 (0.04~0.13)	0.12 (0.06~0.15)	0.15 (0.08~0.18)	0.18 (0.08~0.25)
N	Aluminium Alloy	~13%Si	200 (100~800)	0.06 (0.04~0.1)	0.06 (0.04~0.1)	0.09 (0.04~0.12)	0.1 (0.04~0.15)	0.12 (0.04~0.15)	0.15 (0.06~0.25)	0.2 (0.08~0.3)	0.2 (0.08~0.3)
S	Heat Resistant Aluminium Alloy(Wet) (Inconel 718)	-	30 (15~50)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.04 (0.02~0.06)	0.07 (0.06~0.08)	0.07 (0.06~0.08)	0.07 (0.06~0.08)
	Titanium Alloy (Wet) (Ti-6Al-4V)	-	60 (30~100)	0.05 (0.04~0.08)	0.05 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.1)	0.08 (0.06~0.15)	0.1 (0.08~0.15)	0.1 (0.08~0.15)
H	Pre-hardened Steel NAK80	40~43HRC	100 (60~120)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.06 (0.04~0.08)	0.08 (0.04~0.1)	0.08 (0.06~0.12)	0.1 (0.06~0.12)	0.1 (0.06~0.12)
	Hardened Steel SKD11	50~55HRC	60 (40~80)	0.05 (0.04~0.07)	0.05 (0.04~0.07)	0.05 (0.04~0.07)	0.06 (0.04~0.07)	0.06 (0.04~0.08)	0.07 (0.04~0.1)	0.08 (0.04~0.1)	0.08 (0.04~0.1)

# CUTTING CONDITIONS

Drilling | Indexables | Cutting conditions

## PZAG

	Work Material	Tensile Strength/ Hardness	Vc (m/min)	Feed Rate (mm/rev)				
				ø14~ø17.5	ø20~ø23	ø26~ø48	ø54~ø72	ø76~ø82
P	Mild Steel-Carbon Steel (S5400-S10C)	~180HB	160 (100~200)	0.14(0.08~0.2)	0.18(0.1~0.25)	0.2(0.12~0.3)	0.4(0.2~0.6)	0.4(0.2~0.6)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	150 (100~220)	0.14(0.08~0.2)	0.18(0.1~0.25)	0.2(0.12~0.3)	0.4(0.2~0.6)	0.4(0.2~0.6)
	Die Steel (SKD11-SKD61)	~280HB	120 (80~180)	0.12(0.08~0.15)	0.14(0.1~0.2)	0.18(0.12~0.25)	0.4(0.2~0.5)	0.4(0.2~0.5)
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	130 (80~180)	0.1(0.08~0.15)	0.12(0.1~0.2)	0.16(0.12~0.25)	0.35(0.2~0.5)	0.35(0.2~0.5)
K	Cast Iron (FC250)	~350N/mm <sup>2</sup>	200 (150~280)	0.16(0.08~0.25)	0.2(0.1~0.3)	0.3(0.15~0.4)	0.6(0.3~0.8)	0.6(0.3~0.8)
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	160 (100~220)	0.14(0.08~0.2)	0.18(0.1~0.25)	0.2(0.15~0.3)	0.4(0.3~0.6)	0.4(0.3~0.6)
N	Aluminium Alloy	~13%Si	200 (100~800)	0.16(0.08~0.25)	0.2(0.1~0.3)	0.3(0.15~0.4)	0.6(0.3~0.8)	0.6(0.3~0.8)
S	Heat Resistant Alloy (Wet) (Inconel 718)	–	50 (30~60)	0.08(0.05~0.14)	0.08(0.06~0.14)	0.12(0.08~0.2)	0.25(0.16~0.4)	0.25(0.16~0.4)
	Titanium Alloy (Wet) (Ti-6Al-4V)	–	60 (30~100)	0.08(0.05~0.14)	0.1(0.06~0.16)	0.14(0.08~0.2)	0.3(0.16~0.5)	0.3(0.16~0.5)
H	Pre-hardened Steel NAK80	40~43HRC	100 (60~120)	0.08(0.05~0.14)	0.1(0.06~0.16)	0.14(0.08~0.2)	0.3(0.16~0.5)	0.3(0.16~0.5)
	Hardened Steel SKD11	50~55HRC	60 (40~80)	0.08(0.05~0.14)	0.08(0.05~0.14)	0.12(0.08~0.2)	0.25(0.16~0.4)	0.25(0.16~0.4)







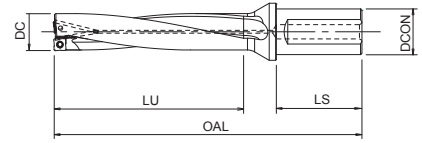
# DRILLING INDEXABLE

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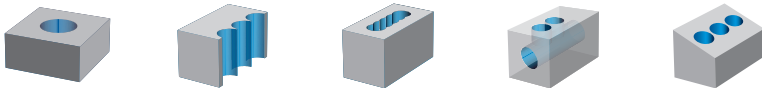


# P2D

Drilling | Indexable | Body



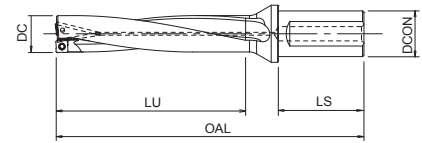
- Indexable drill with internal coolant
- Up to 2xD
- 3 different insert grades available
- 77 sizes



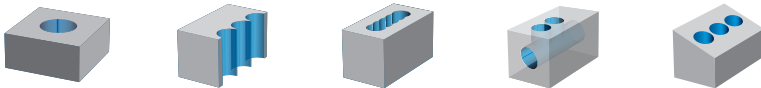
Drilling | Indexable

Body

EDP	Designation	DC	Applicable inserts type	OAL	LU	LS	DCON
7803180	P2D1200FS20M03	12	XCMT03	87	24	50	20
7803181	P2D1250FS20M03	12,5	XCMT03	88	25	50	20
7803182	P2D1300FS20M03	13	XCMT03	89	26	50	20
7803183	P2D1350FS20M03	13,5	XCMT03	90	27	50	20
7803184	P2D1400FS20M03	14	XCMT03	91	28	50	20
7803185	P2D1450FS20M03	14,5	XCMT03	92	29	50	20
7803117	P2D1500FS20M04	15	XCMT04	95	30	50	20
7803118	P2D1550FS20M04	15,5	XCMT04	96	31	50	20
7803119	P2D1600FS20M04	16	XCMT04	97	32	50	20
7803120	P2D1650FS20M04	16,5	XCMT04	98	33	50	20
7803121	P2D1700FS20M05	17	XCMT05	102	34	50	20
7803122	P2D1750FS20M05	17,5	XCMT05	103	35	50	20
7803190	P2D1750FS25M05	17,5	XCMT05	109	35	56	25
7803123	P2D1800FS25M05	18	XCMT05	110	36	56	25
7803124	P2D1850FS25M05	18,5	XCMT05	111	37	56	25
7803125	P2D1900FS25M06	19	XCMT06	112	38	56	25
7803126	P2D1950FS25M06	19,5	XCMT06	113	39	56	25
7803127	P2D2000FS25M06	20	XCMT06	114	40	56	25
7803128	P2D2050FS25M06	20,5	XCMT06	115	41	56	25
7803129	P2D2100FS25M07	21	XCMT07	121	42	56	25
7803130	P2D2150FS25M07	21,5	XCMT07	122	43	56	25
7803131	P2D2200FS25M07	22	XCMT07	123	44	56	25
7803132	P2D2250FS25M07	22,5	XCMT07	124	45	56	25
7803133	P2D2300FS25M07	23	XCMT07	125	46	56	25
7803134	P2D2350FS32M07	23,5	XCMT07	130	47	60	32
7803191	P2D2350FS25M07	23,5	XCMT07	126	47	56	25
7803135	P2D2400FS32M07	24	XCMT07	131	48	60	32
7803192	P2D2400FS25M07	24	XCMT07	127	48	56	25
7803136	P2D2450FS32M07	24,5	XCMT07	132	49	60	32
7803193	P2D2450FS25M07	24,5	XCMT07	128	49	56	25
7803137	P2D2500FS32M08	25	XCMT08	133	50	60	32
7803194	P2D2500FS25M08	25	XCMT08	129	50	56	25
7803138	P2D2550FS32M08	25,5	XCMT08	134	51	60	32
7803195	P2D2550FS25M08	25,5	XCMT08	130	51	56	25
7803139	P2D2600FS32M08	26	XCMT08	135	52	60	32
7803140	P2D2650FS32M08	26,5	XCMT08	136	53	60	32
7803141	P2D2700FS32M08	27	XCMT08	137	54	60	32
7803142	P2D2800FS32M08	28	XCMT08	139	56	60	32
7803143	P2D2850FS32M08	28,5	XCMT08	140	57	60	32
7803144	P2D2900FS32M09	29	XCMT09	141	58	60	32
7803145	P2D3000FS32M09	30	XCMT09	143	60	60	32
7803146	P2D3100FS32M09	31	XCMT09	145	62	60	32
7803196	P2D3100FS40M09	31	XCMT09	155	62	70	40
7803147	P2D3200FS32M09	32	XCMT09	147	64	60	32
7803197	P2D3200FS40M09	32	XCMT09	157	64	70	40
7803148	P2D3300FS40M09	33	XCMT09	159	66	70	40
7803149	P2D3350FS40M09	33,5	XCMT09	160	67	70	40
7803150	P2D3400FS40M10	34	XCMT10	161	68	70	40
7803151	P2D3500FS40M10	35	XCMT10	163	70	70	40
7803152	P2D3600FS40M10	36	XCMT10	165	72	70	40
7803153	P2D3700FS40M10	37	XCMT10	167	74	70	40
7803154	P2D3800FS40M10	38	XCMT10	169	76	70	40
7803155	P2D3900FS40M12	39	XCMT12	178	78	70	40
7803156	P2D4000FS40M12	40	XCMT12	180	80	70	40



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



EDP	Designation	DC	Applicable inserts type	OAL	LU	LS	DCON
7803157	P2D4100FS40M12	41	XCMT12	182	82	70	40
7803158	P2D4200FS40M12	42	XCMT12	184	84	70	40
7803159	P2D4300FS40M12	43	XCMT12	186	86	70	40
7803160	P2D4400FS40M12	44	XCMT12	188	88	70	40
7803161	P2D4500FS40M13	45	XCMT13	190	90	70	40
7803162	P2D4600FS40M13	46	XCMT13	192	92	70	40
7803163	P2D4700FS40M13	47	XCMT13	194	94	70	40
7803164	P2D4800FS40M13	48	XCMT13	196	96	70	40
7803165	P2D4900FS40M13	49	XCMT13	198	98	70	40
7803166	P2D5000FS40M14	50	XCMT14	200	100	70	40
7803167	P2D5100FS40M14	51	XCMT14	202	102	70	40
7803168	P2D5200FS40M14	52	XCMT14	204	104	70	40
7803169	P2D5300FS40M14	53	XCMT14	206	106	70	40
7803170	P2D5400FS40M14	54	XCMT14	208	108	70	40
7803171	P2D5500FS40M14	55	XCMT14	210	110	70	40
7803172	P2D5600FS40M14	56	XCMT14	212	112	70	40
7803173	P2D5700FS40M16	57	XCMT16	214	114	70	40
7803174	P2D5800FS40M16	58	XCMT16	216	116	70	40
7803175	P2D5900FS40M16	59	XCMT16	218	118	70	40
7803176	P2D6000FS40M16	60	XCMT16	220	120	70	40
7803177	P2D6100FS40M16	61	XCMT16	222	122	70	40
7803178	P2D6200FS40M16	62	XCMT16	224	124	70	40
7803179	P2D6300FS40M16	63	XCMT16	226	126	70	40

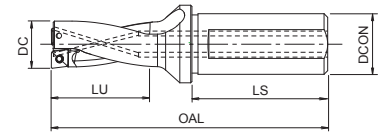
### Accessories and spare parts

Applicable drill DC	EDP	Designation	Specification
12 - 14,5	7808096	FS18536P	Clamping screw
15 - 18,5	7808139	FS20543P	Clamping screw
19 - 20,5	7808138	FS22550P	Clamping screw
21 - 24,5	7808136	FS25560P	Clamping screw
25 - 33,5	7808135	FS30570P	Clamping screw
34 - 44	7808137	FS35586P	Clamping screw
45 - 63	7808114	FS45510P	Clamping screw
12 - 18,5	7808223	6IP-D (Torx 6IP)	Wrench
19 - 20,5	7808224	7IP-D (Torx 7IP)	Wrench
21 - 24,5	7808225	8IP-D (Torx 8IP)	Wrench
25 - 33,5	7808226	9IP-D (Torx 9IP)	Wrench
34 - 44	7808228	15IP-D (Torx 15IP)	Wrench
45 - 63	7808229	20IP-D (Torx 20IP)	Wrench

Drilling | Indexable  
Body

# PDZ NEW

Drilling | Indexable | Body



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



Drilling | Indexable

Body

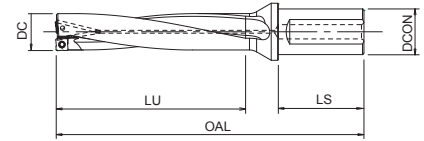
EDP	Designation	DC	Applicable inserts type	OAL	LU	LS	DCON
7803776	PDZ1600FS20M05-2D	16	ZPNT050204EN	97	32	50	20
7803777	PDZ1650FS20M05-2D	16,5	ZPNT050204EN	98	33	50	20
7803778	PDZ1700FS20M05-2D	17	ZPNT050204EN	102	34	50	20
7803779	PDZ1750FS25M05-2D	17,5	ZPNT050204EN	109	35	56	25
7803780	PDZ1800FS25M05-2D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

## Accessories and spare parts

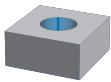
Applicable drill DC	Applicable inserts	EDP	Designation	Specification	Torque
16 - 18,5	ZPNT050204EN	7808139	FS20543P	Clamping screw	0,7 N.m
19 - 22	ZPNT060204EN	7808138	FS22550P	Clamping screw	1,0 N.m
23 - 26	ZPNT070304EN	7808136	FS25560P	Clamping screw	1,6 N.m
27 - 34	ZPNT080304EN / ZPNT090404EN	7808135	FS30570P	Clamping screw	2,2 N.m
35 - 38	ZPNT100408EN	7808137	FS35586P	Clamping screw	3,2 N.m
39 - 43	ZPNT130508EN	7808114	FS45510P	Clamping screw	5,0 N.m
16 - 18,5	ZPNT050204EN	7808223	6IP-D (Torx 6IP)	Wrench	-
19 - 22	ZPNT060204EN	7808224	7IP-D (Torx 7IP)	Wrench	-
23 - 26	ZPNT070304EN	7808225	8IP-D (Torx 8IP)	Wrench	-
27 - 34	ZPNT080304EN / ZPNT090404EN	7808226	9IP-D (Torx 9IP)	Wrench	-
35 - 38	ZPNT100408EN	7808228	15IP-D (Torx 15IP)	Wrench	-
39 - 43	ZPNT130508EN	7808229	20IP-D (Torx 20IP)	Wrench	-

# P3D

## Drilling | Indexable | Body



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



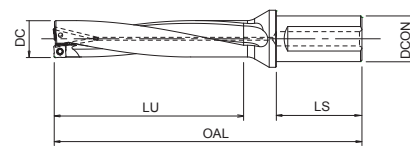
EDP	Designation	DC	Applicable inserts type	OAL	LU	LS	DCON
7803210	P3D1200FS20M03	12	XCMT03	99	36	50	20
7803211	P3D1250FS20M03	12,5	XCMT03	100,5	37,5	50	20
7803212	P3D1270FS20M03	12,7	XCMT03	101,1	38,1	50	20
7803213	P3D1300FS20M03	13	XCMT03	102	39	50	20
7803214	P3D1350FS20M03	13,5	XCMT03	103,5	40,5	50	20
7803215	P3D1400FS20M03	14	XCMT03	105	42	50	20
7803216	P3D1450FS20M03	14,5	XCMT03	106,5	43,5	50	20
7803217	P3D1500FS20M04	15	XCMT04	110	45	50	20
7803218	P3D1550FS20M04	15,5	XCMT04	112	47	50	20
7803219	P3D1600FS20M04	16	XCMT04	113	48	50	20
7803220	P3D1650FS20M04	16,5	XCMT04	115	50	50	20
7803221	P3D1700FS20M05	17	XCMT05	119	51	50	20
7803222	P3D1750FS20M05	17,5	XCMT05	121	53	50	20
7803290	P3D1750FS25M05	17,5	XCMT05	127	53	56	25
7803223	P3D1800FS25M05	18	XCMT05	128	54	56	25
7803224	P3D1850FS25M05	18,5	XCMT05	130	56	56	25
7803225	P3D1900FS25M06	19	XCMT06	131	57	56	25
7803226	P3D1950FS25M06	19,5	XCMT06	133	59	56	25
7803227	P3D2000FS25M06	20	XCMT06	134	60	56	25
7803228	P3D2050FS25M06	20,5	XCMT06	136	62	56	25
7803229	P3D2100FS25M07	21	XCMT07	142	63	56	25
7803230	P3D2150FS25M07	21,5	XCMT07	144	65	56	25
7803231	P3D2200FS25M07	22	XCMT07	145	66	56	25
7803232	P3D2250FS25M07	22,5	XCMT07	147	68	56	25
7803233	P3D2300FS25M07	23	XCMT07	148	69	56	25
7803234	P3D2350FS32M07	23,5	XCMT07	154	71	60	32
7803291	P3D2350FS25M07	23,5	XCMT07	150	71	56	25
7803235	P3D2400FS32M07	24	XCMT07	155	72	60	32
7803292	P3D2400FS25M07	24	XCMT07	151	72	56	25
7803236	P3D2450FS32M07	24,5	XCMT07	157	74	60	32
7803293	P3D2450FS25M07	24,5	XCMT07	153	74	56	25
7803237	P3D2500FS32M08	25	XCMT08	158	75	60	32
7803294	P3D2500FS25M08	25	XCMT08	154	75	56	25
7803238	P3D2550FS32M08	25,5	XCMT08	160	77	60	32
7803295	P3D2550FS25M08	25,5	XCMT08	156	77	56	25
7803239	P3D2600FS32M08	26	XCMT08	161	78	60	32
7803240	P3D2650FS32M08	26,5	XCMT08	163	80	60	32
7803241	P3D2700FS32M08	27	XCMT08	164	81	60	32
7803300	P3D2750FS32M08	27,5	XCMT08	166	83	60	32
7803242	P3D2800FS32M08	28	XCMT08	167	84	60	32
7803243	P3D2850FS32M08	28,5	XCMT08	169	86	60	32
7803244	P3D2900FS32M09	29	XCMT09	170	87	60	32
7803301	P3D2950FS32M09	29,5	XCMT09	172	89	60	32
7803245	P3D3000FS32M09	30	XCMT09	173	90	60	32
7803302	P3D3050FS32M09	30,5	XCMT09	175	92	60	32
7803246	P3D3100FS32M09	31	XCMT09	176	93	60	32
7803296	P3D3100FS40M09	31	XCMT09	186	93	70	40
7803303	P3D3150FS32M09	31,5	XCMT09	178	95	60	32
7803247	P3D3200FS32M09	32	XCMT09	179	96	60	32
7803297	P3D3200FS40M09	32	XCMT09	189	96	70	40
7803304	P3D3250FS40M09	32,5	XCMT09	191	98	70	40
7803248	P3D3300FS40M09	33	XCMT09	192	99	70	40
7803249	P3D3350FS40M09	33,5	XCMT09	194	101	70	40
7803250	P3D3400FS40M10	34	XCMT10	195	102	70	40

Drilling | Indexable

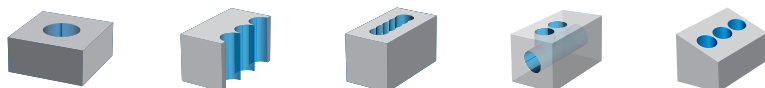
Body

# P3D

Drilling | Indexable | Body



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



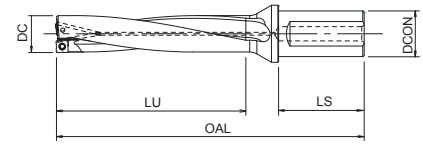
EDP	Designation	DC	Applicable inserts type	OAL	LU	LS	DCON
7803305	P3D3450FS40M10	34,5	XCMT10	197	104	70	40
7803251	P3D3500FS40M10	35	XCMT10	198	105	70	40
7803306	P3D3550FS40M10	35,5	XCMT10	200	107	70	40
7803252	P3D3600FS40M10	36	XCMT10	201	108	70	40
7803253	P3D3700FS40M10	37	XCMT10	204	111	70	40
7803307	P3D3750FS40M10	37,5	XCMT10	206	113	70	40
7803254	P3D3800FS40M10	38	XCMT10	207	114	70	40
7803255	P3D3900FS40M12	39	XCMT12	217	117	70	40
7803256	P3D4000FS40M12	40	XCMT12	220	120	70	40
7803308	P3D4050FS40M12	40,5	XCMT12	222	122	70	40
7803257	P3D4100FS40M12	41	XCMT12	223	123	70	40
7803258	P3D4200FS40M12	42	XCMT12	226	126	70	40
7803259	P3D4300FS40M12	43	XCMT12	229	129	70	40
7803260	P3D4400FS40M12	44	XCMT12	232	132	70	40
7803261	P3D4500FS40M13	45	XCMT13	235	135	70	40
7803262	P3D4600FS40M13	46	XCMT13	238	138	70	40
7803263	P3D4700FS40M13	47	XCMT13	241	141	70	40
7803264	P3D4800FS40M13	48	XCMT13	244	144	70	40
7803265	P3D4900FS40M13	49	XCMT13	247	147	70	40
7803266	P3D5000FS40M14	50	XCMT14	250	150	70	40
7803309	P3D5050FS40M14	50,5	XCMT14	252	152	70	40
7803267	P3D5100FS40M14	51	XCMT14	253	153	70	40
7803268	P3D5200FS40M14	52	XCMT14	256	156	70	40
7803269	P3D5300FS40M14	53	XCMT14	259	159	70	40
7803270	P3D5400FS40M14	54	XCMT14	262	162	70	40
7803271	P3D5500FS40M14	55	XCMT14	265	165	70	40
7803272	P3D5600FS40M14	56	XCMT14	268	168	70	40
7803273	P3D5700FS40M16	57	XCMT16	271	171	70	40
7803274	P3D5800FS40M16	58	XCMT16	274	174	70	40
7803275	P3D5900FS40M16	59	XCMT16	277	177	70	40
7803276	P3D6000FS40M16	60	XCMT16	280	180	70	40
7803277	P3D6100FS40M16	61	XCMT16	283	183	70	40
7803278	P3D6200FS40M16	62	XCMT16	286	186	70	40
7803279	P3D6300FS40M16	63	XCMT16	289	189	70	40

Drilling | Indexable

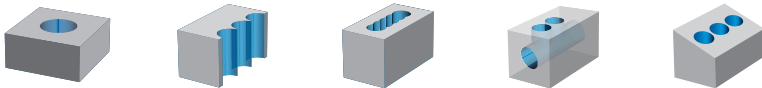
Body

## Accessories and spare parts

Applicable drill DC	EDP	Designation	Specification
12 - 14,5	7808096	FS18536P	Clamping screw
15 - 18,5	7808139	FS20543P	Clamping screw
19 - 20,5	7808138	FS22550P	Clamping screw
21 - 24,5	7808136	FS25560P	Clamping screw
25 - 33,5	7808135	FS30570P	Clamping screw
34 - 44	7808137	FS35586P	Clamping screw
45 - 63	7808114	FS45510P	Clamping screw
12 - 18,5	7808223	6IP-D (Torx 6IP)	Wrench
19 - 20,5	7808224	7IP-D (Torx 7IP)	Wrench
21 - 24,5	7808225	8IP-D (Torx 8IP)	Wrench
25 - 33,5	7808226	9IP-D (Torx 9IP)	Wrench
34 - 44	7808228	15IP-D (Torx 15IP)	Wrench
45 - 63	7808229	20IP-D (Torx 20IP)	Wrench



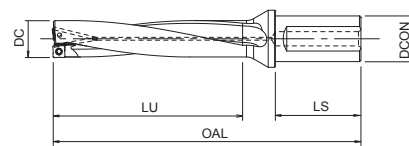
- Indexable drill with internal coolant
- Up to 4xD
- 3 different insert grades available
- 77 sizes



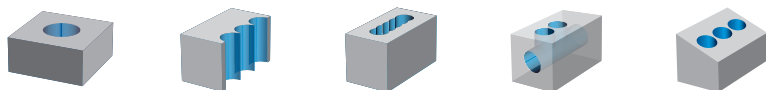
EDP	Designation	DC	Applicable inserts type	OAL	LU	LS	DCON
7803311	P4D1200FS20M03	12	XCMT03	111	48	50	20
7803312	P4D1250FS20M03	12,5	XCMT03	113	50	50	20
7803313	P4D1300FS20M03	13	XCMT03	115	52	50	20
7803314	P4D1350FS20M03	13,5	XCMT03	117	54	50	20
7803315	P4D1400FS20M03	14	XCMT03	119	56	50	20
7803316	P4D1450FS20M03	14,5	XCMT03	121	58	50	20
7803317	P4D1500FS20M04	15	XCMT04	125	60	50	20
7803318	P4D1550FS20M04	15,5	XCMT04	127	62	50	20
7803319	P4D1600FS20M04	16	XCMT04	129	64	50	20
7803320	P4D1650FS20M04	16,5	XCMT04	131	66	50	20
7803321	P4D1700FS20M05	17	XCMT05	136	68	50	20
7803322	P4D1750FS20M05	17,5	XCMT05	138	70	50	20
7803390	P4D1750FS25M05	17,5	XCMT05	144	70	56	25
7803323	P4D1800FS25M05	18	XCMT05	146	72	56	25
7803324	P4D1850FS25M05	18,5	XCMT05	148	74	56	25
7803325	P4D1900FS25M06	19	XCMT06	150	76	56	25
7803326	P4D1950FS25M06	19,5	XCMT06	152	78	56	25
7803327	P4D2000FS25M06	20	XCMT06	154	80	56	25
7803328	P4D2050FS25M06	20,5	XCMT06	156	82	56	25
7803329	P4D2100FS25M07	21	XCMT07	163	84	56	25
7803330	P4D2150FS25M07	21,5	XCMT07	165	86	56	25
7803331	P4D2200FS25M07	22	XCMT07	167	88	56	25
7803332	P4D2250FS25M07	22,5	XCMT07	169	90	56	25
7803333	P4D2300FS25M07	23	XCMT07	171	92	56	25
7803334	P4D2350FS32M07	23,5	XCMT07	177	94	60	32
7803391	P4D2350FS25M07	23,5	XCMT07	173	94	56	25
7803335	P4D2400FS32M07	24	XCMT07	179	96	60	32
7803392	P4D2400FS25M07	24	XCMT07	175	96	56	25
7803336	P4D2450FS32M07	24,5	XCMT07	181	98	60	32
7803393	P4D2450FS25M07	24,5	XCMT07	177	98	56	25
7803337	P4D2500FS32M08	25	XCMT08	183	100	60	32
7803394	P4D2500FS25M08	25	XCMT08	179	100	56	25
7803338	P4D2550FS32M08	25,5	XCMT08	185	102	60	32
7803395	P4D2550FS25M08	25,5	XCMT08	181	102	56	25
7803339	P4D2600FS32M08	26	XCMT08	187	104	60	32
7803340	P4D2650FS32M08	26,5	XCMT08	189	106	60	32
7803341	P4D2700FS32M08	27	XCMT08	191	108	60	32
7803342	P4D2800FS32M08	28	XCMT08	195	112	60	32
7803343	P4D2850FS32M08	28,5	XCMT08	197	114	60	32
7803344	P4D2900FS32M09	29	XCMT09	199	116	60	32
7803345	P4D3000FS32M09	30	XCMT09	203	120	60	32
7803346	P4D3100FS32M09	31	XCMT09	207	124	60	32
7803396	P4D3100FS40M09	31	XCMT09	217	124	70	40
7803347	P4D3200FS32M09	32	XCMT09	211	128	60	32
7803397	P4D3200FS40M09	32	XCMT09	221	128	70	40
7803348	P4D3300FS40M09	33	XCMT09	225	132	70	40
7803349	P4D3350FS40M09	33,5	XCMT09	227	134	70	40
7803350	P4D3400FS40M10	34	XCMT10	229	136	70	40
7803351	P4D3500FS40M10	35	XCMT10	233	140	70	40
7803352	P4D3600FS40M10	36	XCMT10	237	144	70	40
7803353	P4D3700FS40M10	37	XCMT10	241	148	70	40
7803354	P4D3800FS40M10	38	XCMT10	245	152	70	40
7803355	P4D3900FS40M12	39	XCMT12	256	156	70	40
7803356	P4D4000FS40M12	40	XCMT12	260	160	70	40

# P4D

Drilling | Indexable | Body



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



EDP	Designation	DC	Applicable inserts type	OAL	LU	LS	DCON
7803357	P4D4100FS40M12	41	XCMT12	264	164	70	40
7803358	P4D4200FS40M12	42	XCMT12	268	168	70	40
7803359	P4D4300FS40M12	43	XCMT12	272	172	70	40
7803360	P4D4400FS40M12	44	XCMT12	276	176	70	40
7803361	P4D4500FS40M13	45	XCMT13	280	180	70	40
7803362	P4D4600FS40M13	46	XCMT13	284	184	70	40
7803363	P4D4700FS40M13	47	XCMT13	288	188	70	40
7803364	P4D4800FS40M13	48	XCMT13	292	192	70	40
7803365	P4D4900FS40M13	49	XCMT13	296	196	70	40
7803366	P4D5000FS40M14	50	XCMT14	300	200	70	40
7803367	P4D5100FS40M14	51	XCMT14	304	204	70	40
7803368	P4D5200FS40M14	52	XCMT14	308	208	70	40
7803369	P4D5300FS40M14	53	XCMT14	312	212	70	40
7803370	P4D5400FS40M14	54	XCMT14	316	216	70	40
7803371	P4D5500FS40M14	55	XCMT14	320	220	70	40
7803372	P4D5600FS40M14	56	XCMT14	324	224	70	40
7803373	P4D5700FS40M16	57	XCMT16	328	228	70	40
7803374	P4D5800FS40M16	58	XCMT16	332	232	70	40
7803375	P4D5900FS40M16	59	XCMT16	336	236	70	40
7803376	P4D6000FS40M16	60	XCMT16	340	240	70	40
7803377	P4D6100FS40M16	61	XCMT16	344	244	70	40
7803378	P4D6200FS40M16	62	XCMT16	348	248	70	40
7803379	P4D6300FS40M16	63	XCMT16	352	252	70	40

Drilling | Indexable

Body

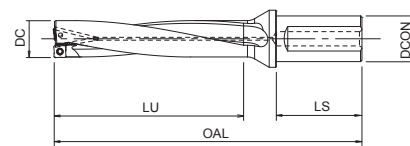
## Accessories and spare parts

Applicable drill DC	EDP	Designation	Specification
12 - 14,5	7808096	FS18536P	Clamping screw
15 - 18,5	7808139	FS20543P	Clamping screw
19 - 20,5	7808138	FS22550P	Clamping screw
21 - 24,5	7808136	FS25560P	Clamping screw
25 - 33,5	7808135	FS30570P	Clamping screw
34 - 44	7808137	FS35586P	Clamping screw
45 - 63	7808114	FS45510P	Clamping screw
12 - 18,5	7808223	6IP-D (Torx 6IP)	Wrench
19 - 20,5	7808224	7IP-D (Torx 7IP)	Wrench
21 - 24,5	7808225	8IP-D (Torx 8IP)	Wrench
25 - 33,5	7808226	9IP-D (Torx 9IP)	Wrench
34 - 44	7808228	15IP-D (Torx 15IP)	Wrench
45 - 63	7808229	20IP-D (Torx 20IP)	Wrench

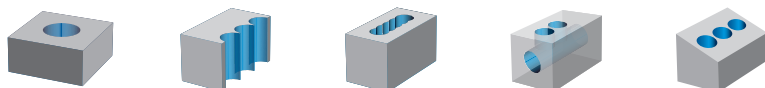


# P5D

Drilling | Indexable | Body



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



EDP	Designation	DC	Applicable inserts type	OAL	LU	LS	DCON
7802780	P5D1200FS20M03	12	XCMT03	123	60	50	20
7802781	P5D1250FS20M03	12,5	XCMT03	125,5	62,5	50	20
7802782	P5D1300FS20M03	13	XCMT03	128	65	50	20
7802783	P5D1350FS20M03	13,5	XCMT03	130,5	67,5	50	20
7802784	P5D1400FS20M03	14	XCMT03	133	70	50	20
7802785	P5D1450FS20M03	14,5	XCMT03	135,5	72,5	50	20
7802717	P5D1500FS20M04	15	XCMT04	140	75	50	20
7802718	P5D1550FS20M04	15,5	XCMT04	143	78	50	20
7802719	P5D1600FS20M04	16	XCMT04	145	80	50	20
7802720	P5D1650FS20M04	16,5	XCMT04	148	83	50	20
7802721	P5D1700FS20M05	17	XCMT05	153	85	50	20
7802722	P5D1750FS20M05	17,5	XCMT05	156	88	50	20
7802790	P5D1750FS25M05	17,5	XCMT05	162	88	56	25
7802723	P5D1800FS25M05	18	XCMT05	164	90	56	25
7802724	P5D1850FS25M05	18,5	XCMT05	167	93	56	25
7802725	P5D1900FS25M06	19	XCMT06	169	95	56	25
7802726	P5D1950FS25M06	19,5	XCMT06	172	98	56	25
7802727	P5D2000FS25M06	20	XCMT06	174	100	56	25
7802728	P5D2050FS25M06	20,5	XCMT06	177	103	56	25
7802729	P5D2100FS25M07	21	XCMT07	184	105	56	25
7802730	P5D2150FS25M07	21,5	XCMT07	187	108	56	25
7802731	P5D2200FS25M07	22	XCMT07	189	110	56	25
7802732	P5D2250FS25M07	22,5	XCMT07	192	113	56	25
7802733	P5D2300FS25M07	23	XCMT07	194	115	56	25
7802734	P5D2350FS32M07	23,5	XCMT07	201	118	60	32
7802791	P5D2350FS25M07	23,5	XCMT07	197	118	56	25
7802735	P5D2400FS32M07	24	XCMT07	203	120	60	32
7802792	P5D2400FS25M07	24	XCMT07	199	120	56	25
7802736	P5D2450FS32M07	24,5	XCMT07	206	123	60	32
7802793	P5D2450FS25M07	24,5	XCMT07	202	123	56	25
7802737	P5D2500FS32M08	25	XCMT08	208	125	60	32
7802794	P5D2500FS25M08	25	XCMT08	204	125	56	25
7802738	P5D2550FS32M08	25,5	XCMT08	211	128	60	32
7802795	P5D2550FS25M08	25,5	XCMT08	207	128	56	25
7802739	P5D2600FS32M08	26	XCMT08	213	130	60	32
7802740	P5D2650FS32M08	26,5	XCMT08	216	133	60	32
7802741	P5D2700FS32M08	27	XCMT08	218	135	60	32
7802742	P5D2800FS32M08	28	XCMT08	223	140	60	32
7802743	P5D2850FS32M08	28,5	XCMT08	226	143	60	32
7802744	P5D2900FS32M09	29	XCMT09	228	145	60	32
7802745	P5D3000FS32M09	30	XCMT09	233	150	60	32
7802746	P5D3100FS32M09	31	XCMT09	238	155	60	32
7802796	P5D3100FS40M09	31	XCMT09	248	155	70	40
7802747	P5D3200FS32M09	32	XCMT09	243	160	60	32
7802797	P5D3200FS40M09	32	XCMT09	253	160	70	40
7802748	P5D3300FS40M09	33	XCMT09	258	165	70	40
7802749	P5D3350FS40M09	33,5	XCMT09	261	168	70	40
7802750	P5D3400FS40M10	34	XCMT10	263	170	70	40
7802751	P5D3500FS40M10	35	XCMT10	268	175	70	40
7802752	P5D3600FS40M10	36	XCMT10	273	180	70	40
7802753	P5D3700FS40M10	37	XCMT10	278	185	70	40
7802754	P5D3800FS40M10	38	XCMT10	283	190	70	40
7802755	P5D3900FS40M12	39	XCMT12	295	195	70	40
7802756	P5D4000FS40M12	40	XCMT12	300	200	70	40

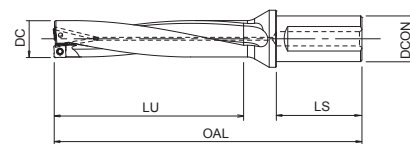
Drilling | Indexable



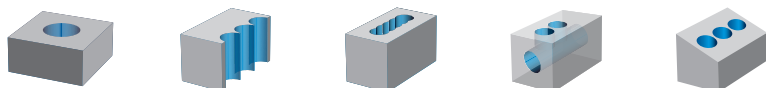
Body

# P5D

Drilling | Indexable | Body



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



EDP	Designation	DC	Applicable inserts type	OAL	LU	LS	DCON
7802757	P5D4100FS40M12	41	XCMT12	305	205	70	40
7802758	P5D4200FS40M12	42	XCMT12	310	210	70	40
7802759	P5D4300FS40M12	43	XCMT12	315	215	70	40
7802760	P5D4400FS40M12	44	XCMT12	320	220	70	40
7802761	P5D4500FS40M13	45	XCMT13	325	225	70	40
7802762	P5D4600FS40M13	46	XCMT13	330	230	70	40
7802763	P5D4700FS40M13	47	XCMT13	335	235	70	40
7802764	P5D4800FS40M13	48	XCMT13	340	240	70	40
7802765	P5D4900FS40M13	49	XCMT13	345	245	70	40
7802766	P5D5000FS40M14	50	XCMT14	350	250	70	40
7802767	P5D5100FS40M14	51	XCMT14	355	255	70	40
7802768	P5D5200FS40M14	52	XCMT14	360	260	70	40
7802769	P5D5300FS40M14	53	XCMT14	365	265	70	40
7802770	P5D5400FS40M14	54	XCMT14	370	270	70	40
7802771	P5D5500FS40M14	55	XCMT14	375	275	70	40
7802772	P5D5600FS40M14	56	XCMT14	380	280	70	40
7802773	P5D5700FS40M16	57	XCMT16	385	285	70	40
7802774	P5D5800FS40M16	58	XCMT16	390	290	70	40
7802775	P5D5900FS40M16	59	XCMT16	395	295	70	40
7802776	P5D6000FS40M16	60	XCMT16	400	300	70	40
7802777	P5D6100FS40M16	61	XCMT16	405	305	70	40
7802778	P5D6200FS40M16	62	XCMT16	410	310	70	40
7802779	P5D6300FS40M16	63	XCMT16	415	315	70	40

Drilling | Indexable

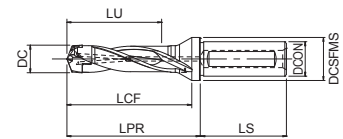
Body

Accessories and spare parts

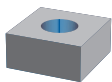
Applicable drill DC	EDP	Designation	Specification
12 - 14,5	7808096	FS18536P	Clamping screw
15 - 18,5	7808139	FS20543P	Clamping screw
19 - 20,5	7808138	FS22550P	Clamping screw
21 - 24,5	7808136	FS25560P	Clamping screw
25 - 33,5	7808135	FS30570P	Clamping screw
34 - 44	7808137	FS35586P	Clamping screw
45 - 63	7808114	FS45510P	Clamping screw
12 - 18,5	7808223	6IP-D (Torx 6IP)	Wrench
19 - 20,5	7808224	7IP-D (Torx 7IP)	Wrench
21 - 24,5	7808225	8IP-D (Torx 8IP)	Wrench
25 - 33,5	7808226	9IP-D (Torx 9IP)	Wrench
34 - 44	7808228	15IP-D (Torx 15IP)	Wrench
45 - 63	7808229	20IP-D (Torx 20IP)	Wrench

# PXD-3D

Drilling | Indexable | Body



- Exchangeable head drill with internal coolant
- Up to 3xD
- 3 different solid carbide head types based on work material
- 13 sizes
- Including driver



EDP	Designation	DCN	DCX	seat size	DC	LU	LCF	LPR	LS	DCON	DCSFMS
48173001	PXDZ140-3D-113,5-16	14	14,49	PXDH1400 PXDH1440	13,5	43	63,4	69,9	48	16	20
48173002	PXDZ145-3D-115,5-16	14,5	14,99	PXDH1450 PXDH1495	14	44,5	65,5	72	48	16	20
48173003	PXDZ150-3D-119,5-20	15	15,99	PXDH1500 PXDH1590	14,5	46,5	67,1	73,6	50	20	25
48173004	PXDZ160-3D-123,5-20	16	16,99	PXDH1600 PXDH1690	15,5	49,5	71,7	78,2	50	20	25
48173005	PXDZ170-3D-128,5-20	17	17,99	PXDH1700 PXDH1790	16,5	52,5	76,8	83,3	50	20	25
48173006	PXDZ180-3D-138,5-25	18	18,99	PXDH1800 PXDH1890	17,5	55,5	81,4	87,9	56	25	32
48173007	PXDZ190-3D-142,5-25	19	19,99	PXDH1900 PXDH1990	18,5	58,5	85,4	91,9	56	25	32
48173008	PXDZ200-3D-146,5-25	20	20,99	PXDH2000 PXDH2090	19,5	61,5	90,1	96,6	56	25	32
48173009	PXDZ210-3D-154,5-32	21	21,99	PXDH2100 PXDH2190	20,5	64,5	94,7	101,2	60	32	42
48173010	PXDZ220-3D-158,5-32	22	22,99	PXDH2200 PXDH2290	21,5	67,5	98,8	105,3	60	32	42
48173011	PXDZ230-3D-162,5-32	23	23,99	PXDH2300 PXDH2390	22,5	70,5	103,4	109,9	60	32	42
48173012	PXDZ240-3D-167,5-32	24	24,99	PXDH2400 PXDH2490	23,5	73,5	108,4	114,9	60	32	42
48173013	PXDZ250-3D-170,5-32	25	25,99	PXDH2500 PXDH2540	24,5	76,5	112	118,5	60	32	42

## Accessories and spare parts

Applicable drill DC	EDP	Designation
14 - 18,9	7808282	Driver 1,5 thickness
19 - 22,9	7808283	Driver 1,8 thickness
23 - 25,4	7808284	Driver 2 thickness

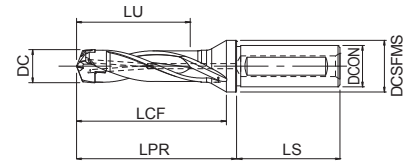
Drilling | Indexable



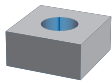
Body

# PXD-5D

Drilling | Indexable | Body



- Exchangeable head drill with internal coolant
- Up to 5xD
- 3 different solid carbide head types based on work material
- 13 sizes
- Including driver



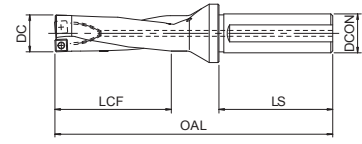
Drilling | Indexable

Body

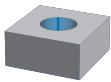
EDP	Designation	DCN	DCX	seat size	DC	LU	LCF	LPR	LS	DCON	DCSFMS
48173014	PXDZ140-5D-141,5-16	14	14,49	PXDH1400 PXDH1440	13,5	71,2	92,9	97,9	48	16	20
48173015	PXDZ145-5D-144,5-16	14,5	14,99	PXDH1450 PXDH1495	14	73,7	96	101	48	16	20
48173016	PXDZ150-5D-149,5-20	15	15,99	PXDH1500 PXDH1590	14,5	77,5	97,1	103,6	50	20	25
48173017	PXDZ160-5D-155,5-20	16	16,99	PXDH1600 PXDH1690	15,5	82,5	103,7	110,2	50	20	25
48173018	PXDZ170-5D-162,5-20	17	17,99	PXDH1700 PXDH1790	16,5	87,5	110,8	117,3	50	20	25
48173019	PXDZ180-5D-174,5-25	18	18,99	PXDH1800 PXDH1890	17,5	92,5	117,4	123,9	56	25	32
48173020	PXDZ190-5D-180,5-25	19	19,99	PXDH1900 PXDH1990	18,5	97,5	123,4	129,9	56	25	32
48173021	PXDZ200-5D-186,5-25	20	20,99	PXDH2000 PXDH2090	19,5	102,5	130,1	136,6	56	25	32
48173022	PXDZ210-5D-196,5-32	21	21,99	PXDH2100 PXDH2190	20,5	107,5	136,7	143,2	60	32	42
48173023	PXDZ220-5D-202,5-32	22	22,99	PXDH2200 PXDH2290	21,5	112,5	142,8	149,3	60	32	42
48173024	PXDZ230-5D-208,5-32	23	23,99	PXDH2300 PXDH2390	22,5	117,5	149,4	155,9	60	32	42
48173025	PXDZ240-5D-215,5-32	24	24,99	PXDH2400 PXDH2490	23,5	122,5	156,4	162,9	60	32	42
48173026	PXDZ250-5D-220,5-32	25	25,99	PXDH2500 PXDH2540	24,5	127,5	162	168,5	60	32	42

## Accessories and spare parts

Applicable drill DC	EDP	Designation
14 - 18,9	7808282	Driver 1,5 thickness
19 - 22,9	7808283	Driver 1,8 thickness
23 - 25,4	7808284	Driver 2 thickness



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

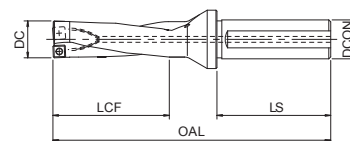


EDP	Designation	DC	Applicable inserts type	OAL	LCF	LS	DCON
7800100	PHP140FS20M04-3D	14	SCMT04	116	42	50	20
7800101	PHP145FS20M04-3D	14,5	SCMT04	119	45	50	20
7800102	PHP150FS20M04-3D	15	SCMT04	119	45	50	20
7800103	PHP155FS20M04-3D	15,5	SCMT04	122	48	50	20
7800104	PHP160FS20M04-3D	16	SCMT04	122	48	50	20
7800105	PHP165FS20M05-3D	16,5	SCMT05	125	51	50	20
7800106	PHP170FS20M05-3D	17	SCMT05	125	51	50	20
7800107	PHP175FS25M05-3D	17,5	SCMT05	134	54	56	25
7800108	PHP180FS25M05-3D	18	SCMT05	134	54	56	25
7800109	PHP185FS25M06-3D	18,5	SCMT06	137	57	56	25
7800110	PHP190FS25M06-3D	19	SCMT06	137	57	56	25
7800111	PHP195FS25M06-3D	19,5	SCMT06	140	60	56	25
7800112	PHP200FS25M06-3D	20	SCMT06	140	60	56	25
7800113	PHP205FS25M06-3D	20,5	SCMT06	143	63	56	25
7800114	PHP210FS25M07-3D	21	SCMT07	143	63	56	25
7800115	PHP215FS25M07-3D	21,5	SCMT07	146	66	56	25
7800116	PHP220FS25M07-3D	22	SCMT07	146	66	56	25
7800117	PHP225FS25M07-3D	22,5	SCMT07	149	69	56	25
7800118	PHP230FS25M07-3D	23	SCMT07	149	69	56	25
7800119	PHP235FS32M07-3D	23,5	SCMT07	156	72	60	32
7800120	PHP240FS32M07-3D	24	SCMT07	156	72	60	32

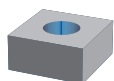
### Accessories and spare parts

Applicable drill DC	EDP	Designation	Specification
14 - 16	7808100	FS18538 (Torx 6)	Clamping screw
16,5 - 18	7808102	FS20540 (Torx 6)	Clamping screw
18,5 - 20,5	7808104	FS22550 (Torx 7)	Clamping screw
21 - 24	7808108	FS25560 (Torx 8)	Clamping screw
14 - 18	7808203	T6-D (Torx 6)	Wrench
18,5 - 20,5	7808204	T7-D (Torx 7)	Wrench
21 - 24	7808205	T8-D (Torx 8)	Wrench





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



Drilling | Indexable



Body

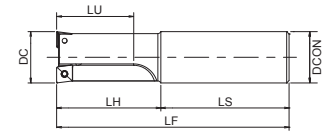
EDP	Designation	DC	Applicable inserts type	OAL	LCF	LS	DCON
7800121	PHP245FS32M08-3D	24,5	SCMT08	159	75	60	32
7800122	PHP250FS32M08-3D	25	SCMT08	159	75	60	32
7800123	PHP255FS32M08-3D	25,5	SCMT08	162	78	60	32
7800124	PHP260FS32M08-3D	26	SCMT08	162	78	60	32
7800125	PHP265FS32M08-3D	26,5	SCMT08	165	81	60	32
7800126	PHP270FS32M08-3D	27	SCMT08	165	81	60	32
7800127	PHP280FS32M08-3D	28	SCMT08	168	84	60	32
7800128	PHP290FS32M10-3D	29	SCMT10	171	87	60	32
7800130	PHP300FS32M10-3D	30	SCMT10	179	90	60	32
7800131	PHP310FS32M10-3D	31	SCMT10	182	93	60	32
7800132	PHP320FS32M10-3D	32	SCMT10	185	96	60	32
7800133	PHP330FS40M10-3D	33	SCMT10	196	99	68	40
7800134	PHP340FS40M10-3D	34	SCMT10	199	102	68	40
7800135	PHP350FS40M12-3D	35	SCMT12	202	105	68	40
7800136	PHP360FS40M12-3D	36	SCMT12	205	108	68	40
7800137	PHP370FS40M12-3D	37	SCMT12	218	111	68	40
7800138	PHP380FS40M12-3D	38	SCMT12	221	114	68	40
7800139	PHP390FS40M12-3D	39	SCMT12	224	117	68	40
7800140	PHP400FS40M12-3D	40	SCMT12	227	120	68	40

Accessories and spare parts

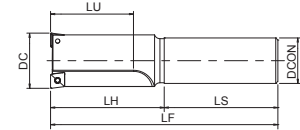
Applicable drill DC	EDP	Designation	Specification
24,5 - 28	7808110	FS30573 (Torx 8)	Clamping screw
29 - 34	7808111	FS35572 (Torx 15)	Clamping screw
35 - 40	7808113	FS45510 (Torx 20)	Clamping screw
24,5 - 28	7808205	T8-D (Torx 8)	Wrench
29 - 34	7808208	T15-D (Torx 15)	Wrench
35 - 40	7808209	T20-D (Torx 20)	Wrench

# PZAG SS

## Drilling | Counterboring



Type 1



Type 2

- Counterboring cutter straight shank.
- 2 corners inserts
- Cylindrical type
- 14 - 48 mm



EDP	Designation	ZEFP	DC	Applicable inserts type	LF	LU	LH	LS	DCON	ae	PHD	Type
7832100	PZAG04R014SS20-2	2	14	ZPNT04	100	21	30	70	20	4	6	1
7832101	PZAG06R0175SS20-2	2	17,5	ZPNT06	105	26	35	70	20	6	5,5	1
7832102	PZAG06R020SS20-2	2	20	ZPNT06	110	30	40	70	20	6	8	1
7832103	PZAG06R023SS25-2	2	23	ZPNT06	125	34,5	50	75	25	6	11	1
7832104	PZAG09R026SS25-2	2	26	ZPNT09	130	39	55	75	25	9	8	1
7832105	PZAG09R029SS32-2	2	29	ZPNT09	140	43,5	60	80	32	9	11	1
7832106	PZAG09R032SS32-2	2	32	ZPNT09	145	48	65	80	32	9	14	1
7832107	PZAG09R035SS32-2	2	35	ZPNT09	150	52,5	70	80	32	9	17	2
7832108	PZAG09R039SS32-2	2	39	ZPNT09	160	58,5	80	80	32	9	21	2
7832109	PZAG09R043SS32-2	2	43	ZPNT09	170	64,5	90	80	32	9	25	2
7832110	PZAG09R048SS32-2	2	48	ZPNT09	180	72	100	80	32	9	30	2

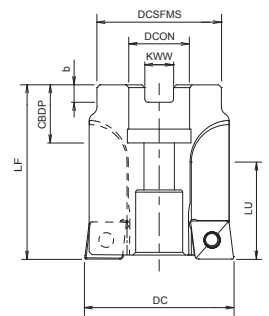
### Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
14	7808096	FS18536P	Clamping screw
17,5 - 23	7808138	FS22550P	Clamping screw
26 - 48	7808135	FS30570P	Clamping screw
54 - 82	7808114	FS45510P	Clamping screw
14	7808223	6IP-D (Torx 6IP)	Wrench
17,5 - 23	7808224	7IP-D (Torx 7IP)	Wrench
26 - 48	7808226	9IP-D (Torx 9IP)	Wrench
54 - 82	7808229	20IP-D (Torx 20IP)	Wrench



# PZAG BORE

Drilling | Counterboring



- Counterboring cutter
- Excellent chip breaking properties
- Bore type
- 54 - 82 mm



Drilling | Counterboring

EDP	Designation	ZEFP	DC	Applicable inserts type	LF	LU	DCON	DCSFMS	KWW	b	CBDP	ae	PHD
7832111	PZAG13R054M22-4	4	54	ZPNT130	63	35	22	45	10,4	6,3	21	12,5	29
7832112	PZAG13R058M22-4	4	58	ZPNT130	63	38	22	45	10,4	6,3	21	12,5	33
7832113	PZAG13R062M22-4	4	62	ZPNT130	63	41	22	45	10,4	6,3	21	12,5	37
7832114	PZAG13R067M22-4	4	67	ZPNT130	63	44	22	45	10,4	6,3	21	12,5	42
7832115	PZAG13R072M22-4	4	72	ZPNT130	63	47	22	45	10,4	6,3	21	12,5	47
7832116	PZAG17R076M22-4	4	76	ZPNT170	63	50	22	45	10,4	6,3	21	16	44
7832117	PZAG17R082M22-4	4	82	ZPNT170	63	54	22	45	10,4	6,3	21	16	50

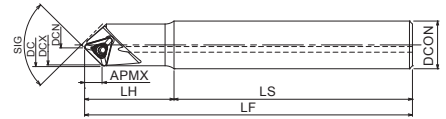
## Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
14	7808096	FS18536P	Clamping screw
17,5 - 23	7808138	FS22550P	Clamping screw
26 - 48	7808135	FS30570P	Clamping screw
54 - 82	7808114	FS45510P	Clamping screw
14	7808223	6IP-D (Torx 6IP)	Wrench
17,5 - 23	7808224	7IP-D (Torx 7IP)	Wrench
26 - 48	7808226	9IP-D (Torx 9IP)	Wrench
54 - 82	7808229	20IP-D (Torx 20IP)	Wrench



# PLDS SS NEW

Centring and chamfering | Indexable



- Indexable multi purpose centring and chamfering tool
- 3 corners inserts
- Cylindrical type, with internal coolant



EDP	Designation	SIG	ZEFP	DCN	DCX	DC	Applicable inserts type	LF	LH	LS	DCON	APMX
7803401	PLDS11R002SS16-90	90	1	2,5	13,5	14,4	TPKT110308ER-DM	110	30	80	16	5,8
7803402	PLDS11R002SS16-L90	90	1	2,5	13,5	14,4	TPKT110308ER-DM	200	30	170	16	5,8
7803403	PLDS11R002SS16-120	120	1	2,4	16	17,3	TPKT110308ER-DM	110	30	80	16	4
7803404	PLDS11R002SS16-L120	120	1	2,4	16	17,3	TPKT110308ER-DM	200	30	170	16	4

## Accessories and spare parts

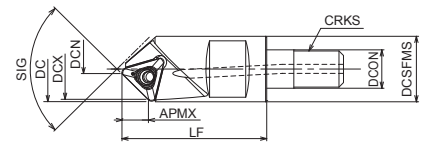
EDP	Designation	Specification	Torque
7808138 7808224	FS22550P 7IP-D (Torx 7IP)	Clamping screw Wrench	1,0 N.m -

Centring and chamfering | Indexable



# PLDS SF NEW

Centring and chamfering | Indexable



- Indexable multi purpose centring and chamfering tool
- 3 corners inserts
- Screw fit type



Centring and chamfering | Indexable

EDP	Designation	SIG	ZEFP	DCN	DCX	DC	Applicable inserts type	LF	DCON	DCSFMS	APMX	CRKS
7803405	PLDS11R002SF8-90	90	1	2,5	13,5	14,4	TPKT110308ER-DM	32	8,5	14,5	5,8	8
7803406	PLDS11R002SF8-120	120	1	2,4	16	17,3	TPKT110308ER-DM	32	8,5	14,5	4	8

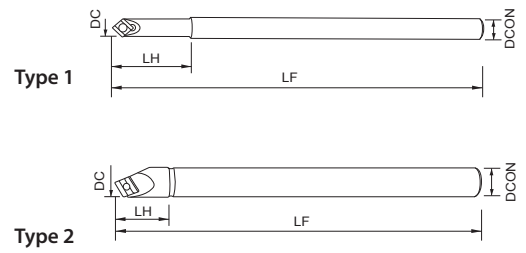
Accessories and spare parts

EDP	Designation	Specification	Torque
7808138	FS22550P	Clamping screw	1,0 N.m
7808224	7IP-D (Torx 7IP)	Wrench	-

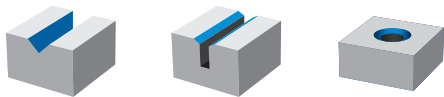


# HY-PRO CARB

Drilling | Spotting and Chamfering



- Indexable multi purpose centring and chamfering tool



EDP	SIG	DC	LF	LH	DCON	Type
738015	90	13,5	110	28	16	1
738055	90	13,5	200	28	16	1
738025	118	16,15	110	28	16	2
738065	118	16,15	200	28	16	2

Drilling | Spotting and Chamfering

## Inserts

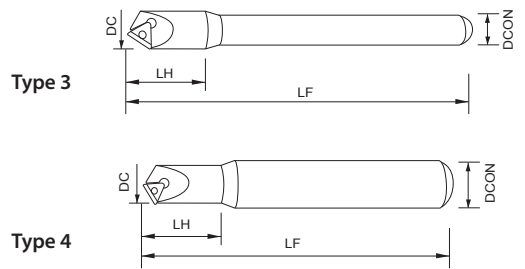
EDP	Designation	Material	RE	P		M		K		N		S		H	
				dry	⊖	dry	⊖	GG	GGG	dry	⊖	dry	⊖	dry	⊖
73811000	NK1010	Carbide	0,6					●			●				
73812000	NK2020	Carbide	0,6	●											

## Accessories and spare parts

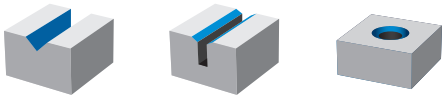
Applicable cutter DC	EDP	Designation	Specification
13,5 - 16,15	73801600	K-3	Wrench
13,5 - 16,15	73801100	L-6	Clamping screw

# HY-PRO CARB

Drilling | Spotting and Chamfering



- Indexable multi purpose centring and chamfering tool



EDP	Designation	SIG	DC	LF	LH	DCON	Type
738095	SFM16SS32190CS	90	22,5	130	30	20	3
738097	SFM16SS32190CS	90	22,5	200	50	25	3
738096	SFM16SS32190CS	120	26,6	130	35	25	4
738098	SFM16SS32190CS	120	26,6	200	50	32	4

## Inserts

EDP	Designation	Material	RE	P		M		K		N		S		H	
				dry	water	dry	water	GG	GGG	dry	water	dry	water	dry	water
73819000	NK2020	Carbide	0,6		●		○								
73819011	NK6060	Carbide/TiAlN	0,6				●								
73819100	NK1010	Carbide	0,6					●			●				
73819111	NK8080	Carbide/TiAlN	0,6								●				

## Accessories and spare parts

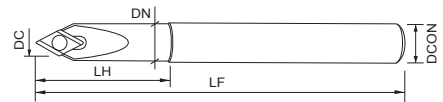
Applicable cutter DC	EDP	Designation	Specification
22,5 - 26,6	73801600	K-3	Wrench
22,5 - 26,6	73801200	L-10	Clamping screw

Drilling | Spotting and Chamfering

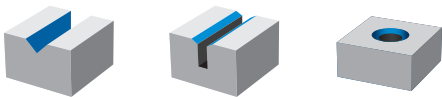


# HY-PRO CARB

Drilling | Spotting and Chamfering



- Indexable multi purpose centring and chamfering tool



EDP	SIG	DC	LF	LH	DN	DCON
738086	60	12	110	25	15	16

## Inserts

EDP	Designation	Material	RE	P		M		K		N		S		H	
				dry	☹	dry	☹	GG	GGG	dry	☹	dry	☹	dry	☹
73818006	ZC16N	Carbide	0,4					●		●					

## Accessories and spare parts

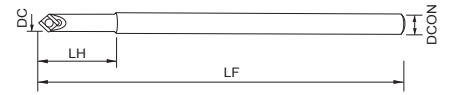
Applicable cutter DC	EDP	Designation	Specification
12	73801700	N-6	Wrench
12	73801300	L-15	Clamping screw

Drilling | Spotting and Chamfering

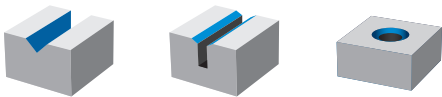


# HY-PRO CARB

Drilling | Spotting and Chamfering



- Indexable multi purpose centring and chamfering tool



EDP	SIG	DC	LF	LH	DCON
738031	90	9	105	33	10
738036	90	9	165	33	10

## Inserts

EDP	Designation	Material	RE	P		M		K		N		S		H	
				dry	👉	dry	👉	GG	GGG	dry	👉	dry	👉	dry	👉
73813005	NK5050	Carbide/TiN	0,2					●			●				

## Accessories and spare parts

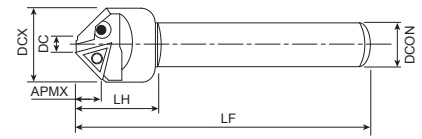
Applicable cutter DC	EDP	Designation	Specification
9	73801500	N-5	Wrench
9	73801400	L-13	Clamping screw

Drilling | Spotting and Chamfering



# HY-PRO CARB

Drilling | Spotting and Chamfering



- Indexable multi purpose centring and chamfering tool



Drilling | Spotting and Chamfering

EDP	SIG	DCX	DC	LF	LH	APMX	DCON
738075	90	29,4	8	130	30	10,7	20

## Inserts

EDP	Designation	Material	RE	P		M		K		N		S		H	
				dry	👉	dry	👉	GG	GGG	dry	👉	dry	👉	dry	👉
73817000	NK2001	Cermet	-	☉		☉		●							

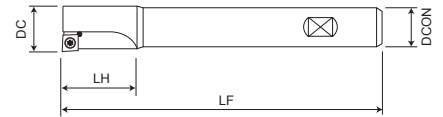
## Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
29,4	73801600	K-3	Wrench
29,4	73801100	L-6	Clamping screw



# HY-PRO CARB 49030 NEW

Drilling | Boring



- With steel shank, Weldon flat, DIN 1835B
- For boring pre-drilled and precast holes



EDP	DC	a (min)	LF	LH	DCON	ZEFP
490300980	9,8	9,3	85	20	8	1
490301080	10,8	10,3	95	20	10	1
490301180	11,8	11,3	100	25	10	1
490301280	12,8	12,3	105	30	10	1
490301380	13,8	13,3	110	35	10	1
490301480	14,8	14,3	120	30	12	1
490301580	15,8	15,3	125	35	12	1
490301680	16,8	15,8	133	30	16	1
490301780	17,8	16,8	138	35	16	1
490301880	18,8	17,8	143	40	16	1
490301980	19,8	18,8	148	45	16	1
490302080	20,8	19,8	153	50	16	1
490302180	21,8	20,8	158	55	16	1

## Inserts

EDP	Designation	Material	Grade	P		M		K		N		S		H	
				dry	water	dry	water	GG	GGG	dry	water	dry	water	dry	water
413200013	MPHT 060202,N12	Carbide	PMK92	●	●	○	○	○	○						
413200014	MPHT 060202,N13	Carbide	CH1			○	○			●					
413200015	MPHT 060202,N14	Carbide	PMK92	●	●	○	○								
413200016	MPHW 060202,N15	Cermet	CT50	○	○			●	●						
413200017	MPHW 060202,N15	Cermet	CT53	○	○			○	○						

## Accessories and spare parts

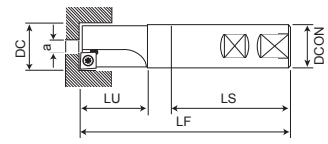
Applicable cutter DC	EDP	Designation	Specification
9,8 - 21,8	7808205	T8-D (Torx 8)	Wrench
9,8 - 21,8	423300002	M2,5x4,5	Clamping screw

Drilling | Boring



# HY-PRO CARB 49037 NEW

Drilling | Counterboring mono



- To produce counterbores for cap screws, hex screwheads, ejectors, spot facing, gasket seats etc.
- Straight shank with Weldon flat, DIN 1835B



Drilling | Counterboring mono

EDP	DC	a (min)	LF	LU	LS	DCON	ZEFP
490370800	8	4	80	23	45	12	1
490370900	9	4	80	23	45	12	1
490371000	10	4	80	23	45	12	1
490371100	11	4	80	23	45	12	1
490371200	12	4	80	26	45	12	1
490371300	13	5	80	26	45	12	1
490371400	14	5	80	26	45	12	1
490371500	15	5	80	26	45	12	1
490371600	16	5	90	31	48	16	1
490371700	17	6	90	31	48	16	1
490371800	18	8	90	31	48	16	1
490371900	19	8	90	31	48	16	1
490372000	20	5	100	36	50	20	1

## Inserts

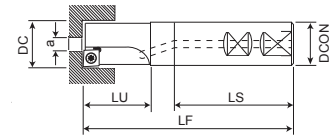
EDP	Applicable cutter DC	Designation	Material	Grade	P		M		K		N		S		H	
					dry	oil	dry	oil	GG	GGG	dry	oil	dry	oil	dry	oil
413200013	8 - 19	MPHT 060202,N12	Carbide	PMK92	●	●	○	○	○	○						
413200014	8 - 19	MPHT 060202,N13	Carbide	CH1			○	○			●					
413200015	8 - 19	MPHT 060202,N14	Carbide	PMK92	●	●	○	○								
413200016	8 - 19	MPHW 060202,N15	Cermet	CT50	○	○			○	○						
413200017	8 - 19	MPHW 060202,N15	Cermet	CT53	○	○			○	○						
413200020	8 - 19	MPMT 060204,N12	Carbide	PMK92	●	●										
413200018	8 - 19	MPMT 060204,N12	Carbide	CH1					○	○						
413200019	8 - 19	MPMT 060204,N12	Carbide	KM22					○	○						
413200007	20	MCHT 09T304,N12	Carbide	PMK92	●	●	○	○	○	○						
413200008	20	MCHT 09T304,N13	Carbide	CH1			○	○			●					
413200009	20	MCHT 09T304,N14	Carbide	PMK92			●	●								
413200012	20	MCMT 09T308,N12	Carbide	PMK92	●	●										
413200010	20	MCMT 09T308,N12	Carbide	CH1					○	○						
413200011	20	MCMT 09T308,N12	Carbide	KM22					○	○						

## Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
8 - 19	7808205	T8-D (Torx 8)	Wrench
20	7808208	T15-D (Torx 15)	Wrench
8 - 19	423300002	M2,5x4,5	Clamping screw
20	423300003	M4x7,5	Clamping screw

# HY-PRO CARB 49038 NEW

Drilling | Counterboring mono



- To produce counterbores for cap screws, hex screwheads, ejectors, spot facing, gasket seats etc.
- Straight shank with Weldon flat, DIN 1835B
- With internal coolant supply



EDP	DC	a (min)	LF	LU	LS	DCON	ZEFP
490381000	10	4	80	23	45	12	1
490381100	11	4	80	23	45	12	1
490381200	12	4	80	26	45	12	1
490381300	13	5	80	26	45	12	1
490381400	14	5	80	26	45	12	1
490381500	15	5	80	26	45	12	1
490381600	16	5	90	31	48	16	1
490381700	17	6	90	31	48	16	1
490381800	18	8	90	31	48	16	1
490381900	19	8	90	31	48	16	1
490382000	20	5	100	36	50	20	1
490382100	21	5	100	36	50	20	1
490382200	22	6	100	36	50	20	1
490382300	23	6	100	36	50	20	1
490382400	24	8	100	36	50	20	1
490382500	25	8	120	43	56	25	1
490382600	26	10	120	43	56	25	1
490382700	27	10	120	43	56	25	1
490382800	28	12	120	43	56	25	1
490382900	29	12	120	43	56	25	1
490383000	30	14	120	43	56	25	1

## Inserts

EDP	Applicable cutter DC	Designation	Material	Grade	P		M		K		N		S		H	
					dry	⊖	dry	⊖	GG	GGG	dry	⊖	dry	⊖	dry	⊖
413200013	10 - 19	MPHT 060202,N12	Carbide	PMK92	●	●	○	○	○	○						
413200014	10 - 19	MPHT 060202,N13	Carbide	CH1	○	○	○	○			●					
413200015	10 - 19	MPHT 060202,N14	Carbide	PMK92	●	●	●	●								
413200016	10 - 19	MPHW 060202,N15	Cermet	CT50	○	○			●	○						
413200017	10 - 19	MPHW 060202,N15	Cermet	CT53	○	○			○	●						
413200020	10 - 19	MPMT 060204,N12	Carbide	PMK92	●	●										
413200018	10 - 19	MPMT 060204,N12	Carbide	CH1					●	○						
413200019	10 - 19	MPMT 060204,N12	Carbide	KM22					●	○						
413200007	20 - 30	MCHT 09T304,N12	Carbide	PMK92	●	●	○	○	○	○						
413200008	20 - 30	MCHT 09T304,N13	Carbide	CH1			○	○			●					
413200009	20 - 30	MCHT 09T304,N14	Carbide	PMK92			●	●								
413200012	20 - 30	MCMT 09T308,N12	Carbide	PMK92	●	●										
413200010	20 - 30	MCMT 09T308,N12	Carbide	CH1					●	○						
413200011	20 - 30	MCMT 09T308,N12	Carbide	KM22					○	●						

## Accessories and spare parts

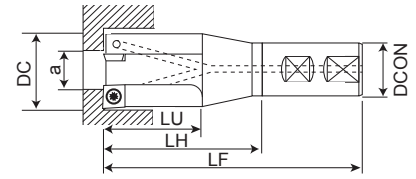
Applicable cutter DC	EDP	Designation	Specification
10 - 19	7808205	T8-D (Torx 8)	Wrench
20 - 30	7808208	T15-D (Torx 15)	Wrench
10 - 19	423300002	M2,5x4,5	Clamping screw
20 - 30	423300003	M4x7,5	Clamping screw

Drilling | Counterboring mono



# HY-PRO CARB 49039 NEW

Drilling | Counterboring multi



- To produce counterbores for cap screws, hex screwheads, ejectors, spot facing, gasket seats etc.
- Straight shank with Weldon flat, DIN 1835B
- With internal coolant supply



Drilling | Counterboring multi

EDP	DC	a (min)	LF	LU	LH	DCON	ZEFP
490391500	15	4	100	30	40	20	2
490391800	18	6	100	30	40	20	2
490392000	20	8	100	30	40	20	2
490392200	22	10	100	30	40	20	2
490392400	24	6	136	50	68	25	2
490392600	26	8	136	50	68	25	2
490392800	28	10	136	50	68	25	2
490393000	30	12	136	50	66	32	3
490393300	33	15	136	50	66	32	3
490393600	36	18	136	50	66	32	3
490394000	40	16	136	50	66	32	3

## Inserts

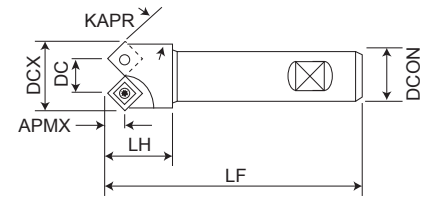
EDP	Applicable cutter DC	Designation	Material	Grade	P		M		K		N		S		H	
					dry	☉	dry	☉	GG	GGG	dry	☉	dry	☉	dry	☉
413200013	15 - 22	MPHT 060202,N12	Carbide	PMK92	☉	☉	☉	☉	☉	☉						
413200014	15 - 22	MPHT 060202,N13	Carbide	CH1			☉	☉			☉					
413200015	15 - 22	MPHT 060202,N14	Carbide	PMK92	☉	☉	☉	☉								
413200016	15 - 22	MPHW 060202,N15	Cermet	CT50	☉	☉			☉	☉						
413200017	15 - 22	MPHW 060202,N15	Cermet	CT53	☉	☉			☉	☉						
413200020	15 - 22	MPMT 060204,N12	Carbide	PMK92	☉	☉										
413200018	15 - 22	MPMT 060204,N12	Carbide	CH1					☉	☉						
413200019	15 - 22	MPMT 060204,N12	Carbide	KM22					☉	☉						
413200007	24 - 36	MCHT 09T304,N12	Carbide	PMK92	☉	☉	☉	☉	☉	☉						
413200008	24 - 36	MCHT 09T304,N13	Carbide	CH1			☉	☉			☉					
413200009	24 - 36	MCHT 09T304,N14	Carbide	PMK92			☉	☉								
413200012	24 - 36	MCMT 09T308,N12	Carbide	PMK92	☉	☉										
413200010	24 - 36	MCMT 09T308,N12	Carbide	CH1					☉	☉						
413200011	24 - 36	MCMT 09T308,N12	Carbide	KM22					☉	☉						
413200001	40	MBHT 120404,N12	Carbide	PMK92	☉	☉	☉	☉	☉	☉						
413200002	40	MBHT 120404,N13	Carbide	CH1			☉	☉			☉					
413200003	40	MBHT 120404,N14	Carbide	PMK92			☉	☉								
413200006	40	MBMT 120408,N12	Carbide	PMK92	☉	☉										
413200004	40	MBMT 120408,N12	Carbide	CH1					☉	☉						
413200005	40	MBMT 120408,N12	Carbide	KM22					☉	☉						

## Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
15 - 22	7808205	T8-D (Torx 8)	Wrench
24 - 40	7808208	T15-D (Torx 15)	Wrench
15 - 22	423300002	M2,5x4,5	Clamping screw
24 - 36	423300003	M4x7,5	Clamping screw
40	423300004	M4x9,5	Clamping screw

# HY-PRO CARB 49100 NEW

Drilling | Chamfering and face milling



- For chamfering, countersinking, facing, etc.
- Straight shank with Weldon flat, DIN 1835B



EDP	DCX	KAPR	DC	LF	LH	APMX	DCON	ZEFP
491001345	13	45	6	80	16	4	10	1
491001915	19	15	16	90	19	6	16	2
491001930	19	30	13	90	18	5,5	16	2
491001945	19	45	11	90	18	4	16	2
491002645	26	45	15	100	26	6	20	2
491003260	32	60	17,5	100	30	4	20	2
491003275	32	75	15,5	100	30	2	20	2
491004015	40	15	34	120	36	10	25	2
491004030	40	30	28	120	38	10,5	25	2
491004045	40	45	25	120	38	8	25	2

## Inserts

EDP	Applicable cutter DC	Designation	Material	Grade	P		M		K		N		S		H	
					dry	👉	dry	👉	GG	GGG	dry	👉	dry	👉	dry	👉
413200013	13 - 19	MPHT 060202,N12	Carbide	PMK92	●	●	○	○	○	○						
413200014	13 - 19	MPHT 060202,N13	Carbide	CH1			○	○			●					
413200015	13 - 19	MPHT 060202,N14	Carbide	PMK92	●	●	●	●								
413200016	13 - 19	MPHW 060202,N15	Cermet	CT50	○	○			●	●						
413200017	13 - 19	MPHW 060202,N15	Cermet	CT53	○	○			○	○						
413200020	13 - 19	MPMT 060204,N12	Carbide	PMK92	●	●										
413200018	13 - 19	MPMT 060204,N12	Carbide	CH1					●	●						
413200019	13 - 19	MPMT 060204,N12	Carbide	KM22					○	○						
413200007	26 - 32	MCHT 09T304,N12	Carbide	PMK92	●	●	○	○	○	○						
413200008	26 - 32	MCHT 09T304,N13	Carbide	CH1			○	○			●					
413200009	26 - 32	MCHT 09T304,N14	Carbide	PMK92			●	●								
413200012	26 - 32	MCMT 09T308,N12	Carbide	PMK92	●	●										
413200010	26 - 32	MCMT 09T308,N12	Carbide	CH1					●	●						
413200011	26 - 32	MCMT 09T308,N12	Carbide	KM22					○	○						
413200001	40	MBHT 120404,N12	Carbide	PMK92	●	●	○	○	○	○						
413200002	40	MBHT 120404,N13	Carbide	CH1			○	○			●					
413200003	40	MBHT 120404,N14	Carbide	PMK92			●	●								
413200006	40	MBMT 120408,N12	Carbide	PMK92	●	●										
413200004	40	MBMT 120408,N12	Carbide	CH1					●	●						
413200005	40	MBMT 120408,N12	Carbide	KM22					○	○						

## Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
13 - 19	7808205	T8-D (Torx 8)	Wrench
26 - 40	7808208	T15-D (Torx 15)	Wrench
13 - 19	423300002	M2,5x4,5	Clamping screw
26 - 32	423300003	M4x7,5	Clamping screw
40	423300004	M4x9,5	Clamping screw

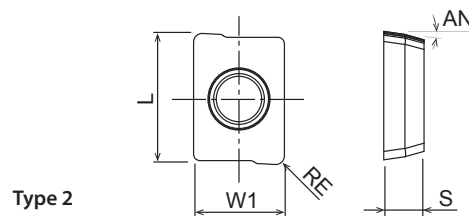
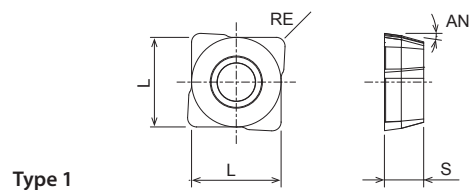


# P2D • P3D • P4D • P5D INSERTS

Drilling | Indexable | Inserts and heads



- Applicable insert for PD drill



EDP	Designation	W1	L	S	AN	RE	Grade	P		M		K		N		S		H		Applicable body DC
								dry	☉	dry	☉	GG	GGG	dry	☉	dry	☉	dry	☉	
7823098	XCMT031904ER-DM	6,1	4,5	1,9	8	0,4	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	12-14,5
7823064	XCMT042204ER-DM	-	5	2,2	8	0,4	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	15-16,5
7823065	XCMT052404ER-DM	-	5,83	2,4	8	0,4	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	17-18,5
7823066	XCMT062706ER-DM	-	6,46	2,7	8	0,6	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	19-20,5
7823067	XCMT073106ER-DM	-	7,11	3,1	8	0,6	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	21-24,5
7823068	XCMT083508ER-DM	-	8,36	3,5	8	0,8	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	25-28,5
7823069	XCMT094008ER-DM	-	9,62	4	8	0,8	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	29-33,5
7823097	XCMT104608ER-DM	-	10,89	4,6	8	0,8	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	34-38
7823071	XCMT125010ER-DM	-	12,57	5	8	1	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	39-44
7823072	XCMT135212ER-DM	-	14,05	5,2	8	1,2	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	45-49
7823073	XCMT145612ER-DM	-	15,58	5,6	8	1,2	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	50-56
7823075	XCMT165912ER-DM	-	17,28	5,9	8	1,2	XP9020	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	57-63
7823163	XCMT031904ER-DR	6,1	4,5	1,9	8	0,4	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	12-14,5
7823164	XCMT042204ER-DR	-	5	2,2	8	0,4	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	15-16,5
7823165	XCMT052404ER-DR	-	5,83	2,4	8	0,4	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	17-18,5
7823166	XCMT062706ER-DR	-	6,46	2,7	8	0,6	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	19-20,5
7823167	XCMT073106ER-DR	-	7,11	3,1	8	0,6	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	21-24,5
7823168	XCMT083508ER-DR	-	8,36	3,5	8	0,8	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	25-28,5
7823169	XCMT094008ER-DR	-	9,62	4	8	0,8	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	29-33,5
7823197	XCMT104608ER-DR	-	10,89	4,6	8	0,8	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	34-38
7823171	XCMT125010ER-DR	-	12,57	5	8	1	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	39-44
7823172	XCMT135212ER-DR	-	14,05	5,2	8	1,2	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	45-49
7823173	XCMT145612ER-DR	-	15,58	5,6	8	1,2	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	50-56
7823175	XCMT165912ER-DR	-	17,28	5,9	8	1,2	XP1010	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	57-63
7823263	XCMT031904ER-DN	6,1	4,5	1,9	8	0,4	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	12-14,5
7823264	XCMT042204ER-DN	-	5	2,2	8	0,4	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	15-16,5
7823265	XCMT052404ER-DN	-	5,83	2,4	8	0,4	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	17-18,5
7823266	XCMT062706ER-DN	-	6,46	2,7	8	0,6	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	19-20,5
7823267	XCMT073106ER-DN	-	7,11	3,1	8	0,6	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	21-24,5
7823268	XCMT083508ER-DN	-	8,36	3,5	8	0,8	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	25-28,5
7823269	XCMT094008ER-DN	-	9,62	4	8	0,8	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	29-33,5
7823297	XCMT104608ER-DN	-	10,89	4,6	8	0,8	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	34-38
7823271	XCMT125010ER-DN	-	12,57	5	8	1	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	39-44
7823272	XCMT135212ER-DN	-	14,05	5,2	8	1,2	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	45-49
7823273	XCMT145612ER-DN	-	15,58	5,6	8	1,2	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	50-56
7823275	XCMT165912ER-DN	-	17,28	5,9	8	1,2	CK110	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	57-63

Drilling | Indexable

Inserts and heads

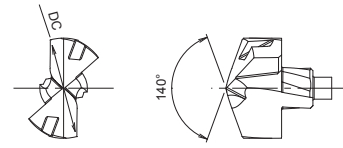







# PXD HEADS

Drilling | Indexable | Inserts and heads



- Applicable head for non ferrous metals

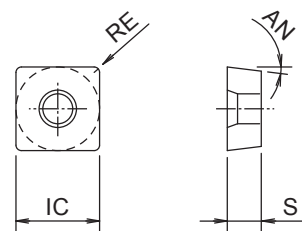


EDP	Designation	DC	Grade	N		Applicable body DC
				dry		
7831740	PXDH1400-NC	14	CF225		●	PXDZ140
7831745	PXDH1450-NC	14,5	CF225		●	PXDZ145
7831750	PXDH1500-NC	15	CF225		●	PXDZ150
7831755	PXDH1550-NC	15,5	CF225		●	PXDZ150
7831760	PXDH1600-NC	16	CF225		●	PXDZ160
7831765	PXDH1650-NC	16,5	CF225		●	PXDZ160
7831767	PXDH1670-NC	16,7	CF225		●	PXDZ160
7831770	PXDH1700-NC	17	CF225		●	PXDZ170
7831775	PXDH1750-NC	17,5	CF225		●	PXDZ170
7831780	PXDH1800-NC	18	CF225		●	PXDZ180
7831785	PXDH1850-NC	18,5	CF225		●	PXDZ180
7831787	PXDH1870-NC	18,7	CF225		●	PXDZ180
7831790	PXDH1900-NC	19	CF225		●	PXDZ190
7831795	PXDH1950-NC	19,5	CF225		●	PXDZ190
7831800	PXDH2000-NC	20	CF225		●	PXDZ200
7831805	PXDH2050-NC	20,5	CF225		●	PXDZ200
7831807	PXDH2070-NC	20,7	CF225		●	PXDZ200
7831810	PXDH2100-NC	21	CF225		●	PXDZ210
7831815	PXDH2150-NC	21,5	CF225		●	PXDZ210
7831820	PXDH2200-NC	22	CF225		●	PXDZ220
7831824	PXDH2240-NC	22,4	CF225		●	PXDZ220
7831825	PXDH2250-NC	22,5	CF225		●	PXDZ220
7831830	PXDH2300-NC	23	CF225		●	PXDZ230
7831835	PXDH2350-NC	23,5	CF225		●	PXDZ230
7831840	PXDH2400-NC	24	CF225		●	PXDZ240
7831845	PXDH2450-NC	24,5	CF225		●	PXDZ240
7831850	PXDH2500-NC	25	CF225		●	PXDZ250
7831854	PXDH2540-NC	25,4	CF225		●	PXDZ250

Drilling | Indexable  
Inserts and heads

# PHP INSERTS

Drilling | Indexable | Inserts and heads



- Applicable insert for PHP drill



EDP	Designation	IC	S	AN	RE	Grade	P		M		K		N		S		H		Applicable body DC
							dry	☉	dry	☉	GG	GGG	dry	☉	dry	☉	dry	☉	
7818001	SCMT042204-DM	4,8	2,2	7	0,4	XP9040	☉	●	●	●			●	●	○				14-16
7818002	SCMT052404-DM	5,4	2,4	7	0,4	XP9040	☉	●	●	●			●	●	○				16,5-18
7818003	SCMT062806-DM	6,2	2,8	7	0,6	XP9040	☉	●	●	●			●	●	○				18,5-20,5
7818004	SCMT073206-DM	7,2	3,2	7	0,6	XP9040	☉	●	●	●			●	●	○				21-24
7818005	SCMT083608-DM	8,6	3,6	7	0,8	XP9040	☉	●	●	●			●	●	○				24,5-28
7818006	SCMT104208-DM	10	4,2	7	0,8	XP9040	☉	●	●	●			●	●	○				29-34
7818007	SCMT125008-DM	12,3	5	7	0,8	XP9040	☉	●	●	●			●	●	○				35-40
7817001	SCMT042204-DM	4,8	2,2	7	0,4	XP9025	○	○	○		●		○						14-16
7817002	SCMT052404-DM	5,4	2,4	7	0,4	XP9025	○	○	○		●		○						16,5-18
7817003	SCMT062806-DM	6,2	2,8	7	0,6	XP9025	○	○	○		●		○						18,5-20,5
7817004	SCMT073206-DM	7,2	3,2	7	0,6	XP9025	○	○	○		●		○						21-24
7817005	SCMT083608-DM	8,6	3,6	7	0,8	XP9025	○	○	○		●		○						24,5-28
7817006	SCMT104208-DM	10	4,2	7	0,8	XP9025	○	○	○		●		○						29-34
7817007	SCMT125008-DM	12,3	5	7	0,8	XP9025	○	○	○		●		○						35-40

Drilling | Indexable

Inserts and heads

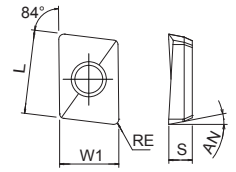
# PZAG INSERTS

Drilling | Indexable | Inserts and heads

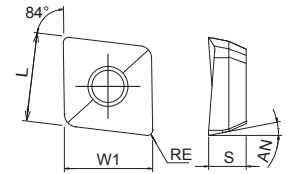


- Counterboring cutter
- 2 corners inserts

Type 1



Type 2



EDP	Designation	W1	L	S	AN	RE	Type	Grade	P		M		K		N		S		H		Applicable body DC
									dry	☉	dry	☉	GG	GGG	dry	☉	dry	☉	dry	☉	
7814101	ZPNT040104ER	6,35	4,45	1,76	11	0,4	1	XP8030	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	14
7814103	ZPNT060204EN	6,95	6,95	2,93	11	0,4	2	XP8030	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	17,5-23
7814106	ZPNT090404EN	9,94	9,94	4,65	11	0,4	2	XP8030	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	26-48
7814109	ZPNT130504EN	13,92	13,92	5,46	11	0,4	2	XP8030	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	54-72
7814111	ZPNT170608EN	17,85	17,85	6,31	11	0,8	2	XP8030	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	76-82
7815101	ZPNT040104ER	6,35	4,45	1,76	11	0,4	1	XC8035	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	14
7815103	ZPNT060204EN	6,95	6,95	2,93	11	0,4	2	XC8035	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	17,5-23
7815106	ZPNT090404EN	9,94	9,94	4,65	11	0,4	2	XC8035	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	26-48
7815109	ZPNT130504EN	13,92	13,92	5,46	11	0,4	2	XC8035	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	54-72
7815111	ZPNT170608EN	17,85	17,85	6,31	11	0,8	2	XC8035	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	76-82

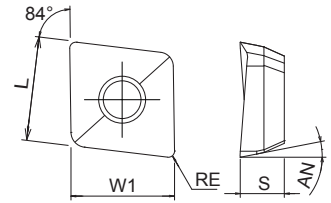
Drilling | Indexable

Inserts and heads



# PDZ INSERTS

Drilling | Indexable | Inserts and heads



- Counterboring cutter
- 2 corners inserts



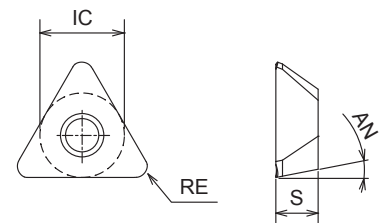
Drilling | Indexable

Inserts and heads

EDP	Designation	W1	L	S	AN	RE	Specification	Grade	P		M		K		N		S		H		Applicable body DC
									dry	👉	dry	👉	GG	GGG	dry	👉	dry	👉	dry	👉	
7814102	ZPNT050204EN	5,9	5,9	2,25	11	0,4	Center cutting	XP8030	👉	●	👉	●	👉	●	👉	●	👉	●	👉	●	16-18,5
7814103	ZPNT060204EN	6,95	6,95	2,93	11	0,4	Center cutting	XP8030	👉	●	👉	●	👉	●	👉	●	👉	●	👉	●	19-22
7814104	ZPNT070304EN	7,84	7,84	3,87	11	0,4	Center cutting	XP8030	👉	●	👉	●	👉	●	👉	●	👉	●	👉	●	23-26
7814105	ZPNT080304EN	8,85	8,85	3,92	11	0,4	Center cutting	XP8030	👉	●	👉	●	👉	●	👉	●	👉	●	👉	●	27-31
7814106	ZPNT090404EN	9,94	9,94	4,65	11	0,4	Center cutting	XP8030	👉	●	👉	●	👉	●	👉	●	👉	●	👉	●	32-34
7814108	ZPNT100408EN	10,95	10,95	4,65	11	0,8	Center cutting	XP8030	👉	●	👉	●	👉	●	👉	●	👉	●	👉	●	35-38
7814110	ZPNT130508EN	13,92	13,92	5,46	11	0,8	Center cutting	XP8030	👉	●	👉	●	👉	●	👉	●	👉	●	👉	●	39-43
7815102	ZPNT050204EN	5,9	5,9	2,25	11	0,4	Peripheral	XC8035	👉	👉	👉	●	👉	●	👉	●	👉	●	👉	●	16-18,5
7815103	ZPNT060204EN	6,95	6,95	2,93	11	0,4	Peripheral	XC8035	👉	👉	👉	●	👉	●	👉	●	👉	●	👉	●	19-22
7815104	ZPNT070304EN	7,84	7,84	3,87	11	0,4	Peripheral	XC8035	👉	👉	👉	●	👉	●	👉	●	👉	●	👉	●	23-26
7815105	ZPNT080304EN	8,85	8,85	3,92	11	0,4	Peripheral	XC8035	👉	👉	👉	●	👉	●	👉	●	👉	●	👉	●	27-31
7815106	ZPNT090404EN	9,94	9,94	4,65	11	0,4	Peripheral	XC8035	👉	👉	👉	●	👉	●	👉	●	👉	●	👉	●	32-34
7815108	ZPNT100408EN	10,95	10,95	4,65	11	0,8	Peripheral	XC8035	👉	👉	👉	●	👉	●	👉	●	👉	●	👉	●	35-38
7815110	ZPNT130508EN	13,92	13,92	5,46	11	0,8	Peripheral	XC8035	👉	👉	👉	●	👉	●	👉	●	👉	●	👉	●	39-43

# PLDS INSERTS

Drilling | Indexable | Inserts and heads



- Applicable insert for PLDS drill



EDP	Designation	IC	S	AN	RE	Grade	P		M		K		N		S		H		Applicable body DC
							dry	👉	dry	👉	GG	GGG	dry	👉	dry	👉	dry	👉	
7814205	TPKT110308ER-DM	6,35	3,18	11	0,8	XP9020	👉	●	👉	👉	●	●	👉	👉	👉	●	●	14,4-17,3	
7813205	TPKT110308ER-DM	6,35	3,18	11	0,8	XP2040	👉	👉	👉	●			👉		●	●	14,4-17,3		

Drilling | Indexable  
Inserts and heads



# MILLING









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# ICONS LEGEND

## Milling | Icons legend




### Material

 <b>CARBIDE</b> Carbide	 <b>CBN</b> CBN	 <b>XPM</b> High grade powder metallurgy HSS (XPM) (Co10+V5)
 <b>CPM</b> Powder Metallurgy HSS (PM-T15) (Co5 + V5)	 <b>HSS-Co</b> HSS Cobalt (Co8)	 <b>CERAMIC</b> Ceramic
 <b>HONEYCOMB</b> Honeycomb	 <b>CFRP</b> CFRP	










### Coating / surface treatment

 <b>FX</b> Multilayer coating TiAlN	 <b>WX</b> Multilayer composite TiAlN	 <b>CrN</b> Chromium nitride
 <b>DIA</b> Diamond	 <b>DLC</b> Coating DLC	 <b>WDI</b> Multilayer coating WDI
 <b>TiAlN</b> Multilayer coating TiAlN	 <b>V</b> Multilayer coating TiCN	 <b>DG</b> Coating DG
 <b>WXS</b> Multilayer coating WXS	 <b>WXL</b> Multilayer coating WXL	 <b>DUR</b> Coating Duarise
 <b>DLC-IGUSS</b> DLC IGUSS coating	 <b>DUREORY</b> Coating DURORAY	

### Helix angle

 <b>30°</b> Helix angle	 <b>±0°</b> Taper angle per side	 <b>45°</b> 45° degrees cutter
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### Shank

 Long pencil neck	 Pencil neck	 Short neck
 Long neck	 Extra long neck	 Slim shank
 <b>SHRINK FIT</b> Suitable for Shrink fit system	 <b>HB</b> Weldon	 Straight shank

### Tolerance

 Milling diameter tolerance	 <b>R ±0.01</b> Radius tolerance
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### Coolant

 Internal coolant	 Coolant
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### A-Brand

 <b>A</b> A-Brand product
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# ICONS LEGEND

Milling | Icons legend






## Cutting specification

	Centre cutting		Sharp corner		220° cutting edge
	High feed corner radius		High feed		Square
	Corner radius		Ball nose		Radius cutter
	Roughing				


















## Recommendation

	Steel Full recommendation		Stainless steel Full recommendation		Cast iron Full recommendation
	Steel Suitable		Stainless steel Suitable		Cast iron Suitable
	Non-ferrous materials Full recommendation		Super alloys Full recommendation		Hardened material Full recommendation
	Non-ferrous materials Suitable		Super alloys Suitable		Hardened material Suitable

## Page reference

	Cutting conditions page reference		Body page reference		Arbor/holder page reference
	Inserts page reference		Holder page reference		

## Application

	Side milling		Side milling		Side milling
	Slotting		Slotting		Slotting
	Contouring		Profile milling		Profile milling
	Plunging		High feed corner radius		High feed long neck corner radius
	Long neck slotting		Long neck profile milling		Deep pocket
	Deep wall milling		Deep slotting		

## Product group

	Solid end mills		Indexable milling
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# MATERIAL OVERVIEW

Milling | Overview DIN ISO 513

Work Material			DIN
P	~45 HRC	Steel	1.0501 (C35)
	~55 HRC		1.0535 (C55) 1.0553 (S355J0)
H	~60 HRC	Hardened steel	
	~65 HRC		
M	~35 HRC	Stainless steel	1.4301 (X5CrNi18-10)
K	~350 HB	Cast iron	0.6025 (EN-GJL-250/GG25)
N		Aluminium	3.0205 (Al99)
S		Titanium	3.7164 (Ti6Al4V)

CFRP	CFRP
Honeycomb	Honeycomb
Graphite	Graphite



# AE-N SERIES



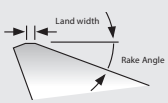
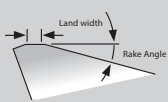
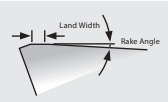
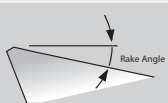
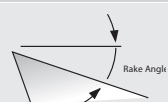
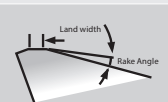
# GRADE & CHIPBREAKER SELECTION

Indexables | Milling

## Grades for milling

Material	Grades	Coolant/dry	Coating	Hardness (HRA)	Surface main component	Surface coating thickness	Features
P	XC3020	Dry	CVD	90,5	TiCN+Al <sub>2</sub> O <sub>3</sub>	10 μm	For steel and cast iron High strength and tough material, wear resistant coating
	XC3025	Dry	CVD	90,8	TiCN+TiN+Al <sub>2</sub> O <sub>3</sub>	4 μm	For steel, stainless steel and cast iron High strength material, excellent wear resistant coating
	XP3025	Dry	PVD	90,5	TiAlN	5 μm	For steel and cast iron High strength and tough material, wear resistant coating
	XC3030	Dry	CVD	89,5	TiCN+Al <sub>2</sub> O <sub>3</sub>	10 μm	For steel and cast iron High strength and tough material, wear resistant coating
	XP3035	Dry	PVD	89,5	TiAlN-TiN	5 μm	For machining steel, stainless steel and cast irons. A grade for general-purpose milling. Made of a tough, high-strength carbide. Treated with chipping-resistant and wear-resistant coating.
	XP3225	Dry	PVD	91,5	Cr	3 μm	For machining steel, stainless steel and cast iron. High-strength and tough material, wear-resistant coating
	XP3310	Dry	PVD	92,5	SiC Silicon-based heat-resistant coating	3 μm	For steel and cast iron. A tough carbide base grade and excellent general purpose coating
	XP3320	Dry	PVD	91,5	SiC Silicon-based heat-resistant coating	3 μm	For machining steel, stainless steel and cast irons. A tough carbide grade with a heat-resistant and wear-resistant coating
	XP3930	Dry	PVD	90,8	TiAlN	3 μm	For machining steel, cast irons and stainless steel Excellent balance, can accommodate a range of workpiece materials
M	XP2025	Coolant	PVD	91,0	TiAlN	5 μm	For stainless steel and steel Composed of a tough carbide material with a wear resistant coating
	XP2040	Coolant	PVD	89,6	TiAlN	5 μm	For machining stainless steel and steel. Grade for general-purpose milling. A tough, high-strength carbide grade with an anti-chipping and wear-resistant coating
K	XC1015	Dry	CVD	91,5	TiCN-Al <sub>2</sub> O <sub>3</sub>	10 μm	For machining cast irons. Grade for milling cast-iron. Tough, high-strength carbide grade with an anti-chipping and wear-resistant coating
	XP1020	Dry	PVD	91,4	TiAlN	5 μm	For cast iron. High rigidity of cutting edge is acquired by optimal land width and rake angle.
N	CK010	-	-	92,0	-	-	For machining non-ferrous materials A non-coated carbide grade with both anti-chipping and wear resistant features
	XC4505	Dry	CVD	93,0	DIA	12 μm	High strength coating of fine diamond
S	XC5035	Coolant	CVD	89,3	TiN-Ti(CN)-Al <sub>2</sub> O <sub>3</sub> -Ti(BN)	6 μm	Grade for machining heat-resistant steel. Tough, carbide grade with an oxidation-resistant and high-lubricity coating
	XC5040	Coolant	CVD	89,3	TiN-TiB <sub>2</sub>	4 μm	Grade for machining heat-resistant steel. For wet machining. Tough, carbide grade with an oxidation-resistant and high-lubricity coating
H	XP6015	Dry	PVD	92,2	TiAlN	4 μm	A grade designed for milling high hardness steel, made of tough, high strength carbide material with a wear resistant coating
	XP6305	Dry	PVD	93,0	SiC Silicon-based heat-resistant coating	3 μm	For machining high hardness materials High temperature hardness levels and excellent thermal conductivity for machining high hardness materials

## Chipbreakers for milling

Chipbreaker	Material	Cutting edge	Rake angle	Features
GL	P M		25°	For milling stainless-steel Chipbreaker with a large rake angle and a small flat land to reduce cutting force.
GM	P M K		15° (35° PAS)	For machining various materials (steel, stainless steel, cast iron) Chipbreaker with a superior balance of rake angle and flat land.
GR	P M K H		7° (35° PAS)	For machining various materials from steel to cast iron: a highly rigid breaker with large rake angle and flat land to provide a sharp cutting edge and enable efficient milling.
SM	S		15°	For machining difficult materials Chipbreaker with a sharp cutting edge to reduce cutting force and provide smooth chip evacuation.
NM	N		30°	For machining non-ferrous materials Chipbreaker with a sharp cutting edge and a large rake angle to suppress welding, improve the milling surface and prevent burrs.
HR	H		3°	For milling high hardened steel: a breaker with sharpness and rigidity on the cutting edge.

Chipbreaker & grade



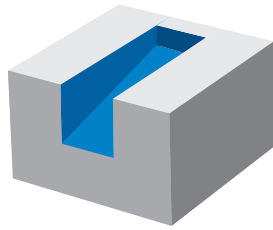




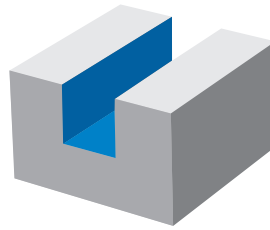
# MULTI PURPOSE



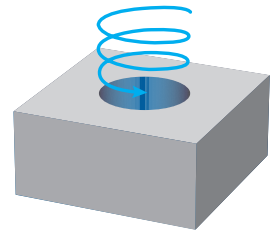
Side milling



Ramping



Slotting



Helical milling



## AE-VM Series

First choice in quality and performance

Carbide end mill with DUARISE coating

Wide variety in applications and work materials

4 flutes, variable helix and unequal spacing



C.708

Product map

## THE OSG ADVANTAGE

- Variable helix
- Unequal spacing
- Coating



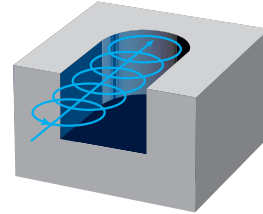
# SIDE MILLING / TROCHOIDAL MILLING



Side milling



Side milling



Trochoidal milling



## AE-VML

First choice in quality and performance

Carbide end mill with DUARISE coating

Also with chipbreaker



C.715



## WXL Series

Carbide end mill with WXL coating

For steels, stainless, copper

4 flutes, up to 4xD applications, square



C.758



## AE-H Series

First choice in quality and performance

Carbide end mill with DUOREY coating

For hardened materials up to 70 HRC

Multi flute, high speed machining



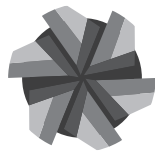
C.722

Product map



## THE OSG ADVANTAGE

- Flute geometry
- Suitable coatings



# MOLD AND DIE INDUSTRY



Copper



52 HRC



## AE-N Series

First choice in quality and performance

Carbide end mill with DLC coating

For non-ferrous materials

2-flute long neck ball type for high precision finishing

**72 sizes**

C.828



## WXL Series

Carbide end mill with WXL coating

For hardened steels up to **52 HRC**

2 flutes, long neck, square or ball nose (not shown)

**284 sizes**

C.760



Product map

## THE OSG ADVANTAGE

- Semi roughing - high feed productivity
- F=4000 mm/min





62 HRC



Graphite



## AE-H Series

First choice in quality and performance  
 Carbide end mill with DUOREY coating  
 For hardened materials up to 70 HRC  
 2 flutes, long neck type for high precision finishing

**261 sizes**

C.727



## DG Series

Carbide end mill with diamond coating  
 For **graphite** milling  
 2 flutes, ball nose, long neck for deep reach

C.804

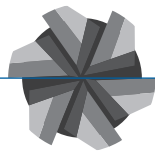


Product map

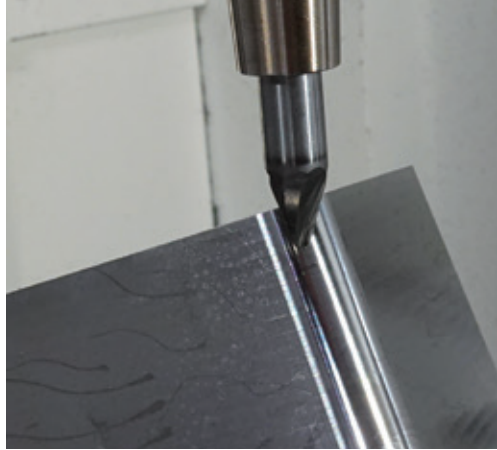


## THE OSG ADVANTAGE

- Flute geometry
- Suitable coatings



# HIGH EFFICIENCY FINISHING



WXL CARBIDE

## VU Series

Carbide end mill with WXL coating

For general steel and hardened material

High-efficiency multi-flute specification

C.782



Product map

## THE OSG ADVANTAGE

- Flute geometry
- Suitable coating



# COMPOSITE MATERIAL



CFRP



Honeycomb



## DIA Series

Carbide end mill with diamond coating

For CFRP milling

Multi flute, fine nick geometry  
(specification from shown example, DIA-HBC)

4 flutes, left-hand / right-hand flute to  
suppress delamination  
(specification from shown example, DIA-HBC)



C.806



## HBC60

Carbide end mill, bright finish

For honeycomb composite materials

2 flutes, left-hand / right-hand flute



C.810

Product map

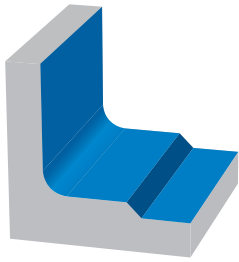


## THE OSG ADVANTAGE

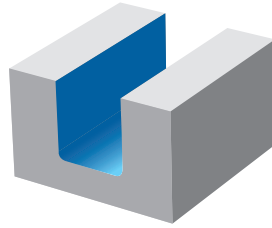
- No delamination
  - Surface finish
- DIA coating - sharp



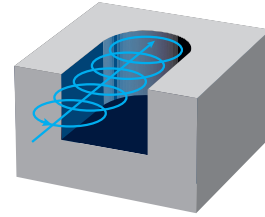
# TITANIUM



Side milling



Slotting



Trochoidal milling



## UVX-Ti Series

First choice in quality and performance

Carbide end mill with FX coating

For Titanium alloys

4 or 5 flutes, variable helix and unequal spacing, corner radius

C.811



## THE OSG ADVANTAGE

- Anti vibration
- Special flute geometry
- Extra long cutting edge



# ALUMINIUM



M.R.R. (metal removal rate)



## AE-N Series

First choice in quality and performance

Carbide end mill with DLC coating

For non-ferrous materials

3 flutes



C.821



## AERO Series

Carbide end mill with DLC coating

For ultra high volume milling of aluminium alloys

3 or 2 flutes, corner radius

Also long neck available



C.832

Product map



## THE OSG ADVANTAGE

- Aggressive flute design to achieve maximum MRR (metal removal rate)
- Optimised for AL milling

# SELECTION CHART

Milling | Selection chart | By application & material

Application	A-Brand	Product name	Page		Z	Range	P		H		M	K	N	S		GRAPHITE
							~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB				
<b>A</b>		AE-VMS	C.708		4	3 ~ 25	●	●	○		●	●	○	○		
<b>A</b>		AE-VMS RA NEW	C.710		4	3 ~ 6	●	●	○		●	●	○	○		
<b>A</b>		AE-VMSS	C.711		4	1 ~ 12	●	●	○		●	●	○	○		
<b>A</b>		AE-VMSS RA NEW	C.713		4	1 ~ 6	●	●	○		●	●	○	○		
		NEO-PHS	C.837		4	3 ~ 20	●	●	○		●	●	○	○		
		UP-PHS	C.790		4	3 ~ 12	●	●	○		●	●	○	○		
		UVX-Ti-4FL	C.811		4	12 ~ 25	●	●	○		●	●	○	○		
		UVX-Ti-4FL SAFE-LOCK®	C.812		4	12 ~ 25	●	●	○		●	●	○	○		
		UVX-Ti-5FL	C.813		5	12 ~ 25	●	●	○		●	●	○	○		
		UVX-Ti-5FL-HB	C.814		5	12 ~ 20	●	●	○		●	●	○	○		
		UVX-Ti-5FL SAFE-LOCK®	C.815		5	12 ~ 25	●	●	○		●	●	○	○		
		UVXL-Ti-5FL	C.816		5	12 ~ 25	●	●	○		●	●	○	○		
		UVXL-Ti-5FL SAFE-LOCK®	C.817		5	12 ~ 25	●	●	○		●	●	○	○		
<b>A</b>		AE-TS-N NEW	C.821		3	3 ~ 25							●	○		
<b>A</b>		AE-TS-N SP NEW	C.822		3	3 ~ 12							●	○		
<b>A</b>		AE-VTS-N NEW	C.825		3	3 ~ 12							●	○		
<b>A</b>		AE-VTS-N SP NEW	C.826		3	3 ~ 12							●	○		
		AERO-ETS	C.832		3	12 ~ 25							●	○		
		WX-G-ETSS	C.786		3	3 ~ 16	●	●	○		●	○	○	○		
		CA-ETS	C.843	-	3	3 ~ 20							●	○		
		EPN-AL-3FS	C.847	-	3	3 ~ 20							●	○		
		EPN-AL-3FL	C.848	-	3	3 ~ 20							●	○		
		EPA-AL-3FS	C.849		3	3 ~ 20							●	○		
		EPA-AL-3FL	C.850		3	3 ~ 20							●	○		
		HYP-HI-(W)EMS	C.880		4	4 ~ 20	●	●	○		●	●	○	○		
		HYP-HP-WRESF	C.877		4/5/6	6 ~ 25	●	●			○	○	○	○		
		EPL-HP-4FL	C.851		4	3-20	●	●			●	●	○	○		
		EPL-HP-5FL	C.853		5	6-20	●	●			●	●	○	○		
		EPL-HI-(W)EMS	C.858		4	4 ~ 20	●	●	○		●	●	○	○		
		EPL-ETS	C.854		3	4 ~ 16	●	●	○		●	●	○	○		
		EPL-WRESF	C.862		3/4	4 ~ 25	●	●			○	○	○	○		



Milling | Selection chart

By application & material



# SELECTION CHART

Milling | Selection chart | By application & material

Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE	
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB					
	<b>A</b>	AE-VMS	C.708	DUARISE	4	3 ~ 25	●	●	○		●	●	○			
		NEO-CR-PHS	C.838	FX	4	3 ~ 20	●	●	○		●	●	○			
		UVX-Ti-4FL	C.811	FX	4	12 ~ 25	●	●	○		●	●	○			
		UVX-Ti-4FL SAFE-LOCK®	C.812	FX	4	12 ~ 25	●	●	○		●	●	○			
		UVX-Ti-5FL	C.813	FX	5	12 ~ 25	●	●	○		●	●	○			
		UVX-Ti-5FL-HB	C.814	FX	5	12 ~ 20	●	●	○		●	●	○			
		UVX-Ti-5FL SAFE-LOCK®	C.815	FX	5	12 ~ 25	●	●	○		●	●	○			
		UVXL-Ti-5FL	C.816	FX	5	12 ~ 25	●	●	○		●	●	○			
		UVXL-Ti-5FL SAFE-LOCK®	C.817	FX	5	12 ~ 25	●	●	○		●	●	○			
		<b>A</b> AE-TS-N NEW	C.821	DLC	3	3 ~ 12							●			
		<b>A</b> AE-VTS-N NEW	C.825	DLC/GUSS	3	3 ~ 12							●			
		AERO-(O)-ETS	C.832	DLC	3	12 ~ 25							●			
		DLC-AIR-EDS	C.830	DLC	2	12 ~ 25							●			
		HYP-CR-HI-WEMS	C.878	FX	4	4 ~ 20	●	●	○		●	●	○	●		
		HYP-CR-HD-WEMS	C.879	FX	4	6 ~ 20	●	●	○		●	●	○	●		
	EPL-HI-CR-(W)EMS	C.860	FX	4	4 ~ 20	●	●	○		●	●	○	●			
	EPL-HP-4FL	C.851	WXL	4	3-20	●	●			●	●	○	●			
	EPL-HP-5FL	C.853	WXL	5	6-20	●	●			●	●	○	●			

Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE	
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB					
		WXL-1,5D-DE	C.748	WXL	2	0,1 ~ 12	●	●			●	●	○			
		WXL-2D-DE	C.750	WXL	2	0,1 ~ 30	●	●			●	●	○			
		WXL-3D-DE	C.754	WXL	2	0,1 ~ 20	●	●			●	●	○			
		WXL-4D-DE	C.756	WXL	2	0,2 ~ 12	●	●			●	●	○			
		WX-G-EDSS	C.785	WX	2	1 ~ 12	●	○	○		○	●	○	○		
		CA-RG-EDS	C.841	-	2	1 ~ 20							●			
		CA-RG-EDL	C.842	-	2	3 ~ 12							●			
		FX-MG-EDL	C.791	FX	2	6,5 ~ 11,5	●	○			○	●	○	○		
		HYP-F1	C.876	-	1	3 ~ 12							●			


Milling | Selection chart





By application & material

# SELECTION CHART

Milling | Selection chart | By application & material

Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE	
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB					
	<b>A</b>	AE-VML	C.715	DUARISE	4/5	6 ~ 20	●	●	○	○	●	●	○			
	<b>A</b>	AE-MS-H NEW	C.723	DUROREY	4/6	1 ~ 20	●	●	●	○	○	●	○			
	<b>A</b>	AE-MSS-H NEW	C.722	DUROREY	4/6	3 ~ 12	●	●	●	○	○	●	○			
	<b>A</b>	AE-ML-H NEW	C.724	DUROREY	4/6	3 ~ 12	●	●	●	○	○	●	○			
		WXL-EMS	C.758	WXL	4	1 ~ 30	●	●	○	○	●	●	○			
		WXS-EMS	C.735	WXS	4/6	1 ~ 20	●	●	●	○	○	●	○			
		NEO-EMS	C.839	FX	6	6 ~ 20	●	●			●	●	○	●		
		WX-G-EMSS	C.787	WX	4	3 ~ 12	●	○	○		○	●	○	○		
	<b>A</b>	AE-TL-N NEW	C.823	DLC	3	3 ~ 25							●			
	<b>A</b>	AE-TL-N SP NEW	C.824	DLC	3	3 ~ 12							●			
		AERO-ETL	C.835	DLC	3	12 ~ 20							●			
		FX-MG-EML	C.792	FX	4	3 ~ 11,5	●	○	○		○	●	○	○		
		FX-MG-EXML	C.793	FX	4	3 ~ 12	●	○	○		○	●	○	○		

Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB				
		WXL-CR-EDS-6	C.765	WXL	2	0,6 ~ 2,5	●	●	○	○	●	●	○		
		FX-CR-MG-EDS	C.795	FX	2	3 ~ 12	●	○	○		○	●	○		

Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE	
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB					
	<b>A</b>	AE-VML	C.715	DUARISE	4/5	6 ~ 20	●	●	○	○	●	●	○			
	<b>A</b>	AE-MS-H NEW	C.723	DUROREY	4/6	3 ~ 12	●	●	●	○	○	●	○			
		NEO-CR-EMS	C.840	FX	6	6 ~ 20	●	●	○		○	●	○			
		UVXL-Ti-5FL	C.816	FX	5	12 ~ 25	●	●	○		○	●	○			
		UVXL-Ti-5FL SAFE-LOCK®	C.817	FX	5	12 ~ 25	●	●	○		○	●	○			
		AERO-ETL	C.835	DLC	3	12 ~ 20							●			
		AERO-EXTL	C.836	DLC	3	20							●			
		CM-RMS	C.819	-	4/6	6 ~ 12							●			
		FX-CR-MG-EMS	C.796	FX	4	4 ~ 12	●	○	○		○	●	○	○		


Milling | Selection chart


By application & material





# SELECTION CHART

Milling | Selection chart | By application & material

Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB				
		WXS-(HS)-CRE	C.733	WXS	5/4	2 ~ 12	●	●	●	●	●	●	○		
		WX-(HS)-CRE	C.788	WX	4/3	2 ~ 13	●	●	●	○	●	●	○		
		HYP-(HS)-CRE	C.881	FX	4	6 ~ 12	●	●	●	○	●	●	○		
		HFC-Ti	C.818	-	6/8	16 ~ 25	●	●	●	○	●	●	●		
		CM-CRE	C.820	-	5/7	16 ~ 25					●	●	○		
		AM-CRE	C.719	DUROREY	6/8	6 ~ 20	○	●	●	●	●	●	●		
		AM-HFC	C.721	DUROREY	6	4 ~ 12	○	●	●	●	●	●	●		

Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB				
		PHX-LN-CRE	C.780	WXS	4	0,8 ~ 3	●	●	○	○	○	○	○		
		WXS-CPR	C.742	WXS	2/4	0,2 ~ 4	●	●	●	●	●	○	○		
		DG-CPR	C.805	DG	2/4	0,5 ~ 12					●	●	○		●
		EPL-CPR	C.867	FX	2	2 ~ 8	●	●	●	○	○	○	○		
		EPS-CPR	C.874	TIAIN	2/4	1 ~ 4	○	○	●	●	○	○	○		
		EPL-CPR-DIA	C.870	DIA	2	4 ~ 8					●	●	○		●

Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB				
		WXL-LN-EDS	C.760	WXL	2	0,1 ~ 12	●	●	○	○	○	○	○		
		WXL-LN-EMS-6	C.759	WXL	4	1 ~ 6	●	●	○	○	○	○	○		

Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB				
	<b>A</b>	AE-VMFE NEW	C.718	DUARISE	4/5	6 ~ 22	●	●	○	○	○	○	○		
	<b>A</b>	AE-VTFE-N NEW	C.827	DLC-IGUSS	3	6 ~ 22					●	●	○		
		AERO-LN-EDS	C.831	DLC	2	16 ~ 25					●	●	○		
		AERO-LN-ETS	C.833	DLC	3	16 ~ 25					●	●	○		
		FXS-(HS)-PKE	C.800	FX	4	3 ~ 12	●	●	○	○	●	●	○		
		CA-PKE	C.845	-	3	3 ~ 20					●	●	○		
		CA-MFE	C.846	-	3	10 ~ 22					●	●	○		


Milling | Selection chart



By application & material

# SELECTION CHART

Milling | Selection chart | By application & material

Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB				
	<b>A</b>	AE-BD-H NEW	C.726	DUROREY	2	R0,5 ~ R6	●	●	●	●	○	○	○		
	<b>A</b>	AE-BM-H NEW	C.725	DUROREY	4	R1 ~ R6	●	●	●	●	○	○	○		
		WXL-EBD	C.767	WXL	2	R0,05 ~ R10	●	●	○		●	●	○		
		WXL-HS-EBD	C.766	WXL	2	R0,1 ~ R6	●	●	○		●	●	○		
		AM-EBT	C.720	DUROREY	3	R1 ~ R10	●	●	○	○	○		○		
		CAP-EBD	C.844	-	2	R0,5 ~ R10							●		
		DG-EBD	C.803	DG	2	R2 ~ R6						●			●
		FX-SS-EBD	C.794	FX	2	R3 ~ R6	●	●	○		●	●	○		
		FXS-EBT	C.798	FX	3	R3 ~ R10	●	●	●	○					
		FXS-HS-EBM	C.799	FX	4	R3 ~ R10	●	●	●	●					
		FXS-EQD	C.797	FX	2	R0,5 ~ R5	●	●	○		●	●		○	
		CBN-SXB	C.802	CBN	2	R0,5 ~ R1,5	○	●	●	●					
		HYP-SB-EBD	C.882	FX	2	R1,5 ~ R6	●	○	○		●	●	○		
		EPL-SB-EBD	C.855	FX	2	R0,5 ~ R10	●	○	○		○	●	○	○	
		EPL-SB-LN-EBD	C.856	FX	2	R0,5 ~ R10	●	○	○		○	●	○	○	
		EPL-SB-EBM	C.857	FX	4	R2 ~ R6	●	○	○		○	●	○	○	


Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB				
	<b>A</b>	AE-LNBD-H NEW	C.727	DUROREY	2	R0,05 ~ R3	●	●	●	○	○		○		
		WXS-LN-EBD	C.737	WXS	2	R0,05 ~ R3	○	●	●	○	○	○	○		
		WXL-LN-EBD	C.769	WXL	2	R0,05 ~ R3	●	●	○		●	●	○		
		WXL-PC-EBD	C.776	WXL	2	R0,2 ~ R6	●	●	○		●	●	○		
		PHX-LN-DBT	C.781	WXS	3	R0,3 ~ R3	●	●	○		○	○	○		
	<b>A</b>	AE-LNBD-N NEW	C.828	DLC-IUSS	2	R0,05 ~ R3							●		
		DG-LN-EBD	C.804	DG	2	R0,2 ~ R2						●			●
		EPL-LN-EBD	C.863	TiAlN	2	R0,15 ~ R3	●	○	○		●	●	○	○	
		EPL-PC-EBD	C.865	TiAlN	2	R0,5 ~ R4	●	○	○		●	●	○	○	
		EPS-LN-EBD	C.871	TiAlN	2	R0,1 ~ R3	●	○	○		●	●	○	○	
		EPL-PC-EBD-DIA	C.866	DIA	2	R0,5 ~ R4									●

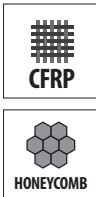
Milling | Selection chart

By application & material

# SELECTION CHART

Milling | Selection chart | By application & material

Application	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	GRAPHITE
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB				
		WX-G-ETSS	C.786	WX	3	3 ~ 16	●	●			●		●		
		HYP-ZDS	C.875	FX	2	4 ~ 10	●	○			●	●	○		

Material	A-Brand	Product name	Page	Z	Range	P		H		M	K	N	S	CFRP	HONEYCOMB
						~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350 HB				
		DIA-BNC	C.806	DIA	8/10/12/14	6 ~ 12								●	
		DIA-HBC	C.807	DIA	4	6 ~ 12								●	
		DIA-MFC	C.808	DIA	8/10/12	6 ~ 10								●	
		DIA-REC	C.809	DIA	4/6	6 ~ 10								●	
		HBC60	C.810	-	-	2	6 ~ 12								●



# SELECTION CHART

Milling | Selection chart | By application & material

## Face milling cutters

Milling | Indexables



Product name	Page	Tool specification	Features
PFAL BORE	C.910	-	Finishing cutter for aluminium with PCD blades
PAS BORE	C.911		45° face milling with double side 8 corner inserts
PAO BORE	C.912		45° face milling with double side 16 corner inserts

## Shoulder cutters

Milling | Indexables






Product name	Page	Tool specification	Features
PSTW SS NEW	C.913		90° shoulder milling with double side 6 corner inserts
PSTW BORE	C.914		90° shoulder milling with double side 6 corner inserts
PSE WS/PSE SS	C.915		90° shoulder milling with 2 corner insert with bottom notch
PSE BORE	C.916		90° shoulder milling with 2 corner insert with bottom notch
PSE SCREW FIT	C.917		90° shoulder milling with 2 corner insert with bottom notch
PSEL SS	C.918		90° shoulder milling with long length of cut
PSEL BORE	C.919		90° shoulder milling with long length of cut
PSF SS	C.920	-	Shoulder milling with 4 corner inserts
PSF BORE	C.921	-	Shoulder milling with 4 corner inserts

Milling | Selection chart

By application & material

# SELECTION CHART

Milling | Selection chart | By application & material

Application	Z	Range	P	M	K	N	S	H
	5 - 20	50 - 160 mm				●		
	4 - 8	50 - 125 mm	●	●	●	●	○	○
	5 - 25	50 - 200 mm	●	●	●	●	●	○

Application	Z	Range	P	M	K	N	S	H
	2 - 5	25 - 40 mm						
	3 - 9	40 - 125 mm	●	●	●		●	○
	2 - 5	16 - 63 mm	●	●	●	●	●	●
	4 - 10	40 - 100 mm	●	●	●	●	●	●
	2 - 6	16 - 40 mm	●	●	●	●	●	●
	2 - 4	25 - 50 mm	●	●	●	●	●	●
	3 - 4	50 - 80 mm	●	●	●	●	●	●
	3 - 5	25 - 40 mm	●	●	●	●	●	○
	6 - 9	50 - 80 mm	●	●	●	●	●	○

Milling | Selection chart

By application & material







# SELECTION CHART

Milling | Selection chart | By application & material

## Shoulder cutters

Milling | Indexables











Product name	Page	Tool specification	Features
PSFL SS	C.922	 90°	90° shoulder milling with long length of cut
PSFL BORE	C.923	 90°	90° shoulder milling with long length of cut
PMD SS NEW	C.924	 90°	Multi function cutter, milling and drilling
PMD SF NEW	C.925	 90°	Multi function cutter, milling and drilling

## Radius Cutter

Milling | Indexables



Product name	Page	Tool specification	Features
PHC SS	C.926	 HIGH FEED	High feed cutter for long over hang 4xD ~
PHC BORE	C.927	 HIGH FEED	High feed cutter
PHC SCREW FIT	C.928	 HIGH FEED	High feed cutter
PRC SS	C.929	 Radius cutter with round inserts ~ 4xD	Radius cutter with round inserts ~ 4xD
PRC BORE	C.930	 Radius cutter with round inserts	Radius cutter with round inserts
PRC SCREW FIT	C.931	 Radius cutter with round inserts	Radius cutter with round inserts
PDR SS	C.932	 HIGH FEED CORNER RADIUS	Corner radius cutter for deep depth of cut
PDR BORE	C.933	 HIGH FEED CORNER RADIUS	Corner radius cutter for deep depth of cut

Milling | Selection chart

By application & material

# SELECTION CHART

Milling | Selection chart | By application & material

Application	Z	Range	P	M	K	N	S	H
	10 - 18	32 - 40 mm	●	●	●	●	●	○
	28 - 72	50 - 100 mm	●	●	●	●	●	○
	2	20 - 32 mm	●	●	●	●	●	○
	2	20 - 32 mm	●	●	●	●	●	○

Application	Z	Range	P	M	K	N	S	H
	2 - 5	16 - 40 mm	●	●	●	●	●	○
	4 - 8	40 - 100 mm	●	●	●	●	●	○
	2 - 5	16 - 40 mm	●	●	●	●	●	○
	2 - 4	20 - 63 mm	●	●	●	●	●	●
	4 - 10	50 - 100 mm	●	●	●	●	●	●
	2 - 4	20 - 40 mm	●	●	●	●	●	●
	2 - 3	40 - 50 mm	●	●	●	●	●	●
	3 - 6	63 - 125 mm	●	●	●	●	●	●

Milling | Selection chart

By application & material











# SELECTION CHART

Milling | Selection chart | By application & material


## Profile finishing

Milling | Indexables

	Product name	Page	Tool specification	Features
	PFB	C.934		Finishing ball nose cutter
	PFB SCREW FIT	C.935		Finishing ball nose cutter
	PFR	C.936		Finishing corner radius cutter
	PFR SCREW FIT	C.937		Finishing corner radius cutter

## Exchangeable Milling Head

Milling | Indexables

	Product name	Page	Tool specification	Features
	PXNL	C.958		Low variable helix with roughing shape ~45HRC ~5xD
	PXNL OH	C.959		Variable helix solid carbide head with coolant hole ~45HRC ~5xD
	PXNH	C.958		High variable helix with roughing shape ~45HRC ~5xD
	PXNH OH	C.960		Variable helix solid carbide head with coolant hole ~45HRC ~5xD
	PXVC	C.961		High variable helix for L/D up to 7xD ~55HRC 4xD - 7xD
	PXSE	C.962		Variable helix for L/D up to 5xD ~55HRC ~5xD
	PXSE OH	C.963		Variable helix solid carbide head with coolant hole ~55HRC ~5xD
	PXSM	C.964		Multi flute variable helix for L/D up to 5xD ~55HRC ~5xD



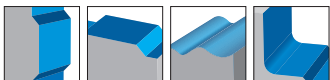
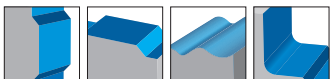
Milling | Selection chart








By application & material



# SELECTION CHART

Milling | Selection chart | By application & material

Application	Z	Range	P	M	K	N	S	H
	2	6 - 32 mm	●	●	●	●	●	●
	2	10 - 30 mm	●	●	●	●	●	●
	2	6 - 32 mm	●	●	●	●	●	●
	2	10 - 32 mm	●	●	●	●	●	●

Application	Z	Range	P	M	K	N	S	H
	4	10 - 25 mm	●	●	●	○	○	○
	4	12 - 25 mm	●	●	●	○	○	○
	4	12 - 25 mm	●	●	●	○	○	○
	4	12 - 25 mm	●	●	●	○	○	○
	4	10 - 32 mm	●	●	●	○	○	○
	4	10 - 25 mm	●	●	●	○	○	○
	4	12 - 25 mm	●	●	●	○	○	○
	6 - 10	10 - 25 mm	●	●	●	○	○	○

Milling | Selection chart



By application & material

# SELECTION CHART

Milling | Selection chart | By application & material

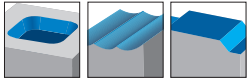


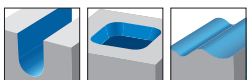
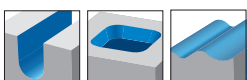
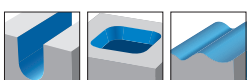

## Exchangeable Milling Head

Milling | Indexables

	Product name	Page	Tool specification	Features
	PXRE	C.965		Corner radius with straight flute for L/D up to 5xD ~60HRC ~5xD
	PXDR-P	C.965		Corner radius with high helix flute for L/D up to 7xD ~52HRC ~7xD
	PXDR-N	C.965		Corner radius with high helix flute for L/D up to 7xD ~60HRC 4xD / 7xD
	PXBE	C.966		Multi flute variable helix solid carbide head for L/D up to 5xD ~60HRC ~5xD
	PXBE OH	C.967		Multi flute variable helix solid carbide head with coolant holes for L/D up to 5xD ~60HRC ~5xD
	PXBM	C.966		Multi flute ball nose for L/D up to 5xD ~60HRC ~5xD
	PXAL NEW	C.968		3 flutes variable helix for aluminium and copper alloys
	PXHF-AM NEW	C.969		Multi flute for high feed additive manufacturing milling ~70HRC

# SELECTION CHART

Milling | Selection chart | By application & material

Application	Z	Range	P	M	K	N	S	H
	2-3	10 - 20 mm	●		●			●
	3	10 - 20 mm	●	●	●			○
	3	10 - 20 mm	●	●	●			●
	3	10 - 20 mm	●	●	●		○	○
	3	12 - 20 mm	●	●	●		○	●
	4-6	10 - 20 mm	●	●	●		○	●
	3	10 - 25 mm				●		
	6	12 - 20 mm						●

Milling | Selection chart



By application & material

# INDEX

## Milling

### CFRP

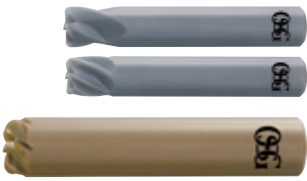
Milling | Carbide end mills



Product name	A-brand	Features	Range	Page
DIA-BNC	DIA	For CFRP milling Multi flute, fine nick geometry	6 - 12	C.806
DIA-HBC	DIA	For CFRP milling 4 flutes, left-hand / right-hand flute to suppress delamination	6 - 12	C.807
DIA-MFC	DIA	For CFRP milling Multi flute, for excellent surface finishing	6 - 10	C.808
DIA-REC	DIA	For CFRP milling Multi flute, roughing and semi finishing	6 - 10	C.809
HBC60	-	For honeycomb composite materials 2 flutes, left-hand / right-hand flute	6 - 12	C.810

### Ceramic end mills

Milling | Ceramic end mills



Product name	A-brand	Features	Range	Page
CM-RMS	CERAMIC	Ceramic end mill, peripheral cutting edge type 4 or 6 flutes	6 - 12	C.819
CM-CRE	CERAMIC	Ceramic end mill, end cutting edge type 5-7 flutes	16 - 25	C.820

### Variant Radius end mills

Milling | Carbide end mills



Product name	A-brand	Features	Range	Page
VU-TBR NEW	WXL	Ball end mill for finishing, Taper barrel solid type	R150 - R500	C.782
VU-EGG NEW	WXL	Ball end mill for finishing, Oval shape type	R50	C.783
VU-EGG-H NEW	DUROREY	Ball end mill for finishing, Oval shape type	R50	C.784
PFB-BR NEW		Ball end mill for finishing, Barrel type	R15 - R48	C.952
PFB-LZ NEW		Ball end mill for finishing, Lens type	R15 - R48	C.953










# INDEX

## Milling

### Super radius end mills

Milling | Carbide end mills










Product name		A-brand	Features	Range	Page
WXS-HS-CRE			For hardened steels up to 65 HRC and stainless steels 5 flutes, shorter overall length, super radius	6 - 12	C.733
WXS-CRE			For hardened steels up to 65 HRC and stainless steels Multi flute with super radius	2 - 12	C.734
WX-HS-CRE			For general applications 4 flutes, shorter overall length, super radius	6 - 12	C.788
WX-CRE			For general applications Multi flute, super radius	2 - 13	C.789
HYP-HS-CRE			For hard materials and cast iron 4 flutes, super radius	6 - 12	C.881
HFC-TI	-		For high feed Titanium alloy milling Multi flute	16 - 25	C.818
AM-HFC NEW		DUROREY	For high feed additive manufacturing milling Multi flute	4 - 12	C.721

### Corner radius long neck

Milling | Carbide end mills



Product name		A-brand	Features	Range	Page
PHX-LN-CRE			For steels up to 60 HRC 4 flutes, long neck, corner radius	0,8 - 3	C.780
WXS-CPR			For hardened steels up to 65 HRC and stainless steels 2 flutes, long and pencil neck, corner radius, for mould and die 164 sizes	0,2 - 4	C.742
DG-CPR			For graphite milling Multi flute, long neck for deep reach, corner radius	0,5 - 12	C.805
EPL-CPR			For general applications 2 flutes, long neck, corner radius	2 - 8	C.867
EPL-CPR-DIA			For steels and stainless steels 2 flutes, long neck, corner radius	4 - 8	C.870
EPS-CPR			For hardened steels up to 65 HRC 2 flutes, long and pencil neck, corner radius	1 - 4	C.874



# INDEX

## Milling

### Corner radius end mills

Milling | Carbide end mills



Product name	A-brand	Features	Range	Page
AE-VMS	DUARISE <b>A</b>	Wide variety in applications and work materials 4 flutes, variable helix and unequal spacing	3 - 25	C.708
AE-VML	DUARISE <b>A</b>	Wide variety in applications and work materials 4 flutes, variable helix and unequal spacing For side milling up to 4xD	6 - 20	C.715
AE-VMFE NEW	DUARISE <b>A</b>	Wide variety in applications and work materials 4 flutes, variable helix and unequal spacing Radius at both ends of cutting edge, deep wall milling	6 - 22	C.718
NEO-CR-PHS	FX	For exotic materials 4 flutes, variable helix and unequal spacing, corner radius	3 - 20	C.838
NEO-CR-EMS	FX	For exotic materials 6 flutes, variable helix and unequal spacing, corner radius	6 - 20	C.840
AE-MS-H NEW	DUROREY <b>A</b>	For hardened steels up to 65 HRC and stainless steels 4-6 flutes, corner radius	3 - 12	C.723
WXL-CR-EDS-6	WXL	For general applications 2 flutes, corner radius Shank diameter 6	0,6 - 2,5	C.765
AM-CRE	DUROREY	For additive manufacturing. 6-8 flutes	6 - 20	C.719
UVX-TI-4FL	FX	For steels and Titanium alloys 4 flutes, variable helix and unequal spacing, corner radius	12 - 25	C.811
UVX-TI-4FL SAFE-LOCK®	FX	For steels and Titanium alloys 4 flutes, variable helix and unequal spacing, corner radius SafeLock shank	12 - 25	C.812
UVX-TI-5FL	FX	For steels and Titanium alloys 5 flutes, variable helix and unequal spacing, corner radius	12 - 25	C.813
UVX-TI-5FL-HB	FX	For steels and Titanium alloys 5 flutes, variable helix and unequal spacing, corner radius Weldon shank	12 - 20	C.814
UVX-TI-5FL SAFE-LOCK®	FX	For steels and Titanium alloys 5 flutes, variable helix and unequal spacing, corner radius SafeLock shank	12 - 25	C.815
UVXL-TI-5FL	FX	For steels and Titanium alloys 5 flutes, long length of cut, variable helix and unequal spacing, corner radius	12 - 25	C.816
UVXL-TI-5FL SAFE-LOCK®	FX	For steels and Titanium alloys 5 flutes, long length of cut, variable helix and unequal spacing, corner radius SafeLock shank	12 - 25	C.817
AE-TS-N NEW	DLC <b>A</b>	For non-ferrous materials 3 flutes, 1,5xD flute length (Neck length 3xD)	3 - 12	C.821
AE-VTS-N NEW	DLC-IGUSS <b>A</b>	For non-ferrous materials 3 flutes, 1,5xD flute length (Neck length 3xD), high performance	3 - 12	C.825
AE-VTFE-N NEW	DLC-IGUSS <b>A</b>	For aluminium and copper alloys 3 flutes, variable helix and unequal spacing Long shank for deep reach	6 - 22	C.827

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## Milling

### Corner radius end mills

Milling | Carbide end mills

	Product name	A-brand	Features	Range	Page
	AERO-O-ETS	DLC	For ultra high volume milling of aluminium alloys 3 flutes, short length of cut, corner radius	20 - 25	C.834
	AERO-ETS	DLC	For ultra high volume milling of aluminium alloys 3 flutes, short length of cut, corner radius	12 - 25	C.832
	AERO-LN-ETS	DLC	For ultra high volume milling of aluminium alloys 3 flutes, long neck, corner radius	16 - 25	C.833
	AERO-ETL	DLC	For ultra high volume milling of aluminium alloys 3 flutes, long length of cut, corner radius	12 - 20	C.835
	AERO-EXTL	DLC	For ultra high volume milling of aluminium alloys 3 flutes, extra long length of cut, corner radius	20	C.836
	AERO-LN-EDS	DLC	For ultra high volume milling of aluminium alloys 2 flutes, long neck, corner radius	16 - 25	C.831
	DLC-AIR-EDS	DLC	For high volume milling of aluminium alloys 2 flutes, short length of cut, corner radius	12 - 25	C.830
	EPL-HP-4FL	WXL	For general applications and exotic materials 4 flutes, variable helix and unequal spacing, corner radius Weldon shank	3 - 20	C.851
	EPL-HP-5FL	WXL	For general applications and exotic materials 5 flutes, variable helix and unequal spacing, corner radius Weldon shank	6 - 20	C.853
	FX-CR-MG-EDS	FX	For general applications and cast iron 2 flutes, short length of cut, corner radius	3 - 12	C.795
	FX-CR-MG-EMS	FX	For general applications and cast iron 4 flutes, short length of cut, corner radius	4 - 12	C.796
	FXS-HS-PKE	FX	For general applications 4 flutes, shorter overall length, corner radius, pocketing	6 - 12	C.800
	FXS-PKE	FX	For general applications 4 flutes, corner radius, for pocketing	20	C.801
	CA-PKE	-	For aluminium and copper alloys 3 flutes, for pocket applications, corner radius	3 - 20	C.845
	CA-MFE	-	For aluminium and copper alloys 3 flutes, radius at both ends of cutting edge, deep wall milling	10 - 22	C.846
	EPN-AL-3FS	-	For aluminium and copper alloys 3 flutes, short length of cut	3 - 20	C.847
	EPN-AL-3FL	-	For aluminium and copper alloys 3 flutes, long length of cut	3 - 20	C.848
	EPA-AL-3FS	ALC	For aluminium and copper alloys 3 flutes, with ALC coating, short length of cut	3 - 20	C.849
	EPA-AL-3FL	ALC	For aluminium and copper alloys 3 flutes, with ALC coating, long length of cut	3 - 20	C.850



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## Milling

### Corner radius end mills

Milling | Carbide end mills



Product name		A-brand	Features	Range	Page
HYP-CR-HI-WEMS	FX		For general applications 4 flutes, variable helix and unequal spacing, corner radius Weldon shank	4 - 20	C.878
HYP-CR-HD-WEMS	FX		For general applications 4 flutes, variable helix and unequal spacing, corner radius Weldon shank	6 - 20	C.879
EPL-HI-CR-WEMS	FX		For general applications 4 flutes, variable helix and unequal spacing, corner radius Weldon shank	4 - 20	C.861
EPL-HI-CR-EMS	FX		For general applications 4 flutes, variable helix and unequal spacing, corner radius	4 - 16	C.860

### Ball nose end mills

Milling | Carbide end mills



Product name		A-brand	Features	Range	Page
AE-BD-H NEW	DUROREY	A	For high hardness steels 2-flute ball type for high precision finishing	R0,5 - R6	C.726
AE-BM-H NEW	DUROREY	A	For high hardness steels 4-flute ball type for high efficiency processing	R1 - R6	C.725
WXS-HS-EBD	WXS		For hardened steels up to 65 HRC and stainless steels 2 flutes, shorter overall length, ball nose	R0,5 - R6	C.736
WXL-EBD	WXL		For high speed milling in steels, stainless and cast iron 2 flutes, ball nose	R0,05 - R10	C.767
WXL-HS-EBD	WXL		For high speed milling in steels, stainless and cast iron 2 flutes, shorter overall length, ball nose	R0,1 - R6	C.766
CAP-EBD	-		For aluminium, copper alloys and plastic 2 flutes, ball nose	R0,5 - R10	C.844
DG-EBD	DG		For graphite milling 2 flutes, ball nose	R2 - R6	C.803
FX-SS-EBD	FX		For general applications 2 flutes, ball nose, reduced shank diameter	R3 - R6	C.794
FXS-EBT	FX		For high speed milling in hardened steels 3 flutes, ball nose	R3 - R10	C.798
FXS-HS-EBM	FX		For high speed milling in hardened steels 4 flutes, ball nose, shorter overall length	R3 - R10	C.799
FXS-EQD	FX		For general applications 2 flutes, 220 degree ball nose	R0,5 - R5	C.797
AM-EBT	DUROREY		For additive manufacturing 3 flutes	R1 - R10	C.720
CBN-SXB	-		For hard materials up to 68 HRC 2 flutes, ball nose	R0,5 - R1,5	C.802



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## Milling

### Ball nose end mills

Milling | Carbide end mills



Product name	A-brand	Features	Range	Page
HYP-SB-EBD	TiAIN	For general applications 2 flutes, ball nose	R1,5 - R6	C.882
EPL-SB-EBD	TiAIN	For general applications 2 flutes, ball nose	R0,5 - R10	C.855
EPL-SB-LN-EBD	TiAIN	For general applications 2 flutes, long neck, ball nose	R0,5 - R10	C.856
EPL-SB-EBM	TiAIN	For general applications 4 flutes, ball nose	R2 - R6	C.857

### Ball nose end mills long neck

Milling | Carbide end mills



Product name	A-brand	Features	Range	Page
AE-LNBD-H NEW	DUROREY <b>A</b>	For hardened steels up to 65 HRC and stainless steels 2 flutes, long neck, ball nose	R0,05 - R3	C.727
WXS-LN-EBD	WXS	For hardened steels up to 65 HRC and stainless steels 2 flutes, long neck, ball nose	R0,05 - R3	C.737
WXL-LN-EBD	WXL	For hardened steels up to 52 HRC and stainless steels 2 flutes, long neck, ball nose	R0,05 - R3	C.769
WXL-PC-EBD	WXL	For hardened steels up to 52 HRC 2 flutes, ball nose, pencil neck	R0,2 - R6	C.776
PHX-LN-DBT	WXS	For steels up to 60 HRC 3 flutes, long neck, ball nose	R0,3 - R3	C.781
AE-LNBD-N NEW	DLC-KGUS <b>A</b>	For aluminium and copper alloys 2 flutes, long neck, ball nose	R0,05 - R3	C.828
DG-LN-EBD	DG	For graphite milling 2 flutes, ball nose, long neck for deep reach	R0,2 - R2	C.804
EPL-LN-EBD	TiAIN	For general applications 2 flutes, long neck, ball nose	R0,15 - R3	C.863
EPS-LN-EBD	TiAIN	For hardened steels up to 65 HRC 2 flutes, long neck, ball nose	R0,1 - R3	C.871
EPL-PC-EBD	TiAIN	For general applications 2 flutes, pencil neck, ball nose	R0,5 - R4	C.865
EPL-PC-EBD-DIA	DIA	For steels and stainless steels 2 flutes, pencil neck, ball nose	R0,5 - R4	C.866



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## Milling

### Square end mills

Milling | Carbide end mills



Product name	A-brand	Features	Range	Page
WXL-1.5D-DE	WXL	For steels, stainless, copper 2 flutes, 1.5xD applications, square	0,1 - 12	C.748
WXL-2D-DE	WXL	For steels, stainless, copper 2 flutes, 2xD applications, square	0,1 - 30	C.750
WXL-3D-DE	WXL	For steels, stainless, copper 2 flutes, 3xD applications, square	0,1 - 20	C.754
WXL-4D-DE	WXL	For steels, stainless, copper 2 flutes, 4xD applications, square	0,2 - 12	C.756
WX-G-EDSS	WX	For general applications 2 flutes, extra short length of cut	1 - 12	C.785
FX-MG-EDL	FX	For general applications and cast iron 2 flutes, long length of cut	6,5 - 11,5	C.791
CA-RG-EDS	-	For aluminium and copper alloys 2 flutes, short length of cut	1 - 20	C.841
CA-RG-EDL	-	For aluminium and copper alloys 2 flutes, long length of cut	3 - 12	C.842
HYP-F1	-	For aluminium milling 1 flute	3 - 12	C.876

### Square end mills multi flute

Milling | Carbide end mills



Product name	A-brand	Features	Range	Page
AE-VMS	DUARISE <b>A</b>	Wide variety in applications and work materials 4 flutes, anti-vibration carbide end mill	3 - 25	C.708
AE-VMS RA NEW	DUARISE <b>A</b>	Wide variety in applications and work materials 4 flutes, anti-vibration carbide end mill With right corner for milling straight corners	3-6	C.710
AE-VMSS	DUARISE <b>A</b>	Wide variety in applications and work materials 4 flutes, anti-vibration stub carbide end mill	1 - 12	C.711
AE-VMSS RA NEW	DUARISE <b>A</b>	Wide variety in applications and work materials 4 flutes, anti-vibration stub carbide end mill With right corner for milling straight corners	1-6	C.713
AE-VML	DUARISE <b>A</b>	Wide variety in applications and work materials 4 flutes, anti-vibration long carbide end mill	6 - 20	C.715
AE-VMFE NEW	DUARISE <b>A</b>	Wide variety in applications and work materials 4 flutes, anti-vibration carbide end mill Long shank for deep reach	6 - 22	C.718
AE-MS-H NEW	DUROREY <b>A</b>	For hardened steels up to 65 HRC and stainless steels 4-6 flutes, anti-vibration carbide end mill	1 - 20	C.723

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## Milling

### Square end mills multi flute

Milling | Carbide end mills

	Product name		A-brand	Features	Range	Page
	AE-MSS-H NEW		<b>A</b>	For hardened steels up to 65HRC and stainless steels 4-6 flutes anti-vibration stub carbide endmills	3 - 12	C.722
	AE-ML-H NEW		<b>A</b>	For hardened steels up to 65HRC and stainless steels 4-6 flutes anti-vibration long carbide endmills	3 - 12	C.724
	WXS-EMS			For hardened steels and stainless steels Multi flute, high speed machining	1 - 20	C.735
	WXL-EMS			For high speed milling in steels, stainless and cast iron 4 flutes, square	1 - 30	C.758
	NEO-EMS			For exotic materials 6 flutes, variable helix and unequal spacing	6 - 20	C.839
	NEO-PHS			For exotic materials 4 flutes, variable helix and unequal spacing	3 - 20	C.837
	UP-PHS			For steels, stainless, Titanium alloys 4 flutes, anti-vibration	3 - 12	C.790
	UVX-TI-4FL			For steels and Titanium alloys 4 flutes, variable helix and unequal spacing, corner radius	12 - 25	C.811
	UVX-TI-4FL SAFE-LOCK			For steels and Titanium alloys 4 flutes, variable helix and unequal spacing, corner radius SafeLock shank	12 - 25	C.812
	UVX-TI-5FL			For steels and Titanium alloys 5 flutes, variable helix and unequal spacing, corner radius	12 - 25	C.813
	UVX-TI-5FL-HB			For steels and Titanium alloys 5 flutes, variable helix and unequal spacing, corner radius Weldon shank	12 - 20	C.814
	UVX-TI-5FL SAFE-LOCK			For steels and Titanium alloys 5 flutes, variable helix and unequal spacing, corner radius SafeLock shank	12 - 25	C.815
	UVXL-TI-5FL			For steels and Titanium alloys 5 flutes, long length of cut, variable helix and unequal spacing, corner radius	12 - 25	C.816
	UVXL-TI-5FL SAFE-LOCK			For steels and Titanium alloys 5 flutes, long length of cut, variable helix and unequal spacing, corner radius SafeLock shank	12 - 25	C.817
	WX-G-ETSS			For general applications 3 flutes, extra short length of cut	3 - 16	C.786
	WX-G-EMSS			For general applications 4 flutes, extra short length of cut	3 - 12	C.787
	AE-TS-N NEW		<b>A</b>	For aluminium and copper alloys 3 flutes, up to 3xD	3 - 25	C.821
	AE-TS-N SP NEW		<b>A</b>	For aluminium and copper alloys 3 flutes, up to 3xD With sharp corner edge for straight corner finishing	3 - 12	C.822
	AE-TL-N NEW		<b>A</b>	For aluminium and copper alloys 3 flutes, up to 5D	3 - 25	C.823



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## Milling

### Square end mills multi flute

Milling | Carbide end mills



Product name		A-brand	Features	Range	Page
AE-TL-N SP NEW	DLC	A	For aluminium and copper alloys 3 flutes, up to 5D With sharp corner edge for straight corner finishing	3 - 12	C.824
AE-VTS-N NEW	DLC-IGUSS	A	For aluminium and copper alloys 3 flutes, variable helix and unequal spacing Up to 3xD	3 - 12	C.825
AE-VTS-N SP NEW	DLC-IGUSS	A	For aluminium and copper alloys 3 flutes, variable helix and unequal spacing up to 3xD With sharp corner edge for straight corner finishing	3 - 12	C.826
AE-VTFE-N NEW	DLC-IGUSS	A	For aluminium and copper alloys 3 flutes, variable helix and unequal spacing Long shank for deep reach	6 - 22	C.827
AERO-ETS	DLC		For ultra high volume milling of aluminium alloys 3 flutes, short length of cut, corner radius	12 - 25	C.832
AERO-ETL	DLC		For ultra high volume milling of aluminium alloys 3 flutes, long length of cut, corner radius	12 - 20	C.835
CA-ETS	-		For aluminium and copper alloys 3 flutes, short length of cut	3 - 20	C.843
EPL-HP-4FL	WXL		For general applications and exotic materials 4 flutes, variable helix and unequal spacing, corner radius Weldon shank	3 - 20	C.851
EPL-HP-5FL	WXL		For general applications and exotic materials 5 flutes, variable helix and unequal spacing, corner radius Weldon shank	6 - 20	C.853
FX-MG-EML	FX		For general applications 4 flutes, long length of cut	3 - 11,5	C.792
FX-MG-EXML	FX		For general applications 4 flutes, extra long length of cut	3 - 12	C.793
HYP-HI-(W)EMS	FX		For general applications 4 flutes, variable helix and unequal spacing Also with Weldon shank	4 - 20	C.880
EPL-ETS	FX		For general applications 3 flutes, square	4 - 16	C.854
EPL-HI-WEMS	FX		For general applications 4 flutes, variable helix and unequal spacing Weldon shank	4 - 20	C.859
EPL-HI-EMS	FX		For general applications 4 flutes, variable helix and unequal spacing	4 - 20	C.858



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## Milling

### Square end mills long neck

Milling | Carbide end mills



Product name		A-brand	Features	Range	Page
WXL-LN-EDS	WXL		For hardened steels up to 52 HRC 2 flutes, long neck, square	0,1 - 12	C.760
WXL-LN-EMS-6	WXL		For hardened steels up to 52 HRC 4 flutes, long neck Shank diameter 6	1 - 6	C.759

### Roughing

Milling | Carbide end mills



Product name		A-brand	Features	Range	Page
HYP-HP-WRESF	TIAN		For general applications Multi flute, for roughing Weldon shank	6 - 25	C.877
EPL-WRESF	TIAN		For general applications 4 flutes, roughing Weldon shank	4 - 25	C.862

### Plunging

Milling | Carbide end mills



Product name		A-brand	Features	Range	Page
WX-G-ETSS	WX		For general applications 3 flutes, extra short length of cut	3 - 16	C.786
HYP-ZDS	FX		For general applications For counterboring	4 - 10	C.875

### Slotting

Milling | HSS/PM end mills



Product name		A-brand	Features	Range	Page
V-XPM-WEDS	V		Powder metal end mill with V coating 2 flutes square, short length of cut Weldon shank	2 - 30	C.883
V-XPM-WEDL	V		Powder metal end mill with V coating 2 flutes square, short length of cut Weldon shank	3 - 30	C.886
V-WEDS	V		HSS-Co end mill with V coating 2 flutes square, short length of cut Weldon shank	1 - 40	C.884
V-WEDL	V		HSS-Co end mill with V coating 2 flutes square, short length of cut Weldon shank	1,5 - 30	C.887













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## Milling

### Multi fluted end mills

Milling | HSS/PM end mills











Product name		A-brand	Features	Range	Page
V-XPM-WETS			Powder metal end mill with V coating 3 flutes square, short length of cut Weldon shank	3 - 30	C.888
V-XPM-WETL			Powder metal end mill with V coating 3 flutes square, long length of cut Weldon shank	3 - 30	C.891
V-XPM-WEHS			Powder metal end mill with V coating Multi flute square with 50° helix, short length of cut Weldon shank	2 - 30	C.889
V-XPM-WEMS			Powder metal end mill with V coating Multi flute square, short length of cut Weldon shank	3 - 30	C.893
V-XPM-WEML			Powder metal end mill with V coating Multi flute square, long length of cut Weldon shank	3 - 30	C.895
V-WETS			HSS-Co end mill with V coating 3 flutes square, short length of cut Weldon shank	1,5 - 30	C.890
V-WETL			HSS-Co end mill with V coating 3 flutes square, long length of cut Weldon shank	3 - 30	C.892
V-WEMS			HSS-Co end mill with V coating Multi flute square, short length of cut Weldon shank	1,5 - 40	C.894
V-WEML			Powder metal end mill with V coating Multi flute square, long length of cut Weldon shank	2 - 40	C.896

### Roughing end mills

Milling | HSS/PM end mills



Product name		A-brand	Features	Range	Page
V-XPM-WRESF			Powder metal end mill with V coating Roughing multi flute square, short length of cut Weldon shank	6 - 32	C.898
VP-RESF-SP			Powder metal end mill with V coating Roughing multi flute square, short length of cut Weldon shank	6 - 25	C.900
VP-RELF			Powder metal end mill with V coating Roughing multi flute square, long length of cut Weldon shank	10 - 25	C.901
V-WREES			HSS-Co end mill with V coating Roughing multi flute square, short length of cut Weldon shank	6 - 40	C.902
V-WREEL			HSS-Co end mill with V coating Roughing multi flute square, long length of cut Weldon shank	8 - 40	C.903
SI-WH-WRESF			Powder metal end mill with WXL coating Roughing fine pitch, multi flute square Short length of cut, variable helix and unequal spacing Weldon shank	6 - 25	C.897
V-WRESF			HSS-Co end mill with V coating Roughing fine pitch, multi flute square, short length of cut Weldon shank	6 - 40	C.899



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## Milling

### Face milling cutters

Milling | Indexables



Product series	Tool specification	Features	Size range	Z	Page
PFAL BORE	-	Finishing cutter for aluminium with PCD blades	50 - 160 mm	5 - 20	C.910
PAS BORE		45° face milling with double side 8 corner inserts	50 - 125 mm	4 - 8	C.911
PAO BORE		45° face milling with double side 16 corner inserts	50 - 200 mm	5 - 25	C.912

### Shoulder cutters

Milling | Indexables



Product series	Tool specification	Features	Size range	Z	Page
PSTW SS NEW		90° shoulder milling with double side 6 corner inserts	25 - 40 mm	2 - 5	C.913
PSTW BORE		90° shoulder milling with double side 6 corner inserts	40 - 125 mm	3 - 9	C.914
PSE WS/PSE SS		90° shoulder milling with 2 corner insert with bottom notch	16 - 63 mm	2 - 6	C.915
PSE BORE		90° shoulder milling with 2 corner insert with bottom notch	40 - 100 mm	4 - 10	C.916
PSE SCREW FIT		90° shoulder milling with 2 corner insert with bottom notch	16 - 40 mm	2 - 6	C.917
PSEL SS		90° shoulder milling with long length of cut	25 - 50 mm	2 - 4	C.918
PSEL BORE		90° shoulder milling with long length of cut	50 - 80 mm	3 - 4	C.919
PSF SS	-	Shoulder milling with 4 corner inserts	25 - 40 mm	3 - 5	C.920
PSF BORE	-	Shoulder milling with 4 corner inserts	50 - 80 mm	6 - 9	C.921
PSFL SS	-	Shoulder milling with 4 corner inserts with long length of cut	32 - 40 mm	2 - 3	C.922





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## Milling

### Shoulder cutters

Milling | Indexables











Product series	Tool specification	Features	Size range	Z	Page
PSFL BORE	-	Shoulder milling with 4 corner inserts with long length of cut	50 - 100 mm	4 - 6	C.923
PMD SS NEW		Multi function cutter, milling and drilling	20 - 32 mm	2	C.924
PMD SF NEW		Multi function cutter, milling and drilling	20 - 32 mm	2	C.925

### Radius cutters

Milling | Indexables



Product series	Tool specification	Features	Size range	Z	Page
PHC SS		High feed cutter for long overhang	16 - 40 mm	2 - 5	C.926
PHC BORE		High feed cutter	40 - 100 mm	4 - 8	C.927
PHC SCREW FIT		High feed cutter	16 - 40 mm	2 - 5	C.928
PRC SS		Radius cutter with round inserts	20 - 63 mm	2 - 4	C.929
PRC BORE		Radius cutter with round inserts	50 - 100 mm	4 - 10	C.930
PRC SCREW FIT		Radius cutter with round inserts	20 - 40 mm	2 - 4	C.931
PDR SS		Corner radius cutter for deep depth of cut	40 - 50 mm	2 - 3	C.932
PDR BORE		Corner radius cutter for deep depth of cut	63 - 125 mm	3 - 6	C.933

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## Milling

### Profile finishing

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Product series	Tool specification	Features	Size range	Z	Page
PFB		Finishing ball nose cutter	6 - 32 mm	2	C.934
PFB SCREW FIT		Finishing ball nose cutter	10 - 30 mm	2	C.935
PFR		Finishing corner radius cutter	6 - 32 mm	2	C.936
PFR SCREW FIT		Finishing corner radius cutter	10 - 32 mm	2	C.937

### Exchangeable Milling Head

Milling | Indexables



Product series	Tool specification	Features	Size range	Z	Page
PXNL		Low variable helix with roughing shape	10 - 25 mm	4	C.958
PXNL OH		Low variable helix with roughing shape	12 - 25 mm	4	C.959
PXNH		High variable helix with roughing shape	10 - 25 mm	4	C.958
PXNH OH		High variable helix with roughing shape	12 - 25 mm	4	C.960
PXVC		High variable helix for L/D up to 7xD	10 - 32 mm	4	C.961
PXSE		Variable helix for L/D up to 5xD	10 - 25 mm	4	C.962
PXSE OH		Variable helix for L/D up to 5xD	12 - 25 mm	4	C.963
PXSM		Multi flute variable helix for L/D up to 5xD	10 - 25 mm	6 - 10	C.964
PXRE		Corner radius with straight flute for L/D up to 5xD	10 - 20 mm	4 - 6	C.965

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## Milling

### Exchangeable Milling Head

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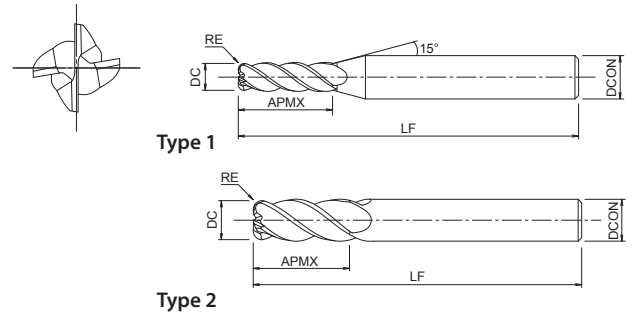
	Product series	Tool specification	Features	Size range	Z	Page
	PXDR-P		Corner radius with high helix flute for L/D up to 7xD	10 - 20 mm	3	C.965
	PXDR-N		Corner radius with high helix flute for L/D up to 7xD	10 - 20 mm	3	C.965
	PXBE-P		3 flute ball nose for L/D up to 7xD	10 - 20 mm	3	C.966
	PXBE-P OH		3 flute ball nose for L/D up to 7xD	12 - 20 mm	3	C.967
	PXBE-N		3 flute ball nose for L/D up to 5xD	10 - 20 mm	3	C.966
	PXBE-N OH		3 flute ball nose for L/D up to 5xD	12 - 20 mm	3	C.967
	PXBМ		Multi flute ball nose for L/D up to 5xD	10 - 20 mm	4 - 6	C.966
	PXAL NEW		3 flutes variable helix for aluminium and copper alloys	10 - 25 mm	3	C.968
	PXHF-AM NEW		Multi flute for high feed additive manufacturing milling	12 - 20 mm	6	C.969





# AE-VMS

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DUARISE coating
- Wide variety in applications and work materials
- 4 flutes, variable helix and unequal spacing

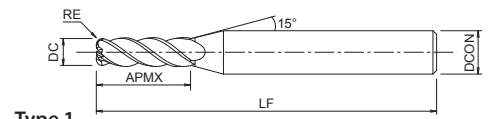
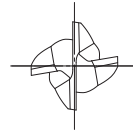


Milling | Solid carbide

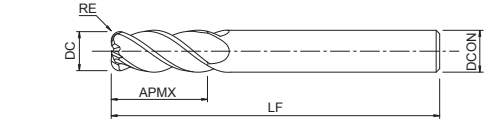
EDP	ZEFP	DC	RE	LF	APMX	DCON	Type
8555830	4	3	-	60	8	6	1
8556050	4	3	0,2	60	8	6	1
8556060	4	3	0,5	60	8	6	1
8555840	4	4	-	60	11	6	1
8556070	4	4	0,2	60	11	6	1
8556080	4	4	0,5	60	11	6	1
8556090	4	4	1	60	11	6	1
8555850	4	5	-	60	13	6	1
8556100	4	5	0,2	60	13	6	1
8556110	4	5	0,5	60	13	6	1
8556120	4	5	1	60	13	6	1
8555860	4	6	-	60	13	6	2
8556130	4	6	0,3	60	13	6	2
8556140	4	6	0,5	60	13	6	2
8556150	4	6	1	60	13	6	2
8555880	4	8	-	70	19	8	2
8556160	4	8	0,3	70	19	8	2
8556170	4	8	0,5	70	19	8	2
8556180	4	8	1	70	19	8	2
8556190	4	8	1,5	70	19	8	2
8556200	4	8	2	70	19	8	2
8555900	4	10	-	80	22	10	2
8556210	4	10	0,3	80	22	10	2
8556220	4	10	0,5	80	22	10	2
8556230	4	10	1	80	22	10	2
8556240	4	10	1,5	80	22	10	2
8556250	4	10	2	80	22	10	2
8556260	4	10	3	80	22	10	2
8555920	4	12	-	90	26	12	2
8556270	4	12	0,5	90	26	12	2
8556280	4	12	1	90	26	12	2
8556290	4	12	1,5	90	26	12	2
8556300	4	12	2	90	26	12	2
8556310	4	12	3	90	26	12	2
8555960	4	16	-	100	32	16	2
8557300	4	16	0,5	100	32	16	2
8557301	4	16	1	100	32	16	2
8557302	4	16	2	100	32	16	2
8557303	4	16	2,5	100	32	16	2
8557304	4	16	3	100	32	16	2
8557305	4	16	4	100	32	16	2
48354163	4	16	1,5	100	32	16	2

# AE-VMS

Milling | Solid carbide



Type 1



Type 2

- First choice in quality and performance
- Carbide end mill with DUARISE coating
- Wide variety in applications and work materials
- 4 flutes, variable helix and unequal spacing

<b>P</b> ○ ~45 HRC	<b>P</b> ○ ~55 HRC	<b>M</b> ○ ~35 HRC	<b>K</b> ○ ~350 HB	<b>N</b> ○	<b>S</b> ○	<b>H</b> ○ ~60 HRC
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<b>A</b>	<b>CARBIDE</b>	<b>DUARISE</b>	37°~40°	0~-0.02	<b>SHRINK</b> <b>FIT</b>
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EDP	ZEFP	DC	RE	LF	APMX	DCON	Type
8556000	4	20	-	110	40	20	2
8557310	4	20	0,5	110	40	20	2
8557311	4	20	1	110	40	20	2
8557312	4	20	2	110	40	20	2
8557313	4	20	2,5	110	40	20	2
8557314	4	20	3	110	40	20	2
8557315	4	20	4	110	40	20	2
8557316	4	20	5	110	40	20	2
8556010	4	25	-	120	50	25	2
8557321	4	25	1	120	50	25	2
8557322	4	25	2	120	50	25	2
8557324	4	25	3	120	50	25	2
8557325	4	25	4	120	50	25	2
8557326	4	25	5	120	50	25	2

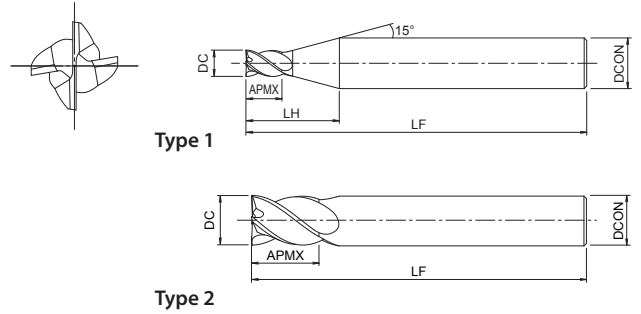
Milling | Solid carbide





# AE-VMSS

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DUARISE coating
- Wide variety in applications and work materials
- 4 flutes, variable helix and unequal spacing
- Stub length of cut



EDP	ZEFP	DC	LF	APMX	LH	DCON	Type
8556410	4	1	40	1,5	7,9	4	1
8556411	4	1,1	40	1,7	8	4	1
8556412	4	1,2	40	1,8	7,9	4	1
8556413	4	1,3	40	2	7,9	4	1
8556414	4	1,4	40	2,1	8	4	1
8556415	4	1,5	40	2,3	7,8	4	1
8556416	4	1,6	40	2,4	7,9	4	1
8556417	4	1,7	40	2,6	7,7	4	1
8556418	4	1,8	40	2,7	7,6	4	1
8556419	4	1,9	40	2,9	7,7	4	1
8556420	4	2	40	3	8,2	4	1
8556421	4	2,1	40	3,2	8,2	4	1
8556422	4	2,2	40	3,3	8,1	4	1
8556423	4	2,3	40	3,5	8,1	4	1
8556424	4	2,4	40	3,6	8	4	1
8556425	4	2,5	40	3,8	8	4	1
8556426	4	2,6	40	3,9	8,5	4	1
8556427	4	2,7	40	4,1	8,5	4	1
8556428	4	2,8	40	4,2	8,4	4	1
8556429	4	2,9	40	4,4	8,4	4	1
8556430	4	3	45	4,5	12,2	6	1
8556431	4	3,1	45	4,7	12,2	6	1
8556432	4	3,2	45	4,8	12,2	6	1
8556433	4	3,3	45	5	12,2	6	1
8556434	4	3,4	45	5,1	12,1	6	1
8556435	4	3,5	45	5,3	12,1	6	1
8556436	4	3,6	45	5,4	12	6	1
8556437	4	3,7	45	5,6	12	6	1
8556438	4	3,8	45	5,7	11,9	6	1
8556439	4	3,9	45	5,9	11,9	6	1
8556440	4	4	45	6	11,9	6	1
8556441	4	4,1	45	6,2	12,1	6	1
8556442	4	4,2	45	6,3	12	6	1
8556443	4	4,3	45	6,5	12	6	1
8556444	4	4,4	45	6,6	11,9	6	1
8556445	4	4,5	45	6,8	11,9	6	1
8556446	4	4,6	45	6,9	11,8	6	1
8556447	4	4,7	45	7,1	11,9	6	1
8556448	4	4,8	45	7,2	11,8	6	1
8556449	4	4,9	45	7,4	11,8	6	1
8556450	4	5	45	7,5	11,7	6	1
8556451	4	5,1	45	7,7	11,7	6	1
8556452	4	5,2	45	7,8	11,6	6	1
8556453	4	5,3	45	8	11,6	6	1
8556454	4	5,4	45	8,1	11,5	6	1
8556455	4	5,5	45	8,3	11,6	6	1

Milling | Solid carbide



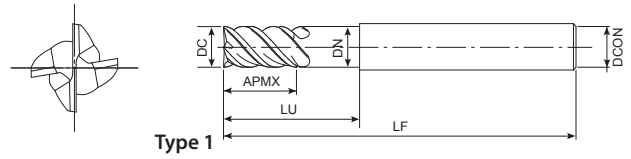






# AE-VMSS

Milling | Solid carbide



Type 1

- First choice in quality and performance
- Carbide end mill with DUARISE coating
- Wide variety in applications and work materials
- 4 flutes, variable helix and unequal spacing
- Stub length of cut, long neck type



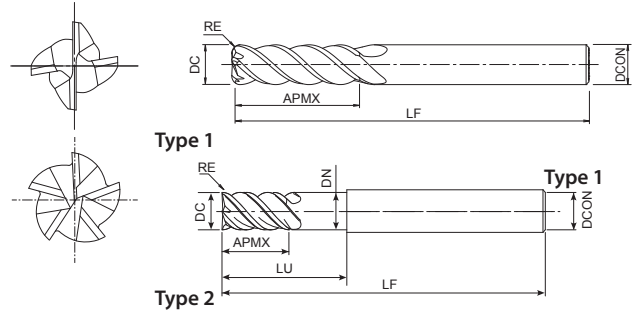
EDP	ZEFP	DC	LU	LF	APMX	DCON	DN
8556618	4	6	18	60	9	6	5,8
8556630	4	6	30	70	9	6	5,8
8556724	4	8	24	70	12	8	7,7
8556740	4	8	40	80	12	8	7,7
8556830	4	10	30	80	15	10	9,7
8556850	4	10	50	100	15	10	9,7
8556936	4	12	36	90	18	12	11,7
8556960	4	12	60	110	18	12	11,7

Milling | Solid carbide



# AE-VML

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DUARISE coating
- For side milling with length of cut up to 4xD
- 4 or 5 flutes, variable helix and unequal spacing



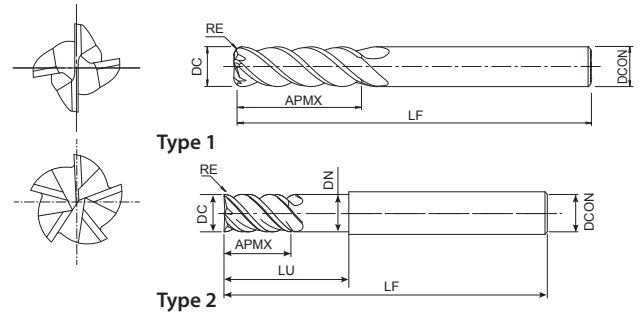
EDP	ZEFP	DC	RE	LF	APMX	DCON	ULDR	Type
8556320	4	6	-	70	19	6	3	1
8556328	4	6	-	70	24	6	4	1
8556336	4	6	0,3	70	19	6	3	1
8556355	4	6	0,3	70	24	6	4	1
8556337	4	6	0,5	70	19	6	3	1
8556356	4	6	0,5	70	24	6	4	1
8556338	4	6	1	70	19	6	3	1
8556357	4	6	1	70	24	6	4	1
8556322	4	8	-	80	25	8	3	1
8556330	4	8	-	90	32	8	4	1
8556339	4	8	0,3	80	25	8	3	1
8556358	4	8	0,3	90	32	8	4	1
8556340	4	8	0,5	80	25	8	3	1
8556359	4	8	0,5	90	32	8	4	1
8556341	4	8	1	80	25	8	3	1
8556360	4	8	1	90	32	8	4	1
8556342	4	8	1,5	80	25	8	3	1
8556361	4	8	1,5	90	32	8	4	1
8556343	4	8	2	80	25	8	3	1
8556362	4	8	2	90	32	8	4	1
8556324	4	10	-	90	31	10	3	1
8556332	4	10	-	100	40	10	4	1
8556344	4	10	0,3	90	31	10	3	1
8556363	4	10	0,3	100	40	10	4	1
8556345	4	10	0,5	90	31	10	3	1
8556364	4	10	0,5	100	40	10	4	1
8556346	4	10	1	90	31	10	3	1
8556365	4	10	1	100	40	10	4	1
8556347	4	10	1,5	90	31	10	3	1
8556366	4	10	1,5	100	40	10	4	1
8556348	4	10	2	90	31	10	3	1
8556367	4	10	2	100	40	10	4	1
8556349	4	10	3	90	31	10	3	1
8556368	4	10	3	100	40	10	4	1

Milling | Solid carbide



# AE-VML

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DUARISE coating
- For side milling with length of cut up to 4xD
- 4 or 5 flutes, variable helix and unequal spacing



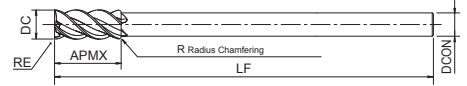
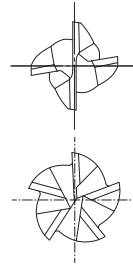
Milling | Solid carbide

EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN	ULDR	Type
8556326	4	12	-	-	100	38	12	-	3	1
8556334	4	12	-	-	110	48	12	-	4	1
8556350	4	12	0,5	-	100	38	12	-	3	1
8556369	4	12	0,5	-	110	48	12	-	4	1
8556351	4	12	1	-	100	38	12	-	3	1
8556370	4	12	1	-	110	48	12	-	4	1
8556352	4	12	1,5	-	100	38	12	-	3	1
8556371	4	12	1,5	-	110	48	12	-	4	1
8556353	4	12	2	-	100	38	12	-	3	1
8556372	4	12	2	-	110	48	12	-	4	1
8556354	4	12	3	-	100	38	12	-	3	1
8556373	4	12	3	-	110	48	12	-	4	1
8556374	5	16	-	-	125	50	16	-	3	1
8556378	5	16	-	-	140	64	16	-	4	1
48330162	4	16	1	100	150	64	16	15,5	4	2
8556376	5	20	-	-	135	62	20	-	3	1
8556380	5	20	-	-	155	80	20	-	4	1
48330202	4	20	1	100	150	80	20	19,4	4	2



# AE-VMFE NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DUARISE coating
- For deep wall milling
- 4 or 5 flutes, variable helix and unequal spacing



EDP	ZEFP	DC	RE	LF	APMX	DCON
8549916	4	6	-	100	15	4
8549945	4	6	0,5	100	15	4
8549918	4	8	-	110	20	6
8549955	4	8	0,5	110	20	6
8549920	4	10	-	130	25	8
8549965	4	10	0,5	130	25	8
8549966	4	10	1	130	25	8
8549922	4	12	-	150	30	10
8549975	4	12	0,5	150	30	10
8549976	4	12	1	150	30	10
8549924	5	14	-	160	35	12
8549985	5	14	0,5	160	35	12
8549986	5	14	1	160	35	12
8549928	5	18	-	180	45	16
8549995	5	18	0,5	180	45	16
8549996	5	18	1	180	45	16
8549932	5	22	-	200	55	20
8550005	5	22	0,5	200	55	20
8550006	5	22	1	200	55	20

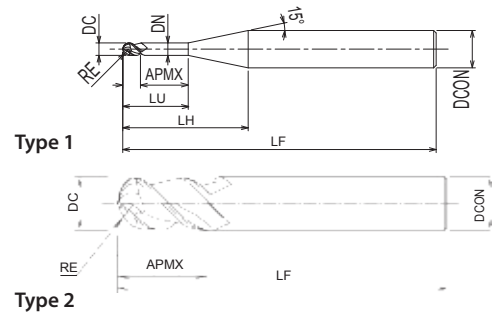
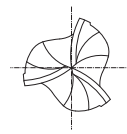
Milling | Solid carbide



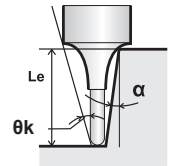


# AM-EBT

Milling | Solid carbide



- Carbide end mill with DUROREY coating
- For additive manufacturing
- 3 flutes, ball nose



EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)	Type
3187240	3	2	1	4	60	2	11,9	6	1,95	10,64	4,19	4,3	4,42	4,85	4,55	1
3187280	3	2	1	8	60	2	15,9	6	1,95	7,79	8,33	8,58	8,86	9,82	9,15	1
3187360	3	3	1,5	6	60	3	11,8	6	2,85	8,15	6,44	6,61	6,79	7,45	7	1
3187392	3	3	1,5	12	60	3	17,8	6	2,85	5,22	12,64	13,03	13,44	14,91	13,89	1
3187408	3	4	2	8	60	4	12	6	3,85	5,65	8,49	8,71	8,96	9,81	9,22	1
3187416	3	4	2	16	60	4	20	6	3,85	3,17	16,76	17,27	17,82	19,76	18,42	1
3187510	3	5	2,5	10	60	5	12,1	6	4,85	2,95	10,54	10,82	11,12	-	11,45	1
3187520	3	5	2,5	20	60	5	22,1	6	4,85	1,46	20,87	21,52	-	-	-	1
3188060	3	6	3	-	60	9	-	6	-	-	-	-	-	-	-	-
3188080	3	8	4	-	70	12	-	8	-	-	-	-	-	-	-	-
3188100	3	10	5	-	80	15	-	10	-	-	-	-	-	-	-	-
3188120	3	12	6	-	90	18	-	12	-	-	-	-	-	-	-	-
3188160	3	16	8	-	105	24	-	16	-	-	-	-	-	-	-	-
3188200	3	20	10	-	110	30	-	20	-	-	-	-	-	-	-	-

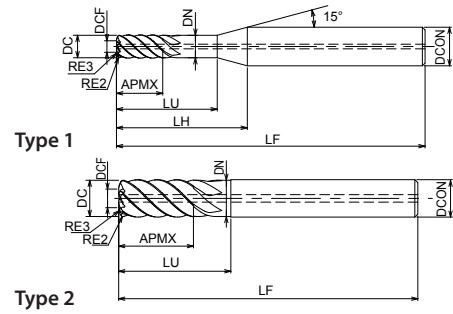
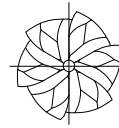
Milling | Solid carbide





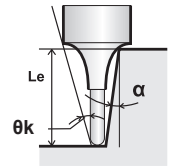
# AM-HFC NEW

Milling | Solid carbide



- Carbide end mill with DUROREY coating
- For high feed additive manufacturing milling
- 6 flutes
- Centre through coolant

<b>P</b> ○ ~45 HRC	<b>P</b> ● ~55 HRC	<b>M</b> ● ~35 HRC	<b>S</b> ● Ti	<b>S</b> ● Ni	<b>H</b> ● ~70 HRC
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<b>CARBIDE</b>	<b>DUROREY</b>	<b>45°</b>	<b>R ± 0.03</b>	<b>SHRINK FIT</b>	<b>C.1067</b>
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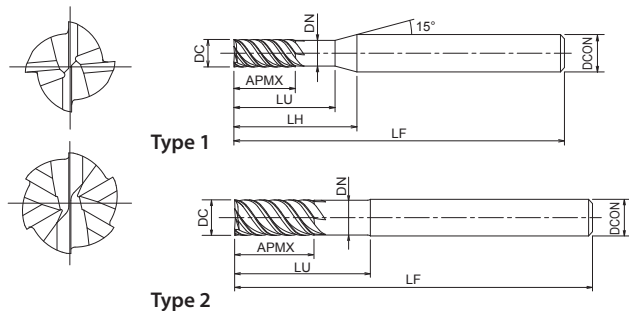
EDP	ZEFP	DC	DCF	RE	RE2	RE3	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=3°)	Type
3188204	6	4	2	0,5	0,4	2,5	12	50	8	15,9	6	3,8	3,73	12,53	12,98	13,43	13,91	15	1
3188205	6	5	2,5	0,6	0,5	3	15	60	10	17	6	4,8	1,76	15,64	16,18	16,74	-	-	1
3188206	6	6	3	0,8	0,6	3,5	18	60	12	-	6	5,8	-	-	-	-	-	-	2
3188208	6	8	4	1	0,8	5	24	70	16	-	8	7,7	-	-	-	-	-	-	2
3188210	6	10	5	1,2	1	6	30	80	20	-	10	9,7	-	-	-	-	-	-	2
3188212	6	12	6	1,5	1,2	7	36	90	24	-	12	11,7	-	-	-	-	-	-	2

Milling | Solid carbide



# AE-MSS-H NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DUREY coating
- For hardened steels and stainless steels
- Multi flute, variable helix and unequal spacing
- 1.5XD length of cut, long neck up to 3XD

P  
~45 HRC

P  
~55 HRC

M  
~35 HRC

K  
~350 HB

S

H  
~60 HRC

H  
~65 HRC

H  
~70 HRC

A

CARBIDE

DUREY

43°

SHRINK  
FIT

0~-0.02

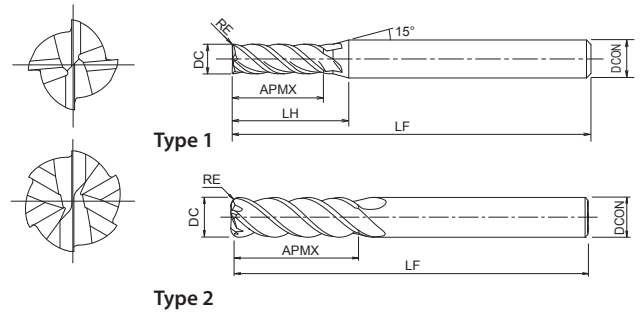
C.981

EDP	ZEFP	DC	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=3°)	Type
8549830	4	3	9	45	4,5	14,8	6	2,85	5,78	9,46	9,87	10,23	10,62	11,48	1
8549831	4	4	12	50	6	16	6	3,85	3,59	12,6	13,09	13,56	14,07	15,21	1
8549832	4	5	15	60	7,5	17,1	6	4,85	1,68	15,72	16,3	16,88	-	-	1
8549833	6	6	18	80	9	-	6	5,85	-	-	-	-	-	-	2
8549834	6	8	24	90	12	-	8	7,85	-	-	-	-	-	-	2
8549835	6	10	30	100	15	-	10	9,85	-	-	-	-	-	-	2
8549836	6	12	36	110	18	-	12	11,8	-	-	-	-	-	-	2

Milling | Solid carbide

# AE-MS-H NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DUREY coating
- For hardened material up to 70HRC
- Multi flute, variable helix and unequal spacing



EDP	ZEFP	DC	RE	LF	APMX	LH	DCON	Type
8549710	4	1	-	60	2,5	12,7	6	1
8549715	4	1,5	-	60	3,8	13	6	1
8549720	4	2	-	60	5	13,9	6	1
8549725	4	2,5	-	60	6,3	14,5	6	1
8549730	4	3	-	60	7,5	15,4	6	1
8549842	4	3	0,2	60	7,5	15,4	6	1
8549845	4	3	0,5	60	7,5	15,4	6	1
8549735	4	3,5	-	60	8,8	15,6	6	1
8549740	4	4	-	60	10	16,1	6	1
8549852	4	4	0,2	60	10	16,1	6	1
8549855	4	4	0,5	60	10	16,1	6	1
8549856	4	4	1	60	10	16,1	6	1
8549745	4	4,5	-	60	11,3	16,4	6	1
8549750	4	5	-	60	12,5	16,7	6	1
8549862	4	5	0,2	60	12,5	16,7	6	1
8549865	4	5	0,5	60	12,5	16,7	6	1
8549866	4	5	1	60	12,5	16,7	6	1
8549755	4	5,5	-	60	13,8	17,1	6	1
8549760	6	6	-	60	15	-	6	2
8549873	6	6	0,3	60	15	-	6	2
8549875	6	6	0,5	60	15	-	6	2
8549876	6	6	1	60	15	-	6	2
8549780	6	8	-	70	20	-	8	2
8549883	6	8	0,3	70	20	-	8	2
8549885	6	8	0,5	70	20	-	8	2
8549886	6	8	1	70	20	-	8	2
8549887	6	8	1,5	70	20	-	8	2
8549888	6	8	2	70	20	-	8	2
8549810	6	10	-	80	25	-	10	2
8549893	6	10	0,3	80	25	-	10	2
8549895	6	10	0,5	80	25	-	10	2
8549896	6	10	1	80	25	-	10	2
8549897	6	10	1,5	80	25	-	10	2
8549898	6	10	2	80	25	-	10	2
8549899	6	10	3	80	25	-	10	2
8549812	6	12	-	90	30	-	12	2
8549903	6	12	0,3	90	30	-	12	2
8549905	6	12	0,5	90	30	-	12	2
8549906	6	12	1	90	30	-	12	2
8549907	6	12	1,5	90	30	-	12	2
8549908	6	12	2	90	30	-	12	2
8549909	6	12	3	90	30	-	12	2
8549816	6	16	-	105	40	-	16	2
8549820	6	20	-	120	50	-	20	2

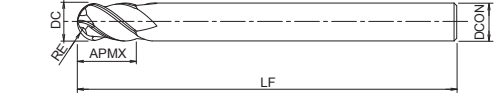
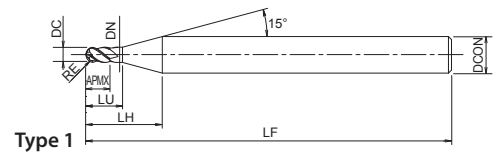
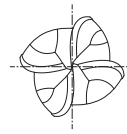
Milling | Solid carbide





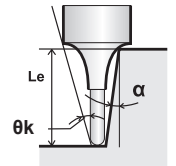
# AE-BM-H NEW

Milling | Solid carbide



Type 2

- First choice in quality and performance
- Carbide end mill with DUREY coating
- For hardened material up to 70HRC
- 4 flutes, ball nose



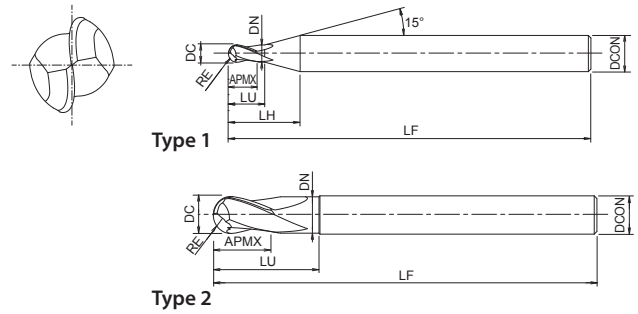
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=3°)	Type
8549602	4	2	1	4	50	2	11,9	6	1,95	10,64	4,19	4,3	4,42	4,55	4,85	1
8549603	4	3	1,5	6	50	3	11,8	6	2,85	8,15	6,44	6,61	6,79	7	7,45	1
8549604	4	4	2	8	60	4	12	6	3,85	5,65	8,49	8,71	8,96	9,22	9,81	1
8549605	4	5	2,5	10	60	5	12,1	6	4,85	2,95	10,54	10,82	11,12	11,45	-	1
8549606	4	6	3	-	60	9	-	6	-	-	-	-	-	-	-	2
8549608	4	8	4	-	70	12	-	8	-	-	-	-	-	-	-	2
8549610	4	10	5	-	80	15	-	10	-	-	-	-	-	-	-	2
8549612	4	12	6	-	90	18	-	12	-	-	-	-	-	-	-	2

Milling | Solid carbide

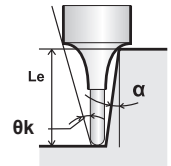


# AE-BD-H NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DUOREY coating
- For hardened material up to 70HRC
- 2 flutes, ball nose



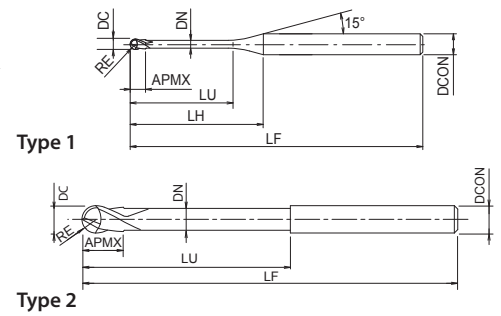
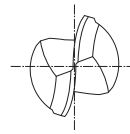
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=3°)	Type
3042001	2	1	0,5	2	50	0,8	7,6	4	0,95	11,71	2,14	2,2	2,26	2,33	2,48	1
3042002	2	1,5	0,75	3	50	1,2	7,8	4	1,45	10,03	3,17	3,25	3,34	3,44	3,66	1
3042003	2	2	1	4	50	1,6	11,9	6	1,95	10,64	4,19	4,3	4,42	4,55	4,85	1
3042004	2	3	1,5	6	60	2,4	11,8	6	2,85	8,15	6,44	6,61	6,79	7	7,45	1
3042005	2	4	2	8	60	3,2	-	4	3,85	-	-	-	-	-	-	2
3042006	2	4	2	8	70	3,2	12	6	3,85	5,65	8,49	8,71	8,96	9,22	9,81	1
3042007	2	4	2	8	45	3,2	12	6	3,85	5,65	8,49	8,71	8,96	9,22	9,81	1
3042008	2	5	2,5	10	80	4	12,1	6	4,8	2,92	10,63	10,9	11,22	11,55	-	1
3042009	2	5	2,5	10	50	4	12,1	6	4,8	2,92	10,63	10,9	11,22	11,55	-	1
3042010	2	6	3	18	90	9	-	6	5,8	-	-	-	-	-	-	2
3042011	2	6	3	18	55	9	-	6	5,8	-	-	-	-	-	-	2
3042012	2	8	4	24	100	12	-	8	7,7	-	-	-	-	-	-	2
3042013	2	8	4	24	75	12	-	8	7,7	-	-	-	-	-	-	2
3042014	2	10	5	30	100	15	-	10	9,7	-	-	-	-	-	-	2
3042015	2	10	5	30	75	15	-	10	9,7	-	-	-	-	-	-	2
3042016	2	12	6	36	110	18	-	12	11,7	-	-	-	-	-	-	2
3042017	2	12	6	36	80	18	-	12	11,7	-	-	-	-	-	-	2

Milling | Solid carbide

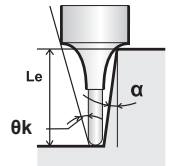


# AE-LNBD-H NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DUREY coating
- For hardened material up to 70HRC
- 2 flutes, long neck, ball nose
- 261 sizes



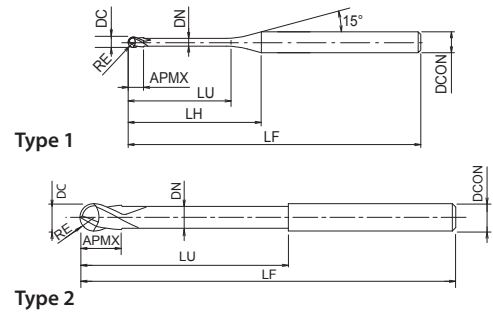
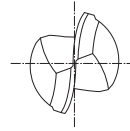
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=3°)	Type
3056100	2	0,1	0,05	0,2	45	0,08	7,5	4	0,09	14,69	0,21	0,22	0,22	0,23	0,24	1
3056101	2	0,1	0,05	0,3	45	0,08	7,6	4	0,09	14,52	0,3	0,31	0,32	0,33	0,36	1
3056102	2	0,1	0,05	0,5	45	0,08	7,8	4	0,09	14,16	0,51	0,53	0,54	0,56	0,6	1
3056103	2	0,2	0,1	0,3	45	0,16	7,4	4	0,19	14,55	0,32	0,33	0,34	0,35	0,37	1
3056104	2	0,2	0,1	0,5	45	0,16	7,6	4	0,19	14,18	0,53	0,54	0,56	0,58	0,62	1
3056105	2	0,2	0,1	0,75	45	0,16	7,9	4	0,19	13,74	0,79	0,81	0,84	0,86	0,93	1
3056106	2	0,2	0,1	1	45	0,16	8,1	4	0,19	13,33	1,04	1,08	1,11	1,15	1,24	1
3056107	2	0,2	0,1	1	45	0,16	11,8	6	0,19	13,86	1,04	1,08	1,11	1,15	1,24	1
3056108	2	0,2	0,1	1,25	45	0,16	8,4	4	0,19	12,94	1,3	1,35	1,39	1,44	1,55	1
3056109	2	0,2	0,1	1,5	45	0,16	8,6	4	0,19	12,58	1,56	1,61	1,67	1,73	1,86	1
3056110	2	0,2	0,1	1,75	45	0,16	8,9	4	0,19	12,23	1,82	1,88	1,94	2,01	2,17	1
3056111	2	0,2	0,1	2	45	0,16	9,1	4	0,19	11,9	2,08	2,15	2,22	2,3	2,48	1
3056112	2	0,2	0,1	2,5	45	0,16	9,6	4	0,19	11,29	2,6	2,68	2,78	2,88	3,1	1
3056113	2	0,2	0,1	3	45	0,16	10,1	4	0,19	10,74	3,11	3,22	3,33	3,45	3,72	1
3056114	2	0,3	0,15	0,5	45	0,24	7,4	4	0,285	14,24	0,53	0,54	0,55	0,57	0,6	1
3056115	2	0,3	0,15	0,6	45	0,24	7,5	4	0,285	14,06	0,63	0,65	0,66	0,68	0,73	1
3056116	2	0,3	0,15	0,75	45	0,24	7,7	4	0,285	13,79	0,78	0,81	0,83	0,86	0,92	1
3056117	2	0,3	0,15	1	45	0,24	7,9	4	0,285	13,36	1,04	1,07	1,11	1,14	1,23	1
3056118	2	0,3	0,15	1,25	45	0,24	8,2	4	0,285	12,96	1,3	1,34	1,39	1,43	1,54	1
3056119	2	0,3	0,15	1,5	45	0,24	8,4	4	0,285	12,59	1,56	1,61	1,66	1,72	1,85	1
3056120	2	0,3	0,15	1,5	45	0,24	12,2	6	0,285	13,34	1,56	1,61	1,66	1,72	1,85	1
3056121	2	0,3	0,15	1,75	45	0,24	8,7	4	0,285	12,23	1,82	1,88	1,94	2,01	2,16	1
3056122	2	0,3	0,15	2	45	0,24	8,9	4	0,285	11,89	2,08	2,14	2,22	2,29	2,47	1
3056123	2	0,3	0,15	2,25	45	0,24	9,2	4	0,285	11,57	2,34	2,41	2,49	2,58	2,78	1
3056124	2	0,3	0,15	2,5	45	0,24	9,4	4	0,285	11,27	2,59	2,68	2,77	2,87	3,09	1
3056125	2	0,3	0,15	3	45	0,24	9,9	4	0,285	10,71	3,11	3,21	3,32	3,44	3,71	1
3056126	2	0,3	0,15	3,5	45	0,24	10,4	4	0,285	10,2	3,63	3,75	3,88	4,02	4,33	1
3056127	2	0,3	0,15	4	45	0,24	10,9	4	0,285	9,74	4,14	4,28	4,43	4,59	4,96	1
3056128	2	0,3	0,15	4,5	45	0,24	11,4	4	0,285	9,31	4,66	4,82	4,99	5,17	5,58	1
3056129	2	0,3	0,15	5	45	0,24	11,9	4	0,285	8,93	5,18	5,35	5,54	5,74	6,2	1
3056130	2	0,4	0,2	0,5	45	0,3	7,3	4	0,38	14,27	0,54	0,56	0,57	0,58	0,62	1
3056131	2	0,4	0,2	0,75	45	0,3	7,5	4	0,38	13,8	0,8	0,82	0,85	0,87	0,93	1
3056132	2	0,4	0,2	0,8	45	0,3	7,6	4	0,38	13,71	0,85	0,88	0,9	0,93	0,99	1
3056133	2	0,4	0,2	1	45	0,3	7,8	4	0,38	13,37	1,06	1,09	1,12	1,16	1,24	1
3056134	2	0,4	0,2	1	45	0,3	11,5	6	0,38	13,91	1,06	1,09	1,12	1,16	1,24	1
3056135	2	0,4	0,2	1,5	45	0,3	8,3	4	0,38	12,57	1,58	1,63	1,68	1,73	1,86	1
3056136	2	0,4	0,2	2	45	0,3	8,8	4	0,38	11,86	2,09	2,16	2,23	2,31	2,48	1
3056137	2	0,4	0,2	2	45	0,3	12,5	6	0,38	12,82	2,09	2,16	2,23	2,31	2,48	1
3056138	2	0,4	0,2	2,5	45	0,3	9,3	4	0,38	11,22	2,61	2,7	2,79	2,88	3,1	1
3056139	2	0,4	0,2	3	45	0,3	9,8	4	0,38	10,65	3,13	3,23	3,34	3,46	3,72	1
3056140	2	0,4	0,2	3,5	45	0,3	10,3	4	0,38	10,14	3,64	3,76	3,89	4,03	4,35	1
3056141	2	0,4	0,2	4	45	0,3	10,8	4	0,38	9,67	4,16	4,3	4,45	4,61	4,97	1
3056142	2	0,4	0,2	4,5	45	0,3	11,3	4	0,38	9,24	4,68	4,83	5	5,18	5,59	1
3056143	2	0,4	0,2	5	45	0,3	11,8	4	0,38	8,85	5,2	5,37	5,56	5,76	6,21	1
3056144	2	0,4	0,2	5,5	45	0,3	12,3	4	0,38	8,49	5,71	5,9	6,11	6,33	6,83	1
3056145	2	0,4	0,2	6	45	0,3	12,8	4	0,38	8,15	6,23	6,44	6,66	6,91	7,45	1

Milling | Solid carbide

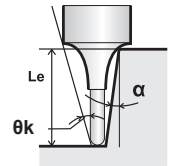


# AE-LNBD-H NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DUREY coating
- For hardened material up to 70HRC
- 2 flutes, long neck, ball nose
- 261 sizes



EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=3°)	Type
3056146	2	0,5	0,25	0,75	45	0,4	7,3	4	0,475	13,85	0,8	0,82	0,84	0,86	0,91	1
3056147	2	0,5	0,25	1	45	0,4	7,6	4	0,475	13,4	1,06	1,09	1,12	1,15	1,23	1
3056148	2	0,5	0,25	1,5	45	0,4	8,1	4	0,475	12,58	1,58	1,62	1,67	1,73	1,85	1
3056149	2	0,5	0,25	2	45	0,4	8,6	4	0,475	11,85	2,09	2,16	2,23	2,3	2,47	1
3056150	2	0,5	0,25	2,5	45	0,4	9,1	4	0,475	11,2	2,61	2,69	2,78	2,88	3,09	1
3056151	2	0,5	0,25	3	45	0,4	9,6	4	0,475	10,62	3,13	3,23	3,33	3,45	3,71	1
3056152	2	0,5	0,25	3,5	45	0,4	10,1	4	0,475	10,09	3,64	3,76	3,89	4,03	4,33	1
3056153	2	0,5	0,25	4	45	0,4	10,6	4	0,475	9,61	4,16	4,3	4,44	4,6	4,95	1
3056154	2	0,5	0,25	4,5	45	0,4	11,1	4	0,475	9,18	4,68	4,83	5	5,18	5,58	1
3056155	2	0,5	0,25	5	45	0,4	11,6	4	0,475	8,78	5,19	5,37	5,55	5,75	6,2	1
3056156	2	0,5	0,25	5,5	45	0,4	12,1	4	0,475	8,41	5,71	5,9	6,11	6,33	6,82	1
3056157	2	0,5	0,25	6	45	0,4	12,6	4	0,475	8,08	6,23	6,44	6,66	6,9	7,44	1
3056158	2	0,5	0,25	7	45	0,4	13,6	4	0,475	7,48	7,26	7,51	7,77	8,05	8,68	1
3056159	2	0,5	0,25	8	45	0,4	14,6	4	0,475	6,97	8,29	8,58	8,88	9,2	9,93	1
3056160	2	0,5	0,25	9	45	0,4	15,6	4	0,475	6,52	9,33	9,64	9,98	10,35	11,17	1
3056161	2	0,5	0,25	10	45	0,4	16,6	4	0,475	6,12	10,36	10,71	11,09	11,5	12,41	1
3056162	2	0,6	0,3	0,75	45	0,5	7,2	4	0,55	13,8	0,86	0,88	0,9	0,92	0,97	1
3056163	2	0,6	0,3	1	45	0,5	7,4	4	0,55	13,34	1,12	1,14	1,17	1,21	1,28	1
3056164	2	0,6	0,3	1,2	45	0,5	7,6	4	0,55	12,99	1,32	1,36	1,4	1,44	1,53	1
3056165	2	0,6	0,3	1,5	45	0,5	7,9	4	0,55	12,5	1,63	1,68	1,73	1,78	1,9	1
3056166	2	0,6	0,3	2	45	0,5	8,4	4	0,55	11,76	2,15	2,21	2,28	2,36	2,53	1
3056167	2	0,6	0,3	2	45	0,5	12,2	6	0,55	12,78	2,15	2,21	2,28	2,36	2,53	1
3056168	2	0,6	0,3	2,5	45	0,5	8,9	4	0,55	11,1	2,67	2,75	2,84	2,93	3,15	1
3056169	2	0,6	0,3	3	45	0,5	9,4	4	0,55	10,51	3,18	3,28	3,39	3,51	3,77	1
3056170	2	0,6	0,3	3	45	0,5	13,2	6	0,55	11,83	3,18	3,28	3,39	3,51	3,77	1
3056171	2	0,6	0,3	3,5	45	0,5	9,9	4	0,55	9,98	3,7	3,82	3,95	4,08	4,39	1
3056172	2	0,6	0,3	4	45	0,5	10,4	4	0,55	9,5	4,22	4,35	4,5	4,66	5,01	1
3056173	2	0,6	0,3	4	45	0,5	14,2	6	0,55	11	4,22	4,35	4,5	4,66	5,01	1
3056174	2	0,6	0,3	4,5	45	0,5	10,9	4	0,55	9,06	4,73	4,89	5,05	5,23	5,63	1
3056175	2	0,6	0,3	5	45	0,5	11,4	4	0,55	8,67	5,25	5,42	5,61	5,81	6,26	1
3056176	2	0,6	0,3	5,5	45	0,5	11,9	4	0,55	8,3	5,77	5,96	6,16	6,38	6,88	1
3056177	2	0,6	0,3	6	45	0,5	12,4	4	0,55	7,96	6,28	6,49	6,72	6,96	7,5	1
3056178	2	0,6	0,3	6,5	45	0,5	12,9	4	0,55	7,65	6,8	7,03	7,27	7,53	8,12	1
3056179	2	0,6	0,3	7	45	0,5	13,4	4	0,55	7,37	7,32	7,56	7,82	8,11	8,74	1
3056180	2	0,6	0,3	7,5	45	0,5	13,9	4	0,55	7,1	7,83	8,1	8,38	8,68	9,36	1
3056181	2	0,6	0,3	8	45	0,5	14,4	4	0,55	6,85	8,35	8,63	8,93	9,26	9,99	1
3056182	2	0,6	0,3	8,5	45	0,5	14,9	4	0,55	6,62	8,87	9,17	9,49	9,83	10,61	1
3056183	2	0,6	0,3	9	45	0,5	15,4	4	0,55	6,41	9,38	9,7	10,04	10,41	11,23	1
3056184	2	0,6	0,3	9,5	45	0,5	15,9	4	0,55	6,2	9,9	10,24	10,6	10,98	11,85	1
3056185	2	0,6	0,3	10	45	0,5	16,4	4	0,55	6,01	10,42	10,77	11,15	11,56	12,47	1
3056186	2	0,6	0,3	11	50	0,5	17,4	4	0,55	5,67	11,45	11,84	12,26	12,71	13,71	1
3056187	2	0,6	0,3	12	50	0,5	18,4	4	0,55	5,36	12,49	12,91	13,37	13,86	14,96	1
3056188	2	0,8	0,4	1	45	0,6	7,1	4	0,75	13,41	1,11	1,14	1,16	1,19	1,26	1
3056189	2	0,8	0,4	1,5	45	0,6	7,6	4	0,75	12,52	1,63	1,67	1,72	1,77	1,88	1
3056190	2	0,8	0,4	2	45	0,6	8,1	4	0,75	11,74	2,15	2,21	2,27	2,34	2,5	1
3056191	2	0,8	0,4	2	45	0,6	11,8	6	0,75	12,81	2,15	2,21	2,27	2,34	2,5	1

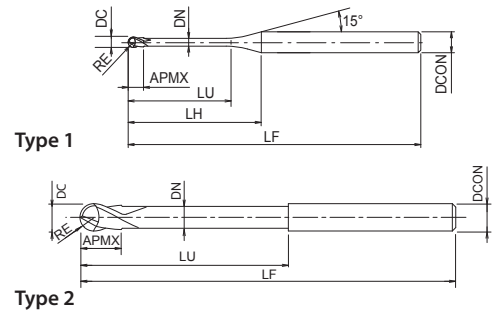
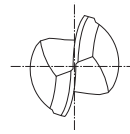
Milling | Solid carbide



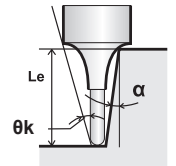


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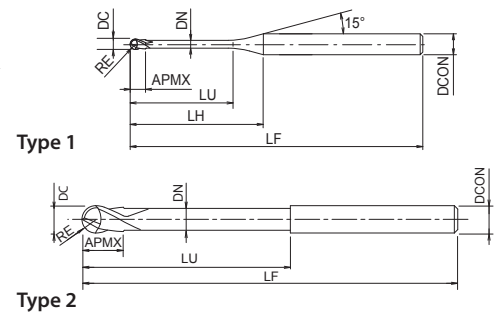
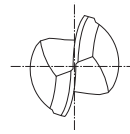
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=3°)	Type
3056192	2	0,8	0,4	2,5	45	0,6	8,6	4	0,75	11,04	2,66	2,74	2,83	2,92	3,12	1
3056193	2	0,8	0,4	3	45	0,6	9,1	4	0,75	10,42	3,18	3,28	3,38	3,49	3,75	1
3056194	2	0,8	0,4	4	45	0,6	10,1	4	0,75	9,37	4,21	4,35	4,49	4,64	4,99	1
3056195	2	0,8	0,4	5	45	0,6	11,1	4	0,75	8,51	5,25	5,42	5,6	5,79	6,23	1
3056196	2	0,8	0,4	6	45	0,6	12,1	4	0,75	7,8	6,28	6,49	6,71	6,94	7,48	1
3056197	2	0,8	0,4	7	45	0,6	13,1	4	0,75	7,19	7,31	7,55	7,81	8,09	8,72	1
3056198	2	0,8	0,4	8	45	0,6	14,1	4	0,75	6,67	8,35	8,62	8,92	9,24	9,96	1
3056199	2	0,8	0,4	9	45	0,6	15,1	4	0,75	6,22	9,38	9,69	10,03	10,39	11,2	1
3056200	2	0,8	0,4	10	45	0,6	16,1	4	0,75	5,83	10,41	10,76	11,14	11,54	12,45	1
3056201	2	0,8	0,4	12	50	0,6	18,1	4	0,75	5,18	12,48	12,9	13,36	13,84	14,93	1
3056202	2	1	0,5	1,5	45	0,8	7,2	4	0,95	12,54	1,63	1,66	1,71	1,75	1,86	1
3056203	2	1	0,5	2	45	0,8	7,7	4	0,95	11,71	2,14	2,2	2,26	2,33	2,48	1
3056204	2	1	0,5	2	45	0,8	11,4	6	0,95	12,83	2,14	2,2	2,26	2,33	2,48	1
3056205	2	1	0,5	2,5	45	0,8	8,2	4	0,95	10,97	2,66	2,73	2,82	2,9	3,1	1
3056206	2	1	0,5	3	45	0,8	8,7	4	0,95	10,33	3,18	3,27	3,37	3,48	3,72	1
3056207	2	1	0,5	3	45	0,8	12,4	6	0,95	11,8	3,18	3,27	3,37	3,48	3,72	1
3056208	2	1	0,5	4	45	0,8	9,7	4	0,95	9,23	4,21	4,34	4,48	4,63	4,97	1
3056209	2	1	0,5	4	45	0,8	13,4	6	0,95	10,91	4,21	4,34	4,48	4,63	4,97	1
3056210	2	1	0,5	5	45	0,8	10,7	4	0,95	8,35	5,24	5,41	5,59	5,78	6,21	1
3056211	2	1	0,5	5	45	0,8	14,4	6	0,95	10,15	5,24	5,41	5,59	5,78	6,21	1
3056212	2	1	0,5	6	45	0,8	11,7	4	0,95	7,62	6,28	6,48	6,69	6,93	7,45	1
3056213	2	1	0,5	6	45	0,8	15,4	6	0,95	9,49	6,28	6,48	6,69	6,93	7,45	1
3056214	2	1	0,5	7	45	0,8	12,7	4	0,95	7	7,31	7,55	7,8	8,08	8,69	1
3056215	2	1	0,5	7	45	0,8	16,4	6	0,95	8,91	7,31	7,55	7,8	8,08	8,69	1
3056216	2	1	0,5	8	45	0,8	13,7	4	0,95	6,48	8,34	8,62	8,91	9,23	9,94	1
3056217	2	1	0,5	8	45	0,8	17,4	6	0,95	8,39	8,34	8,62	8,91	9,23	9,94	1
3056218	2	1	0,5	9	45	0,8	14,7	4	0,95	6,03	9,38	9,69	10,02	10,38	11,18	1
3056219	2	1	0,5	10	45	0,8	15,7	4	0,95	5,64	10,41	10,76	11,13	11,53	12,42	1
3056220	2	1	0,5	10	50	0,8	19,4	6	0,95	7,52	10,41	10,76	11,13	11,53	12,42	1
3056221	2	1	0,5	12	45	0,8	17,7	4	0,95	4,99	12,48	12,9	13,34	13,83	14,91	1
3056222	2	1	0,5	13	50	0,8	18,7	4	0,95	4,71	13,51	13,97	14,45	14,98	16,15	1
3056223	2	1	0,5	14	50	0,8	19,7	4	0,95	4,47	14,55	15,04	15,56	16,13	17,4	1
3056224	2	1	0,5	16	50	0,8	21,7	4	0,95	4,05	16,61	17,18	17,78	18,43	19,88	1
3056225	2	1	0,5	18	55	0,8	23,7	4	0,95	3,7	18,68	19,31	19,99	20,73	22,37	1
3056226	2	1	0,5	20	55	0,8	25,7	4	0,95	3,41	20,75	21,45	22,21	23,03	24,86	1
3056227	2	1	0,5	22	60	0,8	27,7	4	0,95	3,16	22,82	23,59	24,43	25,33	27,34	1
3056228	2	1	0,5	22	60	0,8	31,4	6	0,95	4,62	22,82	23,59	24,43	25,33	27,34	1
3056229	2	1,2	0,6	2	45	1	7,3	4	1,15	11,67	2,14	2,19	2,25	2,31	2,46	1
3056230	2	1,2	0,6	2	45	1	11,1	6	1,15	12,86	2,14	2,19	2,25	2,31	2,46	1
3056231	2	1,2	0,6	2,4	45	1	7,7	4	1,15	11,04	2,55	2,62	2,69	2,77	2,95	1
3056232	2	1,2	0,6	2,5	45	1	7,8	4	1,15	10,9	2,66	2,73	2,81	2,89	3,08	1
3056233	2	1,2	0,6	3	45	1	8,3	4	1,15	10,22	3,17	3,26	3,36	3,46	3,7	1
3056234	2	1,2	0,6	4	45	1	9,3	4	1,15	9,08	4,21	4,33	4,47	4,61	4,94	1
3056235	2	1,2	0,6	4	45	1	13,1	6	1,15	10,87	4,21	4,33	4,47	4,61	4,94	1
3056236	2	1,2	0,6	6	45	1	11,3	4	1,15	7,42	6,27	6,47	6,68	6,91	7,43	1
3056237	2	1,2	0,6	8	45	1	13,3	4	1,15	6,27	8,34	8,61	8,9	9,21	9,91	1

Milling | Solid carbide

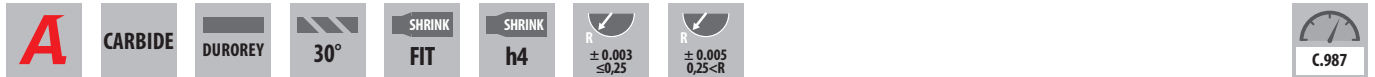
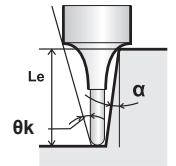


# AE-LNBD-H NEW

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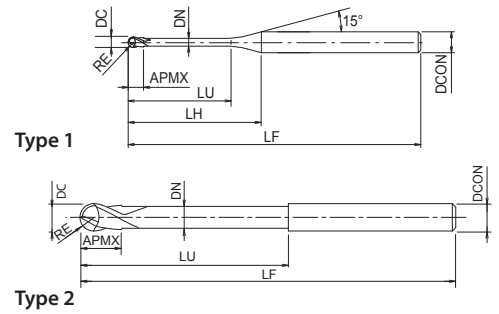
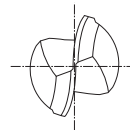
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=3°)	Type
3056238	2	1,2	0,6	10	45	1	15,3	4	1,15	5,43	10,41	10,75	11,12	11,51	12,4	1
3056239	2	1,2	0,6	12	45	1	17,3	4	1,15	4,78	12,48	12,89	13,33	13,81	14,89	1
3056240	2	1,2	0,6	14	50	1	19,3	4	1,15	4,28	14,54	15,03	15,55	16,11	17,37	1
3056241	2	1,2	0,6	16	50	1	21,3	4	1,15	3,87	16,61	17,17	17,77	18,41	19,86	1
3056242	2	1,2	0,6	18	55	1	23,3	4	1,15	3,53	18,68	19,31	19,98	20,71	22,35	1
3056243	2	1,2	0,6	20	55	1	25,3	4	1,15	3,24	20,74	21,45	22,2	23,01	24,83	1
3056244	2	1,5	0,75	2	45	1,2	6,8	4	1,45	2,13	2,13	2,18	2,23	2,29	2,42	1
3056245	2	1,5	0,75	2,5	45	1,2	7,3	4	1,45	10,76	2,65	2,72	2,79	2,87	3,04	1
3056246	2	1,5	0,75	3	45	1,2	7,8	4	1,45	10,03	3,17	3,25	3,34	3,44	3,66	1
3056247	2	1,5	0,75	3	45	1,2	11,5	6	1,45	11,75	3,17	3,25	3,34	3,44	3,66	1
3056248	2	1,5	0,75	4	45	1,2	8,8	4	1,45	8,81	4,2	4,32	4,45	4,59	4,91	1
3056249	2	1,5	0,75	5	45	1,2	9,8	4	1,45	7,86	5,23	5,39	5,56	5,74	6,15	1
3056250	2	1,5	0,75	5	45	1,2	13,5	6	1,45	9,97	5,23	5,39	5,56	5,74	6,15	1
3056251	2	1,5	0,75	6	45	1,2	10,8	4	1,45	7,09	6,27	6,46	6,67	6,89	7,39	1
3056252	2	1,5	0,75	6	45	1,2	14,5	6	1,45	9,26	6,27	6,46	6,67	6,89	7,39	1
3056253	2	1,5	0,75	8	45	1,2	12,8	4	1,45	5,93	8,34	8,6	8,88	9,19	9,88	1
3056254	2	1,5	0,75	8	45	1,2	16,5	6	1,45	8,11	8,34	8,6	8,88	9,19	9,88	1
3056255	2	1,5	0,75	10	45	1,2	14,8	4	1,45	5,09	10,4	10,74	11,1	11,49	12,36	1
3056256	2	1,5	0,75	12	45	1,2	16,8	4	1,45	4,46	12,47	12,88	13,32	13,79	14,85	1
3056257	2	1,5	0,75	14	50	1,2	18,8	4	1,45	3,97	14,54	15,02	15,53	16,09	17,34	1
3056258	2	1,5	0,75	16	50	1,2	20,8	4	1,45	3,58	16,6	17,16	17,75	18,39	19,82	1
3056259	2	1,5	0,75	18	55	1,2	22,8	4	1,45	3,25	18,67	19,3	19,97	20,69	22,31	1
3056260	2	1,5	0,75	20	55	1,2	24,8	4	1,45	2,98	20,74	21,44	22,18	22,99	-	1
3056261	2	1,5	0,75	22	60	1,2	26,8	4	1,45	2,75	22,81	23,58	24,4	25,29	-	1
3056262	2	1,5	0,75	25	65	1,2	29,8	4	1,45	2,47	25,91	26,79	27,73	28,74	-	1
3056263	2	1,5	0,75	30	70	1,2	34,8	4	1,45	2,11	31,08	32,13	33,27	34,49	-	1
3056264	2	1,6	0,8	4	45	1,3	8,6	4	1,55	8,72	4,2	4,32	4,45	4,58	4,89	1
3056265	2	1,6	0,8	8	45	1,3	12,6	4	1,55	5,81	8,33	8,6	8,88	9,18	9,87	1
3056266	2	1,6	0,8	12	45	1,3	16,6	4	1,55	4,35	12,47	12,88	13,31	13,78	14,84	1
3056267	2	1,6	0,8	16	50	1,3	20,6	4	1,55	3,47	16,6	17,15	17,75	18,38	19,81	1
3056268	2	1,6	0,8	20	55	1,3	24,6	4	1,55	2,89	20,74	21,43	22,18	22,98	-	1
3056269	2	2	1	2,5	45	1,6	6,3	4	1,95	10,46	2,64	2,7	2,76	2,83	2,98	1
3056270	2	2	1	3	45	1,6	6,8	4	1,95	9,61	3,16	3,23	3,32	3,4	3,6	1
3056271	2	2	1	3	45	1,6	10,6	6	1,95	11,7	3,16	3,23	3,32	3,4	3,6	1
3056272	2	2	1	4	45	1,6	7,8	4	1,95	8,25	4,19	4,3	4,42	4,55	4,85	1
3056273	2	2	1	4	45	1,6	11,6	6	1,95	10,64	4,19	4,3	4,42	4,55	4,85	1
3056274	2	2	1	5	45	1,6	8,8	4	1,95	7,23	5,23	5,37	5,53	5,7	6,09	1
3056275	2	2	1	6	45	1,6	9,8	4	1,95	6,43	6,26	6,44	6,64	6,85	7,33	1
3056276	2	2	1	6	45	1,6	13,6	6	1,95	9	6,26	6,44	6,64	6,85	7,33	1
3056277	2	2	1	8	45	1,6	11,8	4	1,95	5,26	8,33	8,58	8,86	9,15	9,82	1
3056278	2	2	1	8	45	1,6	15,6	6	1,95	7,79	8,33	8,58	8,86	9,15	9,82	1
3056279	2	2	1	10	45	1,6	13,8	4	1,95	4,45	10,39	10,72	11,07	11,45	12,31	1
3056280	2	2	1	10	50	1,6	17,6	6	1,95	6,87	10,39	10,72	11,07	11,45	12,31	1
3056281	2	2	1	12	45	1,6	15,8	4	1,95	3,86	12,46	12,86	13,29	13,75	14,79	1
3056282	2	2	1	12	50	1,6	19,6	6	1,95	6,14	12,46	12,86	13,29	13,75	14,79	1
3056283	2	2	1	13	50	1,6	16,8	4	1,95	3,61	13,5	13,93	14,4	14,9	16,04	1

Milling | Solid carbide

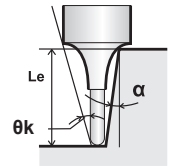


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- 2 flutes, long neck, ball nose
- 261 sizes



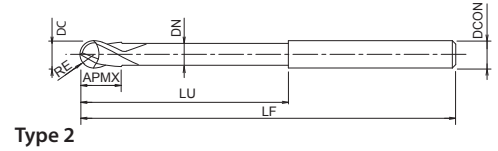
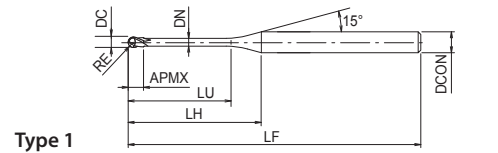
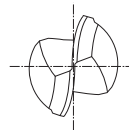
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	$\theta_k$	Le ( $\alpha=0,5^\circ$ )	Le ( $\alpha=1^\circ$ )	Le ( $\alpha=1,5^\circ$ )	Le ( $\alpha=2^\circ$ )	Le ( $\alpha=3^\circ$ )	Type
3056284	2	2	1	14	50	1,6	17,8	4	1,95	3,4	14,53	15	15,51	16,05	17,28	1
3056285	2	2	1	16	50	1,6	19,8	4	1,95	3,04	16,6	17,14	17,72	18,35	19,76	1
3056286	2	2	1	16	55	1,6	23,6	6	1,95	5,06	16,6	17,14	17,72	18,35	19,76	1
3056287	2	2	1	18	55	1,6	21,8	4	1,95	2,75	18,66	19,28	19,94	20,65	-	1
3056288	2	2	1	20	55	1,6	23,8	4	1,95	2,51	20,73	21,42	22,16	22,95	-	1
3056289	2	2	1	20	60	1,6	27,6	6	1,95	4,31	20,73	21,42	22,16	22,95	24,74	1
3056290	2	2	1	22	60	1,6	25,8	4	1,95	2,31	22,8	23,56	24,37	25,25	-	1
3056291	2	2	1	25	65	1,6	28,8	4	1,95	2,06	25,9	26,77	27,7	28,7	-	1
3056292	2	2	1	25	65	1,6	32,6	6	1,95	3,63	25,9	26,77	27,7	28,7	30,95	1
3056293	2	2	1	30	70	1,6	33,8	4	1,95	1,75	31,07	32,12	33,24	-	-	1
3056294	2	2	1	35	70	1,6	38,8	4	1,95	1,52	36,24	37,46	38,78	-	-	1
3056295	2	2	1	40	80	1,6	43,8	4	1,95	1,34	41,4	42,81	-	-	-	1
3056296	2	2,5	1,25	6	45	2	9,1	4	2,35	5,44	6,44	6,63	6,82	7,03	7,51	1
3056297	2	2,5	1,25	8	45	2	11,1	4	2,35	4,35	8,51	8,77	9,04	9,33	9,99	1
3056298	2	2,5	1,25	10	45	2	13,1	4	2,35	3,62	10,58	10,9	11,25	11,63	12,48	1
3056299	2	2,5	1,25	15	50	2	18,1	4	2,35	2,55	15,75	16,25	16,8	17,38	-	1
3056300	2	2,5	1,25	20	55	2	23,1	4	2,35	1,97	20,92	21,6	22,34	-	-	1
3056301	2	2,5	1,25	25	65	2	28,1	4	2,35	1,61	26,08	26,95	27,88	-	-	1
3056302	2	2,5	1,25	30	70	2	33,1	4	2,35	1,35	31,25	32,3	-	-	-	1
3056303	2	2,5	1,25	35	70	2	38,1	4	2,35	1,17	36,42	37,65	-	-	-	1
3056304	2	3	1,5	6	50	2,4	11,9	6	2,85	8,15	6,44	6,61	6,79	7	7,45	1
3056305	2	3	1,5	8	50	2,4	13,9	6	2,85	6,87	8,5	8,75	9,01	9,29	9,93	1
3056306	2	3	1,5	10	50	2,4	15,9	6	2,85	5,93	10,57	10,89	11,23	11,59	12,42	1
3056307	2	3	1,5	12	55	2,4	17,9	6	2,85	5,22	12,64	13,03	13,44	13,89	14,91	1
3056308	2	3	1,5	13	55	2,4	18,9	6	2,85	4,92	13,67	14,1	14,55	15,04	16,15	1
3056309	2	3	1,5	14	55	2,4	19,9	6	2,85	4,66	14,71	15,17	15,66	16,19	17,39	1
3056310	2	3	1,5	15	55	2,4	20,9	6	2,85	4,42	15,74	16,24	16,77	17,34	18,63	1
3056311	2	3	1,5	16	55	2,4	21,9	6	2,85	4,2	16,77	17,31	17,88	18,49	19,88	1
3056312	2	3	1,5	20	60	2,4	25,9	6	2,85	3,52	20,91	21,58	22,31	23,09	24,85	1
3056313	2	3	1,5	25	65	2,4	30,9	6	2,85	2,92	26,08	26,93	27,85	28,84	-	1
3056314	2	3	1,5	30	70	2,4	35,9	6	2,85	2,5	31,24	32,28	33,39	34,59	-	1
3056315	2	3	1,5	35	80	2,4	40,9	6	2,85	2,18	36,41	37,63	38,94	40,34	-	1
3056316	2	3	1,5	40	90	2,4	45,9	6	2,85	1,94	41,58	42,98	44,48	-	-	1
3056317	2	3,5	1,75	10	50	2,8	14,9	6	3,35	5,38	10,56	10,87	11,2	11,56	12,36	1
3056318	2	3,5	1,75	15	55	2,8	19,9	6	3,35	3,92	15,73	16,22	16,74	17,31	18,58	1
3056319	2	3,5	1,75	16	55	2,8	20,9	6	3,35	3,72	16,76	17,29	17,85	18,46	19,82	1
3056320	2	3,5	1,75	20	60	2,8	24,9	6	3,35	3,08	20,9	21,57	22,28	23,06	24,79	1
3056321	2	3,5	1,75	25	65	2,8	29,9	6	3,35	2,54	26,07	26,92	27,83	28,81	-	1
3056322	2	3,5	1,75	30	70	2,8	34,9	6	3,35	2,16	31,24	32,26	33,37	34,55	-	1
3056323	2	3,5	1,75	35	80	2,8	39,9	6	3,35	1,88	36,4	37,61	38,91	-	-	1
3056324	2	3,5	1,75	40	90	2,8	44,9	6	3,35	1,66	41,57	42,96	44,45	-	-	1
3056325	2	3,5	1,75	45	90	2,8	49,9	6	3,35	1,49	46,74	48,31	-	-	-	1
3056326	2	4	2	8	55	3,2	-	4	3,85	-	-	-	-	-	-	2
3056327	2	4	2	8	55	3,2	12	6	3,85	5,65	8,49	8,71	8,96	9,22	9,81	1
3056328	2	4	2	10	60	3,2	14	6	3,85	4,73	10,55	10,85	11,17	11,52	12,3	1
3056329	2	4	2	12	60	3,2	16	6	3,85	4,07	12,62	12,99	13,39	13,82	14,79	1

Milling | Solid carbide

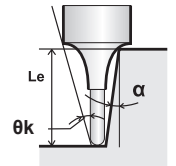


# AE-LNBD-H NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DUOREY coating
- For hardened material up to 70HRC
- 2 flutes, long neck, ball nose
- 261 sizes



EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=3°)	Type
3056330	2	4	2	13	60	3,2	17	6	3,85	3,8	13,65	14,06	14,5	14,97	16,03	1
3056331	2	4	2	14	60	3,2	18	6	3,85	3,56	14,69	15,13	15,61	16,12	17,27	1
3056332	2	4	2	15	60	3,2	19	6	3,85	3,36	15,72	16,2	16,72	17,27	18,52	1
3056333	2	4	2	16	60	3,2	20	6	3,85	3,17	16,76	17,27	17,82	18,42	19,76	1
3056334	2	4	2	20	65	3,2	24	6	3,85	2,6	20,89	21,55	22,26	23,02	-	1
3056335	2	4	2	25	70	3,2	29	6	3,85	2,12	26,06	26,9	27,8	28,77	-	1
3056336	2	4	2	30	80	3,2	34	6	3,85	1,79	31,23	32,25	33,34	-	-	1
3056337	2	4	2	35	80	3,2	39	6	3,85	1,55	36,4	37,6	38,88	-	-	1
3056338	2	4	2	40	90	3,2	44	6	3,85	1,37	41,56	42,94	-	-	-	1
3056339	2	4	2	45	90	3,2	49	6	3,85	1,22	46,73	48,29	-	-	-	1
3056340	2	4	2	50	100	3,2	54	6	3,85	1,11	51,9	53,64	-	-	-	1
3056341	2	5	2,5	10	60	4	12,1	6	4,85	2,95	10,54	10,82	11,12	11,45	-	1
3056342	2	5	2,5	15	60	4	17,1	6	4,85	1,95	15,71	16,17	16,66	-	-	1
3056343	2	5	2,5	20	70	4	22,1	6	4,85	1,46	20,87	21,52	-	-	-	1
3056344	2	5	2,5	25	70	4	27,1	6	4,85	1,17	26,04	26,86	-	-	-	1
3056345	2	5	2,5	30	80	4	32,1	6	4,85	0,97	31,21	-	-	-	-	1
3056346	2	5	2,5	35	80	4	37,1	6	4,85	0,83	36,38	-	-	-	-	1
3056347	2	5	2,5	40	90	4	42,1	6	4,85	0,73	41,55	-	-	-	-	1
3056348	2	5	2,5	45	100	4	47,1	6	4,85	0,65	46,72	-	-	-	-	1
3056349	2	5	2,5	50	100	4	52,1	6	4,85	0,58	51,88	-	-	-	-	1
3056350	2	6	3	10	60	4,8	-	6	5,85	-	-	-	-	-	-	2
3056351	2	6	3	12	60	4,8	-	6	5,85	-	-	-	-	-	-	2
3056352	2	6	3	15	65	4,8	-	6	5,85	-	-	-	-	-	-	2
3056353	2	6	3	20	70	4,8	-	6	5,85	-	-	-	-	-	-	2
3056354	2	6	3	25	70	4,8	-	6	5,85	-	-	-	-	-	-	2
3056355	2	6	3	30	80	4,8	-	6	5,85	-	-	-	-	-	-	2
3056356	2	6	3	35	80	4,8	-	6	5,85	-	-	-	-	-	-	2
3056357	2	6	3	40	90	4,8	-	6	5,85	-	-	-	-	-	-	2
3056358	2	6	3	45	100	4,8	-	6	5,85	-	-	-	-	-	-	2
3056359	2	6	3	50	120	4,8	-	6	5,85	-	-	-	-	-	-	2
3056360	2	6	3	60	120	4,8	-	6	5,85	-	-	-	-	-	-	2

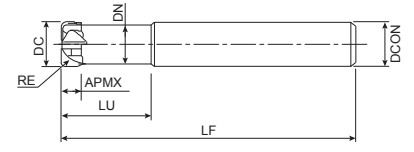
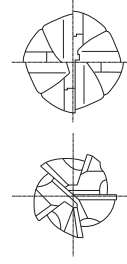
Milling | Solid carbide





# WXS-CRE

Milling | Solid carbide



- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC and stainless steels
- Multi flute with super radius

<b>P</b> ● ~45 HRC	<b>P</b> ● ~55 HRC	<b>M</b> ● ~35 HRC	<b>K</b> ● ~350 HB	<b>S</b> ○	<b>H</b> ● ~60 HRC	<b>H</b> ● ~65 HRC
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<b>CARBIDE</b>	<b>WXS</b>	<b>SHRINK FIT</b>		 0~-0.03
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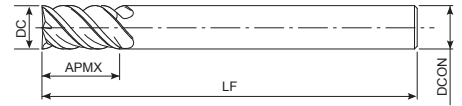
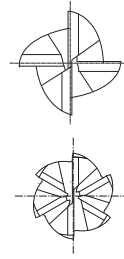
EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
48106421	4	2	0,5	8	50	0,8	6	1,8
48106433	5	3	0,75	12	55	1,3	6	2,7
48106445	5	4	1	12	55	1,6	6	3,6
48106467	5	6	1,5	12	90	2,4	6	5,4
48106489	5	8	2	16	100	3,2	8	7,2
48106509	5	10	2	20	100	4	10	9
48106533	5	12	3	24	110	4,8	12	11

Milling | Solid carbide



# WXS-EMS

Milling | Solid carbide



- Carbide end mill with WXS coating
- For hardened steels and stainless steels
- Multi flute, high speed machining



EDP	ZEFP	DC	LF	APMX	DCON
3041010	4	1	60	2,5	6
3041015	4	1,5	60	4	6
3041020	4	2	60	6	6
3041025	4	2,5	60	8	6
3041030	4	3	60	8	6
3041035	4	3,5	60	10	6
3041040	4	4	60	11	6
3041045	4	4,5	60	11	6
3041050	4	5	60	13	6
3041055	4	5,5	60	13	6
3041060	6	6	60	13	6
3041080	6	8	70	19	8
3041100	6	10	80	22	10
3041120	6	12	90	26	12
3041140	6	14	100	26	16
3041160	6	16	105	32	16
3041180	6	18	110	32	16
3041200	6	20	110	32	20

Milling | Solid carbide

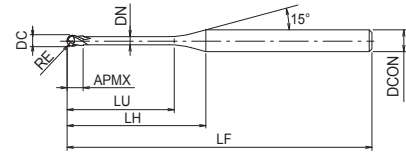
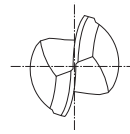






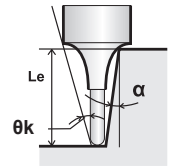
# WXS-LN-EBD

Milling | Solid carbide



- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC and stainless steels
- 2 flutes, long neck, ball nose
- 189 sizes

Material compatibility icons: P (~45 HRC), P (~55 HRC), M (~35 HRC), K (~350 HB), N, S, H (~60 HRC), H (~65 HRC).



Product features: CARBIDE, WXS coating, 30° angle, SHRINK FIT, ±0.005 tolerance, C.1044.

EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3050100	2	0,1	0,05	0,3	45	0,08	7,5	4	0,09	14,51	0,31	0,32	0,33	0,34	0,35	0,36
3050101	2	0,1	0,05	0,5	45	0,08	7,7	4	0,09	14,31	0,42	0,44	0,45	0,47	0,48	0,5
3050201	2	0,2	0,1	0,5	45	0,16	7,5	4	0,18	14,16	0,53	0,55	0,57	0,59	0,61	0,63
3049921	2	0,2	0,1	0,75	45	0,16	7,8	4	0,18	13,72	0,79	0,82	0,85	0,88	0,91	0,94
3050202	2	0,2	0,1	1	45	0,16	8	4	0,18	13,31	1,05	1,09	1,13	1,17	1,21	1,26
3049922	2	0,2	0,1	1,25	45	0,16	8,3	4	0,18	12,92	1,31	1,36	1,41	1,46	1,51	1,57
3050203	2	0,2	0,1	1,5	45	0,16	8,5	4	0,18	12,56	1,57	1,63	1,68	1,74	1,81	1,88
3049923	2	0,2	0,1	1,75	45	0,16	8,8	4	0,18	12,21	1,83	1,9	1,96	2,03	2,11	2,19
3050204	2	0,2	0,1	2	45	0,16	9	4	0,18	11,88	2,09	2,16	2,24	2,32	2,4	2,5
3050205	2	0,2	0,1	2,5	45	0,16	9,5	4	0,18	11,28	2,61	2,7	2,79	2,89	3	3,12
3050206	2	0,2	0,1	3	45	0,16	10	4	0,18	10,73	3,13	3,23	3,35	3,47	3,6	3,74
3050301	2	0,3	0,15	0,6	45	0,24	7,4	4	0,28	14,03	0,63	0,65	0,68	0,7	0,72	0,75
3050302	2	0,3	0,15	1	45	0,24	7,8	4	0,28	13,34	1,05	1,09	1,12	1,16	1,2	1,24
3049932	2	0,3	0,15	1,25	45	0,24	8,1	4	0,28	12,94	1,31	1,36	1,4	1,45	1,5	1,55
3050303	2	0,3	0,15	1,5	45	0,24	8,3	4	0,28	12,57	1,57	1,63	1,68	1,74	1,8	1,87
3049933	2	0,3	0,15	1,75	45	0,24	8,6	4	0,28	12,21	1,83	1,89	1,96	2,02	2,1	2,18
3050304	2	0,3	0,15	2	45	0,24	8,8	4	0,28	11,87	2,09	2,16	2,23	2,31	2,4	2,49
3049934	2	0,3	0,15	2,25	45	0,24	9,1	4	0,28	11,56	2,35	2,43	2,51	2,6	2,69	2,8
3050305	2	0,3	0,15	2,5	45	0,24	9,3	4	0,28	11,25	2,61	2,69	2,79	2,89	2,99	3,11
3050306	2	0,3	0,15	3	45	0,24	9,8	4	0,28	10,69	3,13	3,23	3,34	3,46	3,59	3,73
3050307	2	0,3	0,15	3,5	45	0,24	10,3	4	0,28	10,19	3,64	3,76	3,9	4,04	4,19	4,35
3050308	2	0,3	0,15	4	45	0,24	10,8	4	0,28	9,72	4,16	4,3	4,45	4,61	4,78	4,97
3050309	2	0,3	0,15	4,5	45	0,24	11,3	4	0,28	9,3	4,68	4,83	5	5,19	5,38	5,59
3050310	2	0,3	0,15	5	45	0,24	11,8	4	0,28	8,91	5,19	5,37	5,56	5,76	5,98	6,22
3050401	2	0,4	0,2	0,8	45	0,3	7,4	4	0,37	13,74	0,83	0,86	0,88	0,91	0,94	0,97
3050402	2	0,4	0,2	1	45	0,3	7,6	4	0,37	13,39	1,04	1,07	1,11	1,14	1,18	1,22
3050403	2	0,4	0,2	1,5	45	0,3	8,1	4	0,37	12,59	1,56	1,61	1,66	1,72	1,77	1,84
3050404	2	0,4	0,2	2	45	0,3	8,6	4	0,37	11,88	2,08	2,14	2,21	2,29	2,37	2,46
3050405	2	0,4	0,2	2,5	45	0,3	9,1	4	0,37	11,24	2,6	2,68	2,77	2,87	2,97	3,08
3050406	2	0,4	0,2	3	45	0,3	9,6	4	0,37	10,67	3,11	3,21	3,32	3,44	3,57	3,7
3050407	2	0,4	0,2	3,5	45	0,3	10,1	4	0,37	10,15	3,63	3,75	3,88	4,02	4,16	4,33
3050408	2	0,4	0,2	4	45	0,3	10,6	4	0,37	9,68	4,15	4,28	4,43	4,59	4,76	4,95
3050409	2	0,4	0,2	4,5	45	0,3	11,1	4	0,37	9,25	4,66	4,82	4,99	5,17	5,36	5,57
3050410	2	0,4	0,2	5	45	0,3	11,6	4	0,37	8,86	5,18	5,35	5,54	5,74	5,96	6,19
3050411	2	0,4	0,2	5,5	45	0,3	12,1	4	0,37	8,5	5,7	5,89	6,09	6,32	6,55	6,81
3050412	2	0,4	0,2	6	45	0,3	12,6	4	0,37	8,16	6,21	6,42	6,65	6,89	7,15	7,43
3050500	2	0,5	0,25	1	45	0,4	7,6	4	0,45	13,45	1,03	1,06	1,09	1,12	1,15	1,19
3050501	2	0,5	0,25	1,5	45	0,4	8,1	4	0,45	12,62	1,55	1,59	1,64	1,69	1,75	1,81
3050502	2	0,5	0,25	2	45	0,4	8,6	4	0,45	11,89	2,06	2,13	2,2	2,27	2,35	2,43
3049952	2	0,5	0,25	2,5	45	0,4	9,1	4	0,45	11,23	2,58	2,66	2,75	2,84	2,94	3,05
3050503	2	0,5	0,25	3	45	0,4	9,6	4	0,45	10,65	3,1	3,2	3,3	3,42	3,54	3,68
3049953	2	0,5	0,25	3,5	45	0,4	10,1	4	0,45	10,12	3,61	3,73	3,86	3,99	4,14	4,3
3050504	2	0,5	0,25	4	45	0,4	10,6	4	0,45	9,64	4,13	4,27	4,41	4,57	4,74	4,92
3049954	2	0,5	0,25	4,5	45	0,4	11,1	4	0,45	9,2	4,65	4,8	4,97	5,14	5,33	5,54
3050505	2	0,5	0,25	5	45	0,4	11,6	4	0,45	8,8	5,17	5,34	5,52	5,72	5,93	6,16
3049955	2	0,5	0,25	5,5	45	0,4	12,1	4	0,45	8,43	5,68	5,87	6,07	6,29	6,53	6,78

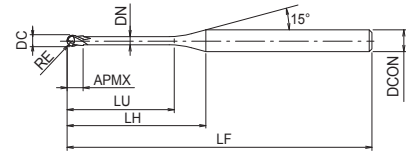
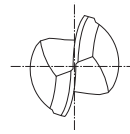
Milling | Solid carbide



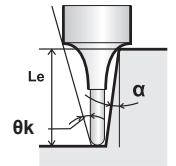
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# WXS-LN-EBD

Milling | Solid carbide



- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC and stainless steels
- 2 flutes, long neck, ball nose
- 189 sizes

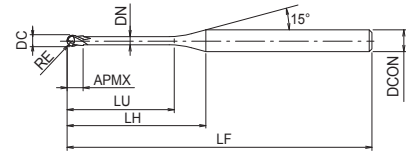
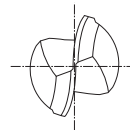


Milling | Solid carbide

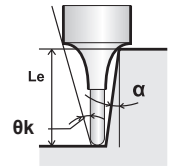
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3050506	2	0,5	0,25	6	45	0,4	12,6	4	0,45	8,1	6,2	6,41	6,63	6,87	7,13	7,41
3050507	2	0,5	0,25	7	45	0,4	13,6	4	0,45	7,49	7,23	7,48	7,74	8,02	8,32	8,65
3050508	2	0,5	0,25	8	45	0,4	14,6	4	0,45	6,98	8,27	8,55	8,85	9,17	9,52	9,89
3050509	2	0,5	0,25	9	45	0,4	15,6	4	0,45	6,52	9,3	9,62	9,95	10,32	10,71	11,14
3050510	2	0,5	0,25	10	45	0,4	16,6	4	0,45	6,13	10,33	10,68	11,06	11,47	11,9	12,38
3050601	2	0,6	0,3	1,2	45	0,5	7,6	4	0,55	13,14	1,24	1,27	1,3	1,34	1,38	1,43
3050602	2	0,6	0,3	2	45	0,5	8,4	4	0,55	11,88	2,06	2,12	2,19	2,26	2,34	2,42
3049962	2	0,6	0,3	2,5	45	0,5	8,9	4	0,55	11,21	2,58	2,66	2,74	2,84	2,94	3,04
3050603	2	0,6	0,3	3	45	0,5	9,4	4	0,55	10,61	3,1	3,19	3,3	3,41	3,53	3,66
3049963	2	0,6	0,3	3,5	45	0,5	9,9	4	0,55	10,07	3,61	3,73	3,85	3,99	4,13	4,29
3050604	2	0,6	0,3	4	45	0,5	10,4	4	0,55	9,58	4,13	4,26	4,41	4,56	4,73	4,91
3049964	2	0,6	0,3	4,5	45	0,5	10,9	4	0,55	9,13	4,65	4,8	4,96	5,14	5,32	5,53
3050605	2	0,6	0,3	5	45	0,5	11,4	4	0,55	8,73	5,16	5,33	5,51	5,71	5,92	6,15
3049965	2	0,6	0,3	5,5	45	0,5	11,9	4	0,55	8,36	5,68	5,87	6,07	6,29	6,52	6,77
3050606	2	0,6	0,3	6	45	0,5	12,4	4	0,55	8,02	6,2	6,4	6,62	6,86	7,12	7,39
3049966	2	0,6	0,3	6,5	45	0,5	12,9	4	0,55	7,7	6,71	6,94	7,18	7,44	7,71	8,02
3050607	2	0,6	0,3	7	45	0,5	13,4	4	0,55	7,41	7,23	7,47	7,73	8,01	8,31	8,64
3049967	2	0,6	0,3	7,5	45	0,5	13,9	4	0,55	7,14	7,75	8,01	8,29	8,59	8,91	9,26
3050608	2	0,6	0,3	8	45	0,5	14,4	4	0,55	6,89	8,26	8,54	8,84	9,16	9,51	9,88
3049968	2	0,6	0,3	8,5	45	0,5	14,9	4	0,55	6,66	8,78	9,08	9,39	9,74	10,1	10,5
3050609	2	0,6	0,3	9	45	0,5	15,4	4	0,55	6,44	9,3	9,61	9,95	10,31	10,7	11,12
3049969	2	0,6	0,3	9,5	45	0,5	15,9	4	0,55	6,23	9,81	10,15	10,5	10,89	11,3	11,75
3050610	2	0,6	0,3	10	45	0,5	16,4	4	0,55	6,04	10,33	10,68	11,06	11,46	11,9	12,37
3050611	2	0,6	0,3	11	50	0,5	17,4	4	0,55	5,69	11,37	11,75	12,16	12,61	13,09	13,61
3050612	2	0,6	0,3	12	50	0,5	18,4	4	0,55	5,38	12,4	12,82	13,27	13,76	14,28	14,85
3050802	2	0,8	0,4	2	45	0,6	8,1	4	0,75	11,86	2,06	2,12	2,18	2,25	2,32	2,4
3050803	2	0,8	0,4	3	45	0,6	9,1	4	0,75	10,52	3,09	3,19	3,29	3,4	3,51	3,64
3050804	2	0,8	0,4	4	45	0,6	10,1	4	0,75	9,45	4,13	4,26	4,4	4,55	4,71	4,88
3050805	2	0,8	0,4	5	45	0,6	11,1	4	0,75	8,58	5,16	5,33	5,5	5,7	5,9	6,13
3050806	2	0,8	0,4	6	45	0,6	12,1	4	0,75	7,85	6,19	6,4	6,61	6,85	7,1	7,37
3050807	2	0,8	0,4	7	45	0,6	13,1	4	0,75	7,24	7,23	7,47	7,72	8	8,29	8,61
3050808	2	0,8	0,4	8	45	0,6	14,1	4	0,75	6,71	8,26	8,54	8,83	9,15	9,49	9,86
3050810	2	0,8	0,4	10	45	0,6	16,1	4	0,75	5,86	10,33	10,67	11,05	11,45	11,88	12,34
3050812	2	0,8	0,4	12	50	0,6	18,1	4	0,75	5,2	12,4	12,81	13,26	13,75	14,27	14,83
3051002	2	1	0,5	2	45	0,8	7,7	4	0,95	11,84	2,06	2,11	2,17	2,23	2,3	2,37
3051003	2	1	0,5	3	45	0,8	8,7	4	0,95	10,43	3,09	3,18	3,28	3,38	3,49	3,62
3051004	2	1	0,5	4	45	0,8	9,7	4	0,95	9,32	4,12	4,25	4,39	4,53	4,69	4,86
3051005	2	1	0,5	5	45	0,8	10,7	4	0,95	8,41	5,16	5,32	5,49	5,68	5,88	6,1
3051006	2	1	0,5	6	45	0,8	11,7	4	0,95	7,67	6,19	6,39	6,6	6,83	7,08	7,35
3051007	2	1	0,5	7	45	0,8	12,7	4	0,95	7,05	7,22	7,46	7,71	7,98	8,27	8,59
3051008	2	1	0,5	8	45	0,8	13,7	4	0,95	6,52	8,26	8,53	8,82	9,13	9,47	9,83
3051009	2	1	0,5	9	45	0,8	14,7	4	0,95	6,06	9,29	9,6	9,93	10,28	10,66	11,08
3051010	2	1	0,5	10	45	0,8	15,7	4	0,95	5,66	10,33	10,67	11,04	11,43	11,86	12,32
3051012	2	1	0,5	12	45	0,8	17,7	4	0,95	5,01	12,39	12,81	13,25	13,73	14,25	14,81
3051014	2	1	0,5	14	50	0,8	19,7	4	0,95	4,49	14,46	14,95	15,47	16,03	16,64	17,29
3051016	2	1	0,5	16	50	0,8	21,7	4	0,95	4,06	16,53	17,09	17,69	18,33	19,03	19,78

# WXS-LN-EBD

Milling | Solid carbide



- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC and stainless steels
- 2 flutes, long neck, ball nose
- 189 sizes



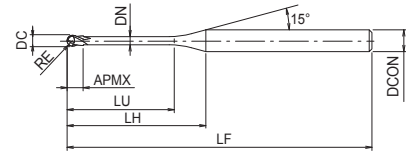
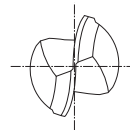
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3051018	2	1	0,5	18	55	0,8	23,7	4	0,95	3,71	18,59	19,23	19,9	20,63	21,41	22,26
3051020	2	1	0,5	20	55	0,8	25,7	4	0,95	3,42	20,66	21,36	22,12	22,93	23,8	24,75
3051022	2	1	0,5	22	60	0,8	27,7	4	0,95	3,17	22,73	23,5	24,33	25,23	26,19	27,24
3051202	2	1,2	0,6	2,4	45	1	7,8	4	1,15	11,03	2,51	2,61	2,7	2,78	2,87	2,96
3051204	2	1,2	0,6	4	45	1	9,4	4	1,15	9,07	4,19	4,34	4,48	4,62	4,78	4,95
3051206	2	1,2	0,6	6	45	1	11,4	4	1,15	7,41	6,27	6,48	6,69	6,92	7,17	7,44
3051208	2	1,2	0,6	8	45	1	13,4	4	1,15	6,26	8,35	8,62	8,91	9,22	9,56	9,93
3051210	2	1,2	0,6	10	45	1	15,4	4	1,15	5,42	10,42	10,76	11,13	11,52	11,95	12,41
3051212	2	1,2	0,6	12	45	1	17,4	4	1,15	4,78	12,49	12,9	13,34	13,82	14,34	14,9
3051214	2	1,2	0,6	14	50	1	19,4	4	1,15	4,27	14,55	15,04	15,56	16,12	16,73	17,38
3051216	2	1,2	0,6	16	50	1	21,4	4	1,15	3,86	16,62	17,18	17,78	18,42	19,12	19,87
3051218	2	1,2	0,6	18	55	1	23,4	4	1,15	3,52	18,69	19,32	19,99	20,72	21,51	22,36
3051220	2	1,2	0,6	20	55	1	25,4	4	1,15	3,24	20,75	21,46	22,21	23,02	23,9	24,84
3051503	2	1,5	0,75	3	45	1,2	7,9	4	1,45	10,01	3,13	3,25	3,35	3,45	3,56	3,67
3051504	2	1,5	0,75	4	45	1,2	8,9	4	1,45	8,8	4,18	4,33	4,46	4,6	4,75	4,92
3051506	2	1,5	0,75	6	45	1,2	10,9	4	1,45	7,08	6,27	6,47	6,68	6,9	7,14	7,4
3051508	2	1,5	0,75	8	45	1,2	12,9	4	1,45	5,92	8,34	8,61	8,9	9,2	9,53	9,89
3051510	2	1,5	0,75	10	45	1,2	14,9	4	1,45	5,09	10,41	10,75	11,11	11,5	11,92	12,38
3051512	2	1,5	0,75	12	45	1,2	16,9	4	1,45	4,46	12,48	12,89	13,33	13,8	14,31	14,86
3051514	2	1,5	0,75	14	50	1,2	18,9	4	1,45	3,96	14,55	15,03	15,55	16,1	16,7	17,35
3051516	2	1,5	0,75	16	50	1,2	20,9	4	1,45	3,57	16,62	17,17	17,76	18,4	19,09	19,83
3051518	2	1,5	0,75	18	55	1,2	22,9	4	1,45	3,25	18,68	19,31	19,98	20,7	21,48	22,32
3051520	2	1,5	0,75	20	55	1,2	24,9	4	1,45	2,98	20,75	21,45	22,19	23	23,87	-
3051522	2	1,5	0,75	22	60	1,2	26,9	4	1,45	2,75	22,82	23,59	24,41	25,3	26,26	-
3051530	2	1,5	0,75	30	70	1,2	34,9	4	1,45	2,1	31,09	32,14	33,28	34,5	-	-
3051608	2	1,6	0,8	8	45	1,3	12,7	4	1,55	5,8	8,34	8,61	8,89	9,19	9,52	9,88
3051612	2	1,6	0,8	12	45	1,3	16,7	4	1,55	4,34	12,48	12,89	13,32	13,79	14,3	14,85
3051616	2	1,6	0,8	16	50	1,3	20,7	4	1,55	3,47	16,61	17,16	17,76	18,39	19,08	19,82
3051620	2	1,6	0,8	20	55	1,3	24,7	4	1,55	2,89	20,75	21,44	22,19	22,99	23,86	-
3052004	2	2	1	4	45	1,6	8,3	4	1,95	7,87	4,23	4,44	4,66	4,86	5,06	5,26
3052006	2	2	1	6	45	1,6	10,3	4	1,95	6,19	6,36	6,67	6,96	7,23	7,49	7,76
3052008	2	2	1	8	45	1,6	12,3	4	1,95	5,1	8,48	8,87	9,22	9,55	9,88	10,24
3052010	2	2	1	10	45	1,6	14,3	4	1,95	4,33	10,59	11,05	11,45	11,85	12,27	12,73
3052012	2	2	1	12	45	1,6	16,3	4	1,95	3,77	12,69	13,21	13,67	14,15	14,66	15,22
3052014	2	2	1	14	50	1,6	18,3	4	1,95	3,33	14,78	15,36	15,89	16,45	17,05	17,7
3052016	2	2	1	16	50	1,6	20,3	4	1,95	2,98	16,88	17,51	18,1	18,75	19,44	-
3052018	2	2	1	18	55	1,6	22,3	4	1,95	2,7	18,96	19,65	20,32	21,04	21,83	-
3052020	2	2	1	20	55	1,6	24,3	4	1,95	2,47	21,05	21,78	22,54	23,34	-	-
3052022	2	2	1	22	60	1,6	26,3	4	1,95	2,27	23,13	23,92	24,75	25,64	-	-
3052025	2	2	1	25	65	1,6	29,3	4	1,95	2,03	26,24	27,13	28,08	29,09	-	-
3052030	2	2	1	30	70	1,6	34,3	4	1,95	1,73	31,42	32,48	33,62	-	-	-
3052035	2	2	1	35	70	1,6	39,3	4	1,95	1,5	36,59	37,83	39,16	-	-	-
3052040	2	2	1	40	80	1,6	44,3	4	1,95	1,33	41,76	43,18	-	-	-	-
3052510	2	2,5	1,25	10	45	2	13,1	4	2,35	3,63	10,46	10,85	11,21	11,59	11,99	12,43
3052515	2	2,5	1,25	15	50	2	18,1	4	2,35	2,55	15,67	16,21	16,75	17,34	17,96	-
3052520	2	2,5	1,25	20	55	2	23,1	4	2,35	1,97	20,87	21,56	22,3	-	-	-

Milling | Solid carbide

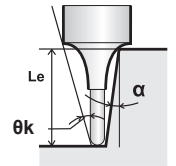


# WXS-LN-EBD

Milling | Solid carbide



- Carbide end mill with WXS coating
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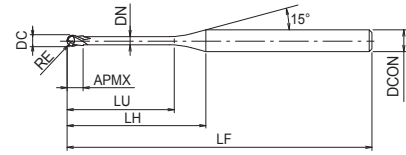
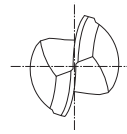
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3052525	2	2,5	1,25	25	65	2	28,1	4	2,35	1,6	26,04	26,91	27,84	-	-	-
3052530	2	2,5	1,25	30	70	2	33,1	4	2,35	1,35	31,21	32,26	-	-	-	-
3052535	2	2,5	1,25	35	70	2	38,1	4	2,35	1,17	36,38	37,61	-	-	-	-
3053006	2	3	1,5	6	50	2,4	11,9	6	2,85	8,17	6,25	6,49	6,72	6,95	7,17	7,4
3053008	2	3	1,5	8	50	2,4	13,9	6	2,85	6,88	8,35	8,67	8,97	9,25	9,55	9,88
3053010	2	3	1,5	10	50	2,4	15,9	6	2,85	5,94	10,44	10,83	11,19	11,55	11,94	12,37
3053012	2	3	1,5	12	55	2,4	17,9	6	2,85	5,22	12,53	12,98	13,4	13,85	14,33	14,86
3053014	2	3	1,5	14	55	2,4	19,9	6	2,85	4,66	14,62	15,13	15,62	16,15	16,72	17,34
3053015	2	3	1,5	15	55	2,4	20,9	6	2,85	4,42	15,66	16,2	16,73	17,3	17,92	18,59
3053016	2	3	1,5	16	55	2,4	21,9	6	2,85	4,21	16,7	17,26	17,84	18,45	19,11	19,83
3053020	2	3	1,5	20	60	2,4	25,9	6	2,85	3,52	20,86	21,54	22,27	23,05	23,89	24,8
3053025	2	3	1,5	25	65	2,4	30,9	6	2,85	2,92	26,04	26,89	27,81	28,8	29,86	-
3053030	2	3	1,5	30	70	2,4	35,9	6	2,85	2,5	31,2	32,24	33,35	34,55	-	-
3053035	2	3	1,5	35	80	2,4	40,9	6	2,85	2,18	36,37	37,59	38,89	40,3	-	-
3053040	2	3	1,5	40	90	2,4	45,9	6	2,85	1,94	41,54	42,94	44,43	-	-	-
3053515	2	3,5	1,75	15	55	2,8	20	6	3,35	3,93	15,65	16,18	16,7	17,26	17,87	18,53
3053520	2	3,5	1,75	20	60	2,8	25	6	3,35	3,08	20,85	21,53	22,24	23,01	23,84	24,74
3053525	2	3,5	1,75	25	65	2,8	30	6	3,35	2,54	26,03	26,87	27,78	28,76	29,82	-
3053530	2	3,5	1,75	30	70	2,8	35	6	3,35	2,16	31,2	32,22	33,32	34,51	-	-
3053535	2	3,5	1,75	35	80	2,8	40	6	3,35	1,88	36,36	37,57	38,87	-	-	-
3053540	2	3,5	1,75	40	90	2,8	45	6	3,35	1,66	41,53	42,92	44,41	-	-	-
3053545	2	3,5	1,75	45	90	2,8	50	6	3,35	1,49	46,7	48,27	-	-	-	-
3054008	2	4	2	8	55	3,2	12,1	6	3,85	5,67	8,33	8,63	8,91	9,18	9,46	9,77
3054010	2	4	2	10	60	3,2	14,1	6	3,85	4,74	10,42	10,79	11,13	11,48	11,85	12,25
3054012	2	4	2	12	60	3,2	16,1	6	3,85	4,07	12,51	12,95	13,35	13,78	14,24	14,74
3054015	2	4	2	15	60	3,2	19,1	6	3,85	3,36	15,64	16,16	16,67	17,23	17,82	18,47
3054016	2	4	2	16	60	3,2	20,1	6	3,85	3,18	16,68	17,23	17,78	18,38	19,02	19,71
3054020	2	4	2	20	65	3,2	24,1	6	3,85	2,6	20,84	21,51	22,22	22,98	23,8	-
3054025	2	4	2	25	70	3,2	29,1	6	3,85	2,12	26,02	26,86	27,76	28,72	-	-
3054030	2	4	2	30	80	3,2	34,1	6	3,85	1,79	31,19	32,21	33,3	-	-	-
3054035	2	4	2	35	80	3,2	39,1	6	3,85	1,55	36,36	37,55	38,84	-	-	-
3054040	2	4	2	40	90	3,2	44,1	6	3,85	1,36	41,52	42,9	-	-	-	-
3054045	2	4	2	45	90	3,2	49,1	6	3,85	1,22	46,69	48,25	-	-	-	-
3054050	2	4	2	50	100	3,2	54,1	6	3,85	1,1	51,86	53,6	-	-	-	-
3055010	2	5	2,5	10	60	4	12,2	6	4,85	2,96	10,4	10,75	11,08	11,4	11,75	-
3055015	2	5	2,5	15	60	4	17,2	6	4,85	1,96	15,62	16,13	16,62	-	-	-
3055020	2	5	2,5	20	70	4	22,2	6	4,85	1,46	20,82	21,47	-	-	-	-
3055025	2	5	2,5	25	70	4	27,2	6	4,85	1,16	26	26,82	-	-	-	-
3055030	2	5	2,5	30	80	4	32,2	6	4,85	0,97	31,17	-	-	-	-	-
3055035	2	5	2,5	35	80	4	37,2	6	4,85	0,83	36,34	-	-	-	-	-
3055040	2	5	2,5	40	90	4	42,2	6	4,85	0,72	41,51	-	-	-	-	-
3055045	2	5	2,5	45	100	4	47,2	6	4,85	0,64	46,68	-	-	-	-	-
3055050	2	5	2,5	50	100	4	52,2	6	4,85	0,58	51,84	-	-	-	-	-
3056012	2	6	3	12	60	4,8	-	6	5,85	-	-	-	-	-	-	-
3056020	2	6	3	20	70	4,8	-	6	5,85	-	-	-	-	-	-	-
3056025	2	6	3	25	70	4,8	-	6	5,85	-	-	-	-	-	-	-

Milling | Solid carbide

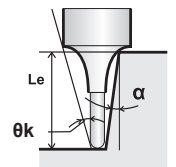


# WXS-LN-EBD

Milling | Solid carbide



- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC and stainless steels
- 2 flutes, long neck, ball nose
- 189 sizes



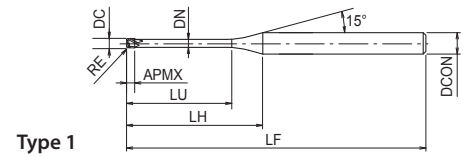
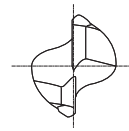
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)
3056030	2	6	3	30	80	4,8	-	6	5,85	-	-
3056035	2	6	3	35	80	4,8	-	6	5,85	-	-
3056040	2	6	3	40	90	4,8	-	6	5,85	-	-
3056045	2	6	3	45	100	4,8	-	6	5,85	-	-
3056050	2	6	3	50	120	4,8	-	6	5,85	-	-

Milling | Solid carbide

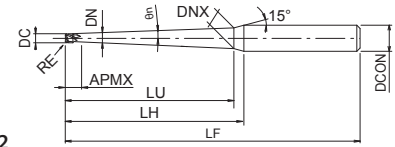


# WXS-CPR

Milling | Solid carbide



Type 1



Type 2

- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC and stainless steels
- 2 flutes, long and pencil neck, corner radius, for mould & die
- 247 sizes



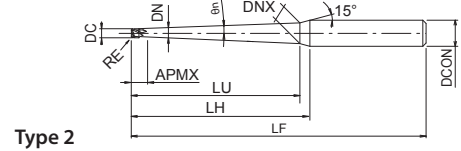
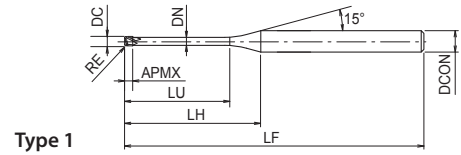
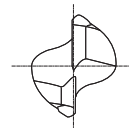
EDP	ZEFP	DC	RE	θn	LU	LF	APMX	LH	DCON	DN	DNX	Type
3100201	2	0,2	0,05	0	0,5	50	0,15	7,6	4	0,18	-	1
3100202	2	0,2	0,05	0	1	50	0,15	8,1	4	0,18	-	1
3100203	2	0,2	0,05	1	1	50	0,15	8,2	4	0,18	0,22	2
3100204	2	0,2	0,05	1	2	50	0,15	9,1	4	0,18	0,26	2
3100301	2	0,3	0,05	0	1	50	0,25	7,9	4	0,28	-	1
3100302	2	0,3	0,05	0	2	50	0,25	8,9	4	0,28	-	1
3100303	2	0,3	0,05	1	2	50	0,25	9	4	0,28	0,35	2
3100304	2	0,3	0,05	1	3	50	0,25	9,9	4	0,28	0,39	2
3100401	2	0,4	0,05	0	1	50	0,3	8,1	4	0,37	-	1
3100402	2	0,4	0,05	0	1,5	50	0,3	8,6	4	0,37	-	1
3100403	2	0,4	0,05	0	2	50	0,3	9,1	4	0,37	-	1
3100404	2	0,4	0,05	0	3	50	0,3	10,1	4	0,37	-	1
3100405	2	0,4	0,05	0	4	50	0,3	11,1	4	0,37	-	1
3100409	2	0,4	0,05	1	3	50	0,3	9,7	4	0,37	0,48	2
3100410	2	0,4	0,05	1	4	50	0,3	10,7	4	0,37	0,51	2
3100406	2	0,4	0,1	0	2	50	0,3	9,1	4	0,37	-	1
3100407	2	0,4	0,1	0	3	50	0,3	10,1	4	0,37	-	1
3100408	2	0,4	0,1	0	4	50	0,3	11,1	4	0,37	-	1
3100415	2	0,4	0,1	1	3	50	0,3	9,7	4	0,37	0,48	2
3100416	2	0,4	0,1	1	4	50	0,3	10,7	4	0,37	0,51	2
3100501	2	0,5	0,05	0	1	50	0,4	8,1	4	0,46	-	1
3100502	2	0,5	0,05	0	2	50	0,4	9,1	4	0,46	-	1
3100503	2	0,5	0,05	0	3	50	0,4	10,1	4	0,46	-	1
3100504	2	0,5	0,05	0	4	50	0,4	11,1	4	0,46	-	1
3100505	2	0,5	0,05	0	5	50	0,4	12,1	4	0,46	-	1
3100506	2	0,5	0,05	0	6	50	0,4	13,1	4	0,46	-	1
3100513	2	0,5	0,05	1	3	50	0,4	9,5	4	0,46	0,58	2
3100514	2	0,5	0,05	1	5	50	0,4	11,4	4	0,46	0,64	2
3100515	2	0,5	0,05	1	8	50	0,4	14,2	4	0,46	0,75	2
3100516	2	0,5	0,05	1	10	50	0,4	16,1	4	0,46	0,81	2
3100517	2	0,5	0,05	1	12	50	0,4	18	4	0,46	0,88	2
3100507	2	0,5	0,1	0	1	50	0,4	8,1	4	0,46	-	1
3100508	2	0,5	0,1	0	2	50	0,4	9,1	4	0,46	-	1
3100509	2	0,5	0,1	0	3	50	0,4	10,1	4	0,46	-	1
3100510	2	0,5	0,1	0	4	50	0,4	11,1	4	0,46	-	1
3100511	2	0,5	0,1	0	5	50	0,4	12,1	4	0,46	-	1
3100512	2	0,5	0,1	0	6	50	0,4	13,1	4	0,46	-	1
3100527	2	0,5	0,1	1	3	50	0,4	9,5	4	0,46	0,58	2
3100528	2	0,5	0,1	1	5	50	0,4	11,4	4	0,46	0,64	2
3100529	2	0,5	0,1	1	8	50	0,4	14,2	4	0,46	0,75	2
3100530	2	0,5	0,1	1	10	50	0,4	16,1	4	0,46	0,81	2
3100531	2	0,5	0,1	1	12	50	0,4	18	4	0,46	0,88	2
3100601	2	0,6	0,1	0	2	50	0,48	8,9	4	0,55	-	1
3100602	2	0,6	0,1	0	4	50	0,48	10,9	4	0,55	-	1
3100603	2	0,6	0,1	0	6	50	0,48	12,9	4	0,55	-	1
3100806	2	0,8	0,05	1	5	50	0,65	11,2	4	0,75	0,93	2

Milling | Solid carbide



# WXS-CPR

Milling | Solid carbide



- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC and stainless steels
- 2 flutes, long and pencil neck, corner radius, for mould & die
- 247 sizes



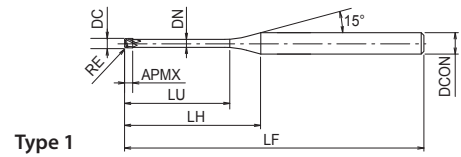
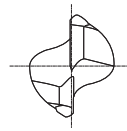
EDP	ZEFP	DC	RE	θn	LU	LF	APMX	LH	DCON	DN	DNX	Type
3100807	2	0,8	0,05	1	8	50	0,65	14	4	0,75	1,04	2
3100801	2	0,8	0,1	0	4	50	0,65	10,5	4	0,75	-	1
3100802	2	0,8	0,1	0	6	50	0,65	12,5	4	0,75	-	1
3100810	2	0,8	0,1	1	5	50	0,65	11,2	4	0,75	0,93	2
3100811	2	0,8	0,1	1	8	50	0,65	14	4	0,75	1,04	2
3100803	2	0,8	0,2	0	4	50	0,65	10,5	4	0,75	-	1
3100804	2	0,8	0,2	0	6	50	0,65	12,5	4	0,75	-	1
3100805	2	0,8	0,2	0	8	50	0,65	14,5	4	0,75	-	1
3100814	2	0,8	0,2	1	5	50	0,65	11,2	4	0,75	0,93	2
3100815	2	0,8	0,2	1	8	50	0,65	14	4	0,75	1,04	2
3101001	2	1	0,05	0	4	50	0,8	10,1	4	0,94	-	1
3101002	2	1	0,05	0	6	50	0,8	12,1	4	0,94	-	1
3101003	2	1	0,05	0	8	50	0,8	14,1	4	0,94	-	1
3101004	2	1	0,05	0	10	50	0,8	16,1	4	0,94	-	1
3101005	2	1	0,05	0	12	50	0,8	18,1	4	0,94	-	1
3101023	2	1	0,05	1	6	50	0,8	11,8	4	0,94	1,16	2
3101024	2	1	0,05	1	10	60	0,8	15,5	4	0,94	1,29	2
3101025	2	1	0,05	1	15	60	0,8	20,2	4	0,94	1,46	2
3101026	2	1	0,05	1	20	60	0,8	24,9	4	0,94	1,61	2
3101027	2	1	0,05	1	25	70	0,8	29,6	4	0,94	1,79	2
3101028	2	1	0,05	1	30	80	0,8	34,3	4	0,94	1,96	2
3101029	2	1	0,05	1	35	80	0,8	39	4	0,94	2,13	2
3101006	2	1	0,1	0	4	50	0,8	10,1	4	0,94	-	1
3101007	2	1	0,1	0	6	50	0,8	12,1	4	0,94	-	1
3101008	2	1	0,1	0	8	50	0,8	14,1	4	0,94	-	1
3101009	2	1	0,1	0	10	50	0,8	16,1	4	0,94	-	1
3101010	2	1	0,1	0	12	50	0,8	18,1	4	0,94	-	1
3101032	2	1	0,1	1	6	50	0,8	11,8	4	0,94	1,16	2
3101033	2	1	0,1	1	10	60	0,8	15,5	4	0,94	1,29	2
3101034	2	1	0,1	1	15	60	0,8	20,2	4	0,94	1,46	2
3101035	2	1	0,1	1	20	60	0,8	24,9	4	0,94	1,61	2
3101036	2	1	0,1	1	25	70	0,8	29,6	4	0,94	1,79	2
3101037	2	1	0,1	1	30	80	0,8	34,3	4	0,94	1,96	2
3101038	2	1	0,1	1	35	80	0,8	39	4	0,94	2,13	2
3101011	2	1	0,2	0	4	50	0,8	10,1	4	0,94	-	1
3101012	2	1	0,2	0	6	50	0,8	12,1	4	0,94	-	1
3101013	2	1	0,2	0	8	50	0,8	14,1	4	0,94	-	1
48253108	2	1	0,2	0	8	50	0,8	17,9	6	0,94	-	1
3101014	2	1	0,2	0	10	50	0,8	16,1	4	0,94	-	1
3101015	2	1	0,2	0	12	50	0,8	18,1	4	0,94	-	1
3101016	2	1	0,2	0	16	60	0,8	22,1	4	0,94	-	1
3101017	2	1	0,2	0	20	60	0,8	26,1	4	0,94	-	1
3101041	2	1	0,2	1	6	50	0,8	11,8	4	0,94	1,16	2
3101042	2	1	0,2	1	10	60	0,8	15,5	4	0,94	1,29	2
3101043	2	1	0,2	1	15	60	0,8	20,2	4	0,94	1,46	2
3101044	2	1	0,2	1	20	60	0,8	24,9	4	0,94	1,61	2

Milling | Solid carbide

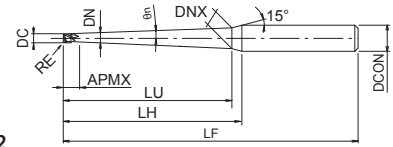


# WXS-CPR

Milling | Solid carbide



Type 1



Type 2

- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC and stainless steels
- 2 flutes, long and pencil neck, corner radius, for mould & die
- 247 sizes



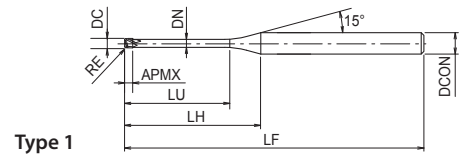
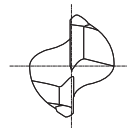
Milling | Solid carbide

EDP	ZEFP	DC	RE	θn	LU	LF	APMX	LH	DCON	DN	DNX	Type
3101045	2	1	0,2	1	25	70	0,8	29,6	4	0,94	1,79	2
3101046	2	1	0,2	1	30	80	0,8	34,3	4	0,94	1,96	2
3101047	2	1	0,2	1	35	80	0,8	39	4	0,94	2,13	2
3101018	2	1	0,3	0	4	50	0,8	10,1	4	0,94	-	1
3101019	2	1	0,3	0	6	50	0,8	12,1	4	0,94	-	1
3101020	2	1	0,3	0	8	50	0,8	14,1	4	0,94	-	1
3101021	2	1	0,3	0	10	50	0,8	16,1	4	0,94	-	1
3101022	2	1	0,3	0	12	50	0,8	18,1	4	0,94	-	1
3101050	2	1	0,3	1	6	50	0,8	11,8	4	0,94	1,16	2
3101051	2	1	0,3	1	10	60	0,8	15,5	4	0,94	1,29	2
3101052	2	1	0,3	1	15	60	0,8	20,2	4	0,94	1,46	2
3101053	2	1	0,3	1	20	60	0,8	24,9	4	0,94	1,61	2
3101054	2	1	0,3	1	25	70	0,8	29,6	4	0,94	1,79	2
3101055	2	1	0,3	1	30	80	0,8	34,3	4	0,94	1,96	2
3101056	2	1	0,3	1	35	80	0,8	39	4	0,94	2,13	2
3101201	2	1,2	0,2	0	6	50	1	11,7	4	1,14	-	1
3101202	2	1,2	0,2	0	8	50	1	13,7	4	1,14	-	1
3101203	2	1,2	0,2	0	10	50	1	15,7	4	1,14	-	1
3101204	2	1,2	0,3	0	6	50	1	11,7	4	1,14	-	1
3101205	2	1,2	0,3	0	8	50	1	13,7	4	1,14	-	1
3101206	2	1,2	0,3	0	10	50	1	15,7	4	1,14	-	1
3101511	2	1,5	0,1	1	10	60	1,2	14,6	4	1,43	1,78	2
3101512	2	1,5	0,1	1	15	60	1,2	19,3	4	1,43	1,94	2
3101513	2	1,5	0,1	1	20	60	1,2	24	4	1,43	2,1	2
3101514	2	1,5	0,1	1	25	70	1,2	28,7	4	1,43	2,27	2
3101515	2	1,5	0,1	1	30	80	1,2	33,4	4	1,43	2,45	2
3101501	2	1,5	0,2	0	6	50	1,2	11,1	4	1,43	-	1
3101502	2	1,5	0,2	0	8	50	1,2	13,1	4	1,43	-	1
3101503	2	1,5	0,2	0	10	50	1,2	15,1	4	1,43	-	1
3101504	2	1,5	0,2	0	12	50	1,2	17,1	4	1,43	-	1
3101505	2	1,5	0,2	0	16	50	1,2	21,1	4	1,43	-	1
3101518	2	1,5	0,2	1	10	60	1,2	14,6	4	1,43	1,78	2
3101519	2	1,5	0,2	1	15	60	1,2	19,3	4	1,43	1,94	2
3101520	2	1,5	0,2	1	20	60	1,2	24	4	1,43	2,1	2
3101521	2	1,5	0,2	1	25	70	1,2	28,7	4	1,43	2,27	2
3101522	2	1,5	0,2	1	30	80	1,2	33,4	4	1,43	2,45	2
3101506	2	1,5	0,3	0	6	50	1,2	11,1	4	1,43	-	1
3101507	2	1,5	0,3	0	8	50	1,2	13,1	4	1,43	-	1
3101508	2	1,5	0,3	0	10	50	1,2	15,1	4	1,43	-	1
3101509	2	1,5	0,3	0	12	50	1,2	17,1	4	1,43	-	1
3101510	2	1,5	0,3	0	16	50	1,2	21,1	4	1,43	-	1
3101525	2	1,5	0,3	1	10	60	1,2	14,6	4	1,43	1,78	2
3101526	2	1,5	0,3	1	15	60	1,2	19,3	4	1,43	1,94	2
3101527	2	1,5	0,3	1	20	60	1,2	24	4	1,43	2,1	2
3101528	2	1,5	0,3	1	25	70	1,2	28,7	4	1,43	2,27	2
3101529	2	1,5	0,3	1	30	80	1,2	33,4	4	1,43	2,45	2

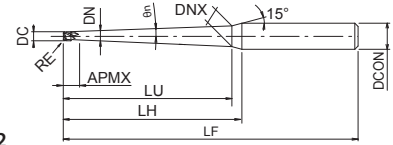


# WXS-CPR

Milling | Solid carbide



Type 1



Type 2

- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC and stainless steels
- 2 flutes, long and pencil neck, corner radius, for mould & die
- 247 sizes



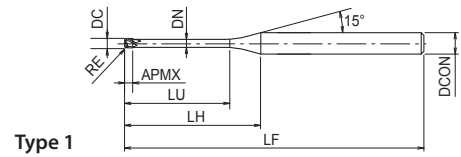
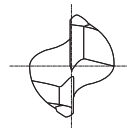
EDP	ZEFP	DC	RE	θn	LU	LF	APMX	LH	DCON	DN	DNX	Type
3102001	2	2	0,1	0	8	50	1,6	12,22	4	1,92	-	1
3102002	2	2	0,1	0	10	50	1,6	14,2	4	1,92	-	1
3102003	2	2	0,1	0	12	50	1,6	16,2	4	1,92	-	1
3102004	2	2	0,1	0	16	60	1,6	20,2	4	1,92	-	1
3102005	2	2	0,1	0	20	60	1,6	24,2	4	1,92	-	1
3102006	2	2	0,1	0	25	70	1,6	29,2	4	1,92	-	1
3102025	2	2	0,1	1	15	60	1,6	18,4	4	1,92	2,43	2
3102026	2	2	0,1	1	20	60	1,6	23,1	4	1,92	2,58	2
3102027	2	2	0,1	1	25	70	1,6	27,8	4	1,92	2,76	2
3102028	2	2	0,1	1	30	80	1,6	32,5	4	1,92	2,93	2
3102029	2	2	0,1	1	40	80	1,6	41,8	4	1,92	3,27	2
3102030	2	2	0,1	1	50	100	1,6	51,1	4	1,92	3,62	2
3102007	2	2	0,2	0	8	50	1,6	12,2	4	1,92	-	1
3102008	2	2	0,2	0	10	50	1,6	14,2	4	1,92	-	1
3102009	2	2	0,2	0	12	50	1,6	16,2	4	1,92	-	1
3102010	2	2	0,2	0	16	60	1,6	20,2	4	1,92	-	1
3102011	2	2	0,2	0	20	60	1,6	24,2	4	1,92	-	1
3102012	2	2	0,2	0	25	70	1,6	29,2	4	1,92	-	1
3102033	2	2	0,2	1	15	60	1,6	18,4	4	1,92	2,43	2
3102034	2	2	0,2	1	20	60	1,6	23,1	4	1,92	2,58	2
3102035	2	2	0,2	1	25	70	1,6	27,8	4	1,92	2,76	2
3102036	2	2	0,2	1	30	80	1,6	32,5	4	1,92	2,93	2
3102037	2	2	0,2	1	40	80	1,6	41,8	4	1,92	3,27	2
3102038	2	2	0,2	1	50	100	1,6	51,1	4	1,92	3,62	2
3102013	2	2	0,3	0	8	50	1,6	12,2	4	1,92	-	1
3102014	2	2	0,3	0	10	50	1,6	14,2	4	1,92	-	1
3102015	2	2	0,3	0	12	50	1,6	16,2	4	1,92	-	1
3102016	2	2	0,3	0	16	60	1,6	20,2	4	1,92	-	1
3102017	2	2	0,3	0	20	60	1,6	24,2	4	1,92	-	1
3102018	2	2	0,3	0	25	70	1,6	29,2	4	1,92	-	1
3102041	2	2	0,3	1	15	60	1,6	18,4	4	1,92	2,43	2
3102042	2	2	0,3	1	20	60	1,6	23,1	4	1,92	2,58	2
3102043	2	2	0,3	1	25	70	1,6	27,8	4	1,92	2,76	2
3102044	2	2	0,3	1	30	80	1,6	32,5	4	1,92	2,93	2
3102045	2	2	0,3	1	40	80	1,6	41,8	4	1,92	3,27	2
3102046	2	2	0,3	1	50	100	1,6	51,1	4	1,92	3,62	2
3102019	2	2	0,5	0	8	50	1,6	12,2	4	1,92	-	1
3102020	2	2	0,5	0	10	50	1,6	14,2	4	1,92	-	1
3102021	2	2	0,5	0	12	50	1,6	16,2	4	1,92	-	1
3102022	2	2	0,5	0	16	60	1,6	20,2	4	1,92	-	1
3102023	2	2	0,5	0	20	60	1,6	24,2	4	1,92	-	1
3102024	2	2	0,5	0	25	70	1,6	29,2	4	1,92	-	1
3102049	2	2	0,5	1	15	60	1,6	18,4	4	1,92	2,43	2
3102050	2	2	0,5	1	20	60	1,6	23,1	4	1,92	2,58	2
3102051	2	2	0,5	1	25	70	1,6	27,8	4	1,92	2,76	2
3102052	2	2	0,5	1	30	80	1,6	32,5	4	1,92	2,93	2

Milling | Solid carbide

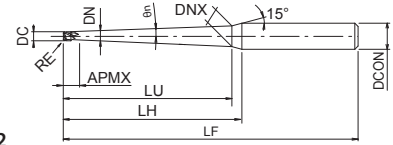


# WXS-CPR

Milling | Solid carbide



Type 1



Type 2

- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC and stainless steels
- 2 flutes, long and pencil neck, corner radius, for mould & die
- 247 sizes



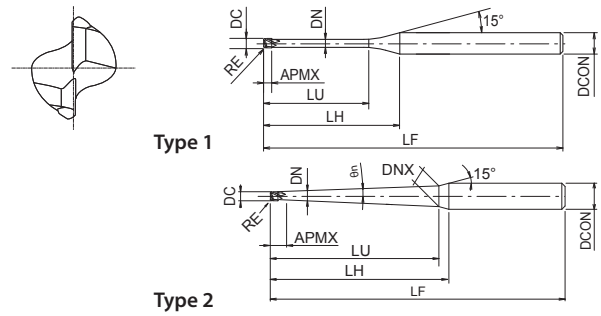
EDP	ZEFP	DC	RE	θn	LU	LF	APMX	LH	DCON	DN	DNX	Type
3102053	2	2	0,5	1	40	80	1,6	41,8	4	1,92	3,27	2
3102054	2	2	0,5	1	50	100	1,6	51,1	4	1,92	3,62	2
3102501	2	2,5	0,2	0	10	50	2,2	13,2	4	2,4	-	1
3102502	2	2,5	0,2	0	20	60	2,2	23,2	4	2,4	-	1
3102503	2	2,5	0,2	0	30	70	2,2	33,2	4	2,4	-	1
3102504	2	2,5	0,5	0	10	50	2,2	13,2	4	2,4	-	1
3102505	2	2,5	0,5	0	20	60	2,2	23,2	4	2,4	-	1
3102506	2	2,5	0,5	0	30	70	2,2	33,2	4	2,4	-	1
3103001	2	3	0,2	0	8	60	2,5	13,9	6	2,85	-	1
3103002	2	3	0,2	0	12	60	2,5	17,9	6	2,85	-	1
3103003	2	3	0,2	0	16	60	2,5	21,9	6	2,85	-	1
3103004	2	3	0,2	0	20	70	2,5	25,9	6	2,85	-	1
3103005	2	3	0,2	0	25	70	2,5	30,9	6	2,85	-	1
3103006	2	3	0,2	0	30	70	2,5	35,9	6	2,85	-	1
3103007	2	3	0,2	0	35	80	2,5	40,9	6	2,85	-	1
3103020	2	3	0,2	1	15	60	2,5	20,3	6	2,85	3,4	2
3103021	2	3	0,2	1	20	60	2,5	25	6	2,85	3,55	2
3103022	2	3	0,2	1	30	80	2,5	34,4	6	2,85	3,9	2
3103023	2	3	0,2	1	40	80	2,5	43,8	6	2,85	4,24	2
3103024	2	3	0,2	1	50	100	2,5	53,1	6	2,85	4,59	2
3103025	2	3	0,2	1	60	110	2,5	62,5	6	2,85	4,94	2
3103008	2	3	0,3	0	12	60	2,5	17,9	6	2,85	-	1
3103009	2	3	0,3	0	16	60	2,5	21,9	6	2,85	-	1
3103010	2	3	0,3	0	20	70	2,5	25,9	6	2,85	-	1
3103011	2	3	0,3	0	25	70	2,5	30,9	6	2,85	-	1
3103012	2	3	0,3	0	30	70	2,5	35,9	6	2,85	-	1
3103013	2	3	0,3	0	35	80	2,5	40,9	6	2,85	-	1
3103014	2	3	0,5	0	12	60	2,5	17,9	6	2,85	-	1
3103015	2	3	0,5	0	16	60	2,5	21,9	6	2,85	-	1
3103016	2	3	0,5	0	20	70	2,5	25,9	6	2,85	-	1
3103017	2	3	0,5	0	25	70	2,5	30,9	6	2,85	-	1
3103018	2	3	0,5	0	30	70	2,5	35,9	6	2,85	-	1
3103019	2	3	0,5	0	35	80	2,5	40,9	6	2,85	-	1
3103026	2	3	0,5	1	15	60	2,5	20,3	6	2,85	3,4	2
3103027	2	3	0,5	1	20	60	2,5	25	6	2,85	3,55	2
3103028	2	3	0,5	1	30	80	2,5	34,4	6	2,85	3,9	2
3103029	2	3	0,5	1	40	80	2,5	43,8	6	2,85	4,24	2
3103030	2	3	0,5	1	50	100	2,5	53,1	6	2,85	4,59	2
3103031	2	3	0,5	1	60	110	2,5	62,5	6	2,85	4,94	2
3104001	4	4	0,2	0	16	60	4	20,1	6	3,84	-	1
3104002	4	4	0,2	0	20	60	4	24,1	6	3,84	-	1
3104003	4	4	0,2	0	25	70	4	29,1	6	3,84	1	
3104004	4	4	0,2	0	30	70	4	34,1	6	3,84	1	
3104005	4	4	0,2	0	40	90	4	44,1	6	3,84	1	
3104006	4	4	0,2	0	50	100	4	54,1	6	3,84	1	
3104007	4	4	0,3	0	16	60	4	20,1	6	3,84	1	

Milling | Solid carbide



# WXS-CPR

Milling | Solid carbide



- Carbide end mill with WXS coating
- For hardened steels up to 65 HRC and stainless steels
- 2 flutes, long and pencil neck, corner radius, for mould & die
- 247 sizes



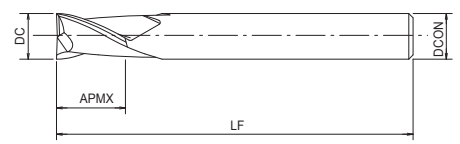
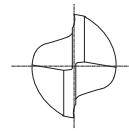
EDP	ZEFP	DC	RE	θn	LU	LF	APMX	LH	DCON	DN	Type
3104008	4	4	0,3	0	20	60	4	24,1	6	3,84	1
3104009	4	4	0,3	0	25	70	4	29,1	6	3,84	1
3104010	4	4	0,3	0	30	70	4	34,1	6	3,84	1
3104011	4	4	0,3	0	40	90	4	44,1	6	3,84	1
3104012	4	4	0,3	0	50	100	4	54,1	6	3,84	1
3104013	4	4	0,5	0	16	60	4	20,1	6	3,84	1
3104014	4	4	0,5	0	20	60	4	24,1	6	3,84	1
3104015	4	4	0,5	0	25	70	4	29,1	6	3,84	1
3104016	4	4	0,5	0	30	70	4	34,1	6	3,84	1
3104017	4	4	0,5	0	40	90	4	44,1	6	3,84	1
3104018	4	4	0,5	0	50	100	4	54,1	6	3,84	1
3104019	4	4	1	0	16	60	4	20,1	6	3,84	1
3104020	4	4	1	0	20	60	4	24,1	6	3,84	1
3104021	4	4	1	0	25	70	4	29,1	6	3,84	1
3104022	4	4	1	0	30	70	4	34,1	6	3,84	1
3104023	4	4	1	0	40	90	4	44,1	6	3,84	1
3104024	4	4	1	0	50	100	4	54,1	6	3,84	1

Milling | Solid carbide



# WXL-1,5D-DE

Milling | Solid carbide



- Carbide end mill with WXL coating
- For steels, stainless, copper
- 2 flutes, 1.5xD applications, square



EDP	ZEFP	DC	LF	APMX	DCON
3181801	2	0,1	45	0,15	4
3181802	2	0,2	45	0,3	4
3181803	2	0,3	45	0,45	4
3181804	2	0,4	45	0,6	4
3181805	2	0,5	45	0,75	4
3181806	2	0,6	45	0,9	4
3181807	2	0,7	45	1,1	4
3181808	2	0,8	45	1,2	4
3181809	2	0,9	45	1,4	4
3181810	2	1	45	1,5	4
3181811	2	1,1	45	1,7	4
3181812	2	1,2	45	1,8	4
3181813	2	1,3	45	2	4
3181814	2	1,4	45	2,1	4
3181815	2	1,5	45	2,3	4
3181816	2	1,6	45	2,4	4
3181817	2	1,7	45	2,6	4
3181818	2	1,8	45	2,7	4
3181819	2	1,9	45	2,9	4
3181820	2	2	45	3	4
3181821	2	2,1	45	3,2	4
3181822	2	2,2	45	3,3	4
3181823	2	2,3	45	3,5	4
3181824	2	2,4	45	3,6	4
3181825	2	2,5	45	3,8	4
3181826	2	2,6	45	3,9	4
3181827	2	2,7	45	4,1	4
3181828	2	2,8	45	4,2	4
3181829	2	2,9	45	4,4	4
3181830	2	3	45	4,5	6
3181831	2	3,1	45	4,7	6
3181832	2	3,2	45	4,8	6
3181833	2	3,3	45	5	6
3181834	2	3,4	45	5,1	6
3181835	2	3,5	45	5,3	6
3181836	2	3,6	45	5,4	6
3181837	2	3,7	45	5,6	6
3181838	2	3,8	45	5,7	6
3181839	2	3,9	45	5,9	6
3181840	2	4	45	6	6
3181841	2	4,1	50	6,2	6
3181842	2	4,2	50	6,3	6
3181843	2	4,3	50	6,5	6
3181844	2	4,4	50	6,6	6
3181845	2	4,5	50	6,8	6
3181846	2	4,6	50	6,9	6

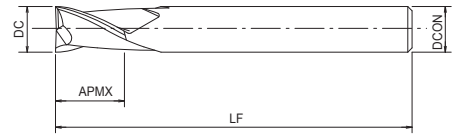
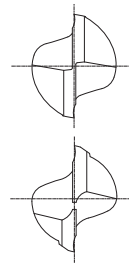
Milling | Solid carbide





# WXL-2D-DE

Milling | Solid carbide



- Carbide end mill with WXL coating
- For steels, stainless, copper
- 2 flutes, 2xD applications, square



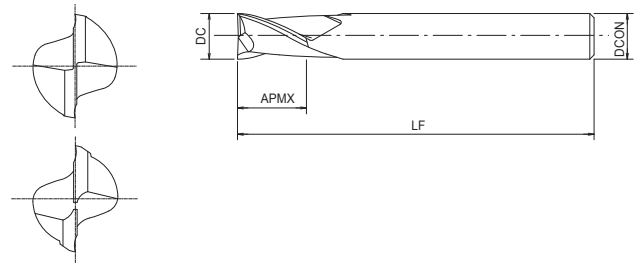
Milling | Solid carbide



EDP	ZEFP	DC	LF	APMX	DCON
3182001	2	0,1	45	0,2	4
3182002	2	0,2	45	0,4	4
3182003	2	0,3	45	0,6	4
3182004	2	0,4	45	0,8	4
3182005	2	0,5	45	1	4
3182006	2	0,6	45	1,2	4
3182007	2	0,7	45	1,4	4
3182008	2	0,8	45	1,6	4
3182009	2	0,9	45	1,8	4
3182010	2	1	45	2	4
3182011	2	1,1	45	2,2	4
3182012	2	1,2	45	2,4	4
3182013	2	1,3	45	2,6	4
3182014	2	1,4	45	2,8	4
3182015	2	1,5	45	3	4
3182016	2	1,6	45	3,2	4
3182017	2	1,7	45	3,4	4
3182018	2	1,8	45	3,6	4
3182019	2	1,9	45	3,8	4
3182020	2	2	45	4	4
3182021	2	2,1	45	4,2	4
3182022	2	2,2	45	4,4	4
3182023	2	2,3	45	4,6	4
3182024	2	2,4	45	4,8	4
3182025	2	2,5	45	5	4
3182026	2	2,6	45	5,2	4
3182027	2	2,7	45	5,4	4
3182028	2	2,8	45	5,6	4
3182029	2	2,9	45	5,8	4
3182030	2	3	45	6	6
3182031	2	3,1	45	6,2	6
3182032	2	3,2	45	6,4	6
3182033	2	3,3	45	6,6	6
3182034	2	3,4	45	6,8	6
3182035	2	3,5	45	7	6
3182036	2	3,6	45	7,2	6
3182037	2	3,7	45	7,4	6
3182038	2	3,8	45	7,6	6
3182039	2	3,9	45	7,8	6
3182040	2	4	45	8	6
3182041	2	4,1	50	8,2	6
3182042	2	4,2	50	8,4	6
3182043	2	4,3	50	8,6	6
3182044	2	4,4	50	8,8	6
3182045	2	4,5	50	9	6
3182046	2	4,6	50	9,2	6

# WXL-2D-DE

Milling | Solid carbide



- Carbide end mill with WXL coating
- For steels, stainless, copper
- 2 flutes, 2xD applications, square



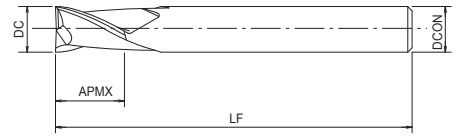
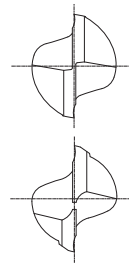
EDP	ZEFP	DC	LF	APMX	DCON
3182047	2	4,7	50	9,4	6
3182048	2	4,8	50	9,6	6
3182049	2	4,9	50	9,8	6
3182050	2	5	50	10	6
3182051	2	5,1	50	10,2	6
3182052	2	5,2	50	10,4	6
3182053	2	5,3	50	10,6	6
3182054	2	5,4	50	10,8	6
3182055	2	5,5	50	11	6
3182056	2	5,6	50	11,2	6
3182057	2	5,7	50	11,4	6
3182058	2	5,8	50	11,6	6
3182059	2	5,9	50	11,8	6
3182060	2	6	50	12	6
3182061	2	6,1	60	12,2	8
3182062	2	6,2	60	12,4	8
3182063	2	6,3	60	12,6	8
3182064	2	6,4	60	12,8	8
3182065	2	6,5	60	13	8
3182066	2	6,6	60	13,2	8
3182067	2	6,7	60	13,4	8
3182068	2	6,8	60	13,6	8
3182069	2	6,9	60	13,8	8
3182070	2	7	60	14	8
3182071	2	7,1	60	14,2	8
3182072	2	7,2	60	14,4	8
3182073	2	7,3	60	14,6	8
3182074	2	7,4	60	14,8	8
3182075	2	7,5	60	15	8
3182076	2	7,6	60	15,2	8
3182077	2	7,7	60	15,4	8
3182078	2	7,8	60	15,6	8
3182079	2	7,9	60	15,8	8
3182080	2	8	60	16	8
3182081	2	8,1	70	16,2	10
3182082	2	8,2	70	16,4	10
3182083	2	8,3	70	16,6	10
3182084	2	8,4	70	16,8	10
3182085	2	8,5	70	17	10
3182086	2	8,6	70	17,2	10
3182087	2	8,7	70	17,4	10
3182088	2	8,8	70	17,6	10
3182089	2	8,9	70	17,8	10
3182090	2	9	70	18	10
3182091	2	9,1	70	18,2	10
3182092	2	9,2	70	18,4	10

Milling | Solid carbide



# WXL-2D-DE

Milling | Solid carbide



- Carbide end mill with WXL coating
- For steels, stainless, copper
- 2 flutes, 2xD applications, square



EDP	ZEFP	DC	LF	APMX	DCON
3182093	2	9,3	70	18,6	10
3182094	2	9,4	70	18,8	10
3182095	2	9,5	70	19	10
3182096	2	9,6	70	19,2	10
3182097	2	9,7	70	19,4	10
3182098	2	9,8	70	19,6	10
3182099	2	9,9	70	19,8	10
3182100	2	10	70	20	10
3182101	2	10,1	75	20,2	12
3182102	2	10,2	75	20,4	12
3182103	2	10,3	75	20,6	12
3182104	2	10,4	75	20,8	12
3182105	2	10,5	75	21	12
3182106	2	10,6	75	21,2	12
3182107	2	10,7	75	21,4	12
3182108	2	10,8	75	21,6	12
3182109	2	10,9	75	21,8	12
3182110	2	11	75	22	12
3182111	2	11,1	75	22,2	12
3182112	2	11,2	75	22,4	12
3182113	2	11,3	75	22,6	12
3182114	2	11,4	75	22,8	12
3182115	2	11,5	75	23	12
3182116	2	11,6	75	23,2	12
3182117	2	11,7	75	23,4	12
3182118	2	11,8	75	23,6	12
3182119	2	11,9	75	23,8	12
3182120	2	12	75	24	12
3182121	2	12,1	85	24,2	12
3182122	2	12,2	85	24,4	12
3182123	2	12,3	85	24,6	12
3182124	2	12,4	85	24,8	12
3182125	2	12,5	85	25	12
3182126	2	12,6	85	25,2	12
3182127	2	12,7	85	25,4	12
3182128	2	12,8	85	25,6	12
3182129	2	12,9	85	25,8	12
3182130	2	13	85	26	12
3182131	2	13,1	85	26,2	12
3182132	2	13,2	85	26,4	12
3182133	2	13,3	85	26,6	12
3182134	2	13,4	85	26,8	12
3182135	2	13,5	85	27	12
3182136	2	13,6	85	27,2	12
3182137	2	13,7	85	27,4	12
3182138	2	13,8	85	27,6	12

Milling | Solid carbide

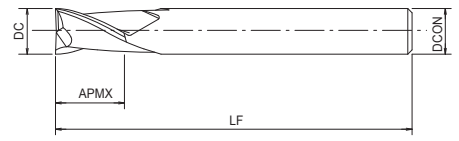
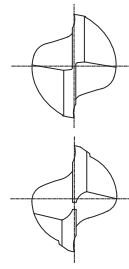






# WXL-3D-DE

Milling | Solid carbide



- Carbide end mill with WXL coating
- For steels, stainless, copper
- 2 flutes, 3xD applications, square



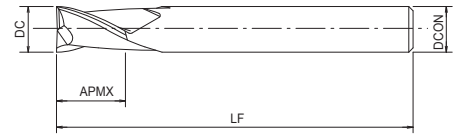
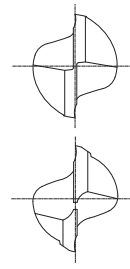
Milling | Solid carbide



EDP	ZEFP	DC	LF	APMX	DCON
3182401	2	0,1	45	0,3	4
3182402	2	0,2	45	0,6	4
3182403	2	0,3	45	0,9	4
3182404	2	0,4	45	1,2	4
3182405	2	0,5	45	1,5	4
3182406	2	0,6	45	1,8	4
3182407	2	0,7	45	2,1	4
3182408	2	0,8	45	2,4	4
3182409	2	0,9	45	2,7	4
3182410	2	1	45	3	4
3182411	2	1,1	45	3,3	4
3182412	2	1,2	45	3,6	4
3182413	2	1,3	45	3,9	4
3182414	2	1,4	45	4,2	4
3182415	2	1,5	45	4,5	4
3182416	2	1,6	45	4,8	4
3182417	2	1,7	45	5,1	4
3182418	2	1,8	45	5,4	4
3182419	2	1,9	45	5,7	4
3182420	2	2	45	6	4
3182421	2	2,1	45	6,3	4
3182422	2	2,2	45	6,6	4
3182423	2	2,3	45	6,9	4
3182424	2	2,4	45	7,2	4
3182425	2	2,5	45	7,5	4
3182426	2	2,6	45	7,8	4
3182427	2	2,7	45	8,1	4
3182428	2	2,8	45	8,4	4
3182429	2	2,9	45	8,7	4
3182430	2	3	45	9	6
3182431	2	3,1	45	9,3	6
3182432	2	3,2	45	9,6	6
3182433	2	3,3	45	9,9	6
3182434	2	3,4	45	10,2	6
3182435	2	3,5	45	10,5	6
3182436	2	3,6	45	10,8	6
3182437	2	3,7	45	11,1	6
3182438	2	3,8	45	11,4	6
3182439	2	3,9	45	11,7	6
3182440	2	4	50	12	6
3182441	2	4,1	50	12,3	6
3182442	2	4,2	50	12,6	6
3182443	2	4,3	50	12,9	6
3182444	2	4,4	50	13,2	6
3182445	2	4,5	50	13,5	6
3182446	2	4,6	55	13,8	6

# WXL-3D-DE

Milling | Solid carbide



- Carbide end mill with WXL coating
- For steels, stainless, copper
- 2 flutes, 3xD applications, square



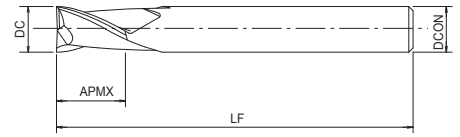
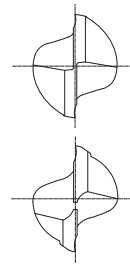
EDP	ZEFP	DC	LF	APMX	DCON
3182447	2	4,7	55	14,1	6
3182448	2	4,8	55	14,4	6
3182449	2	4,9	55	14,7	6
3182450	2	5	55	15	6
3182451	2	5,1	55	15,3	6
3182452	2	5,2	55	15,6	6
3182453	2	5,3	55	15,9	6
3182454	2	5,4	55	16,2	6
3182455	2	5,5	60	16,5	6
3182456	2	5,6	60	16,8	6
3182457	2	5,7	60	17,1	6
3182458	2	5,8	60	17,4	6
3182459	2	5,9	60	17,7	6
3182460	2	6	60	18	6
3182465	2	6,5	65	19,5	8
3182470	2	7	65	21	8
3182475	2	7,5	70	22,5	8
3182480	2	8	70	24	8
3182485	2	8,5	70	25,5	10
3182490	2	9	75	27	10
3182495	2	9,5	75	28,5	10
3182500	2	10	80	30	10
3182510	2	11	80	33	12
3182520	2	12	90	36	12
3182560	2	16	110	48	16
3182580	2	18	130	54	16
3182600	2	20	130	60	20

Milling | Solid carbide



# WXL-4D-DE

Milling | Solid carbide



- Carbide end mill with WXL coating
- For steels, stainless, copper
- 2 flutes, 4xD applications, square



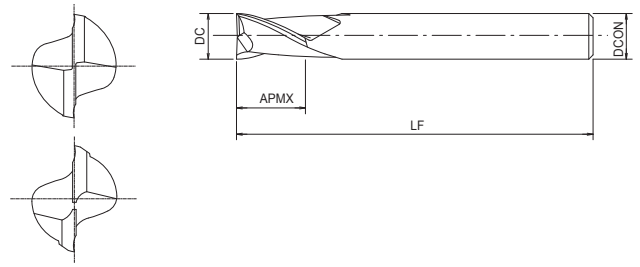
EDP	ZEFP	DC	LF	APMX	DCON
3182602	2	0,2	45	0,8	4
3182603	2	0,3	45	1,2	4
3182604	2	0,4	45	1,6	4
3182605	2	0,5	45	2	4
3182606	2	0,6	45	2,4	4
3182607	2	0,7	45	2,8	4
3182608	2	0,8	45	3,2	4
3182609	2	0,9	45	3,6	4
3182610	2	1	45	4	4
3182611	2	1,1	45	4,4	4
3182612	2	1,2	45	4,8	4
3182613	2	1,3	45	5,2	4
3182614	2	1,4	45	5,6	4
3182615	2	1,5	45	6	4
3182616	2	1,6	45	6,4	4
3182617	2	1,7	45	6,8	4
3182618	2	1,8	45	7,2	4
3182619	2	1,9	45	7,6	4
3182620	2	2	45	8	4
3182621	2	2,1	45	8,4	4
3182622	2	2,2	45	8,8	4
3182623	2	2,3	45	9,2	4
3182624	2	2,4	45	9,6	4
3182625	2	2,5	45	10	4
3182626	2	2,6	50	10,4	4
3182627	2	2,7	50	10,8	4
3182628	2	2,8	50	11,2	4
3182629	2	2,9	50	11,6	4
3182630	2	3	50	12	6
3182631	2	3,1	50	12,4	6
3182632	2	3,2	50	12,8	6
3182633	2	3,3	50	13,2	6
3182634	2	3,4	50	13,6	6
3182635	2	3,5	50	14	6
3182636	2	3,6	50	14,4	6
3182637	2	3,7	50	14,8	6
3182638	2	3,8	50	15,2	6
3182639	2	3,9	50	15,6	6
3182640	2	4	55	16	6
3182641	2	4,1	55	16,4	6
3182642	2	4,2	55	16,8	6
3182643	2	4,3	55	17,2	6
3182644	2	4,4	55	17,6	6
3182645	2	4,5	55	18	6
3182646	2	4,6	55	18,4	6
3182647	2	4,7	55	18,8	6

Milling | Solid carbide



# WXL-4D-DE

Milling | Solid carbide



- Carbide end mill with WXL coating
- For steels, stainless, copper
- 2 flutes, 4xD applications, square



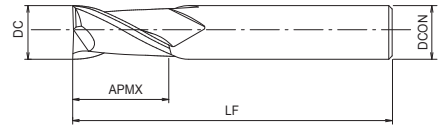
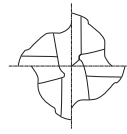
EDP	ZEFP	DC	LF	APMX	DCON
3182648	2	4,8	55	19,2	6
3182649	2	4,9	55	19,6	6
3182650	2	5	60	20	6
3182651	2	5,1	60	20,4	6
3182652	2	5,2	60	20,8	6
3182653	2	5,3	60	21,2	6
3182654	2	5,4	60	21,6	6
3182655	2	5,5	65	22	6
3182656	2	5,6	65	22,4	6
3182657	2	5,7	65	22,8	6
3182658	2	5,8	65	23,2	6
3182659	2	5,9	65	23,6	6
3182660	2	6	65	24	6
3182680	2	8	80	32	8
3182700	2	10	90	40	10
3182720	2	12	100	48	12

Milling | Solid carbide



# WXL-EMS

Milling | Solid carbide



- Carbide end mill with WXL coating
- For high speed milling in steels, stainless and cast iron
- 4 flutes, square



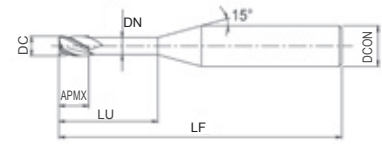
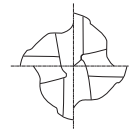
EDP	ZEFP	DC	LF	APMX	DCON
3130510	4	1	40	2,5	4
3130515	4	1,5	40	4	4
3130520	4	2	40	6	4
3130525	4	2,5	40	8	4
3130530	4	3	45	8	6
3130535	4	3,5	45	10	6
3130540	4	4	45	11	6
3130545	4	4,5	45	11	6
3130550	4	5	50	13	6
3130555	4	5,5	50	13	6
3130560	4	6	50	13	6
3130565	4	6,5	60	16	8
3130570	4	7	60	16	8
3130575	4	7,5	60	16	8
3130580	4	8	60	19	8
3130585	4	8,5	70	19	10
3130590	4	9	70	19	10
3130595	4	9,5	70	19	10
3130600	4	10	70	22	10
3130605	4	10,5	75	22	12
3130610	4	11	75	22	12
3130615	4	11,5	75	22	12
3130620	4	12	75	26	12
3130625	4	12,5	85	26	12
3130630	4	13	85	26	12
3130640	4	14	85	26	12
3130650	4	15	90	26	16
3130660	4	16	100	32	16
3130670	4	17	100	32	16
3130680	4	18	100	32	16
3130690	4	19	100	32	20
3130700	4	20	105	38	20
3130710	4	21	105	38	20
3130720	4	22	105	38	20
3130730	4	23	120	45	25
3130740	4	24	120	45	25
3130750	4	25	120	45	25
3130800	4	30	125	45	32

Milling | Solid carbide

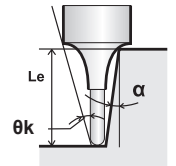


# WXL-LN-EMS-6

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC
- 4 flutes, long neck
- Shank diameter 6

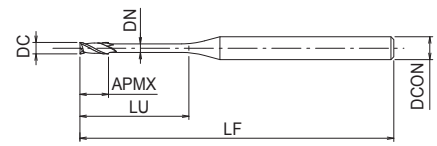
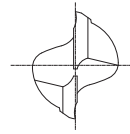


EDP	ZEFP	DC	LU	LF	APMX	DCON	DN	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
48142010	4	1	5	60	1,5	6	0,95	5,16	5,34	5,54	5,74	5,97	6,21
48142015	4	1,5	7,5	60	2,3	6	1,45	7,75	8,02	8,31	8,62	8,96	9,32
48142020	4	2	10	60	3	6	1,95	10,34	10,7	11,08	11,5	11,95	12,43
48142025	4	2,5	12,5	60	3,7	6	2,4	12,92	13,37	13,85	14,37	14,93	15,54
48142030	4	3	15	70	4,5	6	2,85	15,5	16,05	16,62	17,25	17,92	18,65
48142035	4	3,5	17,5	70	5,3	6	3,35	18,09	18,72	19,4	20,12	20,91	21,76
48142040	4	4	20	70	6	6	3,85	20,67	21,39	22,17	23	-	-
48142050	4	5	25	80	7,5	6	4,85	25,84	26,74	-	-	-	-
48142060	4	6	30	90	9	6	5,85	-	-	-	-	-	-

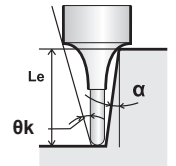


# WXL-LN-EDS

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC
- 2 flutes, long neck, square
- 199 sizes



EDP	ZEFP	DC	LU	LF	APMX	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3131100	2	0,1	0,3	45	0,15	4	0,09	14,61	0,31	0,32	0,33	0,34	0,37	-
3131101	2	0,1	0,5	45	0,15	4	0,09	14,04	0,53	0,56	0,58	0,61	0,66	-
3131102	2	0,1	1	45	0,15	4	0,09	13,22	1,05	1,1	1,14	1,18	1,28	-
3131201	2	0,2	0,5	45	0,3	4	0,18	14,02	0,52	0,55	0,57	0,6	0,62	0,64
3131202	2	0,2	1	45	0,3	4	0,18	13,19	1,05	1,09	1,13	1,17	1,22	1,27
3131203	2	0,2	1,5	45	0,3	4	0,18	12,45	1,57	1,62	1,68	1,75	1,81	1,89
3131204	2	0,2	2	45	0,3	4	0,18	11,78	2,09	2,16	2,24	2,32	2,41	2,51
3131205	2	0,2	2,5	45	0,3	4	0,18	11,18	2,6	2,69	2,79	2,9	3,01	3,13
3131206	2	0,2	3	45	0,3	4	0,18	10,64	3,12	3,23	3,35	3,47	3,61	3,75
3131207	2	0,2	3,5	45	0,3	4	0,18	10,15	3,64	3,76	3,9	4,05	4,2	4,37
3131208	2	0,2	4	45	0,3	4	0,18	9,71	4,15	4,3	4,45	4,62	4,8	5
3131302	2	0,3	1	45	0,45	4	0,28	13,16	1,03	1,08	1,12	1,16	1,21	1,25
3131303	2	0,3	1,5	45	0,45	4	0,28	12,4	1,56	1,61	1,67	1,74	1,8	1,88
3131304	2	0,3	2	45	0,45	4	0,28	11,73	2,08	2,15	2,23	2,31	2,4	2,5
3131305	2	0,3	2,5	45	0,45	4	0,28	11,12	2,59	2,68	2,78	2,88	3	3,12
3131306	2	0,3	3	45	0,45	4	0,28	10,57	3,11	3,22	3,33	3,46	3,59	3,74
3131308	2	0,3	4	45	0,45	4	0,28	9,62	4,14	4,29	4,44	4,61	4,79	4,98
3131310	2	0,3	5	45	0,45	4	0,28	8,83	5,18	5,36	5,55	5,76	5,98	6,23
3131312	2	0,3	6	45	0,45	4	0,28	8,15	6,21	6,43	6,66	6,91	7,18	7,47
3131318	2	0,3	9	45	0,45	4	0,28	6,63	9,31	9,64	9,98	10,36	10,76	11,2
3131403	2	0,4	1,5	45	0,6	4	0,37	12,4	1,52	1,57	1,63	1,69	1,75	1,82
3131404	2	0,4	2	45	0,6	4	0,37	11,71	2,03	2,1	2,18	2,26	2,35	2,45
3131406	2	0,4	3	45	0,6	4	0,37	10,53	3,07	3,17	3,29	3,41	3,55	3,69
3131408	2	0,4	4	45	0,6	4	0,37	9,56	4,1	4,24	4,4	4,56	4,74	4,93
3131410	2	0,4	5	45	0,6	4	0,37	8,76	5,13	5,31	5,51	5,71	5,93	6,18
3131412	2	0,4	6	45	0,6	4	0,37	8,08	6,17	6,38	6,61	6,86	7,13	7,42
3131414	2	0,4	7	45	0,6	4	0,37	7,49	7,2	7,45	7,72	8,01	8,32	8,66
3131416	2	0,4	8	45	0,6	4	0,37	6,99	8,24	8,52	8,83	9,16	9,52	9,9
3131418	2	0,4	9	45	0,6	4	0,37	6,55	9,27	9,59	9,94	10,31	10,71	11,15
3131420	2	0,4	10	45	0,6	4	0,37	6,16	10,3	10,66	11,05	11,46	11,91	12,39
3131424	2	0,4	12	45	0,6	4	0,37	5,5	12,37	12,8	13,26	13,76	14,3	14,88
3131501	2	0,5	1,5	45	0,7	4	0,45	12,29	1,56	1,61	1,67	1,73	1,8	1,87
3131502	2	0,5	2	45	0,7	4	0,45	11,59	2,07	2,14	2,22	2,31	2,4	2,49
3131503	2	0,5	3	45	0,7	4	0,45	10,4	3,11	3,21	3,33	3,46	3,59	3,74
3131504	2	0,5	4	45	0,7	4	0,45	9,43	4,14	4,28	4,44	4,61	4,78	4,98
3131505	2	0,5	5	45	0,7	4	0,45	8,63	5,17	5,35	5,55	5,75	5,98	6,22
3131506	2	0,5	6	45	0,7	4	0,45	7,95	6,21	6,42	6,66	6,9	7,17	7,47
3131507	2	0,5	7	45	0,7	4	0,45	7,37	7,24	7,49	7,76	8,05	8,37	8,71
3131508	2	0,5	8	45	0,7	4	0,45	6,86	8,27	8,56	8,87	9,2	9,56	9,95
3131509	2	0,5	9	45	0,7	4	0,45	6,43	9,31	9,63	9,98	10,35	10,76	11,19
3131510	2	0,5	10	45	0,7	4	0,45	6,04	10,34	10,7	11,09	11,5	11,95	12,44
3131512	2	0,5	12	45	0,7	4	0,45	5,39	12,41	12,84	13,31	13,8	14,34	14,92
3131515	2	0,5	15	50	0,7	4	0,45	4,65	15,51	16,05	16,63	17,25	17,93	18,65
3131602	2	0,6	2	45	0,9	4	0,55	11,51	2,07	2,14	2,22	2,31	2,4	2,49
3131603	2	0,6	3	45	0,9	4	0,55	10,31	3,11	3,21	3,33	3,46	3,59	3,74
3131604	2	0,6	4	45	0,9	4	0,55	9,33	4,14	4,28	4,44	4,61	4,78	4,98

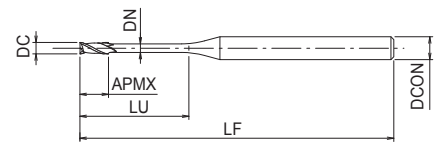
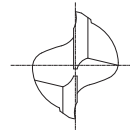
Milling | Solid carbide



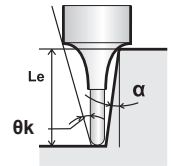


# WXL-LN-EDS

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC
- 2 flutes, long neck, square
- 199 sizes



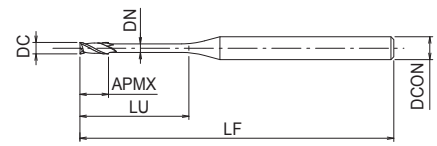
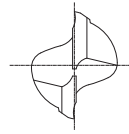
EDP	ZEFP	DC	LU	LF	APMX	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3131605	2	0,6	5	45	0,9	4	0,55	8,52	5,17	5,35	5,55	5,75	5,98	6,22
3131606	2	0,6	6	45	0,9	4	0,55	7,84	6,21	6,42	6,66	6,9	7,17	7,47
3131607	2	0,6	7	45	0,9	4	0,55	7,26	7,24	7,49	7,76	8,05	8,37	8,71
3131608	2	0,6	8	45	0,9	4	0,55	6,76	8,27	8,56	8,87	9,2	9,56	9,95
3131610	2	0,6	10	45	0,9	4	0,55	5,94	10,34	10,7	11,09	11,5	11,95	12,44
3131612	2	0,6	12	45	0,9	4	0,55	5,29	12,41	12,84	13,31	13,8	14,34	14,92
3131615	2	0,6	15	50	0,9	4	0,55	4,55	15,51	16,05	16,63	17,25	17,93	18,65
3131618	2	0,6	18	50	0,9	4	0,55	3,99	18,61	19,26	19,96	20,7	21,51	22,38
3131702	2	0,7	2	45	1	4	0,65	11,43	2,07	2,14	2,22	2,31	2,4	2,49
3131704	2	0,7	4	45	1	4	0,65	9,22	4,14	4,28	4,44	4,61	4,78	4,98
3131706	2	0,7	6	45	1	4	0,65	7,73	6,21	6,42	6,66	6,9	7,17	7,47
3131708	2	0,7	8	45	1	4	0,65	6,65	8,27	8,56	8,87	9,2	9,56	9,95
3131710	2	0,7	10	45	1	4	0,65	5,83	10,34	10,7	11,09	11,5	11,95	12,44
3131804	2	0,8	4	45	1,2	4	0,75	9,11	4,14	4,28	4,44	4,61	4,78	4,98
3131806	2	0,8	6	45	1,2	4	0,75	7,61	6,21	6,42	6,66	6,9	7,17	7,47
3131808	2	0,8	8	45	1,2	4	0,75	6,53	8,27	8,56	8,87	9,2	9,56	9,95
3131810	2	0,8	10	45	1,2	4	0,75	5,72	10,34	10,7	11,09	11,5	11,95	12,44
3131812	2	0,8	12	45	1,2	4	0,75	5,09	12,41	12,84	13,31	13,8	14,34	14,92
3131814	2	0,8	14	50	1,2	4	0,75	4,58	14,48	14,98	15,52	16,1	16,73	17,41
3131816	2	0,8	16	50	1,2	4	0,75	4,16	16,54	17,12	17,74	18,4	19,12	19,9
3131820	2	0,8	20	55	1,2	4	0,75	3,52	20,68	21,4	22,17	23	23,9	24,87
3131824	2	0,8	24	60	1,2	4	0,75	3,06	24,81	25,68	26,6	27,6	28,68	29,84
3131904	2	0,9	4	45	1,35	4	0,85	9	4,14	4,28	4,44	4,61	4,78	4,98
3131906	2	0,9	6	45	1,35	4	0,85	7,49	6,21	6,42	6,66	6,9	7,17	7,47
3131908	2	0,9	8	45	1,35	4	0,85	6,41	8,27	8,56	8,87	9,2	9,56	9,95
3131910	2	0,9	10	45	1,35	4	0,85	5,61	10,34	10,7	11,09	11,5	11,95	12,44
3131915	2	0,9	15	50	1,35	4	0,85	4,26	15,51	16,05	16,63	17,25	17,93	18,65
3132003	2	1	3	45	1,5	4	0,95	9,89	3,11	3,21	3,33	3,46	3,59	3,74
3132004	2	1	4	45	1,5	4	0,95	8,88	4,14	4,28	4,44	4,61	4,78	4,98
3132005	2	1	5	45	1,5	4	0,95	8,05	5,17	5,35	5,55	5,75	5,98	6,22
3132006	2	1	6	45	1,5	4	0,95	7,37	6,21	6,42	6,66	6,9	7,17	7,47
3132007	2	1	7	45	1,5	4	0,95	6,79	7,24	7,49	7,76	8,05	8,37	8,71
3132008	2	1	8	45	1,5	4	0,95	6,29	8,27	8,56	8,87	9,2	9,56	9,95
3132009	2	1	9	45	1,5	4	0,95	5,86	9,31	9,63	9,98	10,35	10,76	11,19
3132010	2	1	10	45	1,5	4	0,95	5,49	10,34	10,7	11,09	11,5	11,95	12,44
3132012	2	1	12	45	1,5	4	0,95	4,87	12,41	12,84	13,31	13,8	14,34	14,92
3132014	2	1	14	50	1,5	4	0,95	4,38	14,48	14,98	15,52	16,1	16,73	17,41
3132016	2	1	16	50	1,5	4	0,95	3,97	16,54	17,12	17,74	18,4	19,12	19,9
3132018	2	1	18	55	1,5	4	0,95	3,64	18,61	19,26	19,96	20,7	21,51	22,38
3132020	2	1	20	55	1,5	4	0,95	3,35	20,68	21,4	22,17	23	23,9	24,87
3132022	2	1	22	60	1,5	4	0,95	3,11	22,75	23,54	24,39	25,3	26,29	27,36
3132025	2	1	25	60	1,5	4	0,95	2,81	25,85	26,75	27,71	28,75	29,87	-
3132030	2	1	30	70	1,5	4	0,95	2,41	31,02	32,1	33,25	34,5	-	-
3132204	2	1,2	4	45	1,8	4	1,15	8,54	4,22	4,38	4,54	4,71	4,9	5,09
3132206	2	1,2	6	45	1,8	4	1,15	7,05	6,3	6,52	6,76	7,01	7,29	7,58
3132208	2	1,2	8	45	1,8	4	1,15	6	8,37	8,66	8,98	9,31	9,67	10,07

Milling | Solid carbide

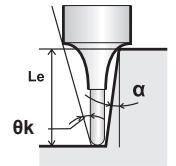


# WXL-LN-EDS

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC
- 2 flutes, long neck, square
- 199 sizes



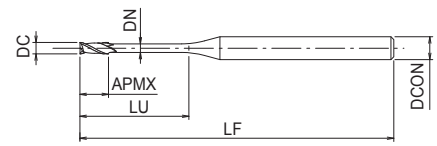
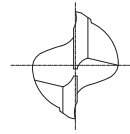
EDP	ZEFP	DC	LU	LF	APMX	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3132210	2	1,2	10	45	1,8	4	1,15	5,22	10,44	10,8	11,19	11,61	12,06	12,55
3132212	2	1,2	12	45	1,8	4	1,15	4,62	12,51	12,94	13,41	13,91	14,45	15,04
3132214	2	1,2	14	50	1,8	4	1,15	4,14	14,57	15,08	15,63	16,21	16,84	17,53
3132216	2	1,2	16	50	1,8	4	1,15	3,76	16,64	17,22	17,84	18,51	19,23	20,01
3132220	2	1,2	20	55	1,8	4	1,15	3,16	20,77	21,5	22,28	23,11	24,01	24,99
3132406	2	1,4	6	45	2,1	4	1,35	6,77	6,3	6,52	6,76	7,01	7,29	7,58
3132408	2	1,4	8	45	2,1	4	1,35	5,73	8,37	8,66	8,98	9,31	9,67	10,07
3132410	2	1,4	10	45	2,1	4	1,35	4,97	10,44	10,8	11,19	11,61	12,06	12,55
3132412	2	1,4	12	45	2,1	4	1,35	4,39	12,51	12,94	13,41	13,91	14,45	15,04
3132414	2	1,4	14	50	2,1	4	1,35	3,92	14,57	15,08	15,63	16,21	16,84	17,53
3132416	2	1,4	16	50	2,1	4	1,35	3,55	16,64	17,22	17,84	18,51	19,23	20,01
3132422	2	1,4	22	60	2,1	4	1,35	2,76	22,84	23,64	24,49	25,41	26,4	-
3132504	2	1,5	4	45	2,3	4	1,45	8,12	4,22	4,38	4,54	4,71	4,9	5,09
3132506	2	1,5	6	45	2,3	4	1,45	6,62	6,3	6,52	6,76	7,01	7,29	7,58
3132508	2	1,5	8	45	2,3	4	1,45	5,59	8,37	8,66	8,98	9,31	9,67	10,07
3132510	2	1,5	10	45	2,3	4	1,45	4,84	10,44	10,8	11,19	11,61	12,06	12,55
3132512	2	1,5	12	45	2,3	4	1,45	4,26	12,51	12,94	13,41	13,91	14,45	15,04
3132514	2	1,5	14	50	2,3	4	1,45	3,81	14,57	15,08	15,63	16,21	16,84	17,53
3132516	2	1,5	16	50	2,3	4	1,45	3,45	16,64	17,22	17,84	18,51	19,23	20,01
3132518	2	1,5	18	55	2,3	4	1,45	3,14	18,71	19,36	20,06	20,81	21,62	22,5
3132520	2	1,5	20	55	2,3	4	1,45	2,89	20,77	21,5	22,28	23,11	24,01	-
3132525	2	1,5	25	60	2,3	4	1,45	2,4	25,94	26,85	27,82	28,86	-	-
3132530	2	1,5	30	70	2,3	4	1,45	2,06	31,11	32,2	33,36	34,61	-	-
3132538	2	1,5	38	80	2,3	4	1,45	1,67	39,38	40,75	42,22	-	-	-
3132540	2	1,5	40	80	2,3	4	1,45	1,6	41,45	42,89	44,44	-	-	-
3132545	2	1,5	45	80	2,3	4	1,45	1,44	46,62	48,24	-	-	-	-
3132606	2	1,6	6	45	2,4	4	1,55	6,47	6,3	6,52	6,76	7,01	7,29	7,58
3132608	2	1,6	8	45	2,4	4	1,55	5,45	8,37	8,66	8,98	9,31	9,67	10,07
3132610	2	1,6	10	45	2,4	4	1,55	4,71	10,44	10,8	11,19	11,61	12,06	12,55
3132612	2	1,6	12	45	2,4	4	1,55	4,14	12,51	12,94	13,41	13,91	14,45	15,04
3132614	2	1,6	14	50	2,4	4	1,55	3,7	14,57	15,08	15,63	16,21	16,84	17,53
3132616	2	1,6	16	50	2,4	4	1,55	3,34	16,64	17,22	17,84	18,51	19,23	20,01
3132618	2	1,6	18	55	2,4	4	1,55	3,04	18,71	19,36	20,06	20,81	21,62	22,5
3132620	2	1,6	20	55	2,4	4	1,55	2,8	20,77	21,5	22,28	23,11	24,01	-
3132806	2	1,8	6	45	2,7	4	1,75	5,96	6,42	6,77	7,1	7,39	7,68	7,99
3132808	2	1,8	8	45	2,7	4	1,75	5,01	8,53	8,96	9,34	9,69	10,07	10,48
3132810	2	1,8	10	45	2,7	4	1,75	4,33	10,64	11,13	11,56	11,99	12,46	12,97
3132812	2	1,8	12	45	2,7	4	1,75	3,81	12,74	13,29	13,78	14,29	14,85	15,45
3132814	2	1,8	14	50	2,7	4	1,75	3,4	14,83	15,44	15,99	16,59	17,24	17,94
3132816	2	1,8	16	50	2,7	4	1,75	3,07	16,92	17,58	18,21	18,89	19,63	20,43
3132818	2	1,8	18	55	2,7	4	1,75	2,79	19,01	19,71	20,43	21,19	22,02	-
3132820	2	1,8	20	55	2,7	4	1,75	2,57	21,09	21,85	22,64	23,49	24,41	-
3132825	2	1,8	25	60	2,7	4	1,75	2,13	26,28	27,2	28,18	29,24	-	-
3133006	2	2	6	45	3	4	1,95	5,62	6,42	6,77	7,1	7,39	7,68	7,99
3133008	2	2	8	45	3	4	1,95	4,7	8,53	8,96	9,34	9,69	10,07	10,48
3133010	2	2	10	45	3	4	1,95	4,04	10,64	11,13	11,56	11,99	12,46	12,97

Milling | Solid carbide

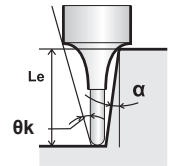


# WXL-LN-EDS

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC
- 2 flutes, long neck, square
- 199 sizes



EDP	ZEFP	DC	LU	LF	APMX	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3133012	2	2	12	45	3	4	1,95	3,54	12,74	13,29	13,78	14,29	14,85	15,45
3133014	2	2	14	50	3	4	1,95	3,15	14,83	15,44	15,99	16,59	17,24	17,94
3133016	2	2	16	50	3	4	1,95	2,84	16,92	17,58	18,21	18,89	19,63	-
3133018	2	2	18	55	3	4	1,95	2,58	19,01	19,71	20,43	21,19	22,02	-
3133020	2	2	20	55	3	4	1,95	2,37	21,09	21,85	22,64	23,49	-	-
3133025	2	2	25	60	3	4	1,95	1,96	26,28	27,2	28,18	-	-	-
3133030	2	2	30	70	3	4	1,95	1,68	31,45	32,55	33,73	-	-	-
3133035	2	2	35	80	3	4	1,95	1,46	36,62	37,9	-	-	-	-
3133040	2	2	40	90	3	4	1,95	1,3	41,79	43,25	-	-	-	-
3133050	2	2	50	100	3	4	1,95	1,06	52,13	53,94	-	-	-	-
3133060	2	2	60	110	3	4	1,95	0,89	62,46	-	-	-	-	-
3133508	2	2,5	8	45	3,7	4	2,4	3,86	8,47	8,87	9,22	9,57	9,94	10,35
3133510	2	2,5	10	45	3,7	4	2,4	3,27	10,57	11,03	11,44	11,87	12,33	12,83
3133512	2	2,5	12	45	3,7	4	2,4	2,84	12,66	13,18	13,66	14,17	14,72	-
3133514	2	2,5	14	50	3,7	4	2,4	2,51	14,75	15,32	15,88	16,47	17,11	-
3133516	2	2,5	16	55	3,7	4	2,4	2,25	16,83	17,46	18,09	18,77	-	-
3133518	2	2,5	18	55	3,7	4	2,4	2,03	18,91	19,6	20,31	21,07	-	-
3133520	2	2,5	20	60	3,7	4	2,4	1,86	20,99	21,74	22,52	-	-	-
3133525	2	2,5	25	70	3,7	4	2,4	1,53	26,17	27,09	28,07	-	-	-
3133530	2	2,5	30	80	3,7	4	2,4	1,3	31,34	32,44	-	-	-	-
3133540	2	2,5	40	90	3,7	4	2,4	1	41,68	-	-	-	-	-
3133550	2	2,5	50	100	3,7	4	2,4	0,81	52,02	-	-	-	-	-
3134008	2	3	8	45	4,5	6	2,85	6,19	8,42	8,79	9,13	9,47	9,84	10,24
3134010	2	3	10	45	4,5	6	2,85	5,41	10,51	10,95	11,35	11,77	12,23	12,73
3134012	2	3	12	45	4,5	6	2,85	4,81	12,6	13,09	13,56	14,07	14,62	15,21
3134014	2	3	14	50	4,5	6	2,85	4,32	14,68	15,23	15,78	16,37	17,01	17,7
3134016	2	3	16	55	4,5	6	2,85	3,93	16,76	17,37	18	18,67	19,4	20,18
3134018	2	3	18	55	4,5	6	2,85	3,6	18,84	19,51	20,21	20,97	21,79	22,67
3134020	2	3	20	60	4,5	6	2,85	3,32	20,91	21,65	22,43	23,27	24,18	25,16
3134025	2	3	25	65	4,5	6	2,85	2,79	26,09	27	27,97	29,02	30,15	-
3134030	2	3	30	80	4,5	6	2,85	2,4	31,25	32,34	33,51	34,77	-	-
3134035	2	3	35	90	4,5	6	2,85	2,1	36,42	37,69	39,05	40,52	-	-
3134040	2	3	40	90	4,5	6	2,85	1,87	41,59	43,04	44,6	-	-	-
3134050	2	3	50	100	4,5	6	2,85	1,54	51,93	53,74	55,68	-	-	-
3135012	2	4	12	50	6	6	3,85	3,58	12,6	13,09	13,56	14,07	14,62	15,21
3135016	2	4	16	60	6	6	3,85	2,87	16,76	17,37	18	18,67	19,4	-
3135020	2	4	20	60	6	6	3,85	2,39	20,91	21,65	22,43	23,27	-	-
3135025	2	4	25	70	6	6	3,85	1,98	26,09	27	27,97	-	-	-
3135030	2	4	30	80	6	6	3,85	1,69	31,25	32,34	33,51	-	-	-
3135035	2	4	35	90	6	6	3,85	1,47	36,42	37,69	-	-	-	-
3135040	2	4	40	90	6	6	3,85	1,3	41,59	43,04	-	-	-	-
3135045	2	4	45	100	6	6	3,85	1,17	46,76	48,39	-	-	-	-
3135050	2	4	50	100	6	6	3,85	1,06	51,93	53,74	-	-	-	-
3135060	2	4	60	110	6	6	3,85	0,9	62,26	-	-	-	-	-
3136016	2	5	16	60	7,5	6	4,85	1,58	16,76	17,37	18	-	-	-
3136020	2	5	20	70	7,5	6	4,85	1,3	20,91	21,65	-	-	-	-

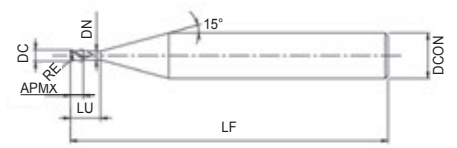
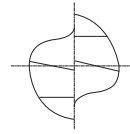
Milling | Solid carbide



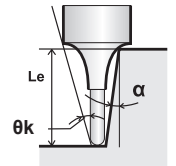


# WXL-CR-EDS-6

Milling | Solid carbide



- Carbide end mill with WXL coating
- For general applications
- 2 flutes, corner radius
- Shank diameter 6



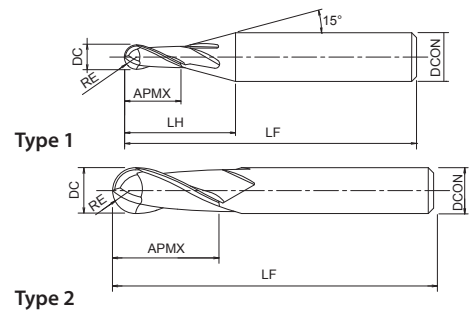
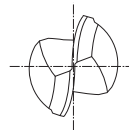
EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN	Le ( $\alpha=0,5^\circ$ )	Le ( $\alpha=1^\circ$ )	Le ( $\alpha=1,5^\circ$ )	Le ( $\alpha=2^\circ$ )	Le ( $\alpha=2,5^\circ$ )	Le ( $\alpha=3^\circ$ )
48144060	2	0,6	0,1	1,8	50	0,9	6	0,55	1,86	1,92	1,99	2,07	2,15	2,23
48144080	2	0,8	0,1	2,4	50	1,2	6	0,75	2,48	2,56	2,66	2,76	2,86	2,98
48144100	2	1	0,1	2,5	50	1,5	6	0,95	2,58	2,67	2,77	2,85	2,98	3,1
48144120	2	1,2	0,1	3	50	1,8	6	1,15	3,1	3,2	3,32	3,45	3,58	3,72
48144150	2	1,5	0,1	3,8	50	2,3	6	1,45	3,92	4,06	4,21	4,36	4,54	4,72
48144180	2	1,8	0,1	4,5	50	2,7	6	1,75	4,62	4,81	4,98	5,17	5,37	5,59
48144200	2	2	0,1	5	50	3	6	1,95	5,16	5,34	5,54	5,74	5,97	6,21
48144250	2	2,5	0,1	5	50	3,7	6	2,4	5,16	5,34	5,54	5,74	5,97	6,21

Milling | Solid carbide



# WXL-HS-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For high speed milling in steels, stainless and cast iron
- 2 flutes, shorter overall length, ball nose



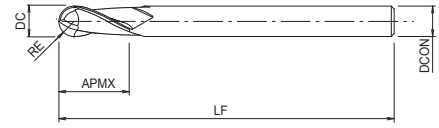
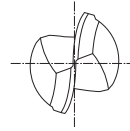
EDP	ZEFP	DC	RE	LF	APMX	LH	DCON	Type
3107020	2	0,2	0,1	35	0,4	6,5	4	1
3107040	2	0,4	0,2	35	0,8	6,9	4	1
3107060	2	0,6	0,3	35	1,1	6,9	4	1
3107080	2	0,8	0,4	35	2	7,4	4	1
3107100	2	1	0,5	40	1,5	6,7	4	1
3107120	2	1,2	0,6	40	3	7,9	4	1
3107150	2	1,5	0,75	40	2	6,4	4	1
3107200	2	2	1	40	3	7,1	4	1
3107300	2	3	1,5	40	4,5	7,9	4	1
3107400	2	4	2	40	6	11,2	6	1
3108500	2	5	2,5	40	8	11,6	6	1
3108600	2	6	3	45	10	-	6	2
3108620	2	8	4	55	12	-	8	2
3108640	2	10	5	65	15	-	10	2
3108660	2	12	6	70	18	-	12	2

Milling | Solid carbide



# WXL-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For high speed milling in steels, stainless and cast iron
- 2 flutes, ball nose



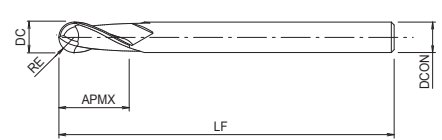
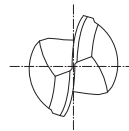
EDP	ZEFP	DC	RE	LF	APMX	DCON
3105010	2	0,1	0,05	40	0,2	4
3105020	2	0,2	0,1	40	0,4	4
3105030	2	0,3	0,15	40	0,6	4
3106030	2	0,3	0,15	50	0,6	6
3105040	2	0,4	0,2	40	0,8	4
3106040	2	0,4	0,2	50	0,8	6
3105050	2	0,5	0,25	40	1,1	4
3106050	2	0,5	0,25	50	1,1	6
3105060	2	0,6	0,3	40	1,1	4
3106060	2	0,6	0,3	50	1,1	6
3106710	2	0,7	0,35	40	1,5	4
3105080	2	0,8	0,4	40	2	4
3106080	2	0,8	0,4	50	2	6
3106720	2	0,9	0,45	50	2,2	4
3105100	2	1	0,5	50	1,5	4
3105101	2	1	0,5	50	2,5	4
3106100	2	1	0,5	60	2,5	6
3106730	2	1,1	0,55	50	2,7	4
3105120	2	1,2	0,6	50	3	4
3106740	2	1,3	0,65	50	3,2	4
3105140	2	1,4	0,7	50	3,5	4
3105150	2	1,5	0,75	50	2	4
3105151	2	1,5	0,75	50	4	4
3106150	2	1,5	0,75	50	4	6
3105160	2	1,6	0,8	50	4	4
3106750	2	1,7	0,85	50	4,2	4
3106760	2	1,8	0,9	50	4,5	4
3106770	2	1,9	0,95	50	4,7	4
3105200	2	2	1	50	3	4
3105201	2	2	1	50	6	4
3106200	2	2	1	50	5	6
3106780	2	2,1	1,05	50	4,8	6
3106790	2	2,2	1,1	50	4,9	6
3106800	2	2,3	1,15	50	5	6
3106810	2	2,4	1,2	50	5,1	6
3105250	2	2,5	1,25	50	3	4
3105251	2	2,5	1,25	50	6	4
3106250	2	2,5	1,25	60	6	6
3106820	2	2,6	1,3	50	5,2	6
3106830	2	2,7	1,35	50	5,4	6
3106840	2	2,8	1,4	60	5,6	6
3106850	2	2,9	1,45	60	5,8	6
3105300	2	3	1,5	60	4,5	4
3106300	2	3	1,5	60	4,5	6
3106301	2	3	1,5	60	8	6
3106350	2	3,5	1,75	70	8	6

Milling | Solid carbide



# WXL-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For high speed milling in steels, stainless and cast iron
- 2 flutes, ball nose



EDP	ZEFP	DC	RE	LF	APMX	DCON
3105400	2	4	2	60	8	4
3106400	2	4	2	70	6	6
3106401	2	4	2	70	8	6
3106860	2	4,5	2,25	80	8	6
3106500	2	5	2,5	80	8	6
3106501	2	5	2,5	80	10	6
3106502	2	5	2,5	80	12	6
3106870	2	5,5	2,75	80	10	6
3106600	2	6	3	90	10	6
3106601	2	6	3	90	12	6
3106880	2	6,5	3,25	90	13	6
3106610	2	7	3,5	90	14	6
3106890	2	7,5	3,75	90	14	6
3106620	2	8	4	100	12	8
3106621	2	8	4	100	14	8
3106900	2	8,5	4,25	100	16	8
3106630	2	9	4,5	100	18	8
3106910	2	9,5	4,75	100	18	8
3106640	2	10	5	100	15	10
3106641	2	10	5	100	18	10
3106650	2	11	5,5	100	22	10
3106660	2	12	6	110	18	12
3106661	2	12	6	110	22	12
3106920	2	13	6,5	110	24	12
3106670	2	14	7	110	26	12
3106930	2	15	7,5	110	28	12
3106680	2	16	8	140	30	16
3106690	2	18	9	140	34	16
3106700	2	20	10	160	38	20

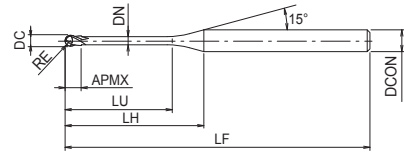
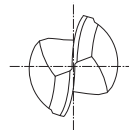
Milling | Solid carbide



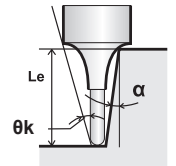


# WXL-LN-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC and stainless
- 2 flutes, long neck, ball nose
- 284 sizes

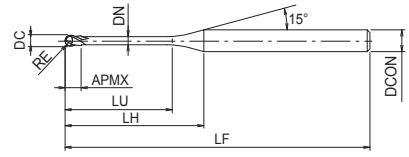
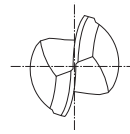


EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3110103	2	0,1	0,05	0,3	45	0,08	7,5	4	0,085	14,46	0,34	0,35	0,36	0,37	0,38	0,4
3110105	2	0,1	0,05	0,5	45	0,08	7,7	4	0,085	14,1	0,54	0,56	0,58	0,6	0,62	0,64
3110203	2	0,2	0,1	0,3	45	0,16	7,3	4	0,18	14,59	0,3	0,31	0,32	0,33	0,34	0,35
3110205	2	0,2	0,1	0,5	45	0,16	7,5	4	0,18	14,44	0,53	0,55	0,57	0,59	0,61	0,63
3120205	2	0,2	0,1	0,5	50	0,16	11,3	6	0,18	14,16	0,53	0,55	0,57	0,59	0,61	0,63
3110207	2	0,2	0,1	0,75	45	0,16	7,8	4	0,18	13,72	0,79	0,82	0,85	0,88	0,91	0,94
3110210	2	0,2	0,1	1	45	0,16	8	4	0,18	13,31	1,05	1,09	1,13	1,17	1,21	1,26
3120210	2	0,2	0,1	1	50	0,16	11,8	6	0,18	13,85	1,05	1,09	1,13	1,17	1,21	1,26
3110212	2	0,2	0,1	1,25	45	0,16	8,3	4	0,18	12,92	1,31	1,36	1,41	1,46	1,51	1,57
3110215	2	0,2	0,1	1,5	45	0,16	8,5	4	0,18	12,56	1,57	1,63	1,68	1,74	1,81	1,88
3120215	2	0,2	0,1	1,5	50	0,16	12,3	6	0,18	13,3	1,57	1,63	1,68	1,74	1,81	1,88
3110217	2	0,2	0,1	1,75	45	0,16	8,8	4	0,18	12,21	1,83	1,9	1,96	2,03	2,11	2,19
3110220	2	0,2	0,1	2	45	0,16	9	4	0,18	11,88	2,09	2,16	2,24	2,32	2,4	2,5
3120220	2	0,2	0,1	2	50	0,16	12,8	6	0,18	12,8	2,09	2,16	2,24	2,32	2,4	2,5
3110225	2	0,2	0,1	2,5	45	0,16	9,5	4	0,18	11,28	2,61	2,7	2,79	2,89	3	3,12
3110230	2	0,2	0,1	3	45	0,16	10	4	0,18	10,73	3,13	3,23	3,35	3,47	3,6	3,74
3110305	2	0,3	0,15	0,5	45	0,24	7,3	4	0,28	14,22	0,52	0,54	0,56	0,58	0,6	0,62
3110306	2	0,3	0,15	0,6	45	0,24	7,4	4	0,28	14,03	0,63	0,65	0,68	0,7	0,72	0,75
3110307	2	0,3	0,15	0,75	45	0,24	7,6	4	0,28	13,77	0,79	0,82	0,85	0,87	0,9	0,93
3110310	2	0,3	0,15	1	45	0,24	7,8	4	0,28	13,34	1,05	1,09	1,12	1,16	1,2	1,24
3120310	2	0,3	0,15	1	50	0,24	11,6	6	0,28	13,88	1,05	1,09	1,12	1,16	1,2	1,24
3110312	2	0,3	0,15	1,25	45	0,24	8,1	4	0,28	12,94	1,31	1,36	1,4	1,45	1,5	1,55
3110315	2	0,3	0,15	1,5	45	0,24	8,3	4	0,28	12,57	1,57	1,63	1,68	1,74	1,8	1,87
3120315	2	0,3	0,15	1,5	50	0,24	12,1	6	0,28	13,33	1,57	1,63	1,68	1,74	1,8	1,87
3110317	2	0,3	0,15	1,75	45	0,24	8,6	4	0,28	12,21	1,83	1,89	1,96	2,02	2,1	2,18
3110320	2	0,3	0,15	2	45	0,24	8,8	4	0,28	11,87	2,09	2,16	2,23	2,31	2,4	2,49
3120320	2	0,3	0,15	2	50	0,24	12,6	6	0,28	12,81	2,09	2,16	2,23	2,31	2,4	2,49
3110322	2	0,3	0,15	2,25	45	0,24	9,1	4	0,28	11,56	2,35	2,43	2,51	2,6	2,69	2,8
3110325	2	0,3	0,15	2,5	45	0,24	9,3	4	0,28	11,25	2,61	2,69	2,79	2,89	2,99	3,11
3120325	2	0,3	0,15	2,5	50	0,24	13,1	6	0,28	12,34	2,61	2,69	2,79	2,89	2,99	3,11
3110327	2	0,3	0,15	2,75	45	0,24	9,6	4	0,28	10,97	2,87	2,96	3,06	3,17	3,29	3,42
3110330	2	0,3	0,15	3	45	0,24	9,8	4	0,28	10,69	3,13	3,23	3,34	3,46	3,59	3,73
3120330	2	0,3	0,15	3	50	0,24	13,6	6	0,28	11,89	3,13	3,23	3,34	3,46	3,59	3,73
3110335	2	0,3	0,15	3,5	45	0,24	10,3	4	0,28	10,19	3,64	3,76	3,9	4,04	4,19	4,35
3110340	2	0,3	0,15	4	45	0,24	10,8	4	0,28	9,72	4,16	4,3	4,45	4,61	4,78	4,97
3110345	2	0,3	0,15	4,5	45	0,24	11,3	4	0,28	9,3	4,68	4,83	5	5,19	5,38	5,59
3110350	2	0,3	0,15	5	45	0,24	11,8	4	0,28	8,91	5,19	5,37	5,56	5,76	5,98	6,22
3110405	2	0,4	0,2	0,5	45	0,3	7,1	4	0,37	14,3	0,52	0,53	0,55	0,56	0,58	0,6
3110407	2	0,4	0,2	0,75	45	0,3	7,4	4	0,37	13,83	0,78	0,8	0,83	0,85	0,88	0,91
3110410	2	0,4	0,2	1	45	0,3	7,6	4	0,37	13,39	1,04	1,07	1,11	1,14	1,18	1,22
3120410	2	0,4	0,2	1	50	0,3	11,4	6	0,37	13,93	1,04	1,07	1,11	1,14	1,18	1,22
3110415	2	0,4	0,2	1,5	45	0,3	8,1	4	0,37	12,59	1,56	1,61	1,66	1,72	1,77	1,84
3120415	2	0,4	0,2	1,5	50	0,3	11,9	6	0,37	13,36	1,56	1,61	1,66	1,72	1,77	1,84
3110420	2	0,4	0,2	2	45	0,3	8,6	4	0,37	11,88	2,08	2,14	2,21	2,29	2,37	2,46
3120420	2	0,4	0,2	2	50	0,3	12,4	6	0,37	12,83	2,08	2,14	2,21	2,29	2,37	2,46
3110425	2	0,4	0,2	2,5	45	0,3	9,1	4	0,37	11,24	2,6	2,68	2,77	2,87	2,97	3,08

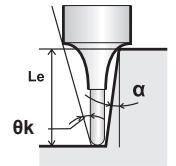


# WXL-LN-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC and stainless
- 2 flutes, long neck, ball nose
- 284 sizes

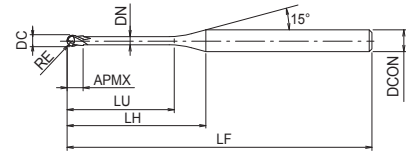
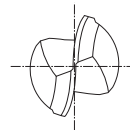


Milling | Solid carbide

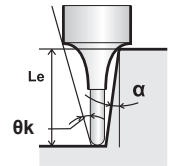
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3120425	2	0,4	0,2	2,5	50	0,3	12,9	6	0,37	12,35	2,6	2,68	2,77	2,87	2,97	3,08
3110430	2	0,4	0,2	3	45	0,3	9,6	4	0,37	10,67	3,11	3,21	3,32	3,44	3,57	3,7
3120430	2	0,4	0,2	3	50	0,3	13,4	6	0,37	11,9	3,11	3,21	3,32	3,44	3,57	3,7
3110435	2	0,4	0,2	3,5	45	0,3	10,1	4	0,37	10,15	3,63	3,75	3,88	4,02	4,16	4,33
3110440	2	0,4	0,2	4	45	0,3	10,6	4	0,37	9,68	4,15	4,28	4,43	4,59	4,76	4,95
3120440	2	0,4	0,2	4	50	0,3	14,4	6	0,37	11,09	4,15	4,28	4,43	4,59	4,76	4,95
3110445	2	0,4	0,2	4,5	45	0,3	11,1	4	0,37	9,25	4,66	4,82	4,99	5,17	5,36	5,57
3110450	2	0,4	0,2	5	45	0,3	11,6	4	0,37	8,86	5,18	5,35	5,54	5,74	5,96	6,19
3120450	2	0,4	0,2	5	50	0,3	15,4	6	0,37	10,38	5,18	5,35	5,54	5,74	5,96	6,19
3110455	2	0,4	0,2	5,5	45	0,3	12,1	4	0,37	8,5	5,7	5,89	6,09	6,32	6,55	6,81
3110460	2	0,4	0,2	6	45	0,3	12,6	4	0,37	8,16	6,21	6,42	6,65	6,89	7,15	7,43
3120460	2	0,4	0,2	6	50	0,3	16,4	6	0,37	9,76	6,21	6,42	6,65	6,89	7,15	7,43
3110510	2	0,5	0,25	1	45	0,4	7,6	4	0,45	13,45	1,03	1,06	1,09	1,12	1,15	1,19
3110515	2	0,5	0,25	1,5	45	0,4	8,1	4	0,45	12,62	1,55	1,59	1,64	1,69	1,75	1,81
3120515	2	0,5	0,25	1,5	50	0,4	11,9	6	0,45	13,4	1,55	1,59	1,64	1,69	1,75	1,81
3110520	2	0,5	0,25	2	45	0,4	8,6	4	0,45	11,89	2,06	2,13	2,2	2,27	2,35	2,43
3120520	2	0,5	0,25	2	50	0,4	12,4	6	0,45	12,86	2,06	2,13	2,2	2,27	2,35	2,43
3110525	2	0,5	0,25	2,5	45	0,4	9,1	4	0,45	11,23	2,58	2,66	2,75	2,84	2,94	3,05
3120525	2	0,5	0,25	2,5	50	0,4	12,9	6	0,45	12,36	2,58	2,66	2,75	2,84	2,94	3,05
3110530	2	0,5	0,25	3	45	0,4	9,6	4	0,45	10,65	3,1	3,2	3,3	3,42	3,54	3,68
3120530	2	0,5	0,25	3	50	0,4	13,4	6	0,45	11,9	3,1	3,2	3,3	3,42	3,54	3,68
3110535	2	0,5	0,25	3,5	45	0,4	10,1	4	0,45	10,12	3,61	3,73	3,86	3,99	4,14	4,3
3110540	2	0,5	0,25	4	45	0,4	10,6	4	0,45	9,64	4,13	4,27	4,41	4,57	4,74	4,92
3120540	2	0,5	0,25	4	50	0,4	14,4	6	0,45	11,08	4,13	4,27	4,41	4,57	4,74	4,92
3110545	2	0,5	0,25	4,5	45	0,4	11,1	4	0,45	9,2	4,65	4,8	4,97	5,14	5,33	5,54
3110550	2	0,5	0,25	5	45	0,4	11,6	4	0,45	8,8	5,17	5,34	5,52	5,72	5,93	6,16
3120550	2	0,5	0,25	5	50	0,4	15,4	6	0,45	10,36	5,17	5,34	5,52	5,72	5,93	6,16
3110555	2	0,5	0,25	5,5	45	0,4	12,1	4	0,45	8,43	5,68	5,87	6,07	6,29	6,53	6,78
3110560	2	0,5	0,25	6	45	0,4	12,6	4	0,45	8,1	6,2	6,41	6,63	6,87	7,13	7,41
3120560	2	0,5	0,25	6	50	0,4	16,4	6	0,45	9,73	6,2	6,41	6,63	6,87	7,13	7,41
3110570	2	0,5	0,25	7	45	0,4	13,6	4	0,45	7,49	7,23	7,48	7,74	8,02	8,32	8,65
3110580	2	0,5	0,25	8	45	0,4	14,6	4	0,45	6,98	8,27	8,55	8,85	9,17	9,52	9,89
3120580	2	0,5	0,25	8	50	0,4	18,4	6	0,45	8,67	8,27	8,55	8,85	9,17	9,52	9,89
3110590	2	0,5	0,25	9	45	0,4	15,6	4	0,45	6,52	9,3	9,62	9,95	10,32	10,71	11,14
3110600	2	0,5	0,25	10	45	0,4	16,6	4	0,45	6,13	10,33	10,68	11,06	11,47	11,9	12,38
3110610	2	0,6	0,3	1	45	0,5	7,4	4	0,55	13,49	1,03	1,05	1,08	1,11	1,14	1,18
3110615	2	0,6	0,3	1,5	45	0,5	7,9	4	0,55	12,64	1,55	1,59	1,64	1,69	1,74	1,8
3120615	2	0,6	0,3	1,5	50	0,5	11,7	6	0,55	13,42	1,55	1,59	1,64	1,69	1,74	1,8
3110620	2	0,6	0,3	2	45	0,5	8,4	4	0,55	11,88	2,06	2,12	2,19	2,26	2,34	2,42
3120620	2	0,6	0,3	2	50	0,5	12,2	6	0,55	12,87	2,06	2,12	2,19	2,26	2,34	2,42
3110625	2	0,6	0,3	2,5	45	0,5	8,9	4	0,55	11,21	2,58	2,66	2,74	2,84	2,94	3,04
3120625	2	0,6	0,3	2,5	50	0,5	12,7	6	0,55	12,37	2,58	2,66	2,74	2,84	2,94	3,04
3110630	2	0,6	0,3	3	45	0,5	9,4	4	0,55	10,61	3,1	3,19	3,3	3,41	3,53	3,66
3120630	2	0,6	0,3	3	50	0,5	13,2	6	0,55	11,9	3,1	3,19	3,3	3,41	3,53	3,66
3110635	2	0,6	0,3	3,5	45	0,5	9,9	4	0,55	10,07	3,61	3,73	3,85	3,99	4,13	4,29
3110640	2	0,6	0,3	4	45	0,5	10,4	4	0,55	9,58	4,13	4,26	4,41	4,56	4,73	4,91

# WXL-LN-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC and stainless
- 2 flutes, long neck, ball nose
- 284 sizes



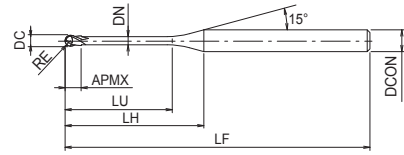
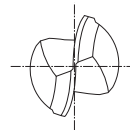
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3120640	2	0,6	0,3	4	50	0,5	14,2	6	0,55	11,06	4,13	4,26	4,41	4,56	4,73	4,91
3110645	2	0,6	0,3	4,5	45	0,5	10,9	4	0,55	9,13	4,65	4,8	4,96	5,14	5,32	5,53
3110650	2	0,6	0,3	5	45	0,5	11,4	4	0,55	8,73	5,16	5,33	5,51	5,71	5,92	6,15
3120650	2	0,6	0,3	5	50	0,5	15,2	6	0,55	10,33	5,16	5,33	5,51	5,71	5,92	6,15
3110655	2	0,6	0,3	5,5	45	0,5	11,9	4	0,55	8,36	5,68	5,87	6,07	6,29	6,52	6,77
3110660	2	0,6	0,3	6	45	0,5	12,4	4	0,55	8,02	6,2	6,4	6,62	6,86	7,12	7,39
3120660	2	0,6	0,3	6	50	0,5	16,2	6	0,55	9,69	6,2	6,4	6,62	6,86	7,12	7,39
3110665	2	0,6	0,3	6,5	45	0,5	12,9	4	0,55	7,7	6,71	6,94	7,18	7,44	7,71	8,02
3110670	2	0,6	0,3	7	45	0,5	13,4	4	0,55	7,41	7,23	7,47	7,73	8,01	8,31	8,64
3110675	2	0,6	0,3	7,5	45	0,5	13,9	4	0,55	7,14	7,75	8,01	8,29	8,59	8,91	9,26
3110680	2	0,6	0,3	8	45	0,5	14,4	4	0,55	6,89	8,26	8,54	8,84	9,16	9,51	9,88
3120680	2	0,6	0,3	8	50	0,5	18,2	6	0,55	8,62	8,26	8,54	8,84	9,16	9,51	9,88
3110685	2	0,6	0,3	8,5	45	0,5	14,9	4	0,55	6,66	8,78	9,08	9,39	9,74	10,1	10,5
3110690	2	0,6	0,3	9	45	0,5	15,4	4	0,55	6,44	9,3	9,61	9,95	10,31	10,7	11,12
3110695	2	0,6	0,3	9,5	45	0,5	15,9	4	0,55	6,23	9,81	10,15	10,5	10,89	11,3	11,75
3110700	2	0,6	0,3	10	45	0,5	16,4	4	0,55	6,04	10,33	10,68	11,06	11,46	11,9	12,37
3120700	2	0,6	0,3	10	50	0,5	20,2	6	0,55	7,76	10,33	10,68	11,06	11,46	11,9	12,37
3110711	2	0,6	0,3	11	45	0,5	17,4	4	0,55	5,69	11,37	11,75	12,16	12,61	13,09	13,61
3110712	2	0,6	0,3	12	45	0,5	18,4	4	0,55	5,38	12,4	12,82	13,27	13,76	14,28	14,85
3110820	2	0,8	0,4	2	45	0,6	8,1	4	0,75	11,86	2,06	2,12	2,18	2,25	2,32	2,4
3120820	2	0,8	0,4	2	50	0,6	11,8	6	0,75	12,9	2,06	2,12	2,18	2,25	2,32	2,4
3110830	2	0,8	0,4	3	45	0,6	9,1	4	0,75	10,52	3,09	3,19	3,29	3,4	3,51	3,64
3120830	2	0,8	0,4	3	50	0,6	12,8	6	0,75	11,89	3,09	3,19	3,29	3,4	3,51	3,64
3110840	2	0,8	0,4	4	45	0,6	10,1	4	0,75	9,45	4,13	4,26	4,4	4,55	4,71	4,88
3120840	2	0,8	0,4	4	50	0,6	13,8	6	0,75	11,02	4,13	4,26	4,4	4,55	4,71	4,88
3110850	2	0,8	0,4	5	45	0,6	11,1	4	0,75	8,58	5,16	5,33	5,5	5,7	5,9	6,13
3120850	2	0,8	0,4	5	50	0,6	14,8	6	0,75	10,27	5,16	5,33	5,5	5,7	5,9	6,13
3110860	2	0,8	0,4	6	45	0,6	12,1	4	0,75	7,85	6,19	6,4	6,61	6,85	7,1	7,37
3120860	2	0,8	0,4	6	50	0,6	15,8	6	0,75	9,62	6,19	6,4	6,61	6,85	7,1	7,37
3110870	2	0,8	0,4	7	45	0,6	13,1	4	0,75	7,24	7,23	7,47	7,72	8	8,29	8,61
3110880	2	0,8	0,4	8	45	0,6	14,1	4	0,75	6,71	8,26	8,54	8,83	9,15	9,49	9,86
3120880	2	0,8	0,4	8	50	0,6	17,8	6	0,75	8,53	8,26	8,54	8,83	9,15	9,49	9,86
3110890	2	0,8	0,4	9	45	0,6	15,1	4	0,75	6,25	9,29	9,6	9,94	10,3	10,68	11,1
3110900	2	0,8	0,4	10	45	0,6	16,1	4	0,75	5,86	10,33	10,67	11,05	11,45	11,88	12,34
3120900	2	0,8	0,4	10	50	0,6	19,8	6	0,75	7,66	10,33	10,67	11,05	11,45	11,88	12,34
3110912	2	0,8	0,4	12	45	0,6	18,1	4	0,75	5,2	12,4	12,81	13,26	13,75	14,27	14,83
3111025	2	1	0,5	2,5	45	0,8	8,2	4	0,95	11,09	2,57	2,64	2,72	2,81	2,9	3
3111030	2	1	0,5	3	45	0,8	8,7	4	0,95	10,43	3,09	3,18	3,28	3,38	3,49	3,62
3121030	2	1	0,5	3	50	0,8	12,4	6	0,95	11,88	3,09	3,18	3,28	3,38	3,49	3,62
3111040	2	1	0,5	4	45	0,8	9,7	4	0,95	9,32	4,12	4,25	4,39	4,53	4,69	4,86
3121040	2	1	0,5	4	50	0,8	13,4	6	0,95	10,98	4,12	4,25	4,39	4,53	4,69	4,86
3111050	2	1	0,5	5	45	0,8	10,7	4	0,95	8,41	5,16	5,32	5,49	5,68	5,88	6,1
3121050	2	1	0,5	5	50	0,8	14,4	6	0,95	10,21	5,16	5,32	5,49	5,68	5,88	6,1
3111060	2	1	0,5	6	45	0,8	11,7	4	0,95	7,67	6,19	6,39	6,6	6,83	7,08	7,35
3121060	2	1	0,5	6	50	0,8	15,4	6	0,95	9,54	6,19	6,39	6,6	6,83	7,08	7,35
3111070	2	1	0,5	7	45	0,8	12,7	4	0,95	7,05	7,22	7,46	7,71	7,98	8,27	8,59

Milling | Solid carbide

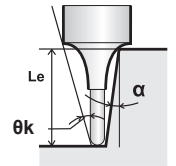


# WXL-LN-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC and stainless
- 2 flutes, long neck, ball nose
- 284 sizes

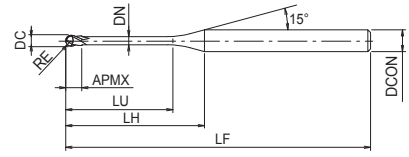
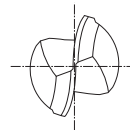


Milling | Solid carbide

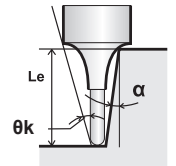
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3121070	2	1	0,5	7	50	0,8	16,4	6	0,95	8,95	7,22	7,46	7,71	7,98	8,27	8,59
3111080	2	1	0,5	8	45	0,8	13,7	4	0,95	6,52	8,26	8,53	8,82	9,13	9,47	9,83
3121080	2	1	0,5	8	50	0,8	17,4	6	0,95	8,43	8,26	8,53	8,82	9,13	9,47	9,83
3111090	2	1	0,5	9	45	0,8	14,7	4	0,95	6,06	9,29	9,6	9,93	10,28	10,66	11,08
3111100	2	1	0,5	10	45	0,8	15,7	4	0,95	5,66	10,33	10,67	11,04	11,43	11,86	12,32
3121100	2	1	0,5	10	50	0,8	19,4	6	0,95	7,55	10,33	10,67	11,04	11,43	11,86	12,32
3111112	2	1	0,5	12	45	0,8	17,7	4	0,95	5,01	12,39	12,81	13,25	13,73	14,25	14,81
3121112	2	1	0,5	12	50	0,8	21,4	6	0,95	6,83	12,39	12,81	13,25	13,73	14,25	14,81
3111114	2	1	0,5	14	50	0,8	19,7	4	0,95	4,49	14,46	14,95	15,47	16,03	16,64	17,29
3121114	2	1	0,5	14	60	0,8	23,4	6	0,95	6,24	14,46	14,95	15,47	16,03	16,64	17,29
3111116	2	1	0,5	16	50	0,8	21,7	4	0,95	4,06	16,53	17,09	17,69	18,33	19,03	19,78
3121116	2	1	0,5	16	60	0,8	25,4	6	0,95	5,74	16,53	17,09	17,69	18,33	19,03	19,78
3111118	2	1	0,5	18	55	0,8	23,7	4	0,95	3,71	18,59	19,23	19,9	20,63	21,41	22,26
3111120	2	1	0,5	20	55	0,8	25,7	4	0,95	4,95	20,66	21,36	22,12	22,93	23,8	24,75
3121120	2	1	0,5	20	60	0,8	29,4	6	0,95	3,42	20,66	21,36	22,12	22,93	23,8	24,75
3121122	2	1	0,5	22	60	0,8	31,4	6	0,95	4,63	22,73	23,5	24,33	25,23	26,19	27,24
3111240	2	1,2	0,6	4	45	1	9,4	4	1,15	9,07	4,19	4,34	4,48	4,62	4,78	4,95
3111260	2	1,2	0,6	6	45	1	11,4	4	1,15	7,41	6,27	6,48	6,69	6,92	7,17	7,44
3121260	2	1,2	0,6	6	50	1	15,2	6	1,15	9,4	6,27	6,48	6,69	6,92	7,17	7,44
3111280	2	1,2	0,6	8	45	1	13,4	4	1,15	6,26	8,35	8,62	8,91	9,22	9,56	9,93
3121280	2	1,2	0,6	8	50	1	17,1	6	1,15	8,28	8,35	8,62	8,91	9,22	9,56	9,93
3111300	2	1,2	0,6	10	45	1	15,4	4	1,15	5,42	10,42	10,76	11,13	11,52	11,95	12,41
3121300	2	1,2	0,6	10	50	1	19,2	6	1,15	7,39	10,42	10,76	11,13	11,52	11,95	12,41
3111312	2	1,2	0,6	12	45	1	17,4	4	1,15	4,78	12,49	12,9	13,34	13,82	14,34	14,9
3121312	2	1,2	0,6	12	50	1	21,2	6	1,15	6,68	12,49	12,9	13,34	13,82	14,34	14,9
3111314	2	1,2	0,6	14	50	1	19,4	4	1,15	4,27	14,55	15,04	15,56	16,12	16,73	17,38
3111316	2	1,2	0,6	16	50	1	21,4	4	1,15	3,86	16,62	17,18	17,78	18,42	19,12	19,87
3121316	2	1,2	0,6	16	60	1	25,2	6	1,15	5,6	16,62	17,18	17,78	18,42	19,12	19,87
3111318	2	1,2	0,6	18	55	1	23,4	4	1,15	3,52	18,69	19,32	19,99	20,72	21,51	22,36
3111320	2	1,2	0,6	20	60	1	25,4	4	1,15	3,24	20,75	21,46	22,21	23,02	23,9	24,84
3111324	2	1,2	0,6	24	60	1	29,4	4	1,15	2,79	24,89	25,74	26,64	27,62	28,68	-
3111480	2	1,4	0,7	8	45	1,1	13,1	4	1,35	6,04	8,35	8,61	8,9	9,21	9,54	9,9
3111512	2	1,4	0,7	12	45	1,1	17,1	4	1,35	4,57	12,48	12,89	13,33	13,81	14,32	14,87
3111516	2	1,4	0,7	16	50	1,1	21,1	4	1,35	3,67	16,62	17,17	17,77	18,41	19,1	19,85
3111530	2	1,5	0,75	3	45	1,2	7,9	4	1,45	10,01	3,13	3,25	3,35	3,45	3,56	3,67
3111540	2	1,5	0,75	4	45	1,2	8,9	4	1,45	8,8	4,18	4,33	4,46	4,6	4,75	4,92
3111560	2	1,5	0,75	6	45	1,2	10,9	4	1,45	7,08	6,27	6,47	6,68	6,9	7,14	7,4
3121560	2	1,5	0,75	6	50	1,2	14,6	6	1,45	9,26	6,27	6,47	6,68	6,9	7,14	7,4
3111580	2	1,5	0,75	8	45	1,2	12,9	4	1,45	5,92	8,34	8,61	8,9	9,2	9,53	9,89
3121580	2	1,5	0,75	8	50	1,2	16,6	6	1,45	8,11	8,34	8,61	8,9	9,2	9,53	9,89
3111600	2	1,5	0,75	10	45	1,2	14,9	4	1,45	5,09	10,41	10,75	11,11	11,5	11,92	12,38
3121600	2	1,5	0,75	10	50	1,2	18,6	6	1,45	7,21	10,41	10,75	11,11	11,5	11,92	12,38
3111612	2	1,5	0,75	12	45	1,2	16,9	4	1,45	4,46	12,48	12,89	13,33	13,8	14,31	14,86
3121612	2	1,5	0,75	12	50	1,2	20,6	6	1,45	6,49	12,48	12,89	13,33	13,8	14,31	14,86
3111614	2	1,5	0,75	14	50	1,2	18,9	4	1,45	3,96	14,55	15,03	15,55	16,1	16,7	17,35
3111616	2	1,5	0,75	16	55	1,2	20,9	4	1,45	3,57	16,62	17,17	17,76	18,4	19,09	19,83

# WXL-LN-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC and stainless
- 2 flutes, long neck, ball nose
- 284 sizes



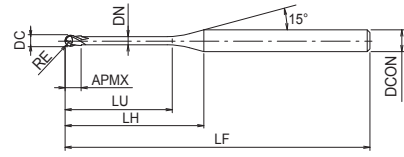
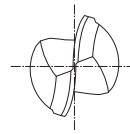
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3121616	2	1,5	0,75	16	60	1,2	24,6	6	1,45	5,4	16,62	17,17	17,76	18,4	19,09	19,83
3111618	2	1,5	0,75	18	55	1,2	22,9	4	1,45	3,25	18,68	19,31	19,98	20,7	21,48	22,32
3111620	2	1,5	0,75	20	55	1,2	24,9	4	1,45	2,98	20,75	21,45	22,19	23	23,87	-
3121620	2	1,5	0,75	20	60	1,2	28,6	6	1,45	4,63	20,75	21,45	22,19	23	23,87	24,81
3111622	2	1,5	0,75	22	55	1,2	26,9	4	1,45	2,75	22,82	23,59	24,41	25,3	26,26	-
3111630	2	1,5	0,75	30	65	1,2	34,9	4	1,45	2,1	31,09	32,14	33,28	34,5	-	-
3111640	2	1,6	0,8	4	45	1,3	8,7	4	1,55	8,7	4,18	4,33	4,46	4,59	4,74	4,91
3111680	2	1,6	0,8	8	45	1,3	12,7	4	1,55	5,8	8,34	8,61	8,89	9,19	9,52	9,88
3111712	2	1,6	0,8	12	45	1,3	16,7	4	1,55	4,34	12,48	12,89	13,32	13,79	14,3	14,85
3111716	2	1,6	0,8	16	50	1,3	20,7	4	1,55	3,47	16,61	17,16	17,76	18,39	19,08	19,82
3111720	2	1,6	0,8	20	55	1,3	24,7	4	1,55	2,89	20,75	21,44	22,19	22,99	23,86	-
3111880	2	1,8	0,9	8	45	1,4	12,6	4	1,75	5,38	8,48	8,88	9,23	9,56	9,9	10,27
3111912	2	1,8	0,9	12	45	1,4	16,6	4	1,75	4,02	12,69	13,22	13,68	14,16	14,68	15,24
3111916	2	1,8	0,9	16	50	1,4	20,6	4	1,75	3,2	16,88	17,51	18,11	18,76	19,46	20,21
3111920	2	1,8	0,9	20	55	1,4	24,6	4	1,75	2,66	21,05	21,79	22,55	23,36	24,24	-
3112030	2	2	1	3	45	1,6	7,3	4	1,95	9,1	3,16	3,31	3,47	3,64	3,8	3,96
3112040	2	2	1	4	45	1,6	8,3	4	1,95	7,87	4,23	4,44	4,66	4,86	5,06	5,26
3122040	2	2	1	4	50	1,6	12	6	1,95	10,32	4,23	4,44	4,66	4,86	5,06	5,26
3112060	2	2	1	6	45	1,6	10,3	4	1,95	6,19	6,36	6,67	6,96	7,23	7,49	7,76
3122060	2	2	1	6	50	1,6	14	6	1,95	8,77	6,36	6,67	6,96	7,23	7,49	7,76
3112080	2	2	1	8	45	1,6	12,3	4	1,95	5,1	8,48	8,87	9,22	9,55	9,88	10,24
3122080	2	2	1	8	50	1,6	16	6	1,95	7,61	8,48	8,87	9,22	9,55	9,88	10,24
3112100	2	2	1	10	45	1,6	14,3	4	1,95	4,33	10,59	11,05	11,45	11,85	12,27	12,73
3122100	2	2	1	10	50	1,6	18	6	1,95	6,73	10,59	11,05	11,45	11,85	12,27	12,73
3112112	2	2	1	12	45	1,6	16,3	4	1,95	3,77	12,69	13,21	13,67	14,15	14,66	15,22
3122112	2	2	1	12	50	1,6	20	6	1,95	6,03	12,69	13,21	13,67	14,15	14,66	15,22
3112114	2	2	1	14	50	1,6	18,3	4	1,95	3,33	14,78	15,36	15,89	16,45	17,05	17,7
3112116	2	2	1	16	50	1,6	20,3	4	1,95	2,98	16,88	17,51	18,1	18,75	19,44	-
3122116	2	2	1	16	60	1,6	24	6	1,95	4,98	16,88	17,51	18,1	18,75	19,44	20,19
3112118	2	2	1	18	55	1,6	22,3	4	1,95	2,7	18,96	19,65	20,32	21,04	21,83	-
3112120	2	2	1	20	55	1,6	24,3	4	1,95	2,47	21,05	21,78	22,54	23,34	-	-
3122120	2	2	1	20	65	1,6	28	6	1,95	4,25	21,05	21,78	22,54	23,34	24,22	25,16
3112122	2	2	1	22	60	1,6	26,3	4	1,95	2,27	23,13	23,92	24,75	25,64	-	-
3112125	2	2	1	25	65	1,6	29,3	4	1,95	2,03	26,24	27,13	28,08	29,09	-	-
3122125	2	2	1	25	70	1,6	33	6	1,95	3,58	26,24	27,13	28,08	29,09	30,19	31,38
3112130	2	2	1	30	70	1,6	34,3	4	1,95	1,73	31,42	32,48	33,62	-	-	-
3122130	2	2	1	30	75	1,6	38	6	1,95	3,1	31,42	32,48	33,62	34,84	36,16	37,59
3112135	2	2	1	35	75	1,6	39,3	4	1,95	1,5	36,59	37,83	39,16	-	-	-
3122135	2	2	1	35	80	1,6	43	6	1,95	2,73	36,59	37,83	39,16	40,59	42,14	-
3112140	2	2	1	40	80	1,6	44,3	4	1,95	1,33	41,76	43,18	-	-	-	-
3112560	2	2,5	1,25	6	45	2	9,1	4	2,35	5,46	6,26	6,51	6,75	6,99	7,21	7,46
3112600	2	2,5	1,25	10	50	2	13,1	4	2,35	3,63	10,46	10,85	11,21	11,59	11,99	12,43
3112615	2	2,5	1,25	15	55	2	18,1	4	2,35	2,55	15,67	16,21	16,75	17,34	17,96	-
3112620	2	2,5	1,25	20	60	2	23,1	4	2,35	1,97	20,87	21,56	22,3	-	-	-
3112625	2	2,5	1,25	25	65	2	28,1	4	2,35	1,6	26,04	26,91	27,84	-	-	-
3112630	2	2,5	1,25	30	70	2	33,1	4	2,35	1,35	31,21	32,26	-	-	-	-

Milling | Solid carbide

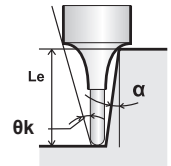


# WXL-LN-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC and stainless
- 2 flutes, long neck, ball nose
- 284 sizes



EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
3112635	2	2,5	1,25	35	70	2	38,1	4	2,35	1,17	36,38	37,61	-	-	-	-
3113060	2	3	1,5	6	45	2,4	8,2	4	2,85	4,29	6,25	6,49	6,72	6,95	7,17	7,4
3123059	2	3	1,5	6	45	2,4	-	3	2,85	-	-	-	-	-	-	-
3123060	2	3	1,5	6	50	2,4	11,9	6	2,85	8,17	6,25	6,49	6,72	6,95	7,17	7,4
3123080	2	3	1,5	8	50	2,4	13,9	6	2,85	6,88	8,35	8,67	8,97	9,25	9,55	9,88
3123100	2	3	1,5	10	50	2,4	15,9	6	2,85	5,94	10,44	10,83	11,19	11,55	11,94	12,37
3123112	2	3	1,5	12	55	2,4	17,9	6	2,85	5,22	12,53	12,98	13,4	13,85	14,33	14,86
3123114	2	3	1,5	14	55	2,4	19,9	6	2,85	4,66	14,62	15,13	15,62	16,15	16,72	17,34
3123115	2	3	1,5	15	55	2,4	20,9	6	2,85	4,42	15,66	16,2	16,73	17,3	17,92	18,59
3123116	2	3	1,5	16	55	2,4	21,9	6	2,85	4,21	16,7	17,26	17,84	18,45	19,11	19,83
3123120	2	3	1,5	20	60	2,4	25,9	6	2,85	3,52	20,86	21,54	22,27	23,05	23,89	24,8
3123125	2	3	1,5	25	65	2,4	30,9	6	2,85	2,92	26,04	26,89	27,81	28,8	29,86	-
3123130	2	3	1,5	30	70	2,4	35,9	6	2,85	2,5	31,2	32,24	33,35	34,55	-	-
3123135	2	3	1,5	35	80	2,4	40,9	6	2,85	2,18	36,37	37,59	38,89	40,3	-	-
3123140	2	3	1,5	40	85	2,4	45,9	6	2,85	1,94	41,54	42,94	44,43	-	-	-
3123600	2	3,5	1,75	10	60	2,8	15	6	3,35	5,4	10,43	10,81	11,16	11,51	11,9	12,31
3123615	2	3,5	1,75	15	60	2,8	20	6	3,35	3,93	15,65	16,18	16,7	17,26	17,87	18,53
3123620	2	3,5	1,75	20	65	2,8	25	6	3,35	3,08	20,85	21,53	22,24	23,01	23,84	24,74
3123625	2	3,5	1,75	25	65	2,8	30	6	3,35	2,54	26,03	26,87	27,78	28,76	29,82	-
3123630	2	3,5	1,75	30	70	2,8	35	6	3,35	2,16	31,2	32,22	33,32	34,51	-	-
3123635	2	3,5	1,75	35	80	2,8	40	6	3,35	1,88	36,36	37,57	38,87	-	-	-
3123640	2	3,5	1,75	40	90	2,8	45	6	3,35	1,66	41,53	42,92	44,41	-	-	-
3123645	2	3,5	1,75	45	90	2,8	50	6	3,35	1,49	46,7	48,27	-	-	-	-
3114080	2	4	2	8	55	3,2	-	4	3,85	-	-	-	-	-	-	-
3124080	2	4	2	8	60	3,2	12,1	6	3,85	5,67	8,33	8,63	8,91	9,18	9,46	9,77
3124100	2	4	2	10	60	3,2	14,1	6	3,85	4,74	10,42	10,79	11,13	11,48	11,85	12,25
3124112	2	4	2	12	60	3,2	16,1	6	3,85	4,07	12,51	12,95	13,35	13,78	14,24	14,74
3124114	2	4	2	14	60	3,2	18,1	6	3,85	3,57	14,6	15,09	15,57	16,08	16,63	17,22
3124115	2	4	2	15	60	3,2	19,1	6	3,85	3,36	15,64	16,16	16,67	17,23	17,82	18,47
3124116	2	4	2	16	60	3,2	20,1	6	3,85	3,18	16,68	17,23	17,78	18,38	19,02	19,71
3124120	2	4	2	20	65	3,2	24,1	6	3,85	2,6	20,84	21,51	22,22	22,98	23,8	-
3124125	2	4	2	25	70	3,2	29,1	6	3,85	2,12	26,02	26,86	27,76	28,72	-	-
3124130	2	4	2	30	80	3,2	34,1	6	3,85	1,79	31,19	32,21	33,3	-	-	-
3124135	2	4	2	35	80	3,2	39,1	6	3,85	1,55	36,36	37,55	38,84	-	-	-
3124140	2	4	2	40	90	3,2	44,1	6	3,85	1,36	41,52	42,9	-	-	-	-
3124145	2	4	2	45	90	3,2	49,1	6	3,85	1,22	46,69	48,25	-	-	-	-
3124150	2	4	2	50	100	3,2	54,1	6	3,85	1,1	51,86	53,6	-	-	-	-
3125100	2	5	2,5	10	65	5	12,2	6	4,85	2,96	10,4	10,75	11,08	11,4	11,75	-
3125115	2	5	2,5	15	70	5	17,2	6	4,85	1,96	15,62	16,13	16,62	-	-	-
3125120	2	5	2,5	20	70	5	22,2	6	4,85	1,46	20,82	21,47	-	-	-	-
3125125	2	5	2,5	25	70	5	27,2	6	4,85	1,16	26	26,82	-	-	-	-
3125130	2	5	2,5	30	80	5	32,2	6	4,85	0,97	31,17	-	-	-	-	-
3125135	2	5	2,5	35	80	5	37,2	6	4,85	0,83	36,34	-	-	-	-	-
3125140	2	5	2,5	40	90	5	42,2	6	4,85	0,72	41,51	-	-	-	-	-
3125145	2	5	2,5	45	100	5	47,2	6	4,85	0,64	46,68	-	-	-	-	-
3125150	2	5	2,5	50	100	5	52,2	6	4,85	0,58	51,84	-	-	-	-	-

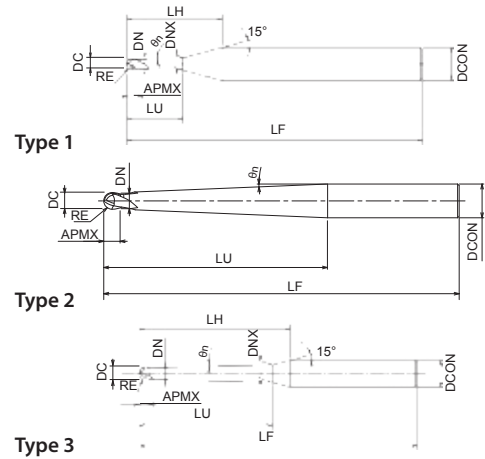
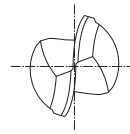
Milling | Solid carbide





# WXL-PC-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC
- 2 flutes, ball nose, pencil neck
- 152 sizes



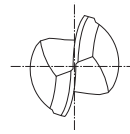
Milling | Solid carbide

EDP	ZEFP	DC	RE	$\theta_n$	LU	LF	APMX	LH	DCON	DN	DNX	Type
3170051	2	0,4	0,2	0,5	2	45	0,3	9	4	0,38	0,41	1
3170052	2	0,4	0,2	0,5	3	45	0,3	9,9	4	0,38	0,43	1
3170053	2	0,4	0,2	0,5	4	45	0,3	10,9	4	0,38	0,44	1
3170061	2	0,4	0,2	1	4	45	0,3	10,8	4	0,38	0,5	1
3170054	2	0,4	0,2	0,5	5	45	0,3	11,9	4	0,38	0,46	1
3170062	2	0,4	0,2	1	5	45	0,3	11,7	4	0,38	0,53	1
3170055	2	0,4	0,2	0,5	6	45	0,3	12,8	4	0,38	0,47	1
3170063	2	0,4	0,2	1	6	45	0,3	12,7	4	0,38	0,57	1
3170091	2	0,6	0,3	0,5	2	45	0,5	9	4	0,58	0,61	1
3170092	2	0,6	0,3	0,5	4	45	0,5	10,9	4	0,58	0,64	1
3170101	2	0,6	0,3	1	4	45	0,5	10,8	4	0,58	0,69	1
3170093	2	0,6	0,3	0,5	6	45	0,5	12,8	4	0,58	0,67	1
3170102	2	0,6	0,3	1	6	45	0,5	12,6	4	0,58	0,76	1
3170094	2	0,6	0,3	0,5	8	45	0,5	14,8	4	0,58	0,7	1
3170103	2	0,6	0,3	1	8	45	0,5	14,5	4	0,58	0,83	1
3170095	2	0,6	0,3	0,5	10	45	0,5	16,7	4	0,58	0,74	1
3170104	2	0,6	0,3	1	10	45	0,5	16,4	4	0,58	0,9	1
3170096	2	0,6	0,3	0,5	12	45	0,5	18,7	4	0,58	0,77	1
3170105	2	0,6	0,3	1	12	45	0,5	18,2	4	0,58	0,97	1
3170097	2	0,6	0,3	0,5	16	50	0,5	22,5	4	0,58	0,84	1
3170106	2	0,6	0,3	1	16	50	0,5	22	4	0,58	1,11	1
3170111	2	0,8	0,4	0,5	4	45	0,6	10,5	4	0,78	0,84	1
3170112	2	0,8	0,4	0,5	6	45	0,6	12,5	4	0,78	0,87	1
3170113	2	0,8	0,4	0,5	8	45	0,6	14,4	4	0,78	0,9	1
3170121	2	0,8	0,4	1	8	45	0,6	14,1	4	0,78	1,02	1
3170114	2	0,8	0,4	0,5	12	45	0,6	18,3	4	0,78	0,97	1
3170122	2	0,8	0,4	1	12	45	0,6	17,9	4	0,78	1,16	1
3170123	2	0,8	0,4	1	16	50	0,6	21,6	4	0,78	1,3	1
3170131	2	1	0,5	0,5	6	45	0,63	12,2	4	0,95	1,03	3
3170132	2	1	0,5	0,5	8	45	0,63	14,1	4	0,95	1,07	3
3170151	2	1	0,5	1,5	8	45	0,63	13,5	4	0,95	1,31	3
3170133	2	1	0,5	0,5	10	45	0,63	16	4	0,95	1,1	3
3170152	2	1	0,5	1,5	10	45	0,63	15,4	4	0,95	1,41	3
3170134	2	1	0,5	0,5	12	45	0,63	18	4	0,95	1,14	3
3170153	2	1	0,5	1,5	12	45	0,63	17,2	4	0,95	1,52	3
3170135	2	1	0,5	0,5	16	50	0,63	21,8	4	0,95	1,21	3
3170154	2	1	0,5	1,5	16	50	0,63	20,8	4	0,95	1,73	3
3170136	2	1	0,5	0,5	18	55	0,63	23,8	4	0,95	1,24	3
3170137	2	1	0,5	0,5	20	55	0,63	25,7	4	0,95	1,28	3
3170155	2	1	0,5	1,5	20	55	0,63	24,4	4	0,95	1,94	3
3170138	2	1	0,5	0,5	25	60	0,63	30,5	4	0,95	1,37	3
3170156	2	1	0,5	1,5	25	60	0,63	28,9	4	0,95	2,2	3
3170139	2	1	0,5	0,5	30	65	0,63	35,4	4	0,95	1,45	3
3170157	2	1	0,5	1,5	30	65	0,63	33,4	4	0,95	2,46	3
3170140	2	1	0,5	0,5	35	70	0,63	40,2	4	0,95	1,54	3
3170141	2	1	0,5	1	10	45	0,63	15,7	4	0,95	1,26	3

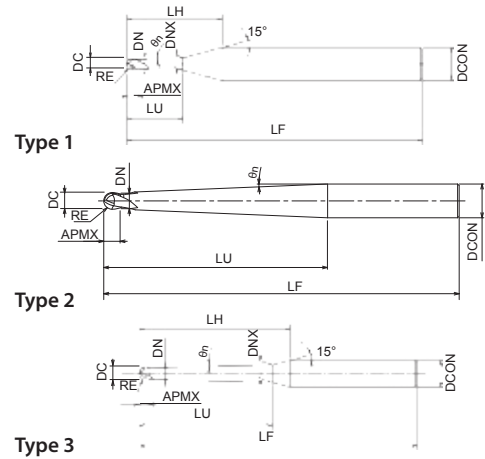


# WXL-PC-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC
- 2 flutes, ball nose, pencil neck
- 152 sizes



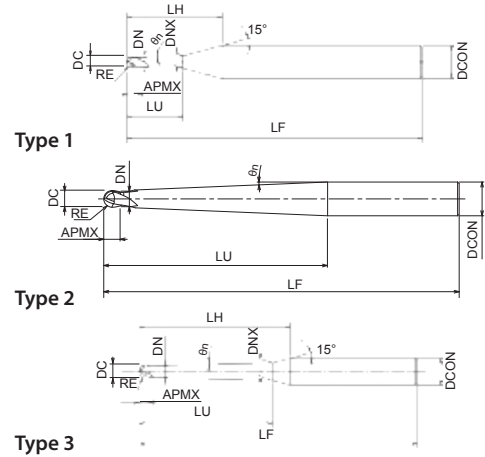
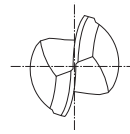
EDP	ZEFP	DC	RE	θn	LU	LF	APMX	LH	DCON	DN	DNX	Type
3170142	2	1	0,5	1	16	50	0,63	21,3	4	0,95	1,47	3
3170143	2	1	0,5	1	20	55	0,63	25	4	0,95	1,61	3
3170144	2	1	0,5	1	25	60	0,63	29,7	4	0,95	1,78	3
3170145	2	1	0,5	1	30	65	0,63	34,4	4	0,95	1,96	3
3170146	2	1	0,5	1	35	70	0,63	39,1	4	0,95	2,13	3
3170158	2	1	0,5	1,5	35	70	0,63	37,9	4	0,95	2,72	3
3170147	2	1	0,5	1	40	80	0,63	43,7	4	0,95	2,31	3
3170161	2	1	0,5	2	45	80	0,63	-	4	0,95	-	2
3170148	2	1	0,5	1	50	90	0,63	53,1	4	0,95	2,66	3
3170149	2	1	0,5	1	60	100	0,63	62,4	4	0,95	3	3
3170150	2	1	0,5	1	70	110	0,63	71,8	4	0,95	3,35	3
3170211	2	1,5	0,75	0,5	8	45	0,95	13,2	4	1,42	1,53	3
3170212	2	1,5	0,75	0,5	10	45	0,95	15,2	4	1,42	1,57	3
3170221	2	1,5	0,75	1	10	45	0,95	14,8	4	1,42	1,71	3
3170230	2	1,5	0,75	1,5	10	45	0,95	14,5	4	1,42	1,87	3
3170213	2	1,5	0,75	0,5	12	45	0,95	17,1	4	1,42	1,6	3
3170222	2	1,5	0,75	1	12	45	0,95	16,7	4	1,42	1,79	3
3170231	2	1,5	0,75	1,5	12	45	0,95	16,3	4	1,42	1,97	3
3170214	2	1,5	0,75	0,5	16	55	0,95	21	4	1,42	1,67	3
3170223	2	1,5	0,75	1	16	55	0,95	20,4	4	1,42	1,93	3
3170232	2	1,5	0,75	1,5	16	55	0,95	19,9	4	1,42	2,18	3
3170215	2	1,5	0,75	0,5	20	55	0,95	24,8	4	1,42	1,74	3
3170224	2	1,5	0,75	1	20	55	0,95	24,2	4	1,42	2,07	3
3170233	2	1,5	0,75	1,5	20	55	0,95	23,5	4	1,42	2,39	3
3170216	2	1,5	0,75	0,5	25	60	0,95	29,7	4	1,42	1,83	3
3170225	2	1,5	0,75	1	25	60	0,95	28,9	4	1,42	2,24	3
3170234	2	1,5	0,75	1,5	25	60	0,95	28	4	1,42	2,65	3
3170217	2	1,5	0,75	0,5	30	65	0,95	34,5	4	1,42	1,92	3
3170226	2	1,5	0,75	1	30	65	0,95	33,5	4	1,42	2,41	3
3170235	2	1,5	0,75	1,5	30	65	0,95	32,6	4	1,42	2,91	3
3170218	2	1,5	0,75	0,5	35	70	0,95	39,4	4	1,42	2	3
3170227	2	1,5	0,75	1	35	70	0,95	38,2	4	1,42	2,59	3
3170236	2	1,5	0,75	1,5	35	70	0,95	37,1	4	1,42	3,17	3
3170241	2	1,5	0,75	2	38,6	70	0,95	-	4	1,42	-	2
3170271	2	2	1	0,5	8	45	1,26	12,3	4	1,93	2,04	3
3170272	2	2	1	0,5	10	45	1,26	14,2	4	1,93	2,07	3
3170273	2	2	1	0,5	12	45	1,26	16,2	4	1,93	2,11	3
3170274	2	2	1	0,5	16	50	1,26	20	4	1,93	2,18	3
3170291	2	2	1	1,5	16	50	1,26	19	4	1,93	2,67	3
3170275	2	2	1	0,5	20	55	1,26	23,9	4	1,93	2,25	3
3170276	2	2	1	0,5	25	65	1,26	28,7	4	1,93	2,33	3
3170277	2	2	1	0,5	30	70	1,26	33,6	4	1,93	2,42	3
3170278	2	2	1	0,5	35	75	1,26	38,4	4	1,93	2,51	3
3170279	2	2	1	0,5	40	80	1,26	43,2	4	1,93	2,6	3
3170281	2	2	1	1	16	50	1,26	19,5	4	1,93	2,43	3
3170282	2	2	1	1	20	55	1,26	23,3	4	1,93	2,57	3

Milling | Solid carbide



# WXL-PC-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC
- 2 flutes, ball nose, pencil neck
- 152 sizes



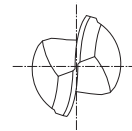
Milling | Solid carbide



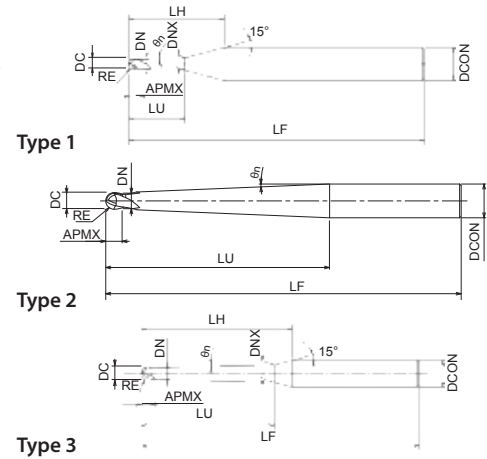
EDP	ZEFP	DC	RE	$\theta_n$	LU	LF	APMX	LH	DCON	DN	DNX	Type
3170292	2	2	1	1,5	20	55	1,26	22,6	4	1,93	2,88	3
3170283	2	2	1	1	25	65	1,26	27,9	4	1,93	2,74	3
3170293	2	2	1	1,5	25	65	1,26	27,1	4	1,93	3,15	3
3170284	2	2	1	1	30	70	1,26	32,6	4	1,93	2,91	3
3170294	2	2	1	1,5	30	70	1,26	31,6	4	1,93	3,41	3
3170301	2	2	1	2	31,5	70	1,26	-	4	1,93	-	2
3170285	2	2	1	1	35	75	1,26	37,3	4	1,93	3,09	3
3170295	2	2	1	1,5	35	75	1,26	36,1	4	1,93	3,67	3
3170286	2	2	1	1	40	80	1,26	41,9	4	1,93	3,26	3
3170296	2	2	1	1,5	41,4	80	1,26	-	4	1,93	-	2
3170287	2	2	1	1	50	90	1,26	55	6	1,93	3,61	3
3170288	2	2	1	1	60	100	1,26	64,4	6	1,93	3,96	3
3170289	2	2	1	1	70	110	1,26	73,7	6	1,93	4,31	3
3170321	2	3	1,5	0,5	8	50	2,4	14,1	6	2,95	3,05	1
3170322	2	3	1,5	0,5	10	50	2,4	16,1	6	2,95	3,08	1
3170323	2	3	1,5	0,5	12	55	2,4	18	6	2,95	3,12	1
3170324	2	3	1,5	0,5	16	55	2,4	21,9	6	2,95	3,18	1
3170325	2	3	1,5	0,5	20	60	2,4	25,8	6	2,95	3,25	1
3170331	2	3	1,5	1	20	60	2,4	25,1	6	2,95	3,55	1
3170341	2	3	1,5	1,5	20	60	2,4	24,5	6	2,95	3,85	1
3170326	2	3	1,5	0,5	25	65	2,4	30,6	6	2,95	3,34	1
3170332	2	3	1,5	1	25	65	2,4	29,8	6	2,95	3,73	1
3170342	2	3	1,5	1,5	25	65	2,4	29	6	2,95	4,11	1
3170327	2	3	1,5	0,5	30	70	2,4	35,4	6	2,95	3,42	1
3170333	2	3	1,5	1	30	70	2,4	34,5	6	2,95	3,9	1
3170343	2	3	1,5	1,5	30	70	2,4	33,6	6	2,95	4,37	1
3170328	2	3	1,5	0,5	35	80	2,4	40,3	6	2,95	3,51	1
3170334	2	3	1,5	1	35	80	2,4	39,2	6	2,95	4,07	1
3170344	2	3	1,5	1,5	35	80	2,4	38,1	6	2,95	4,64	1
3170329	2	3	1,5	0,5	40	85	2,4	45,1	6	2,95	3,6	1
3170335	2	3	1,5	1	40	85	2,4	43,8	6	2,95	4,25	1
3170345	2	3	1,5	1,5	40	85	2,4	42,6	6	2,95	4,9	1
3170351	2	3	1,5	2	47,5	100	2,4	-	6	2,95	-	2
3170330	2	3	1,5	0,5	50	90	2,4	54,8	6	2,95	3,77	1
3170336	2	3	1,5	1	50	90	2,4	53,2	6	2,95	4,6	1
3170346	2	3	1,5	1,5	50	90	2,4	51,6	6	2,95	5,42	1
3170337	2	3	1,5	1	60	100	2,4	62,5	6	2,95	4,95	1
3170347	2	3	1,5	1,5	62,5	100	2,4	-	6	2,95	-	2
3170338	2	3	1,5	1	70	110	2,4	71,9	6	2,95	5,3	1
3170371	2	4	2	1	20	65	3,2	23,4	6	3,93	4,5	1
3170372	2	4	2	1	30	80	3,2	32,7	6	3,93	4,85	1
3170373	2	4	2	1	40	90	3,2	42,1	6	3,93	5,2	1
3170381	2	4	2	1,5	44,2	80	3,2	-	6	3,93	-	2
3170391	2	4	2	2	34	80	3,2	-	6	3,93	-	2
3170374	2	4	2	1	50	100	3,2	55,1	8	3,93	5,55	1
3170375	2	4	2	1	60	110	3,2	64,5	8	3,93	5,9	1

# WXL-PC-EBD

Milling | Solid carbide



- Carbide end mill with WXL coating
- For hardened steels up to 52 HRC
- 2 flutes, ball nose, pencil neck
- 152 sizes



Material compatibility icons: P (blue, ~45 HRC), P (blue, ~55 HRC), M (yellow, ~35 HRC), K (red, ~350 HB), N (green), S (orange), H (grey, ~60 HRC).

Product features icons: CARBIDE, WXL coating, 30° angle, SHRINK FIT, and tolerance ± 0.005.

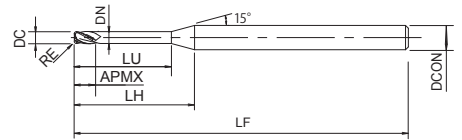
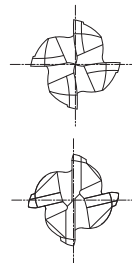
EDP	ZEFP	DC	RE	θn	LU	LF	APMX	LH	DCON	DN	DNX	Type
3170431	2	6	3	1	30	100	6	32,9	8	5,95	6,77	1
3170451	2	6	3	2	36	100	6	-	8	5,95	-	2
3170432	2	6	3	1	40	100	6	42,2	8	5,95	7,12	1
3170441	2	6	3	1,5	49	100	6	-	8	5,95	-	2
3170433	2	6	3	1	50	100	6	51,6	8	5,95	7,47	1
3170434	2	6	3	1	60	110	6	64,6	10	5,95	7,82	1
3170435	2	6	3	1	70	120	6	74	10	5,95	8,17	1
3170436	2	6	3	1	80	130	6	87,1	12	5,95	8,52	1
3170574	2	8	4	3	35,5	100	8	-	10	7,95	-	2
3170576	2	8	4	1,5	54,5	120	8	-	10	7,95	-	2
3170585	2	10	5	3	39,5	110	10	-	12	9,95	-	2
3170587	2	10	5	1,5	58,5	130	10	-	12	9,95	-	2
3170598	2	12	6	3	60	140	12	60,7	16	11,9	15,6	1
3170599	2	12	6	1,5	80	160	12	82,2	16	11,9	14,8	1

Milling | Solid carbide

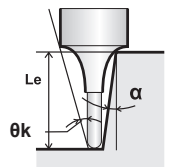


# PHX-LN-CRE

Milling | Solid carbide



- Carbide end mill with WXS coating
- For steels up to 60 HRC
- 4 flutes, long neck, corner radius



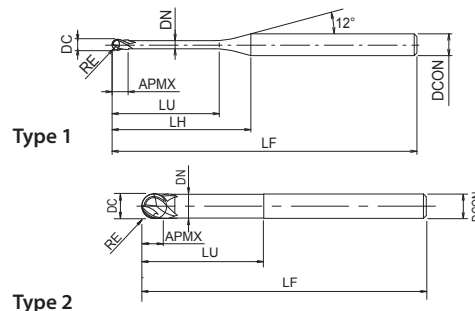
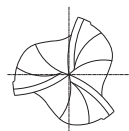
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)
3190800	4	0,8	0,1	2	50	0,32	8,1	4	0,72	11,48	2,06	2,13
3190801	4	0,8	0,1	4	50	0,32	10,1	4	0,72	9,2	4,13	4,27
3190802	4	0,8	0,1	6	50	0,32	12,1	4	0,72	7,67	6,2	6,41
3190803	4	0,8	0,1	8	50	0,32	14,1	4	0,72	6,58	8,27	8,55
3191006	4	1	0,1	4	50	0,4	9,7	4	0,93	8,97	4,13	4,27
3191007	4	1	0,1	6	50	0,4	11,7	4	0,93	7,43	6,2	6,41
3191008	4	1	0,1	8	50	0,4	13,7	4	0,93	6,34	8,27	8,55
3191009	4	1	0,1	10	50	0,4	15,7	4	0,93	5,53	10,33	10,69
3191010	4	1	0,1	12	50	0,4	17,7	4	0,93	4,9	12,4	12,83
3191011	4	1	0,2	4	50	0,4	9,7	4	0,93	9,05	4,13	4,26
3191012	4	1	0,2	6	50	0,4	11,7	4	0,93	7,49	6,2	6,4
3191013	4	1	0,2	8	50	0,4	13,7	4	0,93	6,38	8,26	8,54
3191014	4	1	0,2	10	50	0,4	15,7	4	0,93	5,56	10,33	10,68
3191015	4	1	0,2	12	50	0,4	17,7	4	0,93	4,93	12,4	12,82
3191018	4	1	0,3	4	50	0,4	9,7	4	0,93	9,14	4,12	4,26
3191019	4	1	0,3	6	50	0,4	11,7	4	0,93	7,55	6,19	6,4
3191501	4	1,5	0,1	4	50	0,6	8,8	4	1,41	8,3	4,13	4,27
3191503	4	1,5	0,1	8	50	0,6	12,8	4	1,41	5,68	8,27	8,55
3191505	4	1,5	0,1	12	50	0,6	16,8	4	1,41	4,31	12,4	12,83
3191506	4	1,5	0,2	4	50	0,6	8,8	4	1,41	8,39	4,13	4,26
3191507	4	1,5	0,2	6	50	0,6	10,8	4	1,41	6,8	6,2	6,4
3191508	4	1,5	0,2	8	50	0,6	12,8	4	1,41	5,72	8,26	8,54
3192001	4	2	0,1	8	50	0,8	12,1	4	1,89	4,91	8,27	8,55
3192002	4	2	0,1	10	50	0,8	14,1	4	1,89	4,19	10,33	10,69
3192003	4	2	0,1	12	50	0,8	16,1	4	1,89	3,66	12,4	12,83
3192004	4	2	0,1	16	50	0,8	20,1	4	1,89	2,92	16,54	17,11
3192013	4	2	0,3	8	50	0,8	12,1	4	1,89	4,99	8,26	8,54
3192015	4	2	0,3	12	50	0,8	16,1	4	1,89	3,71	12,39	12,82
3192019	4	2	0,5	6	50	0,8	10,1	4	1,89	6,16	6,19	6,38
3192020	4	2	0,5	8	50	0,8	12,1	4	1,89	5,08	8,25	8,52
3192021	4	2	0,5	10	50	0,8	14,1	4	1,89	4,32	10,32	10,66
3192022	4	2	0,5	12	50	0,8	16,1	4	1,89	3,75	12,39	12,8
3193008	4	3	0,3	12	50	1,2	14,2	4	2,85	2,11	12,39	12,82

Milling | Solid carbide

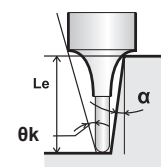


# PHX-LN-DBT

Milling | Solid carbide



- Carbide end mill with WXS coating
- For steels up to 60 HRC
- 3 flutes, long neck, ball nose



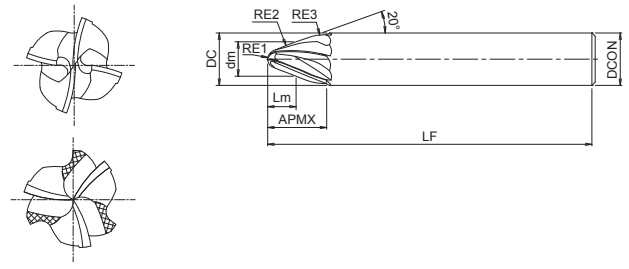
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Type
3194901	3	0,6	0,3	1	50	0,45	9,1	4	0,55	11,02	1,03	1,06	1
3194902	3	0,6	0,3	2	50	0,45	10,1	4	0,55	9,92	2,07	2,15	1
3194903	3	0,6	0,3	3	50	0,45	11,1	4	0,55	9,01	3,12	3,24	1
3194904	3	0,6	0,3	4	50	0,45	12,1	4	0,55	8,25	4,16	4,33	1
3194906	3	0,6	0,3	6	50	0,45	14,1	4	0,55	7,07	6,24	6,51	1
3195004	3	1	0,5	4	50	0,75	11,2	4	0,95	8,06	4,15	4,31	1
3195006	3	1	0,5	6	50	0,75	13,2	4	0,95	6,8	6,24	6,49	1
3195008	3	1	0,5	8	50	0,75	15,2	4	0,95	5,87	8,32	8,67	1
3195010	3	1	0,5	10	50	0,75	17,2	4	0,95	5,17	10,41	10,85	1
3195012	3	1	0,5	12	50	0,75	19,2	4	0,95	4,62	12,49	13,03	1
3195014	3	1	0,5	14	50	0,75	21,2	4	0,95	4,17	14,58	15,21	1
3195016	3	1	0,5	16	50	0,75	23,2	4	0,95	3,8	16,66	17,39	1
3195106	3	1,5	0,75	6	50	1,13	12	4	1,45	6,38	6,22	6,47	1
3195108	3	1,5	0,75	8	50	1,13	14	4	1,45	5,42	8,31	8,65	1
3195110	3	1,5	0,75	10	50	1,13	16	4	1,45	4,71	10,4	10,83	1
3195112	3	1,5	0,75	12	50	1,13	18	4	1,45	4,17	12,48	13,01	1
3195116	3	1,5	0,75	16	50	1,13	22	4	1,45	3,38	16,65	17,36	1
3195206	3	2	1	6	50	1,5	11	4	1,95	5,85	6,21	6,45	1
3195208	3	2	1	8	50	1,5	13	4	1,95	4,87	8,3	8,63	1
3195210	3	2	1	10	50	1,5	15	4	1,95	4,16	10,39	10,81	1
3195212	3	2	1	12	50	1,5	17	4	1,95	3,64	12,47	12,98	1
3195214	3	2	1	14	50	1,5	19	4	1,95	3,23	14,56	15,16	1
3195216	3	2	1	16	50	1,5	21	4	1,95	2,9	16,64	17,34	1
3195218	3	2	1	18	60	1,5	23	4	1,95	2,64	18,73	19,52	1
3195220	3	2	1	20	60	1,5	25	4	1,95	2,41	20,81	21,7	1
3195222	3	2	1	22	60	1,5	27	4	1,95	2,23	22,9	23,88	1
3195312	3	3	1,5	12	60	2,25	14,5	4	2,85	2,22	12,45	12,94	1
3195316	3	3	1,5	16	60	2,25	18,5	4	2,85	1,7	16,62	17,3	1
3195320	3	3	1,5	20	60	2,25	22,5	4	2,85	1,37	20,79	21,66	1
3195325	3	3	1,5	25	60	2,25	27,5	4	2,85	1,11	26,01	27,1	1
3195416	3	4	2	16	60	3	-	4	3,85	-	-	-	2
3195420	3	4	2	20	60	3	-	4	3,85	-	-	-	2
3195425	3	4	2	25	60	3	-	4	3,85	-	-	-	2
3195520	3	6	3	20	70	4,5	-	6	5,85	-	-	-	2
3195530	3	6	3	30	70	4,5	-	6	5,85	-	-	-	2

Milling | Solid carbide



# VU-TBR NEW

Milling | Solid carbide



- Carbide end mill with WXL coating
- High-efficiency finishing
- 4-6 flutes, Taper Barrel Solid Type

Material compatibility icons:
 

- P** (Steel): ~45 HRC
- P** (Steel): ~55 HRC
- M** (Aluminum): ~35 HRC
- K** (Cast Iron): ~350 HB
- S** (Titanium): ~35 HRC
- H** (Inconel): ~60 HRC
- H** (Titanium): ~65 HRC
- H** (Aluminum): ~70 HRC

Key features and specifications:
 

- CARBIDE**: Material
- WXL**: WXL coating
- 15°**: Cutting angle
- ± 10 μm**: Surface finish
- SHANK h5**: Shank fit
- SHRINK FIT**: Shrink fit



	EDP	ZEFP	DC	RE1	RE2	RE3	Lm	dm	LF	APMX	DCON
	8549544	4	6	0,5	150	5	3,43	3,27	50	8,2	6
	8549545	4	8	1	150	5	4,48	4,78	60	9,9	8
	8549546	4	10	1,5	300	5	5,52	6,2	70	11,7	10
	8549547	6	12	2	300	5	6,57	7,7	80	13,5	12
	8549548	6	16	2,5	500	5	8,99	10,18	100	18	16
	8549549	6	16	3	500	5	8,67	10,62	100	17,1	16

Milling | Solid carbide



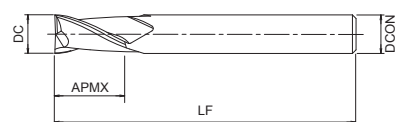
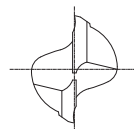






# WX-G-EDSS

Milling | Solid carbide



- Carbide end mill with WX coating
- For general applications
- 2 flutes, extra short length of cut



EDP	ZEFP	DC	LF	APMX	DCON
3019010	2	1	40	1,5	4
3019012	2	1,2	40	1,8	4
3019015	2	1,5	40	2,3	4
3019018	2	1,8	40	2,7	4
3019020	2	2	40	3	4
3019025	2	2,5	40	3,7	4
3019028	2	2,8	40	4,2	4
3019030	2	3	50	4,5	6
3019035	2	3,5	50	5,3	6
3019040	2	4	50	6	6
3019045	2	4,5	50	6,8	6
3019050	2	5	50	7,5	6
3019055	2	5,5	50	8,3	6
3019060	2	6	50	9	6
3019070	2	7	60	11	8
3019080	2	8	60	12	8
3019090	2	9	70	14	10
3019100	2	10	70	15	10
3019120	2	12	75	18	12

Milling | Solid carbide















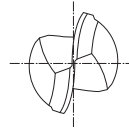






# FX-SS-EBD

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 2 flutes, ball nose, reduced shank diameter

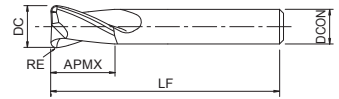
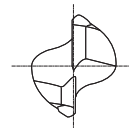


EDP	ZEFP	DC	RE	LF	APMX	DCON
8408556	2	6	3	120	12	5
8408558	2	8	4	130	14	7
8408560	2	10	5	150	18	9
8408562	2	12	6	160	22	11

Milling | Solid carbide

# FX-CR-MG-EDS

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications and cast iron
- 2 flutes, short length of cut, corner radius



EDP	ZEFP	DC	RE	LF	APMX	DCON
8543831	2	3	0,2	60	8	6
8543833	2	3	0,5	60	8	6
8543841	2	4	0,2	70	11	6
8543843	2	4	0,5	70	11	6
8543845	2	4	1	70	11	6
8543851	2	5	0,2	80	13	6
8543853	2	5	0,5	80	13	6
8543855	2	5	1	80	13	6
8543861	2	6	0,2	90	13	6
8543863	2	6	0,5	90	13	6
8543865	2	6	1	90	13	6
8543867	2	6	1,5	90	13	6
8543869	2	6	2	90	13	6
8543883	2	8	0,5	100	19	8
8543885	2	8	1	100	19	8
8543887	2	8	1,5	100	19	8
8543889	2	8	2	100	19	8
8543903	2	10	0,5	100	22	10
8543905	2	10	1	100	22	10
8543907	2	10	1,5	100	22	10
8543909	2	10	2	100	22	10
8543913	2	10	3	100	22	10
8543933	2	12	0,5	110	26	12
8543935	2	12	1	110	26	12
8543937	2	12	1,5	110	26	12
8543939	2	12	2	110	26	12
8543943	2	12	3	110	26	12

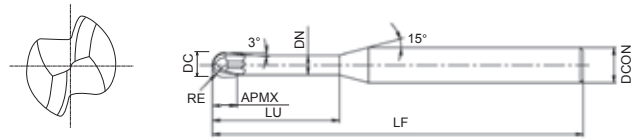
Milling | Solid carbide



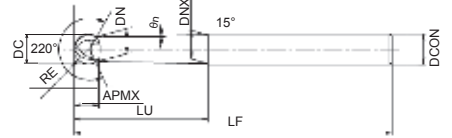


# FXS-EQD

Milling | Solid carbide



**Type 1**



**Type 2**

- Carbide end mill with TiAlN coating
- For general applications
- 2 flutes, 220 degree ball nose

Material compatibility icons: P (~45 HRC), P (~55 HRC), M (~35 HRC), K (~350 HB), S, H (~60 HRC).

Product features: CARBIDE, FX, SHRINK FIT, 220°.



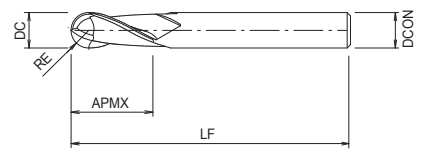
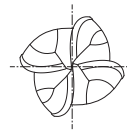
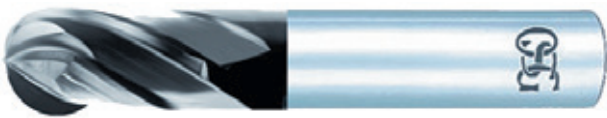
EDP	ZEFP	DC	RE	$\theta_n$	LU	LF	APMX	DCON	DN	DNX	Type
8544005	2	1	0,5	-	5	60	0,7	6	0,85	-	1
8544010	2	2	1	-	10	60	1,5	6	1,7	-	1
8544015	2	3	1,5	-	15	70	2,3	6	2,7	-	1
8544020	2	4	2	-	20	70	3	6	3,7	-	1
8544030	2	6	3	1,5	30	90	4	6	4,6	5,9	2
8544040	2	8	4	1,5	40	100	5,4	8	6,2	7,9	2
8544050	2	10	5	1,5	50	110	6,7	10	7,7	9,9	2





# FXS-HS-EBM

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For high speed milling in hardened steels
- 4 flutes, ball nose, shorter overall length

<b>P</b> ~45 HRC	<b>P</b> ~55 HRC	<b>H</b> ~60 HRC	<b>H</b> ~65 HRC
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<b>CARBIDE</b>	<b>FX</b>	<b>30°</b>	<b>SHRINK FIT</b>	<b>0~-0.015</b>
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C.1027

EDP	ZEFP	DC	RE	LF	APMX	DCON
8521706	4	6	3	50	12	6
8521708	4	8	4	60	14	8
8521710	4	10	5	70	18	10
8521712	4	12	6	80	22	12
8521716	4	16	8	100	30	16
8521720	4	20	10	110	38	20

Milling | Solid carbide

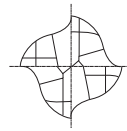






# FXS-PKE

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 4 flutes, corner radius, for pocketing



EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
8547803	4	3	0,2	9	60	4,5	6	2,85
8547853	4	3	0,2	15	70	4,5	6	2,85
8548003	4	3	0,5	9	60	4,5	6	2,85
8548053	4	3	0,5	15	70	4,5	6	2,85
8547804	4	4	0,2	12	70	6	6	3,8
8547854	4	4	0,2	20	80	6	6	3,8
8548004	4	4	0,5	12	70	6	6	3,8
8548054	4	4	0,5	20	80	6	6	3,8
8547805	4	5	0,2	15	80	7,5	6	4,8
8547855	4	5	0,2	25	90	7,5	6	4,8
8548005	4	5	0,5	15	80	7,5	6	4,8
8548055	4	5	0,5	25	90	7,5	6	4,8
8548006	4	6	0,5	18	90	9	6	5,8
8548056	4	6	0,5	30	100	9	6	5,8
8548206	4	6	1	18	90	9	6	5,8
8548256	4	6	1	30	100	9	6	5,8
8548008	4	8	0,5	24	100	12	8	7,7
8548058	4	8	0,5	40	110	12	8	7,7
8548208	4	8	1	24	100	12	8	7,7
8548258	4	8	1	40	110	12	8	7,7
8548010	4	10	0,5	30	100	15	10	9,7
8548060	4	10	0,5	50	120	15	10	9,7
8548210	4	10	1	30	100	15	10	9,7
8548260	4	10	1	50	120	15	10	9,7
8548610	4	10	2	30	100	15	10	9,7
8548660	4	10	2	50	120	15	10	9,7
8548012	4	12	0,5	36	110	18	12	11,7
8548062	4	12	0,5	60	130	18	12	11,7
8548212	4	12	1	36	110	18	12	11,7
8548262	4	12	1	60	130	18	12	11,7
8548612	4	12	2	36	110	18	12	11,7
8548662	4	12	2	60	130	18	12	11,7

Milling | Solid carbide

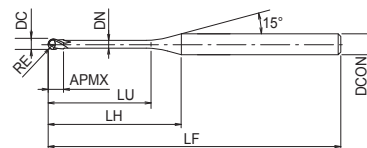
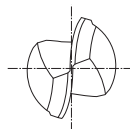






# DG-LN-EBD

Milling | Solid carbide



- Carbide end mill with diamond coating
- For graphite milling
- 2 flutes, ball nose, long neck for deep reach



**CARBIDE**  
**DG**  
**30°**  
**SHRINK FIT**



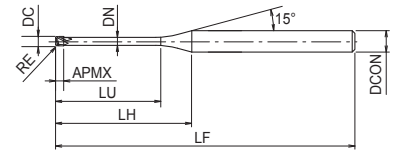
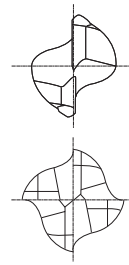
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN
8553701	2	0,4	0,2	4	50	0,6	11,17	4	0,36
8553702	2	0,4	0,2	8	50	0,6	15,17	4	0,36
8553711	2	0,6	0,3	6	50	0,9	12,8	4	0,56
8553712	2	0,6	0,3	10	50	0,9	16,8	4	0,56
48104001	2	0,8	0,4	15	60	1,2	21,4	4	0,76
8553721	2	1	0,5	4	50	1,5	10,05	4	0,96
8553722	2	1	0,5	6	50	1,5	12,05	4	0,96
8553723	2	1	0,5	10	50	1,5	16,05	4	0,96
8553724	2	1	0,5	16	60	1,5	22,05	4	0,96
8553725	2	1	0,5	20	60	1,5	26,05	4	0,96
8553726	2	1	0,5	30	80	1,5	36,05	4	0,96
8553731	2	1,5	0,75	6	50	2,3	11,07	4	1,44
8553732	2	1,5	0,75	10	50	2,3	15,07	4	1,44
8553733	2	1,5	0,75	16	60	2,3	21,07	4	1,44
8553742	2	2	1	10	50	3	14,35	4	1,9
8553743	2	2	1	16	60	3	20,35	4	1,9
8553744	2	2	1	20	60	3	24,35	4	1,9
8553745	2	2	1	30	80	3	34,35	4	1,9
8553761	2	3	1,5	20	60	4,5	22,48	4	2,9
8553762	2	3	1,5	40	80	4,5	42,48	4	2,9
8553781	2	4	2	20	60	6	-	4	3,9

Milling | Solid carbide



# DG-CPR

Milling | Solid carbide



- Carbide end mill with diamond coating
- For graphite milling
- Multi flute, long neck for deep reach, corner radius



GRAPHITE

**CARBIDE** **DG** **30°** **SHRINK FIT**  $R \pm 0.01$   $D < 1$   $0 \sim -0.02$   $D \geq 1$   $0 \sim -0.027$  **C.1016**

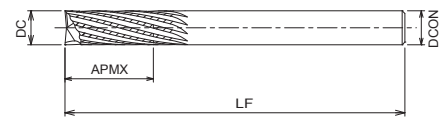
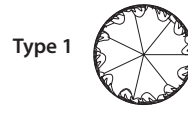
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN
8554511	2	0,5	0,1	4	50	0,9	10,98	4	0,44
8554512	2	0,5	0,1	6	50	0,9	12,98	4	0,44
48103001	2	1	0,1	10	50	1,5	16,05	4	0,96
8554542	2	2	0,2	10	60	3	14,35	4	1,87
8554544	2	2	0,2	20	70	3	24,35	4	1,87
48103002	4	4	0,3	40	100	6	-	6	3,9
48103004	4	4	0,5	25	70	6	-	6	3,9
48103003	4	4	0,5	40	100	6	-	6	3,9
48103005	4	4	1	40	100	6	-	6	3,9
48103006	4	6	0,3	30	100	6	-	6	5,7
8554621	4	6	0,5	30	100	6	-	6	5,7
8554622	4	6	1	30	100	6	-	6	5,67
48103007	4	8	0,3	100	150	8	-	8	7,6
8554661	4	8	0,5	32	100	8	-	8	7,57
48103008	4	8	0,5	100	150	8	-	8	7,6
48103009	4	8	1	100	150	8	-	8	7,6
8554701	4	10	0,5	40	125	10	-	10	9,47
8554702	4	10	1	40	125	10	-	10	9,47
8554722	4	12	1	48	150	12	-	12	11,37

Milling | Solid carbide



# DIA-BNC

Milling | Solid carbide



- Carbide end mill with diamond coating
- For CFRP milling
- Multi flute, fine nick geometry
- Also available with LH helix



CARBIDE	DIA	SHRINK FIT
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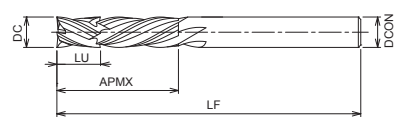
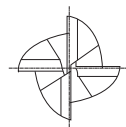
Milling | Solid carbide



EDP	ZEFP	DC	LF	APMX	DCON	Type	Specification
48108001	8	6	68	18	6	1	Trimming
48108002	10	8	74	24	8	1	Trimming
48108003	12	10	80	30	10	1	Trimming
48108004	14	12	86	36	12	1	Trimming
48108011	8	6	68	18	6	2	Trimming & Plunging
48108012	10	8	74	24	8	2	Trimming & Plunging
48108013	12	10	80	30	10	2	Trimming & Plunging
48108014	14	12	86	36	12	2	Trimming & Plunging
8809012	10	6	88	18	6	3	Left helix
8809013	14	8	94	24	8	3	Left helix

# DIA-HBC

Milling | Solid carbide



- Carbide end mill with diamond coating
- For CFRP milling
- 4 flutes, left-hand / right-hand flute to suppress delamination



CARBIDE
DIA
SHRINK FIT



EDP	ZEFP	DC	LU	LF	APMX	DCON
48109001	4	6	15	65	7,5	6
48109002	4	8	20	70	10	8
48109003	4	10	25	75	12,5	10
48109004	4	12	30	100	15	12

Milling | Solid carbide





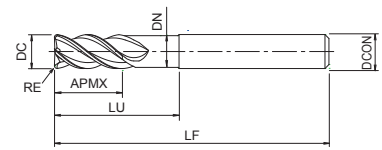
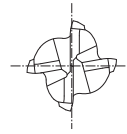






# UVX-TI-4FL

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with TiAlN coating
- For Titanium alloys
- 4 flutes, variable helix and unequal spacing, corner radius



EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
8555120	4	12	-	36	90	24	12	11,5
8555121	4	12	1	36	90	24	12	11,5
8555122	4	12	1,5	36	90	24	12	11,5
8555123	4	12	2	36	90	24	12	11,5
8555124	4	12	2,5	36	90	24	12	11,5
8555125	4	12	3	36	90	24	12	11,5
8555126	4	12	4	36	90	24	12	11,5
8555160	4	16	-	48	100	32	16	15,5
8555161	4	16	1	48	100	32	16	15,5
8555162	4	16	1,5	48	100	32	16	15,5
8555163	4	16	2	48	100	32	16	15,5
8555164	4	16	2,5	48	100	32	16	15,5
8555165	4	16	3	48	100	32	16	15,5
8555166	4	16	4	48	100	32	16	15,5
8555200	4	20	-	60	120	40	20	19,5
8555201	4	20	1	60	120	40	20	19,5
8555202	4	20	1,5	60	120	40	20	19,5
8555203	4	20	2	60	120	40	20	19,5
8555204	4	20	2,5	60	120	40	20	19,5
8555205	4	20	3	60	120	40	20	19,5
8555206	4	20	4	60	120	40	20	19,5
8555207	4	20	5	60	120	40	20	19,5
8555250	4	25	-	75	140	50	25	24,5
8555251	4	25	1	75	140	50	25	24,5
8555252	4	25	1,5	75	140	50	25	24,5
8555253	4	25	2	75	140	50	25	24,5
8555254	4	25	2,5	75	140	50	25	24,5
8555255	4	25	3	75	140	50	25	24,5
8555256	4	25	4	75	140	50	25	24,5
8555257	4	25	5	75	140	50	25	24,5
8555258	4	25	6	75	140	50	25	24,5

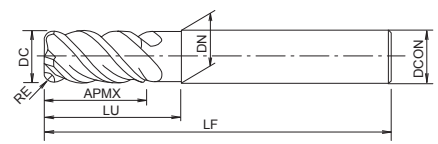
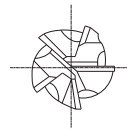
Milling | Solid carbide





# UVX-TI-5FL

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with TiAlN coating
- For Titanium alloys
- 5 flutes, variable helix and unequal spacing, corner radius



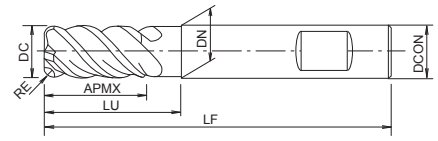
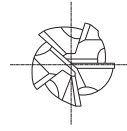
EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
8555320	5	12	-	36	90	24	12	11,5
8555321	5	12	1	36	90	24	12	11,5
8555322	5	12	1,5	36	90	24	12	11,5
8555323	5	12	2	36	90	24	12	11,5
8555324	5	12	2,5	36	90	24	12	11,5
8555325	5	12	3	36	90	24	12	11,5
8555326	5	12	4	36	90	24	12	11,5
8555360	5	16	-	48	100	32	16	15,5
8555361	5	16	1	48	100	32	16	15,5
8555362	5	16	1,5	48	100	32	16	15,5
8555363	5	16	2	48	100	32	16	15,5
8555364	5	16	2,5	48	100	32	16	15,5
8555365	5	16	3	48	100	32	16	15,5
8555366	5	16	4	48	100	32	16	15,5
8555400	5	20	-	60	120	40	20	19,5
8555401	5	20	1	60	120	40	20	19,5
8555402	5	20	1,5	60	120	40	20	19,5
8555403	5	20	2	60	120	40	20	19,5
8555404	5	20	2,5	60	120	40	20	19,5
8555405	5	20	3	60	120	40	20	19,5
8555406	5	20	4	60	120	40	20	19,5
8555407	5	20	5	60	120	40	20	19,5
8555450	5	25	-	75	140	50	25	24,5
8555451	5	25	1	75	140	50	25	24,5
8555452	5	25	1,5	75	140	50	25	24,5
8555453	5	25	2	75	140	50	25	24,5
8555454	5	25	2,5	75	140	50	25	24,5
8555455	5	25	3	75	140	50	25	24,5
8555456	5	25	4	75	140	50	25	24,5
8555457	5	25	5	75	140	50	25	24,5
8555458	5	25	6	75	140	50	25	24,5

Milling | Solid carbide



# UVX-TI-5FL Weldon

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with TiAlN coating
- For Titanium alloys
- 5 flutes, variable helix and unequal spacing, corner radius
- Weldon shank



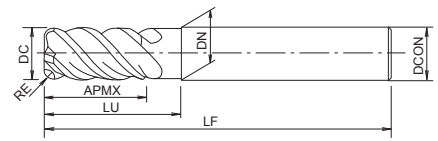
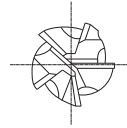
EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
W1204247	5	12	-	36	80	24	12	11,5
W1204248	5	12	1	36	80	24	12	11,5
W1204249	5	12	2,5	36	80	24	12	11,5
W1304511	5	12	4	36	90	24	12	11,5
W1204250	5	16	-	48	100	32	16	15,5
W1304512	5	16	1	48	100	32	16	15,5
W1204251A	5	16	2,5	48	100	32	16	15,5
W1204252A	5	16	4	48	100	32	16	15,5
W1204253	5	20	-	52	105	40	20	19,5
W1304513	5	20	1	52	105	40	20	19,5
W1204254A	5	20	2,5	52	105	40	20	19,5
W1204255A	5	20	4	52	105	40	20	19,5
W1204256A	5	20	5	52	105	40	20	19,5
W1204257	5	20	6	52	105	40	20	19,5

Milling | Solid carbide



# UVX-TI-5FL SAFE LOCK

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with TiAlN coating
- For Titanium alloys
- 5 flutes, variable helix and unequal spacing, corner radius
- SafeLock shank



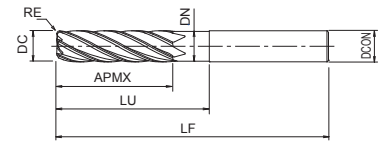
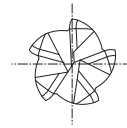
EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
48247120	5	12	-	36	90	24	12	11,5
8555670	5	12	1	36	90	24	12	11,5
48247123	5	12	1,5	36	90	24	12	11,5
48247124	5	12	2	36	90	24	12	11,5
48247125	5	12	2,5	36	90	24	12	11,5
8555671	5	12	3	36	90	24	12	11,5
48247127	5	12	4	36	90	24	12	11,5
48247160	5	16	-	48	100	32	16	15,5
8555672	5	16	1	48	100	32	16	15,5
48247163	5	16	1,5	48	100	32	16	15,5
48247164	5	16	2	48	100	32	16	15,5
48247165	5	16	2,5	48	100	32	16	15,5
8555673	5	16	3	48	100	32	16	15,5
48247167	5	16	4	48	100	32	16	15,5
48247200	5	20	-	60	120	40	20	19,5
8555674	5	20	1	60	120	40	20	19,5
48247203	5	20	1,5	60	120	40	20	19,5
48247204	5	20	2	60	120	40	20	19,5
48247205	5	20	2,5	60	120	40	20	19,5
8555675	5	20	3	60	120	40	20	19,5
48247207	5	20	4	60	120	40	20	19,5
8555676	5	20	5	60	120	40	20	19,5
48247250	5	25	-	75	140	50	25	24,5
8555677	5	25	1	75	140	50	25	24,5
48247253	5	25	1,5	75	140	50	25	24,5
48247254	5	25	2	75	140	50	25	24,5
48247255	5	25	2,5	75	140	50	25	24,5
8555678	5	25	3	75	140	50	25	24,5
48247257	5	25	4	75	140	50	25	24,5
8555679	5	25	5	75	140	50	25	24,5
48247259	5	25	6	75	140	50	25	24,5

Milling | Solid carbide



# UVXL-TI-5FL

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with TiAlN coating
- For Titanium alloys
- 5 flutes, long length of cut, variable helix and unequal spacing, corner radius



Milling | Solid carbide

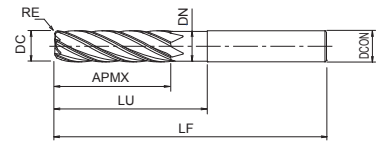
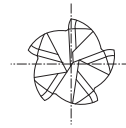


EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
8555520	5	12	-	60	110	48	12	11,5
8555521	5	12	1	60	110	48	12	11,5
8555522	5	12	1,5	60	110	48	12	11,5
8555523	5	12	2	60	110	48	12	11,5
8555524	5	12	2,5	60	110	48	12	11,5
8555525	5	12	3	60	110	48	12	11,5
8555526	5	12	4	60	110	48	12	11,5
8555560	5	16	-	80	130	64	16	15,5
8555561	5	16	1	80	130	64	16	15,5
8555562	5	16	1,5	80	130	64	16	15,5
8555563	5	16	2	80	130	64	16	15,5
8555564	5	16	2,5	80	130	64	16	15,5
8555565	5	16	3	80	130	64	16	15,5
8555566	5	16	4	80	130	64	16	15,5
8555600	5	20	-	100	160	80	20	19,5
8555601	5	20	1	100	160	80	20	19,5
8555602	5	20	1,5	100	160	80	20	19,5
8555603	5	20	2	100	160	80	20	19,5
8555604	5	20	2,5	100	160	80	20	19,5
8555605	5	20	3	100	160	80	20	19,5
8555606	5	20	4	100	160	80	20	19,5
8555607	5	20	5	100	160	80	20	19,5
8555650	5	25	-	125	190	100	25	24,5
8555651	5	25	1	125	190	100	25	24,5
8555652	5	25	1,5	125	190	100	25	24,5
8555653	5	25	2	125	190	100	25	24,5
8555654	5	25	2,5	125	190	100	25	24,5
8555655	5	25	3	125	190	100	25	24,5
8555656	5	25	4	125	190	100	25	24,5
8555657	5	25	5	125	190	100	25	24,5
8555658	5	25	6	125	190	100	25	24,5

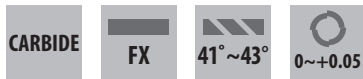


# UVXL-TI-5FL SAFE LOCK

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with TiAlN coating
- For Titanium alloys
- 5 flutes, long length of cut, variable helix and unequal spacing, corner radius
- SafeLock shank



EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
48248120	5	12	-	60	110	48	12	11,5
8555680	5	12	1	60	110	48	12	11,5
48248123	5	12	1,5	60	110	48	12	11,5
48248124	5	12	2	60	110	48	12	11,5
48248125	5	12	2,5	60	110	48	12	11,5
8555681	5	12	3	60	110	48	12	11,5
48248127	5	12	4	60	110	48	12	11,5
48248160	5	16	-	80	130	64	16	15,5
8555682	5	16	1	80	130	64	16	15,5
48248163	5	16	1,5	80	130	64	16	15,5
48248164	5	16	2	80	130	64	16	15,5
48248165	5	16	2,5	80	130	64	16	15,5
8555683	5	16	3	80	130	64	16	15,5
48248167	5	16	4	80	130	64	16	15,5
48248200	5	20	-	100	160	80	20	19,5
8555684	5	20	1	100	160	80	20	19,5
48248203	5	20	1,5	100	160	80	20	19,5
48248204	5	20	2	100	160	80	20	19,5
48248205	5	20	2,5	100	160	80	20	19,5
8555685	5	20	3	100	160	80	20	19,5
48248207	5	20	4	100	160	80	20	19,5
8555686	5	20	5	100	160	80	20	19,5
48248250	5	25	-	125	190	100	25	24,5
8555687	5	25	1	125	190	100	25	24,5
48248253	5	25	1,5	125	190	100	25	24,5
48248254	5	25	2	125	190	100	25	24,5
48248255	5	25	2,5	125	190	100	25	24,5
8555688	5	25	3	125	190	100	25	24,5
48248257	5	25	4	125	190	100	25	24,5
8555689	5	25	5	125	190	100	25	24,5
48248259	5	25	6	125	190	100	25	24,5

Milling | Solid carbide



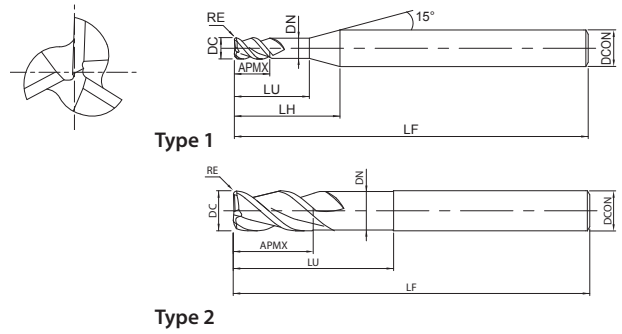






# AE-TS-N NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DLC coating
- For non-ferrous materials
- 3 flutes, short length of cut



EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	Type
8557330	3	3	-	9	55	4,5	14,9	6	2,85	1
8557370	3	3	0,2	9	55	4,5	14,8	6	2,85	1
8557371	3	3	0,5	9	55	4,5	14,8	6	2,85	1
8557331	3	4	-	12	55	6	16	6	3,8	1
8557372	3	4	0,2	12	55	6	15,9	6	3,8	1
8557373	3	4	0,5	12	55	6	15,9	6	3,8	1
8557374	3	4	1	12	55	6	15,9	6	3,8	1
8557332	3	5	-	15	55	7,5	17,1	6	4,8	1
8557375	3	5	0,2	15	55	7,5	16,8	6	4,8	1
8557376	3	5	0,5	15	55	7,5	16,8	6	4,8	1
8557377	3	5	1	15	55	7,5	16,8	6	4,8	1
8557333	3	6	-	18	60	9	-	6	5,8	2
8557378	3	6	0,3	18	60	9	-	6	5,8	2
8557379	3	6	0,5	18	60	9	-	6	5,8	2
8557380	3	6	1	18	60	9	-	6	5,8	2
8557334	3	8	-	24	70	12	-	8	7,7	2
8557381	3	8	0,3	24	70	12	-	8	7,7	2
8557382	3	8	0,5	24	70	12	-	8	7,7	2
8557383	3	8	1	24	70	12	-	8	7,7	2
8557384	3	8	1,5	24	70	12	-	8	7,7	2
8557385	3	8	2	24	70	12	-	8	7,7	2
8557335	3	10	-	30	75	15	-	10	9,7	2
8557386	3	10	0,3	30	75	15	-	10	9,7	2
8557387	3	10	0,5	30	75	15	-	10	9,7	2
8557388	3	10	1	30	75	15	-	10	9,7	2
8557389	3	10	1,5	30	75	15	-	10	9,7	2
8557390	3	10	2	30	75	15	-	10	9,7	2
8557391	3	10	3	30	75	15	-	10	9,7	2
8557336	3	12	-	36	80	18	-	12	11,7	2
8557392	3	12	0,3	36	80	18	-	12	11,7	2
8557393	3	12	0,5	36	80	18	-	12	11,7	2
8557394	3	12	1	36	80	18	-	12	11,7	2
8557395	3	12	1,5	36	80	18	-	12	11,7	2
8557396	3	12	2	36	80	18	-	12	11,7	2
8557397	3	12	3	36	80	18	-	12	11,7	2
8557337	3	16	-	48	110	24	-	16	15,7	2
8557338	3	20	-	60	120	30	-	20	19,7	2
8557339	3	25	-	75	140	37,5	-	25	24,7	2

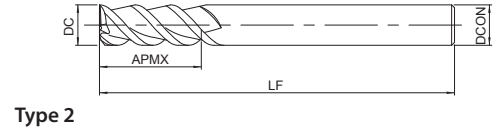
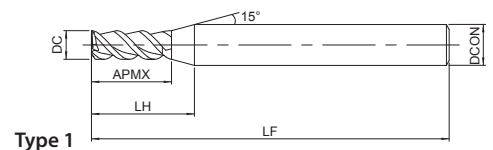
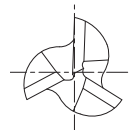
Milling | Solid carbide





# AE-TL-N NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DLC coating
- For non-ferrous materials
- 3 flutes, long length of cut



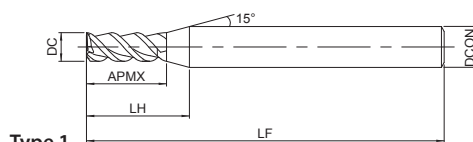
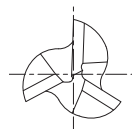
EDP	ZEFP	DC	LF	APMX	LH	DCON	ULDR	Type
8557340	3	3	55	9	17	6	3	1
8557350	3	3	55	15	23	6	5	1
8557341	3	4	55	12	18,1	6	3	1
8557351	3	4	60	20	26,1	6	5	1
8557342	3	5	55	15	19,3	6	3	1
8557352	3	5	65	25	29,3	6	5	1
8557343	3	6	60	18	-	6	3	2
8557353	3	6	75	30	-	6	5	2
8557344	3	8	70	24	-	8	3	2
8557354	3	8	90	40	-	8	5	2
8557345	3	10	75	30	-	10	3	2
8557355	3	10	100	50	-	10	5	2
8557346	3	12	80	36	-	12	3	2
8557356	3	12	110	60	-	12	5	2
8557347	3	16	120	48	-	16	3	2
8557357	3	16	150	80	-	16	5	2
8557348	3	20	135	60	-	20	3	2
8557358	3	20	175	100	-	20	5	2
8557349	3	25	155	75	-	25	3	2
8557359	3	25	205	125	-	25	5	2

Milling | Solid carbide

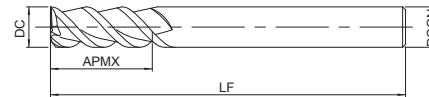


# AE-TL-N SP NEW

Milling | Solid carbide



Type 1



Type 2

- First choice in quality and performance
- Carbide end mill with DLC coating
- For non-ferrous materials
- 3 flutes, long length of cut
- Sharp corner for milling 90° corner



EDP	ZEFP	DC	LF	APMX	LH	DCON	ULDR	Type
8557440	3	3	55	9	16,6	6	3	1
8557450	3	3	55	15	22,6	6	5	1
8557441	3	4	55	12	17,7	6	3	1
8557451	3	4	60	20	25,7	6	5	1
8557442	3	5	55	15	18,9	6	3	1
8557452	3	5	65	25	28,9	6	5	1
8557443	3	6	60	18	-	6	3	2
8557453	3	6	75	30	-	6	5	2
8557444	3	8	70	24	-	8	3	2
8557454	3	8	90	40	-	8	5	2
8557445	3	10	75	30	-	10	3	2
8557455	3	10	100	50	-	10	5	2
8557446	3	12	80	36	-	12	3	2
8557456	3	12	110	60	-	12	5	2

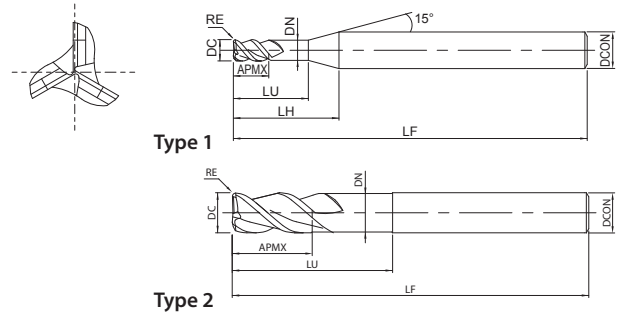
Milling | Solid carbide





# AE-VTS-N NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DLC-IGUSS coating
- For non-ferrous materials
- 3 flutes, variable helix and unequal spacing



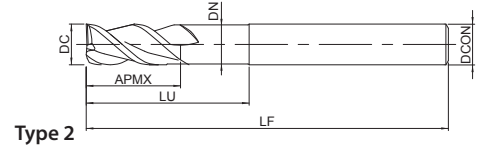
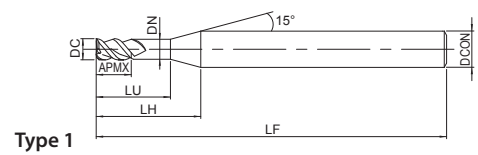
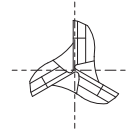
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	Type
8557360	3	3	-	9	55	4,5	14,9	6	2,85	1
8557400	3	3	0,2	9	55	4,5	14,8	6	2,85	1
8557401	3	3	0,5	9	55	4,5	14,8	6	2,85	1
8557361	3	4	-	12	55	6	16	6	3,8	1
8557402	3	4	0,2	12	55	6	15,9	6	3,8	1
8557403	3	4	0,5	12	55	6	15,9	6	3,8	1
8557404	3	4	1	12	55	6	15,9	6	3,8	1
8557362	3	5	-	15	55	7,5	17,1	6	4,8	1
8557405	3	5	0,2	15	55	7,5	16,8	6	4,8	1
8557406	3	5	0,5	15	55	7,5	16,8	6	4,8	1
8557407	3	5	1	15	55	7,5	16,8	6	4,8	1
8557363	3	6	-	18	60	9	-	6	5,8	2
8557408	3	6	0,3	18	60	9	-	6	5,8	2
8557409	3	6	0,5	18	60	9	-	6	5,8	2
8557410	3	6	1	18	60	9	-	6	5,8	2
8557364	3	8	-	24	70	12	-	8	7,7	2
8557411	3	8	0,3	24	70	12	-	8	7,7	2
8557412	3	8	0,5	24	70	12	-	8	7,7	2
8557413	3	8	1	24	70	12	-	8	7,7	2
8557414	3	8	1,5	24	70	12	-	8	7,7	2
8557415	3	8	2	24	70	12	-	8	7,7	2
8557365	3	10	-	30	75	15	-	10	9,7	2
8557416	3	10	0,3	30	75	15	-	10	9,7	2
8557417	3	10	0,5	30	75	15	-	10	9,7	2
8557418	3	10	1	30	75	15	-	10	9,7	2
8557419	3	10	1,5	30	75	15	-	10	9,7	2
8557420	3	10	2	30	75	15	-	10	9,7	2
8557421	3	10	3	30	75	15	-	10	9,7	2
8557366	3	12	-	36	80	18	-	12	11,7	2
8557422	3	12	0,3	36	80	18	-	12	11,7	2
8557423	3	12	0,5	36	80	18	-	12	11,7	2
8557424	3	12	1	36	80	18	-	12	11,7	2
8557425	3	12	1,5	36	80	18	-	12	11,7	2
8557426	3	12	2	36	80	18	-	12	11,7	2
8557427	3	12	3	36	80	18	-	12	11,7	2

Milling | Solid carbide



# AE-VTS-N SP NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DLC-IGUSS coating
- For non-ferrous materials
- 3 flutes, variable helix and unequal spacing
- Sharp corner for milling 90° corner



EDP	ZEFP	DC	LU	LF	APMX	LH	DCON	DN	Type
8557460	3	3	9	55	4,5	14,8	6	2,85	1
8557461	3	4	12	55	6	15,9	6	3,8	1
8557462	3	5	15	55	7,5	16,8	6	4,8	1
8557463	3	6	18	60	9	-	6	5,8	2
8557464	3	8	24	70	12	-	8	7,7	2
8557465	3	10	30	75	15	-	10	9,7	2
8557466	3	12	36	80	18	-	12	11,7	2

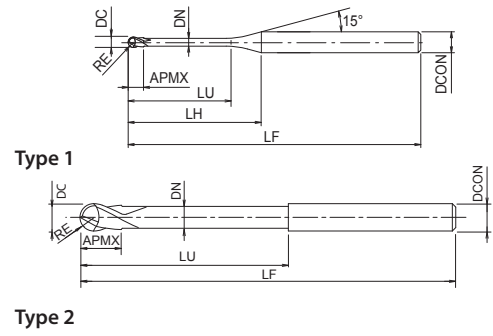
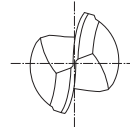
Milling | Solid carbide



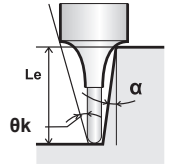


# AE-LNBD-N NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DLC coating
- For copper electrodes
- 2 flutes, long neck, ball nose
- 72 sizes



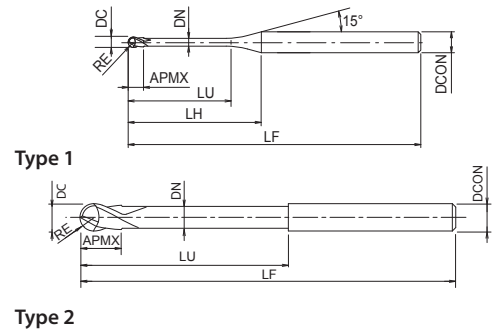
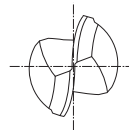
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=3°)	Type
3056370	2	0,1	0,05	0,3	45	0,08	7,6	4	0,09	14,52	0,3	0,31	0,32	0,33	0,36	1
3056371	2	0,1	0,05	0,5	45	0,08	7,8	4	0,09	14,07	0,53	0,56	0,59	0,62	0,67	1
3056372	2	0,15	0,075	0,3	45	0,12	7,5	4	0,135	14,55	0,3	0,31	0,32	0,33	0,35	1
3056373	2	0,15	0,075	0,5	45	0,12	7,7	4	0,135	14,12	0,52	0,55	0,58	0,6	0,65	1
3056374	2	0,15	0,075	1	45	0,12	8,2	4	0,135	13,29	1,05	1,1	1,14	1,18	1,27	1
3056375	2	0,2	0,1	0,3	45	0,16	7,4	4	0,19	14,59	0,3	0,31	0,32	0,33	0,34	1
3056376	2	0,2	0,1	0,5	45	0,16	7,6	4	0,19	14,12	0,53	0,56	0,58	0,61	0,66	1
3056377	2	0,2	0,1	1	45	0,16	8,1	4	0,19	13,28	1,06	1,11	1,15	1,19	1,28	1
3056378	2	0,2	0,1	1,5	45	0,16	8,6	4	0,19	12,53	1,58	1,65	1,7	1,76	1,9	1
3056379	2	0,3	0,15	0,6	45	0,24	7,5	4	0,285	14,02	0,63	0,65	0,68	0,7	0,75	1
3056380	2	0,3	0,15	1	45	0,24	7,9	4	0,285	13,33	1,05	1,09	1,13	1,17	1,25	1
3056381	2	0,3	0,15	1,5	45	0,24	8,4	4	0,285	12,56	1,57	1,63	1,68	1,74	1,87	1
3056382	2	0,3	0,15	2	45	0,24	8,9	4	0,285	11,87	2,09	2,16	2,24	2,32	2,49	1
3056383	2	0,4	0,2	1	45	0,3	7,7	4	0,38	13,38	1,04	1,08	1,11	1,15	1,23	1
3056384	2	0,4	0,2	2	45	0,3	8,7	4	0,38	11,87	2,08	2,15	2,22	2,3	2,47	1
3056385	2	0,4	0,2	3	45	0,3	9,7	4	0,38	10,66	3,12	3,22	3,33	3,45	3,71	1
3056386	2	0,4	0,2	4	45	0,3	10,7	4	0,38	9,68	4,15	4,29	4,44	4,6	4,95	1
3056387	2	0,5	0,25	1	45	0,4	7,6	4	0,475	13,43	1,03	1,07	1,1	1,13	1,2	1
3056388	2	0,5	0,25	2	45	0,4	8,6	4	0,475	11,87	2,07	2,14	2,21	2,28	2,45	1
3056389	2	0,5	0,25	3	45	0,4	9,6	4	0,475	10,63	3,11	3,21	3,32	3,43	3,69	1
3056390	2	0,5	0,25	4	45	0,4	10,6	4	0,475	9,63	4,14	4,28	4,42	4,58	4,93	1
3056391	2	0,5	0,25	5	45	0,4	11,6	4	0,475	8,79	5,18	5,35	5,53	5,73	6,18	1
3056392	2	0,6	0,3	1	45	0,5	7,3	4	0,55	13,5	1,02	1,05	1,07	1,1	1,17	1
3056393	2	0,6	0,3	2	45	0,5	8,3	4	0,55	11,89	2,06	2,12	2,18	2,25	2,41	1
3056394	2	0,6	0,3	3	45	0,5	9,3	4	0,55	10,62	3,09	3,19	3,29	3,4	3,66	1
3056395	2	0,6	0,3	4	45	0,5	10,3	4	0,55	9,59	4,12	4,26	4,4	4,55	4,9	1
3056396	2	0,6	0,3	5	45	0,5	11,3	4	0,55	8,74	5,16	5,33	5,51	5,7	6,14	1
3056397	2	0,6	0,3	6	45	0,5	12,3	4	0,55	8,02	6,19	6,4	6,62	6,85	7,39	1
3056398	2	0,8	0,4	2	45	0,6	8	4	0,75	11,87	2,05	2,11	2,17	2,24	2,39	1
3056399	2	0,8	0,4	3	45	0,6	9,1	4	0,75	10,53	3,09	3,18	3,28	3,39	3,63	1
3056400	2	0,8	0,4	4	45	0,6	10	4	0,75	9,46	4,12	4,25	4,39	4,54	4,88	1
3056401	2	0,8	0,4	6	45	0,6	12	4	0,75	7,86	6,19	6,39	6,61	6,84	7,36	1
3056402	2	0,8	0,4	8	45	0,6	14	4	0,75	6,72	8,25	8,53	8,82	9,14	9,85	1
3056403	2	1	0,5	2	45	0,8	7,6	4	0,95	11,85	2,05	2,1	2,16	2,22	2,37	1
3056404	2	1	0,5	3	45	0,8	8,6	4	0,95	10,44	3,08	3,17	3,27	3,37	3,61	1
3056405	2	1	0,5	4	45	0,8	9,6	4	0,95	9,32	4,12	4,24	4,38	4,52	4,85	1
3056406	2	1	0,5	5	45	0,8	10,6	4	0,95	8,42	5,15	5,31	5,49	5,67	6,1	1
3056407	2	1	0,5	6	45	0,8	11,6	4	0,95	7,68	6,18	6,38	6,59	6,82	7,34	1
3056408	2	1	0,5	8	45	0,8	13,6	4	0,95	6,52	8,25	8,52	8,81	9,12	9,83	1
3056409	2	1	0,5	10	45	0,8	15,6	4	0,95	5,67	10,32	10,66	11,03	11,42	12,31	1
3056410	2	1	0,5	12	45	0,8	17,6	4	0,95	5,01	12,39	12,8	13,24	13,72	14,8	1
3056411	2	1,5	0,75	4	45	1,2	8,8	4	1,45	8,8	4,18	4,33	4,46	4,6	4,92	1
3056412	2	1,5	0,75	6	45	1,2	10,8	4	1,45	7,09	6,27	6,47	6,68	6,9	7,4	1
3056413	2	1,5	0,75	12	55	1,2	16,8	4	1,45	4,46	12,48	12,89	13,33	13,8	14,86	1

Milling | Solid carbide

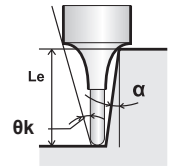
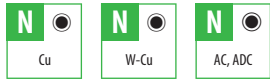


# AE-LNBD-N NEW

Milling | Solid carbide



- First choice in quality and performance
- Carbide end mill with DLC coating
- For copper electrodes
- 2 flutes, long neck, ball nose
- 72 sizes



CARBIDE

DLC-IGUSS

30°

SHANK h4

SHRINK FIT

R ± 0,002 RE ≤ 2

R ± 0,003 0,2 < RE ≤ 1,5

R ± 0,004 1,5 < RE

C.1078

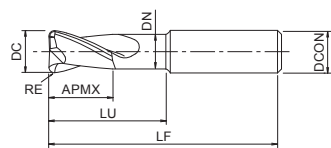
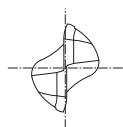
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=3°)	Type
3056414	2	1,5	0,75	18	55	1,2	22,8	4	1,45	3,25	18,68	19,31	19,98	20,7	22,32	1
3056415	2	2	1	4	50	1,6	8,2	4	1,95	7,88	4,22	4,44	4,65	4,86	5,26	1
3056416	2	2	1	6	50	1,6	10,2	4	1,95	6,2	6,35	6,67	6,96	7,23	7,75	1
3056417	2	2	1	8	50	1,6	12,2	4	1,95	5,1	8,47	8,87	9,22	9,54	10,24	1
3056418	2	2	1	10	50	1,6	14,2	4	1,95	4,34	10,58	11,05	11,45	11,84	12,73	1
3056419	2	2	1	12	50	1,6	16,2	4	1,95	3,77	12,68	13,21	13,67	14,14	15,21	1
3056420	2	2	1	14	50	1,6	18,2	4	1,95	3,33	14,78	15,36	15,88	16,44	17,7	1
3056421	2	2	1	16	50	1,6	20,2	4	1,95	2,99	16,87	17,5	18,1	18,74	-	1
3056422	2	2	1	20	60	1,6	24,2	4	1,95	2,47	21,04	21,78	22,53	23,34	-	1
3056423	2	2	1	25	60	1,6	29,2	4	1,95	2,04	26,24	27,13	28,07	29,09	-	1
3056424	2	3	1,5	10	55	2,4	15,8	6	2,85	5,95	10,44	10,83	11,18	11,55	12,37	1
3056425	2	3	1,5	12	55	2,4	17,8	6	2,85	5,23	12,53	12,98	13,4	13,85	14,85	1
3056426	2	3	1,5	14	55	2,4	19,8	6	2,85	4,67	14,62	15,12	15,62	16,15	17,34	1
3056427	2	3	1,5	16	55	2,4	21,8	6	2,85	4,21	16,7	17,26	17,83	18,45	19,83	1
3056428	2	3	1,5	20	55	2,4	25,8	6	2,85	3,53	20,85	21,54	22,27	23,05	24,8	1
3056429	2	3	1,5	25	65	2,4	30,8	6	2,85	2,93	26,03	26,89	27,81	28,8	-	1
3056430	2	3	1,5	30	65	2,4	35,8	6	2,85	2,5	31,2	32,24	33,35	34,54	-	1
3056431	2	4	2	10	60	3,2	14	6	3,85	4,75	10,42	10,79	11,13	11,47	12,25	1
3056432	2	4	2	15	60	3,2	19	6	3,85	3,37	15,64	16,16	16,67	17,22	18,47	1
3056433	2	4	2	20	65	3,2	24	6	3,85	2,61	20,84	21,51	22,21	22,97	-	1
3056434	2	4	2	25	65	3,2	29	6	3,85	2,13	26,02	26,85	27,75	28,72	-	1
3056435	2	4	2	30	80	3,2	34	6	3,85	1,79	31,18	32,2	33,3	-	-	1
3056436	2	4	2	40	80	3,2	44	6	3,85	1,37	41,52	42,9	-	-	-	1
3056437	2	6	3	10	70	4,8	-	6	5,85	-	-	-	-	-	-	2
3056438	2	6	3	15	70	4,8	-	6	5,85	-	-	-	-	-	-	2
3056439	2	6	3	20	70	4,8	-	6	5,85	-	-	-	-	-	-	2
3056440	2	6	3	30	90	4,8	-	6	5,85	-	-	-	-	-	-	2
3056441	2	6	3	50	90	4,8	-	6	5,85	-	-	-	-	-	-	2

Milling | Solid carbide



# DLC-AIR-EDS

Milling | Solid carbide



- Carbide end mill with DLC coating
- For high volume milling of aluminium alloys
- 2 flutes, short length of cut, corner radius



CARBIDE

DLC

25°

0~-0.02



EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
8528822	2	12	1	40	90	14	12	11
8528823	2	12	1,6	40	90	14	12	11
8528826	2	12	3	40	90	14	12	11
8528862	2	16	1	45	100	18	16	14,4
8528863	2	16	1,6	45	100	18	16	14,4
8528866	2	16	3	45	100	18	16	14,4
8528902	2	20	1	56	110	22	20	18
8528903	2	20	1,6	56	110	22	20	18
8528906	2	20	3	56	110	22	20	18
8528952	2	25	1	56	110	27	25	23
8528953	2	25	1,6	56	110	27	25	23
8528956	2	25	3	56	110	27	25	23

Milling | Solid carbide



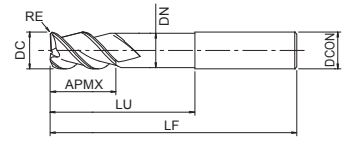
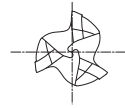






# AERO-LN-ETS

Milling | Solid carbide



- Carbide end mill with DLC coating
- For ultra high volume milling of aluminium alloys
- 3 flutes, long neck, corner radius



EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
48237166	3	16	3	80	130	24	16	14,4
48237167	3	16	4	80	130	24	16	14,4
48237206	3	20	3	80	130	30	20	18
48237207	3	20	4	80	130	30	20	18
48237256	3	25	3	80	130	37,5	25	23
48237257	3	25	4	80	130	37,5	25	23

Milling | Solid carbide





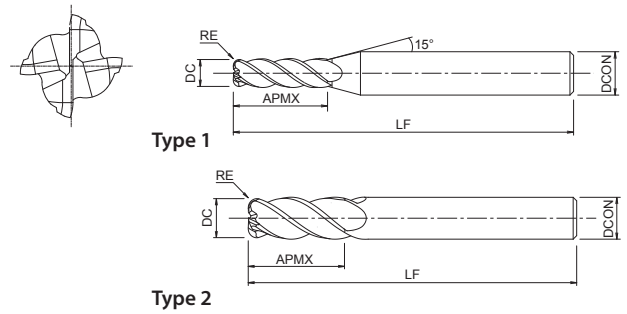






# NEO-CR-PHS

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For exotic materials
- 4 flutes, variable helix and unequal spacing, corner radius



EDP	ZEFP	DC	RE	LF	APMX	DCON	Type
8529531	4	3	0,2	50	6	6	1
8529533	4	3	0,5	50	6	6	1
8529541	4	4	0,2	50	8	6	1
8529543	4	4	0,5	50	8	6	1
8529545	4	4	1	50	8	6	1
8529551	4	5	0,2	50	10	6	1
8529553	4	5	0,5	50	10	6	1
8529555	4	5	1	50	10	6	1
8529562	4	6	0,3	50	12	6	2
8529563	4	6	0,5	50	12	6	2
8529565	4	6	1	50	12	6	2
8529582	4	8	0,3	60	16	8	2
8529583	4	8	0,5	60	16	8	2
8529585	4	8	1	60	16	8	2
8529587	4	8	1,5	60	16	8	2
8529589	4	8	2	60	16	8	2
8529602	4	10	0,3	70	20	10	2
8529603	4	10	0,5	70	20	10	2
8529605	4	10	1	70	20	10	2
8529607	4	10	1,5	70	20	10	2
8529609	4	10	2	70	20	10	2
8529613	4	10	3	70	20	10	2
8529633	4	12	0,5	75	24	12	2
8529635	4	12	1	75	24	12	2
8529637	4	12	1,5	75	24	12	2
8529639	4	12	2	75	24	12	2
8529643	4	12	3	75	24	12	2
8529662	4	16	1	100	32	16	2
8529663	4	16	1,5	100	32	16	2
8529664	4	16	2	100	32	16	2
8529665	4	16	3	100	32	16	2
8529682	4	20	1	105	40	20	2
8529684	4	20	2	105	40	20	2
8529685	4	20	3	105	40	20	2
8529686	4	20	4	105	40	20	2
8529687	4	20	5	105	40	20	2

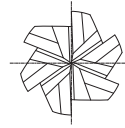
Milling | Solid carbide





# NEO-CR-EMS

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For exotic materials
- 6 flutes, variable helix and unequal spacing, corner radius

<b>P</b> ○ ~45 HRC	<b>P</b> ○ ~55 HRC	<b>M</b> ○ ~35 HRC	<b>K</b> ○ ~350 HB	<b>S</b> ○	<b>H</b> ○ ~60 HRC
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<b>CARBIDE</b>	<b>FX</b>	36° ~ 39°	<b>SHRINK</b> <b>FIT</b>	$D > 16$ 0 ~ 0.03	$D \leq 16$ 0 ~ 0.02
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	EDP	ZEFP	DC	RE	LF	APMX	DCON
	8519662	6	6	0,3	50	12	6
	8519663	6	6	0,5	50	12	6
	8519665	6	6	1	50	12	6
	8519682	6	8	0,3	60	16	8
	8519683	6	8	0,5	60	16	8
	8519685	6	8	1	60	16	8
	8519687	6	8	1,5	60	16	8
	8519689	6	8	2	60	16	8
	8519702	6	10	0,3	70	20	10
	8519703	6	10	0,5	70	20	10
	8519705	6	10	1	70	20	10
	8519707	6	10	1,5	70	20	10
	8519709	6	10	2	70	20	10
	8519713	6	10	3	70	20	10
	8519733	6	12	0,5	75	24	12
	8519735	6	12	1	75	24	12
	8519737	6	12	1,5	75	24	12
	8519739	6	12	2	75	24	12
	8519743	6	12	3	75	24	12
	8519762	6	16	1	100	32	16
	8519763	6	16	1,5	100	32	16
	8519764	6	16	2	100	32	16
	8519765	6	16	3	100	32	16
	8519782	6	20	1	105	40	20
	8519784	6	20	2	105	40	20
	8519785	6	20	3	105	40	20
	8519786	6	20	4	105	40	20
	8519787	6	20	5	105	40	20

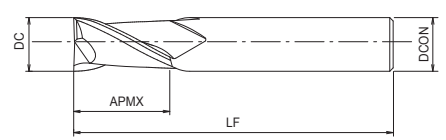
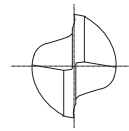
Milling | Solid carbide





# CA-RG-EDS

Milling | Solid carbide



- Carbide end mill, bright finish
- For aluminium and copper alloys
- 2 flutes, short length of cut



CARBIDE 30° SHRINK FIT 0~-0.03



EDP	ZEFP	DC	LF	APMX	DCON
8502010	2	1	40	2,5	4
8502015	2	1,5	40	4	4
8502020	2	2	40	6	4
8502025	2	2,5	40	8	4
8502030	2	3	45	8	6
8502035	2	3,5	45	10	6
8502040	2	4	45	11	6
8502045	2	4,5	45	11	6
8502050	2	5	50	13	6
8502055	2	5,5	50	13	6
8502060	2	6	50	13	6
8502065	2	6,5	60	16	8
8502070	2	7	60	16	8
8502075	2	7,5	60	16	8
8502080	2	8	60	19	8
8502085	2	8,5	70	19	10
8502090	2	9	70	19	10
8502095	2	9,5	70	19	10
8502100	2	10	70	22	10
8502105	2	10,5	75	22	12
8502110	2	11	75	22	12
8502115	2	11,5	75	22	12
8502120	2	12	75	26	12
8502130	2	13	85	26	12
8502140	2	14	85	26	12
8502150	2	15	90	26	16
8502160	2	16	100	32	16
8502170	2	17	100	32	16
8502180	2	18	100	32	16
8502190	2	19	100	32	20
8502200	2	20	105	38	20

Milling | Solid carbide



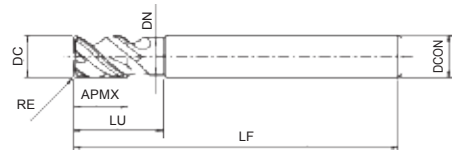
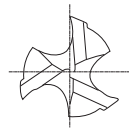






# CA-PKE

Milling | Solid carbide



- Carbide end mill, bright finish
- For aluminium and copper alloys
- 3 flutes, for pocket applications, corner radius



CARBIDE  $\pm 40^\circ$  SHRINK FIT  $0 \sim 0.02$



EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
8533033	3	3	0,5	9	50	4,5	6	2,7
8533043	3	4	0,5	12	50	6	6	3,6
8533053	3	5	0,5	15	60	7,5	6	4,5
8533063	3	6	0,5	15	60	9	6	5,4
8533065	3	6	1	15	60	9	6	5,4
8533083	3	8	0,5	20	70	12	8	7,2
8533085	3	8	1	20	70	12	8	7,2
8533103	3	10	0,5	25	80	15	10	9
8533105	3	10	1	25	80	15	10	9
8533123	3	12	0,5	30	90	18	12	11
8533125	3	12	1	30	90	18	12	11
8533163	3	16	0,5	40	115	24	16	15
8533165	3	16	1	40	115	24	16	15
8533169	3	16	3	40	115	24	16	15
8533203	3	20	0,5	50	125	30	20	19
8533205	3	20	1	50	125	30	20	19
8533209	3	20	3	50	125	30	20	19

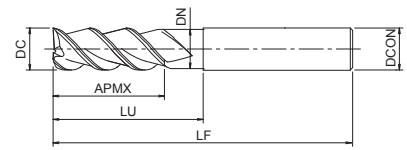
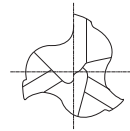
Milling | Solid carbide





# EPN-AL-3FS

Milling | Solid carbide



- Carbide end mill, bright finish
- For aluminium and copper alloys
- 3 flutes, short length of cut



EDP	ZEFP	DC	CHW	LU	LF	APMX	DCON	DN
EP019703	3	3	0,05	7	50	4	6	2,8
EP019704	3	4	0,05	8	54	5	6	3,8
EP019705	3	5	0,1	9	54	6	6	4,8
EP019706	3	6	0,1	15	54	7	6	5,8
EP019708	3	8	0,1	17	55	9	8	7,8
EP019710	3	10	0,1	20	60	11	10	9,8
EP019712	3	12	0,2	24	70	12	12	11,8
EP019716	3	16	0,2	28	80	16	16	15,8
EP019720	3	20	0,2	32	82	20	20	19,8

Milling | Solid carbide



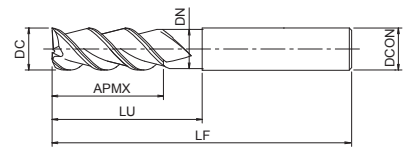
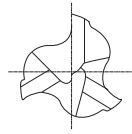






# EPA-AL-3FL

Milling | Solid carbide



- Carbide end mill with ALC coating
- For aluminium and copper alloys
- 3 flutes, long length of cut



line Plus
CARBIDE
ALC
40°
h6
D=3  
-0,004~  
+0,006
6≥D>3  
-0,006~  
+0,006
10≥D≥8  
-0,007~  
+0,006
16≥D≥12  
-0,009~  
+0,006
D≥20  
-0,011~  
+0,006
45°



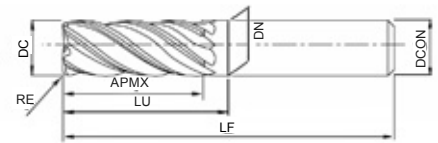
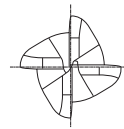
EDP	ZEFP	DC	CHW	LU	LF	APMX	DCON	DN
EP020003	3	3	0,05	12	57	9	6	2,9
EP020004	3	4	0,05	16	57	11	6	3,8
EP020005	3	5	0,1	18	57	13	6	4,8
EP020006	3	6	0,1	20	57	13	6	5,8
EP020008	3	8	0,1	25	63	19	8	7,8
EP020010	3	10	0,1	32	72	22	10	9,8
EP020012	3	12	0,2	38	83	26	12	11,8
EP020016	3	16	0,2	50	92	32	16	15,8
EP020020	3	20	0,2	62	104	38	20	19,8

Milling | Solid carbide



# EPL-HP-4FL

Milling | Solid carbide



- Carbide end mill with WXL coating
- For general applications and exotic materials
- 4 flutes, variable helix and unequal spacing, corner radius
- Weldon shank



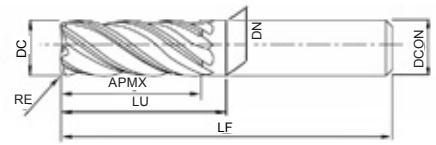
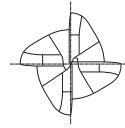
EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
EP01930399	4	3	-	11	57	8	6	-
EP01930300	4	3	0,25	11	57	8	6	-
EP01930301	4	3	0,5	11	57	8	6	-
EP01930499	4	4	-	13	57	11	6	-
EP01930400	4	4	0,25	13	57	11	6	-
EP01930401	4	4	0,5	13	57	11	6	-
EP01930402	4	4	1	13	57	11	6	-
EP01930599	4	5	-	15	57	13	6	-
EP01930500	4	5	0,25	15	57	13	6	-
EP01930501	4	5	0,5	15	57	13	6	-
EP01930502	4	5	1	15	57	13	6	-
EP01930699	4	6	-	20	57	13	6	5,8
EP01930600	4	6	0,25	20	57	13	6	5,8
EP01930601	4	6	0,5	20	57	13	6	5,8
EP01930602	4	6	1	20	57	13	6	5,8
EP01930603	4	6	1,5	20	57	13	6	5,8
EP01930899	4	8	-	25	63	19	8	7,8
EP01930800	4	8	0,25	25	63	19	8	7,8
EP01930801	4	8	0,5	25	63	19	8	7,8
EP01930802	4	8	1	25	63	19	8	7,8
EP01930803	4	8	1,5	25	63	19	8	7,8
EP01931099	4	10	-	30	72	22	10	9,8
EP01931000	4	10	0,25	30	72	22	10	9,8
EP01931001	4	10	0,5	30	72	22	10	9,8
EP01931002	4	10	1	30	72	22	10	9,8
EP01931003	4	10	1,5	30	72	22	10	9,8
EP01931004	4	10	2	30	72	22	10	9,8
EP01931006	4	10	3	30	72	22	10	9,8
EP01931299	4	12	-	38	83	26	12	11,8
EP01931200	4	12	0,25	38	83	26	12	11,8
EP01931201	4	12	0,5	38	83	26	12	11,8
EP01931202	4	12	1	38	83	26	12	11,8
EP01931204	4	12	2	38	83	26	12	11,8
EP01931206	4	12	3	38	83	26	12	11,8
EP01931207	4	12	4	38	83	26	12	11,8
EP01931499	4	14	-	44	92	32	16	15,8
EP01931400	4	14	0,25	44	92	32	16	15,8
EP01931402	4	14	1	44	92	32	16	15,8
EP01931699	4	16	-	44	92	32	16	15,8
EP01931600	4	16	0,25	44	92	32	16	15,8
EP01931601	4	16	0,5	44	92	32	16	15,8
EP01931602	4	16	1	44	92	32	16	15,8
EP01931604	4	16	2	44	92	32	16	15,8
EP01931606	4	16	3	44	92	32	16	15,8
EP01931607	4	16	4	44	92	32	16	15,8
EP01932099	4	20	-	54	104	38	20	19,8

Milling | Solid carbide



# EPL-HP-4FL

Milling | Solid carbide



- Carbide end mill with WXL coating
- For general applications and exotic materials
- 4 flutes, variable helix and unequal spacing, corner radius
- Weldon shank



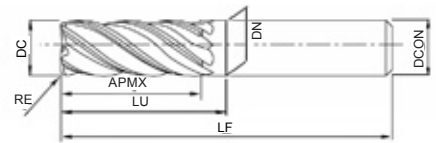
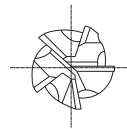
EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
EP01932000	4	20	0,25	54	104	38	20	19,8
EP01932001	4	20	0,5	54	104	38	20	19,8
EP01932002	4	20	1	54	104	38	20	19,8
EP01932004	4	20	2	54	104	38	20	19,8
EP01932006	4	20	3	54	104	38	20	19,8
EP01932007	4	20	4	54	104	38	20	19,8

Milling | Solid carbide



# EPL-HP-5FL

Milling | Solid carbide



- Carbide end mill with WXL coating
- For general applications and exotic materials
- 5 flutes, variable helix and unequal spacing, corner radius
- Weldon shank



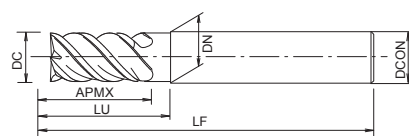
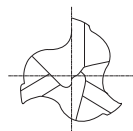
EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
EP01940699	5	6	-	20	57	13	6	5,8
EP01940600	5	6	0,25	20	57	13	6	5,8
EP01940601	5	6	0,5	20	57	13	6	5,8
EP01940602	5	6	1	20	57	13	6	5,8
EP01940899	5	8	-	25	63	19	8	7,8
EP01940800	5	8	0,25	25	63	19	8	7,8
EP01940801	5	8	0,5	25	63	19	8	7,8
EP01940802	5	8	1	25	63	19	8	7,8
EP01940803	5	8	1,5	25	63	19	8	7,8
EP01941099	5	10	-	30	72	22	10	9,8
EP01941000	5	10	0,25	30	72	22	10	9,8
EP01941001	5	10	0,5	30	72	22	10	9,8
EP01941002	5	10	1	30	72	22	10	9,8
EP01941003	5	10	1,5	30	72	22	10	9,8
EP01941004	5	10	2	30	72	22	10	9,8
EP01941006	5	10	3	30	72	22	10	9,8
EP01941299	5	12	-	38	83	26	12	11,8
EP01941200	5	12	0,25	38	83	26	12	11,8
EP01941201	5	12	0,5	38	83	26	12	11,8
EP01941202	5	12	1	38	83	26	12	11,8
EP01941204	5	12	2	38	83	26	12	11,8
EP01941206	5	12	3	38	83	26	12	11,8
EP01941207	5	12	4	38	83	26	12	11,8
EP01941699	5	16	-	44	92	32	16	15,8
EP01941600	5	16	0,25	44	92	32	16	15,8
EP01941601	5	16	0,5	44	92	32	16	15,8
EP01941602	5	16	1	44	92	32	16	15,8
EP01941604	5	16	2	44	92	32	16	15,8
EP01941606	5	16	3	44	92	32	16	15,8
EP01941607	5	16	4	44	92	32	16	15,8
EP01942099	5	20	-	54	104	38	20	19,8
EP01942000	5	20	0,25	54	104	38	20	19,8
EP01942001	5	20	0,5	54	104	38	20	19,8
EP01942002	5	20	1	54	104	38	20	19,8
EP01942004	5	20	2	54	104	38	20	19,8
EP01942006	5	20	3	54	104	38	20	19,8
EP01942007	5	20	4	54	104	38	20	19,8

Milling | Solid carbide



# EPL-ETS

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 3 flutes, square



EDP	ZEFP	DC	LU	LFN	APMX	DCON	DN
EP01860400	3	4	8,4	57	6	6	4
EP01860450	3	4,5	8,9	57	6,5	6	4,5
EP01860500	3	5	9,9	57	7,5	6	5
EP01860550	3	5,5	10,9	57	8,5	6	5,5
EP01860600	3	6	21	57	9	6	5,7
EP01860700	3	7	24	63	10,5	8	6,6
EP01860800	3	8	27	63	12	8	7,6
EP01860900	3	9	30	72	13,5	10	8,5
EP01861000	3	10	32	72	15	10	9,5
EP01861200	3	12	38	83	18	12	11,5
EP01861600	3	16	44	92	24	16	15

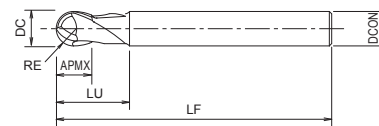
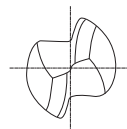
Milling | Solid carbide





# EPL-SB-LN-EBD

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 2 flutes, long neck, ball nose



EDP	ZEFP	DC	RE	LU	LF	APMX	DCON
EP01770100	2	1	0,5	3	75	1,5	6
EP01770150	2	1,5	0,75	4,5	75	2	6
EP01770200	2	2	1	6	75	3	6
EP01770300	2	3	1,5	9	60	4	6
EP01770301	2	3	1,5	9	75	4	6
EP01770400	2	4	2	12	60	5	6
EP01770401	2	4	2	12	90	5	6
EP01770500	2	5	2,5	15	90	6	6
EP01770600	2	6	3	18	90	7	6
EP01770800	2	8	4	24	100	9	8
EP01771000	2	10	5	30	100	11	10
EP01771200	2	12	6	36	110	13	12
EP01771600	2	16	8	40	150	18	16
EP01772000	2	20	10	40	150	20	20

Milling | Solid carbide

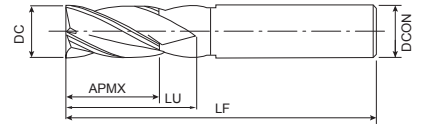
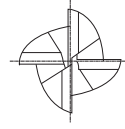






# EPL-HI-EMS

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 4 flutes, variable helix and unequal spacing



EDP	ZEFP	DC	LU	LF	APMX	DCON
EP00990400	4	4	-	57	11	6
EP00990500	4	5	-	57	13	6
EP00990600	4	6	20	57	13	6
EP00990800	4	8	25	63	19	8
EP00991000	4	10	30	72	22	10
EP01001000	4	10	60	100	40	10
EP00991200	4	12	38	83	26	12
EP01001200	4	12	65	150	45	12
EP00991600	4	16	45	92	32	16
EP01001600	4	16	100	150	65	16
EP00992000	4	20	60	104	38	20
EP01002000	4	20	100	150	65	20

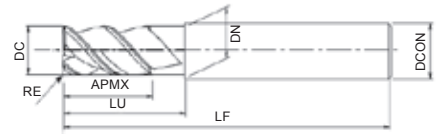
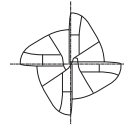
Milling | Solid carbide





# EPL-HI-CR-EMS

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 4 flutes, variable helix and unequal spacing, corner radius

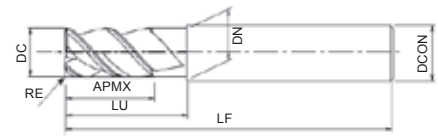
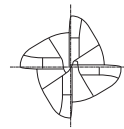


Milling | Solid carbide

EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
EP01760400	4	4	0,25	-	57	11	6	-
EP01760401	4	4	0,5	-	57	11	6	-
EP01760402	4	4	1	-	57	11	6	-
EP01760500	4	5	0,25	-	57	13	6	-
EP01760501	4	5	0,5	-	57	13	6	-
EP01760600	4	6	0,25	20	57	13	6	5,8
EP01760601	4	6	0,5	20	57	13	6	5,8
EP01760602	4	6	1	20	57	13	6	5,8
EP01760603	4	6	1,5	20	57	13	6	5,8
EP01760800	4	8	0,25	25	63	19	8	7,8
EP01760801	4	8	0,5	25	63	19	8	7,8
EP01760802	4	8	1	25	63	19	8	7,8
EP01760803	4	8	1,5	25	63	19	8	7,8
EP01761000	4	10	0,25	30	72	22	10	9,8
EP01761001	4	10	0,5	30	72	22	10	9,8
EP01761002	4	10	1	30	72	22	10	9,8
EP01761003	4	10	2	30	72	22	10	9,8
EP01761200	4	12	0,25	38	83	26	12	11,8
EP01761201	4	12	0,5	38	83	26	12	11,8
EP01761202	4	12	1	38	83	26	12	11,8
EP01761203	4	12	2	38	83	26	12	11,8
EP01761600	4	16	0,25	45	92	32	16	15,8
EP01761601	4	16	1	45	92	32	16	15,8
EP01761602	4	16	2	45	92	32	16	15,8

# EPL-HI-CR-WEMS

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 4 flutes, variable helix and unequal spacing, corner radius
- Weldon shank



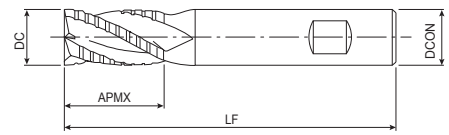
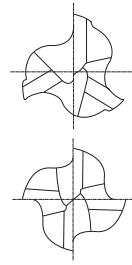
EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
EP01020400	4	4	0,25	-	57	11	6	-
EP01020401	4	4	0,5	-	57	11	6	-
EP01020402	4	4	1	-	57	11	6	-
EP01020500	4	5	0,25	-	57	13	6	-
EP01020501	4	5	0,5	-	57	13	6	-
EP01020502	4	5	1	20	57	13	6	5,8
EP01020600	4	6	0,25	20	57	13	6	5,8
EP01020601	4	6	0,5	20	57	13	6	5,8
EP01020602	4	6	1	20	57	13	6	5,8
EP01020603	4	6	1,5	20	57	13	6	7,8
EP01020800	4	8	0,25	25	63	19	8	7,8
EP01020801	4	8	0,5	25	63	19	8	7,8
EP01020802	4	8	1	25	63	19	8	7,8
EP01020803	4	8	1,5	30	72	22	8	9,8
EP01021000	4	10	0,25	30	72	22	10	9,8
EP01021001	4	10	0,5	30	72	22	10	9,8
EP01021002	4	10	1	30	72	22	10	9,8
EP01021003	4	10	1,5	38	83	26	10	11,8
EP01021004	4	10	2	38	83	26	10	11,8
EP01021200	4	12	0,25	38	83	26	12	11,8
EP01021201	4	12	0,5	38	83	26	12	11,8
EP01021202	4	12	1	38	83	26	12	11,8
EP01021203	4	12	2	38	83	26	12	11,8
EP01021600	4	16	0,25	45	92	32	16	15,8
EP01021601	4	16	1	45	92	32	16	15,8
EP01021602	4	16	2	45	92	32	16	15,8
EP01022000	4	20	1	60	104	38	20	19,8
EP01022001	4	20	2	60	104	38	20	19,8

Milling | Solid carbide



# EPL-WRESF

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 4 flutes, roughing
- Weldon shank



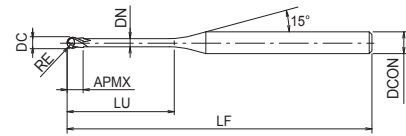
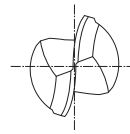
EDP	ZEFP	DC	LF	APMX	DCON
EP01200400	3	4	50	11	6
EP01200500	3	5	50	13	6
EP01200600	4	6	64	19	6
EP01200800	4	8	64	21	8
EP01201000	4	10	70	22	10
EP01201200	4	12	76	25	12
EP01201600	4	16	89	32	16
EP01202000	4	20	102	38	20
EP01202500	4	25	102	38	25

Milling | Solid carbide

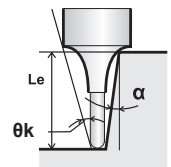


# EPL-LN-EBD

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 2 flutes, long neck, ball nose



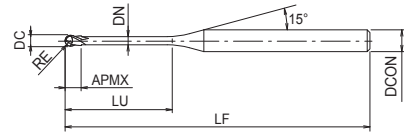
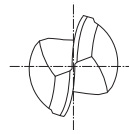
EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
EP48165001	2	0,3	0,15	0,5	45	0,24	4	0,28	14,22	0,52	0,54	0,56	0,58	0,6	0,62
EP48165002	2	0,3	0,15	1	45	0,24	4	0,28	13,34	1,05	1,09	1,12	1,16	1,2	1,24
EP48165003	2	0,4	0,2	1	45	0,3	4	0,37	13,39	1,04	1,07	1,11	1,14	1,18	1,22
EP48165004	2	0,4	0,2	2	45	0,3	4	0,37	11,88	2,08	2,14	2,21	2,29	2,37	2,46
EP48165005	2	0,5	0,25	1	45	0,4	4	0,45	13,45	1,03	1,06	1,09	1,12	1,15	1,19
EP48165006	2	0,5	0,25	2	45	0,4	4	0,45	11,89	2,06	2,13	2,2	2,27	2,35	2,43
EP48165007	2	0,5	0,25	3	45	0,4	4	0,45	10,65	3,1	3,2	3,3	3,42	3,54	3,68
EP48165008	2	0,5	0,25	4	45	0,5	4	0,45	9,64	4,13	4,27	4,41	4,57	4,74	4,92
EP48165009	2	0,6	0,3	1	45	0,5	4	0,55	13,49	1,03	1,05	1,08	1,11	1,14	1,18
EP48165010	2	0,6	0,3	2	45	0,5	4	0,55	11,88	2,06	2,12	2,19	2,26	2,34	2,42
EP48165011	2	0,6	0,3	3	45	0,5	4	0,55	10,61	3,1	3,19	3,3	3,41	3,53	3,66
EP48165012	2	0,6	0,3	4	45	0,5	4	0,55	9,58	4,13	4,26	4,41	4,56	4,73	4,91
EP48165013	2	0,6	0,3	6	45	0,5	4	0,55	8,02	6,2	6,4	6,62	6,86	7,12	7,39
EP48165014	2	0,8	0,4	2	45	0,6	4	0,75	11,86	2,06	2,12	2,18	2,25	2,32	2,4
EP48165015	2	0,8	0,4	4	45	0,6	4	0,75	9,45	4,13	4,26	4,4	4,55	4,71	4,88
EP48165016	2	0,8	0,4	6	45	0,6	4	0,75	7,85	6,19	6,4	6,61	6,85	7,1	7,37
EP48165017	2	1	0,5	2,5	45	0,8	4	0,95	11,09	2,57	2,64	2,72	2,81	2,9	3
EP48165018	2	1	0,5	3	45	0,8	4	0,95	10,43	3,09	3,18	3,28	3,38	3,49	3,62
EP48165019	2	1	0,5	4	45	0,8	4	0,95	9,32	4,12	4,25	4,39	4,53	4,69	4,86
EP48165020	2	1	0,5	5	45	0,8	4	0,95	8,41	5,16	5,32	5,49	5,68	5,88	6,1
EP48165021	2	1	0,5	6	45	0,8	4	0,95	7,67	6,19	6,39	6,6	6,83	7,08	7,35
EP48165022	2	1	0,5	8	45	0,8	4	0,95	6,52	8,26	8,53	8,82	9,13	9,47	9,83
EP48165023	2	1	0,5	10	45	0,8	4	0,95	5,66	10,33	10,67	11,04	11,43	11,86	12,32
EP48165024	2	1	0,5	12	45	0,8	4	0,95	5,01	12,39	12,81	13,25	13,73	14,25	14,81
EP48165025	2	1,5	0,75	4	45	1,2	4	1,45	8,8	4,18	4,33	4,46	4,6	4,75	4,92
EP48165026	2	1,5	0,75	8	45	1,2	4	1,45	5,92	8,34	8,61	8,9	9,2	9,53	9,89
EP48165027	2	2	1	6	45	1,6	4	1,95	6,19	6,36	6,67	6,96	7,23	7,49	7,76
EP48165028	2	2	1	8	45	1,6	4	1,95	5,1	8,48	8,87	9,22	9,55	9,88	10,24
EP48165029	2	2	1	10	45	1,6	4	1,95	4,33	10,59	11,05	11,45	11,85	12,27	12,73
EP48165030	2	2	1	12	45	1,6	4	1,95	3,77	12,69	13,21	13,67	14,15	14,66	15,22
EP48165031	2	2	1	14	50	1,6	4	1,95	3,33	14,78	15,36	15,89	16,45	17,05	17,7
EP48165032	2	2	1	16	50	1,6	4	1,95	2,98	16,88	17,51	18,1	18,75	19,44	-
EP48165033	2	2	1	20	55	1,6	4	1,95	2,47	21,05	21,78	22,54	23,34	-	-
EP48165034	2	2	1	25	65	1,6	4	1,95	2,03	26,24	27,13	28,08	29,09	-	-
EP48165035	2	3	1,5	8	50	2,4	6	2,85	6,88	8,35	8,67	8,97	9,25	9,55	9,88
EP48165036	2	3	1,5	10	50	2,4	6	2,85	5,94	10,44	10,83	11,19	11,55	11,94	12,37
EP48165037	2	3	1,5	16	55	2,4	6	2,85	4,21	16,7	17,26	17,84	18,45	19,11	19,83
EP48165038	2	3	1,5	20	60	2,4	6	2,85	3,52	20,86	21,54	22,27	23,05	23,89	24,8

Milling | Solid carbide

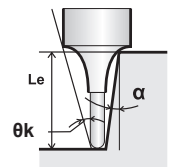


# EPL-LN-EBD

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 2 flutes, long neck, ball nose



EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
EP48165039	2	4	2	10	60	3,2	6	3,85	4,74	10,42	10,79	11,13	11,48	11,85	12,25
EP48165040	2	4	2	16	60	3,2	6	3,85	3,18	16,68	17,23	17,78	18,38	19,02	19,71
EP48165041	2	4	2	20	65	3,2	6	3,85	2,6	20,84	21,51	22,22	22,98	23,8	-
EP48165042	2	4	2	25	70	3,2	6	3,85	2,12	26,02	26,86	27,76	28,72	-	-
EP48165043	2	4	2	30	80	3,2	6	3,85	1,79	31,19	32,21	33,3	-	-	-
EP48165044	2	6	3	10	60	6	6	5,85	-	-	-	-	-	-	-
EP48165045	2	6	3	12	60	6	6	5,85	-	-	-	-	-	-	-
EP48165046	2	6	3	20	70	6	6	5,85	-	-	-	-	-	-	-
EP48165047	2	6	3	30	80	6	6	5,85	-	-	-	-	-	-	-

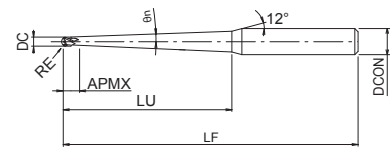
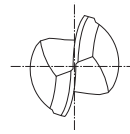
Milling | Solid carbide





# EPL-PC-EBD

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 2 flutes, ball nose, pencil neck



EDP	ZEFP	DC	RE	θn	LU	LF	APMX	DCON
W0900958	2	1	0,5	0,9	10	55	3	6
W0900959	2	1	0,5	0,9	15	60	3	6
W0900960	2	1	0,5	0,9	20	65	3	6
W0900962	2	1,5	0,75	0,9	20	65	4	6
W0900988	2	1,5	0,75	1,4	20	65	4	6
W0900963	2	1,5	0,75	0,9	30	70	4	6
W0900964	2	2	1	0,9	20	65	6	6
W0900989	2	2	1	1,4	20	65	6	6
W0900965	2	2	1	0,9	30	70	6	6
W0900990	2	2	1	1,4	30	70	6	6
W0900991	2	2	1	1,4	40	80	6	6
W0900967	2	3	1,5	0,9	20	65	8	6
W0900992	2	3	1,5	1,4	20	65	8	6
W0900968	2	3	1,5	0,9	30	70	8	6
W0900993	2	3	1,5	1,4	30	70	8	6
W0900969	2	3	1,5	0,9	40	80	8	6
W0900994	2	3	1,5	1,4	40	80	8	6
W0900971	2	4	2	0,9	30	90	10	8
W0900972	2	4	2	0,9	40	100	10	8
W0900995	2	4	2	1,4	40	100	10	8
W0900973	2	4	2	0,9	50	120	10	8
W0900996	2	4	2	1,4	50	120	10	8
W0900974	2	4	2	0,9	60	120	10	8
W0900997	2	4	2	1,4	60	120	10	8
W0900975	2	4	2	0,9	70	130	10	8
W0900978	2	6	3	0,9	50	120	12	10
W0900979	2	6	3	0,9	60	120	12	10
W0900998	2	6	3	1,4	60	120	12	10
W0900980	2	6	3	0,9	70	130	12	10
W0900981	2	6	3	0,9	80	130	12	10
W0900984	2	8	4	0,9	60	150	20	10
W0900999	2	8	4	1,4	60	150	20	12
W0900985	2	8	4	0,9	80	150	20	10
W0901000	2	8	4	1,4	80	150	20	12

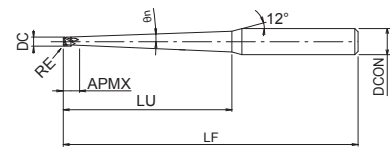
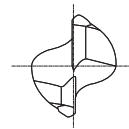
Milling | Solid carbide





# EPL-CPR

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 2 flutes, long neck, corner radius



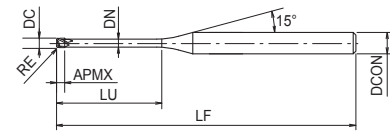
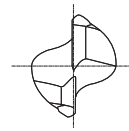
EDP	ZEFP	DC	RE	θn	LU	LF	APMX	DCON
W0901001	2	2	0,5	0,9	20	65	6	6
W0901002	2	2	0,5	0,9	30	70	6	6
W0901003	2	3	0,5	0,9	20	65	8	6
W0901034	2	3	0,5	1,4	20	65	8	6
W0901004	2	3	0,5	0,9	30	70	8	6
W0901035	2	3	0,5	1,4	30	70	8	6
W0901005	2	3	0,5	0,9	40	80	8	6
W0901006	2	3	1	0,9	20	65	8	6
W0901036	2	3	1	1,4	20	65	8	6
W0901007	2	3	1	0,9	30	70	8	6
W0901037	2	3	1	1,4	30	70	8	6
W0901008	2	3	1	0,9	40	80	8	6
W0901038	2	3	1	1,4	40	80	8	6
W0901009	2	4	0,5	0,9	30	90	10	8
W0901039	2	4	0,5	1,4	30	100	10	8
W0901010	2	4	0,5	0,9	40	100	10	8
W0901040	2	4	0,5	1,4	40	100	10	8
W0901011	2	4	0,5	0,9	50	120	10	8
W0901012	2	4	1	0,9	30	90	10	8
W0901041	2	4	1	1,4	30	100	10	8
W0901013	2	4	1	0,9	40	100	10	8
W0901042	2	4	1	1,4	40	100	10	8
W0901014	2	4	1	0,9	50	120	10	8
W0901015	2	4	1	0,9	60	120	10	8
W0901018	2	6	0,5	0,9	50	120	12	10
W0901019	2	6	0,5	0,9	60	120	12	10
W0901020	2	6	0,5	0,9	70	130	12	10
W0901021	2	6	1	0,9	50	120	12	10
W0901022	2	6	1	0,9	60	120	12	10
W0901023	2	6	1	0,9	70	130	12	10
W0901024	2	6	1	0,9	80	130	12	10
W0901027	2	8	0,5	0,9	60	150	20	10
W0901028	2	8	0,5	0,9	80	150	20	10
W0901029	2	8	1	0,9	60	150	20	10
W0901030	2	8	1	0,9	80	150	20	10
W0901033	2	8	2	0,9	80	150	20	10

Milling | Solid carbide



# EPL-CPR

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 2 flutes, long neck, corner radius



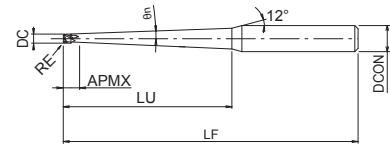
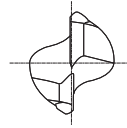
Milling | Solid carbide

EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
EP48166001	2	1	0,1	4	50	0,8	4	0,95
EP48166002	2	1	0,1	6	50	0,8	4	0,95
EP48166003	2	1	0,1	8	50	0,8	4	0,95
EP48166004	2	1	0,2	4	50	0,8	4	0,95
EP48166005	2	1	0,2	6	50	0,8	4	0,95
EP48166006	2	1	0,2	8	50	0,8	4	0,95
EP48166007	2	1	0,2	10	50	0,8	4	0,95
EP48166008	2	1	0,3	4	50	0,8	4	0,95
EP48166009	2	1	0,3	6	50	0,8	4	0,95
EP48166010	2	1	0,3	8	50	0,8	4	0,95
EP48166011	2	1	0,3	10	50	0,8	4	0,95
EP48166012	2	2	0,2	6	50	1,6	4	1,95
EP48166013	2	2	0,2	8	50	1,6	4	1,95
EP48166014	2	2	0,2	10	50	1,6	4	1,95
EP48166015	2	2	0,2	12	50	1,6	4	1,95
EP48166016	2	2	0,2	16	50	1,6	4	1,95
EP48166017	2	2	0,5	6	50	1,6	4	1,95
EP48166018	2	2	0,5	8	50	1,6	4	1,95
EP48166019	2	2	0,5	10	50	1,6	4	1,95
EP48166020	2	2	0,5	12	50	1,6	4	1,95
EP48166021	2	2	0,5	16	50	1,6	4	1,95
EP48166022	2	3	0,2	6	60	2,5	6	2,85
EP48166023	2	3	0,2	8	60	2,5	6	2,85
EP48166024	2	3	0,2	10	60	2,5	6	2,85
EP48166025	2	3	0,2	12	60	2,5	6	2,85
EP48166026	2	3	0,2	16	60	2,5	6	2,85
EP48166027	2	3	0,5	6	60	2,5	6	2,85
EP48166028	2	3	0,5	8	60	2,5	6	2,85
EP48166029	2	3	0,5	10	60	2,5	6	2,85
EP48166030	2	3	0,5	12	60	2,5	6	2,85
EP48166031	2	3	0,5	16	60	2,5	6	2,85
EP48166032	4	4	0,5	12	60	4	6	3,85
EP48166033	4	4	0,5	16	60	4	6	3,85
EP48166034	4	4	0,5	20	60	4	6	3,85
EP48166035	4	4	1	10	60	4	6	3,85
EP48166036	4	4	1	12	60	4	6	3,85
EP48166037	4	4	1	16	60	4	6	3,85
EP48166038	4	4	1	20	60	4	6	3,85
EP48166039	4	6	0,5	12	70	6	6	5,85
EP48166040	4	6	0,5	16	70	6	6	5,85
EP48166041	4	6	0,5	20	70	6	6	5,85
EP48166042	4	6	0,5	25	70	6	6	5,85



# EPL-CPR-DIA

Milling | Solid carbide



- Carbide end mill with diamond coating
- For graphite milling
- 2 flutes, long neck, corner radius

GRAPHITE



EDP	ZEFP	DC	RE	$\theta_n$	LU	LF	APMX	DCON
W0901016	2	4	1	0,9	80	130	10	8
W0901017	2	4	1	0,9	110	160	10	8
W0901025	2	6	1	0,9	100	160	12	10
W0901026	2	6	1	0,9	150	220	12	12
W0901031	2	8	1	0,9	100	170	20	12
W0901032	2	8	1	0,9	150	220	20	12

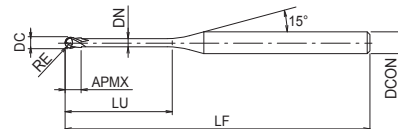
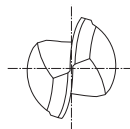
Milling | Solid carbide



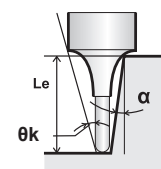


# EPS-LN-EBD

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For hardened steels up to 65 HRC
- 2 flutes, long neck, ball nose



EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
EP01950501	2	1	0,5	2	45	0,8	4	0,95	11,84	2,06	2,11	2,17	2,23	2,3	2,37
EP01950502	2	1	0,5	3	45	0,8	4	0,95	10,43	3,09	3,18	3,28	3,38	3,49	3,62
EP01950503	2	1	0,5	4	45	0,8	4	0,95	9,32	4,12	4,25	4,39	4,53	4,69	4,86
EP01950508	2	1	0,5	5	45	0,8	4	0,95	8,41	5,16	5,32	5,88	5,49	6,1	5,68
EP01950504	2	1	0,5	6	45	0,8	4	0,95	7,67	6,19	6,39	6,6	6,83	7,08	7,35
EP01950509	2	1	0,5	7	45	0,8	4	0,95	7,05	7,22	7,46	8,27	7,71	8,59	7,98
EP01950505	2	1	0,5	8	45	0,8	4	0,95	6,52	8,26	8,53	8,82	9,13	9,47	9,83
EP01950506	2	1	0,5	10	45	0,8	4	0,95	5,66	10,33	10,67	11,04	11,43	11,86	12,32
EP01950507	2	1	0,5	12	45	0,8	4	0,95	5,01	12,39	12,81	13,25	13,73	14,25	14,81
EP01950510	2	1	0,5	14	50	0,8	4	0,95	4,49	14,46	14,95	16,64	15,47	17,29	16,03
EP01950511	2	1	0,5	16	50	0,8	4	0,95	4,06	16,53	17,09	19,03	17,69	19,78	18,33
EP01951301	2	1,2	0,6	2,4	45	1	4	1,15	11,03	2,51	2,61	2,87	2,7	2,96	2,78
EP01951302	2	1,2	0,6	4	45	1	4	1,15	9,07	4,19	4,34	4,78	4,48	4,95	4,62
EP01951303	2	1,2	0,6	6	45	1	4	1,15	7,41	6,27	6,48	7,17	6,69	7,44	6,92
EP01951304	2	1,2	0,6	8	45	1	4	1,15	6,26	8,35	8,62	9,56	8,91	9,93	9,22
EP01950601	2	1,5	0,75	3	45	1,2	4	1,45	10,01	3,13	3,25	3,35	3,45	3,56	3,67
EP01950602	2	1,5	0,75	4	45	1,2	4	1,45	8,8	4,18	4,33	4,46	4,6	4,75	4,92
EP01950603	2	1,5	0,75	6	45	1,2	4	1,45	7,08	6,27	6,47	6,68	6,9	7,14	7,4
EP01950604	2	1,5	0,75	8	45	1,2	4	1,45	5,92	8,34	8,61	8,9	9,2	9,53	9,89
EP01950606	2	1,5	0,75	10	45	1,2	4	1,45	5,09	10,41	10,75	11,92	11,11	12,38	11,5
EP01950605	2	1,5	0,75	12	45	1,2	4	1,45	4,46	12,48	12,89	13,33	13,8	14,31	14,86
EP01950607	2	1,5	0,75	16	50	1,2	4	1,45	3,57	16,62	17,17	19,09	17,76	19,83	18,4
EP01950608	2	1,5	0,75	20	55	1,2	4	1,45	2,98	20,75	21,45	23,87	22,19	-	23
EP01951401	2	1,6	0,8	8	45	1,3	4	1,55	5,8	8,34	8,61	9,52	8,89	9,88	9,19
EP01951402	2	1,6	0,8	12	45	1,3	4	1,55	4,34	12,48	12,89	14,3	13,32	14,85	13,79
EP01950701	2	2	1	4	45	1,6	4	1,95	7,87	4,18	4,33	4,46	4,6	4,75	4,92
EP01950702	2	2	1	6	45	1,6	4	1,95	6,19	6,27	6,47	6,68	6,9	7,14	7,4
EP01950703	2	2	1	8	45	1,6	4	1,95	5,1	8,34	8,61	8,9	9,2	9,53	9,89
EP01950704	2	2	1	10	45	1,6	4	1,95	4,33	10,41	10,75	11,11	11,5	11,92	12,38
EP01950705	2	2	1	12	45	1,6	4	1,95	3,77	12,48	12,89	13,33	13,8	14,31	14,86
EP01950706	2	2	1	14	50	1,6	4	1,95	3,33	14,55	15,03	15,55	16,1	16,7	17,35
EP01950707	2	2	1	16	50	1,6	4	1,95	2,98	16,62	17,17	17,76	18,4	19,09	19,83
EP01950708	2	2	1	20	55	1,6	4	1,95	2,47	21,05	21,78	-	22,54	-	23,34
EP01950709	2	2	1	25	65	1,6	4	1,95	2,03	26,24	27,13	-	28,08	-	29,09
EP01950710	2	2	1	30	70	1,6	4	1,95	1,73	31,42	32,48	-	33,62	-	-
EP01950801	2	2,5	1,25	10	45	2	4	2,35	3,63	10,46	10,85	11,21	11,59	11,99	12,43
EP01950802	2	2,5	1,25	20	55	2	4	2,35	1,97	20,87	21,56	-	22,3	-	-

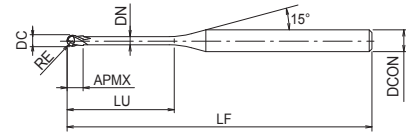
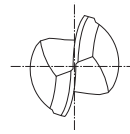
Milling | Solid carbide



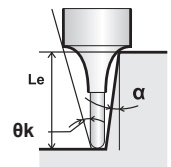


# EPS-LN-EBD

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For hardened steels up to 65 HRC
- 2 flutes, long neck, ball nose



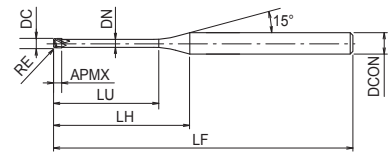
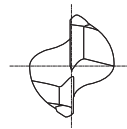
EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN	θk	Le (α=0,5°)	Le (α=1°)	Le (α=1,5°)	Le (α=2°)	Le (α=2,5°)	Le (α=3°)
EP01950901	2	3	1,5	6	50	2,4	6	2,85	8,17	6,25	6,49	6,72	6,95	7,17	7,4
EP01950902	2	3	1,5	8	50	2,4	6	2,85	6,88	8,35	8,67	8,97	9,25	9,55	9,88
EP01950903	2	3	1,5	10	50	2,4	6	2,85	5,94	10,44	10,83	11,19	11,55	11,94	12,37
EP01950904	2	3	1,5	12	55	2,4	6	2,85	5,22	12,53	12,98	13,4	13,85	14,33	14,86
EP01950908	2	3	1,5	14	55	2,4	6	2,85	4,66	14,62	15,13	16,72	15,62	17,34	16,15
EP01950905	2	3	1,5	15	55	2,4	6	2,85	4,42	15,66	16,2	16,73	17,3	17,92	18,59
EP01950906	2	3	1,5	16	55	2,4	6	2,85	4,21	16,7	17,26	17,84	18,45	19,11	19,83
EP01950907	2	3	1,5	20	60	2,4	6	2,85	3,52	20,86	21,54	22,27	23,05	23,89	24,8
EP01950909	2	3	1,5	25	65	2,4	6	2,85	2,92	26,04	26,89	29,86	27,81	-	28,8
EP01950910	2	3	1,5	30	70	2,4	6	2,85	2,5	31,2	32,24	-	33,35	-	34,55
EP01951501	2	3,5	1,75	20	60	2,8	6	3,35	3,08	20,85	21,53	23,84	22,24	24,74	23,01
EP01951001	2	4	2	8	55	3,2	6	3,85	5,67	8,33	8,63	8,91	9,18	9,46	9,77
EP01951002	2	4	2	10	60	3,2	6	3,85	4,74	10,42	10,79	11,13	11,48	11,85	12,25
EP01951003	2	4	2	12	60	3,2	6	3,85	4,07	12,51	12,95	13,35	13,78	14,24	14,74
EP01951006	2	4	2	15	60	3,2	6	3,85	3,36	15,64	16,16	17,82	16,67	18,47	17,23
EP01951004	2	4	2	16	60	3,2	6	3,85	3,18	16,68	17,23	17,78	18,38	19,02	19,71
EP01951005	2	4	2	20	65	3,2	6	3,85	2,6	20,84	21,51	22,22	22,98	23,8	-
EP01951007	2	4	2	25	70	3,2	6	3,85	2,12	26,02	26,86	-	27,76	-	28,72
EP01951601	2	5	2,5	20	70	4	6	4,85	1,46	20,82	21,47	-	-	-	-
EP01951602	2	5	2,5	40	90	4	6	4,85	0,72	41,51	-	-	-	-	-
EP01951101	2	6	3	12	60	4,8	6	5,85	-	-	-	-	-	-	-
EP01951102	2	6	3	20	70	4,8	6	5,85	-	-	-	-	-	-	-
EP01951103	2	6	3	25	70	4,8	6	5,85	-	-	-	-	-	-	-
EP01951104	2	6	3	30	80	4,8	6	5,85	-	-	-	-	-	-	-

Milling | Solid carbide



# EPS-CPR

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For hardened steels up to 65 HRC
- 2 flutes, long neck, corner radius



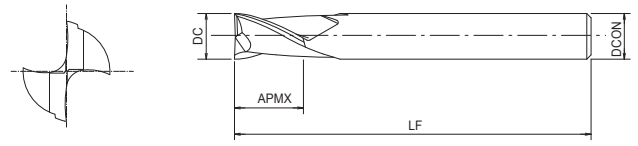
EDP	ZEFP	DC	RE	LU	LF	APMX	LH	DCON	DN
EP01960001	2	1	0,05	4	50	0,8	9,69	4	0,94
EP01960002	2	1	0,1	4	50	0,8	9,69	4	0,94
EP01960003	2	1	0,1	6	50	0,8	11,69	4	0,94
EP01960004	2	1	0,2	6	50	0,8	11,69	4	0,94
EP01960005	2	1	0,3	4	50	0,8	9,69	4	0,94
EP01960101	2	1,5	0,2	6	50	1,2	10,75	4	1,43
EP01960102	2	1,5	0,2	10	50	1,2	14,75	4	1,43
EP01960103	2	1,5	0,2	16	50	1,2	20,75	4	1,43
EP01960104	2	1,5	0,3	6	50	1,2	10,75	4	1,43
EP01960201	2	2	0,1	8	50	1,6	11,82	4	1,92
EP01960202	2	2	0,2	10	50	1,6	13,82	4	1,92
EP01960203	2	2	0,2	12	50	1,6	15,82	4	1,92
EP01960204	2	2	0,3	8	50	1,6	11,82	4	1,92
EP01960205	2	2	0,5	8	50	1,6	11,82	4	1,92
EP01960206	2	2	0,5	12	50	1,6	15,82	4	1,92
EP01960301	2	3	0,2	8	60	2,5	13,87	6	2,85
EP01960302	2	3	0,3	12	60	2,5	17,87	6	2,85
EP01960303	2	3	0,3	16	60	2,5	21,87	6	2,85
EP01960401	4	4	0,2	16	60	4	20,01	6	3,84
EP01960402	4	4	0,2	20	60	4	24,01	6	3,84
EP01960403	4	4	0,5	16	60	4	20,01	6	3,84

Milling | Solid carbide



# HYP-ZDS

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- For counterboring

**P** ● ● ~45 HRC
**P** ○ ○ ~55 HRC
**M** ● ● ~35 HRC
**K** ● ● ~350 HB
**N** ○ ○
**S** ○ ○

CARBIDE
TiAlN
20°
0~-0.02
C.1094

EDP	ZEFP	DC	LF	APMX	DCON
48370040	2	4	50	11	6
48370050	2	5	60	13	6
48370060	2	6	60	13	6
48370070	2	7	70	16	8
48370080	2	8	70	19	8
48370090	2	9	80	19	10
48370100	2	10	80	22	10

Milling | Solid carbide

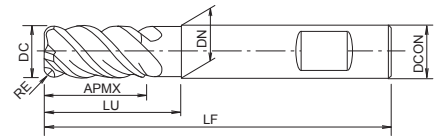
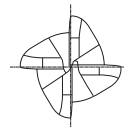






# HYP-CR-HI-WEMS

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 4 flutes, variable helix and unequal spacing, corner radius
- Weldon shank



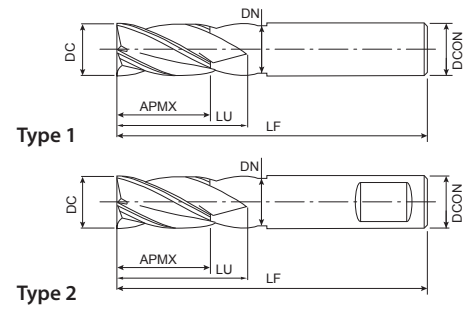
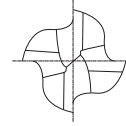
Milling | Solid carbide

EDP	ZEFP	DC	RE	LU	LF	APMX	DCON	DN
4832004011	4	4	0,5	-	57	11	6	-
4832005011	4	5	0,5	-	57	13	6	-
4832006011	4	6	0,5	20	57	13	6	5,8
4832006012	4	6	1	20	57	13	6	5,8
4832006013	4	6	1,5	20	57	13	6	5,8
4832006014	4	6	2	20	57	13	6	5,8
4832008011	4	8	0,5	25	63	19	8	7,8
4832008012	4	8	1	25	63	19	8	7,8
4832008013	4	8	1,5	25	63	19	8	7,8
4832008014	4	8	2	25	63	19	8	7,8
4832010011	4	10	0,5	30	72	22	10	9,8
4832010012	4	10	1	30	72	22	10	9,8
4832010013	4	10	1,5	30	72	22	10	9,8
4832010014	4	10	2	30	72	22	10	9,8
4832010016	4	10	3	30	72	22	10	9,8
4832012011	4	12	0,5	38	83	26	12	11,8
4832012012	4	12	1	38	83	26	12	11,8
4832012013	4	12	1,5	38	83	26	12	11,8
4832012014	4	12	2	38	83	26	12	11,8
4832012016	4	12	3	38	83	26	12	11,8
4832016011	4	16	0,5	44	92	32	16	15,8
4832016012	4	16	1	44	92	32	16	15,8
4832016014	4	16	2	44	92	32	16	15,8
4832016016	4	16	3	44	92	32	16	15,8
4832016018	4	16	4	44	92	32	16	15,8
4832020012	4	20	1	54	104	38	20	19,8
4832020014	4	20	2	54	104	38	20	19,8
4832020016	4	20	3	54	104	38	20	19,8
4832020018	4	20	4	54	104	38	20	19,8
4832020020	4	20	5	54	104	38	20	19,8



# HYP-HI-(W)EMS

Milling | Solid carbide



- Carbide end mill with TiAlN coating
- For general applications
- 4 flutes, variable helix and unequal spacing
- Also with Weldon shank



Milling | Solid carbide

EDP	ZEFP	DC	LU	LF	APMX	DCON	DN	Type
48320040	4	4	-	57	11	6	-	1
483200401	4	4	-	57	11	6	-	2
48320050	4	5	-	57	13	6	-	1
483200501	4	5	-	57	13	6	-	2
48320060	4	6	20	57	13	6	5,8	1
483200601	4	6	20	57	13	6	5,8	2
48320080	4	8	25	63	19	8	7,8	1
483200801	4	8	25	63	19	8	7,8	2
48320100	4	10	30	72	22	10	9,8	1
483201001	4	10	30	72	22	10	9,8	2
48320120	4	12	38	83	26	12	11,8	1
483201201	4	12	38	83	26	12	11,8	2
48320160	4	16	45	92	32	16	15,8	1
483201601	4	16	45	92	32	16	15,8	2
48320200	4	20	60	104	38	20	19,8	1
483202001	4	20	60	104	38	20	19,8	2

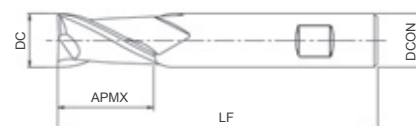
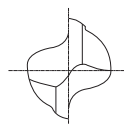






# V-XPM-WEDS

Milling | Powder metal



- Powder metal end mill with TiCN coating
- 2 flutes square
- Short length of cut
- Weldon shank

**XPM**

**V**

**32°**

**DIN 327**

**HB**

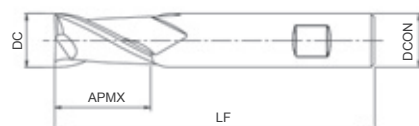
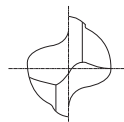


EDP	ZEFP	DC	LF	APMX	DCON
99025901	2	2	48	4	6
99025902	2	2,5	49	5	6
99025903	2	3	49	5	6
99025904	2	3,5	50	6	6
99025906	2	4	51	7	6
99025907	2	4,5	51	7	6
99025909	2	5	52	8	6
99025910	2	5,5	52	8	6
99025912	2	6	52	8	6
99025913	2	6,5	60	10	10
99025915	2	7	60	10	10
99025916	2	7,5	60	10	10
99025918	2	8	61	11	10
99025919	2	8,5	61	11	10
99025921	2	9	61	11	10
99025922	2	9,5	61	11	10
99025924	2	10	63	13	10
99025925	2	10,5	70	13	12
99025926	2	11	70	13	12
99025927	2	11,5	70	13	12
99025929	2	12	73	16	12
99025930	2	12,5	73	16	12
99025932	2	13	73	16	12
99025935	2	14	73	16	12
99025937	2	15	73	16	12
99025940	2	16	79	19	16
99025942	2	17	79	19	16
99025945	2	18	79	19	16
99025947	2	19	79	19	16
99025950	2	20	88	22	20
99025952	2	22	88	22	20
99025954	2	24	102	26	25
99025955	2	25	102	26	25
99025960	2	30	102	26	25

Milling | Powder metal

# V-WEDS

Milling | HSS-Co



- HSS-Co end mill with TiCN coating
- 2 flutes square
- Short length of cut
- Weldon shank

HSS-Co

V

30°



DIN 327

HB

C.1095

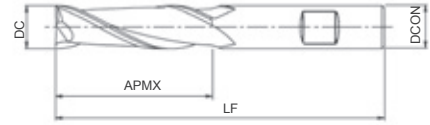
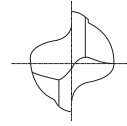
EDP	ZEFP	DC	LF	APMX	DCON
2002801660	2	1	46	2,5	6
2002800010	2	1,5	47	3	6
2002801670	2	1,8	48	4	6
2001801180	2	2	48	4	6
2002800020	2	2,5	49	5	6
2003800030	2	2,8	49	5	6
2001801190	2	3	49	5	6
2002800030	2	3,5	50	6	6
2003800040	2	3,8	51	7	6
2001801200	2	4	51	7	6
2002800040	2	4,5	51	7	6
2002801240	2	4,8	52	8	6
2001801210	2	5	52	8	6
2002800050	2	5,5	52	8	6
2003800050	2	5,75	52	8	6
2001801220	2	6	52	8	6
2002800060	2	6,5	60	10	10
2003800060	2	6,75	60	10	10
2002800070	2	7	60	10	10
2002800080	2	7,5	60	10	10
2002802010	2	7,75	61	11	10
2001801230	2	8	61	11	10
2002800090	2	8,5	61	11	10
2003800070	2	8,7	61	11	10
2001801240	2	9	61	11	10
2003800080	2	9,5	61	11	10
2003800090	2	9,7	63	13	10
2001801250	2	10	63	13	10
2002800100	2	10,5	70	13	12
2002800110	2	11	70	13	12
2003800100	2	11,5	70	13	12
2003800110	2	11,7	73	16	12
2001801260	2	12	73	16	12
2002800120	2	12,5	73	16	12
2003800120	2	12,7	73	16	12
2002800130	2	13	73	16	12
2003800130	2	13,7	73	16	12
2001801270	2	14	73	16	12
2002800140	2	15	73	16	12
2003800140	2	15,7	79	19	16
2001801280	2	16	79	19	16
2002800150	2	17	79	19	16
2003800150	2	17,7	79	19	16
2001801290	2	18	79	19	16
2002800160	2	19	79	19	16
2003800160	2	19,7	88	22	20





# V-WEDL

Milling | HSS-Co



- HSS-Co end mill with TiCN coating
- 2 flutes square
- Long length of cut
- Weldon shank

HSS-Co	V	30°		DIN 844	HB
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EDP	ZEFP	DC	LF	APMX	DCON
2003804860	2	1,5	54	7	6
2002801680	2	2	54	7	6
2003800240	2	2,5	56	8	6
2003800250	2	3	56	8	6
2003800260	2	3,5	59	10	6
2002801360	2	4	63	11	6
2003800270	2	4,5	63	11	6
2002800590	2	5	68	13	6
2002801690	2	5,5	68	13	6
2002800600	2	6	68	13	6
2002801700	2	6,5	80	16	10
2002801710	2	7	80	16	10
2003800280	2	7,5	80	16	10
2002800610	2	8	88	19	10
2003800290	2	8,5	88	19	10
2002801720	2	9	88	19	10
2003800300	2	9,5	88	19	10
2002801730	2	10	95	22	10
2002801740	2	11	102	22	12
2002800620	2	12	110	26	12
2003800310	2	13	110	26	12
2002800630	2	14	110	26	12
2003800320	2	15	110	26	12
2002801970	2	16	123	32	16
2003800330	2	17	123	32	16
2003800340	2	18	123	32	16
2003800350	2	19	123	32	16
2002800640	2	20	141	38	20
2003800380	2	25	166	45	25
2003800400	2	28	166	45	25
2003800410	2	30	166	45	25

Milling | HSS-Co



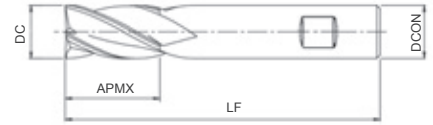
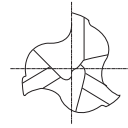






# V-WETS

Milling | HSS-Co



- HSS-Co end mill with TiCN coating
- 3 flutes square
- Short length of cut
- Weldon shank

HSS-Co	V	30°	+	DIN 327	HB
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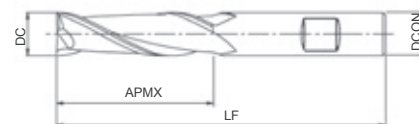
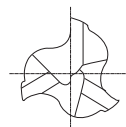
Milling | HSS-Co

EDP	ZEFP	DC	LF	APMX	DCON
2002800220	3	1,5	47	3	6
2002800230	3	2	48	4	6
2002800240	3	2,5	49	5	6
2001801480	3	3	49	5	6
2002801260	3	3,5	50	6	6
2001801490	3	4	51	7	6
2002801270	3	4,5	51	7	6
2001801500	3	5	52	8	6
2002800250	3	5,5	52	8	6
2001801510	3	6	52	8	6
2002800260	3	6,5	60	10	10
2001801520	3	7	60	10	10
2002800270	3	7,5	60	10	10
2001801530	3	8	61	11	10
2002801280	3	8,5	61	11	10
2002800280	3	9	61	11	10
2003800470	3	9,5	61	11	10
2001801540	3	10	63	13	10
2002800290	3	10,5	70	13	12
2002800300	3	11	70	13	12
2003800480	3	11,5	70	13	12
2001801550	3	12	73	16	12
2003800490	3	12,5	73	16	12
2002800310	3	13	73	16	12
2001801560	3	14	73	16	12
2002800320	3	15	73	16	12
2001801570	3	16	79	19	16
2002800330	3	17	79	19	16
2001801580	3	18	79	19	16
2003804870	3	19	79	19	16
2001801590	3	20	88	22	20
2003800510	3	21	88	22	20
2002801290	3	22	88	22	20
2003804850	3	23	88	22	20
2002801300	3	25	102	26	25
2003800540	3	26	102	26	25
2003800560	3	28	102	26	25
2002800340	3	30	102	26	25



# V-WETL

Milling | HSS-Co



- HSS-Co end mill with TiCN coating
- 3 flutes square
- Long length of cut
- Weldon shank

HSS-Co	V	30°		DIN 844	HB
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EDP	ZEFP	DC	LF	APMX	DCON
2003800640	3	3	56	12	6
2003800650	3	3,5	59	15	6
2003800660	3	4	63	19	6
2003800670	3	4,5	63	19	6
2002802100	3	5	68	24	6
2003800680	3	5,5	68	24	6
2002801750	3	6	68	24	6
2003800690	3	6,5	80	30	10
2003800700	3	7	80	30	10
2003800710	3	7,5	80	30	10
2002801760	3	8	88	38	10
2002801770	3	9	88	38	10
2002800720	3	10	95	45	10
2002802110	3	11	102	45	12
2003800720	3	12	110	53	12
2002801550	3	13	110	53	12
2002801330	3	14	110	53	12
2003800730	3	15	110	53	12
2002801340	3	16	123	63	16
2003800740	3	17	123	63	16
2003800750	3	18	123	63	16
2003800760	3	19	123	63	16
2002801350	3	20	141	75	20
2002802050	3	30	166	90	25

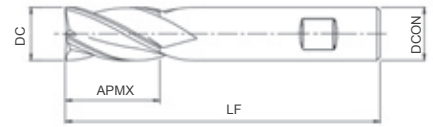
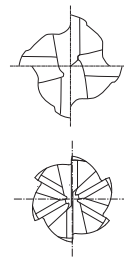
Milling | HSS-Co





# V-WEMS

Milling | HSS-Co



- HSS-Co end mill with TiCN coating
- Multi flute square
- Short length of cut
- Weldon shank

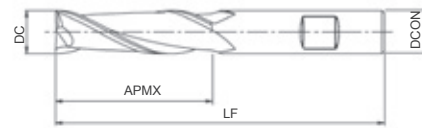
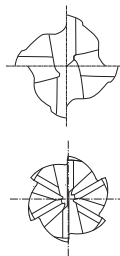


EDP	ZEFP	DC	LF	APMX	DCON
2003800010	4	1,5	49	5	6
2001801310	4	2	51	7	6
2002800350	4	2,5	52	8	6
2002800360	4	3	52	8	6
2002800370	4	3,5	54	10	6
2001801320	4	4	55	11	6
2002800380	4	4,5	55	11	6
2001801330	4	5	57	13	6
2002800390	4	5,5	57	13	6
2001801340	4	6	57	13	6
2003800790	4	6,5	66	16	10
2002800400	4	7	66	16	10
2003800800	4	7,5	66	16	10
2001801350	4	8	69	19	10
2003800810	4	8,5	69	19	10
2001801360	4	9	69	19	10
2003800820	4	9,5	69	19	10
2001801370	4	10	72	22	10
2003800830	4	10,5	79	22	12
2002800410	4	11	79	22	12
2003800840	4	11,5	83	26	12
2001801380	4	12	83	26	12
2002800420	4	13	83	26	12
2001801390	4	14	83	26	12
2002800430	4	15	83	26	12
2001801400	4	16	92	32	16
2002800440	4	17	92	32	16
2001801410	4	18	92	32	16
2002800450	4	19	92	32	16
2001801420	4	20	104	38	20
2003800850	6	21	104	38	20
2001801430	6	22	104	38	20
2003800860	6	23	104	38	20
2002802240	6	24	121	45	25
2001801440	6	25	121	45	25
2002800460	6	26	121	45	25
2002800470	6	28	121	45	25
2001801450	6	30	121	45	25
2001801460	6	32	133	53	32
2003800890	6	36	133	53	32
2001801470	6	40	143	63	32



# V-WEML

Milling | HSS-Co



- HSS-Co end mill with TiCN coating
- Multi flute square
- Long length of cut
- Weldon shank

HSS-Co
V
30°
DIN 844
HB

EDP	ZEFP	DC	LF	APMX	DCON
2002801640	4	2	54	10	6
2002801650	4	2,5	56	12	6
2003804880	4	3	56	12	6
2003804890	4	3,5	59	15	6
2003804900	4	4	63	19	6
2003804910	4	4,5	63	19	6
2002800650	4	5	68	24	6
2003804920	4	5,5	68	24	6
2003804930	4	6	68	24	6
2003804940	4	6,5	80	30	10
2003804950	4	7	80	30	10
2003804960	4	7,5	80	30	10
2002800660	4	8	88	38	10
2003804970	4	8,5	88	38	10
2003804980	4	9	88	38	10
2003804990	4	9,5	88	38	10
2002800670	4	10	95	45	10
2003805000	4	11	102	45	12
2002801600	4	12	110	53	12
2003805010	4	13	110	53	12
2003805020	4	14	110	53	12
2003805030	4	15	110	53	12
2002802210	4	16	123	63	16
2003805040	4	17	123	63	16
2003805050	4	18	123	63	16
2003805060	4	19	123	63	16
2002800680	4	20	141	75	20
2003805070	6	22	141	75	20
2003805080	6	24	166	90	25
2002800690	6	25	166	90	25
2003805100	6	28	166	90	25
2002800700	6	30	166	90	25
2002800710	6	32	186	106	32
2003805110	6	35	186	106	32
2003805120	6	36	186	106	32
2002801580	6	40	205	125	32

Milling | HSS-Co









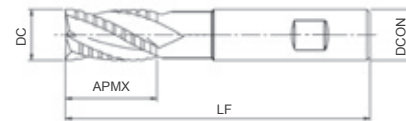
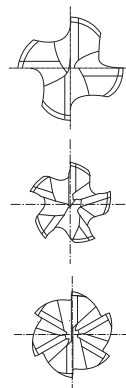






# V-WREES

Milling | HSS-Co



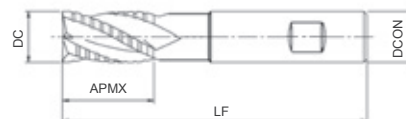
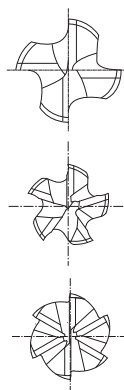
- HSS-Co end mill with TiCN coating
- Roughing multi flute square
- Short length of cut
- Weldon shank



EDP	ZEFP	DC	LF	APMX	DCON
2001801600	4	6	57	13	6
2002800480	4	7	66	16	10
2001801610	4	8	69	19	10
2002800490	4	9	69	19	10
2001801620	4	10	72	22	10
2002800500	4	11	79	22	12
2001801630	4	12	83	26	12
2002801180	4	13	83	26	12
2001801640	4	14	83	26	12
2002800510	4	15	83	26	12
2002801190	4	16	92	32	16
2002800520	4	18	92	32	16
2001801650	4	20	104	38	20
2002800530	5	22	104	38	20
2001801660	5	24	121	45	25
2001801670	5	25	121	45	25
2002801540	5	26	121	45	25
2001801680	5	28	121	45	25
2001801690	6	30	121	45	25
2001801700	6	32	133	53	32
2003800980	6	35	133	53	32
2003800990	6	36	133	53	32
2001801710	6	40	143	63	32

# V-WREEL

Milling | HSS-Co



- HSS-Co end mill with TiCN coating
- Roughing multi flute square
- Long length of cut
- Weldon shank

HSS-Co

V

30°

DIN  
844

HB

EDP	ZEFP	DC	LF	APMX	DCON
2002801780	4	8	88	38	10
2002802130	4	10	95	45	10
2002801790	4	12	110	53	12
2002801800	4	14	110	53	12
2003805430	4	15	110	53	12
2003805440	4	16	123	63	16
2003805450	4	18	123	63	16
2002801810	4	20	141	75	20
2003805460	5	22	141	75	20
2003805470	5	24	166	90	25
2002800730	5	25	166	90	25
2003805480	5	26	166	90	25
2003805490	5	28	166	90	25
2002801820	6	30	166	90	25
2002801560	6	32	186	106	32
2003805500	6	36	186	106	32
2002801570	6	40	205	125	32

Milling | HSS-Co

# MILLING INDEXABLES

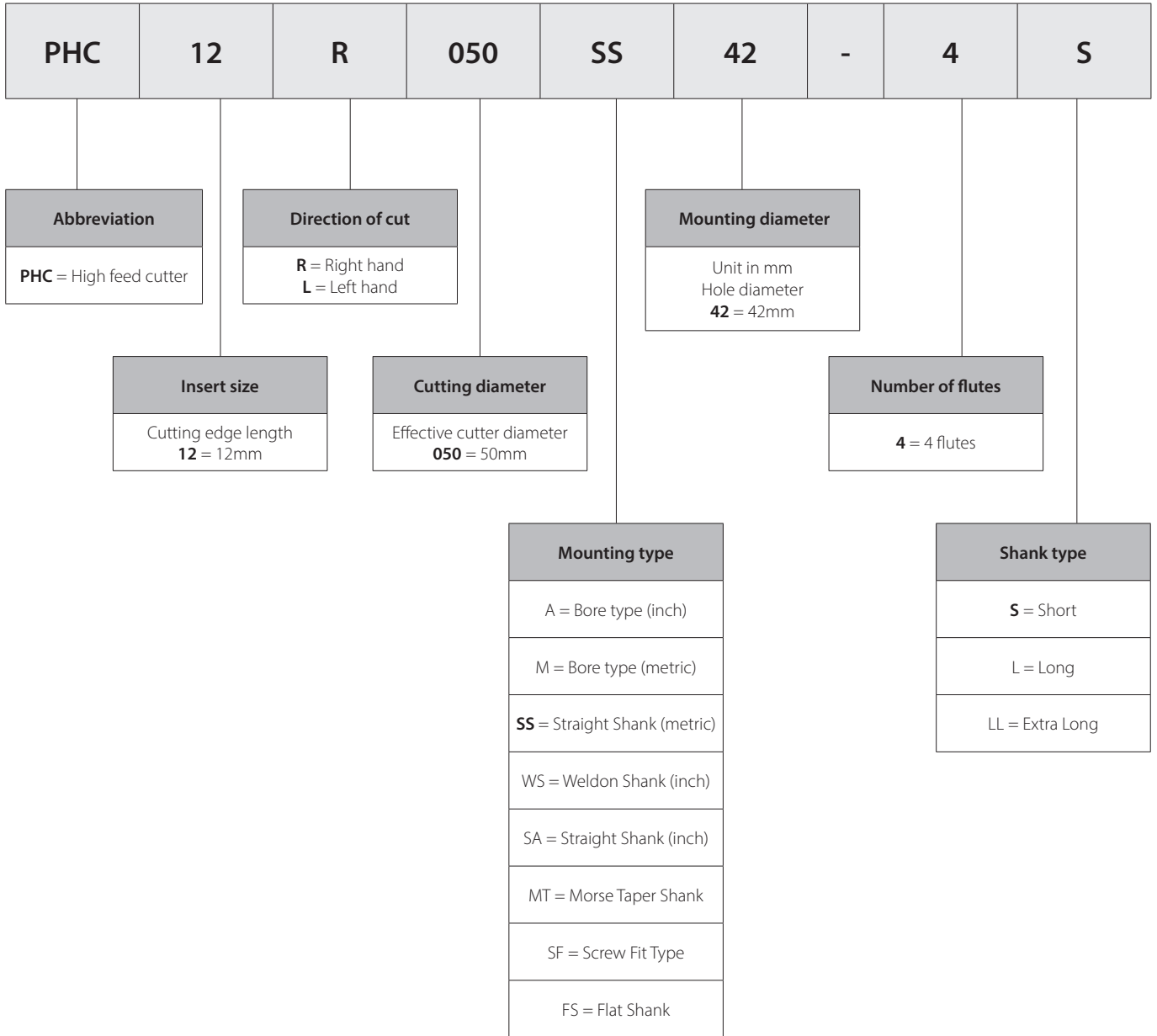
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# DESIGNATION SYSTEMS FOR BODY

Milling | Indexables



# DESIGNATION SYSTEMS FOR INSERTS

Milling | Indexables

<b>Z</b>	<b>D</b>	<b>K</b>	<b>T</b>
----------	----------	----------	----------

Shape		
<b>C</b>	80° diamond apex	
<b>D</b>	55° diamond apex	
<b>O</b>	octagon	
<b>R</b>	round	
<b>S</b>	square	
<b>T</b>	triangle	
<b>V</b>	35° diamond apex	
<b>W</b>	axonometric hexagon	
<b>Z</b>	other shapes	-

Tolerance			
Symbol	dia d (mm) Inscribed circle tolerance	m (mm) Corner height tolerance	s (mm) Thickness tolerance
<b>A</b>	±0.025	±0.005	±0.025
<b>C</b>	±0.025	±0.013	±0.025
<b>E</b>	±0.025	±0.025	±0.025
<b>H</b>	±0.013	±0.013	±0.025
<b>K*</b>	±0.05 ~ ±0.15	±0.013	±0.025
<b>M*</b>	±0.05 ~ ±0.15	±0.08 ~ ±0.18	±0.13
<b>N*</b>	±0.05 ~ ±0.15	±0.08 ~ ±0.18	±0.025

Clearance angle	
<b>A</b>	3°
<b>C</b>	7°
<b>D</b>	15°
<b>E</b>	20°
<b>N</b>	0°
<b>P</b>	11°
<b>X</b>	Special dimension

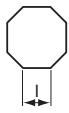

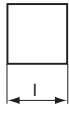


Feature of inserts			
Symbol	Shape of hole	Chipbreaker	Shape
<b>W</b>	40° - 60° Partial cylindrical hole	No breaker	
<b>T</b>		One side	
<b>B</b>	70° - 90° Partial cylindrical hole	No breaker	
<b>N</b>	-	No breaker	
<b>R</b>	-	One side	



# DESIGNATION SYSTEMS FOR INSERTS

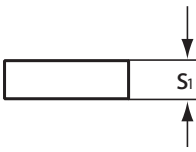
Milling | Indexables





15	05	08	S	R	-	GM
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Length of the cutting edge	
O	
R	
S	
T	
Z	

Corner radius	
Symbol	Corner radius
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
24	2.4

Cutting direction	
Symbol	Cutting direction
R	Right hand
L	Left hand
N	Neutral

Thickness of insert	
	
Symbol	S1 (mm) Thickness
02	2.38
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35

Type of cutting edge	
Symbol	Appearance
F	 <b>Sharpe edge</b>
E	 <b>Round honing</b>
T	 <b>Chamfer honing</b>
S	 <b>Combination honing</b>

Type of chipbreaker	
Symbol	Material
GL	Stainless steel
GM	Steel, stainless steel, cast iron
GR	Steel - Cast Iron
NM	Non ferrous materials, sharp cutting edge
SM	Difficult materials, sharp cutting edge
DM	Steel, stainless steel, cast iron general purpose chipbreaker
HR	Hardened steel
DN	Non ferrous
DR	Cast Iron





# ISO 13399 LEGEND

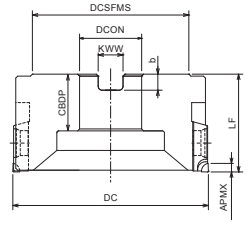
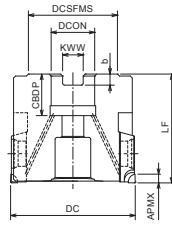
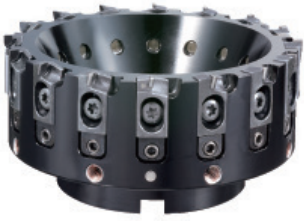
Indexables | ISO 13399 Legend

ISO code	Description
ae	Maximum depth plunging
AN	Clearance angle major
APMX	Depth of cut maximum
b	Keyway depth
BD	Body diameter
BHTA	Body half taper angle
BS	Wiper edge length
CBDP	Connection bore depth
CHW	Corner chamfer width
CRKS	Connection retention knob thread size
CS	Head connexion C
DC	Cutting diameter
DCB	Connection bore diameter
DCF	Cutting diameter face contact
DCN	Cutting diameter minimum
DCON	Connection diameter
DCONWS	Connection diameter workpiece side
DCSFMS	Contact surface diameter machine side
DCX	Cutting diameter maximum
DN	Neck diameter
DRVS	Drive size
FHA	Flute helix angle
IC	Inscribed circle diameter
KAPR	Tool cutting edge angle
KCH	Corner chamfer angle
KWW	Keyway width
L	Cutting edge length
LB	Body length
LC	Length at widest point
LCF	Length chip flute
LE	Cutting edge effective length
LF	Functional length
LH	Head length
LPR	Protruding length
LS	Shank length
LU	Usable length
NOF	Flute count
OAL	Overall length
PHD	Premachined hole diameter
RE	Corner radius
RE2	Secondary radius
RE3	Tertiary radius
S	Insert thickness
SIG	Point angle
ULDR	Usable length diameter ratio
W1	Insert width
ZEFP	Peripheral effective cutting edge count



# PFAL BORE

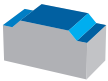
Milling | Indexable | 90 degrees



Type 1

Type 2

- Face milling finishing cutter for aluminium
- PCD blades
- Bore type
- 50 -160 mm



EDP	Designation	ZEFP	DC	LF	DCON	DCSFMS	KWW	b	CBDP	Type
7803600	PFAL04R050M16-5	5	50	55	16	40	8,4	5,6	20	1
7803601	PFAL04R063M22-6	6	63	55	22	45	10,4	6,3	21	1
7803602	PFAL04R063M22-8	8	63	55	22	45	10,4	6,3	21	1
7803604	PFAL04R080M27-8	8	80	50	27	70	12,4	7	28	2
7803606	PFAL04R080M27-10	10	80	50	27	70	12,4	7	28	2
7803608	PFAL04R100M27-8	8	100	50	27	80	12,4	7	28	2
7803610	PFAL04R100M32-8	8	100	50	32	80	14,4	8,2	28	2
7803612	PFAL04R100M27-12	12	100	50	27	80	12,4	7	28	2
7803614	PFAL04R100M32-12	12	100	50	32	80	14,4	8,2	28	2
7803616	PFAL04R125M27-10	10	125	50	27	80	12,4	7	28	2
7803618	PFAL04R125M40-10	10	125	63	40	85	16,4	9,2	30	2
7803620	PFAL04R125M27-16	16	125	50	27	80	12,4	7	28	2
7803622	PFAL04R125M40-16	16	125	63	40	85	16,4	9,2	30	2
7803624	PFAL04R160M27-12	12	160	50	27	80	12,4	7	28	2
7803625	PFAL04R160M40-12	12	160	63	40	85	16,4	9,2	30	2
7803630	PFAL04R160M27-20	20	160	50	27	80	12,4	7	28	2
7803627	PFAL04R160M40-20	20	160	63	40	85	16,4	9,2	30	2

Milling | Indexable



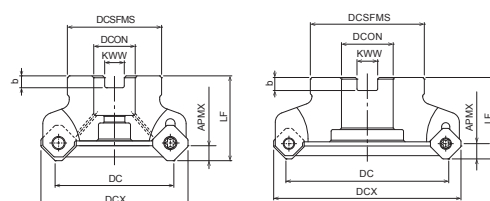
90 degrees

## Accessories and spare parts

EDP	Designation	Specification
7808143	W12-06	Wedge
7808125	FS60620 (Torx 25)	Clamping screw
7808142	WS0617	Clamping screw (wedge)
7808231	3MM-L	L-wrench (wedge)
7808211	T25-T (Torx 25)	Wrench

# PAS BORE

Milling | Indexable | 45 degree



Type 1

Type 2

- 45° face milling cutter
- Double sided 8 corners inserts
- Bore type
- 50 -125 mm



EDP	Designation	ZEFP	DC	DCX	LF	APMX	DCON	DCSFMS	KWW	b	Type	Specification
7802000	PAS15R050M22-4	4	50	65	45	6,5	22	45	10,4	6,3	1	With coolant
7802001	PAS15R063M22-5	5	63	78	45	6,5	22	50	10,4	6,3	1	With coolant
47802002	PAS15R080M27-6	6	80	95	50	6,5	27	60	12,4	7	1	With coolant
47802003	PAS15R100M32-7	7	100	115	50	6,5	32	70	14,4	8	2	Without coolant
47802004	PAS15R125M40-8	8	125	140	63	6,5	40	90	16,4	9	2	Without coolant

## Accessories and spare parts

EDP	Designation	Specification
7808131	FS45513P (Torx 20IP)	Clamping screw
7808000	20IP-T (Torx 20IP)	Wrench

Milling | Indexable



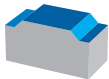
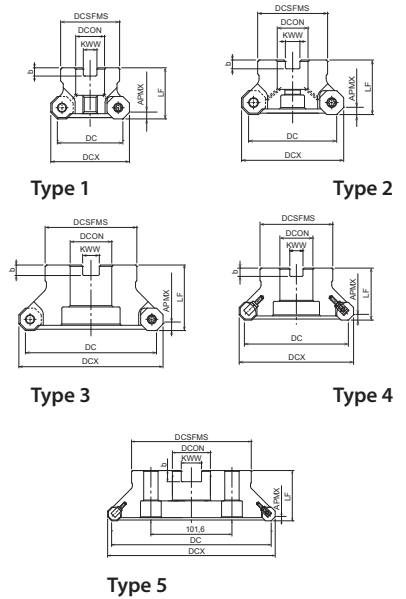
45 degree

# PAO BORE

Milling | Indexable | 45 degrees



- 45° face milling cutter
- Double sided 16 corners inserts
- Bore type
- 50 -200 mm



EDP	Designation	ZEFP	DC	DCX	LF	APMX	DCON	DCSFMS	KWW	b	Type	Specification
7802020	PAO06R050M22-5	5	50	60,2	40	3,5	22	45	10,4	6,3	1	With coolant
7802021	PAO06R063M22-7	7	63	73,2	40	3,5	22	50	10,4	6,3	2	With coolant
7802085	PAO06R080M27-8	8	80	90,2	50	3,5	27	60	12,4	7	2	With coolant
7802086	PAO06R100M32-10	10	100	110,2	50	3,5	32	70	14,4	8	3	Without coolant
7802087	PAO06R125M40-12	12	125	135,2	63	3,5	40	90	16,4	9	3	Without coolant
7802088	PAO06R100M32W-14	14	100	110,2	50	3,5	32	70	14,4	8	4	Without coolant
7802090	PAO06R125M40W-17	17	125	135,2	63	3,5	40	90	16,4	9	4	Without coolant
7802092	PAO06R160M40W-20	20	160	170,2	63	3,5	40	100	16,4	9	4	Without coolant
7802094	PAO06R200M60W-25	25	200	210,2	63	3,5	60	150	25,7	14	5	Without coolant

Milling | Indexable



45 degrees

## Accessories and spare parts

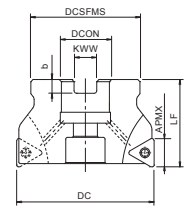
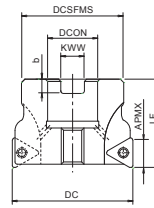
Applicable cutter DC	EDP	Designation	Specification
50	7808151	PS1031 (M10x31)	Power screw
50 - 125	7808130	FS50614 (Torx 20)	Clamping screw
50 - 125	7808209	T20-D (Torx 20)	Wrench
100 - 200 (Wedge)	7808141	W12F-06N (M6)	Wedge
100 - 200 (Wedge)	7808140	WS0621T (M6x21)	Clamping screw (wedge)
100 - 200 (Wedge)	7808208	T15-D (Torx 15)	Wrench





# PSTW BORE

Milling | Indexable | 90 degrees



Type 1

Type 2

- 90° shoulder cutter
- Double sided 6 corners inserts
- Bore type
- 40 - 125 mm



EDP	Designation	ZEFP	DC	LF	APMX	DCON	DCSFMS	KWW	b	Type
7803031	PSTW09R040M16-4	4	40	40	9	16	38	8,4	5,6	2
7803032	PSTW09R040M16-5	5	40	40	9	16	38	8,4	5,6	2
7803100	PSTW12R050M22-3	3	50	40	12	22	45	10,4	6,3	1
7803033	PSTW09R050M22-4	4	50	40	9	22	45	10,4	6,3	2
7803101	PSTW12R050M22-4	4	50	40	12	22	45	10,4	6,3	1
7803034	PSTW09R050M22-6	6	50	40	9	22	45	10,4	6,3	2
7803102	PSTW12R063M22-3	3	63	40	12	22	50	10,4	6,3	2
7803035	PSTW09R063M22-5	5	63	40	9	22	50	10,4	6,3	2
7803103	PSTW12R063M22-5	5	63	40	12	22	50	10,4	6,3	2
7803036	PSTW09R063M22-7	7	63	40	9	22	50	10,4	6,3	2
7803110	PSTW12R080M27-5	5	80	50	12	27	60	12,4	7	2
7803111	PSTW12R080M27-6	6	80	50	12	27	60	12,4	7	2
7803112	PSTW12R100M32-5	5	100	50	12	32	70	14,4	8	2
7803113	PSTW12R100M32-7	7	100	50	12	32	70	14,4	8	2
7803114	PSTW12R125M40-7	7	125	63	12	40	90	16,4	9	2
7803115	PSTW12R125M40-9	9	125	63	12	40	90	16,4	9	2

Milling | Indexable



90 degrees

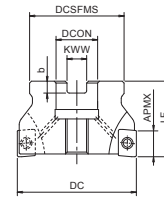
Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification	Insert
50 (Type 1)	7808151	PS1031 (M10x31)	Power screw	TN*U12
40 - 63	7808097	FS30668 (Torx 8)	Clamping screw	TN*U09
40 - 63	7808205	T8-D (Torx 8)	Wrench	TN*U09
50 - 125	7808129	FS40511 (Torx 15)	Clamping screw	TN*U12
50 - 125	7808208	T15-D (Torx 15)	Wrench	TN*U12

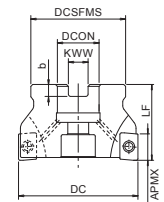


# PSE BORE

Milling | Indexable | 90 degrees

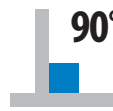
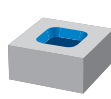
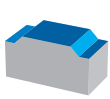


Type 1



Type 2

- 90° shoulder cutter
- 2 corners inserts with bottom notch
- Bore type
- 40 - 100 mm



EDP	Designation	ZEFP	DC	LF	APMX	DCON	DCSFMS	KWW	b	Applicable inserts type	Type
7801000	PSE11R040M16-4	4	40	40	10	16	38	8,4	5,6	ZDT11	1
7801004	PSE11R040M16-6	6	40	40	10	16	38	8,4	5,6	ZDT11	1
7801001	PSE11R050M22-5	5	50	40	10	22	45	10,4	6,3	ZDT11	1
7801005	PSE11R050M22-7	7	50	40	10	22	45	10,4	6,3	ZDT11	1
7801002	PSE11R063M22-6	6	63	40	10	22	50	10,4	6,3	ZDT11	2
7801006	PSE11R063M22-8	8	63	40	10	22	50	10,4	6,3	ZDT11	2
7801003	PSE11R080M27-7	7	80	50	10	27	60	12,4	7	ZDT11	2
7801007	PSE11R080M27-10	10	80	50	10	27	60	12,4	7	ZDT11	2
7801008	PSE15R040M16-3	3	40	40	14	16	38	8,4	5,6	ZDT15	1
7801014	PSE15R040M16-4	4	40	40	14	16	38	8,4	5,6	ZDT15	1
7801009	PSE15R050M22-3	3	50	40	14	22	45	10,4	6,3	ZDT15	1
7801015	PSE15R050M22-5	5	50	40	14	22	45	10,4	6,3	ZDT15	1
7801010	PSE15R063M22-4	4	63	40	14	22	50	10,4	6,3	ZDT15	2
7801016	PSE15R063M22-6	6	63	40	14	22	50	10,4	6,3	ZDT15	2
7801011	PSE15R080M27-5	5	80	50	14	27	60	12,4	7	ZDT15	2
7801017	PSE15R080M27-8	8	80	50	14	27	60	12,4	7	ZDT15	2
7801012	PSE15R100M32-7	7	100	50	14	32	70	14,4	8	ZDT15	2
7801018	PSE15R100M32-10	10	100	50	14	32	70	14,4	8	ZDT15	2

Milling | Indexable



90 degrees

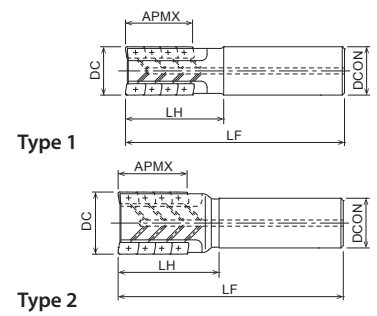
### Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
40	7808150	PS0830 (M8x30)	Power screw
50	7808151	PS1031 (M10x31)	Power screw
40 - 80 (ZD-T11)	7808109	FS25673P (Torx 8IP)	Clamping screw
40 - 80 (ZD-T11)	7808225	8IP-D (Torx 8IP)	Wrench
40 - 125 (ZDKT15)	7808115	FS35686P (Torx 15IP)	Clamping screw
40 - 125 (ZDKT15)	7808228	15IP-D (Torx 15IP)	Wrench



# PSEL SS

Milling | Indexable | 90 degrees



- 90° shoulder cutter with long length of cut
- 2 corners inserts with bottom notch
- Cylindrical type, with internal coolant
- 25 - 50 mm



EDP	Designation	ZEFP	DC	LF	LH	APMX	DCON	Inserts per flute	Inserts total	Applicable inserts type	Type
7802900	PSEL11R025SS25-2-27	2	25	125	50	27	25	3	6	ZDT11	1
7802901	PSEL11R032SS32-2-37	2	32	140	60	37	32	4	8	ZDT11	1
7802902	PSEL11R032SS32-3-45	3	32	140	60	45,5	32	5	15	ZDT11	1
7802903	PSEL11R040SS42-3-37	3	40	140	60	37	42	4	12	ZDT11	1
7802904	PSEL11R040SS42-4-45	4	40	140	60	45,5	42	5	20	ZDT11	1
7802905	PSEL15R040SS42-2-38	2	40	140	60	38	42	3	6	ZDT15	1
7802906	PSEL15R050SS42-3-50	3	50	144	64	50,5	42	4	12	ZDT15	2

Milling | Indexable

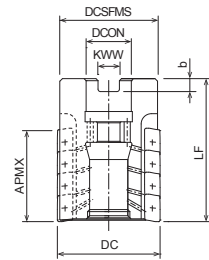
90 degrees

## Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
25 (ZD-T11)	7808107	FS25656P (Torx 8IP)	Clamping screw
25 (ZD-T11)	7808225	8IP-D (Torx 8IP)	Wrench
32 - 40 (ZD-T11)	7808109	FS25673P (Torx 8IP)	Clamping screw
32 - 40 (ZD-T11)	7808225	8IP-D (Torx 8IP)	Wrench
40 - 50 (ZDKT15)	7808115	FS35686P (Torx 15IP)	Clamping screw
40 - 50 (ZDKT15)	7808228	15IP-D (Torx 15IP)	Wrench

# PSEL BORE

Milling | Indexable | 90 degrees



- 90° shoulder cutter with long length of cut
- 2 corners inserts with bottom notch
- Bore type
- 50 - 80 mm



EDP	Designation	ZEFP	DC	LF	APMX	DCON	DCSFMS	KWW	b	Inserts per flute	Inserts total	Applicable inserts type
7802850	PSEL15R050M22-3-50	3	50	74	50,5	22	45	10,4	6,3	4	12	ZDKT150
7802851	PSEL15R063M27-3-50	3	63	74	50,5	27	60	12,4	7	4	12	ZDKT150
7802852	PSEL15R080M32-4-63	4	80	88	63	32	76	14,4	8	5	20	ZDKT150

### Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
50 - 80 (ZDKT15)	7808115	FS35686P (Torx 15IP)	Clamping screw
50 - 80 (ZDKT15)	7808228	15IP-D (Torx 15IP)	Wrench
50	7808132	OCB-M20-08	Coolant cap bolt
63	7808133	OCB-M24-10	Coolant cap bolt
80	7808134	OCB-M30-14	Coolant cap bolt

Milling | Indexable  
90 degrees

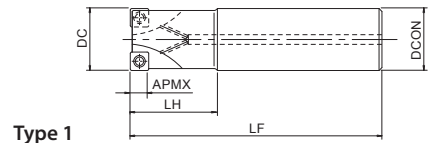


# PSF SS

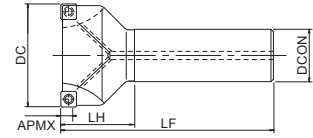
Milling | Indexable | 90 degrees



- Shoulder cutter
- 4 corners inserts
- Cylindrical type, with internal coolant
- 25 - 40 mm



Type 1



Type 2



EDP	Designation	ZEFP	DC	LF	LH	APMX	DCON	Type
7803001	PSF09R025SS25-3S	3	25	120	35	5	25	1
7803002	PSF09R032SS32-4S	4	32	130	45	5	32	1
7803003	PSF09R040SS32-5S	5	40	140	50	5	32	2

Milling | Indexable



90 degrees

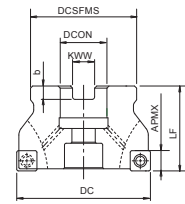
Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
25 - 40	7808110	FS30573 (Torx 8)	Clamping screw Wrench
25 - 40	7808205	T8-D (Torx 8)	



# PSF BORE

Milling | Indexable | 90 degrees



- Shoulder cutter
- 4 corners inserts
- Bore type
- 50 - 80 mm



EDP	Designation	ZEFP	DC	LF	APMX	DCON	DCSFMS	KWW	b
7803011	PSF09R050M22-6	6	50	40	5	22	45	10,4	6,3
7803012	PSF09R063M22-7	7	63	40	5	22	50	10,4	6,3
47803013	PSF09R080M27-9	9	80	50	5	27	60	12,4	7

## Accessories and spare parts

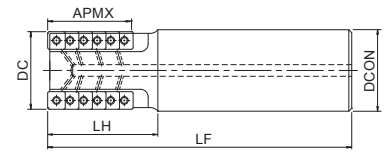
Applicable cutter DC	EDP	Designation	Specification
50 - 80	7808110	FS30573 (Torx 8)	Clamping screw Wrench
50 - 80	7808205	T8-D (Torx 8)	

Milling | Indexable  
90 degrees



# PSFL SS

Milling | Indexable | 90 degrees



- 90° shoulder cutter with long length of cut
- 4 corners inserts with bottom notch
- Cylindrical type, with internal coolant
- 32 - 40 mm



EDP	Designation	ZEFP	DC	LF	LH	APMX	DCON	Inserts per flute	Inserts total	Applicable inserts type
7803700	PSFL09R032SS32-2-36	2	32	140	60	36	32	5	10	SD*T09
7803701	PSFL09R040SS42-3-43	3	40	140	60	43	42	6	18	SD*T09

Milling | Indexable



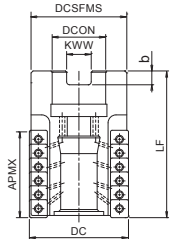
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## Accessories and spare parts

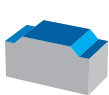
Applicable cutter DC	EDP	Designation	Specification
32 - 40	7808110	FS30573 (Torx 8)	Clamping screw Wrench
32 - 40	7808205	T8-D (Torx 8)	

# PSFL BORE

Milling | Indexable | 90 degrees



- 90° shoulder cutter with long length of cut
- 4 corners inserts with bottom notch
- Bore type
- 50 - 100 mm



EDP	Designation	ZEFP	DC	LF	APMX	DCON	DCSFMS	KWW	b	Inserts per flute	Inserts total	Applicable inserts type
7803702	PSFL09R050M22-4-50	4	50	75	50	22	48,5	10,4	6,3	7	28	SD*T09
7803703	PSFL09R050M22-4-78	4	50	100	78	22	48,5	10,4	6,3	11	44	SD*T09
7803704	PSFL09R050M27-4-50	4	50	75	50	27	48,5	12,4	7	7	28	SD*T09
7803705	PSFL09R050M27-4-78	4	50	100	78	27	48,5	12,4	7	11	44	SD*T09
7803706	PSFL12R063M27-4-60	4	63	85	60	27	60,5	12,4	7	6	24	SD*T12
7803707	PSFL12R063M27-4-100	4	63	125	100	27	60,5	12,4	7	10	40	SD*T12
7803708	PSFL12R080M32-5-70	5	80	95	70	32	77,3	14,4	8	7	35	SD*T12
7803709	PSFL12R080M32-5-110	5	80	143	110	32	77,3	14,4	8	11	55	SD*T12
7803710	PSFL12R100M32-6-120	6	100	153	120	32	97	16,4	9	12	72	SD*T12

Accessories and spare parts

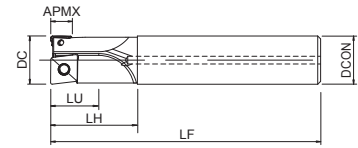
Applicable cutter DC	EDP	Designation	Specification
50	7808110	FS30573 (Torx 8)	Clamping screw
50	7808205	T8-D (Torx 8)	Wrench
63 - 100	7808129	FS40511 (Torx 15)	Clamping screw
63 - 100	7808208	T15-D (Torx 15)	Wrench
50	7808132	OCB-M20-08	Coolant cap bolt
63	7808133	OCB-M24-10	Coolant cap bolt
80 - 100	7808134	OCB-M30-14	Coolant cap bolt

Milling | Indexable  
90 degrees



# PMD SS NEW

Milling | Indexable | 90 degrees



- 90° multi-function cutter
- 2 types of inserts (PSE & PZAG)
- Cylindrical type, with internal coolant
- 20 - 32 mm



EDP	Designation	ZEFP	DC	LF	LH	APMX	DCON	LU	NOF	Applicable center inserts type	Applicable inserts type
7803410	PMD11R020SS20-1S	1	20	130	35	10	20	20	2	ZPNT100408EN	ZDKT11T308...
7803413	PMD11R020SS20-1L	1	20	185	60	10	20	20	2	ZPNT100408EN	ZDKT11T308...
7803411	PMD11R025SS25-1S	1	25	140	45	10	25	25	2	ZPNT130508EN	ZDKT11T308...
7803414	PMD11R025SS25-1L	1	25	220	75	10	25	25	2	ZPNT130508EN	ZDKT11T308...
7803412	PMD11R032SS32-1S	1	32	150	50	10	32	28	2	ZPNT170608EN	ZDKT11T308...
7803415	PMD11R032SS32-1L	1	32	230	90	10	32	28	2	ZPNT170608EN	ZDKT11T308...

Milling | Indexable



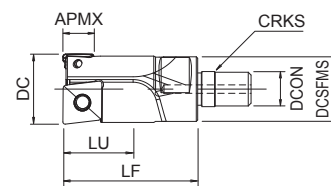
90 degrees

## Accessories and spare parts

Applicable cutter DC	EDP	Designation	Insert	Torque	Specification
20 - 32	7808107	FS25656P (Torx 8IP)	ZDKT11	1,6 N.m	Clamping screw
20	7808115	FS35686P (Torx 15IP)	ZPNT10	3,2 N.m	Clamping screw
25	7808114	FS45510P (Torx 20IP)	ZPNT13	5,0 N.m	Clamping screw
32	7808114	FS45510P	ZPNT17	5,0 N.m	Clamping screw
20 - 32	7808225	8IP-D (Torx 8IP)	-	-	Wrench
20	7808228	15IP-D (Torx 15IP)	-	-	Wrench
25 - 32	7808229	20IP-D (Torx 20IP)	-	-	Wrench

# PMD SCREW FIT NEW

Milling | Indexable | 90 degrees



- 90° multi-function cutter
- 2 types of inserts (PSE & PZAG)
- Screw fit type
- 20 - 32 mm



EDP	Designation	ZEFP	DC	LF	APMX	DCON	DCSFMS	DN	LU	NOF	CRKS	Wrench size	Applicable center inserts type	Applicable inserts type
7803416	PMD11R020SF10-1	1	20	48	10	10,5	18	18	20	2	10	14	ZDKT11T308...	ZPNT100408EN
7803417	PMD11R025SF12-1	1	25	48	10	12,5	23	22	25	2	12	17	ZDKT11T308...	ZPNT130508EN
7803418	PMD11R032SF16-1	1	32	58	10	17	28	27	28	2	16	22	ZDKT11T308...	ZPNT170608EN

## Accessories and spare parts

Applicable cutter DC	EDP	Designation	Insert	Torque	Specification
20 - 32	7808107	FS25656P (Torx 8IP)	ZDKT11	1,6 N.m	Clamping screw
20	7808115	FS35686P (Torx 15IP)	ZPNT10	3,2 N.m	Clamping screw
25	7808114	FS45510P (Torx 20IP)	ZPNT13	5,0 N.m	Clamping screw
32	7808114	FS45510P	ZPNT17	5,0 N.m	Clamping screw
20 - 32	7808225	8IP-D (Torx 8IP)	-	-	Wrench
20	7808228	15IP-D (Torx 15IP)	-	-	Wrench
25 - 32	7808229	20IP-D (Torx 20IP)	-	-	Wrench

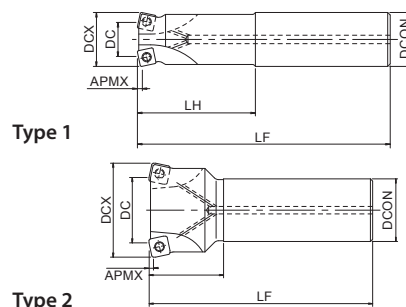
Milling | Indexable



90 degrees

# PHC SS

Milling | Indexable | 90 degrees



- High feed radius cutter for long over hang
- 4 corners high feed inserts
- Cylindrical type, with internal coolant
- 16 - 40 mm



EDP	Designation	ZEFP	DC	DCX	LF	LH	APMX	DCON	Applicable inserts type	Type
7800750	PHC07R016SS16-2S	2	7,4	16	100	30	0,8	16	SPMT07	1
7800755	PHC07R016SS16-2L	2	7,4	16	150	50	0,8	16	SPMT07	1
7800757	PHC07R018SS16-2L	2	9,4	18	150	25	0,8	16	SPMT07	2
7800751	PHC07R020SS20-3S	3	11,4	20	130	50	0,8	20	SPMT07	1
7800758	PHC07R020SS20-3L	3	11,4	20	160	80	0,8	20	SPMT07	1
7800760	PHC07R022SS20-3L	3	13,4	22	160	30	0,8	20	SPMT07	2
7800752	PHC07R025SS25-4S	4	16,4	25	140	60	0,8	25	SPMT07	1
7800761	PHC07R025SS25-4L	4	16,4	25	200	100	0,8	25	SPMT07	1
7800753	PHC07R030SS32-4S	4	21,4	30	150	70	0,8	32	SPMT07	1
7800764	PHC07R030SS32-4L	4	21,4	30	200	120	0,8	32	SPMT07	1
7800754	PHC07R032SS32-5S	5	23,4	32	150	70	0,8	32	SPMT07	1
7800765	PHC07R032SS32-5L	5	23,4	32	200	120	0,8	32	SPMT07	1
7800767	PHC07R035SS32-5L	5	26,4	35	200	50	0,8	32	SPMT07	2
7800700	PHC09R025SS25-2S	2	13,2	25	140	60	1	25	SDMT09	1
7800701	PHC09R025SS25-3S	3	13,2	25	140	60	1	25	SDMT09	1
7800704	PHC09R025SS25-2L	2	13,2	25	200	120	1	25	SDMT09	1
7800705	PHC09R025SS25-3L	3	13,2	25	200	120	1	25	SDMT09	1
7800716	PHC09R028SS25-3S	3	16,2	28	140	40	1	25	SDMT09	2
7800720	PHC09R028SS25-3L	3	16,2	28	200	40	1	25	SDMT09	2
7800717	PHC09R030SS32-3S	3	18,2	30	150	70	1	32	SDMT09	1
7800721	PHC09R030SS32-3L	3	18,2	30	200	120	1	32	SDMT09	1
7800702	PHC09R032SS32-3S	3	20,2	32	150	70	1	32	SDMT09	1
7800706	PHC09R032SS32-3L	3	20,2	32	200	120	1	32	SDMT09	1
7800718	PHC09R035SS32-3S	3	23,2	35	150	50	1	32	SDMT09	2
7800722	PHC09R035SS32-3L	3	23,2	35	200	50	1	32	SDMT09	2
7800703	PHC09R040SS32-4S	4	28,2	40	150	50	1	32	SDMT09	2
7800730	PHC12R030SS32-2S	2	13,4	30	150	70	2	32	SXMT12	1
7800708	PHC12R032SS32-2S	2	15,4	32	150	70	2	32	SXMT12	1
7800731	PHC12R035SS32-3S	3	18,4	35	150	50	2	32	SXMT12	2
7800709	PHC12R040SS32-3S	3	23,4	40	150	50	2	32	SXMT12	2

## Accessories and spare parts

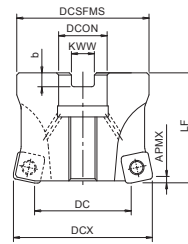
Applicable cutter DC	EDP	Designation	Specification
16 - 35 (SPMT07)	7808105	FS25550 (Torx 8)	Clamping screw
16 - 35 (SPMT07)	7808205	T8-D (Torx 8)	Wrench
25 - 35 (SDMT09)	7808111	FS35572 (Torx 15)	Clamping screw
25 - 35 (SDMT09)	7808208	T15-D (Torx 15)	Wrench
40 (SDMT09)	7808112	FS35586 (Torx 15)	Clamping screw
40 (SDMT09)	7808208	T15-D (Torx 15)	Wrench
30 - 40 (SXMT12)	7808113	FS45510 (Torx 20)	Clamping screw
30 - 40 (SXMT12)	7808209	T20-D (Torx 20)	Wrench

Milling | Indexable

90 degrees

# PHC BORE

Milling | Indexable



- High feed radius cutter
- 4 corners high feed inserts
- Bore type
- 40 - 100 mm



EDP	Designation	ZEFP	DC	DCX	LF	APMX	DCON	DCSFMS	KWW	b	Applicable inserts type	Type
7800600	PHC09R040M16-4	4	28,2	40	40	1	16	38	8,4	5,6	SDMT09...	1
7800601	PHC09R050M22-5	5	38,2	50	50	1	22	47	10,4	6,3	SDMT09...	2
7800602	PHC09R052M22-5	5	40,2	52	50	1	22	47	10,4	6,3	SDMT09...	2
7800603	PHC09R063M22-6	6	51,2	63	50	1	22	60	10,4	6,3	SDMT09...	2
7800604	PHC09R066M22-7	7	54,2	66	50	1	22	60	10,4	6,3	SDMT09...	2
7800607	PHC12R040M16-3	3	23,4	40	40	2	16	38	8,4	5,6	SXMT12...	1
7800608	PHC12R050M22-4	4	33,4	50	50	2	22	47	10,4	6,3	SXMT12...	2
7800609	PHC12R052M22-4	4	35,4	52	50	2	22	47	10,4	6,3	SXMT12...	2
7800610	PHC12R063M22-5	5	46,4	63	50	2	22	60	10,4	6,3	SXMT12...	2
7800611	PHC12R066M22-6	6	49,4	66	50	2	22	60	10,4	6,3	SXMT12...	2
7800612	PHC12R080M27-7	7	63,4	80	50	2	27	76	12,4	7	SXMT12...	2
7800613	PHC12R100M32-8	8	83,4	100	63	2	32	96	14,4	8	SXMT12...	2

## Accessories and spare parts

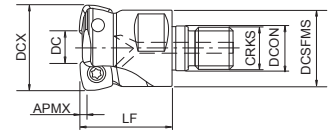
Applicable cutter DC	EDP	Designation	Specification
40	7808150	PS0830 (M8x30)	Power screw
40 - 63 (SDMT09)	7808112	FS35586 (Torx 15)	Clamping screw
40 - 63 (SDMT09)	7808208	T15-D (Torx 15)	Wrench
40 - 100 (SXMT12)	7808113	FS45510 (Torx 20)	Clamping screw
40 - 100 (SXMT12)	7808209	T20-D (Torx 20)	Wrench

Milling | Indexable



# PHC SCREW FIT

Milling | Indexable



- High feed radius cutter
- 4 corners high feed inserts
- Screw fit type
- 16 - 40 mm



EDP	Designation	ZEFP	DC	DCX	LF	APMX	DCON	DCSFMS	CRKS	Wrench size	Applicable inserts type
7801520	PHC07R016SF8-2	2	7,4	16	27	0,8	8,5	14,5	8	10	SPMT07...
7801523	PHC07R020SF10-3	3	11,4	20	33	0,8	10,5	18	10	14	SPMT07...
7801525	PHC07R022SF10-3	3	13,4	22	33	0,8	10,5	18	10	14	SPMT07...
7801526	PHC07R025SF12-4	4	16,4	25	35	0,8	12,5	23	12	17	SPMT07...
7801529	PHC07R030SF16-4	4	21,4	30	40	0,8	17	28	16	22	SPMT07...
7801530	PHC07R032SF16-5	5	23,4	32	40	0,8	17	28	16	22	SPMT07...
7801532	PHC07R035SF16-5	5	26,4	35	40	0,8	17	28	16	22	SPMT07...
7801500	PHC09R025SF12-3	3	13,2	25	35	1	12,5	23	12	17	SDMT09...
7801501	PHC09R028SF12-3	3	16,2	28	35	1	12,5	23	12	17	SDMT09...
7801502	PHC09R030SF16-3	3	18,2	30	40	1	17	28	16	22	SDMT09...
7801503	PHC09R032SF16-3	3	20,2	32	40	1	17	28	16	22	SDMT09...
7801504	PHC09R035SF16-3	3	23,2	35	40	1	17	28	16	22	SDMT09...
7801505	PHC09R040SF16-4	4	28,2	40	40	1	17	28	16	22	SDMT09...
7801506	PHC12R030SF16-2	2	13,4	30	40	2	17	28	16	22	SXMT12...
7801507	PHC12R032SF16-2	2	15,4	32	40	2	17	28	16	22	SXMT12...
7801508	PHC12R035SF16-3	3	18,4	35	40	2	17	28	16	22	SXMT12...
7801509	PHC12R040SF16-3	3	23,4	40	40	2	17	28	16	22	SXMT12...

Milling | Indexable



## Accessories and spare parts

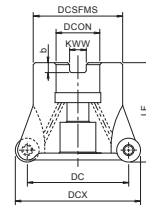
Applicable cutter DC	EDP	Designation	Specification
16 - 35 (SPMT07)	7808105	FS25550 (Torx 8)	Clamping screw
16 - 35 (SPMT07)	7808205	T8-D (Torx 8)	Wrench
25 - 35 (SDMT09)	7808111	FS35572 (Torx 15)	Clamping screw
25 - 35 (SDMT09)	7808208	T15-D (Torx 15)	Wrench
40 (SDMT09)	7808112	FS35586 (Torx 15)	Clamping screw
40 (SDMT09)	7808208	T15-D (Torx 15)	Wrench
30 - 40 (SXMT12)	7808113	FS45510 (Torx 20)	Clamping screw
30 - 40 (SXMT12)	7808209	T20-D (Torx 20)	Wrench



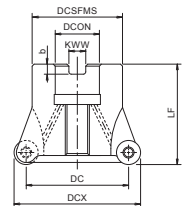


# PRC BORE

Milling | Indexable



Type 1



Type 2

- Radius cutter
- Round inserts
- Bore type
- 50 - 100 mm



EDP	Designation	ZEFP	DC	DCX	LF	DCON	DCSFMS	KWW	b	Applicable inserts type	Type
7800200	PRC12R050M22-4	4	38	50	40	22	45	10,4	6,3	RP12	2
7800204	PRC12R050M22-5	5	38	50	40	22	45	10,4	6,3	RP12	2
7800201	PRC12R063M22-4	4	51	63	40	22	50	10,4	6,3	RP12	2
7800206	PRC12R063M22-6	6	51	63	40	22	50	10,4	6,3	RP12	2
7800202	PRC12R080M27-5	5	68	80	50	27	60	12,4	7	RP12	2
7800207	PRC12R080M27-8	8	68	80	50	27	60	12,4	7	RP12	2
7800203	PRC12R100M32-6	6	88	100	50	32	70	14,4	8	RP12	2
7800208	PRC12R100M32-10	10	88	100	50	32	70	14,4	8	RP12	2
7800213	PRC16R050M22-3	3	34	50	40	22	45	10,4	6,3	RP16	1
7800214	PRC16R063M22-5	5	47	63	40	22	50	10,4	6,3	RP16	2
7800216	PRC16R080M27-6	6	64	80	50	27	60	12,4	7	RP16	2
7800217	PRC16R100M32-7	7	84	100	50	32	70	14,4	8	RP16	2

Milling | Indexable



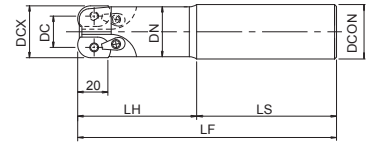
## Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
50	7808151	PS1031 (M10x31)	Power screw
50 - 100 (RPH-12)	7808112	FS35586 (Torx 15)	Clamping screw
50 - 100 (RPH-12)	7808208	T15-D (Torx 15)	Wrench
50 - 100 (RPH-16)	7808113	FS45510 (Torx 20)	Clamping screw
50 - 100 (RPH-16)	7808209	T20-D (Torx 20)	Wrench



# PDR

## Milling | Indexable



- High feed radius cutter, deep depth of cut
- 2 corners inserts
- Cylindrical type
- 40 - 50 mm



EDP	Designation	ZEFP	DC	DCX	LF	LH	APMX	DCON	DN	LS
7800000	PDR20R040SS42-2S	2	20	40	150	50	20	42	38,9	100
7800009	PDR20R040SS42-2L	2	20	40	250	150	20	42	38,9	100
7800004	PDR20R050SS42-3S	3	30	50	150	50	20	42	48,5	100
7800013	PDR20R050SS42-3L	3	30	50	250	150	20	42	48,5	100

### Accessories and spare parts

Applicable cutter DC	EDP	Designation	Specification
50 - 40	7808001	CSPB-5 (Torx 20IP)	Clamping screw
50 - 40	7808000	20IP-T (Torx 20IP)	Wrench
50 - 40	7808002	CSY-20	Clamping set

Milling | Indexable









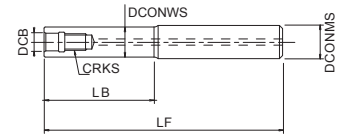






# OP-SFA

Milling | Indexable



- Arbor for Screw fit type

Milling | Indexable



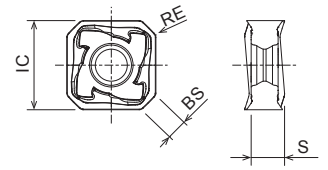
EDP	Designation	LF	LB	DCON	DCONWS	DCB	CRKS	Specification
7801904	SF-M06SS10-4	104	4	10	9	6,5	6	Steel
7801905	SF-M06SS12-10	104	10	12	11	6,5	6	Steel
7801900	SF-M08SS16-15	95	15	16	14,5	8,5	8	Steel
7801901	SF-M10SS20-20	120	20	20	18	10,5	10	Steel
7801902	SF-M12SS25-35	135	35	25	23	12,5	12	Steel
7801903	SF-M16SS32-35	155	35	32	28	17	16	Steel
7801918	SF-M06SS10-24CS	124	24	10	9	6,5	6	Carbide
7801919	SF-M06SS12-34CS	134	34	12	11	6,5	6	Carbide
7801910	SF-M08SS16-55CS	115	55	16	14,5	8,5	8	Carbide
7801911	SF-M08SS16-85CS	145	85	16	14,5	8,5	8	Carbide
7801912	SF-M10SS20-70CS	140	70	20	18	10,5	10	Carbide
7801913	SF-M10SS20-110CS	180	110	20	18	10,5	10	Carbide
7801914	SF-M12SS25-90CS	170	90	25	23	12,5	12	Carbide
7801915	SF-M12SS25-140CS	220	140	25	23	12,5	12	Carbide
7801916	SF-M16SS32-120CS	220	120	32	28	17	16	Carbide
7801917	SF-M16SS32-190CS	290	190	32	28	17	16	Carbide





# PAS INSERTS

Milling | Indexable | Inserts



- 45° face milling cutter
- Double sided 8 corners inserts

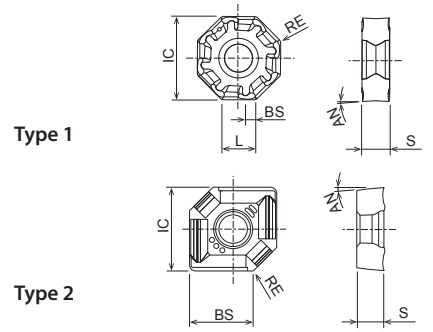


EDP	Designation	IC	S	RE	BS	APMX	Grade	P		M		K		N		S		H	
								dry	⊖	dry	⊖	GG	GGG	dry	⊖	dry	⊖	dry	⊖
7814061	SNKU1505AZER-GM	15,88	7,18	1	3,65	6,5	XP3035	●	●	○	○	○	○						
7819061	SNKU1505AZER-GM	15,88	7,18	1	3,65	6,5	XC3025	●	●	○	○	○	○						
7813061	SNKU1505AZER-GM	15,88	7,18	1	3,65	6,5	XP2040	○	○	○	●					○		○	
7812060	SNKU1505AZER-GR	15,88	7,18	1	3,65	6,5	XC1015					●	●						

Milling | Indexable  
Inserts

# PAO INSERTS

Milling | Indexable | Inserts



- 45° face milling cutter
- Double sided 16 corners inserts



EDP	Designation	IC	S	L	AN	RE	BS	APMX	Type	Grade	P		M		K		N		S		H	
											dry	👉	dry	👉	GG	GGG	dry	👉	dry	👉	dry	👉
7814062	OZKU060508SR-GM	17,1	5,66	6	3	0,8	2	3,5	1	XP3035	●	●	○	○	○	○						
7825062	OZKU060508SR-GM	17,1	5,66	6	3	0,8	2	3,5	1	XC3030	●				○	○						
7813062	OZKU060508SR-GM	17,1	5,66	6	3	0,8	2	3,5	1	XP2040	○	○	○									○
7826062	OZKU060508SR-GM	17,1	5,66	6	3	0,8	2	3,5	1	XP2025		○		●								○
7816085	OZKU060508ER-SM	17,1	5,66	6	3	0,8	2	3,5	1	XC5040				○								●
7812062	OZKU060508SR-GM	17,1	5,66	6	3	0,8	2	3,5	1	XC1015					○	○						
7812086	OZKU060508SR-GR	17,1	5,66	6	3	0,8	2	3,5	1	XC1015					●	○						
7821062	OZKU060508SR-GM	17,1	5,66	6	3	0,8	2	3,5	1	XP1020					○	○						
7814064	XAHT060525SR-GM	17,1	5,66	10	3	2,5	10	3,5	2	XP3035	●	●	○	○	○	○						
7812064	XAHT060525SR-GM	17,1	5,66	10	3	2,5	10	3,5	2	XC1015					○	○						

Milling | Indexable



Inserts

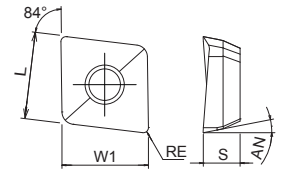






# PZAG INSERTS

Milling | Indexable | Inserts & Heads



- Counterboring cutter
- 2 corners inserts



EDP	Designation	S	W1	L	AN	RE	Grade	P		M		K		N		S		H	
								dry	👉	dry	👉	GG	GGG	dry	👉	dry	👉	dry	👉
7814108	ZPNT100408EN	4,65	10,95	10,95	11	0,8	XP8030	●	●	●	●	○	○	○	○	○	○	○	○
7814110	ZPNT130508EN	5,46	13,92	13,92	11	0,8	XP8030	●	●	●	●	○	○	○	○	○	○	○	○
7814111	ZPNT170608EN	6,31	17,85	17,85	11	0,8	XP8030	●	●	●	●	○	○	○	○	○	○	○	○

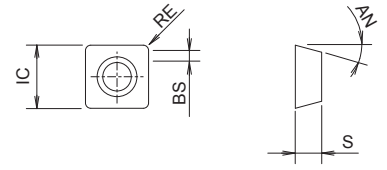
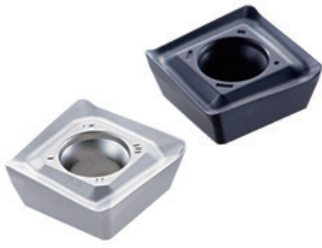
Milling | Indexable  
Inserts & Heads





# PSF/PSFL INSERTS

Milling | Indexable | Inserts



- Shoulder cutter
- 4 corners inserts

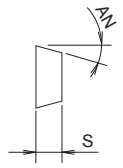
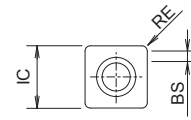


EDP	Designation	IC	S	AN	RE	BS	APMX	Grade	P		M		K		N		S		H		
									dry	⊖	dry	⊖	GG	GGG	dry	⊖	dry	⊖	dry	⊖	
7811076	SDHT09T308FR-NM	9,07	3,97	15	0,8	2,5	5	CK010								●					
7811625	SDHT120508FR-NM	12,38	5	15	0,8	1,2	5	CK010								●					
7825073	SDKT09T308SR-GL	9,07	3,97	15	0,8	2,5	5	XC3030	●												
7825074	SDKT09T308SR-GM	12,38	3,97	15	0,8	2,5	5	XC3030	●												
7825622	SDKT120508SR-GM	9,07	5	15	0,8	1,2	5	XC3030	●												
7814073	SDKT09T308SR-GL	9,07	3,97	15	0,8	2,5	5	XP3035	●	●		○									
7814074	SDKT09T308SR-GM	12,38	3,97	15	0,8	2,5	5	XP3035	●	●	○	○									
7814621	SDKT120508SR-GM	9,07	5	15	0,8	1,2	5	XP3035	●	●	○	○									
7813073	SDKT09T308SR-GL	12,38	3,97	15	0,8	2,5	5	XP2040	○	○		●								○	○
7813074	SDKT09T308SR-GM	9,07	3,97	15	0,8	2,5	5	XP2040	○	○	○	○								○	○
7813623	SDKT120508SR-GL	9,07	5	15	0,8	1,2	5	XP2040	○	○	○	●								○	○
7812075	SDKT09T308SR-GR	12,38	3,97	15	0,8	2,5	5	XC1015					●	●							
7812624	SDKT120508SR-GR	9,07	5	15	0,8	1,2	5	XC1015					●	●							
7816073	SDKT09T308SR-GL	9,07	3,97	15	0,8	2,5	5	XC5040				○								●	
7816620	SDKT120508SR-GL	12,38	5	15	0,8	1,2	5	XC5040				○								●	



# PSF INSERTS

Milling | Indexable | Inserts



- Shoulder cutter
- 4 corners inserts



EDP	Designation	IC	S	AN	RE	BS	APMX	Grade	P		M		K		N		S		H		
									dry	oil	dry	oil	GG	GGG	dry	oil	dry	oil	dry	oil	
7814073	SDKT09T308SR-GL	9,07	3,97	15	0,8	2,5	5	XP3035	●	●	○	○	○	○							
7814074	SDKT09T308SR-GM	9,07	3,97	15	0,8	2,5	5	XP3035	●	●	○	○	○	○							
7813073	SDKT09T308SR-GL	9,07	3,97	15	0,8	2,5	5	XP2040	○	○	○	○	○	○							
7813074	SDKT09T308SR-GM	9,07	3,97	15	0,8	2,5	5	XP2040	○	○	○	○	○	○							
7816073	SDKT09T308SR-GL	9,07	3,97	15	0,8	2,5	5	XC5040													
7812075	SDKT09T308SR-GR	9,07	3,97	15	0,8	2,5	5	XC1015					●	●							
7811076	SDHT09T308FR-NM	9,07	3,97	15	0,8	2,5	5	CK010							●						

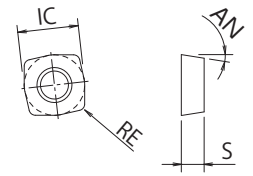
Milling | Indexable



Inserts

# PHC INSERTS

Milling | Indexable | Inserts



- High feed radius cutter for long over hang
- 4 corners inserts



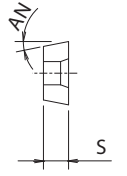
EDP	Designation	IC	S	AN	RE	APMX	Grade	P		M		K		N		S		H	
								dry	⊖	dry	⊖	GG	GGG	dry	⊖	dry	⊖	dry	⊖
7814092	SPMT070305SR-GM	7	2,75	11	0,5	0,8	XP3035	●	●	○	○	○	○						
7828092	SPMT070305SR-GM	7	2,75	11	0,5	0,8	XP3025	●	●			○	○						
7827092	SPMT070305SR-GM	7	2,75	11	0,5	0,8	XC3020	●	●			○	○						
7825092	SPMT070305SR-GM	7	2,75	11	0,5	0,8	XC3030	●	●			○	○						
7813092	SPMT070305SR-GM	7	2,75	11	0,5	0,8	XP2040	○	○	○	●					○	○		
7826092	SPMT070305SR-GM	7	2,75	11	0,5	0,8	XP2025	○	○		●					○	○		
7816093	SPMT070305ER-SM	7	2,75	11	0,5	0,8	XC5040				○					●			
7812092	SPMT070305SR-GM	7	2,75	11	0,5	0,8	XC1015					●	●						
7814020	SDMT09T308SR-GM	9,52	3,97	15	0,8	1	XP3035	●	●	○	○	○	○						
7825020	SDMT09T308SR-GM	9,52	3,97	15	0,8	1	XC3030	●	●			○	○						
7813020	SDMT09T308SR-GM	9,52	3,97	15	0,8	1	XP2040	○	○	○	●					○	○		
7826020	SDMT09T308SR-GM	9,52	3,97	15	0,8	1	XP2025	○	○		●					○	○		
7815021	SDMT09T308ER-SM	9,52	3,97	15	0,8	1	XC5035				●					○	○		
7816021	SDMT09T308ER-SM	9,52	3,97	15	0,8	1	XC5040				○					●			
7812020	SDMT09T308SR-GM	9,52	3,97	15	0,8	1	XC1015					●	●						
7814022	SXMT120410SR-GM	12,7	4,76	9	1	2	XP3035	●	●	○	○	○	○						
7825022	SXMT120410SR-GM	12,7	4,76	9	1	2	XC3030	●	●			○	○						
7813022	SXMT120410SR-GM	12,7	4,76	9	1	2	XP2040	○	○	○	●					○	○		
7826022	SXMT120410SR-GM	12,7	4,76	9	1	2	XP2025	○	○		●					○	○		
7815023	SXMT120410ER-SM	12,7	4,76	9	1	2	XC5035				●					○	○		
7816023	SXMT120410ER-SM	12,7	4,76	9	1	2	XC5040				○					●			
7812022	SXMT120410SR-GM	12,7	4,76	9	1	2	XC1015					●	●						

Milling | Indexable  
Inserts



# PRC INSERTS

Milling | Indexable | Inserts



- Radius cutter
- Round inserts



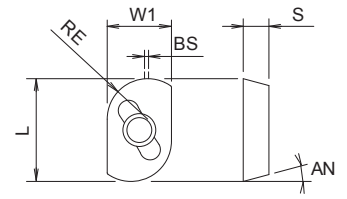
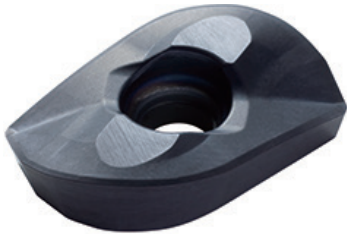
EDP	Designation	IC	S	AN	Grade	P		M		K		N		S		H	
						dry	⊖	dry	⊖	GG	GGG	dry	⊖	dry	⊖	dry	⊖
7814030	RPHW10T3MOSN	10	3,97	11	XP3035	●	●	○	○	○	○						
7825017	RPHW10T3MOSN	10	3,97	11	XC3030	●				○	○						
7813008	RPHT10T3MOEN-GL	10	3,97	11	XP2040	○	○	○	●								○
7826008	RPHT10T3MOEN-GL	10	3,97	11	XP2025		○		●								○
7815050	RPHT10T3M8EN-SM	10	3,97	11	XC5035			●	○								○
7815010	RPHT10T3MOEN-SM	10	3,97	11	XC5035			●	○								○
7816050	RPHT10T3M8EN-SM	10	3,97	11	XC5040				○							●	
7824083	RPMT10T3M8EN-HR	10	3,97	11	XP6015	○				○	○						●
7812017	RPHW10T3MOEN	10	3,97	11	XC1015					●	●						
7811009	RPHT10T3MOFN-NM	10	3,97	11	CK010							●					
7814018	RPHW1204MOSN	12	4,76	11	XP3035	●	●	○	○	○	○						
7825018	RPHW1204MOSN	12	4,76	11	XC3030	●				○	○						
7813011	RPHT1204MOEN-GL	12	4,76	11	XP2040	○	○	○	●							○	○
7826011	RPHT1204MOEN-GL	12	4,76	11	XP2025		○		●								○
7815051	RPHT1204M8EN-SM	12	4,76	11	XC5035			●	○								○
7815012	RPHT1204MOEN-SM	12	4,76	11	XC5035			●	○								○
7816051	RPHT1204M8EN-SM	12	4,76	11	XC5040				○							●	
7824084	RPMT1204M8EN-HR	12	4,76	11	XP6015	○				○	○						●
7812018	RPHW1204MOSN	12	4,76	11	XC1015					●	●						
7811013	RPHT1204MOFN-NM	12	4,76	11	CK010							●					
7814019	RPHW1605MOSN	16	5,56	11	XP3035	●	●	○	○	○	○						
7825019	RPHW1605MOSN	16	5,56	11	XC3030	●				○	○						
7813014	RPHT1605MOEN-GL	16	5,56	11	XP2040	○	○	○	●							○	○
7826014	RPHT1605MOEN-GL	16	5,56	11	XP2025		○		●								○
7815052	RPHT1605M8EN-SM	16	5,56	11	XC5035			●	○								○
7815015	RPHT1605MOEN-SM	16	5,56	11	XC5035			●	○								○
7816052	RPHT1605M8EN-SM	16	5,56	11	XC5040				○							●	
7812019	RPHW1605MOSN	16	5,56	11	XC1015					●	●						
7811016	RPHT1605MOFN-NM	16	5,56	11	CK010							●					

Milling | Indexable

Inserts

# PDR INSERTS

Milling | Indexable | Inserts



- High feed radius cutter, deep depth of cut
- 2 corners inserts

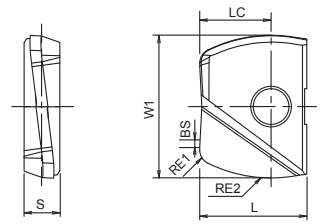


EDP	Designation	S	W1	L	AN	RE	BS	APMX	Grade	P		M		K		N		S		H		
										dry	👉	dry	👉	GG	GGG	dry	👉	dry	👉	dry	👉	
7810000	ADMT2006100PDR-GM	6,35	16	24,18	15	10	1	20	XP3930	●				●	●							

Milling | Indexable  
Inserts

# PFB-BR INSERTS NEW

Milling | Indexable | Inserts



- Barrel type
- Contour milling of vertical slope
- Flat bottom milling
- 10 - 32 mm



EDP	Designation	ZEFP	S	W1	L	RE	RE2	BS	LC	Grade	Body size	P		M		K		N		S		H		
												dry	⊿	dry	⊿	GG	GGG	dry	⊿	dry	⊿	dry	⊿	
7820071	PFB100R150-BR-ST	2	2,6	10	8,5	1	15	0,3	5	XP3225	3	●		○										
7820072	PFB120R180-BR-ST	2	3	12	10	1	18	0,3	6	XP3225	4	●		○										
7820073	PFB160R240-BR-ST	2	4	16	12	2	24	0,5	8	XP3225	5	●		○										
7820074	PFB200R300-BR-ST	2	5	20	15	2	30	0,5	10	XP3225	6	●		○										
7820075	PFB250R375-BR-ST	2	6	25	18,5	2,5	37,5	0,5	12,5	XP3225	7	●		○										
7820076	PFB320R480-BR-ST	2	7	32	23,5	3	48	0,5	16	XP3225	9	●		○										
7820081	PFB100R150-BR-SH	2	2,6	10	8,5	1	15	0,3	5	XP3310	3					●	●						●	
7820082	PFB120R180-BR-SH	2	3	12	10	1	18	0,3	6	XP3310	4					●	●						●	
7820083	PFB160R240-BR-SH	2	4	16	12	2	24	0,5	8	XP3310	5					●	●						●	
7820084	PFB200R300-BR-SH	2	5	20	15	2	30	0,5	10	XP3310	6					●	●						●	
7820085	PFB250R375-BR-SH	2	6	25	18,5	2,5	37,5	0,5	12,5	XP3310	7					●	●						●	
7820086	PFB320R480-BR-SH	2	7	32	23,5	3	48	0,5	16	XP3310	9					●	●						●	

Milling | Indexable

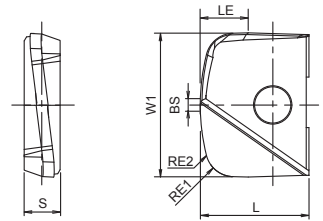


Inserts



# PFB-LZ INSERTS NEW

Milling | Indexable | Inserts



- Lens type
- Copy milling of horizontal slope
- Copy milling of curved surface
- 10 - 32 mm



EDP	Designation	ZEFP	S	W1	L	RE	RE2	BS	LC	Grade	Body size	P		M		K		N		S		H		
												dry	oil	dry	oil	GG	GGG	dry	oil	dry	oil	dry	oil	
7820091	PFB100R150-LZ-ST	2	2,6	10	8,5	1	15	0,75	3,3	XP3225	3	●		○										
7820092	PFB120R180-LZ-ST	2	3	12	10	1	18	0,75	4	XP3225	4	●		○										
7820093	PFB160R240-LZ-ST	2	4	16	12	2	24	1	5,3	XP3225	5	●		○										
7820094	PFB200R300-LZ-ST	2	5	20	15	2	30	1,75	6,7	XP3225	6	●		○										
7820095	PFB250R375-LZ-ST	2	6	25	18,5	2,5	37,5	1,75	8,3	XP3225	7	●		○										
7820096	PFB320R480-LZ-ST	2	7	32	23,5	3	48	2	10,7	XP3225	9	●		○										
7820101	PFB100R150-LZ-SH	2	2,6	10	8,5	1	15	0,75	3,3	XP3310	3					●	●						●	
7820102	PFB120R180-LZ-SH	2	3	12	10	1	18	0,75	4	XP3310	4					●	●						●	
7820103	PFB160R240-LZ-SH	2	4	16	12	2	24	1	5,3	XP3310	5					●	●						●	
7820104	PFB200R300-LZ-SH	2	5	20	15	2	30	1,75	6,7	XP3310	6					●	●						●	
7820105	PFB250R375-LZ-SH	2	6	25	18,5	2,5	37,5	1,75	8,3	XP3310	7					●	●						●	
7820106	PFB320R480-LZ-SH	2	7	32	23,5	3	48	2	10,7	XP3310	9					●	●						●	

Milling | Indexable



Inserts



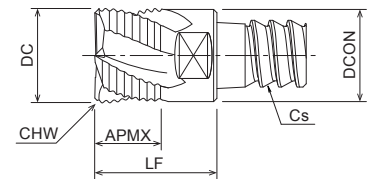




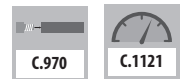


# PXNL / PXNH HEADS

Milling | Indexable | Heads



- Variable helix solid carbide head
- Roughing shape in 45 HRC work materials
- For PXMZ straight shank holder
- 10 - 25 mm



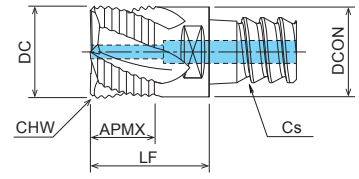
EDP	Designation	ZEFP	DC	CHW	APMX	LF	DCON	CS	FHA	Grade	P		M		K		N		S		H	
											dry	oil	dry	oil	GG	GGG	dry	oil	dry	oil	dry	oil
7830400	PXNL100C10-04C005	4	10	0,5	7	13	9,7	C10	19/21	XP3225	●		●	●					○	○		
7830401	PXNL120C12-04C005	4	12	0,5	8,4	14,4	11,7	C12	19/21	XP3225	●		●	●					○	○		
7830402	PXNL160C16-04C006	4	16	0,6	11,2	18,7	15,7	C16	19/21	XP3225	●		●	●					○	○		
7830403	PXNL200C20-04C006	4	20	0,6	14	21,5	19,6	C20	19/21	XP3225	●		●	●					○	○		
7830404	PXNL250C25-04C006	4	25	0,6	17,5	27,5	24	C25	19/21	XP3225	●		●	●					○	○		
7830450	PXNH100C10-04C005	4	10	0,5	7	13	9,7	C10	40/42	XP3225	●		●	●					○	○		
7830451	PXNH120C12-04C005	4	12	0,5	8,4	14,4	11,7	C12	40/42	XP3225	●		●	●					○	○		
7830452	PXNH160C16-04C006	4	16	0,6	11,2	18,7	15,7	C16	40/42	XP3225	●		●	●					○	○		
7830453	PXNH200C20-04C006	4	20	0,6	14	21,5	19,6	C20	40/42	XP3225	●		●	●					○	○		
7830454	PXNH250C25-04C006	4	25	0,6	17,5	27,5	24	C25	40/42	XP3225	●		●	●					○	○		

Milling | Indexable

Heads

# PXNL OH HEADS

Milling | Indexable | Heads



- Variable helix solid carbide head with coolant hole
- Roughing shape in 45 HRC work materials
- For PXMZ straight shank holder
- 12 - 25 mm



EDP	Designation	ZEPF	DC	CHW	APMX	LF	DCON	CS	FHA	Grade	P		M		K		N		S		H	
											dry	☉	dry	☉	GG	GGG	dry	☉	dry	☉	dry	☉
7830411	PXNL120C12-04C005-O	4	12	0,5	8,4	14,4	11,7	C12	19/21	XP3225	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830412	PXNL160C16-04C006-O	4	16	0,6	11,2	18,7	15,7	C16	19/21	XP3225	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830413	PXNL200C20-04C006-O	4	20	0,6	14	21,5	19,6	C20	19/21	XP3225	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830414	PXNL250C25-04C006-O	4	25	0,6	17,5	27,5	24	C25	19/21	XP3225	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉

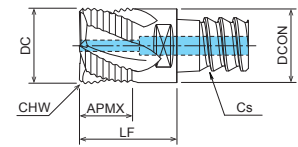
Milling | Indexable



Heads

# PXNH OH HEADS

Milling | Indexable | Heads



- Variable helix solid carbide head with coolant hole
- Roughing shape in 45 HRC work materials
- For PXMZ straight shank holder
- 12 - 25 mm



EDP	Designation	ZEFP	DC	CHW	APMX	LF	DCON	CS	FHA	Grade	P		M		K		N		S		H	
											dry	☉	dry	☉	GG	GGG	dry	☉	dry	☉	dry	☉
7830461	PXNH120C12-04C005-O	4	12	0,5	8,4	14,4	11,7	C12	40/42	XP3225	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830462	PXNH160C16-04C006-O	4	16	0,6	11,2	18,7	15,7	C16	40/42	XP3225	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830463	PXNH200C20-04C006-O	4	20	0,6	14	21,5	19,6	C20	40/42	XP3225	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830464	PXNH250C25-04C006-O	4	25	0,6	17,5	27,5	24	C25	40/42	XP3225	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉

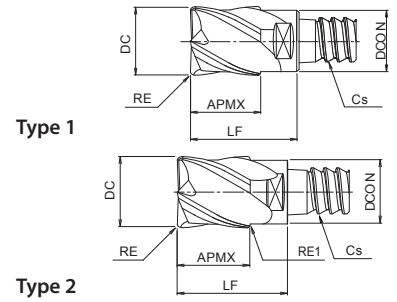
Milling | Indexable

Heads



# PXVC HEADS

Milling | Indexable | Heads



- High variable helix solid carbide head
- Up to 7xD application in 55 HRC work materials
- For PXMZ straight shank holder
- 10 - 32 mm



EDP	Designation	ZEFP	DC	RE	APMX	LF	DCON	CS	FHA	Type	Grade	P		M		K		N		S		H	
												dry	with coolant	dry	with coolant	GG	GGG	dry	with coolant	dry	with coolant	dry	with coolant
7834994	PXVC100C10-04R000	4	10	0	10	16	9,8	C10	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7834995	PXVC100C10-04R005	4	10	0,5	10	16	9,8	C10	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7834996	PXVC100C10-04R010	4	10	1	10	16	9,8	C10	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7834997	PXVC100C10-04R020	4	10	2	10	16	9,8	C10	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7834998	PXVC100C10-04R030	4	10	3	10	16	9,8	C10	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7834999	PXVC120C10-04R000	4	12	0	12	18	9,8	C10	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835000	PXVC120C10-04R005	4	12	0,5	12	18	9,8	C10	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835001	PXVC120C10-04R010	4	12	1	12	18	9,8	C10	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835002	PXVC120C10-04R020	4	12	2	12	18	9,8	C10	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835003	PXVC120C10-04R030	4	12	3	12	18	9,8	C10	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835004	PXVC120C12-04R000	4	12	0	12	18	11,7	C12	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835005	PXVC120C12-04R005	4	12	0,5	12	18	11,7	C12	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835006	PXVC120C12-04R010	4	12	1	12	18	11,7	C12	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835007	PXVC120C12-04R020	4	12	2	12	18	11,7	C12	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835008	PXVC120C12-04R030	4	12	3	12	18	11,7	C12	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835009	PXVC140C12-04R000	4	14	0	14	20	11,7	C12	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835010	PXVC140C12-04R005	4	14	0,5	14	20	11,7	C12	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835011	PXVC140C12-04R010	4	14	1	14	20	11,7	C12	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835012	PXVC140C12-04R020	4	14	2	14	20	11,7	C12	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835013	PXVC140C12-04R030	4	14	3	14	20	11,7	C12	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835014	PXVC160C16-04R000	4	16	0	16	23,5	15,7	C16	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835015	PXVC160C16-04R005	4	16	0,5	16	23,5	15,7	C16	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835016	PXVC160C16-04R010	4	16	1	16	23,5	15,7	C16	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835017	PXVC160C16-04R015	4	16	1,5	16	23,5	15,7	C16	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835018	PXVC160C16-04R020	4	16	2	16	23,5	15,7	C16	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835019	PXVC160C16-04R030	4	16	3	16	23,5	15,7	C16	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835020	PXVC180C16-04R000	4	18	0	18	25,5	15,7	C16	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835021	PXVC180C16-04R005	4	18	0,5	18	25,5	15,7	C16	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835022	PXVC180C16-04R010	4	18	1	18	25,5	15,7	C16	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835023	PXVC180C16-04R020	4	18	2	18	25,5	15,7	C16	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835024	PXVC180C16-04R030	4	18	3	18	25,5	15,7	C16	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835025	PXVC200C20-04R000	4	20	0	20	27,5	19,6	C20	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835026	PXVC200C20-04R005	4	20	0,5	20	27,5	19,6	C20	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835027	PXVC200C20-04R010	4	20	1	20	27,5	19,6	C20	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835028	PXVC200C20-04R020	4	20	2	20	27,5	19,6	C20	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835029	PXVC200C20-04R030	4	20	3	20	27,5	19,6	C20	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835030	PXVC220C20-04R000	4	22	0	22	29,5	19,6	C20	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835038	PXVC220C20-04R005	4	22	0,5	22	29,5	19,6	C20	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835031	PXVC220C20-04R010	4	22	1	22	29,5	19,6	C20	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835032	PXVC220C20-04R020	4	22	2	22	29,5	19,6	C20	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835033	PXVC220C20-04R030	4	22	3	22	29,5	19,6	C20	45/48	2	XP3225	●	●	●	●	●	●	○	○	○	○		
7835034	PXVC250C25-04R000	4	25	0	25	35	24	C25	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835035	PXVC250C25-04R010	4	25	1	25	35	24	C25	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835036	PXVC250C25-04R020	4	25	2	25	35	24	C25	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835037	PXVC250C25-04R030	4	25	3	25	35	24	C25	45/48	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835039	PXVC320C32-05R010	5	32	1	32	44,7	28	C32	45	1	XP3225	●	●	●	●	●	●	○	○	○	○		
7835040	PXVC320C32-08R010	8	32	1	32	44,7	28	C32	38	1	XP3225	●	●	●	●	●	●	○	○	○	○		

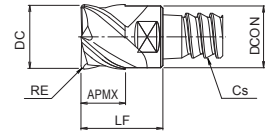
Milling | Indexable



Heads

# PXSE HEADS

Milling | Indexable | Heads



- Variable helix solid carbide head
- Up to 5xD application in 55 HRC work materials
- For PXMZ straight shank holder
- 10 - 25 mm



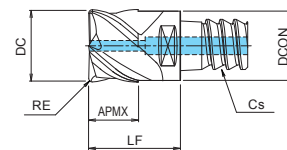
EDP	Designation	ZEFP	DC	RE	APMX	LF	DCON	CS	FHA	Grade	P		M		K		N		S		H	
											dry	oil	dry	oil	GG	GGG	dry	oil	dry	oil	dry	oil
7829994	PXSE100C10-04R000	4	10	0	7	13	9,7	C10	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7829995	PXSE100C10-04R005	4	10	0,5	7	13	9,7	C10	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7829996	PXSE100C10-04R010	4	10	1	7	13	9,7	C10	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7829997	PXSE100C10-04R020	4	10	2	7	13	9,7	C10	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7829998	PXSE100C10-04R030	4	10	3	7	13	9,7	C10	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830004	PXSE120C12-04R000	4	12	0	8,4	14,4	11,7	C12	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830005	PXSE120C12-04R005	4	12	0,5	8,4	14,4	11,7	C12	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830006	PXSE120C12-04R010	4	12	1	8,4	14,4	11,7	C12	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830007	PXSE120C12-04R020	4	12	2	8,4	14,4	11,7	C12	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830008	PXSE120C12-04R030	4	12	3	8,4	14,4	11,7	C12	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830009	PXSE160C16-04R000	4	16	0	8,4	14,4	11,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830010	PXSE160C16-04R005	4	16	0,5	8,4	14,4	11,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830011	PXSE160C16-04R010	4	16	1	8,4	14,4	11,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830012	PXSE160C16-04R015	4	16	1,5	11,2	18,7	15,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830013	PXSE160C16-04R020	4	16	2	11,2	18,7	15,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830014	PXSE160C16-04R030	4	16	3	11,2	18,7	15,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830015	PXSE200C20-04R000	4	20	0	14	21,5	19,6	C20	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830016	PXSE200C20-04R005	4	20	0,5	14	21,5	19,6	C20	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830017	PXSE200C20-04R010	4	20	1	14	21,5	19,6	C20	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830018	PXSE200C20-04R020	4	20	2	14	21,5	19,6	C20	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830019	PXSE200C20-04R030	4	20	3	14	21,5	19,6	C20	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830020	PXSE250C25-04R000	4	25	0	17,5	27,5	24	C25	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830021	PXSE250C25-04R010	4	25	1	17,5	27,5	24	C25	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830022	PXSE250C25-04R020	4	25	2	17,5	27,5	24	C25	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830023	PXSE250C25-04R030	4	25	3	17,5	27,5	24	C25	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○

Milling | Indexable

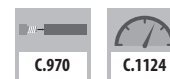
Heads

# PXSE OH HEADS

Milling | Indexable | Heads



- Variable helix solid carbide head with coolant hole
- Up to 5xD application in 55 HRC work materials
- For PXMZ straight shank holder
- 12 - 25 mm



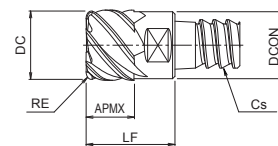
EDP	Designation	ZEPF	DC	RE	APMX	LF	DCON	CS	FHA	Grade	P		M		K		N		S		H	
											dry	oil	dry	oil	GG	GGG	dry	oil	dry	oil	dry	oil
											●	○	●	○	●	○	●	○	●	○	●	○
7830054	PXSE120C12-04R000-O	4	12	0	8,4	14,4	11,7	C12	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○
7830056	PXSE120C12-04R010-O	4	12	1	8,4	14,4	11,7	C12	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○
7830058	PXSE120C12-04R030-O	4	12	3	8,4	14,4	11,7	C12	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○
7830059	PXSE160C16-04R000-O	4	16	0	11,2	18,7	15,7	C16	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○
7830061	PXSE160C16-04R010-O	4	16	1	11,2	18,7	15,7	C16	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○
7830064	PXSE160C16-04R030-O	4	16	3	11,2	18,7	15,7	C16	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○
7830065	PXSE200C20-04R000-O	4	20	0	14	21,5	19,6	C20	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○
7830067	PXSE200C20-04R010-O	4	20	1	14	21,5	19,6	C20	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○
7830069	PXSE200C20-04R030-O	4	20	3	14	21,5	19,6	C20	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○
7830070	PXSE250C25-04R000-O	4	25	0	17,5	27,5	24	C25	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○
7830071	PXSE250C25-04R010-O	4	25	1	17,5	27,5	24	C25	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○
7830074	PXSE250C25-04R030-O	4	25	3	17,5	27,5	24	C25	38	XP3225	●	○	●	○	●	○	●	○	●	○	●	○

Milling | Indexable  
Heads

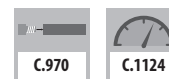


# PXSM HEADS

Milling | Indexable | Heads



- Multi flute variable helix solid carbide head
- Up to 5xD application in 55 HRC work materials
- For PXMZ straight shank holder
- 10 - 25 mm



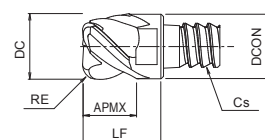
EDP	Designation	ZEFP	DC	RE	APMX	LF	DCON	CS	FHA	Grade	P		M		K		N		S		H	
											dry	with coolant	dry	with coolant	GG	GGG	dry	with coolant	dry	with coolant	dry	with coolant
7830094	PXSM100C10-06R000	6	10	0	7	13	9,7	C10	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830095	PXSM100C10-06R005	6	10	0,5	7	13	9,7	C10	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830096	PXSM100C10-06R010	6	10	1	7	13	9,7	C10	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830097	PXSM100C10-06R020	6	10	2	7	13	9,7	C10	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830104	PXSM120C12-06R000	6	12	0	8,4	14,4	11,7	C12	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830105	PXSM120C12-06R005	6	12	0,5	8,4	14,4	11,7	C12	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830106	PXSM120C12-06R010	6	12	1	8,4	14,4	11,7	C12	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830107	PXSM120C12-06R020	6	12	2	8,4	14,4	11,7	C12	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830108	PXSM120C12-06R030	6	12	3	8,4	14,4	11,7	C12	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830109	PXSM160C16-06R000	6	16	0	11,2	18,7	15,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830115	PXSM160C16-08R000	8	16	0	11,2	18,7	15,7	C16	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830110	PXSM160C16-06R005	6	16	0,5	11,2	18,7	15,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830116	PXSM160C16-08R005	8	16	0,5	11,2	18,7	15,7	C16	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830111	PXSM160C16-06R010	6	16	1	11,2	18,7	15,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830117	PXSM160C16-08R010	8	16	1	11,2	18,7	15,7	C16	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830112	PXSM160C16-06R015	6	16	1,5	11,2	18,7	15,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830118	PXSM160C16-08R015	8	16	1,5	11,2	18,7	15,7	C16	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830113	PXSM160C16-06R020	6	16	2	11,2	18,7	15,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830119	PXSM160C16-08R020	8	16	2	11,2	18,7	15,7	C16	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830114	PXSM160C16-06R030	6	16	3	11,2	18,7	15,7	C16	38	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830120	PXSM160C16-08R030	8	16	3	11,2	18,7	15,7	C16	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830121	PXSM200C20-10R000	10	20	0	14	21,5	19,6	C20	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830122	PXSM200C20-10R005	10	20	0,5	14	21,5	19,6	C20	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830123	PXSM200C20-10R010	10	20	1	14	21,5	19,6	C20	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830124	PXSM200C20-10R020	10	20	2	14	21,5	19,6	C20	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830125	PXSM200C20-10R030	10	20	3	14	21,5	19,6	C20	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830126	PXSM250C25-10R000	10	25	0	17,5	27,5	24	C25	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830127	PXSM250C25-10R010	10	25	1	17,5	27,5	24	C25	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830128	PXSM250C25-10R020	10	25	2	17,5	27,5	24	C25	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○
7830129	PXSM250C25-10R030	10	25	3	17,5	27,5	24	C25	42	XP3225	●	○	○	○	○	○	○	○	○	○	○	○

Milling | Indexable

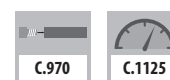
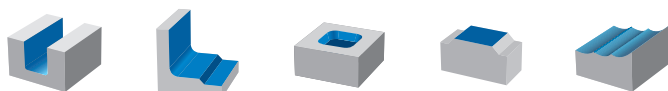
Heads

# PXDR / PXRE HEADS

Milling | Indexable | Heads



- Corner radius with high helix solid carbide head
- Up to 7xD application in 60 HRC work materials
- For PXMZ straight shank holder
- 10 - 20 mm



EDP	Designation	ZEFP	DC	RE	APMX	LF	DCON	CS	FHA	Grade	P		M		K		N		S		H	
											dry	oil	dry	oil	GG	GGG	dry	oil	dry	oil	dry	oil
7830200	PXRE100C10-04R020	4	10	2	4,5	13	9,7	C10	-	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830201	PXRE120C12-04R020	4	12	2	5	14,4	11,7	C12	-	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830202	PXRE160C16-6R030	6	16	3	7	18,7	15,7	C16	-	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830203	PXRE200C20-06R030	6	20	3	10	21,5	19,6	C20	-	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830369	PXDR100C10-03R015-N	3	10	1,5	7	13	9,7	C10	45	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830370	PXDR100C10-03R020-N	3	10	2	7	13	9,7	C10	45	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830371	PXDR120C12-03R015-N	3	12	1,5	8,4	14,4	11,7	C12	45	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830372	PXDR120C12-03R020-N	3	12	2	8,4	14,4	11,7	C12	45	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830373	PXDR160C16-03R020-N	3	16	2	11,2	18,7	15,7	C16	45	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830374	PXDR160C16-03R030-N	3	16	3	11,2	18,7	15,7	C16	45	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830375	PXDR200C20-03R020-N	3	20	2	14	21,5	19,6	C20	45	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830376	PXDR200C20-03R030-N	3	20	3	14	21,5	19,6	C20	45	XP6305	●	○	○	○	●	●	○	○	○	○	○	○
7830349	PXDR100C10-03R015-P	3	10	1,5	7	13	9,7	C10	45	XP3225	●	○	○	○	●	●	○	○	○	○	○	○
7830350	PXDR100C10-03R020-P	3	10	2	7	13	9,7	C10	45	XP3225	●	○	○	○	●	●	○	○	○	○	○	○
7830351	PXDR120C12-03R015-P	3	12	1,5	8,4	14,4	11,7	C12	45	XP3225	●	○	○	○	●	●	○	○	○	○	○	○
7830352	PXDR120C12-03R020-P	3	12	2	8,4	14,4	11,7	C12	45	XP3225	●	○	○	○	●	●	○	○	○	○	○	○
7830353	PXDR160C16-03R020-P	3	16	2	11,2	18,7	15,7	C16	45	XP3225	●	○	○	○	●	●	○	○	○	○	○	○
7830354	PXDR160C16-03R030-P	3	16	3	11,2	18,7	15,7	C16	45	XP3225	●	○	○	○	●	●	○	○	○	○	○	○
7830355	PXDR200C20-03R020-P	3	20	2	14	21,5	19,6	C20	45	XP3225	●	○	○	○	●	●	○	○	○	○	○	○
7830356	PXDR200C20-03R030-P	3	20	3	14	21,5	19,6	C20	45	XP3225	●	○	○	○	●	●	○	○	○	○	○	○

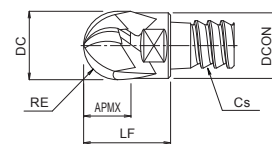
Milling | Indexable



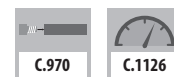
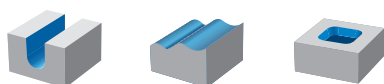
Heads

# PXBE / PXBM HEADS

Milling | Indexable | Heads



- 3 flutes ball nose solid carbide head
- Up to 5xD application in 60 HRC work materials
- For PXMZ straight shank holder
- 10 - 20 mm



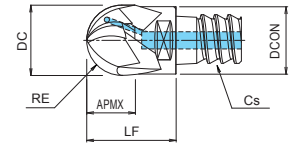
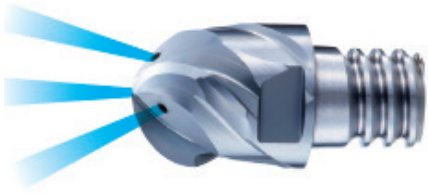
EDP	Designation	ZEFP	DC	RE	APMX	LF	DCON	CS	FHA	Grade	P		M		K		N		S		H		
											dry	with coolant	dry	with coolant	GG	GGG	dry	with coolant	dry	with coolant	dry	with coolant	
7830270	PXBE100C10-03R050-P	3	10	5	7	13	9,7	C10	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○
7830271	PXBE120C12-03R060-P	3	12	6	8,4	14,4	11,7	C12	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○
7830272	PXBE160C16-03R080-P	3	16	8	11,2	18,7	15,7	C16	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○
7830273	PXBE200C20-03R100-P	3	20	10	14	21,5	19,6	C20	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○
7830250	PXBE100C10-03R050-N	3	10	5	7	13	9,7	C10	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○
7830251	PXBE120C12-03R060-N	3	12	6	8,4	14,4	11,7	C12	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○
7830252	PXBE160C16-03R080-N	3	16	8	11,2	18,7	15,7	C16	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○
7830253	PXBE200C20-03R100-N	3	20	10	14	21,5	19,6	C20	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○
7830300	PXBM100C10-04R050	4	10	5	7	13	9,7	C10	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○
7830301	PXBM120C12-04R060	4	12	6	8,4	14,4	11,7	C12	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○
7830302	PXBM160C16-06R080	6	16	8	11,2	18,7	15,7	C16	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○
7830303	PXBM200C20-06R100	6	20	10	14	21,5	19,6	C20	45	XP3320	●	○	●	○	●	○	○	○	○	○	○	○	○

Milling | Indexable

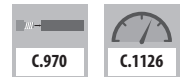
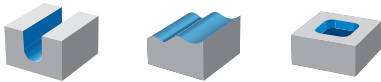
Heads

# PXBE OH HEADS

Milling | Indexable | Heads



- Multi flute variable helix solid carbide head with coolant holes
- Up to 5xD application in 60 HRC work materials
- For PXMZ straight shank holder
- 12 - 20 mm

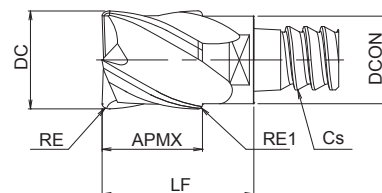


EDP	Designation	ZEFP	DC	RE	APMX	LF	DCON	CS	FHA	Grade	P		M		K		N		S		H	
											dry	☉	dry	☉	GG	GGG	dry	☉	dry	☉	dry	☉
7830281	PXBE120C12-03R060-P-O	3	12	6	8,4	14,4	11,7	C12	45	XP3320	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830282	PXBE160C16-03R080-P-O	3	16	8	11,2	18,7	15,7	C16	45	XP3320	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830283	PXBE200C20-03R100-P-O	3	20	10	14	21,5	19,6	C20	45	XP3320	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830261	PXBE120C12-03R060-N-O	3	12	6	8,4	14,4	11,7	C12	45	XP3320	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830262	PXBE160C16-03R080-N-O	3	16	8	11,2	18,7	15,7	C16	45	XP3320	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830263	PXBE200C20-03R100-N-O	3	20	10	14	21,5	19,6	C20	45	XP3320	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉

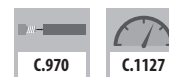
Milling | Indexable  
Heads

# PXAL HEADS NEW

Milling | Indexable | Heads



- 3 flutes solid carbide head
- For Non-ferrous materials
- For PXMZ straight shank holder
- 10 - 25 mm



EDP	Designation	ZEFP	DC	RE	APMX	LF	DCON	CS	FHA	Grade	P		M		K		N		S		H		
											dry	oil	dry	oil	GG	GGG	dry	oil	dry	oil	dry	oil	
7834930	PXAL100C10-03R000	3	10	-	10	16	9,8	C10	45	XP4625								●	●				
7834931	PXAL100C10-03R100	3	10	1	10	16	9,8	C10	45	XP4625								●	●				
7834932	PXAL100C10-03R250	3	10	2,5	10	16	9,8	C10	45	XP4625								●	●				
7834933	PXAL120C10-03R000	3	12	-	12	18	9,8	C10	45	XP4625								●	●				
7834934	PXAL120C12-03R000	3	12	-	12	18	11,7	C12	45	XP4625								●	●				
7834935	PXAL120C12-03R100	3	12	1	12	18	11,7	C12	45	XP4625								●	●				
7834936	PXAL120C12-03R300	3	12	3	12	18	11,7	C12	45	XP4625								●	●				
7834937	PXAL140C12-03R000	3	14	-	14	20	11,7	C12	45	XP4625								●	●				
7834938	PXAL160C16-03R000	3	16	-	16	23,5	15,7	C16	45	XP4625								●	●				
7834939	PXAL160C16-03R100	3	16	1	16	23,5	15,7	C16	45	XP4625								●	●				
7834940	PXAL160C16-03R200	3	16	2	16	23,5	15,7	C16	45	XP4625								●	●				
7834941	PXAL160C16-03R300	3	16	3	16	23,5	15,7	C16	45	XP4625								●	●				
7834942	PXAL160C16-03R400	3	16	4	16	23,5	15,7	C16	45	XP4625								●	●				
7834943	PXAL180C16-03R000	3	18	-	18	25,5	15,7	C16	45	XP4625								●	●				
7834944	PXAL200C20-03R000	3	20	-	20	27,5	19,6	C20	45	XP4625								●	●				
7834945	PXAL200C20-03R100	3	20	1	20	27,5	19,6	C20	45	XP4625								●	●				
7834946	PXAL200C20-03R200	3	20	2	20	27,5	19,6	C20	45	XP4625								●	●				
7834947	PXAL200C20-03R300	3	20	3	20	27,5	19,6	C20	45	XP4625								●	●				
7834948	PXAL200C20-03R400	3	20	4	20	27,5	19,6	C20	45	XP4625								●	●				
7834949	PXAL220C20-03R000	3	22	-	22	29,5	19,6	C20	45	XP4625								●	●				
7834950	PXAL250C25-03R000	3	25	-	25	35	24	C25	45	XP4625								●	●				
7834951	PXAL250C25-03R100	3	25	1	25	35	24	C25	45	XP4625								●	●				
7834952	PXAL250C25-03R300	3	25	3	25	35	24	C25	45	XP4625								●	●				
7834953	PXAL250C25-03R500	3	25	5	25	35	24	C25	45	XP4625								●	●				

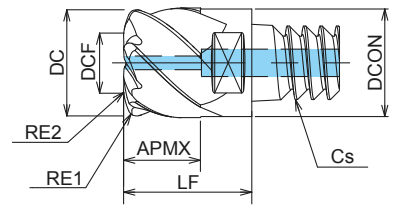
Milling | Indexable

Heads



# PXHF-AM HEADS NEW

Milling | Indexable | Heads

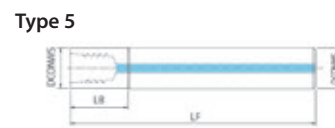
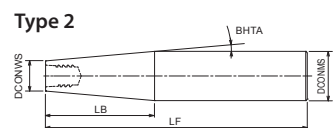
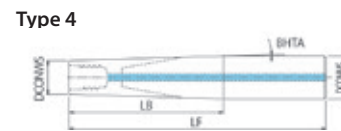
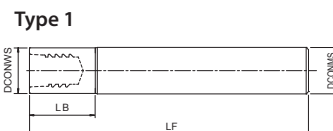


- Multi flute solid carbide head with coolant holes
- For high feed additive manufacturing milling
- For PXMZ straight shank holder



EDP	Designation	ZEPF	DC	RE1	RE2	APMX	LF	DCON	CS	FHA	Grade	P		M		K		N		S		H	
												dry	☉	dry	☉	GG	GGG	dry	☉	dry	☉	dry	☉
7830377	PXHF-AM120C12-06R150-O	6	12	1,5	1,2	8,4	14,4	11,7	C12	45	XP6703	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830378	PXHF-AM160C16-06R200-O	6	16	2	1,6	11,2	18,7	15,7	C16	45	XP6703	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉
7830379	PXHF-AM200C20-06R250-O	6	20	2,5	2	14	21,5	19,6	C20	45	XP6703	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉	☉

Milling | Indexable  
Heads



- Exchangeable carbide/steel body for PXM

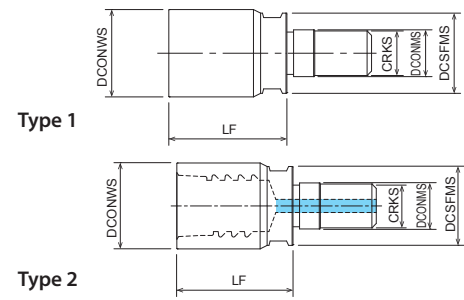
EDP	Designation	CS	LF	DCONWS	LB	DCON	BHTA	Type	Shank material
48174001	PXMZ-C12SS12-S100	C12	100	11,7	18	12	0	1	Steel
48174002	PXMZ-C12TP20-S145	C12	145	11,7	47,4	20	5	2	Steel
48174003	PXMZ-C16SS16-S100	C16	100	15,7	23	16	0	1	Steel
48174004	PXMZ-C16TP25-S155	C16	155	15,7	53,1	25	5	2	Steel
48174005	PXMZ-C20SS20-S120	C20	120	19,6	28	20	0	1	Steel
48174006	PXMZ-C20TP32-S170	C20	170	19,6	70,8	32	5	2	Steel
48174007	PXMZ-C25SS25-S140	C25	140	24	34,5	25	0	1	Steel
48174022	PXMZ-C32SS32-S160	C32	160	28	33	32	0	1	Steel
48309001	PXMZ-C12SS12-S100-O	C12	100	11,7	18	12	0	5	Steel
48309002	PXMZ-C16SS16-S100-O	C16	100	15,7	23	16	0	5	Steel
48309003	PXMZ-C20SS20-S120-O	C20	120	19,6	28	20	0	5	Steel
48309004	PXMZ-C25SS25-S140-O	C25	140	24	34,5	25	0	5	Steel
48174008	PXMZ-C12SS12-S075CS	C12	75	11,7	24	12	0	1	Carbide
48174009	PXMZ-C12SS12-L100CS	C12	100	11,7	45,9	12	0	1	Carbide
48174010	PXMZ-C12SS12-L115CS	C12	115	11,7	64,2	12	0	1	Carbide
48174011	PXMZ-C12TP16-LL135CS	C12	135	11,7	83,8	16	1,3	2	Carbide
48174012	PXMZ-C16SS16-S090CS	C16	90	15,7	39,2	16	0	1	Carbide
48174013	PXMZ-C16SS16-L130CS	C16	130	15,7	61,2	16	0	1	Carbide
48174014	PXMZ-C16SS16-L135CS	C16	135	15,7	84,2	16	0	1	Carbide
48174015	PXMZ-C16TP20-LL165CS	C16	165	15,7	115	20	1,1	2	Carbide
48174016	PXMZ-C20SS20-S090CS	C20	90	19,6	39,1	20	0	1	Carbide
48174017	PXMZ-C20SS20-L150CS	C20	150	19,6	78,4	20	0	1	Carbide
48174018	PXMZ-C20SS20-L180CS	C20	180	19,6	109,1	20	0	1	Carbide
48174019	PXMZ-C20TP25-LL200CS	C20	200	19,6	140	25	1,1	2	Carbide
48174020	PXMZ-C25SS25-L200CS	C25	200	24	96,6	25	0	1	Carbide
48174021	PXMZ-C10SS10-S075	C10	75	9,8	12	10	0	1	Carbide
48174023	PXMZ-C10SS10-L100CS	C10	100	9,8	37,3	10	0	1	Carbide
48174024	PXMZ-C32SS32-L250CS	C32	250	28	115,2	32	0	1	Carbide
48174025	PXMZ-C10SS10-S075CS	C10	75	9,8	17,3	10	0	1	Carbide
48174026	PXMZ-C10TP12-LL130CS	C10	130	9,8	67	12	0,9	2	Carbide
48309005	PXMZ-C12SS12-S075CS-O	C12	75	11,7	25	12	0	3	Carbide
48309006	PXMZ-C12SS12-L100CS-O	C12	100	11,7	46,3	12	0	3	Carbide
48309007	PXMZ-C12SS12-L115CS-O	C12	115	11,7	65	12	0	3	Carbide
48309008	PXMZ-C12TP16-LL135CS-O	C12	135	11,7	85	16	1,3	4	Carbide
48309009	PXMZ-C12TP16-LL150CS-O	C12	150	11,7	85,6	16	1	4	Carbide
48309010	PXMZ-C16SS16-S090CS-O	C16	90	15,7	40	16	0	3	Carbide
48309011	PXMZ-C16SS16-L130CS-O	C16	130	15,7	62	16	0	3	Carbide
48309012	PXMZ-C16SS16-L135CS-O	C16	135	15,7	85	16	0	3	Carbide
48309013	PXMZ-C16TP20-LL165CS-O	C16	165	15,7	115	20	1	4	Carbide
48309014	PXMZ-C16TP20-LL180CS-O	C16	180	15,7	116,6	20	1	4	Carbide
48309015	PXMZ-C20SS20-S090CS-O	C20	90	19,6	40	20	0	3	Carbide
48309016	PXMZ-C20SS20-L150CS-O	C20	150	19,6	79,3	20	0	3	Carbide
48309017	PXMZ-C20SS20-L180CS-O	C20	180	19,6	110	20	0	3	Carbide
48309018	PXMZ-C20TP25-LL200CS-O	C20	200	19,6	140	25	1	4	Carbide
48309019	PXMZ-C20TP25-LL210CS-O	C20	210	19,6	145	25	1	4	Carbide
48309020	PXMZ-C25SS25-L200CS-O	C25	200	24	98	25	0	3	Carbide

### Accessories and spare parts

Applicable head	EDP	Designation	Torque	Specification
10-12	7801890	PXMP8-10	10 N.m	Spanner
12-14	7801890	PXMP8-10	12 N.m	Spanner
16-18	7801891	PXMP13-16	30 N.m	Spanner
20-22	7801891	PXMP13-16	50 N.m	Spanner
25	7801892	PXMP21	60 N.m	Spanner
32	7801897	PXMP24	60 N.m	Spanner

# PXMJ

Milling | Indexable | Arbors



- Exchangeable screw fit body for PXM

EDP	Designation	CS	LF	DCONWS	DCSFMS	DCON	Type
7801893	PXMJ-C12SF06	C12	18	11,7	11	6,5	1
7801894	PXMJ-C16SF08	C16	21,8	15,7	14,5	8,5	1
7801895	PXMJ-C20SF10	C20	26,5	19,6	18	10,5	1
7801896	PXMJ-C25SF12	C25	34	24	23	12,5	1
7803551	PXMJ-C12SF06-O	C12	18	11,7	11	6,5	2
7803552	PXMJ-C16SF08-O	C16	21,8	15,7	14,5	8,5	2
7803553	PXMJ-C20SF10-O	C20	26,5	19,6	18	10,5	2
7803554	PXMJ-C25SF12-O	C25	34	24	23	12,5	2

### Accessories and spare parts

Applicable head	EDP	Designation	Torque	Specification
10-12	7801890	PXMP8-10	10 N.m	Spanner
12-14	7801890	PXMP8-10	12 N.m	Spanner
16-18	7801891	PXMP13-16	30 N.m	Spanner
20-22	7801891	PXMP13-16	50 N.m	Spanner
25	7801892	PXMP21	60 N.m	Spanner
32	7801897	PXMP24	60 N.m	Spanner

Milling | Indexable  
Arbors







# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## DIA-BNC

Trimming & plunging operation

Vc	Side Milling ap: <1,5D / ae: <1D		Slotting ap: 1D	
	120 (m/min)	240 (m/min)	90 (m/min)	180 (m/min)
Ø	F (mm/min)	F (mm/min)	F (mm/min)	F (mm/min)
6	770	1.600	380	750
8	900	1.800	450	900
10	1.000	2.000	510	1.000
12	1.300	2.600	630	1.300

## DIA-HBC

Vc	Side Milling ap: <1,5D / ae: <1D		Slotting ap: 1D	
	120 (m/min)	240 (m/min)	90 (m/min)	180 (m/min)
Ø	F (mm/min)	F (mm/min)	F (mm/min)	F (mm/min)
6	770	1.600	380	750
8	900	1.800	450	900
10	1.000	2.000	510	1.000
12	1.300	2.600	630	1.300

Note: This table's parameters are based on common material thickness of approximately 0,250" under excellent workholding conditions and less than 20% x D depth of cut (side milling). Please adjust your parameters properly for your application or call OSG for assistance. Conventional milling is recommended for better surface finishes. Higher feed rates are possible but quality of part and surface should be considered.

Feed reduction by thickness of part: Recommended feed adjustments based on thickness of part. (Above table is based on approximately 1xD thickness.)

≤0,5D	x 150%
0,5D-1D	x 120%
1D-2D	x 80%
3D-4D	x 50%

## DIA-MFC

Vc	S (min <sup>-1</sup> )	Feed rate	
		(mm/rev)	IPR
		100~180 (m/min)	
6	5.300 ~ 9.500	0,16 ~ 0,24	0,006 ~ 0,009
8	4.000 ~ 7.000	0,3 ~ 1	0,012 ~ 0,039
10	3.200 ~ 5.700	0,48 ~ 1,2	0,019 ~ 0,047

≤0,25D	x 80%
0,25D-0,5D	x 150%
0,5D-1D	x 120%
1D-2D	x 80%
2D-3D	x 50%

## DIA-REC

Vc	S (min <sup>-1</sup> )	Feed rate	
		(mm/rev)	IPR
		100~180 (m/min)	
6	5.300 ~ 9.500	0,1 ~ 0,12	0,004 ~ 0,005
8	4.000 ~ 7.200	0,16 ~ 0,25	0,006 ~ 0,01
10	3.200 ~ 5.700	0,24 ~ 0,3	0,009 ~ 0,012

≤0,25D	x 80%
0,25D-0,5D	x 150%
0,5D-1D	x 120%
1D-2D	x 80%
2D-3D	x 50%

## HBC60

Vc	S (min <sup>-1</sup> )	Feed rate	
		(mm/rev)	IPR
		300~600 (m/min)	
6	20.000 ~ 30.000	0,02 ~ 0,06	0,001 ~ 0,002
8	15.000 ~ 24.000	0,02 ~ 0,06	0,001 ~ 0,002
10	12.000 ~ 19.000	0,02 ~ 0,07	0,001 ~ 0,003
12	10.000 ~ 16.000	0,02 ~ 0,1	0,001 ~ 0,004

≤0,25D	x 80%
0,25D-0,5D	x 150%
0,5D-1D	x 120%
1D-2D	x 80%
2D-3D	x 50%

Milling | Endmills

Cutting conditions

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VMS

Radius Type

Slot Milling

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V		Ni-Based Alloy Inconel 718			
	∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	
100 (80-120) (m/min)																
90 (70-110) (m/min)																
80 (60-100) (m/min)																
70 (50-80) (m/min)																
60 (50-70) (m/min)																
25 (20-30) (m/min)																
Depth of cut	ap 1D				Dc Dc≤6 6<Dc				ap 0,5D 1D				ap 0,25D			

Side Milling

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V		Ni-Based Alloy Inconel 718			
	∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	
130 (100-150) (m/min)																
120 (100-150) (m/min)																
100 (80-120) (m/min)																
80 (60-100) (m/min)																
80 (70-90) (m/min)																
70 (60-80) (m/min)																
30 (25-40) (m/min)																
Depth of cut	ap 1,5D				ae 0,2D											

1. The above milling condition is a guideline for the overhang length is 3×D.
2. Use a rigid and precise machine and holder.
3. The rotational speed is calculated by the median of the recommended cutting speed. Adjustment may be necessary depending on the rigidity of the workpiece fixture and machine.
4. Please use a suitable fluid with high smoke retardant properties.
5. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
6. Please use water-soluble oil when machining stainless steel.
7. Reduce speed and feed as well as depth of cut when high precision is required.
8. Adjust the speed and feed accordingly when the overhang length is longer than specified.

Fix rate cutting condition

DC≥∅6

Work Material	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V		Ni-Based Alloy Inconel 718		
	∅	L/D	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	
Side Milling	4		80%		70%		70%		60%		60%		50%		50%
	5		70%		60%		60%		50%		50%		50%		50%
Slotting	4		90%		90%		80%		70%		70%		60%		60%
	5		80%		80%		70%		70%		70%		60%		60%

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VMSS

Square Type / Right Angle Type\*

### Slot milling

\* For right angle type, please use 70% of the speed and feed shown in the table below as reference.

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V		Ni-Based Alloy Inconel 718	
	∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )
1	28.700	570	25.500	460	22.300	360	19.100	340	25.620	320	22.280	300	9.550	120
1,5	19.100	610	17.000	480	14.900	420	12.700	360	16.980	360	14.850	340	6.370	130
2	14.300	630	12.700	510	11.100	440	9.600	380	12.810	360	11.140	350	4.770	140
2,5	11.500	780	10.200	570	8.900	460	7.600	430	10.190	410	8.910	390	3.820	150
3	10.600	930	9.600	690	8.500	510	7.400	470	8.540	430	7.430	410	3.180	160
4	8.000	960	7.200	720	6.400	510	5.600	490	6.410	460	5.570	440	2.390	170
5	6.400	1.020	5.700	800	5.100	610	4.500	560	5.120	490	4.460	470	1.910	180
6	5.300	1.060	4.800	900	4.200	670	3.700	370	4.270	480	3.710	460	1.590	180
8	4.000	910	3.600	720	3.200	640	2.800	370	2.750	450	2.390	430	1.190	200
10	3.200	840	2.900	700	2.500	550	2.200	350	2.200	420	1.910	400	950	180
12	2.700	810	2.400	670	2.100	550	1.900	330	1.830	420	1.590	400	800	180
16	2.000	600	1.800	500	1.600	420	1.200	310	1.140	260	990	250	500	110
20	1.600	480	1.400	390	1.300	340	900	250	920	270	800	260	400	120
25	1.300	390	1.100	310	1.000	260	600	170	730	250	640	240	250	90
Depth of cut	ap 1D						Dc ap Dc≤6 0,5D Dc>6 1D		ap 0,25D					

### Side milling

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V		Ni-Based Alloy Inconel 718	
	∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )
1	38.200	840	28.700	690	25.500	510	22.300	450	29.280	370	25.460	350	12.730	160
1,5	25.500	920	21.200	760	17.000	540	14.900	460	19.520	410	16.980	400	8.490	180
2	19.900	1.430	17.500	840	14.300	630	11.100	470	14.640	440	12.730	420	6.370	190
2,5	15.900	1.590	14.000	900	11.500	690	8.900	480	11.710	480	10.190	460	5.039	210
3	13.800	1.660	12.700	1.070	10.600	760	8.000	480	9.760	510	8.490	480	4.240	220
4	10.400	1.830	9.600	1.150	8.000	800	6.000	530	7.320	550	6.370	530	3.180	240
5	8.300	1.990	7.600	1.220	6.400	900	4.800	560	5.860	560	5.090	540	2.550	250
6	6.900	2.070	6.400	1.540	5.300	1.060	4.200	640	4.880	580	4.240	550	2.120	250
8	5.200	1.770	4.800	1.540	4.000	1.040	3.200	610	3.200	450	2.790	430	1.590	230
10	4.100	1.640	3.800	1.370	3.200	900	2.500	580	2.560	430	2.230	410	1.270	220
12	3.500	1.400	3.200	1.280	2.700	760	2.100	530	2.140	420	1.860	400	1.060	210
16	2.600	1.250	2.400	1.060	2.000	640	1.400	450	1.370	410	1.190	400	700	210
20	2.100	1.010	1.900	840	1.600	510	1.100	370	1.100	390	950	380	560	200
25	1.700	820	1.500	660	1.300	420	900	310	880	310	760	300	320	190
Depth of cut	ap ae 1,5D 0,2D													

- The above milling condition is a guideline for the overhang length is 3×D.
- Use a rigid and precise machine and holder.
- The rotational speed is calculated by the median of the recommended cutting speed. Adjustment may be necessary depending on the rigidity of the workpiece fixture and machine.
- Please use a suitable fluid with high smoke retardant properties.
- During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
- Please use water-soluble oil when machining stainless steel.
- 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.

Milling | Endmills

Cutting conditions



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VMSS

Long Neck Type

Side milling

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V		Ni-Based Alloy Inconel 718					
	∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)			
105 (80-120) (m/min)																		
95 (70-110) (m/min)																		
70 (50-90) (m/min)																		
60 (40-80) (m/min)																		
60 (50-70) (m/min)																		
50 (40-60) (m/min)																		
30 (20-35) (m/min)																		
6	5.520	1.660	5.120	1.230	3.710	740	2.940	450	3.420	410	2.970	390	1.480	180				
8	4.160	1.420	3.840	1.230	2.800	730	2.240	430	2.240	320	1.950	300	1.110	160				
10	3.280	1.310	3.040	1.100	2.240	630	1.750	410	1.790	300	1.560	290	890	150				
12	2.800	1.120	2.560	1.020	1.890	530	1.470	370	1.500	290	1.300	280	740	150				
Depth of cut	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>1,5D</td> <td>0,2D</td> </tr> </table>														ap	ae	1,5D	0,2D
ap	ae																	
1,5D	0,2D																	
<p>1. Use a rigid and precise machine and holder.                  2. The rotational speed is calculated by the median of the recommended cutting speed. Adjustment may be necessary depending on the rigidity of the workpiece fixture and machine.                  3. Please use a suitable fluid with high smoke retardant properties.                  4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.                  5. Please use water-soluble oil when machining stainless steel.                  6. Reduce speed and feed as well as depth of cut when high precision is required.</p>																		

### Fix rate cutting condition

DC ≥ ∅6

∅	L/D	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V		Ni-Based Alloy Inconel 718	
		S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
Side Milling	4	80%		70%		70%		60%		60%		50%		50%	
	5	70%		60%		60%		50%		50%		50%		50%	
Slotting	4	90%		90%		80%		70%		70%		60%		60%	
	5	80%		80%		70%		70%		70%		60%		60%	



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VML

Long Type (Applies to square / radius / chipbreaker type)

### ae=0.05D • Standard side milling 3D

Ø	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V		Ni-Based Alloy Inconel 718	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	8.500	2.480	8.000	2.180	7.400	2.010	6.600	1.660	6.100	1.530	5.600	1.400	4.500	1.080
8	6.400	1.870	6.000	1.630	5.600	1.520	5.000	1.260	4.600	1.160	4.200	1.050	3.400	820
10	5.100	1.730	4.800	1.440	4.500	1.350	4.000	1.120	3.700	1.040	3.300	920	2.700	720
12	4.200	1.430	4.000	1.200	3.700	1.110	3.300	920	3.000	840	2.800	780	2.200	590
16	3.180	1.590	2.990	1.350	2.790	1.260	2.490	1.000	2.290	920	2.090	840	1.690	630
20	2.550	1.280	2.390	1.080	2.230	1.000	1.990	800	1.830	730	1.670	670	1.350	510
Depth of cut							$\frac{ap}{3D}$		$\frac{ae}{0,05D}$					

1. Use a rigid and precise machine and holder.  
 2. The rotational speed is calculated by the median of the recommended cutting speed. Adjustment may be necessary depending on the rigidity of the workpiece fixture and machine.  
 3. Please use a suitable fluid with high smoke retardant properties.  
 4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.  
 5. Please use water-soluble coolant when machining stainless steel.

### ae=0.1D • High efficiency side milling 3D

Ø	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	11.700	3.180	9.000	2.270	7.200	1.810	6.900	1.600	6.400	1.480	5.800	1.340
8	8.800	2.390	6.800	1.710	5.400	1.360	5.200	1.210	4.800	1.120	4.400	1.020
10	7.000	2.240	5.400	1.510	4.300	1.200	4.100	1.070	3.800	990	3.500	910
12	5.800	1.860	4.500	1.260	3.600	1.010	3.500	910	3.200	830	2.900	750
16	4.380	1.970	3.380	1.350	2.690	1.080	2.590	910	2.390	840	2.190	770
20	3.500	1.580	2.710	1.080	2.150	860	2.070	720	1.910	670	1.750	610
Depth of cut							$\frac{ap}{3D}$		$\frac{ae}{0,1D}$			

### ae=0.15D • High efficiency side milling 3D

Ø	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	7.400	1.860	5.600	1.300	4.800	1.110	4.500	950	4.000	840	3.400	720
8	5.600	1.410	4.200	970	3.600	840	3.400	720	3.000	640	2.600	550
10	4.500	1.350	3.300	860	2.900	750	2.700	650	2.400	580	2.100	510
12	3.700	1.110	2.800	730	2.400	620	2.300	550	2.000	480	1.700	410
16	2.790	1.120	1.990	700	1.790	630	1.690	570	1.490	510	1.290	420
20	2.230	890	1.590	560	1.430	500	1.350	460	1.190	400	1.040	340
Depth of cut							$\frac{ap}{3D}$		$\frac{ae}{0,15D}$			

### ae≤0.2D • High efficiency side milling 3D

Ø	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	5.300	1.230	4.200	890	3.700	780	3.500	670	2.900	560	2.400	460
8	4.000	930	3.200	680	2.800	590	2.600	500	2.200	420	1.800	350
10	3.200	900	2.500	600	2.200	530	2.100	460	1.800	390	1.400	310
12	2.700	760	2.100	500	1.900	460	1.700	370	1.500	330	1.200	260
16	1.990	800	1.590	560	1.390	490	1.290	420	1.090	350	900	270
20	1.590	640	1.270	440	1.110	390	1.040	340	880	290	720	220
Depth of cut							$\frac{ap}{3D}$		$\frac{ae}{0,20D}$			

Milling | Endmills

Cutting conditions

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VML

Long type (Applies to square / radius / chipbreaker type)

### ae=0.05D • Standard side milling 4D

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V		Ni-Based Alloy Inconel 718					
	∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)			
140 (120-160) (m/min)	130 (110-150) (m/min)		120 (100-140) (m/min)		115 (90-130) (m/min)		105 (80-120) (m/min)		95 (70-110) (m/min)		75 (60-80) (m/min)							
6	7.400	2.010	6.900	1.740	6.400	1.610	6.100	1.420	5.600	1.300	5.000	1.160	4.000	880				
8	5.600	1.520	5.200	1.310	4.800	1.210	4.600	1.070	4.200	980	3.800	880	3.000	660				
10	4.500	1.440	4.100	1.230	3.800	1.140	3.700	960	3.300	860	3.000	780	2.400	590				
12	3.700	1.180	3.500	1.050	3.200	960	3.100	810	2.800	730	2.500	650	2.000	500				
16	2.790	1.330	2.590	1.170	2.390	1.080	2.290	860	2.090	780	1.890	710	1.490	520				
20	2.230	1.060	2.070	930	1.910	860	1.830	690	1.670	630	1.510	570	1.190	420				
Depth of cut	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>4D</td> <td>0,05D</td> </tr> </table>														ap	ae	4D	0,05D
ap	ae																	
4D	0,05D																	
<p>1. Use a rigid and precise machine and holder.                  2. The rotational speed is calculated by the median of the recommended cutting speed. Adjustment may be necessary depending on the rigidity of the workpiece fixture and machine.                  3. Please use a suitable fluid with high smoke retardant properties.                  4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.                  5. Please use water-soluble coolant when machining stainless steel.</p>																		

### ae=0.1D • High efficiency side milling 4D

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V					
	∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)			
200 (180-220) (m/min)	160 (140-180) (m/min)		130 (110-150) (m/min)		125 (100-140) (m/min)		115 (90-130) (m/min)		105 (80-120) (m/min)							
6	10.600	2.670	8.500	1.970	6.900	1.600	6.600	1.400	6.100	1.290	5.600	1.190				
8	8.000	2.020	6.400	1.480	5.200	1.210	5.000	1.060	4.600	980	4.200	890				
10	6.400	1.920	5.100	1.330	4.100	1.070	4.000	950	3.700	890	3.300	790				
12	5.300	1.590	4.200	1.090	3.500	910	3.300	790	3.000	720	2.800	670				
16	3.980	1.690	3.180	1.190	2.590	970	2.490	870	2.290	800	2.090	730				
20	3.180	1.350	2.550	960	2.070	780	1.990	700	1.830	640	1.670	580				
Depth of cut	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>4D</td> <td>0,1D</td> </tr> </table>												ap	ae	4D	0,1D
ap	ae															
4D	0,1D															

### ae=0.15D • High efficiency side milling 4D

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V					
	∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)			
135 (110-150) (m/min)	115 (100-140) (m/min)		85 (60-100) (m/min)		75 (50-90) (m/min)		65 (50-80) (m/min)		55 (40-70) (m/min)							
6	7.200	1.670	6.100	1.290	4.500	950	4.000	770	3.400	650	2.900	560				
8	5.400	1.250	4.600	980	3.400	720	3.000	580	2.600	500	2.200	430				
10	4.300	1.200	3.700	890	2.700	650	2.400	530	2.100	460	1.800	400				
12	3.600	1.010	3.100	740	2.300	550	2.000	440	1.700	370	1.500	330				
16	2.690	1.080	2.290	800	1.690	590	1.490	480	1.290	420	1.090	330				
20	2.150	860	1.830	640	1.350	470	1.190	390	1.040	340	880	260				
Depth of cut	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>4D</td> <td>≤0,15D</td> </tr> </table>												ap	ae	4D	≤0,15D
ap	ae															
4D	≤0,15D															

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VMFE

(Applies to square / radius type)

### Side milling

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron SS400 • S55C • FC250 ~750N/mm <sup>2</sup>		Alloy Steel • Tool Steel SCM • SKS • SKD ~30HRC		Prehardened Steel • Hardened Steel PX5 • NAK80 30~45HRC		Stainless Steel SUS304 • SUS420 ≤200HB		Precipitation Stainless Steel SUS630		Titanium Alloy Ti-6Al-4V		Ni-Based Alloy Inconel 718	
	120 (100-140) (m/min)	120 (100-140) (m/min)	120 (100-140) (m/min)	120 (100-140) (m/min)	120 (100-140) (m/min)	120 (100-140) (m/min)	115 (100-130) (m/min)	105 (90-120) (m/min)	70 (60-80) (m/min)					
∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	6.370	2.550	6.370	2.290	6.370	2.040	6.370	1.910	6.100	1.590	5.570	1.340	3.720	740
8	4.780	1.910	4.780	1.720	4.780	1.530	4.780	1.430	4.580	1.190	4.180	1.000	2.790	560
10	3.820	1.530	3.820	1.380	3.820	1.220	3.820	1.150	3.660	950	3.340	800	2.230	490
12	3.180	1.270	3.180	1.140	3.180	1.020	3.180	950	3.050	790	2.790	670	1.860	410
14	2.730	1.090	2.730	980	2.730	870	2.730	820	2.620	680	2.390	570	1.590	480
18	2.120	850	2.120	760	2.120	680	2.120	640	2.030	530	1.860	450	1.240	370
22	1.740	700	1.740	630	1.740	560	1.740	520	1.660	430	1.520	360	1.010	300

ap	ae
2D	0,1D

1. The above milling condition is a guideline for the overhang length is 5×D.
2. Use a rigid and precise machine and holder.
3. Adjustment may be necessary depending on the rigidity of the workpiece fixture and machine.
4. Please use a suitable fluid with high smoke retardant properties.
5. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
6. Please use water-soluble coolant when machining stainless steel, precipitation stainless steel, titanium alloy, Ni-based alloy.
7. Reduce speed and feed as well as depth of cut when high precision is required.
8. Adjust the speed and feed accordingly when the overhang length is longer than specified.

### Cutting Condition Guide for Changes in Overhang Length

Cutting Speed	Mild Steel • Carbon Steel • Cast Iron • Alloy Steel • Tool Steel (~750N/mm <sup>2</sup> ~30HRC)				Prehardened Steel • Hardened Steel • Stainless Steel 30~45HRC				Titanium Alloy • Ni-Based Alloy Ti-6Al-4V - Inconel 718			
	Cutting Speed (m/min)	Feed (mm/min)	Depth of cut		Cutting Speed (m/min)	Feed (mm/min)	Depth of cut		Cutting Speed (m/min)	Feed (mm/min)	Depth of cut	
			ap	ae			ap	ae			ap	ae
L/D	(m/min)	(mm/min)	ap	ae	(m/min)	(mm/min)	ap	ae	(m/min)	(mm/min)	ap	ae
6	80%	80%	1,7D	0,08D	80%	80%	1,7D	0,08D	80%	80%	1,7D	0,08D
7	65%	65%	1,6D	0,05D	65%	65%	1,6D	0,05D	65%	65%	1,6D	0,05D
8	50%	50%	1,5D	0,03D	40%	40%	1,5D	0,03D	30%	30%	1,5D	0,03D

Milling | Endmills

Cutting conditions



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-MSS-H

Square Type


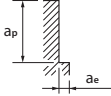
Side Milling

	ToolSteel • Hardened Steel • Prehardened Steel SKD11 • SKD61 • NAK80		Hardened Steel																			
			~ 55HRC		~ 62HRC		~ 66HRC		~ 70HRC													
Vc (m/min)	110 ~ 130		80 ~ 100		60 ~ 80		50 ~ 70		40 ~ 60													
DC X LU	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)												
3 X 9	12.740	1.220	9.550	880	7.430	530	6.370	400	5.310	250												
4 X 12	9.550	1.220	7.170	890	5.570	530	4.780	400	3.980	250												
5 X 15	7.640	1.220	5.730	920	4.460	540	3.820	400	3.180	250												
6 X 18	6.370	1.830	4.780	1.350	3.720	800	3.180	600	2.650	380												
8 X 24	4.780	1.840	3.580	1.350	2.790	800	2.390	600	1.990	380												
10 X 30	3.820	1.830	2.870	1.340	2.230	800	1.910	600	1.590	380												
12 X 36	3.180	1.830	2.390	1.330	1.860	800	1.590	600	1.330	380												
Depth of cut	 <table border="1"> <tr><th>ap</th><th>ae</th></tr> <tr><td>≤1,5D</td><td>≤0,1D</td></tr> </table> <p>ae Max = 1mm</p>		ap	ae	≤1,5D	≤0,1D	<table border="1"> <tr><th>ap</th><th>ae</th></tr> <tr><td>≤1,5D</td><td>≤0,05D</td></tr> </table> <p>ae Max = 0,5mm</p>				ap	ae	≤1,5D	≤0,05D	<table border="1"> <tr><th>ap</th><th>ae</th></tr> <tr><td>≤1,5D</td><td>≤0,03D</td></tr> </table> <p>ae Max = 0,3mm</p>				ap	ae	≤1,5D	≤0,03D
ap	ae																					
≤1,5D	≤0,1D																					
ap	ae																					
≤1,5D	≤0,05D																					
ap	ae																					
≤1,5D	≤0,03D																					
<ol style="list-style-type: none"> <li>Use a rigid and precise machine and holder.</li> <li>When chattering occurs, reduce the speed and feed simultaneously.</li> <li>Use an air blow or a suitable cutting fluid with high smoke retardant properties.</li> </ol>																						

## AE-MSS-H

Square Type

High-Speed Side Milling

	ToolSteel • Hardened Steel • Prehardened Steel SKD11 • SKD61 • NAK80		Hardened Steel															
			~ 55HRC		~ 62HRC		~ 66HRC		~ 70HRC									
Vc (m/min)	290 ~ 310		240 ~ 260		150 ~ 170		130 ~ 150		90 ~ 110									
DC X LU	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)								
3 X 9	31.850	3.440	26.540	2.870	16.990	1.530	14.860	1.190	10.620	720								
4 X 12	23.890	3.440	19.900	2.870	12.740	1.530	11.150	1.190	7.960	720								
5 X 15	19.110	3.440	15.920	2.870	10.190	1.530	8.920	1.190	6.370	720								
6 X 18	15.920	5.160	13.270	4.300	8.490	2.290	7.430	1.780	5.310	1.080								
8 X 24	11.940	5.160	9.950	4.300	6.370	2.290	5.570	1.770	3.980	1.080								
10 X 30	9.550	5.160	7.960	4.300	5.100	2.300	4.460	1.770	3.180	1.080								
12 X 36	7.960	5.160	6.630	4.300	4.250	2.300	3.720	1.770	2.650	1.080								
Depth of cut	 <table border="1"> <tr><th>ap</th><th>ae</th></tr> <tr><td>≤1,5D</td><td>≤0,02D</td></tr> </table> <p>ae Max = 0,2mm</p>		ap	ae	≤1,5D	≤0,02D	<table border="1"> <tr><th>ap</th><th>ae</th></tr> <tr><td>≤1,5D</td><td>≤0,01D</td></tr> </table> <p>ae Max = 0,01mm</p>				ap	ae	≤1,5D	≤0,01D				
ap	ae																	
≤1,5D	≤0,02D																	
ap	ae																	
≤1,5D	≤0,01D																	
<ol style="list-style-type: none"> <li>Tools can cause sparks. Do not use flammable fluids.</li> <li>Use an air blow or a suitable cutting fluid with high smoke retardant properties.</li> </ol> <p>Caution: Sparks generated during operation or heat caused by tool breakage can cause fire. Be sure to use all proper fire - prevention measures. The conditions are for high speed / high precision machining centers.</p>																		




# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-MS-H

Square Type / Radius Type

Side Milling

 ToolSteel • Hardened Steel • Prehardened Steel SKD11 • SKD61 • NAK80	Hardened Steel									
	~ 55HRC		~ 62HRC		~ 66HRC		~ 70HRC			
Vc (m/min)	110 ~ 130		80 ~ 100		60 ~ 80		50 ~ 70		40 ~ 60	
Mil.Dia (mm)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	38.220	1.530	28.660	1.150	22.290	620	19.110	460	15.920	330
1,5	25.480	1.530	19.110	1.150	14.860	620	12.740	460	10.620	330
2	19.110	1.530	14.330	1.150	11.150	620	9.550	460	7.960	330
2,5	15.290	1.530	11.460	1.150	8.920	620	7.640	460	6.370	330
3	12.740	1.530	9.550	1.150	7.430	620	6.370	460	5.310	340
3,5	10.910	1.220	8.190	890	6.370	540	5.460	400	4.550	250
4	9.550	1.530	7.170	1.150	5.570	620	4.780	460	3.980	340
4,5	8.490	1.220	6.370	890	4.950	530	4.240	400	3.540	250
5	7.640	1.530	5.730	1.150	4.460	620	3.820	460	3.180	360
5,5	6.940	1.220	5.210	890	4.050	530	3.470	400	2.890	250
6	6.370	2.290	4.780	1.720	3.720	940	3.180	690	2.650	510
8	4.780	2.290	3.580	1.720	2.790	940	2.390	690	1.990	510
10	3.820	2.290	2.870	1.720	2.230	940	1.910	690	1.590	510
12	3.180	2.290	2.390	1.720	1.860	950	1.590	690	1.330	510
16	2.390	1.840	1.790	1.340	1.390	800	1.190	590	990	380
20	1.910	1.830	1.430	1.340	1.110	800	950	590	800	380


Depth of cut	ap		ae		ap		ae		ap		ae	
	1D	0,02D	1D	0,05D	1,5D	0,03D	1,5D	0,03D	1D	0,02D	1D	0,02D
	ae Max = 1mm				ae Max = 1mm				ae Max = 0,5mm			
	ae Max = 1mm				ae Max = 0,5mm				ae Max = 0,5mm			

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.

## AE-MS-H

Square Type / Radius Type

High-Speed Side Milling

 ToolSteel • Hardened Steel • Prehardened Steel SKD11 • SKD61 • NAK80	Hardened Steel									
	~ 55HRC		~ 62HRC		~ 66HRC		~ 70HRC			
Vc (m/min)	290 ~ 310		240 ~ 260		150 ~ 170		130 ~ 150		90 ~ 110	
Mil.Dia (mm)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	50.000	2.000	50.000	2.000	50.000	1.600	44.590	1.250	31.850	700
1,5	50.000	3.000	50.000	3.000	33.970	1.630	29.720	1.250	21.230	760
2	47.770	3.820	39.810	3.180	25.480	1.630	22.290	1.250	15.920	800
2,5	38.220	3.820	31.850	3.190	20.380	1.630	17.830	1.250	12.740	800
3	31.850	3.820	26.540	3.180	16.990	1.630	14.860	1.250	10.620	810
3,5	27.280	3.440	22.740	2.870	14.550	1.530	12.730	1.180	9.090	730
4	23.890	3.820	19.900	3.180	12.740	1.630	11.150	1.250	7.960	810
4,5	21.220	3.440	17.680	2.860	11.320	1.530	9.900	1.180	7.070	730
5	19.110	3.820	15.920	3.180	10.190	1.630	8.920	1.250	6.370	810
5,5	17.360	3.440	14.470	2.870	9.260	1.530	8.100	1.180	5.790	730
6	15.920	5.730	13.270	4.780	8.490	2.450	7.430	1.870	5.310	1.210
8	11.940	5.730	9.950	4.780	6.370	2.450	5.570	1.870	3.980	1.210
10	9.550	5.730	7.960	4.780	5.100	2.450	4.460	1.870	3.180	1.210
12	7.960	5.730	6.630	4.770	4.250	2.450	3.720	1.900	2.650	1.210
16	5.970	5.160	4.970	4.290	3.180	2.290	2.790	1.770	1.990	1.090
20	4.770	5.150	3.980	4.300	2.550	2.300	2.230	1.770	1.590	1.090

Depth of cut	ap		ae		ap		ae		ap		ae	
	1D	0,05D	1D	0,03D	1D	0,02D	1D	0,02D	1D	0,01D	1D	0,01D
	ae Max = 0,5mm				ae Max = 0,5mm				ae Max = 0,2mm			
	ae Max = 0,5mm				ae Max = 0,2mm				ae Max = 0,2mm			

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.

Caution: Sparks generated during operation or heat caused by tool breakage can cause fire. Be sure to use all proper fire - prevention measures.  
 The conditions are for high speed / high precision machining centers.

Milling | Endmills

Cutting conditions


# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-ML-H

Square Type

Side Milling

	Hardened Steel - Prehardened Steel SCM • SKD61 • NAK80		Hardened Steel															
			~ 55HRC		~ 62HRC		~ 66HRC		~ 70HRC									
Vc (m/min)	60		45		30		20		15									
Mil.Dia (mm)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)								
3	6.370	650	4.780	370	3.180	170	2.120	100	1.590	60								
4	4.780	650	3.580	370	2.390	170	1.590	100	1.190	60								
5	3.820	650	2.870	370	1.910	170	1.270	100	960	60								
6	3.180	970	2.390	560	1.590	260	1.060	150	800	90								
8	2.390	970	1.790	560	1.190	260	800	150	600	90								
10	1.910	970	1.430	560	960	260	640	150	480	90								
12	1.590	970	1.190	560	800	260	530	150	400	90								
Depth of cut	<table border="1"> <tr> <th>ap</th> <th>ae</th> </tr> <tr> <td>3D</td> <td>0,01D</td> </tr> </table> <p>ae Max = 0,2mm</p>				ap	ae	3D	0,01D	<table border="1"> <tr> <th>ap</th> <th>ae</th> </tr> <tr> <td>3D</td> <td>0,005D</td> </tr> </table> <p>ae Max = 0,1mm</p>						ap	ae	3D	0,005D
ap	ae																	
3D	0,01D																	
ap	ae																	
3D	0,005D																	
<ol style="list-style-type: none"> <li>1. Use a rigid and precise machine and holder.</li> <li>2. When chattering occurs, reduce the speed and feed simultaneously.</li> <li>3. Use an air blow or a suitable cutting fluid with high smoke retardant properties.</li> </ol>																		

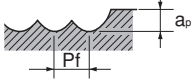


# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

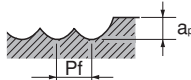
## AE-BD-H

**Finishing** The machining path is on condition of contouring line operation.

R	ToolSteel • Hardened Steel • Prehardened Steel SKD11 • SKD61 • NAK80		Hardened Steel																			
	~45HRC		~55HRC		~62HRC		~66HRC		~70HRC													
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)												
R0,5	38.400	2.350	38.400	2.350	38.400	2.000	38.400	1.600	38.400	1.450												
R0,75	38.400	3.050	38.400	3.050	38.400	2.500	31.800	1.900	25.200	1.450												
R1	38.400	3.600	38.400	3.550	28.800	2.200	24.000	1.750	19.200	1.250												
R1,5	31.800	4.000	25.200	3.200	19.200	2.000	16.200	1.600	12.600	1.200												
R2	24.000	3.650	19.200	2.950	14.400	1.900	11.900	1.500	9.500	1.150												
R2,5	19.200	3.500	15.000	2.650	11.500	1.700	9.500	1.350	7.600	1.000												
R3	16.200	3.350	12.600	2.300	9.500	1.550	8.000	1.250	6.400	955												
R4	11.900	2.850	9.500	2.050	7.100	1.350	5.900	1.050	4.800	830												
R5	9.500	2.550	7.600	1.800	5.800	1.150	4.800	875	3.800	700												
R6	8.000	2.400	6.400	1.650	4.800	955	4.000	795	3.200	635												
Depth of cut			<table border="1"> <tr><th>ap</th><th>Pf</th></tr> <tr><td>0,05D</td><td>0,1D</td></tr> </table>		ap	Pf	0,05D	0,1D	<table border="1"> <tr><th>ap</th><th>Pf</th></tr> <tr><td>0,03D</td><td>0,1D</td></tr> </table>		ap	Pf	0,03D	0,1D	<table border="1"> <tr><th>ap</th><th>Pf</th></tr> <tr><td>0,02D</td><td>0,05D</td></tr> </table>		ap	Pf	0,02D	0,05D		
ap	Pf																					
0,05D	0,1D																					
ap	Pf																					
0,03D	0,1D																					
ap	Pf																					
0,02D	0,05D																					

## AE-BD-H

**High speed Finishing** The machining path is on condition of contouring line operation.

R	ToolSteel • Hardened Steel • Prehardened Steel SKD11 • SKD61 • NAK80		Hardened Steel															
	~45HRC		~55HRC		~62HRC		~66HRC		~70HRC									
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)								
R0,5	50.000	3.700	50.000	3.700	50.000	3.100	50.000	2.600	50.000	2.400								
R0,75	50.000	4.800	50.000	4.800	50.000	3.900	50.000	3.050	38.400	2.300								
R1	50.000	5.600	50.000	5.350	48.000	3.650	38.400	2.800	28.800	2.100								
R1,5	49.800	6.200	38.400	4.800	31.800	3.350	25.200	2.550	19.200	1.900								
R2	37.200	5.700	28.800	4.400	24.000	3.200	19.200	2.400	14.400	1.800								
R2,5	30.000	5.450	22.800	4.000	19.200	2.850	15.600	2.150	11.500	1.600								
R3	24.600	5.200	19.200	3.450	16.200	2.550	12.600	2.050	9.500	1.550								
R4	18.600	4.450	14.400	3.050	11.900	2.250	9.500	1.800	7.100	1.350								
R5	15.000	3.950	11.500	2.650	9.500	1.900	7.600	1.550	5.800	1.150								
R6	12.600	3.700	9.500	2.500	8.000	1.600	6.400	1.350	4.800	995								
Depth of cut			<table border="1"> <tr><th>ap</th><th>Pf</th></tr> <tr><td>0,02D</td><td>0,05D</td></tr> </table>		ap	Pf	0,02D	0,05D			<table border="1"> <tr><th>ap</th><th>Pf</th></tr> <tr><td>0,01D</td><td>0,05D</td></tr> </table>		ap	Pf	0,01D	0,05D		
ap	Pf																	
0,02D	0,05D																	
ap	Pf																	
0,01D	0,05D																	

1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
3. These milling conditions are for an end mill where the tool extension length is 4 times the diameter of the end mill. When length of the tool extension from the machine is long, reduce the speed and feed and milling depth.
4. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machining shape, cutting amount, rigidity of the machine or work holding condition, etc., please adjust the speed, feed and the depth of cut.
5. When the radius of curvature is less than 1.5 times the tool diameter, please reduce the speed to 50-80%, the feed rate to 50-80%, and the pick feed to 20-60% of the above shown cutting conditions.
6. When the machining incline angle (β) is more than 15°, please reduce the speed to 40-60%, the feed 30-50%, and the axial cutting depth to 30-60% of the above shown cutting conditions.
7. If the cutting depth is small, it is possible to further increase the speed and feed.



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-BM-H

**Roughing** The machining path is on condition of contouring line operation.

R	ToolSteel • Hardened Steel • Prehardened Steel SKD11 • SKD61 • NAK80		Hardened Steel							
	~45HRC		~55HRC		~62HRC		~66HRC		~70HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
R1	20.700	3.310	18.300	1.830	15.900	1.590	14.300	1.140	9.600	770
R1,5	13.800	2.760	12.200	1.710	10.600	1.480	9.600	1.150	6.400	770
R2	10.400	2.500	9.200	1.660	8.000	1.440	7.200	1.150	4.800	770
R2,5	8.300	2.660	7.300	1.900	6.400	1.660	5.700	1.370	3.800	910
R3	6.900	2.760	6.100	1.950	5.300	1.700	4.800	1.340	3.200	900
R4	5.200	2.500	4.600	1.840	4.000	1.600	3.600	1.300	2.400	860
R5	4.500	2.340	4.000	1.760	3.500	1.540	3.200	1.280	2.200	850
R6	4.000	2.240	3.600	1.730	3.200	1.540	2.900	1.160	2.100	840

ap	Pf
RE<R3	0,1D
R3≤RE	0,15D

ap	Pf
RE<R3	0,07D
R3≤RE	0,12D

ap	Pf
0,05D	0,15D

1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
3. These milling conditions are for an end mill where the tool extension length is 4 times the diameter of the end mill. When length of the tool extension from the machine is long, reduce the speed and feed and milling depth.
4. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machining shape, cutting amount, rigidity of the machine or work holding condition, etc., please adjust the speed, feed and the depth of cut.
5. When the radius of curvature is less than 1.5 times the tool diameter, please reduce the speed to 50-80%, the feed rate to 50-80%, and the pick feed to 20-60% of the above shown cutting conditions.
6. When the machining incline angle (β) is more than 15°, please reduce the speed to 40-60%, the feed 30-50%, and the axial cutting depth to 30-60% of the above shown cutting conditions.
7. If the cutting depth is small, it is possible to further increase the speed and feed.

## AE-BM-H

**Finishing** The machining path is on condition of contouring line operation.

R	ToolSteel • Hardened Steel • Prehardened Steel SKD11 • SKD61 • NAK80		Hardened Steel							
	~45HRC		~55HRC		~62HRC		~66HRC		~70HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
R1	27.100	4.340	24.700	2.470	22.300	1.780	18.300	1.460	13.500	1.080
R1,5	18.000	3.600	16.500	2.310	14.900	1.780	12.200	1.460	9.000	1.080
R2	13.500	3.240	12.300	2.210	11.100	1.780	9.200	1.470	6.800	1.090
R2,5	10.800	3.460	9.900	2.570	8.900	2.140	7.300	1.750	5.400	1.300
R3	9.000	3.600	8.200	2.620	7.400	2.070	6.100	1.710	4.500	1.260
R4	6.800	3.260	6.200	2.480	5.600	1.790	4.600	1.470	3.400	1.090
R5	5.700	2.960	5.300	2.330	4.800	1.730	4.000	1.440	3.000	1.080
R6	5.000	2.800	4.600	2.210	4.200	1.680	3.500	1.400	2.800	1.120

ap	Pf
0,02D	0,05D


# CUTTING CONDITIONS

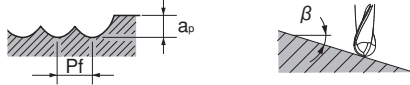
Milling | Endmills | Cutting conditions

## AE-BM-H

**High Speed Roughing** The machining path is on condition of contouring line operation.

R	ToolSteel • Hardened Steel • Prehardened Steel SKD11 • SKD61 • NAK80		Hardened Steel							
	~45HRC		~55HRC		~62HRC		~66HRC		~70HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
R1	37.300	5.970	33.000	3.300	28.700	2.870	25.800	2.060	17.200	1.380
R1,5	24.800	4.960	22.000	3.080	19.100	2.670	17.200	2.060	11.500	1.380
R2	20.700	4.970	18.300	3.290	15.900	2.860	14.300	2.290	9.600	1.540
R2,5	16.600	5.310	14.600	3.800	12.700	3.300	11.500	2.760	7.600	1.820
R3	13.800	5.520	12.200	3.900	10.600	3.390	9.600	2.690	6.400	1.790
R4	10.400	4.990	9.200	3.680	8.000	3.200	7.200	2.590	4.800	1.730
R5	8.900	4.630	8.000	3.520	7.000	3.080	6.400	2.560	4.500	1.800
R6	8.000	4.480	7.200	3.460	6.400	3.070	5.800	2.320	4.200	1.680

Depth of cut	ap Pf		ap Pf		ap Pf		ap Pf		ap Pf	
	0,1D	0,2D	0,08D	0,2D					0,05D	0,1D



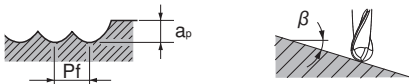
1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
3. These milling conditions are for an end mill where the tool extension length is 4 times the diameter of the end mill. When length of the tool extension from the machine is long, reduce the speed and feed and milling depth.
4. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machining shape, cutting amount, rigidity of the machine or work holding condition, etc., please adjust the speed, feed and the depth of cut.
5. When the radius of curvature is less than 1.5 times the tool diameter, please reduce the speed to 50-80%, the feed rate to 50-80%, and the pick feed to 20-60% of the above shown cutting conditions.
6. When the machining incline angle (β) is more than 15°, please reduce the speed to 40-60%, the feed 30-50%, and the axial cutting depth to 30-60% of the above shown cutting conditions.
7. If the cutting depth is small, it is possible to further increase the speed and feed.

## AE-BM-H

**High Speed Finishing** The machining path is on condition of contouring line operation.

R	ToolSteel • Hardened Steel • Prehardened Steel SKD11 • SKD61 • NAK80		Hardened Steel							
	~45HRC		~55HRC		~62HRC		~66HRC		~70HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
R1	40.610	6.500	37.020	3.700	33.440	2.680	27.470	2.200	20.300	1.620
R1,5	27.070	5.410	24.680	3.460	22.290	2.670	18.310	2.200	13.540	1.620
R2	24.360	5.850	22.210	4.000	20.060	3.210	16.480	2.640	12.180	1.950
R2,5	19.490	6.240	17.770	4.620	16.050	3.850	13.180	3.160	9.750	2.340
R3	16.240	6.500	14.810	4.740	13.380	3.750	10.990	3.080	8.120	2.270
R4	12.180	5.850	11.110	4.440	10.030	3.210	8.240	2.640	6.090	1.950
R5	10.320	5.370	9.460	4.160	8.600	3.100	7.170	2.580	5.450	1.960
R6	9.080	5.080	8.360	4.010	7.640	3.060	6.210	2.480	5.020	2.010

Depth of cut	ap Pf		ap Pf		ap Pf	
	0,02D	0,05D				



1. Use a rigid and precise machine and holder.
2. We suggest using air blow or MQL (mist).
3. These milling conditions are for an end mill where the tool extension length is 4 times the diameter of the end mill. When length of the tool extension from the machine is long, reduce the speed and feed and milling depth.
4. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machining shape, cutting amount, rigidity of the machine or work holding condition, etc., please adjust the speed, feed and the depth of cut.
5. When the radius of curvature is less than 1.5 times the tool diameter, please reduce the speed to 50-80%, the feed rate to 50-80%, and the pick feed to 20-60% of the above shown cutting conditions.
6. When the machining incline angle (β) is more than 15°, please reduce the speed to 40-60%, the feed 30-50%, and the axial cutting depth to 30-60% of the above shown cutting conditions.
7. If the cutting depth is small, it is possible to further increase the speed and feed.

Milling | Endmills

Cutting conditions







# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-LNBD-H

The machining path is on condition of contouring line operation.

RE	LU	ToolSteel • Hardened Steel • Prehardened Steel SKD11 • SKD61 • NAK80				Hardened Steel																										
		~45HRC				~55HRC				~62HRC				~66HRC				~70HRC														
		(mm)	S (min <sup>-1</sup> )	F (mm/min)	ap Pf	S (min <sup>-1</sup> )	F (mm/min)	ap Pf	S (min <sup>-1</sup> )	F (mm/min)	ap Pf	S (min <sup>-1</sup> )	F (mm/min)	ap Pf	S (min <sup>-1</sup> )	F (mm/min)	ap Pf	S (min <sup>-1</sup> )	F (mm/min)	ap Pf												
R3	10	26.400	5.600	0,3 0,5	21.600	3.800	0,3 0,5	18.600	2.800	0,1 0,2	16.800	2.380	0,1 0,2	13.400	1.790	0,1 0,20	24.000	5.200	0,3 0,5	19.200	3.400	0,3 0,5	16.200	2.500	0,1 0,2	14.600	2.130	0,1 0,2	11.700	1.600	0,1 0,20	
R3	12	22.200	4.800	0,3 0,5	17.400	3.250	0,3 0,5	14.400	1.850	0,1 0,2	13.000	1.570	0,1 0,2	10.400	1.180	0,1 0,20	20	19.200	3.900	0,3 0,5	14.400	3.000	0,3 0,5	9.600	1.600	0,1 0,2	8.700	1.360	0,1 0,2	7.000	1.020	0,1 0,20
R3	15	19.200	3.900	0,3 0,5	12.000	2.500	0,3 0,5	7.200	1.200	0,1 0,2	6.500	1.020	0,1 0,2	5.200	770	0,1 0,20	25	14.400	3.000	0,3 0,5	12.000	2.500	0,3 0,5	7.200	1.200	0,1 0,2	6.500	1.020	0,1 0,2	5.200	770	0,1 0,20
R3	20	12.000	2.400	0,3 0,5	10.800	2.100	0,3 0,5	4.800	740	0,1 0,2	4.400	630	0,1 0,2	3.500	470	0,1 0,20	30	10.800	2.100	0,2 0,4	10.800	2.000	0,2 0,4	4.200	620	0,1 0,2	3.800	530	0,1 0,2	3.100	400	0,1 0,20
R3	25	10.800	1.900	0,2 0,3	10.800	1.800	0,2 0,3	3.600	480	0,1 0,2	3.300	410	0,1 0,2	2.600	310	0,1 0,20	35	10.800	1.900	0,2 0,3	10.800	1.800	0,2 0,3	3.600	480	0,1 0,2	3.300	410	0,1 0,2	2.600	310	0,1 0,20
R3	30	9.600	1.700	0,2 0,3	9.600	1.600	0,2 0,3	3.400	440	0,1 0,2	3.100	370	0,1 0,2	2.500	280	0,1 0,20	40	9.600	1.700	0,2 0,3	9.600	1.600	0,2 0,3	3.400	440	0,1 0,2	3.100	370	0,1 0,2	2.500	280	0,1 0,20
R3	35	8.400	1.500	0,2 0,3	8.400	1.400	0,2 0,3	3.000	400	0,1 0,2	2.700	340	0,1 0,2	2.200	260	0,1 0,20	45	8.400	1.500	0,2 0,3	8.400	1.400	0,2 0,3	3.000	400	0,1 0,2	2.700	340	0,1 0,2	2.200	260	0,1 0,20
R3	40	7.200	1.250	0,2 0,3	7.200	1.150	0,2 0,3	2.800	350	0,1 0,2	2.500	300	0,1 0,2	2.000	230	0,1 0,20	50	7.200	1.250	0,2 0,3	7.200	1.150	0,2 0,3	2.800	350	0,1 0,2	2.500	300	0,1 0,2	2.000	230	0,1 0,20
<ol style="list-style-type: none"> <li>1. Use a rigid and precise machine and holder.</li> <li>2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / oil mist coolant) or air blow is recommended.</li> <li>3. Use an air blow or a suitable cutting fluid with high smoke retardant properties.</li> <li>4. The above cutting conditions are for contouring operation with low-load and stable condition. Refer to the table above to set the milling conditions in accordance with the actual situation.</li> <li>5. Please adjust conditions based on machining accuracy, machining shape and machining path.</li> <li>6. When using a tool with a diameter of <math>\phi 0.5</math> (R0.25) or less, or L/D (aspect ratio) is greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.</li> <li>7. When RPM are insufficient, please reduce the RPM and feed rates at same ratio as listed above.</li> </ol>																																

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## VU-TBR

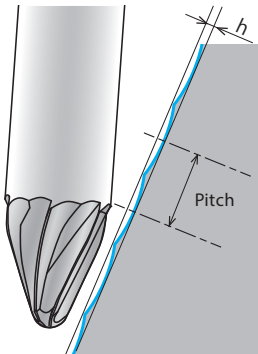
Using peripheral edge R (RE2)

Vc	Carbon Steel • Alloy Steel S55C • SCM • SKT				Hardened Steel • Prehardened Steel SKT • SKD • NAK55 • HPM1				Hardened Steel • Prehardened Steel			
	~30HRC				30~45HRC				45~55HRC			
∅	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)
R0,5 × R150 × 20°	10.700	3.400	Based on Cusp height (see chart below)	0,3	8.800	2.500	Based on Cusp height (see chart below)	0,3	6.800	1.600	Based on Cusp height (see chart below)	0,3
R1 × R150 × 20°	7.300	2.300		0,3	6.000	1.700		0,3	4.700	1.100		
R1,5 × R300 × 20°	5.600	1.800		0,3	4.600	1.300		0,3	3.600	900		
R2 × R300 × 20°	4.500	2.200		0,3	3.700	1.600		0,3	2.900	1.000		
R2,5 × R500 × 20°	3.400	1.600		0,3	2.800	1.200		0,3	2.200	800		
R3 × R500 × 20°	3.300	1.600	0,3	2.700	1.100	0,3	2.100	800				

1. Use a rigid and precise machine and holder.
2. 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.
3. "Using tip R (RE1)" is the guide to use the tip R. Please adjust the rotation speed, feed rate and cutting pitch based on the cutting shape, machine rigidity, workpiece and holding conditions.
4. When chattering, vibration or abnormal cutting noise occurs, please adjust the rotation speed, feed rate and cutting pitch.
5. In order to change the rotation speed, both the rotation speed and the feed rate should be changed at the same ratio.

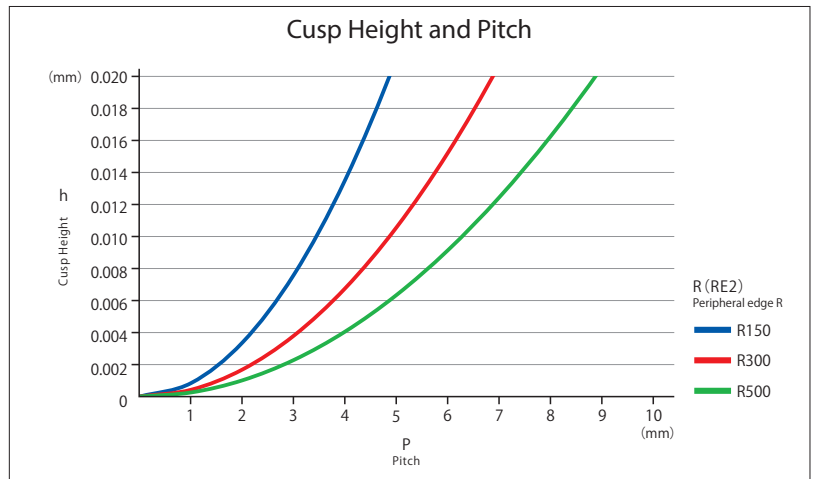
### Theoretical Cusp Height

(VU-TBR) Taper Barrel Type



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

h: Cusp height P: Pitch RE2: peripheral edge R



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

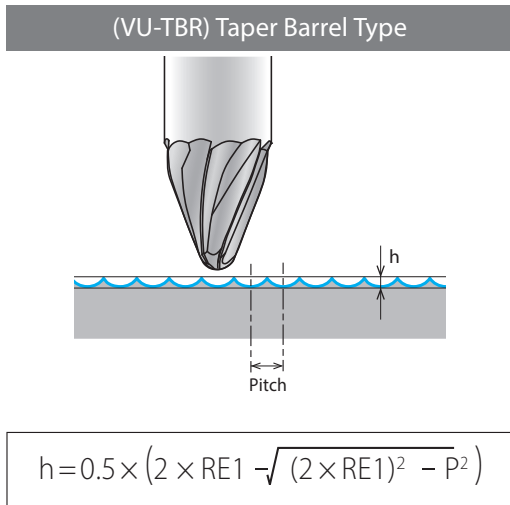
## VU-TBR

Using Tip R (RE1)

Vc	Carbon Steel • Alloy Steel S55C • SCM • SKT				Hardened Steel • Prehardened Steel SKT • SKD • NAK55 • HPM1				Hardened Steel • Prehardened Steel			
	~30HRC				30~45HRC				45~55HRC			
∅	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)
R0,5 × R150 × 20°	19.500	6.200	Based on Cusp height (see chart below)	~0,1	15.600	4.400	Based on Cusp height (see chart below)	~0,1	13.600	3.300	Based on Cusp height (see chart below)	~0,1
R1 × R150 × 20°	13.000	4.300		~0,2	10.700	3.000		~0,2	9.300	2.200		~0,2
R1,5 × R300 × 20°	10.300	3.300		~0,25	8.200	2.300		~0,25	7.200	1.700		~0,25
R2 × R300 × 20°	8.300	4.000		~0,3	6.600	2.800		~0,3	5.800	2.100		~0,3
R2,5 × R500 × 20°	6.300	3.000		~0,3	5.000	2.100		~0,3	4.400	1.600		~0,3
R3 × R500 × 20°	6.000	2.900		~0,3	4.800	2.000		~0,3	4.200	1.500		~0,3

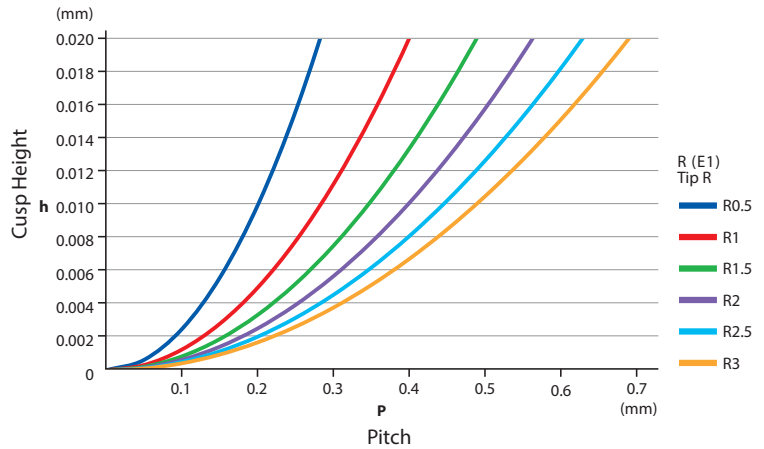
1. Use a rigid and precise machine and holder.
2. Use a coolant with low air-blow or fuming property according to the work material. MQL (oil mist coolant) is recommended for cutting hardened steels.
3. "Using tip R (RE1)" is the guide to use the tip R. Please adjust the rotation speed, feed rate and cutting pitch based on the cutting shape, machine rigidity, workpiece and holding conditions.
4. When chattering, vibration or abnormal cutting noise occurs, please adjust the rotation speed, feed rate and cutting pitch.
5. In order to change the rotation speed, both the rotation speed and the feed rate should be changed at the same ratio.

### Theoretical Cusp Height



h: Cusp height  
P: Pitch  
RE1: peripheral edge R

### Cusp Height and Pitch





# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## VU-EGG-(H)

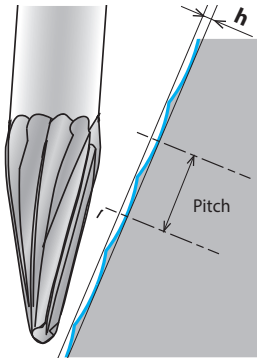
Using peripheral edge R (RE2)

Vc	Carbon Steel • Alloy Steel S55C • SCM • SKT				Hardened Steel • Prehardened Steel SKT • SKD • NAK55 • HPM1				Hardened Steel • Prehardened Steel				Hardened Steel • Prehardened Steel Only VU-EGG-H only, not recommendable for VU-EGG			
	~30HRC				30~45HRC				45~55HRC				55~62HRC			
∅	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)
R1,5XR50	7.300	1.400	Based on Cusp height (see chart below)	0,3	6.000	1.100	Based on Cusp height (see chart below)	0,3	4.700	700	Based on Cusp height (see chart below)	0,3	4.000	500	Based on Cusp height (see chart below)	0,3

1. Use a rigid and precise machine and holder.
2. 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.
3. "Using tip R (RE1)" is the guide to use the tip R. Please adjust the rotation speed, feed rate and cutting pitch based on the cutting shape, machine rigidity, workpiece and holding conditions.
4. When chattering, vibration or abnormal cutting noise occurs, please adjust the rotation speed, feed rate and cutting pitch.
5. In order to change the rotation speed, both the rotation speed and the feed rate should be changed at the same ratio.

### Theoretical Cusp Height

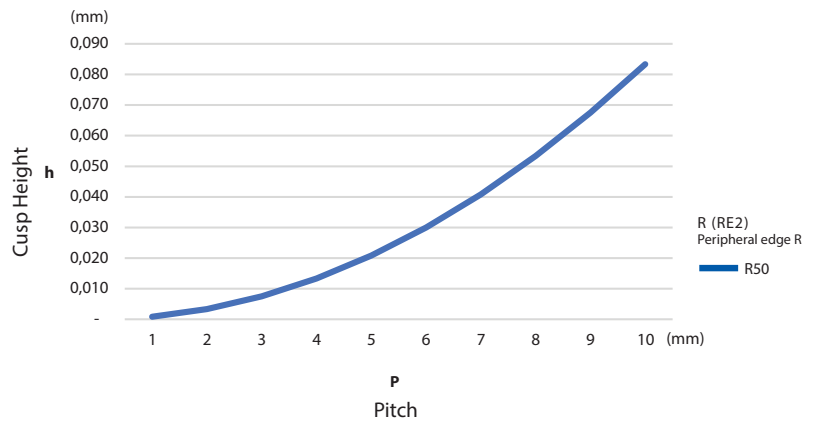
(VU-EGG) Oval shape end-mill



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

h: Cusp height  
P: Pitch  
RE2: peripheral edge R

Cusp Height and Pitch



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

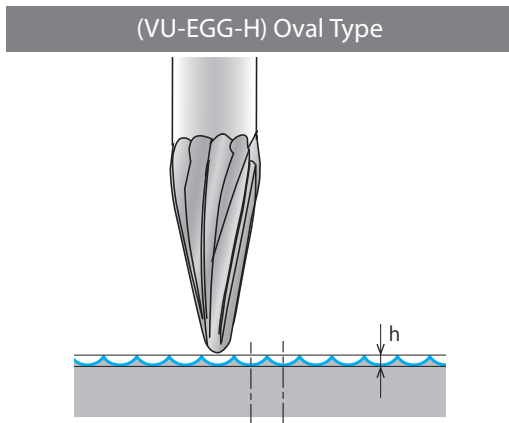
## VU-EGG-(H)

Using Tip R (RE1)

Vc	Carbon Steel • Alloy Steel S55C • SCM • SKT				Hardened Steel • Prehardened Steel SKT • SKD • NAK55 • HPM1				Hardened Steel • Prehardened Steel				Hardened Steel • Prehardened Steel Only VU-EGG-H only, not recommendable for VU-EGG			
	~30HRC				30~45HRC				45~55HRC				55~62HRC			
∅	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)	S (min <sup>-1</sup> )	F (mm/min)	Pitch	Depth of Cut (mm)
R1,5XR50	10.300	1.900	Based on Cusp height (see chart below)	~ 0,25	8.200	1.300	Based on Cusp height (see chart below)	~ 0,25	7.200	1.000	Based on Cusp height (see chart below)	~ 0,25	6.100	610	Based on Cusp height (see chart below)	~ 0,25

1. Use a rigid and precise machine and holder.
2. 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.
3. "Using tip R (RE1)" is the guide to use the tip R. Please adjust the rotation speed, feed rate and cutting pitch based on the cutting shape, machine rigidity, workpiece and holding conditions.
4. When chattering, vibration or abnormal cutting noise occurs, please adjust the rotation speed, feed rate and cutting pitch.
5. In order to change the rotation speed, both the rotation speed and the feed rate should be changed at the same ratio.

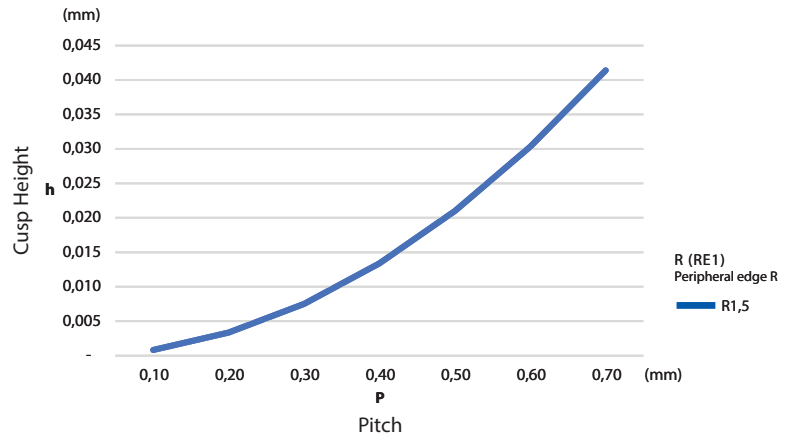
### Theoretical Cusp Height



$$h = 0.5 \times (2 \times RE1 - \sqrt{(2 \times RE1)^2 - P^2})$$

h: Cusp height  
P: Pitch  
RE1: peripheral edge R

### Cusp Height and Pitch



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## WXS-CRE / WXS-HS-CRE

Regular milling

Ø	GG		30~38 HRC NAK55 · HPM1 · SKT · SKD		38~45 HRC SUS304 · SKD · HPM50 NAK80		45~55 HRC		55~60 HRC		60~ HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
2 x R0,5	16.000	5.250	12.500	3.800	11.000	3.350	7.950	2.150	4.750	860	4.270	615
3 x R0,75	10.500	6.250	8.500	4.500	7.450	3.900	5.300	2.600	3.200	995	2.850	715
4 x R1	7.950	6.600	6.350	4.800	5.550	4.200	4.000	2.750	2.400	1.050	2.150	755
6 x R1,5	5.300	7.000	4.250	5.100	3.700	4.450	2.650	2.850	1.600	1.150	1.400	825
8 x R2	4.000	7.000	3.200	5.100	2.800	4.450	2.000	2.850	1.200	1.150	1.050	825
10 x R2	3.200	7.000	2.550	5.100	2.250	4.450	1.600	2.850	955	1.150	860	825
12 x R2	2.650	7.000	2.100	5.100	1.850	4.450	1.350	2.850	795	1.150	715	825

High speed side milling

Ø	GG		30~38 HRC NAK55 · HPM1 · SKT · SKD		38~45 HRC SUS304 · SKD · HPM50 NAK80		45~55 HRC		55~60 HRC		60~ HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
2 x R0,5	31.850	10.500	32.000	9.550	24.000	7.150	24000	6.450	16.000	2.850	14.400	2.050
3 x R0,75	21.000	12.500	21.000	12.000	16.000	8.400	16.000	7.850	10.500	3.300	9.450	2.370
4 x R1	16.000	13.000	16.000	12.000	12.000	9.000	12.000	8.200	7.950	3.550	7.150	2.550
6 x R1,5	10.600	14.000	10.600	12.700	7.950	9.550	7.950	8.600	5.300	3.800	5.300	3.800
8 x R2	7.950	14.000	7.950	12.700	5.950	9.550	5.950	8.600	4.000	3.800	4.000	3.800
10 x R2	6.350	14.000	6.350	12.700	4.750	9.550	4.750	8.600	3.200	3.800	3.200	3.800
12 x R2	5.300	14.000	5.300	12.700	4.000	9.550	4.000	8.600	2.650	3.800	2.650	3.800

Max cutting depth

ap	ae
0,1xR	0,3D

	ap	ae
R<2	0,1xR	0,3D
2<R	0,2mm	0,3D

	ap	ae
R<2	0,05xR	0,3D
2<R	0,1mm	0,3D

1. Use a rigid and precise machine and holder.
2. These milling conditions are based on milling with circular interpolation at corners. For milling without circular interpolation such as right angle corners, reduce the speed to 50-70% and the cutting depth to 50-80% of the above conditions.
3. We suggest using air blow or MQL (mist).
4. Please adjust the speed, feed and cutting depth according to actual cutting conditions.
5. When WX(S)-CRE enters in Z axis, reduce the feed speed to 30-60% of the above conditions with machining incline angle  $\beta < 2^\circ$
6. These milling conditions are for a tool extension length: less than 4 x D. For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.

## HYP-HS-CRE

High speed side milling

Ø	GG		30~38 HRC SKT · SKD · NAK55 · HPM1		38~45 HRC - SUS SUS30 · SKD · NAK80 · HPM50		45~55 HRC		55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6 X R 1,5	5.300	6.300	4.250	4.600	3.700	4.000	2.650	2.600	1.600	1.050
8 X R 2	4.000	6.300	3.200	4.600	2.800	4.000	2.000	2.600	1.200	1.050
10 X R 2	3.200	6.300	2.550	4.600	2.250	4.000	1.600	2.600	955	1.050
12 X R 3	2.650	6.300	2.100	4.600	1.850	4.000	1.350	2.600	795	1.050

Max cutting depth

ap	ae
0,1xR	0,3D

R	ap	ae
≤2	0,1xR	0,3D
>2	0,2mm	0,3D

R	ap	ae
≤2	0,05xR	0,3D
>2	0,1mm	0,3D

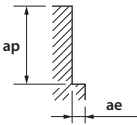
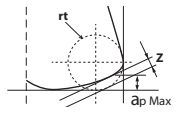


# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

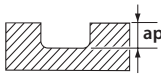
## HFC-TI

Titanium Alloy (Ti-6Al-4V)

Contour milling										
Vc	50 ~ 100 m/min									
Ø	S (min <sup>-1</sup> )	F (mm/min)	Ramping Angle E		rt	Z				
16	1.490	4.500	2°		0,86	0,46				
20	1.190	3.600	2°		1,01	0,58				
25	850	4.860	2°		1,2	0,74				
Max cutting depth	 <table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 0,035 Dc</td> <td>0,39 Dc</td> </tr> </table>		ap	ae	≤ 0,035 Dc	0,39 Dc				
ap	ae									
≤ 0,035 Dc	0,39 Dc									

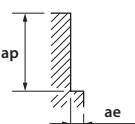
## WX-CR-PHS

High speed Slotting

Vc	C≤0,2% - GG SS400 · SS5C · FC250 ~750 N/mm <sup>2</sup>		~30 HRC SCM · SKT · SKS · SKD		30~38 HRC NAK55 · HPM1 · SKT · SK		38~45 HRC SUS304 · SKD			
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)		
	120 (m/min)		110 (m/min)		90-100 (m/min)		60-70 (m/min)			
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)		
3	12.700	1.050	10.600	935	9.550	745	6.350	460		
4	9.550	1.150	7.950	1.000	7.150	745	5.150	560		
5	7.650	1.200	7.000	1.100	6.350	865	4.150	595		
6	6.350	1.550	5.850	1.150	5.300	910	3.700	670		
8	4.750	1.450	4.400	1.300	4.000	985	2.800	690		
10	3.800	1.400	3.500	1.200	3.200	865	2.250	635		
12	3.200	1.250	2.900	1.150	2.650	815	1.850	595		
16	2.400	1.050	2.200	965	2.000	675	1.400	500		
20	1.900	840	1.750	770	1.600	635	1.100	445		
Max cutting depth	 <table border="1"> <tr> <td>ap</td> </tr> <tr> <td>0,2D</td> </tr> </table>		ap	0,2D	ap max = 3mm					
ap										
0,2D										
<ol style="list-style-type: none"> <li>Use a rigid and precise machine and holder.</li> <li>Adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.</li> <li>Please use a suitable fluid with high smoke retardant properties.</li> <li>During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.</li> </ol>										

## NEO-PHS / NEO-CR-PHS

Side milling

Ø	C≤0,2% - GG SS5C · SS400 · FC250 ~750 N/mm <sup>2</sup>		SCM - SKD SKT · SKS · SCM ~30 N/mm <sup>2</sup>		30~38 HRC NAK55 · HPM1 · SKT · SKD 30~38 N/mm <sup>2</sup>		38~45 HRC - SUS SUS304 · SKD 38~45 N/mm <sup>2</sup>		45~55 HRC - HRS Titanium alloy 45~55 N/mm <sup>2</sup>		Heat resistant alloy steel Inconel																	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)																
3	12,500	1,100	9,550	840	8,100	625	7,650	615	7,400	545	3,800	220																
4	9,750	1,200	7,550	985	6,400	680	6,050	710	5,850	630	3,000	240																
5	7,950	1,300	6,150	1,050	5,250	725	4,950	775	4,800	670	2,450	245																
6	6,750	1,600	5,250	1,200	4,450	890	4,200	835	4,050	695	2,100	250																
8	5,050	1,550	3,950	1,100	3,350	815	3,150	810	3,050	675	1,600	225																
10	4,100	1,450	3,200	1,050	2,700	725	2,550	715	2,450	635	1,250	215																
12	3,400	1,400	2,650	1,000	2,250	720	2,100	675	2,050	605	1,050	210																
16	2,550	1,200	2,000	940	1,700	635	1,600	555	1,550	505	765	210																
20	2,050	985	1,600	755	1,350	590	1,250	515	1,250	460	635	200																
Max cutting depth	 <table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 1,5 D</td> <td>≤ 0,2 D</td> </tr> </table>		ap	ae	≤ 1,5 D	≤ 0,2 D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 1,5 D</td> <td>≤ 0,2 D</td> </tr> </table>		ap	ae	≤ 1,5 D	≤ 0,2 D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 1,5 D</td> <td>≤ 0,1 D</td> </tr> </table>		ap	ae	≤ 1,5 D	≤ 0,1 D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 1,5 D</td> <td>≤ 0,05 D</td> </tr> </table>						ap	ae	≤ 1,5 D	≤ 0,05 D
ap	ae																											
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ap	ae																											
≤ 1,5 D	≤ 0,05 D																											
<ol style="list-style-type: none"> <li>Use a rigid and precise machine and holder,</li> <li>Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used</li> <li>Please use a suitable fluid with high smoke retardant properties</li> <li>During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing</li> </ol>																												

Milling | Endmills

Cutting conditions

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## NEO-PHS / NEO-CR-PHS

### Slotting

Ø	C≤0,2% - GG S55C · S5400 · FC250 ~750 N/mm <sup>2</sup>		SCM - SKD SKT · SKS · SCM ~30 N/mm <sup>2</sup>		30~38 HRC NAK55 · HPM1 · SKT · SKD 30~38 N/mm <sup>2</sup>		38~45 HRC - SUS SUS304 · SKD 38~45 N/mm <sup>2</sup>		45~55 HRC - HRS Titanium alloy 45~55 N/mm <sup>2</sup>		Heat resistant alloy steel Inconel	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	10,500	730	8,550	680	7,850	520	7,450	460	7,200	440	2,500	125
4	7,750	730	6,400	775	5,900	520	5,550	515	5,400	495	1,900	135
5	6,200	735	5,100	755	4,700	545	4,450	545	4,300	535	1,500	145
6	5,150	740	4,250	635	3,950	575	3,700	570	3,600	545	1,250	145
8	3,850	600	3,200	550	2,950	550	2,800	525	2,700	510	945	155
10	3,100	580	2,550	540	2,350	480	2,250	475	2,150	455	760	145
12	2,600	560	2,150	475	1,950	460	1,850	440	1,800	435	630	145
16	1,950	555	1,600	430	1,500	370	1,400	370	1,350	365	475	110
20	1,550	475	1,300	380	1,200	355	1,100	330	1,100	330	380	110

Max cutting depth		ap	ap	ap
		≤ 1 D	≤ 0,5 D	≤ 0,2 D

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. Please use a suitable fluid with high smoke retardant properties
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing

## NEO-EMS / NEO-CR-EMS

### Side milling

Ø	C≤0,2% - GG S55C · S5400 · FC250 ~750 N/mm <sup>2</sup>		SCM - SKD SKT · SKS · SCM ~30 N/mm <sup>2</sup>		30~38 HRC NAK55 · HPM1 · SKT · SKD 30~38 N/mm <sup>2</sup>		38~45 HRC - SUS SUS304 · SKD 38~45 N/mm <sup>2</sup>		45~55 HRC - HRS Titanium alloy 45~55 N/mm <sup>2</sup>		Heat resistant alloy steel Inconel	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	7,100	2,300	5,500	1,750	4,700	1,300	4,400	1,250	4,300	1,050	2,200	360
8	5,350	2,250	4,150	1,600	3,500	1,200	3,300	1,200	3,200	1,000	1,650	330
10	4,300	2,100	3,350	1,550	2,850	1,100	2,650	1,050	2,600	925	1,350	310
12	3,600	2,000	2,800	1,500	2,350	1,050	2,250	980	2,150	875	1,100	305
16	2,700	1,750	2,100	1,350	1,750	925	1,650	805	1,600	735	835	305
20	2,150	1,450	1,650	1,100	1,400	850	1,350	745	1,300	665	670	300

Max cutting depth		ap	ae	ap	ae	ap	ae
		≤ 1,5 D	≤ 0,2 D	≤ 1,5 D	≤ 0,1 D	≤ 1,5 D	≤ 0,05 D

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. Please use a suitable fluid with high smoke retardant properties
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing

## NEO-EMS / NEO-CR-EMS

### High speed side milling

Ø	C≤0,2% - GG S55C · S5400 · FC250 ~750 N/mm <sup>2</sup>		SCM - SKD SKT · SKS · SCM ~30 N/mm <sup>2</sup>		30~38 HRC NAK55 · HPM1 · SKT · SKD 30~38 N/mm <sup>2</sup>		38~45 HRC - SUS SUS304 · SKD 38~45 N/mm <sup>2</sup>		45~55 HRC - HRS Titanium alloy 45~55 N/mm <sup>2</sup>		Heat resistant alloy steel Inconel	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	14,000	4,750	11,000	3,550	9,150	2,650	8,600	2,500	8,350	2,100	4,300	745
8	10,500	4,600	8,050	3,300	6,850	2,450	6,450	2,400	6,250	2,050	3,250	675
10	8,400	3,900	6,500	3,000	5,550	2,200	5,200	2,100	5,050	1,900	2,600	640
12	7,000	3,800	5,450	2,900	4,600	2,150	4,350	2,000	4,200	1,800	2,150	625
16	5,250	3,550	4,100	2,800	3,450	1,900	3,250	1,650	3,150	1,500	1,650	620
20	4,200	2,900	3,250	2,250	2,750	1,750	2,600	1,550	2,550	1,350	1,300	610

Max cutting depth		ap	ae	ap	ae	ap	ae
		≤ 1,5 D	≤ 0,05 D	≤ 1,5 D	≤ 0,02 D	≤ 1 D	≤ 0,02 D

ae max = 0,5mm

ae max = 0,5mm

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. Please use a suitable fluid with high smoke retardant properties
4. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing

# CUTTING CONDITIONS

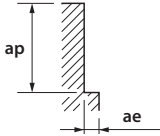
Milling | Endmills | Cutting conditions

## WXS-CR-EMS

High speed milling

Ø	C≤0,2% - GG S55C · S5400 ~750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SNCM		30~38 HRC NAK55 · HPM1 · SKT		38~45 HRC-SUS SUS304 · X210CR12 X40CRMV51		45~55 HRC HRS		55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	47.500	6.250	42.000	5.350	31.500	2.650	26.500	1.650	15.500	830	12.500	590
4	35.500	6.250	31.500	5.750	23.500	3.350	19.500	1.650	11.500	960	9.500	595
5	28.500	6.700	25.000	6.000	19.000	3.600	15.500	1.650	9.500	995	7.600	595
6	23.500	4.400	21.000	3.750	15.500	2.800	13.000	2.000	7.950	1.200	6.350	960
8	17.500	4.300	15.500	3.750	11.500	2.800	9.900	2.050	5.950	1.250	4.750	955
10	14.000	4.250	12.500	3.750	9.500	2.800	7.950	2.100	4.750	1.250	3.800	955
12	11.500	3.950	10.500	3.500	7.950	2.600	6.600	1.950	3.950	1.150	3.150	875
14	10.000	3.750	9.050	3.350	6.800	2.500	5.650	1.750	3.400	1.050	2.700	795
16	8.950	3.500	7.950	3.100	5.950	2.300	4.950	1.600	2.950	970	2.350	740
18	7.950	3.100	7.050	2.750	5.300	2.050	4.400	1.450	2.650	885	2.100	690
20	7.150	2.800	6.350	2.500	4.750	1.850	3.950	1.350	2.350	785	1.900	625
25	5.700	2.350	5.050	2.100	3.800	1.500	3.150	1.100	1.900	675	1.500	525
30	4.750	1.950	4.200	1.750	3.150	1.250	2.650	940	1.550	550	1.250	435

Max cutting depth



D	ap	ae
< 12	1D	0,01D
> 12	1D	0,02D

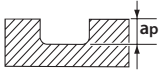
1. Conditions to be used if slant is = 3 x dia.  
If length is 5 x dia, than reduce feed and rotation by 10 to 20%.  
If length is 6 x dia, than reduce feed and rotation by 40 to 60% and use 1/2 of aa and 1/3 of ar.
2. Reduce speed to avoid distortion from deep passes or low rigidity
3. For milling > 18 mm, machining centre ISO50 is recommended
4. Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

## WXL-CR-EDS-6

Slotting

Ø	C≤0,2% - GG SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		~30 HRC SCM · SKT · SKS · SKD		30~38 HRC SKT · SKD · NAK55 · HPM1		38~45 HRC SUS304 · SKD		45~55 HRC		55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
0,2	32.000	125	32.000	115	32.000	100	32.000	90	32.000	60	24.500	30
0,3	32.000	190	32.000	170	32.000	150	32.000	135	32.000	90	18.000	40
0,4	32.000	250	32.000	230	32.000	200	32.000	180	32.000	120	14.000	40
0,5	32.000	320	32.000	290	32.000	250	32.000	225	26.000	130	12.000	40
0,6	32.000	380	32.000	345	32.000	310	27.500	250	22.000	130	10.500	40
0,8	32.000	512	32.000	460	29.000	370	22.000	280	17.500	130	8.750	45
1	30.000	600	27.000	480	25.000	400	19.000	300	14.000	130	7.600	50
1,2	26.500	630	23.500	510	21.000	400	15.500	300	11.500	130	6.600	55
1,4	22.500	630	20.000	510	18.000	400	13.500	300	10.000	130	5.900	55
1,5	21.000	630	19.000	510	16.500	400	12.500	300	9.500	130	5.700	60
1,6	19.500	630	17.500	510	15.500	400	11.500	300	8.950	130	5.550	60
1,8	17.500	630	15.500	510	14.000	400	10.500	300	7.950	130	5.300	65
2	15.500	630	14.000	510	12.500	400	9.500	300	7.150	130	4.750	65
2,5	12.500	630	11.000	510	10.000	400	7.600	300	5.700	130	3.800	65

Max cutting depth



D	ap
< 1	0,1D
≥ 1	0,3D

D	ap
< 1	0,02D
≥ 1	0,05D

D	ap
< 1	0,01D
≥ 1	

Milling | Endmills

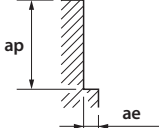
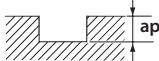
Cutting conditions

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

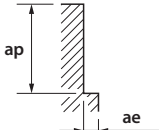
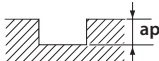
## UVX-TI-4FL / SAFE-LOCK®

Titanium alloy (Ti-6Al-4V)

	Side milling		Slotting					
Vc	60 ~ 80 m/min		30 ~ 50 m/min					
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)				
12	1.900	680	1.350	270				
16	1.400	500	990	200				
20	1.100	480	800	190				
25	900	400	640	150				
Max cutting depth		<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 1,8 Dc</td> <td>0,2 Dc</td> </tr> </table>	ap	ae	≤ 1,8 Dc	0,2 Dc		
ap	ae							
≤ 1,8 Dc	0,2 Dc							

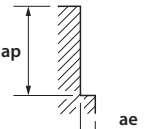
## UVX-TI-5FL / UVX-TI-5FL-HB / SAFE-LOCK®

Titanium alloy (Ti-6Al-4V)

	Side milling		Slotting							
Vc	60 ~ 80 m/min		30 ~ 50 m/min							
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)						
12	1.900	855	1.350	340						
16	1.400	630	990	250						
20	1.100	600	800	240						
25	900	500	640	192						
Max cutting depth		<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 1,8 Dc</td> <td>0,2 Dc</td> </tr> </table>	ap	ae	≤ 1,8 Dc	0,2 Dc		<table border="1"> <tr> <td>ap</td> </tr> <tr> <td>≤ 1 Dc</td> </tr> </table>	ap	≤ 1 Dc
ap	ae									
≤ 1,8 Dc	0,2 Dc									
ap										
≤ 1 Dc										

## UVXL-TI-5FL / SAFE-LOCK®

Titanium alloy (Ti-6Al-4V)

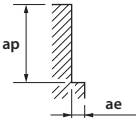
	Side milling					
Vc	60 ~ 80 m/min					
Ø	S (min <sup>-1</sup> )	F (mm/min)				
12	2.100	1.050				
16	1.600	920				
20	1.270	760				
25	1.020	587				
Max cutting depth		<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 3,75 Dc</td> <td>0,1 Dc</td> </tr> </table>	ap	ae	≤ 3,75 Dc	0,1 Dc
ap	ae					
≤ 3,75 Dc	0,1 Dc					



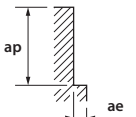
# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

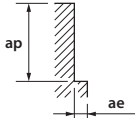
## AERO-ETS

Aluminium alloy							
$\emptyset$	S (min <sup>-1</sup> )	F (mm/min)					
12	≤ 33.000	≤ 15.000					
16	≤ 33.000	≤ 20.000					
20	≤ 33.000	≤ 25.700					
25	≤ 33.000	≤ 32.600					
Max cutting depth	 <table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 0,4 Dc</td> <td>1 Dc</td> </tr> </table>		ap	ae	≤ 0,4 Dc	1 Dc	
ap	ae						
≤ 0,4 Dc	1 Dc						

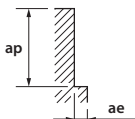
## AERO-O-ETS

Aluminium alloy							
Vc	1000 ~ 3000 m/min						
$\emptyset$	S (min <sup>-1</sup> )	F (mm/min)					
12	≤ 33.000	≤ 25.700					
25	≤ 33.000	≤ 32.600					
Max cutting depth	 <table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>≤ 0,4 Dc</td> <td>1 Dc</td> </tr> </table>		ap	ae	≤ 0,4 Dc	1 Dc	
ap	ae						
≤ 0,4 Dc	1 Dc						

## AERO-ETL

Aluminium alloy				
$\emptyset$	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	ae (mm)
12	≤ 14.000	≤ 4.000	≤ 45	≤ 0,15
16	≤ 14.000	≤ 5.000	≤ 45	≤ 0,2
20	≤ 14.000	≤ 6.000	≤ 45	≤ 0,3
Max cutting depth				

## AERO-EXTL

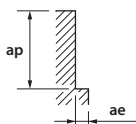
Aluminium alloy				
$\emptyset$	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	ae (mm)
20	≤ 14.000	≤ 6.000	≤ 95	≤ 0,2
Max cutting depth				



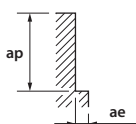
# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

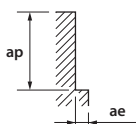
## AERO-LN-ETS

Aluminium alloy							
$\emptyset$	S ( $\text{min}^{-1}$ )	F ( $\text{mm}/\text{min}$ )					
16	$\leq 33.000$	$\leq 20.000$					
20	$\leq 33.000$	$\leq 25.700$					
25	$\leq 33.000$	$\leq 32.600$					
Max cutting depth	 <table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td><math>\leq 0,2 D</math></td> <td><math>1 D</math></td> </tr> </table>		ap	ae	$\leq 0,2 D$	$1 D$	
ap	ae						
$\leq 0,2 D$	$1 D$						

## AERO-LN-EDS

Aluminium alloy							
$\emptyset$	S ( $\text{min}^{-1}$ )	F ( $\text{mm}/\text{min}$ )					
16	$\leq 33.000$	$\leq 12.000$					
20	$\leq 33.000$	$\leq 15.000$					
25	$\leq 33.000$	$\leq 15.000$					
Max cutting depth	 <table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td><math>\leq 0,4 D</math></td> <td><math>0,6 D</math></td> </tr> </table>		ap	ae	$\leq 0,4 D$	$0,6 D$	
ap	ae						
$\leq 0,4 D$	$0,6 D$						

## DLC-AIR-EDS

Aluminium alloy							
Vc	1000 ~ 3000 m/min						
$\emptyset$	S ( $\text{min}^{-1}$ )	F ( $\text{mm}/\text{min}$ )					
12	33.000	$\leq 9.100$					
16	33.000	$\leq 12.000$					
20	33.000	$\leq 15.000$					
25	33.000	$\leq 15.000$					
Max cutting depth	 <table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td><math>\leq 0,6 Dc</math></td> <td><math>1,0 Dc</math></td> </tr> </table>		ap	ae	$\leq 0,6 Dc$	$1,0 Dc$	
ap	ae						
$\leq 0,6 Dc$	$1,0 Dc$						



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPL-HP-4FL

Slotting

Vc		Steels St-52 • C45 • GG-25			Hardened steels ~35 HRC 42CrMo4			Hardened steels ~45 HRC 1.2379			Stainless steel 1.4301			Titanium Ti6AlV4		
Vc		120 m/min			120 m/min			70 m/min			60 m/min			50 m/min		
Ø	Z	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
4	4	9.549	1.146	0,030	9.549	1.146	0,030	5.570	668	0,030	4.775	382	0,020	3.979	318	0,020
5	4	7.639	1.146	0,038	7.639	1.146	0,038	4.456	668	0,038	3.820	382	0,025	3.183	318	0,025
6	4	6.366	1.146	0,045	6.366	1.146	0,045	3.714	668	0,045	3.183	382	0,030	2.653	318	0,030
8	4	4.775	1.146	0,060	4.775	1.146	0,060	2.785	668	0,060	2.387	382	0,040	1.989	318	0,040
10	4	3.820	1.146	0,075	3.820	1.146	0,075	2.228	668	0,075	1.910	382	0,050	1.592	318	0,050
12	4	3.183	1.146	0,090	3.183	1.146	0,090	1.857	668	0,090	1.592	382	0,060	1.326	318	0,060
14	4	2.728	1.146	0,105	2.728	1.146	0,105	1.592	668	0,105	1.364	382	0,070	1.137	318	0,070
16	4	2.387	1.146	0,120	2.387	1.146	0,120	1.393	668	0,120	1.194	382	0,080	995	318	0,080
20	4	1.910	1.146	0,150	1.910	1.146	0,150	1.114	668	0,150	955	382	0,100	796	318	0,100

ap x d

F(fz)  
correction

ap	Fakt.
0,5	1,0
1,0	0,7
1,5	0,5
2,0	0,3

The above stated application data are as per **RED** marked parameters.

## EPL-HP-4FL

Side milling

Vc		Steels St-52 • C45 • GG-25			Hardened steels ~35 HRC 42CrMo4			Hardened steels ~45 HRC 1.2379			Stainless steel 1.4301			Titanium Ti6AlV4		
Vc		140 m/min			140 m/min			80 m/min			70 m/min			60 m/min		
Ø	Z	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
4	4	11.141	3.565	0,080	11.141	3.565	0,080	6.366	2.037	0,080	5.570	891	0,040	4.775	764	0,040
5	4	8.913	3.565	0,100	8.913	3.565	0,100	5.093	2.037	0,100	4.456	891	0,050	3.820	764	0,050
6	4	7.427	3.565	0,120	7.427	3.565	0,120	4.244	2.037	0,120	3.714	891	0,060	3.183	764	0,060
8	4	5.570	3.565	0,160	5.570	3.565	0,160	3.183	2.037	0,160	2.785	891	0,080	2.387	764	0,080
10	4	4.456	3.565	0,200	4.456	3.565	0,200	2.546	2.037	0,200	2.228	891	0,100	1.910	764	0,100
12	4	3.714	3.565	0,240	3.714	3.565	0,240	2.122	2.037	0,240	1.857	891	0,120	1.592	764	0,120
14	4	3.183	3.565	0,280	3.183	3.565	0,280	1.819	2.037	0,280	1.592	891	0,140	1.364	764	0,140
16	4	2.785	3.565	0,320	2.785	3.565	0,320	1.592	2.037	0,320	1.393	891	0,160	1.194	764	0,160
20	4	2.228	3.565	0,400	2.228	3.565	0,400	1.273	2.037	0,400	1.114	891	0,200	955	764	0,200

ap x d

F(fz)  
correction

ap	Fakt.
0,5	1,3
1,0	1,2
1,5	1,0
2,0	0,8

ap	Fakt.
0,5	1,2
1,0	1,0
1,5	0,7
2,0	0,5

The above stated application data are as per **RED** marked parameters.

## EPL-HP-5FL

Slotting

Vc		Steels St-52 • C45 • GG-25			Hardened steels ~35 HRC 42CrMo4			Hardened steels ~45 HRC 1.2379			Stainless steel 1.4301			Titanium Ti6AlV4		
Vc		120 m/min			120 m/min			70 m/min			60 m/min			50 m/min		
Ø	Z	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
8	5	4.775	1.432	0,060	4.775	1.432	0,060	2.785	836	0,060	2.387	477	0,040	1.989	398	0,040
10	5	3.820	1.432	0,075	3.820	1.432	0,075	2.228	836	0,075	1.910	477	0,050	1.592	398	0,050
12	5	3.183	1.432	0,090	3.183	1.432	0,090	1.857	836	0,090	1.592	477	0,060	1.326	398	0,060
16	5	2.387	1.432	0,120	2.387	1.432	0,120	1.393	836	0,120	1.194	477	0,080	995	398	0,080
20	5	1.910	1.432	0,150	1.910	1.432	0,150	1.114	836	0,150	955	477	0,100	796	398	0,100

ap x d

F(fz)  
correction

ap	Fakt.
0,5	1,0
1,0	0,7
1,5	0,5
2,0	0,3

The above stated application data are as per **RED** marked parameters.

Milling | Endmills

Cutting conditions

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPL-HP-5FL

Side milling

Vc		Steels St-52 · C45 · GG-25			Hardened steels ~35 HRC 42CrMo4			Hardened steels ~45 HRC 1.2379			Stainless steel 1.4301			Titanium Ti6AlV4		
Vc		140 m/min			140 m/min			80 m/min			70 m/min			60 m/min		
Ø	Z	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
8	5	5.570	4.456	0,160	5.570	4.456	0,160	3.183	2.546	0,160	2.785	1.114	0,080	2.387	955	0,080
10	5	4.456	4.456	0,200	4.456	4.456	0,200	2.546	2.546	0,200	2.228	1.114	0,100	1.910	955	0,100
12	5	3.714	4.456	0,240	3.714	4.456	0,240	2.122	2.546	0,240	1.857	1.114	0,120	1.592	955	0,120
16	5	2.785	4.456	0,320	2.785	4.456	0,320	1.592	2.546	0,320	1.393	1.114	0,160	1.194	955	0,160
20	5	2.228	4.456	0,400	2.228	4.456	0,400	1.273	2.546	0,400	1.114	1.114	0,200	955	955	0,200

ap x d	F(fz) correction	Diagram	ap	Fakt.	ap	Fakt.
0,5			0,5	1,3	0,5	1,2
1			1	1,2	<b>1,0</b>	<b>1,0</b>
<b>1,5</b>			<b>1,5</b>	<b>1,0</b>	1,5	0,7
2			2	0,8	2,0	0,5

The above stated application data are as per **RED** marked parameters.

## FX-CR-MG-EDS

Slotting

Vc		Mild Steel · Carbon Steel · Cast Iron SS400 · S55C · FC250 (~750N/mm <sup>2</sup> )		Alloy Steel · Tool Steel SCM · SKT · SKS · SKD (~30HRC)		Hardened Steel · Prehardened Steel (Free-Cutting) SKT · SKD · NAK55 · HPM1 (30~38HRC)		Hardened Steel · Prehardened Steel (Nonfree-Cutting) SKT · SKD · NAK80 · HPM50 (38~45HRC)		Hardened Steel · Heat Resistant Alloy Steel (45~55HRC)		Hardened Steel (55~60HRC)	
Vc		150 m/min		130 m/min		110 m/min		80 m/min		60 m/min		30 m/min	
Ø		S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
0,2		32.000	90	32.000	90	32.000	75	32.000	35	32.000	30	25.000	25
0,3		32.000	115	32.000	115	32.000	80	32.000	55	23.000	30	16.500	25
0,4		32.000	125	32.000	125	32.000	90	27.500	60	17.500	30	12.500	25
0,5		32.000	125	29.500	125	25.000	90	22.000	60	14.000	30	10.000	25
0,6		32.000	125	24.500	125	21.000	90	18.500	60	11.500	30	8.450	25
0,8		24.500	125	18.500	125	15.500	90	13.500	65	8.750	30	6.350	25
1		19.500	130	14.500	125	12.500	90	11.000	65	7.000	30	5.050	25
1,5		14.000	130	10.500	125	8.900	90	7.950	65	5.050	40	3.550	25
2		11.000	135	8.400	125	7.000	90	6.350	70	3.950	40	2.750	25
3		7.400	200	6.350	150	5.300	100	4.450	75	2.750	45	2.000	30
4		5.950	235	4.900	185	4.250	125	3.500	90	2.200	50	1.550	30
5		5.300	315	4.300	235	3.550	130	3.050	100	1.900	55	1.250	30
6		4.450	310	3.600	235	2.950	130	2.500	100	1.550	55	1.050	25
8		3.300	295	2.700	235	2.200	125	1.900	100	1.150	50	795	25
10		2.650	280	2.150	230	1.750	125	1.500	95	955	50	635	25
12		2.200	280	1.800	230	1.450	125	1.250	95	795	45	530	20
14		1.900	280	1.500	215	1.250	110	1.050	95	680	40	455	18
16		1.650	260	1.350	200	1.100	100	955	85	595	35	395	16
18		1.450	230	1.200	180	990	90	845	75	530	30	350	14
20		1.300	205	1.050	155	890	80	760	65	475	30	315	13
22		1.200	190	980	145	810	70	690	60	430	25	285	11
24		1.100	175	900	135	740	65	635	55	395	25	265	11
25		1.050	165	865	130	710	65	610	55	380	20	255	10
30		890	140	720	105	590	50	505	45	315	20	210	10

Max cutting depth	Diagram	D	ap	D	ap	D	ap
		< 1	0,1D	< 1	0,02D	< 1	0,01D
		1 - 3	0,3D	≥ 1	0,05D	1 - 3	0,02D
		≥ 3	0,5D			≥ 3	0,05D

- Use high precision machine set up to ensure maximum rigidity.
- In case of vibration, reduce both feed and speed.
- Use a coolant that has a low co-efficient of smoke emission.

\* Modified parameters

# CUTTING CONDITIONS

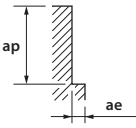
Milling | Endmills | Cutting conditions

## FX-CR-MG-EMS

Side milling

Ø	Cast Iron		Mild Steel, Carbon Steel		Alloy Steel - Tool Steel		Hardened Steel - Prehardened Steel		Stainless Steel - Hardened Steel Z38CDV5		Hardened Steel Heat Resistant Alloy Steel		Hardened Steel	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
2	15,500	370	13,000	310	11,000	280	7,000	110	6,350	100	3,950	60	2,750	40
3	10,500	595	8,900	505	7,400	355	5,300	125	4,750	110	2,750	60	2,000	45
4	7,950	635	6,650	530	5,550	370	4,250	135	3,700	115	2,200	70	1,550	45
5	6,350	740	5,300	620	4,450	425	3,550	140	3,150	125	1,900	75	1,250	40
6	5,300	735	4,450	615	3,700	425	2,950	145	2,650	130	1,550	70	1,050	40
8	3,950	710	3,300	590	2,750	420	2,200	145	1,950	130	1,150	65	795	35
10	3,150	710	2,650	590	2,200	420	1,750	145	1,550	130	955	65	635	35
12	2,650	710	2,200	590	1,850	420	1,450	145	1,300	130	795	60	530	30
14	2,250	680	1,900	575	1,550	415	1,250	145	1,100	125	680	50	455	25
16	1,950	655	1,650	550	1,350	415	1,100	130	995	115	595	45	395	20
18	1,750	655	1,450	540	1,200	405	990	115	880	105	530	40	350	20
20	1,550	620	1,300	520	1,100	370	890	105	795	95	475	35	315	19
22	1,400	560	1,200	480	1,000	340	810	95	720	85	430	30	285	17
24	1,300	520	1,100	440	925	315	740	85	660	75	395	30	265	16
25	1,250	500	1,050	420	890	300	710	85	635	75	380	30	255	15
30	1,050	420	890	355	740	250	590	70	530	60	315	25	210	13

Max cutting depth



D	ap	ae
< 3	1,5D	0,05D
≥ 3	1,5D	0,1D

ap	ae
1D	0,02D

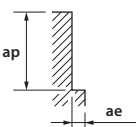
1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.
4. When FX-MG-EDSS, FX-MG-EDS and FX-CR-MG-EDS are used, please reduce the feed rate to half of the above.

## FX-CR-MG-EMS

High speed light milling

Ø	Mild steel - Carbon steel Cast iron		Alloy Steel - Tool Steel		Hardened steel - Prehardened steel (free-cutting)		Hardened Steel - Prehardened Steel (non-free cutting)		Hardened Steel	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	21,000	2,450	18,500	2,150	13,000	1,500	7,950	795	4,200	420
8	15,500	2,450	13,500	2,100	9,900	1,450	5,950	795	3,150	425
10	12,500	2,500	11,000	2,100	7,950	1,450	4,750	800	2,500	420
12	10,500	2,450	9,250	2,100	6,600	1,450	3,950	790	2,100	410
14	9,050	2,350	7,950	2,000	5,650	1,350	3,400	740	1,800	390
16	7,950	2,250	6,950	1,950	4,950	1,350	2,950	715	1,550	375
18	7,050	2,250	6,150	1,900	4,400	1,300	2,650	705	1,400	375
20	6,350	2,100	5,550	1,850	3,950	1,300	2,350	665	1,250	355
22	5,750	1,950	5,050	1,700	3,600	1,200	2,150	635	1,150	325
24	5,300	1,800	4,600	1,550	3,300	1,100	1,950	575	1,050	295
25	5,050	1,700	4,450	1,500	3,150	1,050	1,900	560	1,000	280
30	4,200	1,400	3,700	1,250	2,650	890	1,550	455	845	240

Max cutting depth



D	ap	ae
≤ 8	1,5D	0,01D
8 - 16	1,5D	0,02D
> 16	1,5D	0,05D

D	ap	ae
≤ 8	1D	0,01D
> 8	1D	0,02D

1. The indicated speeds and feeds are for high speed light milling with high speed / high precision machining centers.
2. Tools can cause sparks. Do not use flammable fluids.
3. We recommend using an air blow. When using cutting fluids, use a high-quality fluid with high smoke retardant properties.
4. In general, use FX End Mills for milling less hard materials. For harder materials, use FXS End Mills (FXS-EMS).

Milling | Endmills

Cutting conditions

# CUTTING CONDITIONS

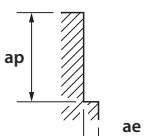
Milling | Endmills | Cutting conditions

## FXS-HS-PKE

High speed side milling

Ø	C≤0,2% S55C · S5400 · FC250 ~750 N/mm <sup>2</sup>		~30 HRC SCM · SKT · SKS · HPM1		30~38 HRC SKT · SKD · NAK55 · HPM1		38~45 HRC SUS SUS304 · SKD		45~55 HRC TiAl		55~60 HRC SCM	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	10.600	2.650	10.600	2.150	10.600	1.600	8.000	1.000	8.000	825	5.300	535
8	8.000	2.400	8.000	1.950	8.000	1.450	6.000	920	6.000	750	4.000	485
10	6.350	2.100	6.350	1.700	6.350	1.300	4.800	805	4.800	655	3.200	420
12	5.300	2.100	5.300	1.700	5.300	1.350	4.000	805	4.000	655	2.650	420
16	4.000	2.150	4.000	1.700	4.000	1.350	3.000	805	3.000	655	2.000	420
20	3.200	2.150	3.200	1.700	3.200	1.350	2.400	805	2.400	655	1.600	420

Max cutting depth		ap	ae	ap	ae
		1D	0,1D	1D	0,05D

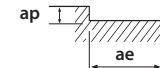
  

- Use highest possible speed.
- On lower speed machines, use maximum speed & feed settings.
- Cutter mis-alignment must not exceed 10µ.
- Always use coolant.

## High speed contouring

Ø	C≤0,2% - GG S55C · S5400 · FC250 ~750 N/mm <sup>2</sup>		~30 HRC SCM · SKD · SKS · SNCM		30~38 HRC NAK55 · HPM1 · SKT · SKD		38~45 HRC SUS SUS304 · SKD		45~55 HRC HRS		55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	10.600	1.650	10.600	1.250	10.600	1.000	8.000	900	8.000	520	5.300	310
8	8.000	1.500	8.000	1.150	8.000	920	6.000	790	6.000	460	4.000	290
10	6.400	1.300	6.400	1.050	6.400	795	4.800	690	4.800	405	3.200	260
12	5.300	1.300	5.300	1.000	5.300	790	4.000	690	4.000	405	2.700	260
16	4.000	1.280	4.000	1.050	4.000	795	3.000	690	3.000	405	2.000	255
20	3.200	1.050	3.200	1.050	3.200	795	2.400	580	2.400	405	1.600	255

Max cutting depth		ap	ae	ap	ae	ap	ae
		0,1D	0,3D-0,5D	0,05D	0,2D-0,3D	0,05D	0,2D-0,3D

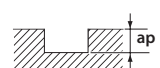
  

- Conditions to be used if slant is = 3 x dia.  
If length is 5 x dia, than reduce feed and rotation by 30 to 40% and use 1/2 of depth of passes.  
If length is 6 x dia, than reduce feed and rotation by 40 to 60% and use 1/4 of depth of passes.
- Reduce speed to avoid distortion from deep passes or low rigidity
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

## Slotting

Ø	C≤0,2% - GG S55C · S5400 · FC250 ~750 N/mm <sup>2</sup>		~30 HRC SCM · SKD · SKS · SNCM		30~38 HRC NAK55 · HPM1 · SKT · SK		38~45 HRC SUS SUS304 · SKD		45~55 HRC HRS		55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	4.450	770	3.350	580	2.900	400	1.900	120	1.600	95	1.050	40
8	3.350	710	2.500	530	2.200	350	1.450	120	1.200	95	800	40
10	2.700	650	2.000	480	1.750	350	1.150	120	950	95	650	40
12	2.250	650	1.650	475	1.450	350	950	120	800	95	530	40
16	1.650	635	1.250	480	1.100	350	700	120	600	95	400	40
20	1.350	540	1.000	400	900	300	550	115	500	85	300	40

Max cutting depth		ap	ap
		0,5D	0,05D

- These milling conditions are for an end mill where the tool extension length is 3 times the diameter of the end mill.
- Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
- Please use a suitable fluid with high smoke retardant properties.
- During dry (no fluid) milling, please use an air blow to remove disposable chips from the milling area and to eliminate chip packing.

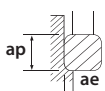


# CUTTING CONDITIONS

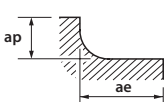
Milling | Endmills | Cutting conditions

## FXS-MFE

High speed side milling

Vc	C≤0,2% S55C · S5400 ~750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SNCM		30~38 HRC NAK55 · HPMI · SKT		38~45 HRC SUS SUS304 · X210CR12 X40CRMOV51		45~55 HRC HRS		55~60 HRC											
	200 m/min		200 m/min		150 m/min		150 m/min		120 m/min		100 m/min											
∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)										
10	6.400	2.120	6.400	1.700	4.800	1.060	4.800	800	3.800	510	3.180	420										
12	5.300	2.120	5.300	1.700	4.000	1.060	4.000	800	3.180	510	2.650	420										
14	4.550	2.120	4.550	1.700	3.400	1.060	3.400	800	2.750	510	2.270	420										
18	3.500	1.750	3.500	1.400	2.650	1.060	2.650	800	2.150	510	1.750	420										
22	2.900	1.450	2.900	1.150	2.170	880	2.170	800	1.750	510	1.450	420										
Max cutting depth	 <table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>1,5D</td> <td>0,05D</td> </tr> </table>						ap	ae	1,5D	0,05D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>1,5D</td> <td>0,02D</td> </tr> </table>		ap	ae	1,5D	0,02D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>1,5D</td> <td>0,01D</td> </tr> </table>		ap	ae	1,5D	0,01D
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ap	ae																					
1,5D	0,01D																					
<p>1. Conditions to be used if slant is = 3 x dia.            If length is 5 x dia, than reduce feed and rotation by 10 to 20%.            If length is 6 x dia, than reduce feed and rotation by 40 to 60% and use 1/2 of aa and 1/3 of ar.</p> <p>2. Reduce speed to avoid distortion from deep passes or low rigidity</p> <p>3. For milling &gt; 18 mm, machining center ISO50 is recommended</p> <p>4. Use compressed air or a high quality coolant with a low co-efficient of smoke emission.</p>																						

## High speed contouring

Vc	C≤0,2% S55C · S5400 ~750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SNCM		30~38 HRC NAK55 · HPMI · SKT		38~45 HRC SUS SUS304 · X210CR12 X40CRMOV51		45~55 HRC HRS		55~60 HRC											
	200 m/min		200 m/min		150 m/min		150 m/min		120 m/min		100 m/min											
∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)										
10	6.400	1.300	6.400	1.100	4.800	800	4.800	700	3.800	320	3.180	250										
12	5.300	1.300	5.300	1.100	4.000	800	4.000	700	3.180	320	2.650	250										
14	4.550	1.300	4.550	1.100	3.400	800	3.400	700	2.750	320	2.270	250										
18	3.500	1.300	3.500	1.100	2.650	800	2.650	700	2.150	320	1.750	250										
22	2.900	1.300	2.900	1.100	2.170	750	2.170	700	1.750	320	1.450	250										
Max cutting depth	 <table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>0,1D</td> <td>0,3D-0,5D</td> </tr> </table>						ap	ae	0,1D	0,3D-0,5D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>0,05D</td> <td>0,2D-0,3D</td> </tr> </table>		ap	ae	0,05D	0,2D-0,3D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>0,02D</td> <td>0,2D-0,3D</td> </tr> </table>		ap	ae	0,02D	0,2D-0,3D
ap	ae																					
0,1D	0,3D-0,5D																					
ap	ae																					
0,05D	0,2D-0,3D																					
ap	ae																					
0,02D	0,2D-0,3D																					
<p>1. Conditions to be used if slant is = 3 x dia.            If length is 5 x dia, than reduce feed and rotation by 10 to 20%.            If length is 6 x dia, than reduce feed and rotation by 40 to 60% and use 1/2 of aa and 1/3 of ar.</p> <p>2. Reduce speed to avoid distortion from deep passes or low rigidity</p> <p>3. For milling &gt; 18 mm, machining center ISO50 is recommended</p> <p>4. Use compressed air or a high quality coolant with a low co-efficient of smoke emission.</p>																						

Milling | Endmills

Cutting conditions

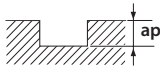
# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## FXS-PKE

Slotting milling

Vc	C≤0,2% S55C · SS400 · FC250 ~750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SNCM		30~38 HRC NAK55 · HPM1 · SKT		38~45 HRC SUS SUS304 · X210CR12 X40CRMOV51		45~55 HRC HRS		55~60 HRC	
	80 m/min		60 m/min		50 m/min		40 m/min		30 m/min		20 m/min	
∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	8.900	665	6.650	595	5.900	350	3.800	90	3.150	55	2.000	30
4	6.650	695	5.000	675	4.450	400	2.850	100	2.350	70	1.550	35
5	5.300	715	4.000	660	3.550	360	2.250	105	1.900	70	1.250	35
6	4.450	740	3.300	550	2.950	345	1.900	110	1.600	90	1.050	35
8	3.300	660	2.500	500	2.200	360	1.400	115	1.200	95	795	35
10	2.650	630	2.000	475	1.750	325	1.100	115	955	95	635	35
12	2.200	590	1.650	440	1.450	300	955	110	800	95	530	35
16	1.650	640	1.250	480	1.100	335	720	120	600	95	400	40
20	1.350	535	1.000	400	875	280	570	120	480	80	320	40



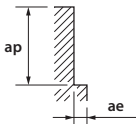
ap
0,5D

ap
0,05D

1. Conditions to be used if slant is = 3 x dia.  
 If length is 5 x dia, than reduce feed and rotation by 30 to 40% and use 1/2 of depth of passes.  
 If length is 6 x dia, than reduce feed and rotation by 40 to 60% and use 1/4 of depth of passes.  
 2. Reduce speed to avoid distortion from deep passes or low rigidity  
 3. Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

## High speed side milling

Vc	C≤0,2% S55C · SS400 · FC250 ~750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SNCM		30~38 HRC NAK55 · HPM1 · SKT		38~45 HRC SUS SUS304 · X210CR12 X40CRMOV51		45~55 HRC HRS		55~60 HRC	
	200 m/min		200 m/min		200 m/min		150 m/min		150 m/min		100 m/min	
∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	10.600	2.650	10.600	2.200	10.600	1.350	8.000	1.000	8.000	800	5.300	530
8	8.000	2.650	8.000	2.200	8.000	1.350	6.000	1.000	6.000	800	4.000	530
10	6.400	2.100	6.400	1.700	6.400	1.050	4.800	800	4.800	640	3.200	420
12	5.300	2.100	5.300	1.700	5.300	1.050	4.000	800	4.000	640	2.650	420
16	4.000	2.150	4.000	1.700	4.000	1.100	3.000	805	3.000	665	2.000	420
20	3.200	2.100	3.200	1.700	3.200	1.100	2.400	805	2.400	665	1.600	420



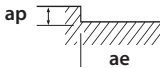
ap	ae
1D	0,1D

ap	ae
1,D	0,02D

1. Conditions to be used if slant is = 3 x dia.  
 If length is 5 x dia, than reduce feed and rotation by 30 to 40% and use 1/2 of depth of passes.  
 If length is 6 x dia, than reduce feed and rotation by 40 to 60% and use 1/4 of depth of passes.  
 2. Reduce speed to avoid distortion from deep passes or low rigidity  
 3. Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

## High speed contouring

Vc	C≤0,2% S55C · SS400 · FC250 ~750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SNCM		30~38 HRC NAK55 · HPM1 · SKT		38~45 HRC SUS SUS304 · X210CR12 X40CRMOV51		45~55 HRC HRS		55~60 HRC	
	200 m/min		200 m/min		200 m/min		150 m/min		150 m/min		100 m/min	
∅	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	10.600	1.600	10.600	1.300	10.600	1.000	8.000	1.000	8.000	500	5.300	310
8	8.000	1.600	8.000	1.300	8.000	1.000	6.000	1.000	6.000	500	4.000	310
10	6.400	1.300	6.400	1.000	6.400	800	4.800	700	4.800	400	3.200	250
12	5.300	1.300	5.300	1.000	5.300	800	4.000	700	4.000	400	2.650	250
16	4.000	1.300	4.000	1.050	4.000	795	3.000	690	3.000	405	2.000	255
20	3.200	1.050	3.200	1.050	3.200	795	2.400	580	2.400	405	1.600	255



ap	ae
0,1D	0,3-0,5D

ap	ae
0,05D	0,2-0,3D

ap	ae
0,02D	0,2-0,3D

1. Conditions to be used if slant is = 3 x dia.  
 If length is 5 x dia, than reduce feed and rotation by 30 to 40% and use 1/2 of depth of passes.  
 If length is 6 x dia, than reduce feed and rotation by 40 to 60% and use 1/4 of depth of passes.  
 2. Reduce speed to avoid distortion from deep passes or low rigidity  
 3. Use compressed air or a high quality coolant with a low co-efficient of smoke emission.



# CUTTING CONDITIONS


Milling | Endmills | Cutting conditions

## CA-PKE

High speed side milling

Ø	AL A7075		AC <Si 13%		Cu C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	40.000	2.100	24.000	1.250	17.000	625
4	32.000	2.550	19.200	1.550	14.300	800
5	32.000	3.250	19.200	1.950	12.700	960
6	26.500	3.500	15.900	2.150	10.600	960
8	20.000	3.750	12.000	2.250	8.000	1.130
10	16.000	4.300	9.600	2.580	6.350	1.150
12	13.300	4.400	8.000	2.650	5.300	1.250
16	10.000	4.400	6.000	2.650	4.000	1.250
20	8.000	4.400	4.800	2.650	3.200	1.250

Max cutting depth		<table border="1"><tr><td>ap</td><td>ae</td></tr><tr><td>1D</td><td>0,1D</td></tr></table>	ap	ae	1D	0,1D
	ap	ae				
1D	0,1D					

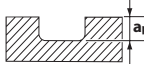
  

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

## Slotting

Ø	AL A7075		AC <Si 13%		Cu C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	40.000	1.450	24.000	880	7.950	325
4	32.000	1.700	19.200	1.000	5.950	375
5	32.000	2.200	19.200	1.330	4.750	385
6	26.500	2.400	15.900	1.450	3.950	400
8	20.000	2.500	12.000	1.500	2.950	460
10	16.000	2.800	9.600	1.700	2.350	475
12	13.300	2.950	8.000	1.800	1.950	510
16	10.000	3.000	6.000	1.800	1.450	510
20	8.000	3.000	4.800	1.800	1.150	510

Max cutting depth	<table border="1"><tr><td>ap</td></tr><tr><td>0,25D</td></tr></table>	ap	0,25D		<table border="1"><tr><td>ap</td></tr><tr><td>0,5D</td></tr></table>	ap	0,5D
	ap						
0,25D							
ap							
0,5D							

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 properties.



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## CA-MFE

High speed side milling

Ø	AL A7075		AC <Si 13%		Cu C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	16.000	4.300	9.600	2.600	6.350	1.150
12	13.300	4.400	8.000	2.650	5.300	1.250
14	11.500	4.400	6.900	2.650	4.500	1.250
18	8.850	4.400	5.300	2.650	3.500	1.250
22	7.400	4.000	4.500	2.400	3.000	1.200

max depth	ap	ae	S	F
Dx4	1,2D	0,100D	100%	100%
Dx5	1,2D	0,050D	60-80%	60-80%
Dx6	1,2D	0,025D	40-60%	40-60%

ap	ae
1,2D	0,1D

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 properties.

## High speed slotting milling

Ø	AL A7075		AC <Si 13%	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	16.000	2.800	9.600	1.700
12	13.300	2.950	8.000	1.750
14	11.500	3.000	6.800	1.800
18	8.850	3.000	5.300	1.800
22	7.400	3.000	4.450	1.800

max depth	ap	S	F
Dx4	1D	100%	100%
Dx5	0,50D	60-80%	60-80%
Dx6	0,025D	40-60%	40-60%

ap
0,1D

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 properties.



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## HYP-CR-HI-WEMS / HYP-CR-HD-WEMS

High speed contouring

Low Carbon - Alloy - Tool Steel			GG-GGG-GTW			Stainless steel			Aluminium - Mg			Ti Alloys									
HB/HRC	HB 150-250			HB 20-30			HRC 30-40			>HB 180			HRC 20			HRC 40-50					
N/mm <sup>2</sup>	500~800 N/mm <sup>2</sup>			800~1000 N/mm <sup>2</sup>			1000~1300 N/mm <sup>2</sup>			Non - Alloyed			400~700 N/mm <sup>2</sup>			Non-alloyed					
Vc	160 m/min			120 m/min			100 m/min			140 m/min			50 m/min			180 m/min			65 m/min		
∅	FZ	S=n	F=Vf	FZ	S=n	F=Vf	FZ	S=n	F=Vf	FZ	S=n	F=Vf	FZ	S=n	F=Vf	FZ	S=n	F=Vf	FZ	S=n	F=Vf
4	0,035	12.730	1.790	0,03	9.550	1.150	0,03	7.960	960	0,035	11.150	1.570	0,03	3.980	480	0,035	14.330	2.010	0,025	5.180	520
6	0,04	8.490	1.360	0,035	6.370	900	0,035	5.310	750	0,04	7.430	1.190	0,035	2.660	380	0,04	9.550	1.530	0,027	3.450	380
8	0,07	6.370	1.790	0,065	4.780	1.250	0,065	3.980	1040	0,07	5.580	1.570	0,065	1.990	520	0,07	7.170	2.010	0,031	2.590	330
10	0,1	5.090	2.040	0,08	3.820	1.230	0,08	3.190	1030	0,1	4.460	1.790	0,08	1.600	520	0,1	5.730	2.300	0,038	2.070	320
12	0,12	4.240	2.040	0,1	3.190	1.280	0,1	2.660	1070	0,12	3.720	1.790	0,1	1.330	540	0,12	4.780	2.300	0,045	1.730	320
16	0,13	3.180	1.660	0,12	2.390	1.150	0,12	1.990	960	0,13	2.790	1.460	0,12	1.000	480	0,13	3.590	1.870	0,052	1.300	280
20	0,15	2.550	1.530	0,12	1.910	920	0,12	1.600	770	0,15	2.230	1.340	0,12	800	390	0,15	2.870	1.730	0,059	1.040	250

ap x d	ap		Fakt.	
F(fz) correction	0,5	1,0	0,5	1,2
	1,0	0,7	1,0	1,0
	1,5	0,5	1,5	1,0
	2,0	0,3	2,0	0,8

The above stated application data are as per RED marked parameters.

## EPL-HI-CR-EMS / EPL-HI-CR-WEMS

Carbon Steel / Alloyed Steel / Tool Steel									GG-GGG-GTW			INOX			Aluminium / Mg			
~20 HRC			20 - 35 HRC			35 - 45 HRC			Unalloyed			~20HRC			Wrought Alloy			
Vc	180 m/min			160 m/min			140 m/min			145 m/min			45 m/min			180 m/min		
∅	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
4	14.320	1.720	0,03	12.730	1.370	0,03	11.140	1.080	0,02	11.540	1.300	0,03	3.580	310	0,02	14.320	1.720	0,03
5	11.460	1.380	0,03	10.190	1.220	0,03	8.920	1.070	0,03	9.240	1.110	0,03	2.870	230	0,02	11.460	1.380	0,03
6	9.550	1.240	0,03	8.490	990	0,03	7.430	780	0,03	7.690	1.100	0,04	2.390	230	0,02	9.550	1.240	0,03
8	7.160	1.110	0,04	6.370	890	0,03	5.570	700	0,03	5.770	1.000	0,04	1.790	200	0,03	7.160	1.110	0,04
10	5.730	1.110	0,05	5.090	890	0,04	4.460	700	0,04	4.620	1.000	0,05	1.430	200	0,03	5.730	1.110	0,05
12	4.770	1.110	0,06	4.240	890	0,05	3.710	700	0,05	3.850	1.000	0,06	1.190	200	0,04	4.770	1.110	0,06
16	3.580	1.020	0,07	3.180	820	0,06	2.790	640	0,06	2.880	900	0,08	900	190	0,05	3.580	1.020	0,07
20	2.860	960	0,08	2.250	770	0,09	2.230	610	0,07	2.340	800	0,09	720	180	0,06	2.860	960	0,08

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## PHX-LN-CRE

Rib groove milling & Contour line finish milling



			Slotting CENA1 · STAVAX · HPM38 · SKD61 42~55HRC				Contour offset CENA1 · STAVAX · HPM38 · SKD61 42~55HRC				Contour line finish milling CENA1 · STAVAX · HPM38 · SKD61 42~55HRC		
Ø	R	l2	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	ae (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	ae (mm)	S (min <sup>-1</sup> )	F (mm/min)	ae (mm)
0,8	0,1	2	18,000	720	0,020	0,200	18,000	930	0,020	0,200	18,000	1,150	0,015
0,8	0,1	4	18,000	720	0,020	0,200	18,000	930	0,020	0,200	18,000	1,150	0,015
0,8	0,1	6	18,000	720	0,020	0,200	18,000	930	0,020	0,200	18,000	1,150	0,015
0,8	0,1	8	15,000	540	0,013	0,200	15,000	630	0,013	0,200	16,000	700	0,013
1	0,1	4	18,000	830	0,030	0,230	18,000	880	0,030	0,230	18,000	1,440	0,015
1	0,1	6	18,000	830	0,024	0,230	18,000	880	0,024	0,230	18,000	1,440	0,015
1	0,1	8	15,000	750	0,013	0,230	15,000	800	0,013	0,230	15,000	1,200	0,015
1	0,1	10	12,000	300	0,007	0,200	12,000	400	0,007	0,200	12,000	960	0,015
1	0,1	12	10,500	220	0,006	0,180	10,500	288	0,006	0,180	10,500	840	0,015
1	0,2	4	18,000	830	0,030	0,230	18,000	880	0,030	0,230	18,000	1,440	0,018
1	0,2	6	18,000	830	0,024	0,230	18,000	880	0,024	0,230	18,000	1,440	0,018
1	0,2	8	15,000	750	0,013	0,230	15,000	800	0,013	0,230	15,000	1,200	0,018
1	0,2	10	12,000	300	0,007	0,200	12,000	400	0,007	0,200	12,000	960	0,018
1	0,2	12	10,500	220	0,006	0,180	10,500	290	0,006	0,180	10,500	840	0,018
1	0,3	4	18,000	830	0,030	0,230	18,000	1,000	0,030	0,230	18,000	1,440	0,022
1	0,3	6	18,000	830	0,024	0,230	18,000	890	0,024	0,230	18,000	1,440	0,022
1,5	0,1	4	16,000	1,230	0,030	0,340	16,000	1,300	0,030	0,340	18,000	1,620	0,015
1,5	0,1	8	16,000	1,230	0,026	0,340	16,000	1,300	0,026	0,340	18,000	1,620	0,015
1,5	0,1	12	10,000	480	0,013	0,300	10,000	750	0,013	0,300	10,000	900	0,015
1,5	0,2	4	16,000	1,230	0,030	0,340	16,000	1,300	0,030	0,340	18,000	1,620	0,018
1,5	0,2	6	16,000	1,230	0,029	0,340	16,000	1,300	0,029	0,340	18,000	1,620	0,018
1,5	0,2	8	16,000	1,230	0,026	0,340	16,000	1,300	0,026	0,340	18,000	1,620	0,018
2	0,1	8	12,000	1,300	0,030	0,460	12,000	1,760	0,030	0,460	18,000	1,620	0,015
2	0,1	10	12,000	1,200	0,030	0,460	12,000	1,620	0,030	0,460	15,000	1,350	0,015
2	0,1	12	12,000	1,150	0,024	0,460	12,000	1,320	0,024	0,460	13,000	1,170	0,015
2	0,1	16	7,600	780	0,012	0,460	7,600	750	0,012	0,460	7,000	630	0,015
2	0,3	8	12,000	1,300	0,050	0,460	12,000	1,620	0,050	0,460	18,000	1,620	0,022
2	0,3	12	12,000	1,150	0,040	0,460	12,000	1,320	0,040	0,460	13,000	1,170	0,022
2	0,5	6	12,000	1,300	0,080	0,450	12,000	1,760	0,080	0,450	18,000	1,620	0,025
2	0,5	8	12,000	1,300	0,075	0,450	12,000	1,760	0,075	0,450	18,000	1,620	0,025
2	0,5	10	12,000	1,200	0,070	0,450	12,000	1,620	0,070	0,450	15,000	1,350	0,025
2	0,5	12	12,000	1,150	0,060	0,450	12,000	1,320	0,060	0,450	13,000	1,170	0,025
3	0,3	12	8,000	1,200	0,046	0,700	8,000	1,400	0,046	0,700	13,000	1,170	0,022






# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## WXS-CPR

Regular milling



Ø	α°	l1 (mm)	ap							ae	~ 45 HRC SKD61 • NAK55 • NAK80 • HPMI		45 ~ 55 HRC SKD61 • STAVAX • HPM38		55 ~ 65 HRC Hardened Steel	
			R0,05	R0,1	R0,2	R0,3	R0,5	R1	ap = 120%		ae = 120%	ap = 100%	ae = 100%	ap = 60%	ae = 80%	
									S (min <sup>-1</sup> )		F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	
1,5	0°	12	-	-	0,012	0,018	-	-	0,270	13.500	900	12.500	790	10.500	550	
1,5	0°	16	-	-	0,007	0,01	-	-	0,112	9.150	525	8.650	460	7.150	320	
1,5	1°	10	-	0,019	0,039	0,049	-	-	0,450	18.500	1.500	17.500	1.300	14.500	905	
1,5	1°	15	-	0,015	0,03	0,037	-	-	0,405	17.000	1.150	16.000	1.000	13.500	705	
1,5	1°	20	-	0,01	0,02	0,025	-	-	0,270	15.500	1.100	15.000	970	12.000	675	
1,5	1°	25	-	0,008	0,008	0,01	-	-	0,135	14.500	950	13.500	835	11.500	580	
1,5	1°	30	-	0,003	0,006	0,007	-	-	0,067	13.500	840	12.500	740	10.500	515	
1,5	3°	10	-	0,02	0,04	0,05	-	-	0,450	18.500	1.550	17.500	1.350	14.500	940	
1,5	3°	15	-	0,02	0,04	0,05	-	-	0,450	17.000	1.450	16.000	1.250	13.500	880	
2	0°	8	-	0,02	0,04	0,06	0,075	-	0,600	13.000	1.450	13.000	1.300	11.500	1.000	
2	0°	10	-	0,016	0,032	0,048	0,06	-	0,510	12.000	1.300	12.000	1.150	11.000	905	
2	0°	12	-	0,01	0,02	0,03	0,037	-	0,420	11.500	1.150	11.500	1.050	10.000	810	
2	0°	16	-	0,006	0,012	0,018	0,022	-	0,360	10.000	900	10.000	800	8.900	630	
2	0°	20	-	0,004	0,008	0,012	0,015	-	0,180	9.300	730	9.300	650	8.250	510	
2	0°	25	-	0,002	0,004	0,007	0,009	-	0,120	8.600	625	8.600	560	7.650	440	
2	1°	15	-	0,018	0,036	0,046	0,064	-	0,600	13.500	1.450	13.500	1.300	12.000	1.000	
2	1°	20	-	0,015	0,03	0,037	0,052	-	0,540	13.000	1.300	13.000	1.150	11.500	910	
2	1°	25	-	0,012	0,024	0,03	0,04	-	0,390	12.000	1.150	12.000	1.050	11.000	810	
2	1°	30	-	0,01	0,02	0,025	0,03	-	0,240	11.500	1.050	11.500	920	10.000	720	
2	1°	40	-	0,006	0,012	0,015	0,02	-	0,090	10.000	840	10.000	750	8.900	590	
2	1°	50	-	0,005	0,01	0,01	0,01	-	0,060	9.300	730	9.300	650	8.250	510	
2	3°	15	-	0,02	0,04	0,06	0,075	-	0,600	13.500	1.500	13.500	1.350	12.000	1.050	
2	3°	20	-	0,02	0,04	0,06	0,075	-	0,600	13.000	1.450	13.000	1.300	11.500	1.000	
2,5	0°	10	-	-	0,04	-	0,075	-	0,750	11.500	1.600	10.500	1.200	9.150	1.000	
2,5	0°	20	-	-	0,02	-	0,037	-	0,450	8.900	1.000	8.000	740	7.150	630	
2,5	0°	30	-	-	0,006	-	0,011	-	0,150	7.650	700	6.850	520	6.100	445	
3	0°	8	-	-	0,04	-	-	-	0,900	9.550	1.500	8.600	1.150	7.650	825	
3	0°	12	-	-	0,04	0,06	0,075	-	0,900	9.550	1.500	8.600	1.150	7.650	825	
3	0°	16	-	-	0,028	0,042	0,052	-	0,720	8.500	1.200	7.650	910	6.800	660	
3	0°	20	-	-	0,018	0,027	0,033	-	0,612	7.400	985	6.700	750	5.950	545	
3	0°	25	-	-	0,012	0,018	0,022	-	0,540	7.100	830	6.400	635	5.700	460	
3	0°	30	-	-	0,008	0,012	0,015	-	0,270	6.900	755	6.200	575	5.500	420	
3	0°	35	-	-	0,006	0,009	0,011	-	0,180	6.350	655	5.700	500	5.100	365	
3	1°	15	-	-	0,04	-	0,075	-	0,900	10.500	1.650	9.550	1.250	8.500	920	
3	1°	20	-	-	0,039	-	0,07	-	0,900	9.950	1.500	8.950	1.150	7.950	830	
3	1°	30	-	-	0,03	-	0,05	-	0,810	9.550	1.350	8.600	1.000	7.650	745	
3	1°	40	-	-	0,022	-	0,04	-	0,522	8.900	1.150	8.000	890	7.150	650	
3	1°	50	-	-	0,016	-	0,03	-	0,297	8.050	980	7.250	750	6.450	545	
3	1°	60	-	-	0,012	-	0,02	-	0,135	7.400	870	6.700	660	5.950	480	
4	0°	16	-	-	0,04	0,06	0,075	0,12	1,200	7.150	2.050	6.450	1.550	5.000	965	
4	0°	20	-	-	0,032	0,048	0,06	0,2	1,020	6.750	1.950	6.100	1.450	4.750	910	
4	0°	25	-	-	0,02	0,03	0,037	0,06	0,816	5.950	1.700	5.350	1.300	4.150	800	
4	0°	30	-	-	0,014	0,021	0,026	0,04	0,744	5.550	1.600	5.000	1.200	3.900	750	
4	0°	40	-	-	0,008	0,012	0,015	0,024	0,360	5.150	1.500	4.650	1.100	3.600	695	
4	0°	50	-	-	0,004	0,007	0,009	0,014	0,216	4.550	1.300	4.100	980	3.150	610	

1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication/mist coolant) is recommended.
3. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machineshape, cutting amount, rigidity of the machine or work holding condition etc., please adjust the speed, feed and the depth of cut.
4. Adjust the speed, feed rate, and depth of cut if chattering, vibration or abnormal grinding sounds occur.
5. Helical or ramp milling is recommended during the approach of a Z cut.
6. Adjust the speed, feed rate, and the depth of the cut according to the shape of the work, rigidity of the machine, and how the work is held.







# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## DG-CPR

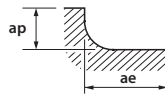
### Roughing

R	Graphite					
	S (min <sup>-1</sup> )		F (mm/min)		ap (mm)	pf (mm)
	short	long	short	long		
0,5 x R0,1 x 0° x 4	20.000	16.000	720	575	0,05	0,24
0,5 x R0,1 x 0° x 6	20.000	16.000	720	575	0,05	0,24
1 x R0,1 x 0° x 10	16.000	12.000	1.150	865	0,1	0,48
2 x R0,2 x 0° x 10	16.000	12.000	2.050	1.500	0,3	1,28
2 x R0,2 x 0° x 20	11.000	8.000	1.400	1.000	0,18	1,2
4 x R0,3 x 0° x 40	12.000	8.000	3.450	2.300	0,35	2,8
4 x R0,5 x 0° x 25	12.000	8.000	2.950	1.870	0,4	3
4 x R0,5 x 0° x 40	12.000	8.000	3.450	2.300	0,35	3
4 x R1 x 0° x 40	12.000	8.000	3.450	2.300	0,35	3
6 x R0,3 x 0° x 30	12.000	8.000	3.450	2.300	1,5	4,8
6 x R0,5 x 0° x 30	12.000	7.000	4.300	2.500	1,5	4
6 x R1 x 0° x 30	12.000	7.000	4.300	2.500	1,5	3,2
8 x R0,3 x 0° x 100	5.000	3.500	2.000	800	2	4,2
8 x R0,5 x 0° x 32	10.000	7.000	3.800	2.650	2	5,6
8 x R0,5 x 0° x 100	5.000	3.500	2.000	800	2	3,6
8 x R1 x 0° x 100	5.000	3.500	2.000	800	2	3
10 x R0,5 x 0° x 40	8.000	4.000	3.050	1.500	2,5	7,2
10 x R1 x 0° x 40	8.000	4.000	3.050	1.500	2,5	6,4
12 x R1 x 0° x 48	6.000	3.000	2.300	1.150	3	8

### Finishing

R	Graphite					
	S (min <sup>-1</sup> )		F (mm/min)		ap (mm)	pf (mm)
	short	long	short	long		
0,5 x R0,1 x 0° x 4	20.000	16.000	600	480	0,05	0,12
0,5 x R0,1 x 0° x 6	20.000	16.000	600	480	0,05	0,12
1 x R0,1 x 0° x 10	16.000	12.000	960	720	0,08	0,24
2 x R0,2 x 0° x 10	16.000	12.000	1.450	1.100	0,08	0,64
2 x R0,2 x 0° x 20	11.000	8.000	990	720	0,08	0,64
4 x R0,3 x 0° x 40	12.000	8.000	2.450	1.650	0,08	1,4
4 x R0,5 x 0° x 25	12.000	8.000	2.180	1.180	0,32	1,5
4 x R0,5 x 0° x 40	12.000	8.000	2.410	1.650	0,08	1,7
4 x R1 x 0° x 40	12.000	8.000	2.410	1.650	0,08	2
6 x R0,3 x 0° x 30	12.000	8.000	2.410	1.650	0,15	2,4
6 x R0,5 x 0° x 30	12.000	7.000	3.050	1.800	0,2	2
6 x R1 x 0° x 30	12.000	7.000	3.050	1.800	0,4	1,6
8 x R0,3 x 0° x 100	5.000	3.500	1.500	500	0,1	2
8 x R0,5 x 0° x 32	10.000	7.000	2.700	1.900	0,2	2,8
8 x R0,5 x 0° x 100	5.000	3.500	1.500	500	0,1	1,4
8 x R1 x 0° x 100	5.000	3.500	1.500	500	0,2	1
10 x R0,5 x 0° x 40	8.000	4.000	2.200	1.100	0,2	4,4
10 x R1 x 0° x 40	8.000	4.000	2.200	1.100	0,4	3,2
12 x R1 x 0° x 48	6.000	3.000	1.650	815	0,4	4

Max cutting depth



Set the diagonal plunge angle to be approximately 0,5° and 1°

1. Adjust the speed, the feed rate, and the depth of cut to suit your operating conditions, such as the milling shape, machine rigidity, tool holder rigidity, and work holding force.
2. If you are unable to raise the speed and feed rate higher than those indicated in the table above, lower the speed and feed rate using the same ratio.
3. If the workpiece gets chipped or if the operation requires a higher level of milling precision, lower the feed rate as necessary.
4. Depending on the shape, if the workpiece chatters, lower the speed and feed rate using the same ratio.
5. To mill graphite, use a dedicated milling machine. To prevent inhalation of dust, use a dust collector and a dust mask when working around graphite.
6. During milling, keep the runout at the tip of the end mill to be less than 0.01 mm.
7. To achieve efficient finishing, the feed rate may be adjusted as high as triple the rate.
8. For high-efficiency machining, lower the feed rate as far down as 30% for high-load operations such as slotting. This can minimize the amount of cutting remnants resulting from the flexing of the tool.
9. If gouging occurs while milling a flat area, raise the speed.
10. If a cut involves the shaping of a corner, use the corner radius process of the program, or adjust the speed so that it would not cause chattering, and reduce the speed at the corner at the same time (by approximately 60%).



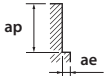
# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPS-CPR

Regular milling



			max. depth of cut 							~ 45 HRC SKD61 • NAK55 • NAK80 • HPMI		45 ~ 55 HRC SKD61 • STAVAX • HPM38		55 ~ 65 HRC Hardened Steel	
Ø	α°	l1	ap						ae	ap = 120%	ae = 120%	ap = 100%	ae = 100%	ap = 60%	ae = 80%
			R0,05	R0,1	R0,2	R0,3	R0,5	R1		S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	0°	4	0,01	0,02	0,04	0,05	-	-	0,300	23.000	1.300	20.000	1.050	17.000	755
1	0°	4	-	-	-	-	-	-	0,300	23000	1300	20000	1050	17000	755
1	0°	6	0,005	0,01	0,02	0,025	-	-	0,210	20.500	1.050	18.000	835	15.500	605
1	0°	6	0,01	0,02	0,04	0,05	-	-	0,300	25.500	1.250	22.500	1.150	19.000	840
1,5	0°	6	-	-	0,04	0,06	-	-	0,450	17.000	1.450	16.000	1.250	13.500	880
1,5	0°	10	-	-	0,018	0,027	-	-	0,292	14.500	1.000	13.500	900	11.000	625
1,5	0°	16	-	-	0,007	0,01	-	-	0,112	9.150	525	8.650	460	7.150	320
2	0°	8	-	0,02	0,04	0,06	0,075	-	0,600	13.000	1.450	13.000	1.300	11.500	1.000
2	0°	10	-	0,016	0,032	0,048	0,06	-	0,510	12.000	1.300	12.000	1.150	11.000	905
2	0°	12	-	0,01	0,02	0,03	0,037	-	0,420	11.500	1.150	11.500	1.050	10.000	810
3	0°	8	-	-	0,04	-	-	-	0,900	9.550	1.500	8.600	1.150	7.650	825
3	0°	12	-	-	0,04	0,06	0,075	-	0,900	9.550	1.500	8.600	1.150	7.650	825
3	0°	16	-	-	0,028	0,042	0,052	-	0,720	8.500	1.200	7.650	910	6.800	660
4	0°	16	-	-	0,04	0,06	0,075	0,12	1,200	7.150	2.050	6.450	1.550	5.000	965
4	0°	20	-	-	0,032	0,048	0,06	0,2	1,020	6.750	1.950	6.100	1.450	4.750	910

1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication/mist coolant) is recommended.
3. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machineshape, cutting amount, rigidity of the machine or work holding condition etc., please adjust the speed, feed and the depth of cut.
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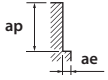
# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPS-CPR

Side milling (Contour line finish)

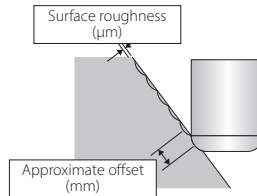


		max. depth of cut 								~ 45 HRC SKD61 • NAK55 • NAK80 • HPM1		45 ~ 55 HRC SKD61 • STAVAX • HPM38		55 ~ 65 HRC Hardened Steel	
Ø	α°	l1	ap						ae	ap = 120%	ae = 120%	ap = 100%	ae = 100%	ap = 60%	ae = 80%
			R0,05	R0,1	R0,2	R0,3	R0,5	R1		S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	0°	4	0,006	0,015	0,02	0,03	-	-	0,030	27.000	1.500	24.500	1.250	22.500	995
1	0°	6	0,006	0,015	0,02	0,03	-	-	0,027	24.000	1.200	21.500	1.000	20.000	800
1,5	0°	6	-	-	0,02	0,03	-	-	0,045	21.000	1.750	18.500	1.450	16.000	1.050
1,5	0°	10	-	-	0,018	0,027	-	-	0,036	17.500	1.250	15.500	1.050	13.500	760
1,5	0°	16	-	-	0,008	0,012	-	-	0,022	11.000	640	10.000	530	8.650	390
2	0°	8	-	0,015	0,02	0,03	0,05	-	0,060	16.500	1.850	16.000	1.600	15.000	1.350
2	0°	10	-	0,015	0,02	0,03	0,05	-	0,060	15.500	1.650	15.500	1.450	14.500	1.200
2	0°	12	-	0,015	0,02	0,03	0,05	-	0,054	14.500	1.500	14.500	1.300	13.500	1.050
3	0°	8	-	-	0,02	-	-	-	0,080	12.000	2.000	11.000	1.400	10.000	1.100
3	0°	12	-	-	0,02	0,03	0,05	-	0,080	12.000	2.000	11.000	1.400	10.000	1.100
3	0°	16	-	-	0,02	0,03	0,05	-	0,080	10.500	1.600	9.600	1.150	9.000	875
4	0°	16	-	-	0,02	0,03	0,05	0,08	0,080	7.900	2.500	7.150	2.050	6.450	1.450
4	0°	20	-	-	0,02	0,03	0,05	0,08	0,080	7.450	2.400	6.750	1.950	6.100	1.350

### Approximate offset (mm)



Target surface roughness (µm)														
Corner Radius R (mm)	0,1	0,25	0,5	0,75	1	1,25	1,5	1,75	2	2,5	3	3,5	4	5
R 0,05	0,006	0,01	0,014	0,017	0,02	0,022	0,024	0,026	0,028	-	-	-	-	-
R 0,1	0,009	0,014	0,02	0,024	0,028	0,032	0,035	0,037	0,04	0,045	0,049	-	-	-
R 0,2	0,012	0,02	0,028	0,035	0,04	0,045	0,049	0,053	0,057	0,063	0,07	0,075	0,08	0,9
R 0,3	0,015	0,025	0,035	0,042	0,049	0,055	0,06	0,065	0,07	0,077	0,085	0,092	0,098	0,11
R 0,5	0,02	0,032	0,045	0,055	0,065	0,07	0,078	0,084	0,09	0,1	0,11	0,118	0,125	0,141
R 1	0,028	0,045	0,063	0,078	0,09	0,1	0,11	0,118	0,125	0,142	0,155	0,168	0,18	0,2



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPL-CPR

Regular milling



Ø	α°	l1	max. depth of cut							< 45 HRC ap=120% ae=120%		45 - 55 HRC ap=100% ae=120%		55 - 65 HRC ap=60% ae=80%	
			R0,1	R0,2	R0,3	ap	R1	R2	ae	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	0°	4	0,020	0,04	0,050	-	-	-	0,300	23.000	1.300	20.000	1.050	17.000	755
1	0°	6	0,010	0,02	0,025	-	-	-	0,210	20.500	1.050	18.000	835	15.500	605
1	0°	8	0,006	0,012	0,015	-	-	-	0,180	18.000	780	15.500	650	13.500	470
1	0°	10	-	0,008	0,010	-	-	-	0,090	16.500	650	14.500	530	12.500	380
2	0°	6	-	0,040	-	0,075	-	-	0,600	15.000	1680	15.000	1500	11.500	1.000
2	0°	8	-	0,040	-	0,075	-	-	0,600	13.000	1.450	13.000	1.300	11.500	1.000
2	0°	10	-	0,032	-	0,060	-	-	0,510	12.000	1.300	12.000	1.150	11.000	905
2	0°	12	-	0,020	-	0,037	-	-	0,420	11.500	1.150	11.500	1.050	10.000	810
2	0°	16	-	0,012	-	0,022	-	-	0,360	10.000	900	10.000	800	8.900	630
2	0,9°	20	-	-	-	0,052	-	-	0,540	13.000	1.300	13.000	1.150	11.500	910
2	0,9°	30	-	-	-	0,030	-	-	0,240	11.500	1.050	11.500	920	10.000	720
3	0°	6	-	0,044	-	0,083	-	-	0,990	11.700	2000	10.500	1530	7.650	825
3	0°	8	-	0,040	-	0,075	-	-	0,900	9.550	1.500	8.600	1.150	7.650	825
3	0°	10	-	0,040	-	0,075	-	-	0,900	9.550	1.500	8.600	1.150	7.650	825
3	0°	12	-	0,040	-	0,075	-	-	0,900	9.550	1.500	8.600	1.150	7.650	825
3	0°	16	-	0,028	-	0,052	-	-	0,720	8.500	1.200	7.650	910	6.800	660
3	0,9°	20	-	-	-	0,070	0,09	-	0,900	9.950	1.500	8.950	1.150	7.950	830
3	0,9°	30	-	-	-	0,050	0,07	-	0,810	9.550	1.350	8.600	1.000	7.650	745
3	0,9°	40	-	-	-	0,040	0,05	-	0,522	8.900	1.150	8.000	890	7.150	650
3	1,4°	20	-	-	-	0,090	0,13	-	0,900	9.950	1.690	8.950	1.350	7.950	950
3	1,4°	30	-	-	-	0,070	0,13	-	0,810	9.550	1.550	8.600	1.200	7.650	850
3	1,4°	40	-	-	-	-	0,13	-	0,522	8.900	1.350	8.000	1.040	7.150	700
4	0°	10	-	-	-	-	0,13	-	1,320	8.750	2.770	7.900	2080	5.750	1.250
4	0°	12	-	-	-	0,075	0,12	-	1,200	8.350	2.400	7.500	1800	5.400	1.080
4	0°	16	-	-	-	0,075	0,12	-	1,200	7.150	2.050	6.450	1.550	5.000	965
4	0°	20	-	-	-	0,060	0,2	-	1,020	6.750	1.950	6.100	1.450	4.750	910
4	0,9°	30	-	-	-	0,050	0,09	-	1,120	7.550	1.500	7.150	1.300	6.400	950
4	0,9°	40	-	-	-	0,040	0,09	-	0,900	7.200	1.350	6.750	1.150	5.950	850
4	0,9°	50	-	-	-	0,030	0,07	-	0,810	7.150	1.300	6.600	1.050	5.800	750
4	0,9°	60	-	-	-	-	0,05	-	0,522	6.800	1.150	6.400	950	5.600	700
4	1,4°	30	-	-	-	0,070	0,13	-	1,120	7.550	1.500	7.150	1.300	6.400	950
4	1,4°	40	-	-	-	0,060	0,13	-	0,900	7.200	1.400	6.750	1.150	5.950	850
6	0°	12	-	-	-	0,083	0,13	-	1,980	6.130	2.900	5.550	2200	3.850	900
6	0°	16	-	-	-	0,075	0,12	-	1,800	5.000	2.170	4.540	1630	3.600	800
6	0°	20	-	-	-	0,075	0,12	-	1,800	5.000	2.170	4.540	1630	3.350	700
6	0°	25	-	-	-	0,075	0,12	-	1,800	5.000	2.170	4.540	1630	3.180	650
6	0,9°	50	-	-	-	0,030	0,13	-	1,680	5.300	1.100	5.050	950	4.250	700
6	0,9°	60	-	-	-	0,030	0,09	-	1,200	5.150	1.030	4.900	900	3.950	600
6	0,9°	70	-	-	-	0,020	0,07	-	1,200	4.950	950	4.750	800	3.800	550
6	0,9°	80	-	-	-	-	0,07	-	1,020	4.750	850	4.500	720	3.750	500
8	0,9°	60	-	-	-	0,070	0,13	-	2,160	4.350	950	4.000	800	3.800	650
8	0,9°	80	-	-	-	0,050	0,09	0,2	1,920	4.150	830	3.800	700	3.550	550

## Offset



Corner Radius R (mm)	roughness (µm)													
	0,10	0,25	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,25	4,00	5,00	
R 0,1	0,009	0,014	0,024	0,028	0,032	0,035	0,037	0,040	0,045	0,049	-	-	-	
R 0,2	0,012	0,020	0,035	0,040	0,045	0,049	0,053	0,057	0,063	0,070	0,075	0,080	0,900	
R 0,3	0,015	0,025	0,042	0,049	0,055	0,060	0,065	0,070	0,077	0,085	0,092	0,098	0,110	
R 0,5	0,020	0,032	0,055	0,065	0,070	0,078	0,084	0,090	0,100	0,110	0,118	0,125	0,141	
R 1	0,028	0,045	0,078	0,090	0,100	0,110	0,111	0,125	0,142	0,155	0,168	0,180	0,200	

Surface roughness (µm)

Approximate offset (mm)

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPL-CPR

Side milling (Contour line finish)



											< 45 HRC ap=120% ae=120%		45 - 55 HRC ap=100% ae=120%		55 - 65 HRC ap=60% ae=80%	
D	α°	l1	max. depth of cut							ae	S (mm/min)	F (mm/min)	S (mm/min)	F (mm/min)	S (mm/min)	F (mm/min)
			R0,1	R0,2	R0,3	ap R0,5	R1	R2								
1	0°	4	0,015	0,020	0,03	-	-	-	0,030	27.000	1.500	24.500	1.250	22.500	995	
1	0°	6	0,015	0,020	0,03	-	-	-	0,027	24.000	1.200	21.500	1.000	20.000	800	
1	0°	8	0,009	0,012	0,018	-	-	-	0,021	21.000	950	19.000	790	17.500	620	
1	0°	10	-	0,008	0,012	-	-	-	0,015	19.500	770	17.500	640	16.500	505	
2	0°	6	-	0,020	-	0,05	-	-	0,060	16.500	1850	16.000	1.600	15.000	1.350	
2	0°	8	-	0,020	-	0,05	-	-	0,060	16.500	1.850	16.000	1.600	15.000	1.350	
2	0°	10	-	0,020	-	0,05	-	-	0,060	15.500	1.650	15.500	1.450	14.500	1.200	
2	0°	12	-	0,020	-	0,05	-	-	0,054	14.500	1.500	14.500	1.300	13.500	1.050	
2	0°	16	-	0,012	-	0,03	-	-	0,042	13.000	1.150	12.500	1.000	12.000	830	
2	0,9°	20	0,050	-	-	-	-	-	0,060	16.500	1.650	16.000	1.450	15.000	1.200	
2	0,9°	30	0,040	-	-	-	-	-	0,048	14.500	1.300	14.500	1.150	13.500	950	
3	0°	6	-	0,020	-	0,05	-	-	0,080	12.600	2.100	11.400	1.500	10.000	1.100	
3	0°	8	-	0,020	-	0,05	-	-	0,080	12.000	2.000	11.000	1.400	10.000	1.100	
3	0°	10	-	0,020	-	0,05	-	-	0,080	12.000	2.000	11.000	1.400	10.000	1.100	
3	0°	12	-	0,020	-	0,05	-	-	0,080	12.000	2.000	11.000	1.400	10.000	1.100	
3	0°	16	-	0,020	-	0,05	-	-	0,080	10.500	1.600	9.600	1.150	9.000	875	
3	0,9°	20	0,050	0,090	-	-	-	-	0,080	12.500	2.000	11.500	1.450	10.500	1.100	
3	0,9°	30	0,050	0,070	-	-	-	-	0,080	12.000	1.800	11.000	1.300	10.000	985	
3	0,9°	40	0,045	0,070	-	-	-	-	0,064	11.000	1.550	10.000	1.100	9.450	860	
3	1,4°	20	0,090	0,130	-	-	-	-	0,080	12.500	2.250	11.500	1.750	10.500	1.250	
3	1,4°	30	0,070	0,130	-	-	-	-	0,080	12.000	2.050	11.000	1.550	10.000	1.100	
3	1,4°	40	-	0,130	-	-	-	-	0,064	11.000	1.750	10.000	1.300	9.450	950	
4	0°	10	-	-	-	-	0,08	-	0,080	8.300	2.700	7.550	2.200	7.600	1.650	
4	0°	12	-	-	-	-	0,08	0,08	0,080	7.900	2.500	7.150	2.050	7.200	1.550	
4	0°	16	-	-	-	-	0,08	0,08	0,080	7.900	2.500	7.150	2.050	6.450	1.450	
4	0°	20	-	-	-	0,05	0,08	-	0,080	7.450	2.400	6.750	1.950	6.100	1.350	
4	0,9°	30	-	-	-	0,050	0,090	-	0,106	9.950	1.900	9.150	1.450	8.350	1.100	
4	0,9°	40	-	-	-	0,040	0,090	-	0,106	9.600	1.750	8.800	1.350	8.050	1.000	
4	0,9°	50	-	-	-	0,030	0,070	-	0,085	9.500	1.600	8.500	1.200	7.750	850	
4	0,9°	60	-	-	-	-	0,050	-	0,085	9.150	1.450	8.350	1.100	7.550	750	
4	1,4°	30	-	-	-	0,070	0,130	-	0,106	9.950	2.100	9.150	1.650	8.350	1.100	
4	1,4°	40	-	-	-	0,060	0,130	-	0,106	9.600	1.950	8.800	1.500	8.050	950	
6	0°	12	-	-	-	0,05	0,08	-	0,100	5.500	2.650	5.050	2.150	5.050	1.800	
6	0°	16	-	-	-	0,05	0,08	-	0,100	5.250	2.500	4.750	2.050	4.750	1.750	
6	0°	20	-	-	-	0,05	0,08	-	0,100	5.250	2.500	4.750	2.050	4.500	1.750	
6	0°	25	-	-	-	0,05	0,08	-	0,100	4.950	2.350	4.500	1.950	4.250	1.600	
6	0,9°	50	-	-	-	0,030	0,130	-	0,130	7.450	1.700	6.900	1.400	6.350	950	
6	0,9°	60	-	-	-	0,030	0,090	-	0,130	7.200	1.600	6.700	1.300	6.150	850	
6	0,9°	70	-	-	-	0,020	0,070	-	0,130	7.050	1.500	6.500	1.200	5.900	750	
6	0,9°	80	-	-	-	-	0,070	-	0,100	6.900	1.400	6.350	1.100	5.850	700	
8	0,9°	60	-	-	-	0,070	0,130	-	0,192	6.350	1.550	5.950	1.250	5.550	900	
8	0,9°	80	-	-	-	0,050	0,090	0,2	0,160	5.950	1.300	5.550	1.050	5.150		

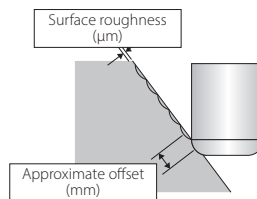
Milling | Endmills

### Offset



roughness (µm)														
Corner Radius R (mm)	0,10	0,25	0,75	1,00	1,25	1,50	1,75	2,00	2,50	3,00	3,25	4,00	5,00	
R 0,1	0,009	0,014	0,024	0,028	0,032	0,035	0,037	0,040	0,045	0,049	-	-	-	
R 0,2	0,012	0,020	0,035	0,040	0,045	0,049	0,053	0,057	0,063	0,070	0,075	0,080	0,900	
R 0,3	0,015	0,025	0,042	0,049	0,055	0,060	0,065	0,070	0,077	0,085	0,092	0,098	0,110	
R 0,5	0,020	0,032	0,055	0,065	0,070	0,078	0,084	0,090	0,100	0,110	0,118	0,125	0,141	
R 1	0,028	0,045	0,078	0,090	0,100	0,110	0,111	0,125	0,142	0,155	0,168	0,180	0,200	

Cutting conditions



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPL-CPR-DIA

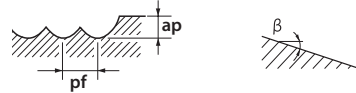
GF							
Ø	l1	Vc	S (min <sup>-1</sup> )	F (mm/min)	ap	ae	fz (mm)
4	80	75	6.000	840	0,75	1,60	0,07
4	110	50	4.000	560	0,75	1,60	0,07
6	100	75	4.000	720	1,10	3,20	0,09
6	150	57	3.000	540	1,10	3,20	0,09
8	100	101	4.000	760	1,50	4,80	0,10
8	150	75	3.000	570	1,50	4,80	0,10

## WXL-EBD

Regular milling

R	Cu				~32 HRC FC250 • S5400 • S55C • NAK55				33~41 HRC SKT • SKD61 • NAK80 • HPM1 • DH				42~50 HRC SKT • SKD61 • NAK80 • HPM1 • DH			
	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)
R 0,05	40.000	150	0,003	0,005	32.000	75	0,005	0,005	32.000	50	0,005	0,005	32.000	170	0,005	0,005
R 0,1	40.000	300	0,010	0,020	32.000	200	0,010	0,010	32.000	200	0,010	0,010	32.000	180	0,005	0,005
R 0,2	40.000	490	0,020	0,080	32.000	410	0,020	0,080	32.000	330	0,020	0,080	32.000	205	0,020	0,040
R 0,3	40.000	580	0,030	0,120	32.000	490	0,030	0,120	32.000	420	0,030	0,120	32.000	265	0,030	0,060
R 0,4	40.000	660	0,040	0,160	32.000	550	0,040	0,160	31.500	420	0,040	0,160	27.500	290	0,040	0,080
R 0,5	32.000	750	0,050	0,200	31.500	620	0,050	0,200	25.000	400	0,050	0,200	22.000	285	0,050	0,100
R 1	19.000	750	0,200	0,400	15.500	620	0,200	0,400	12.500	400	0,200	0,400	11.000	290	0,100	0,200
R 1,5	12.500	760	0,300	0,600	10.500	630	0,300	0,600	8.450	405	0,300	0,600	7.400	290	0,150	0,300
R 2	9.500	760	0,400	0,800	7.950	630	0,400	0,800	6.350	445	0,400	0,800	5.550	370	0,200	0,400
R 3	6.300	800	0,600	1,200	5.300	670	0,600	1,200	4.200	465	0,600	1,200	3.700	390	0,300	0,600
R 4	4.750	950	0,800	1,600	3.950	790	0,800	1,600	3.150	555	0,800	1,600	2.750	455	0,400	0,800
R 5	3.800	890	1,000	2,000	3.150	745	1,000	2,000	2.500	525	1,000	2,000	2.200	430	0,500	1,000
R 6	3.750	840	1,200	2,400	2.650	700	1,200	2,400	2.100	490	1,200	2,400	1.850	430	0,600	1,200
R 8	2.400	630	1,600	3,200	2.000	525	1,600	3,200	1.600	370	1,600	3,200	1.400	325	0,800	1,600
R 10	1.900	500	2,000	4,000	1.600	420	2,000	4,000	1.250	290	2,000	4,000	1.100	260	1,000	2,000

Max cutting depth

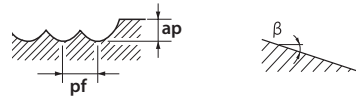


1. Use a rigid and precise machine and holder.
  2. Use a suitable cutting fluid with high smoke retardant properties.
  3. Refer to top the table above to set the milling conditions in accordance with the actual situation.
- \* When the length of tool extension from the machine is long, reduce the speed and feed.  
 \*\* When β is less than 15°, speed and feed in the above table can be increased 1,5 to 2 times.

## High speed milling

R	Cu				~32 HRC FC250 • S5400 • S55C • NAK55				33~41 HRC Hardened steel, pre-hardened steel				42~50 HRC Hardened steel, pre-hardened steel			
	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)
R 0,5	50.000	3.350	0,020	0,050	50.000	2.800	0,020	0,050	50.000	2.500	0,020	0,050	47.500	2.250	0,020	0,050
R 1	31.500	3.350	0,040	0,100	25.000	2.800	0,040	0,100	24.500	2.500	0,040	0,100	23.500	2.250	0,040	0,100
R 1,5	21.000	3.350	0,060	0,150	16.500	2.800	0,060	0,150	16.000	2.500	0,060	0,150	15.500	2.250	0,060	0,150
R 2	15.500	4.080	0,080	0,200	15.500	3.400	0,080	0,200	15.000	2.750	0,080	0,200	13.500	2.450	0,080	0,200
R 2,5	10.500	5.160	0,120	0,300	13.500	4.300	0,300	0,600	11.500	2.750	0,300	0,600	9.500	2.250	0,120	0,300
R 3	7.900	3.840	0,160	0,400	10.000	3.200	0,400	0,800	8.950	2.100	0,400	0,800	7.150	1.700	0,160	0,400
R 4	6.300	3.120	0,200	0,500	8.250	2.600	0,500	1,000	7.150	1.700	0,500	1,000	5.700	1.350	0,200	0,500
R 5	5.250	2.580	0,240	0,600	6.850	2.150	0,500	2,400	5.950	1.400	0,500	2,400	4.750	1.100	0,240	0,600
R 6	4.950	1.550	0,320	0,800	4.110	1.290	0,500	3,200	4.460	1.050	0,500	3,200	3.560	820	0,320	0,800
R 8	3.950	1.240	0,400	1,000	3.250	1.030	0,500	4,000	3.570	840	0,500	4,000	2.850	660	0,320	1,000

Max cutting depth



1. The indicated speeds and feeds are for high speed light milling with high speed/high precision machining centres.
2. We recommend using an air blow. If using cutting fluids, use a high quality fluid with smoke retardant properties.
3. Refer to top the table above to set the milling conditions in accordance with the actual situation.
4. When β is less than 15°, speed and feed in the above table can be increased 1.2 ~ 1.5 times



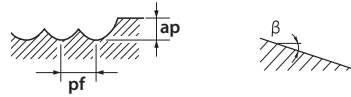
# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## WXL-HS-EBD

R	Copper • Copper Alloy				Mild Steel • Carbon Steel FC250 • SS400 • S55C ~32HRC				Hardened Steel • Prehardened Steel • Stainless Steel SKT • SKD61 • NAK55 • NAK80 • HPM1 • DH* • SUS304							
									33~41HRC				42~50HRC			
	S (min <sup>-1</sup> )	F (mm/min)	Depth of cut		S (min <sup>-1</sup> )	F (mm/min)	Depth of cut		S (min <sup>-1</sup> )	F (mm/min)	Depth of cut		S (min <sup>-1</sup> )	F (mm/min)	Depth of cut	
		ap	pf			ap	pf			ap	pf			ap	pf	
0.1	50.000	540	0,01	0,02	50.000	540	0,01	0,02	50.000	540	0,01	0,02	50.000	440	0,01	0,02
0.2	50.000	880	0,02	0,04	50.000	750	0,02	0,04	50.000	750	0,02	0,04	50.000	680	0,02	0,04
0.3	50.000	1.840	0,02	0,04	50.000	910	0,02	0,04	50.000	910	0,02	0,04	50.000	840	0,02	0,04
0.4	50.000	2.210	0,02	0,05	50.000	1.850	0,02	0,05	50.000	1.850	0,02	0,05	50.000	1.250	0,02	0,05
0.5	50.000	3.350	0,02	0,05	50.000	2.800	0,02	0,05	50.000	2.500	0,02	0,05	47.500	2.250	0,02	0,05
1	31.500	3.350	0,04	0,10	25.000	2.800	0,04	0,10	24.500	2.500	0,04	0,10	23.500	2.250	0,04	0,10
1.5	21.000	3.350	0,06	0,15	16.500	2.800	0,06	0,15	16.000	2.500	0,06	0,15	15.500	2.250	0,06	0,15
2	15.500	4.080	0,08	0,20	15.500	3.400	0,08	0,20	15.000	2.750	0,08	0,20	13.500	2.450	0,08	0,20
3	10.500	5.160	0,12	0,30	13.500	4.300	0,30	0,60	11.500	2.750	0,30	0,60	9.500	2.250	0,12	0,30
4	7.900	3.840	0,16	0,40	10.000	3.200	0,40	0,80	8.950	2.100	0,40	0,80	7.150	1.700	0,16	0,40
5	6.300	3.120	0,20	0,50	8.250	2.600	0,50	1,00	7.150	1.700	0,50	1,00	5.700	1.350	0,20	0,50
6	5.250	2.580	0,24	0,60	6.850	2.150	0,50	2,40	5.950	1.400	0,50	2,40	4.750	1.100	0,24	0,60

Depth of cut



1. The indicated speeds and feeds are for high speed light milling with high speed/high precision machining centers.
  2. Because tools can cause sparks, do not use flammable fluids.
  3. Use an air blow or a suitable cutting fluid with high smoke retardant properties.
  4. Refer to the table above to set the milling conditions in accordance with the actual situation.
- \*If your machine tool does not attain the indicated speed, operate it at the highest possible speed.

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## WXS-EBD / WXS-HS-EBD

High speed light milling

Ø	Tool Steel • Hardened Steel • Prehardened Steel ~45 HRC SKD • NAK80 • HPM50		Hardened Steel 45~55 HRC		Hardened Steel 55~60 HRC		Hardened Steel 60~65 HRC		Hardened Steel 65~70 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
R 0,5x1	50.000	3.700	50.000	3.700	50.000	3.100	50.000	2.600	47.500	2.400
R1x2	50.000	5.600	47.500	5.350	40.000	3.650	32.000	2.800	24.000	2.100
R1,5x3	41.500	6.200	32.000	4.800	26.500	3.350	21.000	2.550	16.000	1.900
R2x4	31.000	5.700	24.000	4.400	20.000	3.200	16.000	2.400	12.000	1.800
R2,5x5	25.000	5.450	19.000	4.000	16.000	2.850	13.000	2.150	9.550	1.600
R3x6	20.500	5.200	16.000	3.450	13.500	2.550	10.500	2.050	7.950	1.550
R4 x 8	15.500	4.450	12.000	3.050	9.950	2.250	7.950	1.800	5.950	1.350
R5x10	12.500	3.950	9.550	2.650	7.950	1.900	6.350	1.550	4.800	1.150
R6x12	10.500	3.700	7.950	2.500	6.650	1.600	5.300	1.350	4.000	995

Max cutting depth		Hardened Steel 45~55 HRC		Hardened Steel 55~60 HRC		Hardened Steel 60~65 HRC		Hardened Steel 65~70 HRC	
		ap	pf	ap	pf	ap	pf	ap	pf
		0,02D	0,05D	0,02D	0,05D	0,01D	0,05D		

1. Use a rigid and precise machine and holder.  
 2. We suggest using air blow or MQL (mist).  
 3. These milling conditions are for end mill where the tool extension length is 4 times the diameter of the end mill. When length of the tool extension from the machine is long, reduce the speed and feed and milling depth.  
 4. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machining shape, cutting amount, rigidity of the machine or work holding condition, etc., please adjust the speed, feed and the depth of cut. As a guideline in selecting end mills. To increase the depth of cut, use the FX Heavy Cutting Strong Ball Series (FX-HS-EBDS). To increase the feed rate, use the FX Multiple Flute Ball Series (FX-EBT, FXS-EBM).

## Regular milling

Ø	Tool Steel • Hardened Steel • Prehardened Steel ~45 HRC SKD • NAK80 • HPM50		Hardened Steel 45~55 HRC		Hardened Steel 55~60 HRC		Hardened Steel 60~65 HRC		Hardened Steel 65~70 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
R0,5	32.000	2.350	32.000	2.350	32.000	2.000	32.000	1.600	32.000	1450
R0,75	32.000	3.050	32.000	3.050	32.000	2.500	26.500	1.900	21.000	1400
R1	32.000	3.600	32.000	3.550	24.000	2.200	2.000	1.750	16.000	1250
R1,5	26.500	4.000	21.000	3.200	16.000	2.000	13.500	1.600	10.500	1200
R2	20.000	3.650	16.000	2.950	12.000	1.900	9.950	1.500	7.950	1150
R2,5	16.000	3.500	12.500	2.650	9.550	1.700	7.950	1.350	6.350	1000
R3	13.500	3.350	10.500	2.300	7.950	1.550	6.650	1.250	5.300	955
R4	9.950	2.850	7.950	2.050	5.950	1.350	4.950	1.050	4.000	830
R5	7.950	2.550	6.350	1.800	4.800	1.150	4.000	875	3.200	700
R6	6.650	2.400	5.300	1.650	4.000	955	3.300	795	2.650	635
R8	4.950	1.800	4.000	1.250	3.000	775	2.500	595	2.000	475
R10	4.000	1.450	3.200	1.000	2.400	620	2.000	475	1.600	380
R12,5	3.200	1.150	2.550	815	1.900	495	1.600	380	1.250	305

Max cutting depth		Hardened Steel 45~55 HRC		Hardened Steel 55~60 HRC		Hardened Steel 60~65 HRC		Hardened Steel 65~70 HRC	
		ap	pf	ap	pf	ap	pf	ap	pf
		0,05D	0,1D	0,03D	0,1D	0,02D	0,05D		
		ap max = 0,5mm		ap max = 0,5mm		ap max = 0,3mm			

1. Use a rigid and precise machine and holder.  
 2. We suggest using air blow or MQL (mist).  
 3. These milling conditions are for end mill where the tool extension length is 4 times the diameter of the end mill. When length of the tool extension from the machine is long, reduce the speed and feed and milling depth.  
 4. The above condition shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur depending on the machining shape, cutting amount, rigidity of the machine or work holding condition, etc., please adjust the speed, feed and the depth of cut. As a guideline in selecting end mills. To increase the depth of cut, use the FX Heavy Cutting Strong Ball Series (FX-HS-EBDS). To increase the feed rate, use the FX Multiple Flute Ball Series (FX-EBT, FXS-EBM).



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## CAP-EBD

Regular milling

Ø	AL		AC		Magnesium Alloy Copper Alloy	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
	A7075		<Si 13%		AZ91 • AZ80A • C1100	
R 0,5 X 1	32.000	845	32.000	845	32.000	845
R 1 X 2	31.800	1.550	31.800	1.550	23.900	1.150
R 1,5 X 3	21.200	1.550	21.200	1.550	15.900	1.150
R 2 X 4	15.900	1.550	15.900	1.550	11.900	1.150
R 3 X 6	10.600	1.600	10.600	1.600	7.950	1.150
R 4 X 8	7.950	1.950	7.950	1.950	5.950	1.450
R 5 X 10	6.350	1.750	6.350	1.750	4.750	1.300
R 6 X 12	5.300	1.650	5.300	1.650	3.950	1.200
R 8 X 16	3.950	1.500	3.950	1.500	2.950	1.150
R10 X 20	3.150	1.350	3.150	1.350	2.350	1.000

1. Use a high rigidity machine set up.
2. Use soluble oil.
3. When chattering occurs, reduce the speed and feed simultaneously.

## High speed milling

Ø	AL		AC		Cu	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
	A7075		<Si 13%		C1100	
R 0,5 X 1	50.000	1.200	50.000	1.200	50.000	1.200
R 1 X 2	50.000	2.200	47.700	2.100	39.800	1.750
R 1,5 X 3	50.000	3.300	31.800	2.100	26.500	1.750
R 2 X 4	39.800	3.500	23.800	2.100	19.900	1.750
R 3 X 6	26.500	3.550	15.900	2.150	13.000	1.800
R 4 X 8	19.500	4.500	11.900	2.650	9.900	2.250
R 5 X 10	15.500	4.050	9.550	2.450	7.950	2.000
R 6 X 12	13.000	3.750	7.950	2.250	6.600	1.900
R 8 X 16	9.900	3.550	5.950	2.100	4.950	1.800
R10 X 20	7.950	3.200	4.750	1.900	3.950	1.600

1. Use a high rigidity machine set up.
2. Use soluble oil.
3. When chattering occurs, reduce the speed and feed simultaneously.



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## DG-EBD

Roughing

		Graphite					
R	mm	S (min <sup>-1</sup> )		F (mm/min)		ap (mm)	pf (mm)
		short	long	short	long		
R 2	16~40	20.000	11.000	3.150	1.800	0,40	1,20
R 3	24~36	20.000	9.600	4.500	2.100	0,60	1,80
R 4	32~56	16.000	7.200	3.900	1.800	0,80	2,40
R 5	40~60	12.500	5.700	3.000	1.350	1,00	3,00
R 6	48~84	10.500	4.800	2.550	1.100	1,20	3,60

Finishing

		Graphite					
R	mm	S (min <sup>-1</sup> )		F (mm/min)		ap (mm)	pf (mm)
		short	long	short	long		
R 2	16~40	20.000	11.000	2.100	1.200	0,12	0,12
R 3	24~36	20.000	9.600	3.000	1.400	0,18	0,18
R 4	32~56	16.000	7.200	2.600	1.200	0,22	0,22
R 5	40~60	12.500	5.700	2.000	900	0,26	0,26
R 6	48~84	10.500	4.800	1.700	750	0,30	0,30



Set the diagonal plunge angle to be approximately 0,5° and 1°

1. Adjust the speed, the feed rate, and the depth of cut to suit your operating conditions, such as the milling shape, machine rigidity, tool holder rigidity, and work holding force.
2. If you are unable to raise the speed and feed rate higher than those indicated in the table above, lower the speed and feed rate using the same ratio.
3. If the workpiece gets chipped or if the operation requires a higher level of milling precision, lower the feed rate as necessary.
4. Depending on the shape, if the workpiece chatters, lower the speed and feed rate using the same ratio.
5. To mill graphite, use a dedicated milling machine. To prevent inhalation of dust, use a dust collector and a dust mask when working around graphite.
6. During milling, keep the runout at the tip of the end mill to be less than 0.01 mm.
7. To achieve efficient finishing, the feed rate may be adjusted as high as triple the rate.
8. For high-efficiency machining, lower the feed rate as far down as 30% for high-load operations such as slotting. This can minimize the amount of cutting remnants resulting from the flexing of the tool.
9. If gouging occurs while milling a flat area, raise the speed.
10. If a cut involves the shaping of a corner, use the corner radius process of the program, or adjust the speed so that it would not cause chattering, and reduce the speed at the corner at the same time (by approximately 60%).

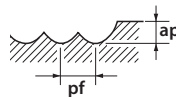
## FX-SS-EBD

Regular milling

Ø	GG GG-GGG		C≤0,2% S55C • SS400 ~750 N/mm <sup>2</sup>		~30 HRC SKD • SKS • SNCM		30~38 HRC NAK55 • HPMI • SKT		38~45 HRC SUS SUS304 • X210CR12 X40CRMV51		45~55 HRC HRS		55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
R 3 X 6	7.950	1.050	6.350	855	5.300	670	4.200	465	3.700	390	3.150	295	2.350	185
R 4 X 8	5.950	1.300	4.750	1.050	3.950	790	3.150	555	2.750	455	2.350	325	1.750	210
R 5 X 10	4.750	1.200	3.800	960	3.150	745	2.500	525	2.200	430	1.900	335	1.400	210
R 6 X 12	3.950	1.100	3.150	890	2.650	700	2.100	490	1.850	430	1.550	310	1.150	195

Max cutting depth

ap	ae
1,2D	0,01D



ap	pf
0,05D	0,1D

1. Use a rigid and precise machine and holder.
2. Please use a suitable fluid with high smoke retardant properties.

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## FXS-EBT

High speed milling roughing

mm	SKD - GG S55C · SS400 ~750 N/mm <sup>2</sup>		30~38 HRC		38~45 HRC		45~55 HRC HRS		55~60 HRC		60~65 HRC		65~70 HRC													
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)												
R 1	50.000	5.520	48.500	5.350	47.500	4.350	40.000	3.450	30.000	2.300	27.000	1.900	19.000	1.350												
R 1,5	33.500	5.550	32.500	5.350	32.000	4.350	26.500	3.450	20.000	2.300	18.000	1.900	12.500	1.350												
R 2	25.000	5.300	24.500	5.150	24.000	4.250	20.000	3.250	15.000	2.250	13.500	1.800	9.550	1.300												
R 2,5	20.000	5.050	19.500	4.900	19.000	4.000	16.000	3.050	12.000	2.200	11.000	1.750	7.650	1.250												
R 3	16.500	4.550	16.000	4.450	16.000	3.900	13.500	2.850	10.000	2.050	9.000	1.700	6.350	1.200												
R 4	12.500	4.450	12.000	4.300	12.000	3.800	9.950	2.750	7.550	1.950	6.750	1.600	4.750	1.150												
R 5	10.000	4.350	9.700	4.200	9.550	3.650	7.950	2.650	6.050	1.900	5.400	1.550	3.800	1.100												
R 6	8.350	4.000	8.100	3.900	7.950	3.200	6.650	2.500	5.050	1.750	4.500	1.300	3.200	915												
R 8	6.250	3.000	6.050	2.900	5.950	2.600	4.950	1.900	3.800	1.350	3.400	975	2.480	685												
R 10	5.000	2.400	4.850	2.350	4.750	2.050	4.000	1.550	3.000	1.100	2.700	780	1.900	550												
Max cutting depth			<table border="1"> <tr><td>ap</td><td>pf</td></tr> <tr><td>0,1D</td><td>0,2D</td></tr> </table> <p>ap max = 1mm</p>		ap	pf	0,1D	0,2D	<table border="1"> <tr><td>ap</td><td>pf</td></tr> <tr><td>0,08D</td><td>0,2D</td></tr> </table> <p>ap max = 0,8mm</p>		ap	pf	0,08D	0,2D	<table border="1"> <tr><td>ap</td><td>pf</td></tr> <tr><td>0,05D</td><td>0,1D</td></tr> </table> <p>ap max = 0,5mm</p>		ap	pf	0,05D	0,1D	<table border="1"> <tr><td>ap</td><td>pf</td></tr> <tr><td>0,03D</td><td>0,1D</td></tr> </table> <p>ap max = 0,3mm</p>		ap	pf	0,03D	0,1D
ap	pf																									
0,1D	0,2D																									
ap	pf																									
0,08D	0,2D																									
ap	pf																									
0,05D	0,1D																									
ap	pf																									
0,03D	0,1D																									

## FXS-EBT

High speed milling finishing

mm	SKD - GG S55C · SS400 ~750 N/mm <sup>2</sup>		30~38 HRC		38~45 HRC		45~55 HRC HRS		55~60 HRC		60~65 HRC		65~70 HRC					
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)				
R 1	50.000	6.480	50.000	7.000	49.500	5.900	41.500	4.950	33.500	3.700	30.000	2.900	20.500	1.800				
R 1,5	36.000	7.000	34.000	6.750	33.000	5.900	27.500	4.950	22.500	3.700	20.000	2.900	14.000	1.800				
R 2	27.000	6.500	25.500	5.850	24.500	5.450	20.500	4.550	16.500	3.350	15.000	2.600	10.500	1.700				
R 2,5	21.500	6.200	20.500	5.600	19.500	5.200	16.500	4.050	13.500	3.050	12.000	2.450	8.300	1.600				
R 3	18.000	5.950	17.000	5.400	16.500	4.950	14.000	3.750	11.000	2.750	10.000	2.300	6.900	1.500				
R 4	13.500	5.200	12.500	4.900	12.500	4.250	10.500	3.200	8.350	2.400	7.550	2.050	5.150	1.300				
R 5	11.000	4.700	10.000	4.400	9.850	3.800	8.300	2.800	6.700	2.100	6.050	1.750	4.150	1.200				
R 6	9.000	4.350	8.500	4.050	8.200	3.550	6.900	2.600	5.550	1.950	5.050	1.450	3.450	995				
R 8	6.750	3.250	6.350	3.050	6.150	2.650	5.150	1.950	4.200	1.500	3.800	1.100	2.600	745				
R 10	5.400	2.600	5.100	2.450	4.950	2.150	4.150	1.600	3.350	1.200	3.000	870	2.050	595				
Max cutting depth			<table border="1"> <tr><td>ap</td><td>pf</td></tr> <tr><td>0,02D</td><td>0,05D</td></tr> </table> <p>ap max = 1mm</p>		ap	pf	0,02D	0,05D										
ap	pf																	
0,02D	0,05D																	

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## FXS-EBM / FXS-HS-EBM

High speed milling roughing

mm	SKD - GG S55C · S5400 ~750 N/mm <sup>2</sup>		30~38 HRC		38~45 HRC		45~55 HRC HRS		55~60 HRC		60~65 HRC		65~70 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
R 3	16.700	6.100	16.200	5.900	15.900	5.200	13.300	3.800	10.100	2.700	9.000	2.250	6.350	1.600
R 4	12.500	5.950	12.100	5.750	11.900	5.050	9.950	3.700	7.550	2.600	6.750	2.150	4.750	1.550
R 5	10.000	5.800	9.700	5.590	9.550	4.900	7.950	3.550	6.050	2.500	5.400	2.100	3.800	1.450
R 6	8.350	5.350	8.100	5.200	7.950	4.300	6.650	3.300	5.050	2.300	4.500	1.750	3.200	1.200
R 8	6.250	4.000	6.050	3.900	5.950	3.800	4.950	2.550	3.800	1.800	3.400	1.300	2.400	915
R 10	5.000	3.200	4.850	3.100	4.750	3.050	4.000	2.050	3.000	1.450	2.700	1.050	1.900	735

Max cutting depth		ap	pf
		0,1D	0,2D
aeMAX = 1mm			
Max cutting depth		ap	pf
		0,08D	0,2D
aeMAX = 0,8mm			
Max cutting depth		ap	pf
		0,05D	0,1D
aeMAX = 0,5mm			
Max cutting depth		ap	pf
		0,03D	0,1D
aeMAX = 0,3mm			

1. Use high precision machine set up to ensure maximum rigidity.  
2. Use a coolant that has a low co-efficient of smoke emission.

High speed milling finishing

mm	SKD - GG S55C · S5400 ~750 N/mm <sup>2</sup>		30~38 HRC		38~45 HRC		45~55 HRC HRS		55~60 HRC		60~65 HRC		65~70 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
R 3	18.000	7.950	17.000	7.200	16.400	6.650	13.800	5.050	11.100	3.650	10.100	3.100	6.900	2.000
R 4	13.500	6.950	12.700	6.500	12.300	5.700	10.300	4.250	8.350	3.200	7.550	2.700	5.150	1.700
R 5	10.800	6.250	10.200	5.850	9.850	5.050	8.300	3.700	6.700	2.800	6.050	2.300	4.150	1.600
R 6	9.000	5.750	8.500	5.450	8.200	4.750	6.900	3.450	5.550	2.550	5.050	1.950	3.450	1.300
R 8	6.750	4.350	6.350	4.050	6.150	3.550	5.150	2.650	4.200	2.000	3.800	1.450	2.600	995
R 10	5.400	3.450	5.100	3.250	4.950	2.850	4.150	2.100	3.350	1.600	3.000	1.150	2.050	795

Max cutting depth		ap	pf
		0,02D	0,05D

1. Use high precision machine set up to ensure maximum rigidity.  
2. Use a coolant that has a low co-efficient of smoke emission.

## FXS-EQD

Regular milling

Ø	C≤0,2% - GG S55C · S5400 ~750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SNCM		30~38 HRC NAK55 · HPM1 · SKT		38~45 HRC SUS SUS304 · X210CR12 X40CRMOV51		45~55 HRC HRS		55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
R 0,5	32.000	860	32.000	860	32.000	860	32.000	860	32.000	860	32.000	765
R 1	31.500	2.250	24.000	1.350	24.000	1.350	24.000	1.350	24.000	1.350	22.000	1.200
R 2	17.500	2.500	15.500	1.800	14.000	1.550	13.500	1.450	12.500	1.350	11.000	1.150
R 3	11.500	2.150	10.500	1.850	9.500	1.700	9.000	1.600	8.450	1.500	7.400	1.300
R 4	8.750	1.800	7.950	1.400	7.150	1.250	6.850	1.200	6.350	1.100	5.550	995
R 5	7.000	1.500	6.350	1.100	5.700	1.000	5.500	980	5.050	905	4.450	800
R 6	6.650	1.170	5.950	1.050	4.750	840	4.550	800	4.200	745	3.800	680

Max cutting depth		ap = 0,05D	pf = 0,10D
Max cutting depth		ap = 0,02D	pf = 0,10D

1. Use high precision machine set up to ensure maximum rigidity.  
2. Set up speed & feed in accordance with cutting conditions and a high rigidity machine set up.

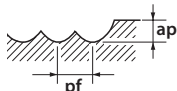


# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## CBN-SXB

Regular milling

Vc	30~45 HRC SKT · SKD · NAK80 · HPM50		45~55 HRC		55~60 HRC		60~68 HRC									
	300 (m/min)		300 (m/min)		250 (m/min)		200 (m/min)									
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)								
R 0,5 X 2,5	50.000	3.000	50.000	3.000	50.000	3.000	50.000	3.000								
R 1 X 5	50.000	4.000	50.000	4.000	40.000	3.200	32.000	2.500								
R 1,5 X 6	32.000	2.550	32.000	2.550	26.500	2.100	21.500	1.700								
Max cutting depth	<table border="1"> <tr><td>ap</td><td>pf</td></tr> <tr><td>0,015D</td><td>0,04D</td></tr> </table> 				ap	pf	0,015D	0,04D	<table border="1"> <tr><td>ap</td><td>pf</td></tr> <tr><td>0,01D</td><td>0,03D</td></tr> </table>				ap	pf	0,01D	0,03D
ap	pf															
0,015D	0,04D															
ap	pf															
0,01D	0,03D															
<p>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 properties.</p>																

## HYP-SB-EBD

Centre cutting

Vc	Cu						30~35 HRC					35~42 HRC					42~55 HRC				
	300 (m/min)						280 (m/min)					260 (m/min)					240 (m/min)				
Ø	Z	fz (mm)	ap (mm)	ae (mm)	n (min <sup>-1</sup> )	F (mm/min)	fz (mm)	ap (mm)	ae (mm)	n (min <sup>-1</sup> )	F (mm/min)	fz (mm)	ap (mm)	ae (mm)	n (min <sup>-1</sup> )	F (mm/min)	fz (mm)	ap (mm)	ae (mm)	n (min <sup>-1</sup> )	F (mm/min)
3	2	0,045	0,15	0,6	31.847	2866	0,045	0,15	0,6	29.724	2675	0,045	0,15	0,6	27.601	2484	0,045	0,15	0,6	25.478	2293
4	2	0,06	0,2	0,8	23.885	2866	0,06	0,2	0,8	22.293	2675	0,06	0,2	0,8	20.701	2484	0,06	0,2	0,8	19.108	2293
5	2	0,075	0,25	1	19.108	2866	0,075	0,25	1	17.834	2675	0,075	0,25	1	16.561	2484	0,075	0,25	1	15.287	2293
6	2	0,09	0,3	1,2	15.924	2866	0,09	0,3	1,2	14.862	2675	0,09	0,3	1,2	13.800	2484	0,09	0,3	1,2	12.739	2293
8	2	0,12	0,4	1,6	11.943	2866	0,12	0,4	1,6	11.146	2675	0,12	0,4	1,6	10.350	2484	0,12	0,4	1,6	9.554	2293
10	2	0,15	0,5	2	9.554	2866	0,15	0,5	2	8.917	2675	0,15	0,5	2	8.280	2484	0,15	0,5	2	7.643	2293
12	2	0,18	0,6	2,4	7.962	2866	0,18	0,6	2,4	7.431	2675	0,18	0,6	2,4	6.900	2484	0,18	0,6	2,4	6.369	2293





# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPL-SB-EBM

High speed milling roughing

Ø	25 - 30 HRC				30~38 HRC				38~45 HRC				45~55 HRC			
	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
4	340	27.070	5.850	0,05	330	26.270	5.680	0,05	260	20.700	4.470	0,05	230	18.310	3.960	0,05
5	380	24.200	6.540	0,07	380	24.200	6.540	0,07	300	19.110	5.160	0,07	250	15.920	4.300	0,07
6	350	18.580	6.020	0,08	400	21.230	6.880	0,08	380	20.170	6.540	0,08	380	20.170	6.540	0,08
8	350	13.930	6.350	0,11	360	14.330	6.540	0,11	350	13.930	6.350	0,11	270	10.750	4.900	0,11
10	350	11.150	6.020	0,13	300	9.550	5.160	0,14	280	8.920	4.820	0,14	250	7.960	4.300	0,14
12	350	9.290	5.350	0,14	300	7.962	4.590	0,14	280	7.430	4.280	0,14	250	6.640	3.820	0,14
ap = 0,05 - 0,07 D ae = 0,25 D				ap = 0,05 - 0,07 D ae = 0,25 D				ap = 0,04 - 0,06 D ae = 0,22 D				ap = 0,02 - 0,04 D ae = 0,20 D				

High speed milling finishing

Ø	25 - 30 HRC				30~38 HRC				38~45 HRC				45~55 HRC			
	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
4	350	27.870	6.020	0,05	340	27.070	5.850	0,05	270	21.500	4.640	0,05	240	19.110	4.130	0,05
5	390	24.840	6.710	0,07	390	24.840	6.710	0,07	310	19.750	5.330	0,07	260	16.560	4.470	0,07
6	360	19.110	6.190	0,08	410	21.760	7.050	0,08	390	20.700	6.710	0,08	390	20.700	6.710	0,08
8	360	14.330	6.540	0,11	370	14.730	6.720	0,11	360	14.330	6.540	0,11	280	11.150	5.080	0,11
10	360	11.470	6.190	0,13	310	9.870	5.330	0,14	290	9.240	4.990	0,14	260	8.280	4.470	0,14
12	360	9.550	5.500	0,14	310	8.230	4.740	0,14	290	7.700	4.430	0,14	260	6.900	3.980	0,14
ap = 0,02 - 0,10 D ae = 0,02 - 0,10 D				ap = 0,02 - 0,10 D ae = 0,02 - 0,10 D				ap = 0,02 - 0,10 D ae = 0,02 - 0,08 D				ap = 0,02 - 0,10 D ae = 0,02 - 0,08 D				

Conventional roughing

Ø	25 - 30 HRC				30~38 HRC				38~45 HRC				45~55 HRC			
	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
4	170	13.540	2.920	0,05	165	13.140	2.840	0,05	130	10.350	2.240	0,05	115	9.160	1.980	0,05
5	190	12.100	3.270	0,07	190	12.100	3.270	0,07	150	9.550	2.580	0,07	125	7.960	2.150	0,07
6	175	9.290	3.010	0,08	200	10.620	3.440	0,08	190	10.090	3.270	0,08	190	10.090	3.270	0,08
8	175	6.970	3.180	0,11	180	7.170	3.270	0,11	175	6.970	3.180	0,11	135	5.370	2.450	0,11
10	175	5.570	3.010	0,14	150	4.780	2.580	0,13	140	4.460	2.410	0,14	125	3.980	2.150	0,14
12	175	4.640	2.680	0,14	150	3.980	2.290	0,14	140	3.720	2.140	0,14	125	3.320	1.910	0,14
ap = 0,05 - 0,07 D ae = 0,02 - 0,10 D				ap = 0,05 - 0,07 D ae = 0,02 - 0,10 D				ap = 0,04 - 0,06 D ae = 0,02 - 0,08 D				ap = 0,02 - 0,04 D ae = 0,02 - 0,08 D				

Conventional finishing

Ø	25 - 30 HRC				30~38 HRC				38~45 HRC				45~55 HRC			
	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
4	175	13.930	3.010	0,05	170	13.540	2.920	0,05	135	10.750	2.320	0,05	120	9.550	2.060	0,05
5	195	12.420	3.350	0,07	195	12.420	3.350	0,07	155	9.870	2.670	0,07	130	8.280	2.240	0,07
6	180	9.550	3.100	0,08	205	10.880	3.530	0,08	195	10.350	3.350	0,08	195	10.350	3.350	0,08
8	180	7.170	3.270	0,11	185	7.370	3.360	0,11	180	7.170	3.270	0,11	140	5.570	2.540	0,11
10	180	5.730	3.100	0,14	155	4.940	2.670	0,14	145	4.620	2.490	0,13	130	4.140	2.240	0,14
12	180	4.780	2.750	0,14	155	4.110	2.370	0,14	145	3.850	2.220	0,14	130	3.450	1.990	0,14
ap = 0,02 - 0,07 D ae = 0,03 - 0,10 D				ap = 0,02 - 0,07 D ae = 0,02 - 0,10 D				ap = 0,02 - 0,06 D ae = 0,02 - 0,08 D				ap = 0,02 - 0,04 D ae = 0,02 - 0,08 D				




# CUTTING CONDITIONS

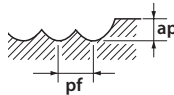
Milling | Endmills | Cutting conditions

## PHX-LN-DBT

Vibration control

			High feed roughing ~40HRC				Semi-roughing 40~60HRC				Slotting ~60HRC				Finishing ~60HRC				
			SKT4 • SKD61 • NAK80 • HPM1 • DH**				DH** • DAC** • ZHD** • SKD61 • SKD11 • Ti-6Al-4V(H) • CoCr • SKT4 • NAK80 • HPM** • SCM**				DH** • DAC** • ZHD** • SKD61 • SKD11 • Ti-6Al-4V(H) • CoCr • SKT4 • NAK80 • HPM** • SCM**				DH** • DAC** • ZHD** • SKD61 • SKD11 • Ti-6Al-4V(H) • CoCr • SKT4 • NAK80 • HPM** • SCM**				
R	l1	Angle	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	Pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	Pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	Last pitch*1	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	Pf (mm)	Clearance (mm)
0,3	1	0,3°	18.000	1.200	0,060	0,140	18.000	1.000	0,050	0,100	18.000	300	0,050	0,050	18.000	700	0,018	0,018	0,03
0,3	2	0,3°	18.000	1.000	0,050	0,120	18.000	850	0,040	0,100	18.000	255	0,040	0,050	18.000	700	0,018	0,018	0,03
0,3	3	0,3°	18.000	850	0,040	0,120	18.000	700	0,030	0,080	18.000	210	0,030	0,040	18.000	700	0,018	0,018	0,025
0,3	4	0,3°	18.000	700	0,030	0,100	18.000	600	0,025	0,080	18.000	180	0,025	0,040	18.000	700	0,018	0,018	0,02
0,3	6	0,3°	18.000	500	0,020	0,090	16.000	400	0,020	0,060	16.000	120	0,020	0,030	16.000	620	0,018	0,018	0,01
0,5	4	0,3°	18.000	1.200	0,080	0,200	18.000	1.100	0,070	0,160	18.000	330	0,070	0,070	18.000	900	0,030	0,030	0,05
0,5	6	0,3°	18.000	1.000	0,050	0,160	18.000	900	0,050	0,160	18.000	270	0,050	0,070	18.000	900	0,030	0,030	0,05
0,5	8	0,3°	16.000	800	0,040	0,160	16.000	700	0,040	0,160	16.000	210	0,040	0,050	16.000	720	0,030	0,030	0,03
0,5	10	0,3°	12.000	650	0,040	0,160	10.000	550	0,030	0,150	10.000	160	0,030	0,050	12.000	540	0,030	0,030	0,03
0,5	12	0,3°	8.000	420	0,030	0,150	8.000	420	0,030	0,150	-	-	-	-	8.000	360	0,030	0,030	0,02
0,5	14	0,3°	7.000	350	0,020	0,130	7.000	350	0,020	0,130	-	-	-	-	7.000	320	0,030	0,030	0,02
0,5	16	0,3°	6.000	260	0,010	0,100	6.000	260	0,010	0,100	-	-	-	-	6.000	270	0,020	0,020	0,01
0,75	6	0,3°	18.000	1.500	0,100	0,300	16.000	1.300	0,100	0,230	16.000	390	0,100	0,100	18.000	1.100	0,040	0,040	0,05
0,75	8	0,3°	16.000	1.300	0,080	0,300	16.000	1.150	0,080	0,230	16.000	340	0,080	0,100	16.000	960	0,040	0,040	0,05
0,75	10	0,3°	15.000	1.100	0,060	0,250	15.000	950	0,060	0,230	15.000	280	0,060	0,100	15.000	900	0,040	0,040	0,03
0,75	12	0,3°	10.000	700	0,040	0,200	10.000	600	0,030	0,200	10.000	180	0,030	0,100	10.000	600	0,040	0,040	0,02
0,75	16	0,3°	7.500	400	0,025	0,150	7.500	400	0,020	0,150	7.500	120	0,020	0,070	10.000	600	0,040	0,040	0,01
1	6	0,3°	18.000	1.600	0,200	0,600	15.000	1.400	0,200	0,300	15.000	420	0,200	0,100	15.000	1.800	0,060	0,050	0,1
1	8	0,3°	14.000	1.400	0,180	0,500	14.000	1.200	0,150	0,300	14.000	360	0,150	0,100	12.000	1.500	0,060	0,050	0,07
1	10	0,3°	12.000	1.250	0,160	0,400	12.000	1.100	0,120	0,300	12.000	330	0,120	0,100	12.000	1.500	0,060	0,050	0,07
1	12	0,3°	10.000	1.050	0,140	0,400	10.000	900	0,100	0,300	10.000	300	0,100	0,100	10.000	1.200	0,060	0,050	0,07
1	14	0,3°	8.000	850	0,120	0,350	8.000	700	0,080	0,300	8.000	240	0,080	0,100	8.000	1.000	0,060	0,050	0,05
1	16	0,3°	7.500	780	0,120	0,400	7.500	650	0,070	0,250	7.500	260	0,070	0,070	7.500	950	0,060	0,050	0,03
1	18	0,3°	6.800	700	0,100	0,400	6.800	630	0,060	0,200	6.800	250	0,060	0,070	6.800	700	0,060	0,050	0,03
1	20	0,3°	6.200	650	0,100	0,400	6.200	600	0,050	0,200	6.200	240	0,050	0,050	6.200	600	0,060	0,050	0,02
1	22	0,3°	6.000	600	0,080	0,300	6.000	450	0,050	0,150	6.000	180	0,050	0,050	6.000	550	0,060	0,050	0,02
1,5	12	0,3°	12.000	1.700	0,300	0,700	8.000	1.200	0,250	0,500	8.000	480	0,250	0,150	11.000	2.050	0,090	0,080	0,1
1,5	16	0,3°	10.000	1.550	0,250	0,700	8.000	1.200	0,200	0,500	8.000	480	0,200	0,150	10.000	1.900	0,090	0,080	0,07
1,5	20	0,3°	7.500	1.150	0,200	0,600	7.200	1.100	0,200	0,500	7.200	440	0,200	0,150	7.500	1.400	0,090	0,080	0,07
1,5	25	0,3°	4.800	750	0,180	0,600	4.600	700	0,180	0,500	4.600	280	0,180	0,150	4.800	900	0,090	0,080	0,05
2	16	0,5°	9.300	1.900	0,270	1,000	6.000	1.200	0,270	0,800	6.000	480	0,270	0,200	9.000	2.250	0,120	0,100	0,1
2	20	0,5°	7.600	1.550	0,250	1,000	6.000	1.150	0,250	0,800	6.000	450	0,250	0,200	8.200	2.050	0,120	0,100	0,1
2	25	0,5°	6.100	1.250	0,230	0,800	5.500	1.100	0,230	0,600	5.500	420	0,230	0,200	5.500	1.350	0,120	0,100	0,07
3	20	0,5°	8.000	3.000	0,430	1,500	4.000	1.200	0,300	1,000	4.000	480	0,300	0,200	8.000	1.800	0,180	0,160	0,1
3	30	0,5°	5.100	1.500	0,340	1,200	4.000	1.150	0,300	1,000	4.000	480	0,300	0,200	5.100	1.150	0,180	0,160	0,07

Max cutting depth









# CUTTING CONDITIONS

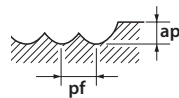
Milling | Endmills | Cutting conditions

## WXL-LN-EBD

Regular milling

R	Lg (mm)	Cu					~32 HRC				33~41 HRC Hardened steel, pre-hardened steel				42~50 HRC Hardened steel, pre-hardened steel			
		S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	
1,5	15	10.000	600	0,200	0,840	8.500	400	0,150	0,420	6.500	250	0,150	0,360	6.500	250	0,150	0,300	
1,5	16	10.000	450	0,200	0,840	8.500	300	0,150	0,420	6.500	250	0,150	0,360	6.500	250	0,150	0,300	
1,5	20	10.000	450	0,200	0,840	8.500	300	0,150	0,420	6.500	250	0,150	0,360	6.500	250	0,150	0,300	
1,5	25	10.000	450	0,200	0,840	8.500	300	0,150	0,420	6.500	250	0,150	0,300	6.500	250	0,090	0,150	
1,5	30	9.000	375	0,200	0,840	7.500	250	0,150	0,420	6.000	200	0,150	0,300	6.000	200	0,090	0,150	
1,5	35	9.000	375	0,200	0,840	7.500	250	0,150	0,420	6.000	200	0,150	0,300	6.000	200	0,090	0,150	
1,5	40	9.000	375	0,200	0,840	7.500	250	0,150	0,420	6.000	200	0,150	0,300	6.000	200	0,090	0,150	
1,75	10	10.000	1.050	0,400	0,980	8.500	700	0,150	0,420	6.500	500	0,150	0,420	6.500	500	0,150	0,350	
1,75	15	10.000	900	0,400	0,980	8.500	600	0,150	0,420	6.500	400	0,150	0,420	6.500	400	0,150	0,350	
1,75	20	8.000	750	0,400	0,980	7.500	500	0,150	0,490	5.500	300	0,150	0,420	5.500	300	0,150	0,350	
1,75	25	8.000	600	0,400	0,980	7.500	400	0,150	0,490	5.500	275	0,150	0,420	5.500	275	0,150	0,350	
1,75	30	8.000	450	0,400	0,980	7.500	300	0,150	0,490	5.500	250	0,150	0,350	5.500	250	0,100	0,200	
1,75	35	8.000	375	0,400	0,980	6.000	250	0,150	0,490	5.000	200	0,150	0,350	5.000	200	0,100	0,200	
1,75	40	6.000	375	0,300	0,980	6.000	250	0,150	0,490	5.000	200	0,150	0,350	5.000	200	0,100	0,200	
1,75	45	6.000	375	0,300	0,980	6.000	250	0,150	0,490	5.000	200	0,150	0,350	5.000	200	0,100	0,200	
2	8	11.000	1.200	0,500	1,280	7.500	800	0,200	0,640	6.000	700	0,200	0,600	6.000	700	0,200	0,400	
2	10	9.000	900	0,500	1,280	7.500	600	0,200	0,640	6.000	400	0,200	0,600	6.000	400	0,200	0,400	
2	12	9.000	900	0,500	1,280	7.500	600	0,200	0,640	6.000	400	0,200	0,600	6.000	400	0,200	0,400	
2	14	9.000	900	0,500	1,280	7.500	600	0,200	0,640	6.000	400	0,200	0,600	6.000	400	0,200	0,400	
2	15	9.000	900	0,500	1,280	7.500	600	0,200	0,640	6.000	400	0,200	0,600	6.000	400	0,200	0,400	
2	16	9.000	900	0,500	1,280	7.500	600	0,200	0,640	6.000	400	0,200	0,600	6.000	400	0,200	0,400	
2	20	7.000	600	0,500	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,600	5.000	250	0,200	0,400	
2	25	7.000	600	0,500	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,600	5.000	250	0,200	0,400	
2	30	7.000	600	0,400	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,560	5.000	250	0,120	0,200	
2	35	7.000	600	0,400	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,560	5.000	250	0,120	0,200	
2	40	5.000	375	0,350	1,280	5.000	250	0,200	0,640	4.000	200	0,200	0,560	4.000	200	0,120	0,200	
2	45	5.000	375	0,350	1,280	5.000	250	0,200	0,640	4.000	200	0,200	0,560	4.000	200	0,120	0,200	
2	50	5.000	375	0,350	1,280	5.000	250	0,200	0,640	4.000	200	0,200	0,560	4.000	200	0,120	0,200	
2,5	10	9.000	1.350	0,600	1,800	6.500	900	0,250	0,900	5.000	750	0,250	0,700	5.000	750	0,250	0,500	
2,5	15	9.000	1.350	0,600	1,800	6.500	900	0,250	0,900	5.000	750	0,250	0,700	5.000	750	0,250	0,500	
2,5	20	7.000	750	0,600	1,800	6.500	500	0,250	0,900	5.000	400	0,250	0,700	5.000	400	0,250	0,500	
2,5	25	6.000	750	0,600	1,800	5.000	500	0,250	0,900	4.000	250	0,250	0,700	4.000	250	0,250	0,500	
2,5	30	6.000	750	0,600	1,800	5.000	500	0,250	0,900	4.000	250	0,250	0,700	4.000	250	0,250	0,500	
2,5	35	6.000	750	0,600	1,800	5.000	500	0,250	0,900	4.000	250	0,250	0,700	4.000	250	0,250	0,500	
2,5	40	5.000	600	0,400	1,800	4.000	400	0,250	0,900	4.000	200	0,250	0,600	4.000	200	0,200	0,250	
2,5	45	5.000	600	0,400	1,800	4.000	400	0,250	0,900	4.000	200	0,250	0,600	4.000	200	0,200	0,250	
2,5	50	5.000	450	0,400	1,800	4.000	300	0,250	0,900	4.000	200	0,250	0,600	4.000	200	0,200	0,250	
3	10	7.000	1.500	0,750	2,400	5.500	1.000	0,300	1,200	4.500	800	0,300	0,960	4.500	800	0,300	0,600	
3	20	7.000	1.200	0,750	2,400	5.500	800	0,300	1,200	4.500	600	0,300	0,960	4.500	600	0,300	0,600	
3	25	6.000	900	0,750	2,400	5.500	600	0,300	1,200	4.500	400	0,300	0,960	4.500	400	0,300	0,600	
3	30	5.000	600	0,750	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,960	4.000	300	0,300	0,600	
3	35	5.000	600	0,750	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,960	4.000	300	0,300	0,600	
3	40	5.000	600	0,600	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,960	4.000	300	0,300	0,600	
3	45	5.000	600	0,600	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,960	4.000	300	0,300	0,600	
3	50	5.000	600	0,600	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,960	4.000	300	0,300	0,600	

Max cutting depth



1. Use a rigid and precise machine and holder.
2. When machining carbon steel or hardened steel, using MQL (Minimum Quantity Lubrication / mist coolant) is recommended.
3. Please adjust conditions based on machining accuracy, machining shape and machining path.
4. When using a tool with a diameter of dia. 0.5 (R0.25) or less, or an L/D (effective length/tool diameter) ratio greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
5. When the available RPM is insufficient, reduce the RPM and feed rates in proportion









# CUTTING CONDITIONS

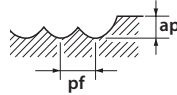
Milling | Endmills | Cutting conditions

## WXL-PC-EBD

Regular milling

R	θ	l2	Cutting angle	Cu				~32 HRC				33~41 HRC Hardened steel, pre-hardened steel				42~50 HRC Hardened steel, pre-hardened steel			
				S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)
2	2°	34	0,5°	7.000	600	0,500	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,600	5.000	250	0,200	0,500
2,5	1°	30	0,5°	7.000	750	0,600	1,800	6.500	500	0,250	0,900	5.000	400	0,250	0,700	5.000	400	0,250	0,500
2,5	1°	40	0,5°	6.000	750	0,600	1,800	5.000	500	0,250	0,900	4.000	250	0,250	0,700	4.000	250	0,250	0,500
2,5	1°	60	0,5°	5.000	600	0,400	1,800	4.000	400	0,250	0,900	4.000	200	0,250	0,600	4.000	200	0,200	0,250
2,5	1,5°	26,9	0,5°	9.000	1.350	0,600	1,800	6.500	900	0,250	0,900	5.000	750	0,250	0,700	5.000	750	0,250	0,500
2,5	1,5°	65,1	0,5°	6.000	750	0,600	1,800	5.000	500	0,250	0,900	4.000	250	0,250	0,700	4.000	250	0,250	0,500
2,5	2°	50,1	0,5°	6.000	750	0,600	1,800	5.000	500	0,250	0,900	4.000	250	0,250	0,700	4.000	250	0,250	0,500
3	1°	30	0,5°	7.000	1.200	0,750	2,400	5.500	800	0,300	1,200	4.500	600	0,300	0,960	4.500	600	0,300	0,600
3	1°	40	0,5°	5.000	600	0,750	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,960	4.000	300	0,300	0,600
3	1°	50	0,5°	5.000	600	0,600	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,960	4.000	300	0,300	0,600
3	1°	60	0,5°	5.000	600	0,600	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,960	4.000	300	0,300	0,600
3	1°	70	0,5°	5.000	600	0,600	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,960	4.000	300	0,300	0,300
3	1°	80	0,5°	5.000	600	0,450	2,400	4.000	400	0,200	1,200	4.000	300	0,200	0,960	4.000	300	0,200	0,300
3	1,5°	49	0,5°	5.000	600	0,600	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,960	4.000	300	0,300	0,600
3	2°	36	0,5°	7.000	1.200	0,750	2,400	5.500	800	0,300	1,200	4.500	600	0,300	0,960	4.500	600	0,300	0,600

Max cutting depth



- Highly rigid machines and tool holders should be used. If not, machining should be kept below above-mentioned conditions
- Tool vibrations should be kept at a minimum level for maximum accuracy.
- Use a suitable cutting fluid with high smoke retardant properties.
- For the milling of corners or removal of residue, reduce the cutting depth and feed to 70%..
- More stable high-feed machining in corners can be attained by setting an R insertion or deceleration on the CAM or machine side.
- When cutting load fluctuates (in the corners, etc.) or when high precision is required, be sure to control the rotational speed.
- When cutting at greater than the recommended cutting angle, reduce the feed.
- When cutting load is fluctuating, or when higher milling accuracy is required, keep machining conditions below the above-mentioned values.
- When the rotational speed does not meet the recommended conditions, reduce the feed in proportion to the RPM that is suitable for your machine.
- The chart above is intended as general guidelines for reference only. The given values should be adjusted individually based on actual machining conditions.
- The cutting conditions are intended for intermediate machining after roughing.
- When the work includes extensive roughing including flat areas, chattering is more likely to occur.
- If the cutting depth is shallow, increase the cutting speed appropriately to minimize chattering.







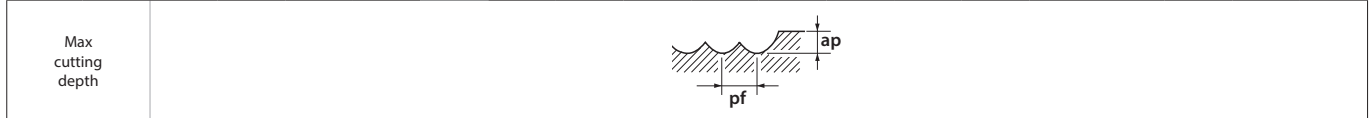
# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## WXL-PC-EBD

High speed milling

R	θ	l2	Cutting angle	Cu				~32 HRC				33~41 HRC Hardened steel, pre-hardened steel				42~50 HRC Hardened steel, pre-hardened steel			
				S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)
2	1,5°	44,2	0,5°	18.000	3.000	0,250	0,600	16.000	2.800	0,100	0,300	16.000	2.600	0,100	0,300	12.000	1.900	0,100	0,300
2	2°	34	0,5°	20.000	3.450	0,400	0,600	18.000	3.200	0,200	0,500	18.000	3.000	0,200	0,500	14.000	2.300	0,200	0,500
2,5	1°	30	0,5°	20.000	3.400	0,400	0,750	15.000	3.200	0,200	0,300	15.000	3.000	0,200	0,300	12.000	2.400	0,200	0,300
2,5	1°	40	0,5°	16.000	2.900	0,250	0,750	14.000	2.500	0,100	0,300	14.000	2.300	0,100	0,300	11.000	1.800	0,100	0,300
2,5	1°	60	0,5°	12.000	1.800	0,250	0,500	10.000	1.200	0,100	0,200	10.000	1.100	0,100	0,200	8.000	880	0,100	0,200
2,5	1,5°	26,9	0,5°	18.000	3.800	0,500	1,250	16.000	3.500	0,250	0,500	16.000	3.300	0,250	0,500	12.000	2.400	0,250	0,500
2,5	1,5°	65,1	0,5°	14.000	2.200	0,250	0,750	12.000	1.600	0,100	0,300	12.000	1.500	0,100	0,300	9.000	1.100	0,100	0,300
2,5	2°	50,1	0,5°	16.000	2.900	0,250	0,750	14.000	2.500	0,100	0,300	14.000	2.300	0,100	0,300	11.000	1.800	0,100	0,300
3	1°	30	0,5°	14.000	4.000	0,600	1,250	12.000	3.200	0,300	0,500	12.000	3.000	0,300	0,500	9.000	2.250	0,300	0,500
3	1°	40	0,5°	10.000	3.200	0,600	1,250	10.000	2.600	0,300	0,500	10.000	2.400	0,300	0,500	8.000	1.900	0,300	0,500
3	1°	50	0,5°	9.000	3.000	0,400	1,000	9.000	2.300	0,200	0,400	9.000	2.100	0,200	0,400	7.000	1.600	0,200	0,400
3	1°	60	0,5°	9.000	2.800	0,400	0,750	9.000	2.000	0,200	0,300	9.000	1.900	0,200	0,300	7.000	1.400	0,200	0,300
3	1°	70	0,5°	7.000	2.300	0,400	0,750	7.000	1.600	0,200	0,300	7.000	1.500	0,200	0,300	5.500	1.100	0,200	0,300
3	1°	80	0,5°	6.000	2.000	0,300	0,750	6.000	1.300	0,150	0,300	6.000	1.200	0,150	0,300	5.000	900	0,150	0,300
3	1,5°	49	0,5°	10.000	3.200	0,600	1,250	10.000	2.600	0,300	0,500	10.000	2.400	0,300	0,500	8.000	1.900	0,300	0,500
3	2°	36	0,5°	14.000	4.000	0,600	1,250	12.000	3.200	0,300	0,500	12.000	3.000	0,300	0,500	9.000	2.250	0,300	0,500



- Highly rigid machines and tool holders should be used. If not, machining should be kept below above-mentioned conditions
- Tool vibrations should be kept at a minimum level for maximum accuracy.
- Use a suitable cutting fluid with high smoke retardant properties.
- For the milling of corners or removal of residue, reduce the cutting depth and feed to 70%.
- More stable high-feed machining in corners can be attained by setting an R insertion or deceleration on the CAM or machine side.
- When cutting load fluctuates (in the corners, etc.) or when high precision is required, be sure to control the rotational speed.
- When cutting at greater than the recommended cutting angle, reduce the feed.
- When cutting load is fluctuating, or when higher milling accuracy is required, keep machining conditions below the above-mentioned values.
- When the rotational speed does not meet the recommended conditions, reduce the feed in proportion to the RPM that is suitable for your machine.
- The chart above is intended as general guidelines for reference only. The given values should be adjusted individually based on actual machining conditions.
- The cutting conditions are intended for intermediate machining after roughing.
- When the work includes extensive roughing including flat areas, chattering is more likely to occur.
- If the cutting depth is shallow, increase the cutting speed appropriately to minimize chattering.





# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## WXS-LN-EBD

High speed milling

Vc		C≤0,2% - GG				~30 HRC				30~38 HRC			
		120 (m/min)				110 (m/min)				100 (m/min)			
R	l1 (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)
3	35	8.000	600	0,020	0,050	8.000	600	0,020	0,050	8.000	570	0,020	0,050
3	40	7.000	500	0,020	0,030	7.000	500	0,020	0,030	7.000	470	0,020	0,030
3,5	15	18.000	3.000	0,100	0,300	18.000	3.000	0,100	0,300	18.000	2.800	0,100	0,300
3,5	20	16.000	2.700	0,100	0,200	16.000	2.700	0,100	0,200	16.000	2.500	0,100	0,200
3,5	25	12.000	2.000	0,100	0,100	12.000	2.000	0,100	0,100	12.000	1.900	0,100	0,100
3,5	30	10.000	1.600	0,050	0,100	10.000	1.600	0,050	0,100	10.000	1.500	0,050	0,100
3,5	35	10.000	1.000	0,050	0,050	10.000	1.000	0,050	0,050	10.000	950	0,050	0,050
3,5	40	8.000	800	0,050	0,050	8.000	800	0,050	0,050	8.000	760	0,050	0,050
3,5	45	7.000	600	0,030	0,030	7.000	600	0,030	0,030	7.000	570	0,030	0,030
4	8	31.000	5.700	0,200	0,500	31.000	5.700	0,200	0,500	31.000	5.700	0,200	0,500
4	10	25.000	4.500	0,200	0,500	25.000	4.500	0,200	0,500	25.000	4.200	0,200	0,500
4	12	20.000	3.600	0,200	0,500	20.000	3.600	0,200	0,500	20.000	3.400	0,200	0,500
4	15	20.000	3.600	0,200	0,500	20.000	3.600	0,200	0,500	20.000	3.400	0,200	0,500
4	16	18.000	3.200	0,200	0,500	18.000	3.200	0,200	0,500	18.000	3.000	0,200	0,500
4	20	16.000	2.800	0,200	0,400	16.000	2.800	0,200	0,400	16.000	2.600	0,200	0,400
4	25	16.000	2.800	0,100	0,300	16.000	2.800	0,100	0,300	16.000	2.600	0,100	0,300
4	30	14.000	2.400	0,100	0,200	14.000	2.400	0,100	0,200	14.000	2.200	0,100	0,200
4	35	12.000	1.800	0,100	0,200	12.000	1.800	0,100	0,200	12.000	1.700	0,100	0,200
4	40	10.000	1.300	0,050	0,100	10.000	1.300	0,050	0,100	10.000	1.200	0,050	0,100
4	45	8.000	1.000	0,050	0,050	8.000	1.000	0,050	0,050	8.000	950	0,050	0,050
4	50	7.000	700	0,020	0,050	7.000	700	0,020	0,050	7.000	660	0,020	0,050
5	10	25.000	5.400	0,250	0,500	25.000	5.400	0,250	0,500	25.000	5.400	0,250	0,500
5	15	20.000	4.200	0,250	0,500	20.000	4.200	0,250	0,500	20.000	3.900	0,250	0,500
5	20	16.000	3.500	0,250	0,500	16.000	3.500	0,250	0,500	16.000	3.300	0,250	0,500
5	25	15.000	3.200	0,200	0,300	15.000	3.200	0,200	0,300	15.000	3.000	0,200	0,300
5	30	14.000	2.500	0,100	0,300	14.000	2.500	0,100	0,300	14.000	2.300	0,100	0,300
5	35	12.000	1.600	0,100	0,300	12.000	1.600	0,100	0,300	12.000	1.500	0,100	0,300
5	40	10.000	1.200	0,100	0,200	10.000	1.200	0,100	0,200	10.000	1.100	0,100	0,200
5	45	9.000	900	0,100	0,100	9.000	900	0,100	0,100	9.000	850	0,100	0,100
5	50	8.000	800	0,100	0,100	8.000	800	0,100	0,100	8.000	760	0,100	0,100
6	12	20.000	5.200	0,300	0,500	20.000	5.200	0,300	0,500	20.000	5.200	0,300	0,500
6	20	16.000	4.200	0,300	0,500	16.000	4.200	0,300	0,500	16.000	3.900	0,300	0,500
6	25	12.000	3.200	0,300	0,500	12.000	3.200	0,300	0,500	12.000	3.000	0,300	0,500
6	30	10.000	2.600	0,300	0,500	10.000	2.600	0,300	0,500	10.000	2.400	0,300	0,500
6	35	9.000	2.300	0,200	0,400	9.000	2.300	0,200	0,400	9.000	2.100	0,200	0,400
6	40	9.000	2.000	0,200	0,300	9.000	2.000	0,200	0,300	9.000	1.900	0,200	0,300
6	45	8.000	1.800	0,200	0,300	8.000	1.800	0,200	0,300	8.000	1.700	0,200	0,300
6	50	7.000	1.600	0,200	0,300	7.000	1.600	0,200	0,300	7.000	1.500	0,200	0,300

Max cutting depth

Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
- Do not use inflammable coolant. Using worn tools may generate sparks.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

\* Modified parameters







# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

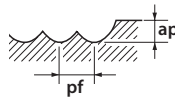
## WXS-LN-EBD

High speed milling



Vc		38 ~ 45 HRC				45 ~ 55 HRC				55 ~ 60 HRC			
R	l1 (mm)	120 (m/min)				110 (m/min)				100 (m/min)			
		S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)
3	35	7.500	570	0,020	0,050	6.000	460	0,020	0,050	5.000	300	0,020	0,050
3	40	6.500	470	0,020	0,030	5.000	360	0,020	0,030	4.000	230	0,020	0,030
3,5	15	18.000	2.800	0,100	0,300	14.000	2.000	0,100	0,300	12.000	1.300	0,070	0,150
3,5	20	16.000	2.500	0,100	0,200	12.000	1.800	0,100	0,200	10.000	1.200	0,070	0,150
3,5	25	12.000	1.900	0,100	0,100	9.000	1.300	0,100	0,100	8.000	920	0,070	0,150
3,5	30	10.000	1.500	0,050	0,100	8.000	1.100	0,050	0,100	7.000	770	0,050	0,100
3,5	35	9.000	950	0,050	0,050	7.000	700	0,050	0,050	5.000	400	0,050	0,050
3,5	40	7.500	760	0,050	0,050	6.000	580	0,050	0,050	4.000	300	0,050	0,050
3,5	45	6.500	570	0,030	0,030	5.000	420	0,030	0,030	4.000	260	0,030	0,030
4	8	31.000	5.700	0,200	0,500	24.000	4.400	0,200	0,500	20.000	3.200	0,080	0,200
4	10	25.000	4.200	0,200	0,500	20.000	3.300	0,200	0,500	18.000	2.300	0,080	0,200
4	12	20.000	3.400	0,200	0,500	17.000	2.900	0,200	0,500	14.000	1.900	0,080	0,200
4	15	20.000	3.400	0,200	0,500	16.000	2.700	0,200	0,500	12.000	1.600	0,080	0,200
4	16	18.000	3.000	0,200	0,500	15.000	2.500	0,200	0,500	10.000	1.300	0,080	0,200
4	20	16.000	2.600	0,200	0,400	14.000	2.300	0,200	0,400	8.000	1.000	0,080	0,200
4	25	16.000	2.600	0,100	0,300	13.000	2.200	0,100	0,300	6.000	810	0,080	0,200
4	30	14.000	2.200	0,100	0,200	12.000	1.900	0,100	0,200	5.000	630	0,080	0,200
4	35	12.000	1.700	0,100	0,200	9.000	1.200	0,100	0,200	4.000	420	0,080	0,200
4	40	9.000	1.200	0,050	0,100	8.000	1.000	0,050	0,100	4.000	400	0,050	0,100
4	45	7.500	950	0,050	0,050	7.000	890	0,050	0,050	3.600	360	0,050	0,050
4	50	6.500	660	0,020	0,050	6.000	600	0,020	0,050	3.600	280	0,020	0,050
5	10	25.000	5.400	0,250	0,500	19.000	4.000	0,250	0,500	16.000	2.800	0,100	0,250
5	15	20.000	3.900	0,250	0,500	17.000	3.300	0,250	0,500	13.000	2.000	0,100	0,250
5	20	16.000	3.300	0,250	0,500	13.000	2.700	0,250	0,500	8.000	1.300	0,100	0,250
5	25	15.000	3.000	0,200	0,300	12.000	2.400	0,200	0,300	6.000	960	0,100	0,250
5	30	14.000	2.300	0,100	0,300	11.000	1.800	0,100	0,300	4.000	520	0,100	0,250
5	35	12.000	1.500	0,100	0,300	10.000	1.100	0,100	0,300	3.200	280	0,100	0,250
5	40	10.000	1.100	0,100	0,200	9.000	990	0,100	0,200	3.000	260	0,100	0,200
5	45	9.000	850	0,100	0,100	8.000	660	0,100	0,100	3.000	200	0,100	0,100
5	50	7.500	760	0,100	0,100	7.000	610	0,100	0,100	2.800	190	0,100	0,100
6	12	20.000	5.200	0,300	0,500	16.000	3.400	0,300	0,500	13.500	2.500	0,100	0,200
6	20	16.000	3.900	0,300	0,500	12.000	3.000	0,300	0,500	8.000	1.600	0,100	0,200
6	25	12.000	3.000	0,300	0,500	10.000	2.500	0,300	0,500	6.000	1.200	0,100	0,200
6	30	10.000	2.400	0,300	0,500	9.000	2.100	0,300	0,500	4.000	740	0,100	0,200
6	35	9.000	2.100	0,200	0,400	9.000	2.000	0,200	0,400	3.500	620	0,100	0,200
6	40	9.000	1.900	0,200	0,300	9.000	1.800	0,200	0,300	3.000	480	0,100	0,200
6	45	8.000	1.700	0,200	0,300	8.000	1.600	0,200	0,300	2.800	440	0,100	0,200
6	50	7.000	1.500	0,200	0,300	7.000	1.400	0,200	0,300	2.500	400	0,100	0,200

Max cutting depth



- Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.
1. Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
  2. Do not use inflammable coolant. Using worn tools may generate sparks.
  3. Use compressed air or a high quality coolant with a low co-efficient of smoke emission.
- \* Modified parameters



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## DG-LN-EBD

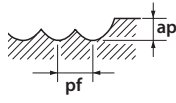
### Roughing

R x l1	Graphite					
	S (min <sup>-1</sup> )		F (mm/min)		ap (mm)	pf (mm)
	short	long	short	long		
R0,2x4	40.000	20.000	960	480	0,040	0,120
R0,2x8	30.000	18.000	430	250	0,030	0,080
R0,3x6	40.000	20.000	960	480	0,060	0,180
R0,3x10	33.000	20.000	635	385	0,050	0,150
R0,4x15	19.000	14.000	370	280	0,050	0,150
R0,5x6	40.000	20.000	1.150	575	0,100	0,300
R0,5x16	23.000	18.000	530	410	0,080	0,240
R0,5x20	18.000	12.000	310	205	0,070	0,200
R0,5x30	8.000	5.000	145	85	0,040	0,130
R0,75x6	40.000	20.000	1.800	900	0,150	0,450
R0,75x10	38.000	20.000	1.600	865	0,150	0,450
R0,75x16	30.000	20.000	1.300	865	0,150	0,450
R1x16	28.000	20.000	1.800	1.350	0,200	0,600
R1x30	16.000	11.500	840	615	0,180	0,520
R1,5x20	20.000	15.500	2.050	1.550	0,300	0,900
R1,5x40	12.500	9.200	1.000	740	0,220	0,650
R2x20	20.000	14.000	2.950	2.050	0,400	1,200

### Finishing

R x l1	Graphite					
	S (min <sup>-1</sup> )		F (mm/min)		ap (mm)	pf (mm)
	short	long	short	long		
R0,2x4	40.000	20.000	800	400	0,012	0,012
R0,2x8	30.000	18.000	360	210	0,012	0,012
R0,3x6	40.000	20.000	800	400	0,018	0,018
R0,3x10	33.000	20.000	530	320	0,018	0,018
R0,4x15	19.000	14.000	280	230	0,021	0,021
R0,5x6	40.000	20.000	950	480	0,030	0,030
R0,5x16	23.000	18.000	440	340	0,030	0,030
R0,5x20	18.000	12.000	260	170	0,030	0,030
R0,5x30	8.000	5.000	120	70	0,020	0,020
R0,75x6	40.000	20.000	1.500	750	0,045	0,045
R0,75x10	38.000	20.000	1.350	720	0,045	0,045
R0,75x16	30.000	20.000	1.100	720	0,045	0,045
R1x16	28.000	20.000	1.300	950	0,060	0,060
R1x30	16.000	11.500	600	440	0,060	0,060
R1,5x20	20.000	15.500	1.450	1.100	0,090	0,090
R1,5x40	12.500	9.200	720	530	0,090	0,090
R2x20	20.000	14.000	2.100	1.450	0,120	0,120

Max cutting depth



Set the diagonal plunge angle to be approximately 0,3° and 0,5°


1. Adjust the speed, the feed rate, and the depth of cut to suit your operating conditions, such as the milling shape, machine rigidity, tool holder rigidity, and work holding force.
2. If you are unable to raise the speed and feed rate higher than those indicated in the table above, lower the speed and feed rate using the same ratio.
3. If the workpiece gets chipped or if the operation requires a higher level of milling precision, lower the feed rate as necessary.
4. Depending on the shape, if the workpiece chatters, lower the speed and feed rate using the same ratio.
5. To mill graphite, use a dedicated milling machine. To prevent inhalation of dust, use a dust collector and a dust mask when working around graphite.
6. During milling, keep the runout at the tip of the end mill to be less than 0.01 mm.
7. To achieve efficient finishing, the feed rate may be adjusted as high as triple the rate.
8. For high-efficiency machining, lower the feed rate as far down as 30% for high-load operations such as slotting. This can minimize the amount of cutting remnants resulting from the flexing of the tool.
9. If gouging occurs while milling a flat area, raise the speed.
10. If a cut involves the shaping of a corner, use the corner radius process of the program, or adjust the speed so that it would not cause chattering, and reduce the speed at the corner at the same time (by approximately 60%).

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPL-LN-EBD

Standard milling



R	Cu					< 32 HRC				32 - 41 HRC				42 - 50 HRC			
	l1 (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)
0,15	0,5	32.000	600	0,020	0,030	32.000	400	0,010	0,015	32.000	300	0,010	0,015	32.000	300	0,005	0,005
0,15	1	32.000	450	0,020	0,030	32.000	300	0,010	0,015	32.000	200	0,010	0,015	32.000	200	0,005	0,005
0,2	1	32.000	600	0,025	0,050	32.000	400	0,015	0,025	32.000	300	0,015	0,020	32.000	300	0,010	0,010
0,2	2	27.000	450	0,025	0,050	27.000	300	0,015	0,025	27.000	200	0,015	0,020	27.000	200	0,010	0,010
0,25	1	32.000	750	0,040	0,050	32.000	500	0,020	0,025	32.000	400	0,020	0,020	32.000	400	0,010	0,010
0,25	2	32.000	600	0,040	0,050	32.000	400	0,020	0,025	32.000	300	0,020	0,020	32.000	300	0,010	0,010
0,25	3	27.000	450	0,040	0,050	27.000	300	0,020	0,025	27.000	200	0,020	0,020	27.000	200	0,010	0,010
0,25	4	27.000	450	0,040	0,050	27.000	300	0,020	0,025	27.000	200	0,020	0,020	27.000	200	0,010	0,010
0,3	1	32.000	900	0,045	0,120	32.000	600	0,030	0,060	32.000	500	0,030	0,050	32.000	500	0,030	0,030
0,3	2	32.000	675	0,045	0,120	32.000	450	0,030	0,060	32.000	300	0,030	0,050	32.000	300	0,030	0,030
0,3	3	30.000	375	0,045	0,120	25.000	250	0,030	0,060	24.000	200	0,030	0,050	24.000	200	0,030	0,030
0,3	4	30.000	375	0,045	0,120	25.000	250	0,030	0,060	24.000	200	0,030	0,040	24.000	200	0,030	0,030
0,3	6	25.000	225	0,045	0,120	20.000	150	0,030	0,060	20.000	150	0,030	0,040	20.000	150	0,020	0,020
0,4	2	27.000	675	0,060	0,160	23.000	450	0,040	0,080	21.000	300	0,040	0,060	21.000	300	0,040	0,040
0,4	4	27.000	675	0,060	0,160	23.000	450	0,040	0,080	21.000	300	0,040	0,060	21.000	300	0,040	0,040
0,4	6	24.000	375	0,060	0,120	21.000	250	0,040	0,060	19.000	200	0,040	0,050	19.000	200	0,020	0,025
0,5	2,5	28.000	900	0,075	0,200	25.000	600	0,050	0,100	21.000	400	0,050	0,080	21.000	400	0,050	0,050
0,5	3	28.000	750	0,075	0,200	25.000	500	0,050	0,100	21.000	300	0,050	0,080	21.000	300	0,050	0,050
0,5	4	28.000	750	0,075	0,200	25.000	500	0,050	0,100	21.000	300	0,050	0,080	21.000	300	0,050	0,050
0,5	5	21.000	450	0,075	0,200	19.000	300	0,050	0,100	16.000	200	0,050	0,080	16.000	200	0,050	0,050
0,5	6	21.000	450	0,075	0,200	19.000	300	0,050	0,100	16.000	200	0,050	0,080	16.000	200	0,050	0,050
0,5	8	21.000	450	0,075	0,150	19.000	300	0,050	0,075	16.000	200	0,050	0,060	16.000	200	0,030	0,030
0,5	10	18.000	300	0,060	0,120	17.000	200	0,030	0,050	14.000	150	0,030	0,040	14.000	150	0,010	0,015
0,5	12	18.000	300	0,060	0,120	17.000	200	0,030	0,050	14.000	150	0,030	0,040	14.000	150	0,010	0,015
0,75	4	20.000	900	0,120	0,300	15.000	600	0,080	0,150	12.000	500	0,080	0,120	12.000	300	0,080	0,100
0,75	8	17.000	450	0,120	0,300	15.000	300	0,080	0,150	12.000	250	0,080	0,120	12.000	250	0,080	0,100
1	6	16.500	1.050	0,150	0,560	16.500	700	0,100	0,280	13.500	500	0,100	0,280	13.500	500	0,100	0,200
1	8	16.500	1.050	0,150	0,560	16.500	700	0,100	0,280	13.500	500	0,100	0,280	13.500	500	0,100	0,200
1	10	14.000	750	0,150	0,560	13.000	500	0,100	0,280	10.000	300	0,100	0,280	10.000	300	0,100	0,200
1	12	14.000	750	0,150	0,560	13.000	500	0,100	0,280	10.000	300	0,100	0,280	10.000	300	0,100	0,200
1	14	14.000	750	0,150	0,560	13.000	500	0,100	0,280	10.000	300	0,100	0,280	10.000	300	0,100	0,200
1	16	14.000	750	0,150	0,420	13.000	500	0,100	0,210	10.000	300	0,100	0,180	10.000	300	0,060	0,100
1	20	11.000	375	0,150	0,420	10.000	250	0,100	0,210	8.000	200	0,100	0,180	8.000	200	0,060	0,100
1	25	11.000	375	0,150	0,420	10.000	250	0,100	0,210	8.000	200	0,100	0,180	8.000	200	0,060	0,100
1,5	8	12.000	900	0,200	0,840	9.500	600	0,150	0,420	7.500	400	0,150	0,360	7.500	400	0,150	0,300
1,5	10	12.000	900	0,200	0,840	9.500	600	0,150	0,420	7.500	400	0,150	0,360	7.500	400	0,150	0,300
1,5	16	10.000	450	0,200	0,840	8.500	300	0,150	0,420	6.500	250	0,150	0,360	6.500	250	0,150	0,300
1,5	20	10.000	450	0,200	0,840	8.500	300	0,150	0,420	6.500	250	0,150	0,360	6.500	250	0,150	0,300
2	10	9.000	900	0,500	1,280	7.500	600	0,200	0,640	6.000	400	0,200	0,600	6.000	400	0,200	0,400
2	16	9.000	900	0,500	1,280	7.500	600	0,200	0,640	6.000	400	0,200	0,600	6.000	400	0,200	0,400
2	20	7.000	600	0,500	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,600	5.000	250	0,200	0,400
2	25	7.000	600	0,500	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,600	5.000	250	0,200	0,400
2	30	7.000	600	0,400	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,560	5.000	250	0,120	0,200
3	10	7.000	1.500	0,750	2,400	5.500	1.000	0,300	1,200	4.500	800	0,300	0,960	4.500	800	0,300	0,600
3	12	7.000	1.500	0,750	2,400	5.500	1.000	0,300	1,200	4.500	800	0,300	0,960	4.500	800	0,300	0,600
3	20	7.000	1.200	0,750	2,400	5.500	800	0,300	1,200	4.500	600	0,300	0,960	4.500	600	0,300	0,600
3	30	5.000	600	0,750	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,960	4.000	300	0,300	0,600





# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPL-PC-EBD

Standard milling



R	φ°	Cu					< 32 HRC				32 - 41 HRC				42 - 50 HRC			
		l1 (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)
0,5	0,9°	10	28.000	750	0,075	0,200	25.000	500	0,050	0,100	21.000	300	0,050	0,080	21.000	300	0,050	0,050
0,5	0,9°	15	21.000	450	0,075	0,150	19.000	300	0,050	0,100	16.000	200	0,050	0,080	16.000	200	0,050	0,050
0,5	0,9°	20	21.000	450	0,075	0,150	17.000	200	0,030	0,050	14.000	150	0,030	0,040	14.000	150	0,010	0,020
0,75	0,9°	20	17.000	450	0,120	0,240	15.000	300	0,080	0,120	12.000	250	0,080	0,100	12.000	250	0,075	0,100
0,75	0,9°	30	13.000	300	0,090	0,200	12.000	200	0,060	0,100	9.500	150	0,060	0,100	9.500	150	0,030	0,100
0,75	1,4°	20	17.000	450	0,120	0,300	15.000	300	0,080	0,150	12.000	250	0,080	0,150	12.000	250	0,080	0,150
1	0,9°	20	14.000	750	0,200	0,560	13.000	500	0,100	0,280	10.000	300	0,100	0,280	10.000	300	0,100	0,200
1	0,9°	30	11.000	375	0,150	0,420	10.000	250	0,100	0,210	8.000	200	0,100	0,180	8.000	200	0,080	0,100
1	1,4°	20	16.500	1.050	0,200	0,560	16.500	700	0,100	0,280	13.500	500	0,100	0,280	13.500	500	0,10	0,200
1	1,4°	30	14.000	750	0,150	0,560	13.000	500	0,100	0,280	10.000	300	0,100	0,280	10.000	300	0,100	0,200
1	1,4°	40	11.000	375	0,150	0,420	10.000	250	0,100	0,210	8.000	200	0,100	0,180	8.000	200	0,060	0,100
1,5	0,9°	20	10.000	900	0,200	0,840	9.500	600	0,150	0,420	7.500	400	0,150	0,360	7.500	400	0,150	0,300
1,5	0,9°	30	10.000	450	0,200	0,840	8.500	300	0,150	0,420	6.500	250	0,150	0,360	6.500	250	0,150	0,300
1,5	0,9°	40	10.000	450	0,200	0,840	8.500	300	0,150	0,420	6.500	250	0,150	0,300	6.500	250	0,090	0,150
1,5	1,4°	20	10.000	900	0,300	0,840	9.500	600	0,150	0,420	7.500	400	0,150	0,360	7.500	400	0,150	0,300
1,5	1,4°	30	10.000	450	0,250	0,840	8.500	300	0,150	0,420	6.500	250	0,150	0,360	6.500	250	0,150	0,300
1,5	1,4°	40	10.000	450	0,250	0,840	8.500	300	0,150	0,420	6.500	250	0,150	0,360	6.500	250	0,150	0,300
2	0,9°	30	7.000	600	0,500	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,600	5.000	250	0,200	0,400
2	0,9°	40	7.000	600	0,400	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,56	5.000	250	0,120	0,300
2	0,9°	50	7.000	600	0,400	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,56	5.000	250	0,120	0,200
2	0,9°	60	5.000	375	0,350	1,280	5.000	250	0,200	0,640	4.000	200	0,200	0,56	4.000	200	0,120	0,200
2	0,9°	70	7.000	600	0,500	1,280	6.000	400	0,200	0,640	5.000	250	0,200	0,6	5.000	250	0,200	0,400
2	1,4°	40	7.000	600	0,450	1,280	6.000	400	0,200	0,640	5.500	350	0,200	0,56	5.500	350	0,200	0,300
2	1,4°	50	7.000	600	0,450	1,280	6.000	400	0,200	0,640	5.500	350	0,200	0,56	5.500	350	0,200	0,300
2	1,4°	60	7.000	600	0,400	1,280	6.000	400	0,200	0,640	5.500	350	0,200	0,56	5.500	350	0,200	0,300
3	0,9°	50	5.000	600	0,600	2,400	6.000	400	0,200	0,640	5.500	350	0,200	0,56	5.500	350	0,200	0,600
3	0,9°	60	5.000	600	0,600	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,96	4.000	300	0,300	0,600
3	0,9°	70	5.000	600	0,600	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,96	4.000	300	0,300	0,300
3	0,9°	80	5.000	600	0,450	2,400	4.000	400	0,200	1,200	4.000	300	0,200	0,96	4.000	300	0,200	0,300
3	1,4°	60	5.000	600	0,600	2,400	4.000	400	0,300	1,200	4.000	300	0,300	0,96	4.000	300	0,300	0,600
4	0,9°	60	4.000	550	0,800	3,200	3.000	350	0,400	1,600	3.000	300	0,400	1,24	3.000	300	0,400	0,800
4	0,9°	80	4.000	550	0,800	3,200	3.000	350	0,400	1,600	3.000	300	0,400	1,24	3.000	300	0,400	0,800
4	1,4°	60	4.000	550	0,900	3,200	3.000	350	0,450	1,600	3.000	300	0,450	1,24	3.000	300	0,450	0,800
4	1,4°	80	4.000	550	0,900	3,200	3.000	350	0,450	1,600	3.000	300	0,450	1,24	3.000	300	0,450	0,800




# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPL-PC-EBD

High speed milling



R	φ°	Cu						< 32 HRC				32 - 41 HRC				42 - 50 HRC			
		l1 (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	
0,5	0,9°	10	30.000	2.350	0,075	0,150	27.000	1.700	0,050	0,100	27.000	1.600	0,050	0,050	27.000	1.600	0,050	0,050	
0,5	0,9°	15	24.000	1.400	0,015	0,040	22.000	1.100	0,010	0,020	22.000	1.000	0,010	0,020	21.000	950	0,010	0,020	
0,5	0,9°	20	24.000	1.000	0,015	0,040	22.000	770	0,010	0,020	22.000	700	0,010	0,020	21.000	680	0,010	0,015	
0,75	0,9°	20	24.000	1.400	0,120	0,200	21.000	1.400	0,075	0,100	21.000	1.300	0,075	0,090	21.000	1.300	0,050	0,060	
0,75	0,9°	30	22.000	1.400	0,070	0,200	18.000	1.200	0,050	0,100	18.000	1.100	0,050	0,070	17.000	1.100	0,030	0,030	
0,75	1,4°	20	30.000	2.400	0,120	0,300	24.000	2.000	0,075	0,150	24.000	1.900	0,075	0,120	24.000	1.900	0,080	0,100	
1	0,9°	20	15.000	2.400	0,150	0,300	15.000	1.800	0,100	0,200	15.000	1.700	0,100	0,200	14.000	1.500	0,100	0,200	
1	0,9°	30	14.000	2.200	0,150	0,200	14.000	1.700	0,100	0,100	14.000	1.600	0,100	0,100	13.000	1.400	0,070	0,100	
1	1,4°	20	22.000	3.050	0,200	0,400	20.000	2.400	0,100	0,200	20.000	2.200	0,100	0,200	19.000	2.000	0,100	0,200	
1	1,4°	30	15.000	2.200	0,150	0,200	14.000	1.700	0,100	0,100	14.000	1.600	0,100	0,100	13.000	1.400	0,100	0,100	
1	1,4°	40	12.000	1.200	0,100	0,200	12.000	1.200	0,050	0,100	11.000	1.100	0,050	0,100	10.000	1.000	0,050	0,100	
1,5	0,9°	20	22.000	2.900	0,200	0,600	18.000	2.700	0,150	0,300	18.000	2.500	0,150	0,300	15.000	2.000	0,150	0,300	
1,5	0,9°	30	16.000	2.200	0,200	0,400	14.000	1.800	0,100	0,200	14.000	1.700	0,100	0,200	11.000	1.300	0,100	0,200	
1,5	0,9°	40	16.000	1.800	0,125	0,200	12.000	1.200	0,050	0,100	12.000	1.100	0,050	0,100	9.000	820	0,050	0,100	
1,5	1,4°	20	22.000	2.900	0,200	0,600	18.000	2.700	0,150	0,300	18.000	2.500	0,150	0,300	15.000	2.000	0,150	0,300	
1,5	1,4°	30	20.000	2.600	0,200	0,400	16.000	2.000	0,100	0,200	16.000	1.900	0,100	0,200	13.000	1.500	0,100	0,200	
1,5	1,4°	40	16.000	2.200	0,200	0,400	14.000	1.800	0,100	0,200	14.000	1.700	0,100	0,200	11.000	1.300	0,100	0,200	
2	0,9°	30	18.000	3.000	0,400	0,500	16.000	2.800	0,200	0,400	16.000	2.600	0,200	0,400	12.000	1.900	0,200	0,400	
2	0,9°	40	18.000	3.000	0,250	0,600	16.000	2.800	0,100	0,300	16.000	2.600	0,100	0,300	12.000	1.900	0,100	0,300	
2	0,9°	50	14.000	2.200	0,250	0,400	12.000	1.800	0,100	0,300	12.000	1.700	0,100	0,200	9.000	1.700	0,100	0,200	
2	0,9°	60	16.000	1.800	0,125	0,200	12.000	1.200	0,050	0,100	12.000	1.100	0,050	0,100	9.000	820	0,050	0,100	
2	0,9°	70	16.000	1.800	0,120	0,200	12.000	1.200	0,050	0,100	12.000	1.100	0,050	0,100	9.000	820	0,050	0,100	
2	1,4°	40	18.000	3.200	0,300	0,600	16.000	3.200	0,150	0,300	16.000	3.000	0,150	0,300	12.000	2.200	0,150	0,300	
2	1,4°	50	18.000	2.800	0,300	0,400	12.000	2.200	0,150	0,300	12.000	2.000	0,150	0,300	9.000	1.600	0,150	0,300	
2	1,4°	60	16.000	2.400	0,300	0,200	12.000	1.600	0,100	0,200	12.000	1.500	0,100	0,200	9.000	1.200	0,100	0,200	
3	0,9°	50	9.000	3.000	0,400	0,100	9.000	2.300	0,200	0,400	9.000	2.100	0,200	0,400	7.000	1.600	0,200	0,400	
3	0,9°	60	9.000	2.800	0,400	0,750	9.000	2.000	0,200	0,300	9.000	1.900	0,200	0,300	7.000	1.400	0,200	0,400	
3	0,9°	70	7.000	2.300	0,400	0,750	7.000	1.500	0,200	0,300	7.000	1.500	0,200	0,300	5.900	1.100	0,200	0,300	
3	0,9°	80	6.000	2.000	0,300	0,750	6.000	1.300	0,150	0,300	6.000	1.200	0,150	0,300	5.000	900	0,150	0,300	
3	1,4°	60	9.000	3.200	0,400	0,750	9.000	2.400	0,200	0,400	9.000	2.200	0,200	0,400	7.000	2.000	0,200	0,400	
4	0,9°	60	7.000	2.400	0,500	1,000	7.000	1.700	0,400	0,400	7.000	1.500	0,400	0,400	5.000	1.100	0,400	0,400	
4	0,9°	80	7.000	2.200	0,450	1,000	6.000	1.500	0,350	0,400	6.000	1.300	0,350	0,400	4.000	800	0,350	0,400	
4	1,4°	60	7.000	2.800	0,500	1,000	7.000	2.100	0,400	0,400	7.000	1.700	0,400	0,400	5.000	1.200	0,400	0,400	
4	1,4°	80	7.000	2.600	0,450	1,000	6.000	1.900	0,350	0,400	6.000	1.400	0,350	0,400	4.000	900	0,350	0,400	

# CUTTING CONDITIONS

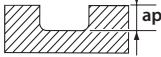
Milling | Endmills | Cutting conditions

## WXL-1,5D-DE

Slotting

Ø	Cu		~32 HRC FC250 • SS400 • S55C • NAK55		33~41 HRC SKT • SKD61 • NAK80 • HPM1 • DH		42~50 HRC SKT • SKD61 • NAK80 • HPM1 • DH	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
0,1	50.000	120	40.000	80	40.000	75	40.000	38
0,2	50.000	170	40.000	110	40.000	90	40.000	45
0,3	50.000	210	40.000	140	40.000	100	40.000	70
0,4	50.000	230	40.000	150	40.000	110	34.500	75
0,5	50.000	250	38.500	150	31.000	110	27.500	75
0,6	50.000	280	33.500	150	24.500	110	21.000	75
0,7	50.000	310	30.000	150	21.500	110	18.500	75
0,8	50.000	360	27.000	150	19.500	110	17.000	80
0,9	50.000	400	23.500	150	17.000	110	15.000	80
1	50.000	430	22.000	150	15.500	110	13.500	80
1,1	50.000	420	20.000	150	14.000	110	12.500	80
1,2	50.000	420	18.500	150	13.500	110	11.500	80
1,3	47.000	410	17.500	150	12.500	110	11.000	80
1,4	44.000	410	16.000	150	11.500	110	10.000	80
1,5	40.000	400	15.500	150	11.000	110	9.900	80
1,6	39.000	400	15.000	150	10.500	110	9.400	80
1,7	36.500	400	14.000	150	9.900	110	8.800	80
1,8	34.500	400	13.500	160	9.400	110	8.500	80
1,9	32.500	400	12.500	160	8.800	110	7.900	85
2	30.000	380	12.000	160	8.700	110	7.900	90
2,1	29.000	410	11.500	170	8.300	110	7.400	90
2,2	28.000	410	11.000	170	8.200	110	7.200	90
2,3	27.500	410	11.000	180	8.000	110	7.000	90
2,4	26.000	430	10.500	180	7.900	110	6.900	90
2,5	24.500	430	10.500	200	7.600	110	6.600	90
2,6	23.500	470	9.800	200	7.400	125	6.300	90
2,7	23.000	470	9.500	200	7.100	125	6.100	90
2,8	22.000	470	9.100	210	6.900	125	5.800	95
2,9	21.500	470	8.800	210	6.700	125	5.700	95
3	21.000	540	8.900	230	6.800	130	5.700	100
3,1	20.000	550	8.700	240	6.700	130	5.600	100
3,2	19.500	560	8.400	240	6.500	145	5.400	105
3,3	19.000	560	8.100	250	6.300	145	5.200	105
3,4	18.000	560	7.900	250	6.100	145	5.100	105
3,5	18.000	560	7.800	250	6.000	155	5.000	105
3,6	17.500	580	7.600	270	5.900	155	4.900	110
3,7	16.500	580	7.400	270	5.700	155	4.700	110
3,8	16.000	590	7.300	280	5.700	155	4.600	110
3,9	15.500	590	7.100	280	5.500	160	4.500	110
4	15.500	600	7.000	280	5.500	160	4.500	115
4,1	15.500	640	6.900	290	5.400	160	4.400	115
4,2	15.000	640	6.800	290	5.300	160	4.400	115
4,3	14.000	640	6.700	310	5.200	160	4.300	115
4,4	14.000	670	6.600	320	5.100	170	4.200	125
4,5	14.000	670	6.600	320	5.100	170	4.200	125
4,6	13.500	700	6.500	330	4.900	170	4.100	125
4,7	13.500	700	6.500	350	4.900	170	4.100	125
4,8	13.500	710	6.400	350	4.800	170	4.100	125
4,9	13.500	710	6.300	360	4.700	170	4.000	125
5	12.500	720	6.200	370	4.600	170	3.900	130
5,1	12.500	720	6.100	370	4.500	170	3.900	130
5,2	12.000	720	6.000	370	4.400	170	3.800	130
5,3	12.000	720	5.900	370	4.400	170	3.800	130
5,4	11.500	720	5.800	370	4.300	170	3.600	130
5,5	11.500	720	5.700	370	4.200	170	3.500	130
5,6	11.500	720	5.600	370	4.100	170	3.500	130
5,7	11.000	720	5.500	370	4.000	170	3.400	130
5,8	11.000	710	5.400	370	3.900	170	3.300	130
5,9	10.500	710	5.300	370	3.800	170	3.300	130
6	10.000	710	5.200	370	3.800	170	3.200	130

Max cutting depth		D < 1	0,1D
		1 ≤ D ≤ 3	0,3D
		3 ≤ D	0,5D

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 properties.



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

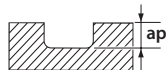
## WXL-2D-DE

Slotting

Ø	Cu		~32 HRC FC250 • SS400 • S55C • NAK55		33~41 HRC SKT • SKD61 • NAK80 • HPM1 • DH		42~50 HRC SKT • SKD61 • NAK80 • HPM1 • DH	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
0,1	50.000	100	32.000	70	32.000	60	32.000	30
0,2	50.000	140	32.000	90	32.000	75	32.000	35
0,3	50.000	170	32.000	110	32.000	80	32.000	55
0,4	50.000	190	32.000	120	32.000	90	27.500	60
0,5	50.000	200	31.000	120	25.000	90	22.000	60
0,6	50.000	230	27.000	120	19.500	90	17.000	60
0,7	50.000	250	24.000	120	17.000	90	15.000	60
0,8	50.000	290	21.500	120	15.500	90	13.500	65
0,9	49.000	320	19.000	120	13.500	90	12.000	65
1	47.500	350	17.500	120	12.500	90	11.000	65
1,1	43.000	340	16.000	120	11.500	90	9.900	65
1,2	40.500	340	15.000	120	10.500	90	9.300	65
1,3	38.000	330	14.000	120	9.900	90	8.700	65
1,4	35.000	330	13.000	120	9.200	90	8.100	65
1,5	32.000	320	12.500	120	8.900	90	7.900	65
1,6	31.000	320	12.000	120	8.500	90	7.500	65
1,7	29.000	320	11.000	120	7.900	90	7.000	65
1,8	28.000	320	10.500	130	7.500	90	6.800	68
1,9	26.000	320	10.000	130	7.100	90	6.300	68
2	24.000	310	9.700	130	7.000	90	6.300	70
2,1	23.000	330	9.300	140	6.600	90	5.900	70
2,2	22.500	330	9.000	140	6.500	90	5.700	70
2,3	22.000	330	8.800	150	6.400	90	5.600	70
2,4	20.500	350	8.600	150	6.300	90	5.500	70
2,5	20.000	350	8.200	160	6.100	90	5.300	70
2,6	19.000	380	7.900	160	5.900	100	5.000	70
2,7	18.000	380	7.600	160	5.700	100	4.900	70
2,8	17.500	380	7.300	170	5.500	100	4.700	75
2,9	17.000	380	7.100	170	5.300	100	4.500	75
3	16.000	400	6.900	170	5.300	100	4.400	75
3,1	15.500	410	6.700	180	5.100	100	4.300	75
3,2	15.000	420	6.500	180	5.000	110	4.200	80
3,3	14.500	420	6.300	190	4.800	110	4.000	80
3,4	14.000	420	6.100	190	4.600	110	3.900	80
3,5	14.000	420	6.000	190	4.600	120	3.800	80
3,6	13.500	430	5.900	200	4.500	120	3.700	85
3,7	12.500	430	5.700	200	4.400	120	3.600	85
3,8	12.500	440	5.600	210	4.400	120	3.600	85
3,9	12.000	440	5.500	210	4.200	125	3.500	85
4	12.000	450	5.400	210	4.200	125	3.500	90
4,1	11.500	480	5.300	220	4.100	125	3.400	90
4,2	11.500	480	5.300	220	4.100	125	3.300	90
4,3	11.000	480	5.200	230	4.000	125	3.300	90
4,4	11.000	500	5.100	240	3.900	130	3.200	95
4,5	10.500	500	5.100	240	3.900	130	3.200	95
4,6	10.500	520	5.000	250	3.800	130	3.200	95
4,7	10.500	520	5.000	260	3.800	130	3.100	95
4,8	10.500	530	4.900	260	3.700	130	3.100	95
4,9	10.000	530	4.900	270	3.600	130	3.100	95
5	9.500	540	4.800	270	3.500	130	3.000	100
5,1	9.500	540	4.700	270	3.500	130	3.000	100
5,2	9.300	540	4.600	270	3.400	130	2.900	100
5,3	9.200	540	4.600	270	3.400	130	2.900	100
5,4	9.000	540	4.500	270	3.300	130	2.800	100
5,5	8.800	540	4.400	270	3.200	130	2.700	100
5,6	8.700	540	4.300	270	3.100	130	2.600	100
5,7	8.500	540	4.200	270	3.100	130	2.600	100
5,8	8.400	530	4.200	270	3.000	130	2.600	100
5,9	8.200	530	4.100	270	2.900	130	2.500	100
6	7.900	530	4.000	270	2.900	130	2.500	100
6,5	7.500	530	3.700	270	2.700	130	2.300	100
7	6.900	530	3.400	270	2.500	130	2.100	100
7,5	6.400	530	3.200	270	2.300	130	2.000	100
8	5.900	520	3.000	260	2.200	125	1.900	100
8,5	5.600	520	2.800	260	2.000	125	1.700	100
9	5.300	510	2.600	260	1.900	125	1.500	100
9,5	5.100	510	2.500	260	1.800	125	1.400	95
10	4.700	500	2.400	250	1.700	125	1.500	95
11	4.400	500	2.200	250	1.600	125	1.100	95
12	4.000	510	2.000	250	1.400	125	1.200	95
16	3.000	400	1.500	200	1.100	115	800	80
18	2.700	360	1.300	180	900	100	700	70
20	2.400	300	1.200	150	800	90	600	60

Milling | Endmills

Cutting conditions



D < 1	0,1D
1 ≤ D ≤ 3	0,3D
3 ≤ D	0,5D

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 properties.



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

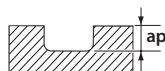
## WXL-3D-DE

Slotting



Ø	Cu		~32 HRC FC250 • SS400 • S55C • NAK55		33~41 HRC SKT • SKD61 • NAK80 • HPM1 • DH		42~50 HRC SKT • SKD61 • NAK80 • HPM1 • DH	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
0,1	50.000	100	32.000	70	32.000	60	32.000	30
0,2	50.000	140	32.000	90	32.000	75	32.000	35
0,3	50.000	170	32.000	110	32.000	80	32.000	55
0,4	50.000	190	32.000	120	32.000	90	27.500	60
0,5	50.000	200	31.000	120	25.000	90	22.000	60
0,6	50.000	230	27.000	120	19.500	90	17.000	60
0,7	50.000	250	24.000	120	17.000	90	15.000	60
0,8	50.000	290	21.500	120	15.500	90	13.500	65
0,9	49.000	320	19.000	120	13.500	90	12.000	65
1	47.500	350	17.500	120	12.500	90	11.000	65
1,1	43.000	340	16.000	120	11.500	90	9.900	65
1,2	40.500	340	15.000	120	10.500	90	9.300	65
1,3	38.000	330	14.000	120	9.900	90	8.700	65
1,4	35.000	330	13.000	120	9.200	90	8.100	65
1,5	32.000	320	12.500	120	8.900	90	7.900	65
1,6	31.000	320	12.000	120	8.500	90	7.500	65
1,7	29.000	320	11.000	120	7.900	90	7.000	65
1,8	28.000	320	10.500	130	7.500	90	6.800	68
1,9	26.000	320	10.000	130	7.100	90	6.300	68
2	24.000	310	9.700	130	7.000	90	6.300	70
2,1	23.000	330	9.300	140	6.600	90	5.900	70
2,2	22.500	330	9.000	140	6.500	90	5.700	70
2,3	22.000	330	8.800	150	6.400	90	5.600	70
2,4	20.500	350	8.600	150	6.300	90	5.500	70
2,5	20.000	350	8.200	160	6.100	90	5.300	70
2,6	19.000	380	7.900	160	5.900	100	5.000	70
2,7	18.000	380	7.600	160	5.700	100	4.900	70
2,8	17.500	380	7.300	170	5.500	100	4.700	75
2,9	17.000	380	7.100	170	5.300	100	4.500	75
3	16.000	400	6.900	170	5.300	100	4.400	75
3,1	15.500	410	6.700	180	5.100	100	4.300	75
3,2	15.000	420	6.500	180	5.000	110	4.200	80
3,3	14.500	420	6.300	190	4.800	110	4.000	80
3,4	14.000	420	6.100	190	4.600	110	3.900	80
3,5	14.000	420	6.000	190	4.600	120	3.800	80
3,6	13.500	430	5.900	200	4.500	120	3.700	85
3,7	12.500	430	5.700	200	4.400	120	3.600	85
3,8	12.500	440	5.600	210	4.400	120	3.600	85
3,9	12.000	440	5.500	210	4.200	125	3.500	85
4	12.000	450	5.400	210	4.200	125	3.500	90
4,1	11.500	480	5.300	220	4.100	125	3.400	90
4,2	11.500	480	5.300	220	4.100	125	3.300	90
4,3	11.000	480	5.200	230	4.000	125	3.300	90
4,4	11.000	500	5.100	240	3.900	130	3.200	95
4,5	10.500	500	5.100	240	3.900	130	3.200	95
4,6	10.500	520	5.000	250	3.800	130	3.200	95
4,7	10.500	520	5.000	260	3.800	130	3.100	95
4,8	10.500	530	4.900	260	3.700	130	3.100	95
4,9	10.000	530	4.900	270	3.600	130	3.100	95
5	9.500	540	4.800	270	3.500	130	3.000	100
5,1	9.500	540	4.700	270	3.500	130	3.000	100
5,2	9.300	540	4.600	270	3.400	130	2.900	100
5,3	9.200	540	4.600	270	3.400	130	2.900	100
5,4	9.000	540	4.500	270	3.300	130	2.800	100
5,5	8.800	540	4.400	270	3.200	130	2.700	100
5,6	8.700	540	4.300	270	3.100	130	2.600	100
5,7	8.500	540	4.200	270	3.100	130	2.600	100
5,8	8.400	530	4.200	270	3.000	130	2.600	100
5,9	8.200	530	4.100	270	2.900	130	2.500	100
6	7.900	530	4.000	270	2.900	130	2.500	100
6,5	7.500	530	3.700	270	2.700	130	2.300	100
7	6.900	530	3.400	270	2.500	130	2.100	100
7,5	6.400	530	3.200	270	2.300	130	2.000	100
8	5.900	520	3.000	260	2.200	125	1.900	100
8,5	5.600	520	2.800	260	2.000	125	1.700	100
9	5.300	510	2.600	260	1.900	125	1.500	100
9,5	5.100	510	2.500	260	1.800	125	1.400	95
10	4.700	500	2.400	250	1.700	125	1.500	95
11	4.400	500	2.200	250	1.600	125	1.100	95
12	4.000	510	2.000	250	1.400	125	1.200	95
16	3.000	400	1.500	200	1.100	115	800	80
18	2.700	360	1.300	180	900	100	700	70
20	2.400	300	1.200	150	800	90	600	60

Max cutting depth



D < 1	0,1D
1 ≤ D ≤ 3	0,3D
3 ≤ D	0,5D

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 properties.



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## WXL-4D-DE

Side milling

Ø	Cu		~32 HRC FC250 • SS400 • S55C • NAK55		33~41 HRC SKT • SKD61 • NAK80 • HPM1 • DH		42~50 HRC SKT • SKD61 • NAK80 • HPM1 • DH	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
0,2	32.000	90	22.500	30	19.000	30	—	—
0,3	32.000	110	22.500	40	19.000	35	—	—
0,4	25.000	110	16.000	45	14.500	35	—	—
0,5	20.000	120	13.000	45	13.000	40	—	—
0,6	16.000	120	11.000	45	10.000	40	—	—
0,7	16.000	120	9.400	45	6.800	40	—	—
0,8	12.000	120	8.400	45	6.000	40	—	—
0,9	12.000	120	7.500	45	5.400	40	—	—
1	9.800	120	5.700	45	5.400	40	—	—
1,1	9.500	140	5.200	45	5.000	40	—	—
1,2	8.600	130	4.800	45	4.500	40	—	—
1,3	8.100	130	4.500	45	4.200	40	—	—
1,4	7.500	130	4.200	45	3.900	40	—	—
1,5	7.000	130	3.900	45	3.600	40	—	—
1,6	6.400	120	3.700	45	3.500	40	—	—
1,7	6.200	120	3.600	45	3.400	40	—	—
1,8	5.800	120	3.300	45	3.100	40	—	—
1,9	5.500	120	3.200	45	3.000	40	—	—
2	5.200	120	3.000	45	2.800	40	—	—
2,1	4.800	120	2.900	45	2.800	40	—	—
2,2	4.600	130	2.700	50	2.600	40	—	—
2,3	4.500	130	2.700	50	2.600	40	—	—
2,4	4.400	130	2.600	55	2.500	40	—	—
2,5	4.100	140	2.500	55	2.500	40	—	—
2,6	3.900	140	2.400	55	2.400	40	—	—
2,7	3.700	150	2.300	55	2.300	45	—	—
2,8	3.600	150	2.200	55	2.200	45	—	—
2,9	3.500	150	2.100	60	2.100	45	—	—
3	3.400	150	2.100	60	2.100	50	1.900	30
3,1	3.200	160	2.000	60	2.000	50	1.800	30
3,2	3.000	160	2.000	65	2.000	50	1.800	30
3,3	2.900	160	1.900	65	1.900	55	1.700	30
3,4	2.800	160	1.800	70	1.800	55	1.700	30
3,5	2.800	160	1.800	70	1.800	55	1.600	30
3,6	2.700	160	1.800	70	1.800	60	1.600	30
3,7	2.700	170	1.700	70	1.700	60	1.500	35
3,8	2.500	170	1.700	70	1.700	60	1.500	35
3,9	2.400	170	1.600	75	1.600	60	1.500	35
4	2.400	170	1.600	75	1.600	65	1.400	35
4,1	2.400	180	1.600	75	1.600	65	1.400	35
4,2	2.300	190	1.600	80	1.600	65	1.400	35
4,3	2.300	190	1.500	80	1.500	65	1.400	35
4,4	2.100	190	1.500	80	1.500	65	1.400	35
4,5	2.100	200	1.500	85	1.500	65	1.300	40
4,6	2.100	200	1.500	85	1.500	65	1.300	40
4,7	2.100	200	1.500	90	1.500	65	1.300	40
4,8	2.100	200	1.500	90	1.500	65	1.300	40
4,9	2.000	210	1.400	90	1.400	65	1.300	40
5	2.000	210	1.400	95	1.400	65	1.300	40
5,1	1.900	210	1.400	95	1.400	65	1.200	40
5,2	1.900	210	1.400	95	1.400	65	1.200	40
5,3	1.800	210	1.300	95	1.300	65	1.200	40
5,4	1.800	210	1.300	95	1.300	65	1.200	40
5,5	1.800	210	1.300	95	1.300	65	1.100	40
5,6	1.700	210	1.300	95	1.300	65	1.100	40
5,7	1.700	210	1.300	95	1.300	65	1.100	40
5,8	1.700	210	1.200	95	1.200	65	1.100	40
5,9	1.600	210	1.200	95	1.200	65	1.000	40
6	1.600	210	1.200	95	1.200	65	1.000	40
8	1.100	200	900	95	900	65	800	40
10	900	200	700	90	700	65	630	40
12	800	200	600	90	600	65	525	40

Max cutting depth		ae			ap = 4D	
	D > 1	0,05D		D < 0,3		0,015D
	D < 1	0,1D		D 0,3-1,0		0,03D
				D 1,0-3,0		0,05D
				D > 3,0	0,1D	

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 properties.

Milling | Endmills

Cutting conditions

# CUTTING CONDITIONS

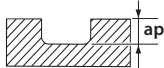
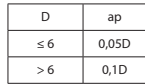
Milling | Endmills | Cutting conditions

## WX-G-EDSS

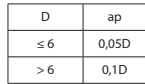
### Slotting

Ø	C≤0,2% - GG SS400 • S55C • FC250 750 N/mm2		~30 HRC SCM • SKT • SKS • SKD		30~38 HRC NAK55 • SKT • HPM1 • SKD		38~45 HRC SUS304 • NAK80 • HPM50 • SKD		45~55 HRC-SUS Z38CDV5		55~60 HRC Z160CDV12	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	19.500	130	14.500	125	12.500	90	11.000	65	7.000	30	5.050	25
1,5	14.000	130	10.500	125	8.900	90	7.950	65	5.050	40	3.550	25
2	11.000	135	8.400	125	7.000	90	6.350	70	3.950	40	2.750	25
2,5	8.900	170	7.250	135	6.000	95	5.600	70	3.250	40	2.300	25
3	7.450	200	7.200	230	5.850	125	5.300	100	3.200	45	2.100	25
3,5	6.650	225	6.200	230	5.000	125	4.550	100	2.750	45	1.800	25
4	6.000	235	5.400	230	4.400	125	4.000	100	2.400	45	1.600	25
4,5	5.650	270	4.800	230	3.900	125	3.550	100	2.100	45	1.400	25
5	5.300	315	4.350	235	3.500	130	3.200	100	1.900	55	1.300	30
5,5	4.800	310	3.950	235	3.250	130	2.750	100	1.750	55	1.150	30
6	4.400	310	3.600	235	2.900	130	2.650	100	1.600	55	1.050	25
8	3.300	295	2.700	235	2.200	125	2.000	100	1.200	50	795	25
10	2.650	280	2.150	230	1.750	125	1.600	95	955	50	635	25
12	2.200	280	1.800	230	1.450	125	1.350	95	795	45	530	20

Max cutting depth	D	ap		D	ap	
	≤ 6	0,3D		≤ 6	0,1D	
	> 6	0,5D		> 6	0,2D	

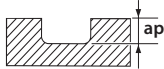
D	ap	
≤ 6	0,05D	
> 6	0,1D	

1. Use high precision machine set up to ensure maximum rigidity.  
 2. In case of vibration, reduce both feed and speed.  
 3. Use a coolant that has a low co-efficient of smoke emission. \* Modified parameters

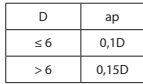
### High speed light milling

Ø	C≤0,2% - GG SS400 • S55C • FC250 750 N/mm2		~30 HRC SCM • SKT • SKS • SKD		30~38 HRC NAK55 • SKT • HPM1 • SKD		38~45 HRC SUS304 • NAK80 • HPM50 • SKD		45~55 HRC-SUS Z38CDV5	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	30.200	545	28.600	515	25.500	405	19.100	275	12.700	120
1,5	20.800	550	20.200	530	17.500	405	12.900	270	8.700	120
2	15.900	550	15.500	530	13.500	405	9.900	270	6.700	120
2,5	13.100	550	12.700	535	11.100	405	8.000	265	5.450	125
3	10.600	605	10.600	575	8.500	410	6.350	285	4.800	145
3,5	9.550	600	9.550	570	7.750	405	5.700	280	4.200	140
4	8.750	560	8.750	560	7.150	400	5.150	270	3.750	135
4,5	8.150	550	8.150	550	6.700	390	4.800	255	3.400	130
5	7.650	535	7.650	535	6.400	380	4.450	250	3.200	130
5,5	6.900	535	6.950	535	5.800	380	4.050	250	2.900	130
6	6.350	535	6.350	535	5.300	380	3.700	250	2.650	130
8	4.800	535	4.800	535	4.000	380	2.800	250	2.000	130
10	3.800	535	3.800	535	3.200	380	2.250	250	1.600	130
12	3.200	535	3.200	535	2.650	380	1.850	250	1.350	130

Max cutting depth	D	ap		D	ap
	≤ 3	0,15D		≤ 6	0,1D
	> 3	0,2D		> 6	0,15D

D	ap	
≤ 6	0,1D	
> 6	0,15D	

1. Use high precision machine set up to ensure maximum rigidity.  
 2. In case of vibration, reduce both feed and speed.  
 3. Use a coolant that has a low co-efficient of smoke emission. \* Modified parameters

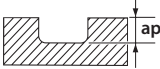


# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## FX-SS-EDS

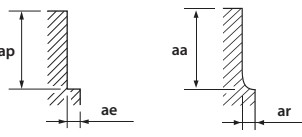
Slotting

Ø	C≤0,2% - GG E24 • XC48 • FT25 ~750 N/mm <sup>2</sup>		~30 HRC 35NCD16 • 40CMD8		30~38 HRC 35NCD16		38~45 HRC SUS304 • SKD • NAK80 • HPM50		45~55 HRC-SUS Z38CDV5		55~60 HRC Z160CDV12	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	4.450	310	3.600	235	2.950	130	2.500	95	1.550	55	1.050	25
8	3.300	295	2.700	230	2.200	125	1.900	95	1.150	50	795	25
10	2.650	280	2.150	230	1.750	125	1.500	95	955	50	635	25
12	2.200	280	1.800	230	1.450	125	1.250	95	795	45	530	20
Max cutting depth	ap 0,5D						ap 0,05D					

1. Use high precision machine set up to ensure maximum rigidity.  
 2. In case of vibration, reduce both feed and speed.  
 3. Use a coolant that has a low co-efficient of smoke emission.  
 \* Modified parameters

## FX-MG-EDL

Side milling

Ø	C≤0,2% - GG SS400 • S55C • FC250 750 N/mm <sup>2</sup>		SCM - SK SCM • SKT • SKS • SKD ~30 HRC		30~38 HRC SKT • SKD • NAK55 • HPM1		38~45 HRC SKT • SKD • NAK80 • HPM50		45~55 HRC																							
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)																						
1	19.000	190	14.000	140	11.000	80	9.500	60	6.350	30																						
2	9.500	190	7.150	140	5.550	80	4.750	60	3.150	30																						
3	6.350	190	4.750	140	3.700	80	3.150	60	2.100	30																						
4	4.750	190	3.550	140	2.750	80	2.350	60	1.550	30																						
5	3.800	190	2.850	140	2.200	80	1.900	60	1.250	30																						
6	3.150	190	2.350	140	1.850	80	1.550	60	1.050	30																						
8	2.350	190	1.950	155	1.550	90	1.350	70	995	40																						
10	1.900	190	1.550	155	1.250	90	1.100	70	795	40																						
12	1.550	185	1.300	155	1.050	90	925	70	660	40																						
14	1.350	185	1.100	150	905	80	795	70	565	35																						
16	1.150	180	995	135	795	70	695	60	495	30																						
18	1.050	165	880	120	705	60	615	55	440	30																						
20	955	150	795	110	635	55	555	50	395	25																						
22	865	135	720	100	575	50	505	45	360	20																						
24	795	125	660	90	530	50	460	40	330	20																						
25	760	120	635	90	505	45	445	40	315	20																						
Max cutting depth	<table border="1"> <tr><th>ap</th><th>ae</th></tr> <tr><td>D ≤ Ø20</td><td>2,5D</td><td>0,05D</td></tr> <tr><td>Ø20 &lt; D</td><td>2,5D</td><td>1mm</td></tr> </table>		ap	ae	D ≤ Ø20	2,5D	0,05D	Ø20 < D	2,5D	1mm					<table border="1"> <tr><th>ap</th><th>ae</th></tr> <tr><td>D ≤ Ø10</td><td>2,5D</td><td>0,05D</td></tr> <tr><td>Ø10 &lt; D</td><td>2,5D</td><td>0,5mm</td></tr> </table>		ap	ae	D ≤ Ø10	2,5D	0,05D	Ø10 < D	2,5D	0,5mm	<table border="1"> <tr><th>ap</th><th>ae</th></tr> <tr><td>2,5D</td><td>0,02D</td></tr> </table>		ap	ae	2,5D	0,02D		
ap	ae																															
D ≤ Ø20	2,5D	0,05D																														
Ø20 < D	2,5D	1mm																														
ap	ae																															
D ≤ Ø10	2,5D	0,05D																														
Ø10 < D	2,5D	0,5mm																														
ap	ae																															
2,5D	0,02D																															

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 properties.

Milling | Endmills

Cutting conditions

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## CA-RG-EDS

Side milling

Ø	AL A7075		Cu C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	32.000	220	23.500	220
2	32.000	420	11.500	215
3	21.000	700	7.950	250
4	15.500	725	5.950	280
5	12.500	760	4.750	295
6	10.500	830	3.950	310
8	7.950	890	2.950	350
10	6.350	995	2.350	365
12	5.300	1.050	1.950	390
14	4.500	1.050	1.700	395
16	3.950	1.050	1.450	390
18	3.500	1.050	1.300	390
20	3.150	1.050	1.150	385

Max cutting depth

ap	ae
1,5D	0,1D

1. Use a high rigidity machine set up.  
2. Use soluble oil.

## Slotting

Ø	AL A7075		Cu C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	32.000	220	23.500	220
2	23.500	310	11.500	215
3	15.500	515	7.950	250
4	11.500	540	5.950	280
5	9.500	575	4.750	295
6	7.950	630	3.950	310
8	5.950	665	2.950	350
10	4.750	745	2.350	365
12	3.950	790	1.950	390
14	3.400	795	1.700	395
16	2.950	795	1.450	390
18	2.650	795	1.300	390
20	2.350	785	1.150	385

Max cutting depth

ap
1D

1. Use a high rigidity machine set up.  
2. Use soluble oil.

## CA-RG-EDL

Side milling

Ø	AL A7075		Cu C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	13.000	390	6.350	195
4	9.900	400	4.750	210
5	7.950	400	3.800	245
6	6.600	450	3.150	260
8	4.950	500	2.350	275
10	3.950	600	1.900	295
12	3.300	630	1.550	305

Max cutting depth

ap	ae
2,5D	0,1D

1. Use a high rigidity machine set up.  
2. Use soluble oil.  
3. For side milling, modify feed to obtain required finish quality




# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## HYP-F1

Slotting



Ø	AL		Plastic	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	40.000	2.500	20.000	2.000
4	35.000	2.500	20.000	2.000
5	30.000	3.000	20.000	3.000
6	25.000	3.000	20.000	3.000
8	25.000	3.000	20.000	3.000
10	22.300	3.000	16.000	2.400
12	18.600	3.000	13.500	2.400









# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AM-EBT

Ball type

Vc	Prehardened Steel • Hardened Steel ~45HRC		Hardened Steel ~65HRC		Stainless Steel ≤200HB		Cobalt Chromium Based Alloy (Stellite)		Titanium Alloy		Ni based Alloy (Inconel 718)	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	3.200	960	2.700	800	3.700	1.120	3.200	960	2.700	800	1.600	480
4	2.400	860	2.000	720	2.800	1.000	2.400	860	2.000	720	1.200	430
5	1.900	860	1.600	720	2.200	1.000	1.900	860	1.600	720	960	430
6	1.600	960	1.300	800	1.900	1.120	1.600	960	1.300	800	800	480
8	1.200	790	1.000	660	1.400	920	1.200	790	1.000	660	600	390
10	1.000	720	800	600	1.100	840	1.000	720	800	600	480	360

Depth of cut	Dc	ap	pf
	R≤6	Max:0,15D	0,05D
	8≤R	Max:3mm	

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 adjust the speed, feed and depth of cut accordingly when the overhang length is longer than specified.
5. Please use a suitable fluid with high smoke retardant properties.
6. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.
7. Please use water-soluble coolant when machining stainless steel, cobalt-chromium based alloy, titanium alloy, and Ni-based alloy.
8. Tool runout should be kept to a minimum for maximum accuracy.
9. When the cutting load fluctuates in areas such as the corners, please reduce the rotational speed.

## AM-CRE

Radius type

Vc	Prehardened Steel • Hardened Steel ~45HRC		Hardened Steel ~65HRC		Stainless Steel ≤200HB		Cobalt Chromium Based Alloy (Stellite)		Titanium Alloy		Ni based Alloy (Inconel 718)	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6xR1,5	3.200	960	2.700	800	3.700	1.120	3.200	960	2.700	800	1.600	480
8xR2	2.400	720	2.000	600	2.800	840	2.400	720	2.000	600	1.200	360
10xR2	1.900	920	1.600	760	2.200	1.070	1.900	920	1.600	760	960	460
12xR2	1.600	1.270	1.300	1.060	1.900	1.490	1.600	1.270	1.300	1.060	800	640
16xR3	1.200	1.430	1.000	1.190	1.400	1.670	1.200	1.430	1.000	1.190	600	720
20xR3	1.000	1.530	800	1.270	1.100	1.780	1.000	1.530	800	1.270	480	760

Depth of cut	ae	ap
	Max:0,5mm	Max:0,5mm

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 speed, feed and depth of cut accordingly when the overhang length is longer than specified.
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 based 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.


# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AM-HFC

High Feed Radius type

Frontal Milling

Vc	Prehardened Steel • Hardened Steel ~45HRC		Hardened Steel ~62HRC		Hardened Steel ~70HRC		Stainless Steel ≤200HB		Cobalt Chromium Based Alloy (Stellite)		Titanium Alloy		Ni based Alloy (Inconel 718)					
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)				
90~110m/min	70~90m/min		50~70m/min		100~120m/min		90~110m/min		70~90m/min		30~50m/min							
4 × R0,5	7.960	5.730	6.370	4.590	4.780	1.720	8.760	6.310	7.960	5.730	6.370	4.590	3.180	760				
5 × R0,6	6.370	5.730	5.100	4.590	3.820	1.720	7.010	6.310	6.370	5.730	5.100	4.590	2.550	770				
6 × R0,8	5.310	5.730	4.250	4.590	3.180	1.720	5.840	6.310	5.310	5.730	4.250	4.590	2.120	760				
8 × R1	3.980	5.730	3.180	4.580	2.390	1.720	4.380	6.310	3.980	5.730	3.180	4.580	1.590	760				
10 × R1,2	3.180	5.720	2.550	4.590	1.910	1.720	3.500	6.300	3.180	5.720	2.550	4.590	1.270	760				
12 × R1,5	2.650	5.720	2.120	4.580	1.590	1.720	2.920	6.310	2.650	5.720	2.120	4.580	1.060	760				
Depth of cut	 <table border="1" style="display: inline-table; margin-left: 20px;"> <tr> <td>ae</td> <td>ap</td> </tr> <tr> <td>Max: 0,5D</td> <td>Max: 0,04D</td> </tr> </table> <p>If the pick amount is 0.5 x D or more, cusp may occur on the machined surface.</p>														ae	ap	Max: 0,5D	Max: 0,04D
ae	ap																	
Max: 0,5D	Max: 0,04D																	
During machining, please program the milling paths according to the recommended simulated R (rt) respective to the individual end mill diameter.																		

## AM-HFC

High Feed Radius type

Side Milling

Vc	Prehardened Steel • Hardened Steel ~45HRC		Hardened Steel ~62HRC		Hardened Steel ~70HRC		Stainless Steel ≤200HB		Cobalt Chromium Based Alloy (Stellite)		Titanium Alloy		Ni based Alloy (Inconel 718)																					
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)																				
80~100m/min	50~70m/min		30~50m/min		90~110m/min		80~100m/min		50~70m/min		20~40m/min																							
4 × R0,5	7.170	1.200	4.780	570	3.180	230	7.960	1.340	7.170	1.200	4.780	570	2.390	230																				
5 × R0,6	5.730	1.200	3.820	570	2.550	230	6.370	1.340	5.730	1.200	3.820	570	1.910	230																				
6 × R0,8	4.780	1.200	3.180	570	2.120	230	5.310	1.340	4.780	1.200	3.180	570	1.590	230																				
8 × R1	3.580	1.720	2.390	800	1.590	380	3.980	1.910	3.580	1.720	2.390	800	1.190	230																				
10 × R1,2	2.870	1.720	1.910	800	1.270	380	3.180	1.910	2.870	1.720	1.910	800	960	230																				
12 × R1,5	2.390	1.720	1.590	800	1.060	380	2.650	1.910	2.390	1.720	1.590	800	800	230																				
Depth of cut	<table border="1"> <tr><td>ae</td><td>ap</td></tr> <tr><td>Max: 0,05D</td><td>Max: 1,5D</td></tr> </table>		ae	ap	Max: 0,05D	Max: 1,5D	<table border="1"> <tr><td>ae</td><td>ap</td></tr> <tr><td>Max: 0,02D</td><td>Max: 1,5D</td></tr> </table>		ae	ap	Max: 0,02D	Max: 1,5D	<table border="1"> <tr><td>ae</td><td>ap</td></tr> <tr><td>Max: 0,02D</td><td>Max: 1D</td></tr> </table>		ae	ap	Max: 0,02D	Max: 1D	<table border="1"> <tr><td>ae</td><td>ap</td></tr> <tr><td>Max: 0,05D</td><td>Max: 1,5D</td></tr> </table>		ae	ap	Max: 0,05D	Max: 1,5D	<table border="1"> <tr><td>ae</td><td>ap</td></tr> <tr><td>Max: 0,02D</td><td>Max: 1,5D</td></tr> </table>		ae	ap	Max: 0,02D	Max: 1,5D				
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<ol style="list-style-type: none"> <li>This tool is recommended for the roughing of additive manufacturing and mold overlay surfaces.</li> <li>Please use machines and holders that are rigid and highly accurate.</li> <li>The values listed above are for reference. Please set the cutting condition in accordance with the actual machining environment.</li> <li>Please reduce the feed rate when the depth of cut is greater than specified.</li> <li>The above table is a guide when the amount of protrusion of the tool is 4 x D or less. If the amount of protrusion is large, chattering is likely to occur, so adjust the rotation speed, feed rate and depth of cut with reference to the coefficients.</li> <li>Please use a suitable fluid with high smoke retardant properties.</li> <li>During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.</li> <li>Please use water-soluble coolant when machining stainless steel, cobalt-chromium alloy, titanium alloy, and Ni-based alloy.</li> <li>Tool runout should be kept to a minimum for maximum accuracy.</li> <li>When the cutting load fluctuates in areas such as the corners, please reduce the rotational speed.</li> </ol>																																		

### Tool extension coefficients

Overhang Length	Cutting Speed	ap	fz
L/D ≤ 4	100%	100%	100%
4 < L/D ≤ 5	90%	75%	80%
5 < L/D ≤ 6	80%	50%	60%



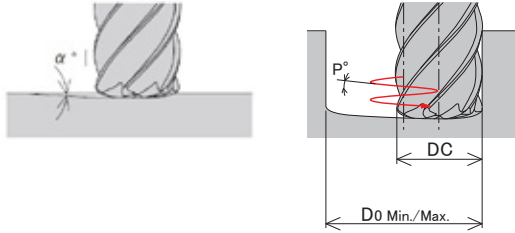
# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AM-HFC

High Feed Radius type Maximum Ramping Angle (E°)

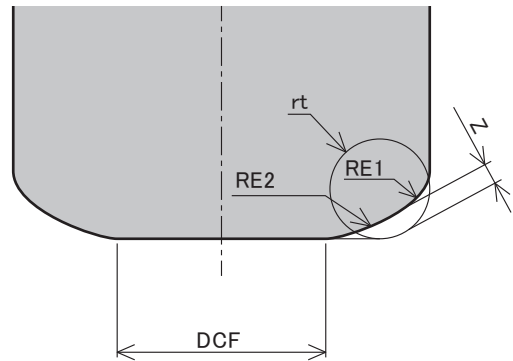
DC x rt	Ramping Angle E°	Helical Milling (mm)		Helical Angle p°
		D0 Min.	D0 Max.	
4xR0,5	3°	6	7	1,5°
5xR0,6	3°	7,5	9	1,5°
6xR0,8	3°	9	11	1,5°
8xR1	3°	12	15	1,5°
10xR1,2	3°	15	19	1,5°
12xR1,5	3°	18	23	1,5°



### 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.



# CUTTING CONDITIONS


Milling | Endmills | Cutting conditions

## PXHF-AM

For both PXMZ straight shank holder / PXMZ collet

### Frontal Milling L/D ≤ 4

Vc	Prehardened Steel • Hardened Steel ~45HRC		Hardened Steel ~62HRC		Hardened Steel ~70HRC		Stainless Steel ≤200HB		Cobalt Chromium Based Alloy (Stellite)		Titanium Alloy		Ni based Alloy (Inconel 718)	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
12	3.180	5.270	2.650	4.390	1.990	1.580	3.580	5.930	3.180	5.270	2.650	4.390	1.060	760
16	2.390	5.280	1.990	4.390	1.490	1.570	2.690	5.940	2.390	5.280	1.990	4.390	800	770
20	1.910	5.270	1.590	4.390	1.190	1.570	2.150	5.930	1.910	5.270	1.590	4.390	640	770

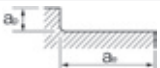


<b>a<sub>e</sub></b>	<b>a<sub>p</sub></b>
Max: 0,5D	Max: 0,04D

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

### Frontal Milling 4 < L/D ≤ 5

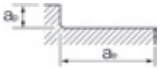
Vc	Prehardened Steel • Hardened Steel ~45HRC		Hardened Steel ~62HRC		Hardened Steel ~70HRC		Stainless Steel ≤200HB		Cobalt Chromium Based Alloy (Stellite)		Titanium Alloy		Ni based Alloy (Inconel 718)	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
12	2.920	3.780	2.390	3.100	1.860	1.210	3.320	4.300	2.920	3.780	2.390	3.100	930	540
16	2.190	3.780	1.790	3.090	1.390	1.200	2.490	4.300	2.190	3.780	1.790	3.090	700	540
20	1.750	3.780	1.430	3.090	1.110	1.200	1.990	4.300	1.750	3.780	1.430	3.090	560	540



<b>a<sub>e</sub></b>	<b>a<sub>p</sub></b>
Max: 0,5D	Max: 0,03D

### Frontal Milling 5 < L/D ≤ 6

Vc	Prehardened Steel • Hardened Steel ~45HRC		Hardened Steel ~62HRC		Hardened Steel ~70HRC		Stainless Steel ≤200HB		Cobalt Chromium Based Alloy (Stellite)		Titanium Alloy		Ni based Alloy (Inconel 718)	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
12	2.650	2.670	2.120	2.140	1.590	800	2.920	2.940	2.650	2.670	2.120	2.140	800	350
16	1.990	2.670	1.590	2.140	1.190	800	2.190	2.940	1.990	2.670	1.590	2.140	600	350
20	1.590	2.670	1.270	2.130	960	810	1.750	2.940	1.590	2.670	1.270	2.130	480	350



<b>a<sub>e</sub></b>	<b>a<sub>p</sub></b>
Max: 0,5D	Max: 0,02D

## PXHF-AM

Side Milling

Vc	Prehardened Steel • Hardened Steel ~45HRC		Hardened Steel ~62HRC		Hardened Steel ~70HRC		Stainless Steel ≤200HB		Cobalt Chromium Based Alloy (Stellite)		Titanium Alloy		Ni based Alloy (Inconel 718)	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
12	2.390	1.200	1.590	570	1.060	230	2.650	1.340	2.390	1.200	1.590	570	800	230
16	1.790	1.200	1.190	570	800	230	1.990	1.340	1.790	1.200	1.190	570	600	230
20	1.430	1.200	960	580	640	230	1.590	1.340	1.430	1.200	960	580	480	230

<b>a<sub>e</sub></b>	<b>a<sub>p</sub></b>
Max: 0,05D	Max: 0,5D

<b>a<sub>e</sub></b>	<b>a<sub>p</sub></b>
Max: 0,02D	Max: 0,5D

<b>a<sub>e</sub></b>	<b>a<sub>p</sub></b>
Max: 0,05D	Max: 0,5D

<b>a<sub>e</sub></b>	<b>a<sub>p</sub></b>
Max: 0,02D	Max: 0,5D

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 the pick amount is 0.5 x D or more, cusp may occur on the machined surface.

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



# CUTTING CONDITIONS

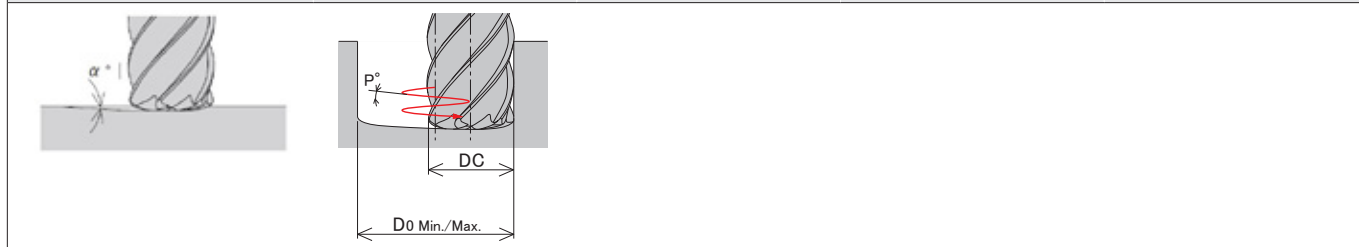
Milling | Endmills | Cutting conditions

## PXHF-AM

For both PXMZ straight shank holder / PXMC collet

Maximum Ramping Angle (E°)

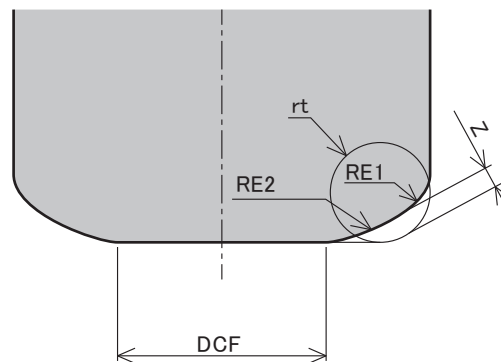
Designation	Ramping Angle E°	Helical Milling (mm)		Helical Angle p°
		D0 Min.	D0 Max.	
PXHF-AM120C12-06R150-O	3°	18	23	1,5°
PXHF-AM160C16-06R200-O	3°	24	31	1,5°
PXHF-AM200C20-06R250-O	3°	30	39	1,5°



### Edge shape definitions for the purpose of creating a program

Designation	R rt	Remainder Z
PXHF-AM120C12-06R150-O	R1,5	0,36
PXHF-AM160C16-06R200-O	R2	0,47
PXHF-AM200C20-06R250-O	R2,5	0,59

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



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-TS-N Applies to square/sharp corner edge/radius type

### Slot Milling

Vc (m/min)	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100					
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)				
300			300		150					
DC X LU	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)				
3 x 9	32.000	1.720	32.000	1.720	16.000	960				
4 x 12	24.000	1.780	24.000	1.780	12.000	1.030				
5 x 15	19.200	1.840	19.200	1.840	9.600	1.090				
6 x 18	16.000	1.900	16.000	1.900	8.000	1.160				
8 x 24	12.000	2.030	12.000	2.030	6.000	1.300				
10 x 30	9.600	2.150	9.600	2.150	4.800	1.430				
12 x 36	8.000	2.270	8.000	2.270	4.000	1.560				
16 x 48	6.000	2.380	6.000	2.380	3.000	1.630				
20 x 60	4.800	2.490	4.800	2.490	2.400	1.700				
25 x 75	3.850	2.600	3.850	2.600	1.900	1.780				
Depth of cut	<table border="1"> <tr><td>ap</td></tr> <tr><td>1D</td></tr> </table>				ap	1D	<table border="1"> <tr><td>ap</td></tr> <tr><td>0,5D</td></tr> </table>		ap	0,5D
ap										
1D										
ap										
0,5D										
<ol style="list-style-type: none"> <li>The above milling condition is a guideline for the overhang length is 4xD.</li> <li>Use a rigid and precise machine and holder.</li> <li>The indicated speeds and feeds are for milling with water-soluble coolant.</li> <li>Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.</li> <li>Reduce speed and feed as well as depth of cut when high precision is required.</li> <li>Adjust the speed and feed accordingly when the overhang length is longer than specified (refer to p.10).</li> <li>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.</li> </ol>										

### Side Milling

Vc (m/min)	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100					
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)				
300			300		150					
DC X LU	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)				
3 x 9	32.000	2.150	32.000	2.150	16.000	1.200				
4 x 12	24.000	2.230	24.000	2.230	12.000	1.290				
5 x 15	19.200	2.300	19.200	2.300	9.600	1.360				
6 x 18	16.000	2.380	16.000	2.380	8.000	1.450				
8 x 24	12.000	2.540	12.000	2.540	6.000	1.620				
10 x 30	9.600	2.690	9.600	2.690	4.800	1.780				
12 x 36	8.000	2.840	8.000	2.840	4.000	1.950				
16 x 48	6.000	2.980	6.000	2.980	3.000	2.040				
20 x 60	4.800	3.100	4.800	3.100	2.400	2.130				
25 x 75	3.850	3.200	3.850	3.200	1.900	2.200				
Depth of cut	<table border="1"> <tr><td>ap</td><td>ae</td></tr> <tr><td>1,5D</td><td>0,2D</td></tr> </table>				ap	ae	1,5D	0,2D		
ap	ae									
1,5D	0,2D									
<ol style="list-style-type: none"> <li>The above milling condition is a guideline for the overhang length is 4xD.</li> <li>Use a rigid and precise machine and holder.</li> <li>The indicated speeds and feeds are for milling with water-soluble coolant.</li> <li>Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.</li> <li>Reduce speed and feed as well as depth of cut when high precision is required.</li> <li>Adjust the speed and feed accordingly when the overhang length is longer than specified (refer to p.10).</li> <li>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.</li> </ol>										



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-TS-N Applies to square/sharp corner edge/radius type

Plunging

	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100	
Vc (m/min)	80		80		60	
DC X LU	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3 x 9	8.500	400	8.500	400	6.400	120
4 x 12	6.400	400	6.400	400	4.800	120
5 x 15	5.100	400	5.100	400	3.800	120
6 x 18	4.200	450	4.200	450	3.100	130
8 x 24	3.200	500	3.200	500	2.400	150
10 x 30	2.550	500	2.550	500	1.900	150
12 x 36	2.100	500	2.100	500	1.600	150
16 x 48	1.600	550	1.600	550	1.200	170
20 x 60	1.300	550	1.300	550	960	170
25 x 75	1.020	550	1.020	550	770	170

Depth of cut	<table border="1"> <tr><td>ap</td></tr> <tr><td>1D</td></tr> </table>		ap	1D	<table border="1"> <tr><td>ap</td></tr> <tr><td>0,5D</td></tr> </table>		ap	0,5D
ap								
1D								
ap								
0,5D								

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.10).
7. When the chips wind around the end mill, reduce the speed and feed.
8. 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

DC = Ø6, Ø8

Work Material	L/D	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100	
		S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
Slot milling	5	70%		70%		70%	
	6	40%		40%		40%	
Side milling	5	70%		70%		70%	
	6	50%		50%		50%	
Plunging	5	80%		80%		80%	
	6	60%		60%		60%	

Milling | Endmills

Cutting conditions





# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-TL-N Applies to square/sharp corner edge/radius type

3XD Cutting length

Slot Milling

Vc (m/min)	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
240			240		120	
3 x 9	25.600	1.380	25.600	1.380	12.800	770
4 x 12	19.200	1.420	19.200	1.420	9.600	820
5 x 15	15.360	1.470	15.360	1.470	7.680	870
6 x 18	12.800	1.520	12.800	1.520	6.400	930
8 x 24	9.600	1.620	9.600	1.620	4.800	1.040
10 x 30	7.680	1.720	7.680	1.720	3.840	1.140
12 x 36	6.400	1.820	6.400	1.820	3.200	1.250
16 x 48	4.800	1.920	4.800	1.920	2.400	1.320
20 x 60	3.800	2.020	3.800	2.020	1.900	1.390
25 x 75	3.060	2.120	3.060	2.120	1.530	1.460

Depth of cut	ap 1D				ap 0,5D	
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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.

## Side Milling

Vc (m/min)	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
240			240		120	
3 x 9	25.600	1.720	25.600	1.720	12.800	960
4 x 12	19.200	1.780	19.200	1.780	9.600	1.020
5 x 15	15.360	1.840	15.360	1.840	7.680	1.080
6 x 18	12.800	1.900	12.800	1.900	6.400	1.160
8 x 24	9.600	2.030	9.600	2.030	4.800	1.300
10 x 30	7.680	2.150	7.680	2.150	3.840	1.420
12 x 36	6.400	2.270	6.400	2.270	3.200	1.550
16 x 48	4.800	2.390	4.800	2.390	2.400	1.630
20 x 60	3.800	2.510	3.800	2.510	1.900	1.710
25 x 75	3.060	2.640	3.060	2.640	1.530	1.800

Depth of cut	ap    ae 3D    0,1D					
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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.

Milling | Endmills



Cutting conditions

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-TL-N Applies to square/sharp corner edge/radius type

3XD Cutting length

Plunging

Vc (m/min)	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
70			70		50	
DC x APMX	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3 x 9	7.500	350	7.500	350	5.300	100
4 x 12	5.600	350	5.600	350	3.980	100
5 x 15	4.460	350	4.460	350	3.180	100
6 x 18	3.680	400	3.680	400	2.650	110
8 x 24	2.800	450	2.800	450	1.990	120
10 x 30	2.230	450	2.230	450	1.590	120
12 x 36	1.840	450	1.840	450	1.330	120
16 x 48	1.400	500	1.400	500	1.000	130
20 x 60	1.100	500	1.100	500	800	130
25 x 75	890	500	890	500	640	130
Depth of cut	ap 1D				ap 0,5D	

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. When the chips wind around the end mill, reduce the speed and feed.
6. 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.

## AE-TL-N

5XD Cutting length

Side Milling

Vc (m/min)	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
100			100		50	
DC x APMX	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3 x 15	10.600	640	10.600	640	5.300	200
4 x 20	8.000	690	8.000	690	4.000	210
5 x 25	6.400	730	6.400	730	3.200	230
6 x 30	5.300	780	5.300	780	2.600	240
8 x 40	4.000	870	4.000	870	2.000	260
10 x 50	3.200	960	3.200	960	1.600	290
12 x 60	2.700	1.050	2.700	1.050	1.300	320
16 x 60	2.000	1.140	2.000	1.140	1.000	350
20 x 80	1.600	1.230	1.600	1.230	800	380
25 x 125	1.300	1.320	1.300	1.320	640	400
Depth of cut	ap    ae 5D    0,1D					

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.

Milling | Endmills

Cutting conditions

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VTS-N Applies to square/sharp corner edge/radius type

### Slot Milling

Vc (m/min)	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100					
	300~400		300~400		150~200					
DC X LU	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)				
3 x 9	32.000	3.820	32.000	3.820	16.000	1.430				
4 x 12	24.000	3.960	24.000	3.960	12.000	1.530				
5 x 15	19.200	4.090	19.200	4.090	9.600	1.640				
6 x 18	18.500	4.230	18.500	4.230	9.300	1.740				
8 x 24	16.000	4.510	16.000	4.510	8.000	1.940				
10 x 30	13.000	4.780	13.000	4.780	6.400	2.150				
12 x 36	11.000	5.050	11.000	5.050	5.300	2.360				
Depth of cut	<table border="1"> <tr> <td>ap</td> </tr> <tr> <td>1D</td> </tr> </table>			ap	1D	<table border="1"> <tr> <td>ap</td> </tr> <tr> <td>0,5D</td> </tr> </table>			ap	0,5D
ap										
1D										
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0,5D										
<ol style="list-style-type: none"> <li>The above milling condition is a guideline for the overhang length is 4xD.</li> <li>Use a rigid and precise machine and holder.</li> <li>The indicated speeds and feeds are for milling with water-soluble coolant.</li> <li>Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.</li> <li>Reduce speed and feed as well as depth of cut when high precision is required.</li> <li>Adjust the speed and feed accordingly when the overhang length is longer than specified (refer to p.18).</li> <li>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.</li> </ol>										

### Side Milling

Vc (m/min)	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100									
	300~400		300~400		150~200									
DC X LU	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)								
3 x 9	32.000	3.820	32.000	3.820	16.000	1.600								
4 x 12	24.000	3.960	24.000	3.960	12.000	1.700								
5 x 15	19.200	4.090	19.200	4.090	9.600	1.830								
6 x 18	18.500	4.230	18.500	4.230	9.300	1.950								
8 x 24	16.000	4.510	16.000	4.510	8.000	2.180								
10 x 30	13.000	4.780	13.000	4.780	6.400	2.400								
12 x 36	11.000	5.050	11.000	5.050	5.300	2.650								
Depth of cut	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>1,5D</td> <td>0,2D</td> </tr> </table>			ap	ae	1,5D	0,2D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>1,5D</td> <td>0,1D</td> </tr> </table>			ap	ae	1,5D	0,1D
ap	ae													
1,5D	0,2D													
ap	ae													
1,5D	0,1D													
<ol style="list-style-type: none"> <li>The above milling condition is a guideline for the overhang length is 4xD.</li> <li>Use a rigid and precise machine and holder.</li> <li>The indicated speeds and feeds are for milling with water-soluble coolant.</li> <li>Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.</li> <li>Reduce speed and feed as well as depth of cut when high precision is required.</li> <li>Adjust the speed and feed accordingly when the overhang length is longer than specified (refer to p.18).</li> <li>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.</li> </ol>														



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VTS-N Applies to square/sharp corner edge/radius type

### Plunging

	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100					
Vc (m/min)	150		150		75					
DC X LU	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)				
3 x 9	15.900	500	15.900	500	8.000	150				
4 x 12	12.000	500	12.000	500	6.000	150				
5 x 15	9.600	500	9.600	500	4.800	150				
6 x 18	8.000	600	8.000	600	4.000	180				
8 x 24	6.000	700	6.000	700	3.000	210				
10 x 30	4.800	700	4.800	700	2.400	210				
12 x 36	4.000	700	4.000	700	2.000	210				
Depth of cut	<table border="1"> <tr> <td>ap</td> </tr> <tr> <td>1D</td> </tr> </table>			ap	1D	<table border="1"> <tr> <td>ap</td> </tr> <tr> <td>0,5D</td> </tr> </table>			ap	0,5D
ap										
1D										
ap										
0,5D										

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.
7. When the chips wind around the end mill, reduce the speed and feed.
8. 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

DC = Ø6, Ø8

	Work Material	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100	
		L/D	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )
Slot milling	5		70%		70%		70%
	6		70%	20%	70%	20%	70%
Side milling	5		70%		70%		70%
	6		50%		50%		50%
Plunging	5		80%		80%		80%
	6		60%		60%		60%

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AE-VTFE-N Applies to square/radius type

### Slot Milling

Vc (m/min)	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
200			200		100	
DC						
6	8.490	1.530	8.490	1.530	4.250	640
8	6.370	1.150	6.370	1.150	3.180	480
10	6.370	1.910	6.370	1.910	3.180	760
12	5.310	1.910	5.310	1.910	2.650	640
14	4.550	1.640	4.550	1.640	2.270	540
18	3.540	1.270	3.540	1.270	1.770	420
22	2.900	1.040	2.900	1.040	1.450	350

Depth of cut		<b>ap</b>
	DC ≤ Ø10	0,1D
	10 < DC	0,2D

1. The above milling condition is a guideline for the overhang length is 5×D.
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.34).
7. When the chips wind around the end mill, reduce the speed and feed.
8. 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.

## AE-VTFE-N Applies to square/radius type

### Side Milling

Vc (m/min)	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A		Aluminium Alloy Casting AC4C • ADC		Copper Alloy C1100	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
300			300		150	
DC						
6	15.920	2.870	15.920	2.870	7.960	1.190
8	11.940	2.150	11.940	2.150	5.970	1.070
10	9.550	2.870	9.550	2.870	4.780	1.000
12	7.960	2.870	7.960	2.870	3.980	960
14	6.820	2.460	6.820	2.460	3.410	820
18	5.310	1.910	5.310	1.910	2.650	640
22	4.340	1.560	4.340	1.560	2.170	520

Depth of cut		<b>ap</b>	<b>ae</b>
	2D	0,1D	

1. The above milling condition is a guideline for the overhang length is 5×D.
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.34).
7. When the chips wind around the end mill, reduce the speed and feed.
8. 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	L/D	Aluminium Alloy Expanding Material • Magnesium Alloy A5052 • A7075 • AZ91 • AZ80A			Aluminium Alloy Casting AC4C • ADC			Copper Alloy C1100					
		S (min <sup>-1</sup> )	F (mm/min)	Depth of Cut		S (min <sup>-1</sup> )	F (mm/min)	Depth of Cut		S (min <sup>-1</sup> )	F (mm/min)	Depth of Cut	
				ap	ae			ap	ae			ap	ae
Slot milling	6	50%	50%	0,015D	-	50%	50%	0,015D	-	50%	50%	0,015D	-
	7	30%	20%	0,01D	-	30%	20%	0,01D	-	30%	20%	0,01D	-
Side milling	6	65%	60%	2D	0,05D	65%	60%	2D	0,05D	90%	90%	2D	0,05D
	7	55%	50%	2D	0,03D	55%	50%	2D	0,03D	70%	70%	2D	0,03D
	8	45%	45%	2D	0,025D	45%	45%	2D	0,025D	65%	65%	2D	0,01D



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## WXL-EMS

Side milling

Ø	Cu		~32 HRC FC250 • SS400 • S55C • NAK55		33~41 HRC SKT • SKD61 • NAK80 • HPM1 • DH		42~50 HRC SKT • SKD61 • NAK80 • HPM1 • DH	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	50.000	440	24.000	210	14.000	78	12.500	70
1,5	50.000	975	16.000	310	9.250	115	8.400	105
2	47.500	1.100	12.000	295	7.000	110	6.350	100
2,5	38.000	1.900	9.600	480	6.200	140	5.550	125
3	32.000	1.600	8.150	430	5.300	125	4.750	110
4	24.000	1.700	6.050	450	4.250	135	3.700	115
5	19.000	2.000	4.900	520	3.550	140	3.150	125
6	16.000	2.000	4.100	520	2.950	145	2.650	130
8	12.000	1.900	3.050	505	2.200	145	1.950	130
10	9.500	1.900	2.450	505	1.750	145	1.550	130
12	7.900	1.900	2.050	505	1.450	145	1.300	130
14	6.800	1.900	1.750	495	1.250	145	1.100	125
15	6.300	1.900	1.600	490	1.150	135	1.050	120
16	5.900	1.800	1.500	480	1.100	130	995	115
18	5.300	1.800	1.350	470	990	115	880	105
20	4.700	1.700	1.200	445	890	105	795	95
25	3.800	1.400	970	360	710	85	635	75
30	3.100	1.100	815	300	590	70	530	60

Max cutting depth		D	ap	ae
		<3	1,5D	0,05D
		>3	1,5D	0,1D

ap	ae
1D	0,02D

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 properties.
4. Refer to the table above to set the milling conditions in accordance with the actual situation

## WXL-EMS

High speed side milling

Ø	Cu		~32 HRC FC250 • SS400 • S55C • NAK55		33~41 HRC SKT • SKD61 • NAK80 • HPM1 • DH		42~50 HRC SKT • SKD61 • NAK80 • HPM1 • DH	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	26.000	2.900	20.000	2.300	13.000	1.500	7.950	795
8	19.500	3.000	14.500	2.300	9.900	1.450	5.950	795
10	15.500	2.900	12.000	2.300	7.950	1.450	4.750	795
12	13.000	3.000	9.900	2.300	6.600	1.450	3.950	790
14	11.000	2.800	8.500	2.200	5.650	1.350	3.400	740
15	10.500	2.800	7.950	2.150	5.250	1.350	3.150	730
16	9.700	2.700	7.450	2.100	4.950	1.350	2.950	715
18	8.600	2.700	6.600	2.100	4.400	1.300	2.650	705
20	7.800	2.600	5.950	2.000	3.950	1.300	2.350	665
25	6.200	2.000	4.750	1.600	3.150	1.050	1.900	560
30	5.200	1.700	3.950	1.350	2.650	890	1.550	455

Max cutting depth		D	ap	ae
		D<Ø8	1,5D	0,01D
		Ø8≤D	1,5D	0,02D

D	ap	ae
D<Ø8	1D	0,01D
Ø8≤D	1D	0,02D



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## WXS-EMS

Side milling

Ø	~ 40 HRC NAK55 • HPM1 • SKT		40 ~ 45 HRC NAK80 • SKD11 • SKD61		45~55 HRC		55~60 HRC		60~65 HRC		65~70 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	20.000	800	20.000	800	20.000	800	20.000	560	20.000	480	16.000	335
2	20.000	1.600	20.000	1.600	16.000	1.250	12.000	670	11.000	535	7.950	335
3	15.000	1.800	13.500	1.600	10.500	1.250	7.950	670	7.450	535	5.300	335
4	11.000	1.800	9.950	1.600	7.950	1.250	5.950	670	5.550	535	4.000	335
5	8.900	1.800	7.950	1.600	6.350	1.250	4.800	670	4.450	535	3.200	335
6	7.450	2.650	6.650	2.400	5.300	1.900	4.000	1.000	3.700	800	2.650	505
8	5.550	2.650	4.950	2.400	4.000	1.900	3.000	1.000	2.800	800	2.000	505
10	4.450	2.650	4.000	2.400	3.200	1.900	2.400	1.000	2.250	800	1.600	505
12	3.700	2.650	3.300	2.400	2.650	1.900	2.000	1.000	1.850	800	1.350	505
14	3.100	2.500	2.800	2.250	2.250	1.800	1.700	1.000	1.550	800	1.100	505
15	2.850	2.400	2.600	2.200	2.100	1.750	1.550	950	1.450	800	1.050	505
16	2.700	2.400	2.400	2.100	1.950	1.700	1.450	930	1.350	800	995	505
18	2.400	2.250	2.200	2.000	1.750	1.600	1.300	895	1.200	800	885	505
20	2.200	2.150	1.950	1.900	1.550	1.500	1.150	845	1.100	695	800	505
25	1.700	2.450	1.550	2.100	1.250	1.500	955	915	890	750	635	505
30	1.400	2.300	1.300	1.750	1.050	1.250	795	760	740	620	620	430

Max cutting depth		D	ap	ae
		< 1,5	1,5D	0,02D
		1,5-2,5	1,5D	0,05D
		> 2,5	1,5D	0,10D
ae max = 1mm				

ap	ae
1,5D	0,05D
ae max = 1mm	

ap	ae
1,5D	0,03D
ae max = 0,5mm	

ap	ae
1D	0,02D
ae max = 0,5mm	

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

## WXS-EMS

High speed side milling

Ø	~ 40 HRC NAK55 • HPM1 • SKT		40 ~ 45 HRC NAK80 • SKD11 • SKD61		45~55 HRC		55~60 HRC		60~65 HRC		65~70 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	50.000	1.600	50.000	2.000	50.000	2.000	50.000	1.600	47.500	1.350	32.000	715
2	47.500	3.250	47.500	3.800	40.000	3.200	25.500	1.650	24.000	1.350	16.000	800
3	32.000	3.450	32.000	3.800	26.500	3.200	17.000	1.650	16.000	1.350	10.500	800
4	24.000	3.900	24.000	3.800	20.000	3.200	12.500	1.650	12.000	1.350	7.950	800
5	19.000	4.100	19.000	3.800	16.000	3.200	10.000	1.650	9.550	1.350	6.350	800
6	16.000	5.750	16.000	5.750	13.500	4.800	8.500	2.450	7.950	2.000	5.300	1.200
8	12.000	5.750	12.000	5.750	9.950	4.800	6.350	2.450	5.950	2.000	4.000	1.200
10	9.550	5.750	9.550	5.750	7.950	4.800	5.100	2.450	4.800	2.000	3.200	1.200
12	7.950	5.750	7.950	5.750	6.650	4.800	4.250	2.450	4.000	2.000	2.650	1.200
14	6.800	5.400	6.800	5.400	5.650	4.500	3.600	2.400	3.400	2.000	2.250	1.200
15	6.350	5.300	6.350	5.300	5.250	4.350	3.350	2.300	3.150	1.950	2.100	1.200
16	5.950	5.150	5.950	5.150	4.950	4.250	3.150	2.250	2.950	1.850	1.950	1.200
18	5.300	4.850	5.300	4.850	4.400	4.050	2.800	2.200	2.650	1.750	1.750	1.200
20	4.750	4.600	4.750	4.600	3.950	3.650	2.500	2.050	2.350	1.550	1.550	1.100
25	3.800	5.350	3.800	5.050	3.150	3.800	2.000	2.000	1.900	1.250	1.250	1.050
30	3.150	4.950	3.150	4.250	2.650	3.150	1.650	1.800	1.550	1.050	1.050	1.000

Max cutting depth		ap	ae
		1D	0,05D
		ae max = 0,5mm	

ap	ae
1D	0,03D
ae max = 0,5mm	

ap	ae
1D	0,02D
ae max = 0,2mm	

ap	ae
1D	0,01D
ae max = 0,2mm	

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

Milling | Endmills

Cutting conditions



# CUTTING CONDITIONS

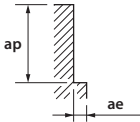
Milling | Endmills | Cutting conditions

## UP-PHS

Side milling

Vc	C≤0,2% - GG SS400 • S55C • FC250 ~750 N/mm2		~30 HRC SCM • SKT • SKS • SKD		30~38 HRC SKT • SKD • NAK55 • HPM1		38~45 HRC-SUS SUS304 • SKD		45~55 HRC TiAl	
	100 (m/min)		78 (m/min)		66 (m/min)		62 (m/min)		60 (m/min)	
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	10.600	1.170	8.300	900	7.000	650	6.600	670	6.350	580
4	7.950	1.200	6.200	980	5.250	650	4.950	700	4.750	620
5	6.350	1.260	4.950	1.000	4.200	700	3.950	750	3.800	640
6	5.300	1.500	4.150	1.100	3.500	840	3.300	800	3.200	650
8	4.000	1.500	3.100	1.100	2.650	790	2.450	770	2.400	660
10	3.200	1.320	2.500	1.000	2.100	720	1.950	700	1.900	630
12	2.650	1.320	2.050	1.000	1.750	680	1.650	650	1.600	570

Max cutting depth			<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>1,5D</td> <td>0,2D</td> </tr> </table>	ap	ae	1,5D	0,2D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>1,5D</td> <td>0,1D</td> </tr> </table>	ap	ae	1,5D	0,1D	<table border="1"> <tr> <td>ap</td> <td>ae</td> </tr> <tr> <td>1D</td> <td>0,05D</td> </tr> </table>	ap	ae	1D	0,05D
	ap	ae															
1,5D	0,2D																
ap	ae																
1,5D	0,1D																
ap	ae																
1D	0,05D																

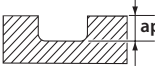
  

- Use a rigid and precise machine and holder.
- Adjust speed and feed when cutting depth is large or when machining with low rigidity tooling.
- Use a suitable cutting fluid with high smoke retardant properties.
- During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.

## Slotting

Vc	C≤0,2% - GG SS400 • S55C • FC250 ~750 N/mm2		~30 HRC SCM • SKT • SKS • SKD		30~38 HRC SKT • SKD • NAK55 • HPM1		38~45 HRC-SUS SUS304 • SKD		45~55 HRC TiAl	
	72 (m/min)		54 (m/min)		41 (m/min)		47 (m/min)		42 (m/min)	
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	7.600	570	5.700	480	4.400	315	4.950	360	4.450	380
4	5.700	570	4.300	480	3.300	315	3.750	400	3.350	430
5	4.600	650	3.400	500	2.600	330	2.950	430	2.650	460
6	3.800	650	2.900	500	2.200	350	2.500	450	2.250	480
8	2.900	660	2.200	520	1.650	380	1.850	465	1.650	480
10	2.300	610	1.700	480	1.300	330	1.500	430	1.350	450
12	1.900	610	1.400	430	1.100	315	1.200	400	1.100	420

Max cutting depth			ap = 1D	ap = 0,2D
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- Use a rigid and precise machine and holder.
- Adjust speed and feed when cutting depth is large or when machining with low rigidity tooling.
- Use a suitable cutting fluid with high smoke retardant properties.
- During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## WX-HS-CRE

High speed milling

Ø	GG		30~38 HRC SKT • SKD • NAK55 • HPM50		38~45 HRC - SUS SUS304 • SKD • NAK80 • HPM50		45~55 HRC		55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6 X R 1,5	10.600	14.000	10.600	12.700	7.950	9.550	7.950	8.600	5.300	3.800
8 X R 2	7.950	14.000	7.950	12.700	5.950	9.550	5.950	8.600	4.000	3.800
10 X R 2	6.350	14.000	6.350	12.700	4.750	9.550	4.750	8.600	3.200	3.800
12 X R 3	5.300	14.000	5.300	12.700	4.000	9.550	4.000	8.600	2.650	3.800

Max cutting depth		ap	ae	R	ap	ae
		0,1xR	0,3D	≤2	0,1xR	0,3D
				>2	0,2mm	0,3D

- Use a rigid and precise machine and holder.
- These milling conditions are based on milling with circular interpolation at corners. For milling without circular interpolation (such as right angle corners), reduce the speed to 50-70% and the cutting depth to 50-80% of the above conditions.
- We suggest using air blow or MQL (mist).
- Please adjust the speed, feed and cutting depth according to actual cutting conditions.
- When WX(S)-CRE enters in Z axis, reduce the feed speed to 30-60% of the above conditions with machining incline angle  $\beta < 2^\circ$
- These milling conditions are for a tool extension length: less than 4 x D.  
For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.

## Low speed, high feed milling

Ø	GG		30~38 HRC SKT • SKD • NAK55 • HPM50		38~45 HRC - SUS SUS304 • SKD • NAK80 • HPM50		45~55 HRC		55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6 X R 1,5	5.300	7.000	4.250	5.100	3.700	4.450	2.650	2.850	1.600	1.150
8 X R 2	4.000	7.000	3.200	5.100	2.800	4.450	2.000	2.850	1.200	1.150
10 X R 2	3.200	7.000	2.550	5.100	2.250	4.450	1.600	2.850	955	1.150
12 X R 3	2.650	7.000	2.100	5.100	1.850	4.450	1.350	2.850	795	1.150

Max cutting depth		ap	ae	R	ap	ae
		0,1xR	0,3D	≤2	0,1xR	0,3D
				>2	0,2mm	0,3D

- Use a rigid and precise machine and holder.
- These milling conditions are based on milling with circular interpolation at corners. For milling without circular interpolation (such as right angle corners), reduce the speed to 50-70% and the cutting depth to 50-80% of the above conditions.
- We suggest using air blow or MQL (mist).
- Please adjust the speed, feed and cutting depth according to actual cutting conditions.
- When WX(S)-CRE enters in Z axis, reduce the feed speed to 30-60% of the above conditions with machining incline angle  $\beta < 2^\circ$
- These milling conditions are for a tool extension length: less than 4 x D.  
For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.

## (%) Tool extension coefficients

Overhang length	Cutting speed	ap	feed
L/D ≤ 4	100	100	100
L/D = 5	60~80	60~80	70~90
L/D = 6	40~60	40~60	60~80

- When milling flat areas with a stable load, the speed and the feed rate of the high-speed conditions can be further increased to 150 - 200%.
- The ultra-high speed conditions are for a tool extension length : less than 4 x D. If the tool extension length is over 4 x D, do not refer to it.

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## WX-CRE

High speed milling

Ø	GG		30~38 HRC SKT · SKD · NAK55 · HPM50		38~45 HRC - SUS SUS304 · SKD · NAK80 · HPM50		45~55 HRC		55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
2 X R 0,5	31.850	10.500	32.000	9.550	24.000	7.150	24.000	6.450	16.000	2.850
3 X R 0,75	21.000	12.500	21.000	12.000	16.000	8.400	16.000	7.850	10.500	3.300
4 X R 1	16.000	13.000	16.000	12.000	12.000	9.000	12.000	8.200	7.950	3.550
5 X R 1,2	12.500	14.000	12.500	12.500	9.550	9.550	9.550	8.600	6.350	3.800
6 X R 1,5	10.600	14.000	10.600	12.700	7.950	9.550	7.950	8.600	5.300	3.800
7 X R 1,5	9.100	12.000	9.100	10.900	6.800	8.200	6.800	7.350	4.550	3.250
8 X R 2	7.950	14.000	7.950	12.700	5.950	9.550	5.950	8.600	4.000	3.800
9 X R 2	7.050	12.400	7.050	11.300	5.300	8.500	5.300	7.650	3.550	3.400
10 X R 2	6.350	14.000	6.350	12.700	4.750	9.550	4.750	8.600	3.200	3.800
11 X R 2	5.800	12.700	5.800	11.600	4.350	8.700	4.350	7.800	2.900	3.500
12 X R 3	5.300	14.000	5.300	12.700	4.000	9.550	4.000	8.600	2.650	3.800
13 X R 3	4.900	12.900	4.900	11.800	3.650	8.800	3.650	7.950	2.450	3.550

Max cutting depth			ap	ae	R	ap	ae	R	ap	ae
			0,1xR	0,3D	≤2	0,1xR	0,3D	≤2	0,05xR	0,3D
					>2	0,2mm	0,3D	>2	0,1mm	0,3D

- Use a rigid and precise machine and holder.
- These milling conditions are based on milling with circular interpolation at corners. For milling without circular interpolation such as right angle corners), reduce the speed to 50-70% and the cutting depth to 50-80% of the above conditions.
- We suggest using air blow or MQL (mist).
- Please adjust the speed, feed and cutting depth according to actual cutting conditions.
- When WX(S)-CRE enters in Z axis, reduce the feed speed to 30-60% of the above conditions with machining incline angle  $\beta < 2^\circ$
- These milling conditions are for a tool extension length: less than 4 x D.  
For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.

## Low speed, high feed milling

Ø	GG		30~38 HRC SKT · SKD · NAK55 · HPM50		38~45 HRC - SUS SUS304 · SKD · NAK80 · HPM50		45~55 HRC		55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
2 X R 0,5	16.000	5.250	12.500	3.800	11.000	3.350	7.950	2.150	4.750	860
3 x R 0,75	10.500	6.250	8.500	4.500	7.450	3.900	5.300	2.600	3.200	995
4 X R 1	7.950	6.600	6.350	4.800	5.550	4.200	4.000	2.750	2.400	1.050
5 X R 1,2	6.350	7.000	5.100	5.100	4.450	4.450	3.200	2.850	1.900	1.150
6 X R 1,5	5.300	7.000	4.250	5.100	3.700	4.450	2.650	2.850	1.600	1.150
7 X R 1,5	4.550	6.000	3.650	4.350	3.200	3.800	2.250	2.450	1.350	980
8 X R 2	4.000	7.000	3.200	5.100	2.800	4.450	2.000	2.850	1.200	1.150
9 X R 2	3.550	6.200	2.850	4.550	2.500	3.950	1.750	2.550	1.050	1.000
10 X R 2	3.200	7.000	2.550	5.100	2.250	4.450	1.600	2.850	955	1.150
11 X R 2	2.900	6.350	2.300	4.650	2.050	4.050	1.450	2.600	870	1.050
12 X R 3	2.650	7.000	2.100	5.100	1.850	4.450	1.350	2.850	795	1.150
13 X R 3	2.450	6.450	1.950	4.700	1.700	4.100	1.200	2.650	735	1.050

Max cutting depth			ap	ae	R	ap	ae	R	ap	ae
			0,1xR	0,3D	≤2	0,1xR	0,3D	≤2	0,05xR	0,3D
					>2	0,2mm	0,3D	>2	0,1mm	0,3D

- Use a rigid and precise machine and holder.
- These milling conditions are based on milling with circular interpolation at corners. For milling without circular interpolation such as right angle corners), reduce the speed to 50-70% and the cutting depth to 50-80% of the above conditions.
- We suggest using air blow or MQL (mist).
- Please adjust the speed, feed and cutting depth according to actual cutting conditions.
- When WX(S)-CRE enters in Z axis, reduce the feed speed to 30-60% of the above conditions with machining incline angle  $\beta < 2^\circ$
- These milling conditions are for a tool extension length: less than 4 x D.  
For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.



# CUTTING CONDITIONS

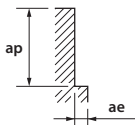
Milling | Endmills | Cutting conditions

## WX-G-ETSS

Side milling (Contour line finish)

Vc	C≤0,2% - GG E24 · XC48 · GG25 750 N/mm <sup>2</sup>			~30 HRC 350NCD16 · 40CMD8			SUS 316 ~ 304 800 N/mm <sup>2</sup>			30~38 HRC Z38CDV5 · Z40CDV5			45~55 HRC Z38CDV5			55~60 HRC Z160CDV12		
	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)
3	10.610	589	0,027	8.488	458	0,018	6.366	267	0,014	6.366	344	0,018	6.366	210	0,011	3.183	105	0,011
4	7.958	907	0,038	6.366	477	0,025	4.775	272	0,019	4.775	358	0,025	4.775	229	0,016	2.387	107	0,015
5	6.366	955	0,05	5.093	519	0,034	3.820	298	0,026	3.820	390	0,034	3.820	241	0,021	1.910	115	0,02
6	5.305	987	0,062	4.244	547	0,043	3.183	306	0,032	3.183	411	0,043	3.183	248	0,026	1.592	119	0,025
8	3.979	883	0,074	3.183	535	0,056	2.387	272	0,038	2.387	401	0,056	2.387	222	0,031	1.194	107	0,03
10	3.183	793	0,083	2.546	519	0,068	1.910	241	0,042	1.910	390	0,068	1.910	195	0,034	955	95	0,033
12	2.653	796	0,100	2.122	497	0,078	1.592	239	0,050	1.592	372	0,078	1.592	196	0,041	796	95	0,04
16	1.989	657	0,100	1.592	525	0,110	1.194	286	0,080	1.194	394	0,110	1.194	190	0,053	597	90	0,05

Max cutting depth



D	ap	ae
< 6	1,5D	0,02D
≥ 6	1,5D	0,05D

ap	ae
1,5D	0,02D

ap max = 0,5mm

ap	ae
1D	0,02D

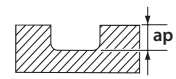
ap max = 0,5mm

- Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.
- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine.
  - Do not use inflammable coolant. Using worn tools may generate sparks.
  - Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

## Slotting

Vc	C≤0,2% - GG E24 · XC48 · GG25 750 N/mm <sup>2</sup>			~30 HRC 350NCD16 · 40CMD8			SUS 316 ~ 304 800 N/mm <sup>2</sup>			30~38 HRC Z38CDV5 · Z40CDV5			45~55 HRC Z38CDV5			55~60 HRC Z160CDV12		
	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)
3	8.488	688	0,027	6.897	372	0,018	5.305	223	0,014	5.836	245	0,014	4.775	158	0,011	2.122	70	0,011
4	6.366	726	0,038	5.173	388	0,025	3.979	227	0,019	4.377	249	0,019	3.581	172	0,016	1.592	72	0,015
5	5.093	764	0,050	4.138	422	0,034	3.183	248	0,026	3.501	273	0,026	2.865	180	0,021	1.273	76	0,020
6	4.244	789	0,062	3.448	445	0,043	2.653	255	0,032	2.918	280	0,032	2.387	186	0,026	1.061	80	0,025
8	3.183	707	0,074	2.586	434	0,056	1.989	233	0,039	2.188	256	0,039	1.790	167	0,031	796	72	0,030
10	2.546	672	0,088	2.069	422	0,068	1.592	224	0,047	1.751	247	0,047	1.432	146	0,034	637	63	0,033
12	2.122	637	0,100	1.724	403	0,078	1.326	215	0,054	1.459	236	0,054	1.194	147	0,041	531	64	0,040
16	1.592	573	0,120	1.293	388	0,100	995	239	0,080	1.094	263	0,080	895	142	0,053	398	60	0,050

Max cutting depth



ap
0,3D

ap max = 3mm

ap max = 0,2D

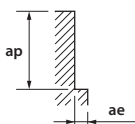
- Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.
- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
  - Do not use inflammable coolant. Using worn tools may generate sparks.
  - Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

## WX-G-EMSS

High speed light milling

Ø	C≤0,2% - GG SS400 · S55C · FC250 750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SKT · SCM		30~38 HRC NAK55 · HPM1 · SKT · SKD		38~45 HRCSUS SUS304 · X210CR12 X40CRMV51		45~55 HRC HRS	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	17.000	1.950	14.900	1.600	14.900	1.450	12.700	1.050	10.600	635
4	12.700	1.850	11.100	1.500	11.100	1.350	9.550	990	7.950	570
5	10.200	1.650	8.900	1.450	8.900	1.250	7.650	915	6.350	540
6	8.500	1.550	7.450	1.350	7.450	1.150	6.350	840	5.300	510
8	6.350	1.450	5.550	1.250	5.550	1.050	4.800	765	4.000	510
10	5.100	1.450	4.450	1.250	4.450	1.050	3.800	765	3.200	510
12	4.250	1.450	3.700	1.250	3.700	1.050	3.200	765	2.650	510

Max cutting depth



D	ap	ae
< 6	1,0D	0,02D
≥ 6	1,0D	0,05D

D	ap	ae
< 6	1,0D	0,01D
≥ 6	1,0D	0,02D

- Use high precision machine set up to ensure maximum rigidity.
- In case of vibration, reduce both feed and speed.
- Use a coolant that has a low co-efficient of smoke emission.

Milling | Endmills

Cutting conditions

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## CA-ETS

Side milling

Vc	AL A7075		AC <Si 13%		CU C1100	
	200 (m/min)		200 (m/min)		75 (m/min)	
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	21.000	950	21.000	950	7.950	320
4	15.500	1.100	15.500	1.100	5.950	350
5	12.500	1.100	12.500	1.100	4.750	380
6	10.500	1.200	10.500	1.200	3.950	400
8	7.950	1.300	7.950	1.300	2.950	450
10	6.350	1.500	6.350	1.500	2.350	480
12	5.300	1.550	5.300	1.550	1.950	510
16	3.950	1.550	3.950	1.550	1.450	510
20	3.150	1.550	3.150	1.550	1.150	510

Max cutting depth	ap	ae
	1,5D	0,1D

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 properties.

## CA-ETS

Slotting

Vc	AL A7075		AC <Si 13%		CU C1100	
	200 (m/min)		200 (m/min)		75 (m/min)	
Ø	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	21.000	670	21.000	670	7.950	325
4	15.500	700	15.500	700	5.950	365
5	12.500	745	12.500	745	4.750	385
6	10.500	820	10.500	820	3.950	405
8	7.950	865	7.950	865	2.950	455
10	6.350	970	6.350	970	2.350	475
12	5.300	1.050	5.300	1.050	1.950	510
16	3.950	1.050	3.950	1.050	1.450	510
20	3.150	1.050	3.150	1.050	1.150	500

Max cutting depth	ap
	0,5D

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 properties.



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## FX-MG-EML

Side milling

Ø	C≤0,2% - GG SS400 • S55C • FC250 750 N/mm <sup>2</sup>		SCM - SK SCM • SKT • SKS • SKD ~30 HRC		30~38 HRC SKT • SKD • NAK55 • HPM1		38~45 HRC SKT • SKD • NAK80 • HPM50		45~55 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	6.350	225	5.300	190	4.200	150	3.700	130	2.100	75
4	4.750	225	3.950	190	3.150	150	2.750	130	1.550	75
5	3.800	225	3.150	190	2.500	150	2.200	130	1.250	75
6	3.150	225	2.650	190	2.100	150	1.850	130	1.050	75
8	2.350	225	1.950	190	1.550	150	1.350	130	995	80
10	1.900	225	1.550	190	1.250	150	1.100	130	795	60
12	1.550	225	1.300	190	1.050	125	925	110	660	50
14	1.350	225	1.100	190	905	105	795	95	565	45
16	1.150	225	995	190	795	95	695	80	495	40
18	1.050	225	880	190	705	85	615	70	440	35
20	955	225	795	190	635	75	555	65	395	30
22	865	225	720	190	575	65	505	60	360	25
24	795	220	660	180	530	60	460	55	330	25
25	760	210	635	170	505	60	445	50	315	25

Max cutting depth	ap	ae		<table border="1"> <tr><td>ap</td><td>ae</td></tr> <tr><td>2,5D</td><td>0,05D</td></tr> <tr><td>Ø20 &lt; Dc</td><td>2,5D</td><td>1mm</td></tr> </table>	ap	ae	2,5D	0,05D	Ø20 < Dc	2,5D	1mm
	ap	ae									
2,5D	0,05D										
Ø20 < Dc	2,5D	1mm									
D < Ø20	2,5D	0,05D	<table border="1"> <tr><td>ap</td><td>ae</td></tr> <tr><td>2,5D</td><td>0,5mm</td></tr> </table>	ap	ae	2,5D	0,5mm				
ap	ae										
2,5D	0,5mm										
Ø20 < Dc	2,5D	1mm	<table border="1"> <tr><td>ap</td><td>ae</td></tr> <tr><td>2,5D</td><td>0,02D</td></tr> </table>	ap	ae	2,5D	0,02D				
ap	ae										
2,5D	0,02D										

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 properties.

## FX-MG-EXML

Side milling

Ø	C≤0,2% - GG SS400 • S55C • FC250 750 N/mm <sup>2</sup>		30~38 HRC SKT • SKD • NAK55 • HPM1		38~45 HRC SKT • SKD • NAK80 • HPM50	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
3	4.200	150	2.950	85	2.650	80
4	3.150	150	2.200	85	1.950	80
5	2.500	150	1.750	85	1.550	80
6	2.100	150	1.450	85	1.300	80
8	1.550	150	1.100	85	995	80
10	1.250	150	890	85	795	80
12	1.050	150	740	85	660	80

Max cutting depth	ap	ae	
	6D	0,01D	

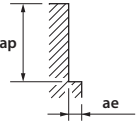
1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## FX-SS-EMS

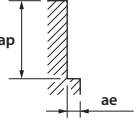
Side milling

Ø	GG - GGG FC · FCD		C≤0,2% - GG E24 · XC48 · FT25 ~750 N/mm <sup>2</sup>		~30 HRC 35NCD16 · 40CMD8		30~38 HRC 35NCD16		38~45 HRC SUS304 · SKD · NAK80 · HPM50		45~55 HRC-SUS Z38CDV5		55~60 HRC Z160CDV12	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	5.300	735	4.450	615	3.700	425	2.950	145	2.650	130	1.550	70	1.000	35
8	3.950	710	3.300	590	2.750	425	2.200	145	1.950	130	1.150	65	750	35
10	3.150	710	2.650	590	2.200	425	1.750	145	1.550	130	955	65	600	35
12	2.650	710	2.200	590	1.850	425	1.450	145	1.300	130	795	55	500	30
Max cutting depth	ap   ae 1,5D   0,1D				ap   ae 1D   0,02D				ap   ae 1D   0,02D					

- Use high precision machine set up to ensure maximum rigidity.
- In case of vibration, reduce both feed and speed.
- Use a coolant that has a low co-efficient of smoke emission.

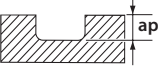
## FXS-HPE

Side milling

Vc	C≤0,2% - GG S55C · SS400 ~750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SNCM		30~38 HRC NAK55 · HPMI · SKT		38~45 HRC SUS304 · X210CR12 X40CRMOV51		45~55 HRC		55~60 HRC			
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)		
100 (m/min)	75 (m/min)		65 (m/min)		40 (m/min)		35 (m/min)		25 (m/min)					
10	3.150	760	2.400	680	2.100	310	1.300	165	1.100	115	760	55		
12	2.650	730	2.000	620	1.750	285	1.100	145	955	105	635	45		
14	2.250	675	1.700	550	1.500	245	955	125	815	95	545	40		
18	1.750	580	1.300	440	1.150	195	740	100	635	85	420	35		
22	1.450	520	1.100	360	940	170	580	100	500	85	360	35		
Max cutting depth	ap   ae 1,2D   0,05D 0,1D   1mm				ap   ae 1,20D   0,02D		ap   ae 2,5D   0,02D							

- Use high precision machine set up to ensure maximum rigidity.
- When chattering occurs, reduce the speed and feed simultaneously.
- Use a coolant that has a low co-efficient of smoke emission.

## Slotting

Vc	C≤0,2% - GG S55C · SS400 ~750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SNCM		30~38 HRC NAK55 · HPMI · SKT		38~45 HRC SUS304 · X210CR12 X40CRMOV51		45~55 HRC		55~60 HRC			
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)		
80 (m/min)	60 (m/min)		50 (m/min)		35 (m/min)		30 (m/min)		20 (m/min)					
10	2.650	630	2.000	475	1.750	325	1.100	115	955	75	635	35		
12	2.200	590	1.650	440	1.450	300	955	110	795	75	530	35		
14	1.900	560	1.400	445	1.250	270	815	95	680	70	455	30		
18	1.450	480	1.100	365	990	225	635	80	530	60	350	25		
22	1.150	410	860	310	790	180	500	65	430	50	290	25		
Max cutting depth	ap 0,5 D				ap 0,1 D		ap 0,05 D							

- Conditions to be used if slant is = 3 x dia.  
If length is 5 x dia, than reduce feed and rotation by 40 to 50% and use 1/2 of depth of passes.  
If length is 6 x dia, than reduce feed and rotation by 60 to 70% and use 1/2 of depth of passes.
- Adjust feed en rotation in function of depth of passes or machine rigidity.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## HYP-HI-EMS / HYP-HI-WEMS

Side milling (Contour line finish)

Vc	Low Carbon - Alloy - Tool Steel									GG-GGG-GTW >HB 180 Non - Alloyed			Stainless steel HRC 20 400~700 N/mm <sup>2</sup>			Aluminium - Mg Non - Alloyed			Ti Alloys HRC 40-50		
	HB 150-250 500~800 N/mm <sup>2</sup>			HB 20-30 800~1000 N/mm <sup>2</sup>			HRC 30-40 1000~1300 N/mm <sup>2</sup>			140 (m/min)			50 (m/min)			180 (m/min)			65 (m/min)		
Ø	Fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	Fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	Fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	Fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	Fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	Fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	Fz (mm)	S (min <sup>-1</sup> )	F (mm/min)
4	0,035	12.730	1.790	0,03	9.550	1.150	0,03	7.960	960	0,035	11.150	1.570	0,03	3.980	480	0,035	14.330	2.010	0,025	5.180	520
6	0,04	8.490	1.360	0,035	6.370	900	0,035	5.310	750	0,04	7.430	1.190	0,035	2.660	380	0,04	9.550	1.530	0,027	3.450	380
8	0,07	6.370	1.790	0,065	4.780	1.250	0,065	3.980	1040	0,7	5.580	1.570	0,065	1.990	520	0,07	7.170	2.010	0,031	2.590	330
10	0,1	5.090	2.040	0,08	3.820	1.230	0,08	3.190	1030	0,1	4.460	1.790	0,08	1.600	520	0,1	5.730	2.300	0,038	2.070	320
12	0,12	4.240	2.040	0,1	3.190	1.280	0,1	2.660	1070	0,12	3.720	1.790	0,1	1.330	540	0,12	4.780	2.300	0,045	1.730	320
16	0,13	3.180	1.660	0,12	2.390	1.150	0,12	1.990	960	0,13	2.790	1.460	0,12	1.000	480	0,13	3.590	1.870	0,052	1.300	280
20	0,15	2.550	1.530	0,12	1.910	920	0,12	1.600	770	0,15	2.230	1.340	0,12	800	390	0,15	2.870	1.730	0,059	1.040	250

ap x d	F(z) correction	ap		Fakt.	
		ap	Fakt.	ap	Fakt.
1xd	1xd	0,5	1,0	0,5	0,7
		1,0	0,7	1,0	1,0
		1,5	0,5	1,5	0,7
		2,0	0,3	2,0	0,5
0,5xd	0,5xd	0,5	0,7	0,5	0,7
		1,0	1,0	1,0	1,0
		1,5	0,7	1,5	0,5
		2,0	0,5	2,0	0,5
0,2xd	0,2xd	0,5	1,3	0,5	1,3
		1,0	1,2	1,0	1,2
		1,5	1,0	1,5	0,8
		2,0	0,8	2,0	0,8

The above stated application data are as per RED marked parameters.

## EPL-ETS

Side milling

Vc	C≤0,2% - GG E24 · XC48 · GG25 750 N/mm <sup>2</sup>			SCM - SK 350NCD16 · 40CMD8 ~30 HRC			SUS 316 · 304 800 N/mm <sup>2</sup>			30~38 HRC Z38CDV5 · Z40CDV5 30~38 HRC			45~55 HRC Z38CDV5 45~55 HRC			55~60 HRC Z160CDV12 55~60 HRC		
	100 (m/min)			80 (m/min)			60 (m/min)			60 (m/min)			60 (m/min)			30 (m/min)		
Ø	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
3	10.610	859	0,027	8.488	458	0,018	6.366	267	0,014	6.366	344	0,018	6.366	210	0,011	3.183	105	0,011
4	7.958	907	0,038	6.366	477	0,025	4.775	272	0,019	4.775	358	0,025	4.775	229	0,016	2.387	107	0,015
5	6.366	955	0,050	5.093	519	0,034	3.820	298	0,026	3.820	390	0,034	3.820	241	0,021	1.910	115	0,020
6	5.305	987	0,062	4.244	547	0,043	3.183	306	0,032	3.183	411	0,043	3.183	248	0,026	1.592	119	0,025
8	3.979	883	0,074	3.183	535	0,056	2.387	272	0,038	2.387	401	0,056	2.387	222	0,031	1.194	107	0,030
10	3.183	793	0,083	2.546	519	0,068	1.910	241	0,042	1.910	390	0,068	1.910	195	0,034	955	95	0,033
12	2.653	796	0,100	2.122	497	0,078	1.592	239	0,050	1.592	372	0,078	1.592	196	0,041	796	95	0,040
16	1.989	657	0,110	1.592	525	0,110	1.194	286	0,080	1.194	394	0,110	1.194	190	0,053	597	90	0,050

Slotting

Vc	C≤0,2% - GG E24 · XC48 · GG25 750 N/mm <sup>2</sup>			SCM - SK 350NCD16 · 40CMD8 ~30 HRC			SUS 316 · 304 800 N/mm <sup>2</sup>			30~38 HRC Z38CDV5 · Z40CDV5 30~38 HRC			45~55 HRC Z38CDV5 45~55 HRC			55~60 HRC Z160CDV12 55~60 HRC		
	80 (m/min)			65 (m/min)			50 (m/min)			55 (m/min)			45 (m/min)			20 (m/min)		
Ø	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
3	8.488	688	0,027	6.897	372	0,018	5.305	223	0,014	5.836	245	0,014	4.775	158	0,011	2.122	70	0,011
4	6.366	726	0,038	5.173	388	0,025	3.979	227	0,019	4.377	249	0,019	3.581	172	0,016	1.592	72	0,015
5	5.093	764	0,05	4.138	422	0,034	3.183	248	0,026	3.501	273	0,026	2.865	180	0,021	1.273	76	0,02
6	4.244	789	0,062	3.448	445	0,043	2.653	255	0,032	2.918	280	0,032	2.387	186	0,026	1.061	80	0,025
8	3.183	707	0,074	2.586	434	0,056	1.989	233	0,039	2.188	256	0,039	1.790	167	0,031	796	72	0,03
10	2.546	672	0,088	2.069	422	0,068	1.592	224	0,047	1.751	247	0,047	1.432	146	0,034	637	63	0,033
12	2.122	637	0,1	1.724	403	0,078	1.326	215	0,054	1.459	236	0,054	1.194	147	0,041	531	64	0,04
16	1.592	573	0,12	1.293	388	0,1	995	239	0,08	1.094	263	0,08	895	142	0,053	398	60	0,05

Milling | Endmills

Cutting conditions



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPL-HI-EMS/EPL-HI-WEMS

Ø	Carbon Steel / Allowed Steel / Tool Steel											
	~ 20 HRC				20 - 35 HRC				35 - 45 HRC			
	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
4	180	14.320	1.720	0,03	160	12.730	1.370	0,03	140	11.140	1.080	0,02
5	180	11.460	1.380	0,03	160	10.190	1.220	0,03	140	8.920	1.070	0,03
6	180	9.550	1.240	0,03	160	8.490	990	0,03	140	7.430	780	0,03
8	180	7.160	1.110	0,04	160	6.370	890	0,03	140	5.570	700	0,03
10	180	5.730	1.110	0,05	160	5.090	890	0,04	140	4.460	700	0,04
12	180	4.770	1.110	0,06	160	4.240	890	0,05	140	3.710	700	0,05
16	180	3.580	1.020	0,07	160	3.180	820	0,06	140	2.790	640	0,06
20	180	2.860	960	0,08	141	2.250	770	0,09	140	2.230	610	0,07

Ø	GG / GGG / GTW				INOX				Aluminium / Mg			
	Unalloyed				~ 20 HRC				Wrought alloy			
	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	Vc	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
4	145	11.540	1.300	0,03	45	3.580	310	0,02	180	14.320	1.720	0,03
5	145	9.240	1.110	0,03	45	2.870	230	0,02	180	11.460	1.380	0,03
6	145	7.690	1.100	0,04	45	2.390	230	0,02	180	9.550	1.240	0,03
8	145	5.770	1.000	0,04	45	1.790	200	0,03	180	7.160	1.110	0,04
10	145	4.620	1.000	0,05	45	1.430	200	0,03	180	5.730	1.110	0,05
12	145	3.850	1.000	0,06	45	1.190	200	0,04	180	4.770	1.110	0,06
16	145	2.880	900	0,08	45	900	190	0,05	180	3.580	1.020	0,07
20	147	2.340	800	0,09	45	720	180	0,06	180	2.860	960	0,08







# CUTTING CONDITIONS

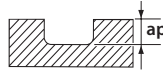
Milling | Endmills | Cutting conditions

## WXL-LN-EDS

Slotting

D		Cu			<32 HRC FC250 • S5400 • S55C			33~41 HRC SKT • SKD61 • NAK80 • HPM1 • DH			42~50 HRC SKT • SKD61 • NAK80 • HPM1 • DH		
		S (min <sup>-1</sup> )	F (mm/min)	ap	S (min <sup>-1</sup> )	F (mm/min)	ap	S (min <sup>-1</sup> )	F (mm/min)	ap	S (min <sup>-1</sup> )	F (mm/min)	ap
3	25	12.000	960	0,132	10.000	800	0,110	9.000	700	0,090	6.000	500	0,07
3	30	9.600	720	0,108	8.000	600	0,090	7.000	500	0,080	5.000	400	0,06
3	35	9.600	720	0,084	8.000	600	0,070	7.000	500	0,060	5.000	400	0,05
3	40	9.600	720	0,048	8.000	600	0,040	7.000	500	0,030	5.000	400	0,02
3	50	6.950	320	0,011	5.800	270	0,009	5.700	240	0,005	5.000	200	0,004
4	12	8.550	1.350	0,456	7.000	1.100	0,380	7.000	1.000	0,320	6.000	700	0,26
4	16	8.550	1.350	0,432	7.000	1.100	0,360	7.000	1.000	0,300	6.000	700	0,24
4	20	8.550	970	0,408	7.000	800	0,340	6.000	700	0,280	5.000	500	0,22
4	25	8.550	970	0,312	7.000	800	0,260	6.000	700	0,220	5.000	500	0,18
4	30	8.550	970	0,228	7.000	800	0,190	6.000	700	0,160	5.000	500	0,13
4	35	8.550	970	0,204	7.000	800	0,170	6.000	700	0,140	5.000	500	0,11
4	40	7.300	730	0,168	6.000	600	0,140	5.000	600	0,120	4.000	400	0,1
4	45	7.300	730	0,144	6.000	600	0,120	5.000	600	0,100	4.000	400	0,08
4	50	7.300	730	0,060	6.000	600	0,050	5.000	600	0,040	4.000	400	0,03
4	60	6.100	340	0,024	5.000	280	0,020	5.000	270	0,020	4.000	250	0,01
5	16	7.300	1.350	0,54	6.000	1.100	0,450	5.000	900	0,380	5.000	600	0,3
5	20	7.300	1.150	0,516	6.000	950	0,430	5.000	780	0,360	5.000	600	0,29
5	25	6.100	970	0,504	5.000	800	0,420	5.000	700	0,350	5.000	600	0,28
5	30	6.100	970	0,456	5.000	800	0,380	5.000	700	0,300	5.000	600	0,25
5	35	6.100	970	0,396	5.000	800	0,330	5.000	700	0,280	5.000	600	0,22
5	40	6.100	730	0,340	5.000	600	0,280	4.000	580	0,200	4.000	500	0,18
5	50	4.900	610	0,180	4.000	500	0,150	3.000	400	0,130	3.000	400	0,1
5	60	4.900	420	0,072	4.000	350	0,060	3.000	330	0,060	3.000	300	0,04

Max cutting depth



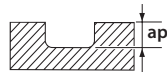
1. Use a rigid and precise machine and holder.
2. When machining carbon steel or hardened steel, using MQL (Minimum Quantity Lubrication, mist coolant) or air blow is recommended.
3. When using cutting fluid, choose based on work material and cutting conditions.
4. The cutting conditions shown for 3D milling are low-load, safe conditions for references. Refer to the table above to set the milling conditions in accordance with the actual situation.
5. Please adjust conditions based on machining accuracy, machining shape and machining path.
6. When using a tool with a dia. of 0,5 or less, or an L/D (effective length/tool diameter) ratio of greater than 10, high loads can cause tool breakage.
7. When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.

## WXL-LN-EMS-6

Slotting

Vc	C≤0,2% - GG S5400 • S55C • FC250 ~750 N/mm <sup>2</sup>		~30 HRC SCM • SKT • SKS • SKD		30~38 HRC SKT • SKD • NAK55 • HPM1		38~45 HRC-SUS SUS304 • SKD		45~55 HRC TiAl		55~60 HRC	
	100 (m/min)	78 (m/min)	66 (m/min)	62 (m/min)	60 (m/min)	30 (m/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
1	26.500	1.000	21.500	700	17.500	500	15.000	400	9.500	160	6.350	60
1,5	17.500	1.000	14.000	700	11.500	500	10.000	400	6.350	160	4.250	60
2	13.000	1.050	10.500	700	8.900	590	7.600	400	4.750	160	3.200	60
2,5	10.400	1.250	8.400	700	7.100	500	6.100	400	3.800	160	2.550	60
3	8.900	1.000	7.200	700	5.900	500	5.050	400	3.150	160	2.100	60
4	6.650	1.000	5.400	700	4.450	500	3.800	400	2.350	160	1.550	60
5	5.300	1.000	4.300	700	3.550	500	3.050	400	1.900	160	1.250	60
6	4.450	1.000	3.600	700	2.950	500	2.500	400	1.550	160	1.050	60

Max cutting depth



ap  
0,5D

ap  
0,05D

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 properties.

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## HYP-HP-WRESF

Side milling

Ø	GG GG-GGG		C≤0,2% S55C · SS400 ~750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SNCM		30~38 HRC NAK55 · HPMI · SKT		38~45 HRC - SUS SUS304 · X210CR12 · X40CRMV51	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	4.200	585	4.200	585	3.700	370	2.900	230	2.650	210
8	3.150	565	3.150	565	2.750	350	2.150	230	1.950	210
10	2.500	500	2.500	500	2.200	350	1.750	230	1.550	210
12	2.100	500	2.100	500	1.850	330	1.450	230	1.300	210
16	1.550	400	1.550	400	1.350	320	1.050	230	995	210
20	1.250	375	1.250	375	1.100	320	875	240	795	220

Slotting

Ø	GG GG-GGG		C≤0,2% S55C · SS400 ~750 N/mm <sup>2</sup>		~30 HRC SKD · SKS · SNCM		30~38 HRC NAK55 · HPMI · SKT		38~45 HRC - SUS SUS304 · X210CR12 · X40CRMV51	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	3.150	315	3.150	315	2.650	265	2.300	180	2.100	165
8	2.350	300	2.350	300	1.950	250	1.750	175	1.550	155
10	1.900	300	1.900	300	1.550	245	1.400	165	1.250	150
12	1.550	280	1.550	280	1.300	235	1.150	160	1.050	145
16	1.150	280	1.150	280	995	235	875	140	795	125
20	955	280	955	280	795	235	700	140	635	125
25	700	245	700	245	640	225	510	125	460	115

## EPL-WRESF

Vc	GG			C < 0,2%			SCM - SKD			25 - 35 HRC			35 - 45 HRC		
	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
80				70			45			35			27		
4	6.370	380	0,02	5.570	340	0,02	3.580	220	0,02	2.790	170	0,02	2.150	130	0,02
5	5.100	460	0,03	4.460	270	0,02	2.870	170	0,02	2.230	160	0,02	1.720	100	0,02
6	4.250	430	0,03	3.720	370	0,02	2.390	240	0,03	1.860	190	0,03	1.430	90	0,02
8	3.190	510	0,04	2.790	510	0,05	1.790	290	0,04	1.390	220	0,04	1.080	90	0,02
10	2.550	610	0,06	2.230	610	0,07	1.430	340	0,06	1.120	270	0,06	860	100	0,03
12	2.120	680	0,08	1.860	680	0,09	1.190	380	0,08	930	300	0,08	720	120	0,04
16	1.590	700	0,11	1.390	700	0,13	900	390	0,11	700	310	0,11	540	130	0,06
20	1.270	710	0,14	1.120	710	0,16	720	400	0,14	560	290	0,13	430	140	0,08
25	1.020	650	0,16	890	650	0,18	570	370	0,16	450	290	0,16	340	140	0,10
		ap		ae											
		1D		0,5D											

Vc	GG			C < 0,2%			SCM - SKD			25 - 35 HRC			35 - 45 HRC		
	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)	S (min <sup>-1</sup> )	F (mm/min)	fz (mm)
65				40			35			30			20		
4	5.180	310	0,02	3.180	190	0,02	2.790	170	0,02	2.390	140	0,02	1.590	70	0,01
5	4.140	250	0,02	2.550	150	0,02	2.230	130	0,02	1.910	110	0,02	1.270	50	0,01
6	3.450	350	0,03	2.129	210	0,02	1.860	190	0,03	1.590	160	0,03	1.060	50	0,01
8	2.590	410	0,04	1.590	250	0,04	1.390	220	0,04	1.190	190	0,04	800	70	0,02
10	2.070	500	0,06	1.270	310	0,06	1.120	270	0,06	960	230	0,06	640	60	0,02
12	1.730	550	0,08	1.060	340	0,08	930	300	0,08	800	240	0,08	530	90	0,04
16	1.290	570	0,11	800	350	0,11	700	310	0,11	600	260	0,11	400	100	0,06
20	1.040	580	0,14	640	360	0,14	560	310	0,14	480	250	0,13	320	100	0,08
25	830	530	0,16	510	330	0,16	450	290	0,16	380	250	0,16	260	100	0,10
		ap		ae											
		1D		1D											

Milling | Endmills

Cutting conditions

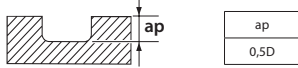


# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## HYP-ZDS

Counterboring

Vc	C≤0,2% - GG S55C • S5400 • GG25 ~750 N/mm <sup>2</sup>		~30 HRC SCM • SKS • SKT • SKD		30~38 HRC NAK55 • HPMI • SKT • SKD		38~45 HRC SUS SUS304 • SKD		Aluminium Alloy A7075		Aluminium Alloy Casting <Si 13%			
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)		
4	5.950	360	4.950	295	4.000	240	3.200	155	12.500	915	9.550	575		
5	4.800	360	3.950	295	3.200	240	2.550	155	10.000	915	7.650	575		
6	4.000	360	3.300	295	2.700	240	2.150	155	8.400	915	6.400	575		
7	3.400	360	2.800	295	2.300	240	1.850	155	7.200	915	5.500	575		
8	3.000	360	2.450	295	2.000	240	1.600	155	6.350	915	4.750	575		
9	2.650	360	2.200	295	1.800	240	1.450	155	5.600	915	4.200	575		
10	2.400	360	2.000	295	1.600	240	1.300	155	5.000	915	3.800	575		
Max cutting depth	 <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>ap</td> </tr> <tr> <td>0,5D</td> </tr> </table>												ap	0,5D
ap														
0,5D														



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## V-XPM-WEMS / V-WEMS

Side milling

Vc	E24 • XC48 Fonte GG25 490 ~ 750 MPA Low carbon steel, cast iron			35NCD16 • 40CMD8 750 ~ 1100 MPA Alloy steel, tool steel			316 • 304 800 MPA Stainless steel			Z38CDV5 • Z40CDV5 38 ~ 45 HRC Treated & pre-treated steel			Inconel • Hastelloy 35 ~ 43 HRC Steel alloys, Nickel base			TA6V 900 ~ 1100 MPA Alloy titanium			
	60 m/min			50 m/min			30 m/min			30 m/min			15 m/min			25 m/min			
Nr. flutes	Ø	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)
4	3	6.366	76	0,003	5.305	64	0,003	3.183	38	0,003	3.183	38	0,003	1.592	19	0,003	2.653	32	0,003
4	4	4.775	76	0,004	3.979	64	0,004	2.387	38	0,004	2.387	38	0,004	1.194	19	0,004	1.989	32	0,004
4	5	3.820	76	0,005	3.183	64	0,005	1.910	38	0,005	1.910	38	0,005	955	19	0,005	1.592	32	0,005
4	6	3.183	127	0,01	2.653	106	0,01	1.592	64	0,01	1.592	64	0,01	796	32	0,01	1.326	53	0,01
4	7	2.728	218	0,02	2.274	182	0,02	1.364	109	0,02	1.364	109	0,02	682	55	0,02	1.137	91	0,02
4	8	2.387	191	0,02	1.989	159	0,02	1.194	95	0,02	1.194	95	0,02	597	48	0,02	995	80	0,02
4	10	1.910	229	0,03	1.592	191	0,03	955	115	0,03	955	115	0,03	477	57	0,03	796	95	0,03
4	12	1.592	286	0,045	1.326	239	0,045	796	143	0,045	796	143	0,045	398	72	0,045	663	119	0,045
4	14	1.364	273	0,05	1.137	227	0,05	682	136	0,05	682	136	0,05	341	68	0,05	568	114	0,05
4	15	1.273	280	0,055	1.061	233	0,055	637	140	0,055	637	140	0,055	318	70	0,055	531	117	0,055
4	16	1.194	263	0,055	995	219	0,055	597	131	0,055	597	131	0,055	298	66	0,055	497	109	0,055
4	18	1.061	276	0,065	884	230	0,065	531	138	0,065	531	138	0,065	265	69	0,065	442	115	0,065
4	20	955	267	0,07	796	223	0,07	477	134	0,07	477	134	0,07	239	67	0,07	398	111	0,07
6	22	868	286	0,055	723	239	0,055	434	143	0,055	434	143	0,055	217	72	0,055	362	119	0,055
6	24	796	286	0,06	663	239	0,06	398	143	0,06	398	143	0,06	199	72	0,06	332	119	0,06
6	25	764	275	0,06	637	229	0,06	382	138	0,06	382	138	0,06	191	69	0,06	318	115	0,06
6	30	637	267	0,07	531	223	0,07	318	134	0,07	318	134	0,07	159	67	0,07	265	111	0,07

These parameters are for use with cutting-depth of 1,5 D and a cutting-width of 1 D.  
 For alu. alloys < 6% Si, please use feed/flute as indicated in the column by X by 3 times the cutting speed.  
 For copper alloys, please use the feed/flute as indicated in the column by X by 2 times the cutting speed.  
 For V-WEMS, reduce cutting speed by 20% and feed/flute by 10%.

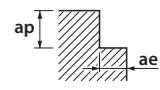
## SI-WH-WRESF

Side milling

Ø	Cast Iron FC250		Mild Steels • Carbon Steels SS400 - S50C		~ 30HRC SCM-SKT-SKS-SKD		~ 45 HRC SKD-NAK80		Stainless Steel SUS304		Titanium Alloy Ti-6Al-4V	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	2.920	300	3.450	300	2.650	210	2.390	170	1.860	130	1.330	80
8	2.190	340	2.590	350	1.990	240	1.790	190	1.390	150	990	90
10	1.750	380	2.070	390	1.590	270	1.430	220	1.110	170	800	110
12	1.460	410	1.720	420	1.330	290	1.190	230	930	180	660	110
16	1.090	480	1.290	490	990	340	900	270	700	210	500	130
20	880	510	1.030	520	800	360	720	290	560	230	400	140
25	700	490	830	510	640	350	570	280	450	220	320	140

Max cutting depth  

ap	ae
≤15	≤0,5D



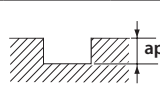
## SI-WH-WRESF

Slotting

Ø	Cast Iron FC250		Mild Steels • Carbon Steels SS400 - S50C		~ 30HRC SCM-SKT-SKS-SKD		~ 45 HRC SKD-NAK80		Stainless Steel SUS304		Titanium Alloy Ti-6Al-4V	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
6	2.390	160	2.650	160	2.120	110	1.860	90	1.330	60	800	30
8	1.790	200	1.990	190	1.590	140	1.390	110	990	80	600	40
10	1.430	220	1.590	210	1.270	150	1.110	120	800	80	480	40
12	1.190	230	1.330	220	1.060	160	930	120	660	90	400	50
16	900	270	990	260	800	190	700	150	500	110	300	60
20	720	290	800	280	640	210	560	160	400	110	240	60
25	570	280	640	280	510	200	450	150	320	110	190	60

Max cutting depth  

ap	≤1D
ap Max	20 mm



Milling | Endmills

Cutting conditions



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## V-XPM-WRESF / V-WREES / V-WRESF

### Slotting

Vc		E24 · XC48 Fonte GG25 490 ~ 750 MPA Low carbon steel, cast iron			35NCD16 · 40CMD8 750 ~ 1100 MPA Alloy steel, tool steel			316 · 304 800 MPA Stainless steel			Z38CDV5 · Z40CDV5 38 ~ 45 HRC Treated & pre-treated steel			Inconel · Hastelloy 35 ~ 43 HRC Steel alloys, Nickel base			TA6V 900 ~ 1100 MPA Alloy titanium		
Vc		55 m/min			45 m/min			25 m/min			30 m/min			15 m/min			22 m/min		
Nr. flutes	Ø	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)
4	6	2.918	233	0,02	2.387	191	0,02	1.326	106	0,02	1.592	127	0,02	796	64	0,02	1.167	93	0,02
4	7	2.501	250	0,025	2.046	205	0,025	1.137	114	0,025	1.364	136	0,025	682	68	0,025	1.000	100	0,025
4	8	2.188	263	0,03	1.790	215	0,03	995	119	0,03	1.194	143	0,03	597	72	0,03	875	105	0,03
4	10	1.751	280	0,04	1.432	229	0,04	796	127	0,04	955	153	0,04	477	76	0,04	700	112	0,04
4	12	1.459	350	0,06	1.194	286	0,06	663	159	0,06	796	191	0,06	398	95	0,06	584	140	0,06
4	14	1.251	325	0,065	1.023	266	0,065	568	148	0,065	682	177	0,065	341	89	0,065	500	130	0,065
4	15	1.167	327	0,07	955	267	0,07	531	149	0,07	637	178	0,07	318	89	0,07	467	131	0,07
4	16	1.094	328	0,075	895	269	0,075	497	149	0,075	597	179	0,075	298	90	0,075	438	131	0,075
4	18	973	331	0,085	796	271	0,085	442	150	0,085	531	180	0,085	265	90	0,085	389	132	0,085
4	20	875	350	0,1	716	286	0,1	398	159	0,1	477	191	0,1	239	95	0,1	350	140	0,1
5	22	796	438	0,11	651	358	0,11	362	199	0,11	434	239	0,11	217	119	0,11	318	175	0,11
5	25	700	438	0,125	573	358	0,125	318	199	0,125	382	239	0,125	191	119	0,125	280	175	0,125
5	28	625	391	0,125	512	320	0,125	284	178	0,125	341	213	0,125	171	107	0,125	250	156	0,125
6	30	584	438	0,125	477	358	0,125	265	199	0,125	318	239	0,125	159	119	0,125	233	175	0,125
6	32	547	410	0,125	448	336	0,125	249	187	0,125	298	224	0,125	149	112	0,125	219	164	0,125
6	35	500	375	0,125	409	307	0,125	227	171	0,125	273	205	0,125	136	102	0,125	200	150	0,125
6	36	486	365	0,125	398	298	0,125	221	166	0,125	265	199	0,125	133	99	0,125	195	146	0,125
6	40	438	328	0,125	358	269	0,125	199	149	0,125	239	179	0,125	119	90	0,125	175	131	0,125

These parameters are for use with cutting-depth of 1 D and a cutting-width of 1 D.  
For V-WREES, V-WRESF, reduce cutting speed by 20% and feed/flute by 10%.

## V-XPM-WRESF / V-WREES / V-WRESF

### Side milling

Vc		E24 · XC48 Fonte GG25 490 ~ 750 MPA Low carbon steel, cast iron			35NCD16 · 40CMD8 750 ~ 1100 MPA Alloy steel, tool steel			316 · 304 800 MPA Stainless steel			Z38CDV5 · Z40CDV5 38 ~ 45 HRC Treated & pre-treated steel			Inconel · Hastelloy 35 ~ 43 HRC Steel alloys, Nickel base			TA6V 900 ~ 1100 MPA Alloy titanium		
Vc		55 m/min			45 m/min			25 m/min			30 m/min			15 m/min			22 m/min		
Nr. flutes	Ø	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)
4	6	2.918	292	0,025	2.387	239	0,025	1.326	133	0,025	1.592	159	0,025	796	80	0,025	1.167	117	0,025
4	7	2.501	300	0,03	2.046	246	0,03	1.137	136	0,03	1.364	164	0,03	682	82	0,03	1.000	120	0,03
4	8	2.188	394	0,045	1.790	322	0,045	995	179	0,045	1.194	215	0,045	597	107	0,045	875	158	0,045
4	10	1.751	385	0,055	1.432	315	0,055	796	175	0,055	955	210	0,055	477	105	0,055	700	154	0,055
4	12	1.459	467	0,08	1.194	382	0,08	663	212	0,08	796	255	0,08	398	127	0,08	584	187	0,08
4	14	1.251	425	0,085	1.023	348	0,085	568	193	0,085	682	232	0,085	341	116	0,085	500	170	0,085
4	15	1.167	397	0,085	955	325	0,085	531	180	0,085	637	216	0,085	318	108	0,085	467	159	0,085
4	16	1.094	438	0,1	895	358	0,1	497	199	0,1	597	239	0,1	298	119	0,1	438	175	0,1
4	18	973	428	0,11	796	350	0,11	442	195	0,11	531	233	0,11	265	117	0,11	389	171	0,11
4	20	875	455	0,13	716	372	0,13	398	207	0,13	477	248	0,13	239	124	0,13	350	182	0,13
5	22	796	557	0,14	651	456	0,14	362	253	0,14	434	304	0,14	217	152	0,14	318	223	0,14
5	25	700	560	0,16	573	458	0,16	318	255	0,16	382	306	0,16	191	153	0,16	280	224	0,16
5	28	625	438	0,14	512	358	0,14	284	199	0,14	341	239	0,14	171	119	0,14	250	175	0,14
6	30	584	490	0,14	477	401	0,14	265	223	0,14	318	267	0,14	159	134	0,14	233	196	0,14
6	32	547	460	0,14	448	376	0,14	249	209	0,14	298	251	0,14	149	125	0,14	219	184	0,14
6	35	500	420	0,14	409	344	0,14	227	191	0,14	273	229	0,14	136	115	0,14	200	168	0,14
6	36	486	408	0,14	398	334	0,14	221	186	0,14	265	223	0,14	133	111	0,14	195	163	0,14
6	40	438	368	0,14	358	301	0,14	199	167	0,14	239	201	0,14	119	100	0,14	175	147	0,14

These parameters are for use with cutting-depth of 1 D and a cutting-width of 1 D.  
For V-WREES, V-WRESF, reduce cutting speed by 20% and feed/flute by 10%.

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## VP-RESF-SP

Slotting

		E24 • XC48 Fonte GG25 490 ~ 750 MPA Low carbon steel, cast iron			35NCD16 • 40CMD8 750 ~ 1100 MPA Alloy steel, tool steel			316 • 304 800 MPA Stainless steel			Z38CDV5 • Z40CDV5 38 ~ 45 HRC Treated & pre-treated steel		
Vc		53 m/min			45 m/min			25 m/min			40 m/min		
Nr. flutes	Ø	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)
3	8	2.109	633	0,1	1.790	537	0,1	995	298	0,1	1.592	477	0,1
3	10	1.687	506	0,1	1.432	430	0,1	796	239	0,1	1.273	382	0,1
3	12	1.406	506	0,12	1.194	430	0,12	663	239	0,12	1.061	382	0,12
3	16	1.054	380	0,12	895	322	0,12	497	179	0,12	796	286	0,12
3	20	844	329	0,13	716	279	0,13	398	155	0,13	560	218	0,13
4	25	400	208	0,13	420	218	0,13	220	114	0,13	400	192	0,12

These parameters are for use with cutting-depth of 0,8 D and a cutting-width of 1 D.  
For the end mill dia 25 mm 4 flutes, the cutting depth may not exceed 0.5D.

## V-XPM-WEHS

Slotting

		E24 • XC48 Fonte GG25 490 ~ 750 MPA Low carbon steel, cast iron			35NCD16 • 40CMD8 750 ~ 1100 MPA Alloy steel, tool steel			316 • 304 800 MPA Stainless steel			Z38CDV5 • Z40CDV5 38 ~ 45 HRC Treated & pre-treated steel			Inconel • Hastelloy 35 ~ 43 HRC Steel alloys, Nickel base			TA6V 900 ~ 1100 MPA Alloy titanium		
Vc		55 m/min			45 m/min			25 m/min			30 m/min			15 m/min			22 m/min		
Nr. flutes	Ø	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)
2	2	8.754	70	0,004	7.162	57	0,004	3.979	32	0,004	4.775	38	0,004	2.387	19	0,004	3.501	28	0,004
2	3	5.836	70	0,006	4.775	57	0,006	2.653	32	0,006	3.183	38	0,006	1.592	19	0,006	2.334	28	0,006
2	4	4.377	70	0,008	3.581	57	0,008	1.989	32	0,008	2.387	38	0,008	1.194	19	0,008	1.751	28	0,008
2	5	3.501	70	0,01	2.865	57	0,01	1.592	32	0,01	1.910	38	0,01	955	19	0,01	1.401	28	0,01
3	6	2.918	96	0,011	2.387	79	0,011	1.326	44	0,011	1.592	53	0,011	796	26	0,011	1.167	39	0,011
3	7	2.501	90	0,012	2.046	74	0,012	1.137	41	0,012	1.364	49	0,012	682	25	0,012	1.000	36	0,012
3	8	2.188	85	0,013	1.790	70	0,013	995	39	0,013	1.194	47	0,013	597	23	0,013	875	34	0,013
3	9	1.945	82	0,014	1.592	67	0,014	884	37	0,014	1.061	45	0,014	531	22	0,014	778	33	0,014
3	10	1.751	95	0,018	1.432	77	0,018	796	43	0,018	955	52	0,018	477	26	0,018	700	38	0,018
3	11	1.592	95	0,02	1.302	78	0,02	723	43	0,02	868	52	0,02	434	26	0,02	637	38	0,02
3	12	1.459	109	0,025	1.194	90	0,025	663	50	0,025	796	60	0,025	398	30	0,025	584	44	0,025
3	13	1.347	105	0,026	1.102	86	0,026	612	48	0,026	735	57	0,026	367	29	0,026	539	42	0,026
3	14	1.251	105	0,028	1.023	86	0,028	568	48	0,028	682	57	0,028	341	29	0,028	500	42	0,028
3	15	1.167	105	0,03	955	86	0,03	531	48	0,03	637	57	0,03	318	29	0,03	467	42	0,03
3	16	1.094	105	0,032	895	86	0,032	497	48	0,032	597	57	0,032	298	29	0,032	438	42	0,032
3	18	973	102	0,035	796	84	0,035	442	46	0,035	531	56	0,035	265	28	0,035	389	41	0,035
3	20	875	105	0,04	716	86	0,04	398	48	0,04	477	57	0,04	239	29	0,04	350	42	0,04
4	22	796	111	0,035	651	91	0,035	362	51	0,035	434	61	0,035	217	30	0,035	318	45	0,035
4	24	729	117	0,04	597	95	0,04	332	53	0,04	398	64	0,04	199	32	0,04	292	47	0,04
4	25	700	126	0,045	573	103	0,045	318	57	0,045	382	69	0,045	191	34	0,045	280	50	0,045
4	28	625	125	0,05	512	102	0,05	284	57	0,05	341	68	0,05	171	34	0,05	250	50	0,05
4	30	584	128	0,055	477	105	0,055	265	58	0,055	318	70	0,055	159	35	0,055	233	51	0,055

These parameters are for use with cutting-depth of 0,5 D and a cutting-width of 1 D for end mills 2 and 3 flutes.  
These parameters are for use with cutting-depth of 0.25 D and a cutting-width of 1 D for end mills 4 flutes.  
For alu. alloys < 6% Si, please use feed/flute as indicated in the column by X by 3 times the cutting speed.  
For copper alloys, please use the feed/flute as indicated in the column by X by 2 times the cutting speed.

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## V-XPM-WEHS

Side milling

Vc		E24 • XC48 Fonte GG25 490 ~ 750 MPA Low carbon steel, cast iron			35NCD16 • 40CMD8 750 ~ 1100 MPA Alloy steel, tool steel			316 • 304 800 MPA Stainless steel			Z38CDV5 • Z40CDV5 38 ~ 45 HRC Treated & pre-treated steel			Inconel • Hastelloy 35 ~ 43 HRC Steel alloys, Nickel base			TA6V 900 ~ 1100 MPA Alloy titanium		
		55 m/min			45 m/min			25 m/min			30 m/min			15 m/min			22 m/min		
Nr. flutes	Ø	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)	S (min <sup>-1</sup> )	F (mm/min)	AZ (mm)
2	2	8.754	70	0,004	7.162	57	0,004	3.979	32	0,004	4.775	38	0,004	2.387	19	0,004	3.501	28	0,004
2	3	5.836	70	0,006	4.775	57	0,006	2.653	32	0,006	3.183	38	0,006	1.592	19	0,006	2.334	28	0,006
2	4	4.377	70	0,008	3.581	57	0,008	1.989	32	0,008	2.387	38	0,008	1.194	19	0,008	1.751	28	0,008
2	5	3.501	70	0,01	2.865	57	0,01	1.592	32	0,01	1.910	38	0,01	955	19	0,01	1.401	28	0,01
3	6	2.918	105	0,012	2.387	86	0,012	1.326	48	0,012	1.592	57	0,012	796	29	0,012	1.167	42	0,012
3	7	2.501	105	0,014	2.046	86	0,014	1.137	48	0,014	1.364	57	0,014	682	29	0,014	1.000	42	0,014
3	8	2.188	131	0,02	1.790	107	0,02	995	60	0,02	1.194	72	0,02	597	36	0,02	875	53	0,02
3	9	1.945	117	0,02	1.592	95	0,02	884	53	0,02	1.061	64	0,02	531	32	0,02	778	47	0,02
3	10	1.751	131	0,025	1.432	107	0,025	796	60	0,025	955	72	0,025	477	36	0,025	700	53	0,025
3	11	1.592	119	0,025	1.302	98	0,025	723	54	0,025	868	65	0,025	434	33	0,025	637	48	0,025
3	12	1.459	153	0,035	1.194	125	0,035	663	70	0,035	796	84	0,035	398	42	0,035	584	61	0,035
3	13	1.347	141	0,035	1.102	116	0,035	612	64	0,035	735	77	0,035	367	39	0,035	539	57	0,035
3	14	1.251	150	0,04	1.023	123	0,04	568	68	0,04	682	82	0,04	341	41	0,04	500	60	0,04
3	15	1.167	140	0,04	955	115	0,04	531	64	0,04	637	76	0,04	318	38	0,04	467	56	0,04
3	16	1.094	148	0,045	895	121	0,045	497	67	0,045	597	81	0,045	298	40	0,045	438	59	0,045
3	18	973	146	0,05	796	119	0,05	442	66	0,05	531	80	0,05	265	40	0,05	389	58	0,05
3	20	875	158	0,06	716	129	0,06	398	72	0,06	477	86	0,06	239	43	0,06	350	63	0,06
4	22	796	223	0,07	651	182	0,07	362	101	0,07	434	122	0,07	217	61	0,07	318	89	0,07
4	24	729	219	0,075	597	179	0,075	332	99	0,075	398	119	0,075	199	60	0,075	292	88	0,075
4	25	700	224	0,08	573	183	0,08	318	102	0,08	382	122	0,08	191	61	0,08	280	90	0,08
4	28	625	225	0,09	512	184	0,09	284	102	0,09	341	123	0,09	171	61	0,09	250	90	0,09
4	30	584	233	0,1	477	191	0,1	265	106	0,1	318	127	0,1	159	64	0,1	233	93	0,1

These parameters are for use with cutting-depth of 1,5 D and a cutting-width of 0,1 D.  
 For alu. alloys < 6% Si, please use feed/flute as indicated in the column by X by 3 times the cutting speed.  
 For copper alloys, please use the feed/flute as indicated in the column by X by 2 times the cutting speed.



# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## CM-RMS

Side milling • 4 flute type

Heat resistant alloys Inconel 718				
Ø	Cutting Speed (m/min)	Feed per tooth (mm/t)	ap (mm)	ae (mm)
6	400-800	0,02-0,04	≤4,5 (0,75D)	≤0,6 (0,1D)
8	400-800	0,02-0,04	≤6,0 (0,75D)	≤0,8 (0,1D)
10	400-800	0,02-0,07	≤7,5 (0,75D)	≤1,0 (0,1D)
12	400-800	0,02-0,07	≤9,0 (0,75D)	≤1,2 (0,1D)

Slotting • 4 flute type

Heat resistant alloys Inconel 718			
Ø	Cutting Speed (m/min)	Feed per tooth (mm/t)	ap
6	400-800	0,02-0,04	≤1,2 (0,2D)
8	400-800	0,02-0,04	≤1,6 (0,2D)
10	400-800	0,02-0,07	≤2,0 (0,2D)
12	400-800	0,02-0,07	≤2,4 (0,2D)

Side milling • 6 flute type

Heat resistant alloys Inconel 718				
Ø	Cutting Speed (m/min)	Feed per tooth (mm/t)	ap (mm)	ae (mm)
6	400-800	0,02-0,04	≤4,5 (0,75D)	≤0,6 (0,1D)
8	400-800	0,02-0,04	≤6,0 (0,75D)	≤0,8 (0,1D)
10	400-800	0,02-0,07	≤7,5 (0,75D)	≤1,0 (0,1D)
12	400-800	0,02-0,07	≤9,5 (0,75D)	≤1,2 (0,1D)

## CM-CRE

Side milling End cutting edge type\*

Heat resistant alloys Inconel 718				
Ø	Cutting Speed (m/min)	Feed per tooth (mm/t)	ap (mm)	ae (mm)
16	400-800	0,03-0,05	1	≤9,6 (0,6D)
20	400-800	0,04-0,06	1	≤12,0 (0,6D)
25	400-800	0,05-0,08	1	≤15,0 (0,6D)

\*Specify a draft (at least 3°) in the milling program to avoid neck interferences .

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPS-LN-EBD

High speed milling • (1/2)

Vc		C≤0,2% - GG				~30 HRC				30~38 HRC			
		120 (m/min)				110 (m/min)				100 (m/min)			
R	l1 (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)
0,15	0,6	50000	250	0,004	0,004	50000	250	0,004	0,004	50000	240	0,004	0,004
0,15	1	50000	230	0,004	0,004	50000	230	0,004	0,004	50000	220	0,004	0,004
0,15	1,5	50000	200	0,004	0,004	50000	200	0,004	0,004	50000	190	0,004	0,004
0,2	0,8	50000	360	0,005	0,005	50000	360	0,005	0,005	50000	340	0,005	0,005
0,2	1	50.000	360	0,005	0,005	50.000	360	0,005	0,005	50.000	340	0,005	0,005
0,2	1,25	47.000	320	0,005	0,005	47.000	320	0,005	0,005	47.000	300	0,005	0,005
0,2	1,5	45.000	300	0,005	0,005	45.000	300	0,005	0,005	45.000	280	0,005	0,005
0,2	2	38.000	230	0,005	0,005	38.000	230	0,005	0,005	38.000	210	0,005	0,005
0,25	1	50000	500	0,005	0,008	50000	500	0,005	0,008	50000	470	0,005	0,008
0,25	1,5	50000	500	0,005	0,008	50000	500	0,005	0,008	50000	470	0,005	0,008
0,25	2	50000	480	0,005	0,007	50000	480	0,005	0,007	50000	440	0,005	0,007
0,25	2,5	45000	460	0,005	0,006	45000	460	0,005	0,006	45000	420	0,005	0,006
0,25	3,5	45000	440	0,005	0,005	45000	440	0,005	0,005	45000	390	0,005	0,005
0,25	4	45000	400	0,005	0,005	45000	400	0,005	0,005	45000	360	0,005	0,005
0,25	6	40000	260	0,005	0,005	40000	260	0,005	0,005	40000	240	0,005	0,005
0,3	1,2	50.000	600	0,005	0,01	50.000	600	0,005	0,01	50.000	570	0,005	0,01
0,3	2	50.000	600	0,005	0,01	50.000	600	0,005	0,01	50.000	570	0,005	0,01
0,3	3	50.000	600	0,005	0,01	50.000	600	0,005	0,01	50.000	570	0,005	0,01
0,3	4	45.000	480	0,005	0,005	45.000	480	0,005	0,005	45.000	450	0,005	0,005
0,3	5	40.000	300	0,005	0,005	40.000	300	0,005	0,005	40.000	280	0,005	0,005
0,4	2	50.000	700	0,01	0,02	50.000	700	0,01	0,02	50.000	660	0,01	0,02
0,4	3	43.000	500	0,005	0,01	43.000	500	0,005	0,01	43.000	470	0,005	0,01
0,4	4	36.000	370	0,005	0,005	36.000	370	0,005	0,005	36.000	350	0,005	0,005
0,4	5	32.000	280	0,004	0,005	32.000	280	0,004	0,005	32.000	260	0,004	0,005
0,5	2	50.000	1.000	0,015	0,03	50.000	1.000	0,015	0,03	50.000	950	0,015	0,03
0,5	3	48.000	900	0,01	0,02	48.000	900	0,01	0,02	48.000	850	0,01	0,02
0,5	4	43.000	600	0,01	0,01	43.000	600	0,01	0,01	43.000	570	0,01	0,01
0,5	6	26.000	250	0,004	0,005	26.000	250	0,004	0,005	26.000	230	0,004	0,005
0,5	8	22.000	160	0,004	0,005	22.000	160	0,004	0,005	22.000	150	0,004	0,005
0,5	10	20.000	100	0,004	0,005	20.000	100	0,004	0,005	20.000	95	0,004	0,005
0,5	12	20000	90	0,004	0,005	20000	90	0,004	0,005	20000	80	0,004	0,005
0,75	3	45000	2400	0,04	0,08	45000	2400	0,04	0,08	45000	2200	0,04	0,08
0,75	4	42000	1900	0,04	0,08	42000	1900	0,04	0,08	42000	1700	0,04	0,08
0,75	6	28000	1400	0,04	0,08	28000	1400	0,04	0,08	28000	1150	0,04	0,08
0,75	8	24000	800	0,02	0,05	24000	800	0,02	0,05	24000	650	0,02	0,05
0,75	12	21000	680	0,008	0,01	21000	680	0,008	0,01	21000	540	0,008	0,01
1	4	40.000	3.000	0,05	0,1	40.000	3.000	0,05	0,1	40.000	2.850	0,05	0,1
1	6	30.000	2.000	0,05	0,1	30.000	2.000	0,05	0,1	30	1900	0,05	0,1
1	8	26.000	1.600	0,05	0,1	26.000	1.600	0,05	0,1	26.000	1.500	0,05	0,1
1	10	22.000	1.100	0,01	0,02	22.000	1.100	0,01	0,02	22.000	1.000	0,01	0,02
1	12	20.000	800	0,01	0,01	20.000	800	0,01	0,01	20.000	760	0,01	0,01
1	14	18.000	600	0,005	0,01	18.000	600	0,005	0,01	18.000	570	0,005	0,01
1	16	16.000	420	0,005	0,01	16.000	420	0,005	0,01	16.000	400	0,005	0,01
1,25	10	21000	1700	0,01	0,01	21000	1700	0,01	0,01	21000	1500	0,01	0,01
1,5	6	30.000	2.900	0,075	0,15	30.000	2.900	0,075	0,15	30.000	2.700	0,075	0,15
1,5	8	24.000	2.300	0,075	0,15	24.000	2.300	0,075	0,15	24.000	2.100	0,075	0,15
1,5	10	24.000	2.000	0,075	0,15	24.000	2.000	0,075	0,15	24.000	1.900	0,075	0,15
1,5	12	21.000	1.400	0,075	0,1	21.000	1.400	0,075	0,1	21.000	1.300	0,075	0,1
1,5	15	17000	1000	0,06	0,1	17000	1000	0,06	0,1	17000	940	0,06	0,1
1,5	16	16.000	800	0,05	0,1	16.000	800	0,05	0,1	16.000	760	0,05	0,1
1,5	20	13.000	360	0,02	0,05	13.000	360	0,02	0,05	13.000	340	0,02	0,05
2	8	25.000	2.600	0,1	0,2	25.000	2.600	0,1	0,2	25.000	2.400	0,1	0,2
2	10	20.000	2.400	0,1	0,2	20.000	2.400	0,1	0,2	20.000	2.200	0,1	0,2
2	12	16.000	2.000	0,1	0,2	16.000	2.000	0,1	0,2	16.000	1.900	0,1	0,2
2	16	14.000	1.700	0,1	0,1	14.000	1.700	0,1	0,1	14.000	1.600	0,1	0,1
2	20	12.000	1.200	0,05	0,1	12.000	1.200	0,05	0,1	12.000	1.100	0,05	0,1
3	12	20.000	3.000	0,15	0,3	20.000	3.000	0,15	0,3	20.000	2.800	0,15	0,3

Max cutting depth

Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
- Do not use inflammable coolant. Using worn tools may generate sparks.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

\* Modified parameters

Milling | Endmills  
Cutting conditions

# CUTTING CONDITIONS

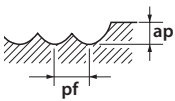
Milling | Endmills | Cutting conditions

## EPS-LN-EBD

High speed milling • (2/2)

Vc		38 ~ 45 HRC				45 ~ 55 HRC				55 ~ 60 HRC			
R		120 (m/min)				110 (m/min)				100 (m/min)			
R	l1 (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)	S (min <sup>-1</sup> )	F (mm/min)	ap (mm)	pf (mm)
0,15	0,6	50000	240	0,004	0,004	50000	230	0,004	0,004	50000	220	0,004	0,004
0,15	1	50000	220	0,004	0,004	50000	200	0,004	0,004	50000	180	0,004	0,004
0,15	1,5	50000	190	0,004	0,004	50000	170	0,004	0,004	50000	150	0,004	0,004
0,2	0,8	50000	340	0,005	0,005	50000	230	0,005	0,005	50000	180	0,005	0,005
0,2	1	50.000	340	0,005	0,005	50.000	230	0,005	0,005	50.000	180	0,004	0,005
0,2	1,25	47.000	300	0,005	0,005	47.000	210	0,005	0,005	43.000	150	0,004	0,005
0,2	1,5	45.000	280	0,005	0,005	45.000	190	0,005	0,005	41.000	130	0,004	0,005
0,2	2	38.000	210	0,005	0,005	37.000	140	0,005	0,005	33.000	100	0,004	0,005
0,25	1	50000	470	0,005	0,008	50000	450	0,005	0,008	50000	430	0,005	0,008
0,25	1,5	50000	470	0,005	0,008	50000	450	0,005	0,008	50000	430	0,005	0,008
0,25	2	50000	440	0,005	0,007	50000	420	0,005	0,007	50000	400	0,005	0,007
0,25	2,5	45000	420	0,005	0,006	45000	400	0,005	0,006	45000	380	0,005	0,006
0,25	3,5	45000	390	0,005	0,005	45000	370	0,005	0,005	45000	350	0,005	0,005
0,25	4	45000	360	0,005	0,005	45000	340	0,005	0,005	45000	320	0,005	0,005
0,25	6	40000	240	0,005	0,005	40000	220	0,005	0,005	40000	200	0,005	0,005
0,3	1,2	50.000	570	0,005	0,01	50.000	390	0,005	0,01	50.000	300	0,005	0,01
0,3	2	50.000	570	0,005	0,01	50.000	390	0,005	0,01	50.000	310	0,005	0,01
0,3	3	50.000	570	0,005	0,01	50.000	370	0,005	0,01	50.000	290	0,005	0,01
0,3	4	45.000	450	0,005	0,005	45.000	290	0,005	0,005	41.000	210	0,004	0,005
0,3	5	40.000	280	0,005	0,005	40.000	190	0,005	0,005	36.000	130	0,004	0,005
0,4	2	50.000	670	0,01	0,02	50.000	460	0,01	0,02	45.000	330	0,008	0,015
0,4	3	43.000	460	0,005	0,01	43.000	320	0,005	0,01	38.000	220	0,005	0,01
0,4	4	36.000	350	0,005	0,005	35.000	230	0,005	0,005	31.000	160	0,005	0,005
0,4	5	32.000	260	0,004	0,005	31.000	170	0,004	0,005	28.000	120	0,004	0,005
0,5	2	50.000	950	0,015	0,03	50.000	650	0,015	0,03	50.000	520	0,01	0,02
0,5	3	48.000	850	0,01	0,02	48.000	550	0,01	0,02	43.000	390	0,01	0,02
0,5	4	43.000	570	0,01	0,01	43.000	390	0,01	0,01	38.000	270	0,01	0,01
0,5	6	26.000	230	0,004	0,005	25.000	150	0,004	0,005	22.000	100	0,004	0,005
0,5	8	22.000	150	0,004	0,005	21.000	110	0,004	0,005	20.000	100	0,004	0,005
0,5	10	20.000	95	0,004	0,005	21.000	100	0,004	0,005	20.000	90	0,004	0,005
0,5	12	20000	80	0,004	0,005	20000	70	0,004	0,005	20000	60	0,004	0,005
0,75	3	45000	2200	0,04	0,08	45000	1800	0,04	0,08	45000	1400	0,02	0,05
0,75	4	42000	1700	0,04	0,08	42000	1400	0,04	0,08	42000	1100	0,02	0,05
0,75	6	28000	1150	0,04	0,08	28000	860	0,04	0,08	28000	660	0,02	0,05
0,75	8	24000	650	0,02	0,05	24000	580	0,02	0,05	24000	520	0,02	0,05
0,75	12	21000	540	0,008	0,01	21000	480	0,008	0,01	21000	400	0,008	0,01
1	4	40.000	2.850	0,05	0,1	40.000	2.200	0,05	0,1	40.000	1.700	0,02	0,05
1	6	30.000	1.900	0,05	0,1	30	1.500	0,05	0,1	30	1.200	0,02	0,05
1	8	26.000	1.500	0,05	0,1	26.000	1.200	0,05	0,1	26.000	960	0,02	0,05
1	10	22.000	1.000	0,01	0,02	21.000	760	0,01	0,02	18.000	520	0,01	0,02
1	12	20.000	760	0,01	0,01	19.000	570	0,01	0,01	17.000	400	0,01	0,01
1	14	18.000	570	0,005	0,01	17.000	430	0,005	0,01	15.000	300	0,005	0,01
1	16	16.000	400	0,005	0,01	15.000	300	0,005	0,01	13.000	200	0,005	0,01
1,25	10	21000	1500	0,05	0,01	21000	1200	0,05	0,05	21000	950	0,015	0,01
1,5	6	30.000	2.700	0,075	0,15	30.000	2.200	0,075	0,15	27.000	1.500	0,03	0,06
1,5	8	24.000	2.100	0,075	0,15	24.000	1.700	0,075	0,15	21.000	1.100	0,03	0,06
1,5	10	24.000	1.900	0,075	0,15	24.000	1.500	0,075	0,15	21.000	1.000	0,03	0,06
1,5	12	21.000	1.300	0,075	0,1	21.000	1.000	0,075	0,1	18.000	680	0,03	0,06
1,5	15	17.000	940	0,05	0,1	17.000	720	0,05	0,1	17.000	490	0,03	0,05
1,5	16	14.000	760	0,05	0,1	13.000	560	0,05	0,1	10.000	340	0,03	0,05
1,5	20	12.000	340	0,02	0,05	11.000	240	0,02	0,05	9.000	150	0,02	0,05
2	8	25.000	2.400	0,1	0,2	24.000	2.300	0,1	0,2	20.000	1.500	0,05	0,1
2	10	20.000	2.200	0,1	0,2	19.000	2.000	0,1	0,2	17.000	1.400	0,05	0,1
2	12	16.000	1.900	0,1	0,2	15.000	1.700	0,1	0,2	13.000	1.100	0,05	0,1
2	16	14.000	1.600	0,1	0,1	13.000	1.400	0,1	0,1	11.000	950	0,05	0,1
2	20	11.000	1.100	0,05	0,1	10.000	890	0,05	0,1	9.000	640	0,05	0,1
3	12	20.000	2.800	0,15	0,3	18.000	2.500	0,15	0,3	16.000	1.700	0,06	0,15

Max cutting depth



Attention : sparks and/or flames can cause coolant fire. Be sure adequate fire prevention is available.

- Speeds and feeds are designed to be used in conjunction with small passes on a high speed & precision machine set-up.
- Do not use inflammable coolant. Using worn tools may generate sparks.
- Use compressed air or a high quality coolant with a low co-efficient of smoke emission.

\* Modified parameters

Milling | Endmills


Cutting conditions

# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions


## EPN-AL-3FS/FL

Side milling

	Aluminium wrought alloys	Aluminium cast alloy >5% Si <10% Si
	Vc	400 - 600 (m/min)
Ø	fz (mm)	fz (mm)
3	0,027	0,024
4	0,036	0,032
5	0,045	0,041
6	0,054	0,049
8	0,072	0,065
10	0,090	0,081
12	0,108	0,097
16	0,144	0,130
20	0,195	0,175
ae max. 60% x D ap = 1xD		


## EPN-AL-3FS/FL

Slotting

	Aluminium wrought alloys	Aluminium cast alloy >5% Si <10% Si
	Vc	400 - 600 (m/min)
Ø	fz (mm)	fz (mm)
3	0,019	0,017
4	0,025	0,022
5	0,032	0,029
6	0,038	0,034
8	0,050	0,046
10	0,063	0,057
12	0,076	0,068
16	0,101	0,091
20	0,137	0,123
ap = 1xD		

## EPA-AL-3FS/FL

Side milling

	Aluminium wrought alloys	Aluminium cast alloy >5% Si <10% Si
	Vc	500 - 800 (m/min)
Ø	fz (mm)	fz (mm)
3	0,027	0,024
4	0,036	0,032
5	0,045	0,041
6	0,054	0,049
8	0,072	0,065
10	0,090	0,081
12	0,108	0,097
16	0,144	0,130
20	0,195	0,175
ae max. 60% x D ap = 1xD		




# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## EPA-AL-3FS/FL

Slotting



	Aluminium wrought alloys	Aluminium cast alloy >5% Si <10% Si
Vc	500 - 800 (m/min)	400 - 700 (m/min)
Ø	fz (mm)	fz (mm)
3	0,019	0,017
4	0,025	0,022
5	0,032	0,029
6	0,038	0,034
8	0,050	0,046
10	0,063	0,057
12	0,076	0,068
16	0,101	0,091
20	0,137	0,123

ap = 1xD





# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PFAL BORE

Face milling finishing cutter for aluminium

	Work Material	Component	Material Symbol	Application	Cutting Speed Vc (m/min)		Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)
					BT30	BT40, BT50 HSK63		
N	Aluminium Alloy	~ 12% Si	A7075, A5052, A2017, ADC12	Semi-finishing	1,000 (800 ~ 2,000)	2,000 (1,000 ~ 5,000)	0.08 (0.05 ~ 0.10)	1.5 (1.0 ~ 2.0)
				Finishing			0.06 (0.05 ~ 0.08)	0.5 (0.3 ~ 1.0)
	Aluminium Alloy	~ 13% Si	AC9A, AC98	Semi-finishing	600 (400 ~ 800)		0.08 (0.05 ~ 0.10)	1.5 (1.0 ~ 2.0)
				Finishing			0.06 (0.05 ~ 0.08)	0.5 (0.3 ~ 1.0)

## PAS BORE

45° Face milling

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)	Grade
P	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	180 (100 ~ 250)	0,18 (0,15 ~ 0,35)	3	XP3035 XC3025
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	180 (100 ~ 250)	0,18 (0,15 ~ 0,35)	3	XP3035 XC3025
	Die Steel (SKD11-SKD61)	~280HB	150 (80 ~ 200)	0,15 (0,10 ~ 0,30)	3	XP3035 XC3025
M	Stainless Steel (Wet) (SUS304-SUS420)	~250HB	120 (80 ~ 180)	0,12 (0,08 ~ 0,25)	3	XP2040
K	Cast Iron (FC250)	~300N/mm <sup>2</sup>	180 (100 ~ 350)	0,20 (0,15 ~ 0,35)	4	XC1015
	Ductile Cast Iron (FCD400)	~600N/mm <sup>2</sup>	180 (100 ~ 270)	0,20 (0,10 ~ 0,30)	3	XC1015
H	Pre-hardened Steel (NAK80)	40~43HRC	100 (60 ~ 150)	0,12 (0,08 ~ 0,20)	1,5	XP2040
	Steel for Die Casting (DAC55-DH31)	43~48HRC	80 (40 ~ 120)	0,10 (0,05 ~ 0,15)	0,5	XP2040
	Hardened Steel (SKD11)	50~60HRC	60 (40 ~ 90)	0,08 (0,05 ~ 0,15)	0,5	XP2040

## PAO BORE

45° Face milling

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)	Grade
P	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	180 (100 ~ 250)	0,25 (0,20 ~ 0,50)	2	XP3035
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	180 (100 ~ 250)	0,25 (0,20 ~ 0,50)	2	XP3035
	Die Steel (SKD11-SKD61)	~280HB	150 (80 ~ 200)	0,25 (0,15 ~ 0,40)	2	XP3035
M	Stainless Steel (Wet) (SUS304-SUS420)	~250HB	120 (80 ~ 180)	0,20 (0,15 ~ 0,40)	2	XP2040
K	Cast Iron (FC250)	~300N/mm <sup>2</sup>	200 (100 ~ 350)	0,30 (0,20 ~ 0,50)	2	XC1015 XP1020
	Ductile Cast Iron (FCD400)	~600N/mm <sup>2</sup>	180 (100 ~ 270)	0,28 (0,15 ~ 0,40)	2	XC1015 XP1020
S	Heat Resistant Alloys (Inconel 718)	-	35 (25 ~ 60)	0,12 (0,05 ~ 0,2)	1	XC5040
	Titanium Alloy (Ti-Al-4V)	-	40 (30 ~ 120)	0,15 (0,1 ~ 0,25)	1,5	XC5040
H	Pre-hardened Steel (NAK80)	40~43HRC	100 (60 ~ 150)	0,15 (0,10 ~ 0,25)	1,5	XP2040
	Steel for Die Casting (DAC55-DH31)	43~48HRC	80 (40 ~ 120)	0,12 (0,05 ~ 0,20)	0,5	XP2040
	Hardened Steel (SKD11)	50~55HRC	60 (40 ~ 90)	0,10 (0,05 ~ 0,20)	0,5	XP2040

Milling | Indexables

Cutting conditions

# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PSTW BORE

90° shoulder cutter

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Insert size			
				TN*U09...		TN*U12...	
				Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)
<b>P</b>	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	180 (100~250)	0,12 (0,05~0,2)	2	0,15 (0,05~0,25)	3
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	180 (100~250)	0,12 (0,05~0,2)	2	0,15 (0,05~0,25)	3
	Die Steel (SKD11-SKD61)	~280HB	150 (80~200)	0,1 (0,05~0,18)	2	0,12 (0,05~0,2)	3
<b>M</b>	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	150 (80~200)	0,08 (0,05~0,16)	1,5	0,1 (0,05~0,18)	2
	Stainless Steel (Wet) (SUS304,SUS420)	~250HB	80 (60~120)	0,08 (0,05~0,16)	1,5	0,1 (0,05~0,18)	2
<b>K</b>	Cast Iron (FC250)	~350N/mm <sup>2</sup>	200 (100~350)	0,15 (0,05~0,25)	2	0,2 (0,1~0,3)	3
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	180 (100~270)	0,12 (0,05~0,2)	2	0,15 (0,05~0,25)	3
<b>N</b>	Aluminium Alloy	~13%Si	300 (200~1.500)	0,12 (0,08~0,25)	2	0,15 (0,1~0,3)	3
<b>S</b>	Superalloy (Wet) (Inconel®718)	-	35 (25~60)	0,06 (0,04~0,1)	0,8	0,08 (0,05~0,15)	1
	Titanium Alloy (Ti-Al-4V)	-	40 (30~120)	0,06 (0,04~0,1)	1	0,08 (0,05~0,15)	1,5
<b>H</b>	Pre-hardened Steel (NAK80)	40~43HRC	100 (50~150)	0,08 (0,06~0,15)	1	0,1 (0,08~0,2)	1,5
	Steel for Die Casting (DAC55-DH31)	43~48HRC	80 (40~120)	0,06 (0,05~0,13)	0,8	0,08 (0,06~0,15)	1
	Hardened Steel (SKD11)	50~55HRC	60 (40~90)	0,05 (0,04~0,08)	0,4	0,06 (0,05~0,1)	0,5

## PSF

4 corner shoulder cutter

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)	Grade
<b>P</b>	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	180 (100~250)	0,12 (0,05~0,2)	3	XP3035 XP2040
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	180 (100~250)	0,12 (0,05~0,2)	3	XP3035 XP2040
	Die Steel (SKD11-SKD61)	~280HB	150 (80~200)	0,1 (0,05~0,18)	3	XP3035 XP2040
<b>M</b>	Stainless Steel (coolant) (SUS304-SUS420)	~250HB	80 (60~120)	0,1 (0,05~0,18)	2	XP2040
	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	150 (80~200)	0,1 (0,05~0,18)	2	XC5035
<b>K</b>	Cast Iron (FC250)	~350N/mm <sup>2</sup>	180 (100~350)	0,12 (0,05~0,2)	3	XC1015
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	180 (100~270)	0,12 (0,05~0,2)	3	XC1015
<b>N</b>	Alluminium Alloy	~13%Si	300 (200~1.500)	0,15 (0,1~0,25)	3	CK010
<b>S</b>	Heat Resistant Alloy (Wet) (Inconel 718)	-	35 (25~60)	0,1 (0,05~0,15)	1,5	XC5040
	Titanium Alloy (Wet) (Ti-6Al-4V)	-	40 (30~120)	0,1 (0,05~0,18)	1,5	XC5040
<b>H</b>	Pre-hardened Steel (NAK80)	40~43HRC	90 (40~150)	0,1 (0,08~0,2)	1,5	XP2040
	Steel for Die Casting (DAC55-DH31)	43~48HRC	70 (40~120)	0,08 (0,06~0,15)	0,5	XP2040
	Hardened Steel (SKD11)	50~55HRC	50 (40~90)	0,06 (0,05~0,1)	0,5	XP2040



# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PSEL

90° shoulder cutter

	Work Material	Tensile Strength / Hardness	Insert Size				Grade
			ZD-T11...		ZDKT15...		
			Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)	Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)	
P	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	160 (100~200)	0,25 (0,2~0,4)	160 (100~200)	0,3 (0,2~0,4)	XP3035
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	150 (100~200)	0,2 (0,15~0,3)	150 (100~200)	0,25 (0,15~0,3)	XP3035
	Die Steel (SKD11-SKD61)	~280HB	130 (80~180)	0,2 (0,15~0,3)	130 (80~180)	0,25 (0,15~0,3)	XP3035
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	150 (100~200)	0,12 (0,1~0,3)	150 (100~200)	0,15 (0,1~0,3)	XC5035
	Stainless Steel (Coolant) (SUS304-SUS420)	~250HB	80 (60~120)	0,12 (0,1~0,3)	80 (60~120)	0,15 (0,1~0,3)	XP2040
K	Cast Iron (FC250)	~350N/mm <sup>2</sup>	160 (100~300)	0,2 (0,2~0,35)	160 (100~300)	0,25 (0,2~0,35)	XC1015
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	160 (100~250)	0,15 (0,2~0,3)	160 (100~250)	0,2 (0,2~0,3)	XC1015
N	Aluminium Alloys	~13%Si	300 (200~1.000)	0,25 (0,1~0,4)	300 (200~1.000)	0,3 (0,1~0,4)	CK010
S	Heat Resistant Alloys (Wet) (Inconel 718)	–	35 (25~60)	0,15 (0,1~0,3)	35 (25~60)	0,18 (0,1~0,3)	XC5040
	Titanium Alloy (Wet) (Ti-6Al-4V)	–	40 (30~120)	0,15 (0,1~0,3)	40 (30~120)	0,18 (0,1~0,3)	XC5040
H	Pre-hardened Steel (NAK80)	40~43HRC	100 (40~150)	0,15 (0,1~0,3)	100 (40~150)	0,18 (0,1~0,3)	XP6015
	Steel for Die Casting (DAC55-DH31)	43~48HRC	60 (40~120)	0,12 (0,05~0,2)	60 (40~120)	0,15 (0,05~0,2)	XP6015

## PSE

90° shoulder cutter

	Work Material	Tensile Strength / Hardness	Insert Size								Grade
			ZD-T11...				ZDKT15...				
			ap:10mm ae:0,2D		ap:3mm ae:1,0D		ap:14mm ae:0,2D		ap:5mm ae:1,0D		
Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)	Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)	Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)	Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)				
P	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	180 (100~250)	0,25 (0,2~0,5)	180 (100~250)	0,12 (0,05~0,2)	180 (100~250)	0,3 (0,2~0,6)	180 (100~250)	0,15 (0,05~0,25)	XP3035
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	180 (100~250)	0,2 (0,15~0,4)	180 (100~250)	0,11 (0,05~0,2)	180 (100~250)	0,25 (0,15~0,5)	180 (100~250)	0,12 (0,05~0,2)	XP3035
	Die Steel (SKD11-SKD61)	~280HB	150 (80~200)	0,2 (0,15~0,4)	150 (80~200)	0,1 (0,05~0,18)	150 (80~200)	0,25 (0,15~0,5)	150 (80~200)	0,12 (0,05~0,2)	XP3035
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	150 (80~200)	0,18 (0,15~0,4)	150 (80~200)	0,1 (0,05~0,18)	150 (80~200)	0,2 (0,15~0,45)	150 (80~200)	0,12 (0,05~0,2)	XC5035
	Stainless Steel (Coolant) (SUS304-SUS420)	~250HB	80 (60~120)	0,18 (0,15~0,4)	80 (60~120)	0,1 (0,05~0,18)	80 (60~120)	0,2 (0,15~0,45)	80 (60~120)	0,12 (0,05~0,2)	XP2040
K	Cast Iron (FC250)	~350N/mm <sup>2</sup>	180 (100~300)	0,25 (0,15~0,5)	180 (100~300)	0,12 (0,05~0,2)	180 (100~300)	0,3 (0,2~0,6)	180 (100~300)	0,15 (0,05~0,25)	XC1015
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	180 (100~250)	0,15 (0,1~0,4)	180 (100~250)	0,12 (0,05~0,2)	180 (100~250)	0,2 (0,15~0,5)	180 (100~250)	0,15 (0,05~0,25)	XC1015
N	Aluminium Alloys	~13%Si	300 (200~1.500)	0,3 (0,2~0,5)	300 (200~1.500)	0,15 (0,1~0,25)	300 (200~1.500)	0,35 (0,2~0,6)	300 (200~1.500)	0,18 (0,1~0,3)	CK010
S	Heat Resistant Alloys (Wet) (Inconel 718)	–	35 (25~60)	0,15 (0,1~0,3)	35 (25~60)	0,1 (0,05~0,15)	35 (25~60)	0,2 (0,1~0,3)	35 (25~60)	0,12 (0,05~0,15)	XC5040
	Titanium Alloy (Wet) (Ti-6Al-4V)	–	40 (30~120)	0,18 (0,1~0,35)	40 (30~120)	0,1 (0,08~0,25)	40 (30~120)	0,22 (0,1~0,35)	40 (30~120)	0,12 (0,08~0,25)	XC5040
H	Pre-hardened Steel (NAK80)	40~43HRC	100 (40~150)	0,18 (0,1~0,3)	90 (40~150)	0,1 (0,08~0,2)	100 (40~150)	0,22 (0,1~0,35)	90 (40~150)	0,12 (0,08~0,25)	XP6015
	Steel for Die Casting (DAC55-DH31)	43~48HRC	80 (40~120)	0,12 (0,08~0,2)	70 (40~120)	0,08 (0,06~0,15)	80 (40~120)	0,15 (0,08~0,25)	70 (40~120)	0,1 (0,06~0,2)	XP6015
	Hardened Steel (SKD11)	50~55HRC	60 (40~90)	0,1 (0,05~0,2)	50 (40~90)	0,06 (0,05~0,1)	60 (40~90)	0,12 (0,05~0,2)	50 (40~90)	0,08 (0,05~0,12)	XP6015

Milling | Indexables

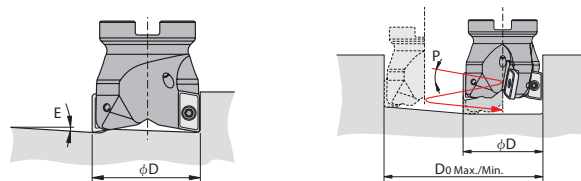
Cutting conditions

# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## Maximum ramping (E) & Helical angle (P)

Insert Size	ZD-T11...				ZDKT15...			
	Ramping Angle E°	Helical Milling (mm)		Helical Angle P°	Ramping Angle E°	Helical Milling (mm)		Helical Angle P°
		D Min.	D Max.			D Min.	D Max.	
16	10,8	18	29	9,8	-	-	-	-
17	9,8	22	31	7,0	-	-	-	-
18	9,8	22	33	7,0	-	-	-	-
20	9,8	30	37	7,0	-	-	-	-
21	8,5	32	39	4,5	-	-	-	-
22	7,5	34	41	4,5	-	-	-	-
25	7,5	40	47	4,5	9,5	37	48	7,5
26	6,8	42	49	4,2	8,3	38	50	6,0
28	6,3	46	53	3,9	8,3	39	54	5,6
30	5,5	50	57	3,4	7,4	43	58	5,3
32	4,8	53	61	3,2	6,8	47	62	5,0
33	4,5	56	63	3,0	6,3	49	64	4,2
35	3,2	60	67	2,5	5,9	53	68	3,8
40	2,9	72	77	2,2	5,1	63	78	3,2
50	2,2	93	98	1,7	2,5	86	98	2,5
63	1,8	118	123	1,5	2,5	111	124	1,5
80	1,4	152	157	1,0	2,0	147	158	1,3
100	-	-	-	-	1,5	190	198	1,1
125	-	-	-	-	0,9	240	248	0,9



# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PSFL

90° shoulder cutter

	Work Material	Tensile Strength / Hardness	Insert Size			
			SD-T09...		SD-T12...	
			Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)	Milling Speed Vc (m/min)	Feed per Tooth fz (mm/t)
<b>P</b>	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	160 (100~200)	0,25 (0,2~0,4)	160 (100~200)	0,3 (0,2~0,4)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	150 (100~200)	0,2 (0,15~0,3)	150 (100~200)	0,25 (0,15~0,3)
	Die Steel (SKD11-SKD61)	~280HB	130 (80~180)	0,2 (0,15~0,3)	130 (80~180)	0,25 (0,15~0,3)
<b>M</b>	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	150 (100~200)	0,12 (0,1~0,3)	150 (100~200)	0,15 (0,1~0,3)
	Stainless Steel (Coolant) (SUS304-SUS420)	~250HB	80 (60~120)	0,12 (0,1~0,3)	80 (60~120)	0,15 (0,1~0,3)
<b>K</b>	Cast Iron (FC250)	~350N/mm <sup>2</sup>	160 (100~300)	0,2 (0,2~0,35)	160 (100~300)	0,25 (0,2~0,4)
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	160 (100~250)	0,2 (0,15~0,3)	160 (100~250)	0,2 (0,15~0,35)
<b>N</b>	Aluminium Alloys	~13%Si	300 (200~1.000)	0,25 (0,1~0,4)	300 (200~1.000)	0,3 (0,1~0,4)
<b>S</b>	Heat Resistant Alloys (Wet) (Inconel 718)	–	35 (25~60)	0,15 (0,08~0,3)	35 (25~60)	0,18 (0,1~0,3)
	Titanium Alloy (Wet) (Ti-6Al-4V)	–	40 (30~120)	0,15 (0,08~0,3)	40 (30~120)	0,18 (0,1~0,3)
<b>H</b>	Pre-hardened Steel (NAK80)	40~43HRC	100 (40~150)	0,15 (0,08~0,3)	100 (40~150)	0,18 (0,1~0,3)
	Steel for Die Casting (DAC55-DH31)	43~48HRC	60 (40~120)	0,12 (0,05~0,2)	60 (40~120)	0,15 (0,05~0,2)

## Ratio cutting depth

Depth of cut ap (mm)	Maximum width of Cut ae (mm)	Ratio to adjust cutting speed vp	Ratio to adjust feed rate fp
~0,2D	1D	0,8	0,5
0,2~0,3D	0,7D	0,8	0,6
0,4~0,5D	0,5D	0,9	0,7
0,6~0,7D	0,3D	0,9	0,8
0,8~1D	0,2D	1	0,9
1,1~1,5D	0,1D	1	1



# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

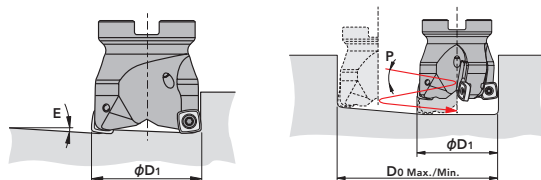
## PHC

High feed radius cutter

	Work Material	Tensile Strength / Hardness	Vc (m/min)	Insert Size												Grade
				SDMT07...			SDMT09...			SXMT12...						
				ap (mm)			ap (mm)			ap (mm)						
			Feed per Tooth fz (mm/t)	L/D=2	L/D=3	L/D=4	Feed per Tooth fz (mm/t)	L/D=2	L/D=3	L/D=4	Feed per Tooth fz (mm/t)	L/D=2	L/D=3	L/D=4		
P	Mild Steel-Carbon Steel (S5400-S10C)	~180HB	180 (60~250)	0,7 (0,3~1,5)	0,8	0,6	0,4	0,8 (0,3~1,8)	1	0,8	0,5	1,25 (0,5~3,2)	1,2	1,2	1	XP3035
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	180 (60~250)	0,7 (0,3~1,3)	0,8	0,6	0,4	0,8 (0,3~1,5)	1	0,8	0,5	1,25 (0,5~3)	1,2	1,2	1	XP3035
	Die Steel (SKD11-SKD61)	~280HB	180 (60~250)	0,7 (0,3~1,3)	0,6	0,5	0,3	0,8 (0,3~1,5)	0,8	0,6	0,4	1,25 (0,5~3)	1,2	1,2	1	XP3035
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	160 (80~200)	0,4 (0,3~1,2)	0,6	0,5	0,3	0,5 (0,3~1,5)	0,8	0,6	0,4	1 (0,5~2,5)	1,2	1	1	XC5035
	Stainless Steel (Coolant) (SUS304-SUS420)	~250HB	120 (60~180)	0,4 (0,3~1,2)	0,6	0,5	0,3	0,5 (0,3~1,5)	0,8	0,6	0,4	1 (0,5~2,5)	1,2	1	1	XP2040
K	Cast Iron (FC250)	~350N/mm <sup>2</sup>	200 (100~300)	0,8 (0,4~1,5)	0,8	0,6	0,4	1 (0,5~1,8)	1	0,8	0,5	1,5 (0,5~3,5)	1,5	1,5	1	XC1015
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	180 (100~250)	0,7 (0,3~1,3)	0,8	0,6	0,4	0,9 (0,5~1,5)	1	0,8	0,5	1,35 (0,5~3)	1,2	1,2	0,9	XC1015
S	Heat Resistant Alloys (Wet) (Inconel 718)	-	30 (25~60)	0,3 (0,2~0,7)	0,4	0,4	0,3	0,4 (0,2~0,8)	0,5	0,5	0,4	0,5 (0,2~1)	1	1	0,8	XC5040
	Titanium Alloy (Wet) (Ti-6Al-4V)	-	80 (50~120)	0,4 (0,3~0,8)	0,4	0,4	0,3	0,5 (0,3~1)	0,5	0,5	0,3	0,7 (0,3~1,2)	0,8	0,8	0,4	XC5040
H	Pre-hardened Steel (NAK80)	40~43HRC	120 (40~150)	0,4 (0,2~0,8)	0,4	0,4	0,3	0,5 (0,2~1)	0,5	0,5	0,3	0,8 (0,3~1,5)	1	1	0,5	XP2040
	Steel for Die Casting (DAC55-DH31)	43~48HRC	90 (40~120)	0,3 (0,2~0,6)	0,4	0,4	0,3	0,4 (0,2~0,8)	0,5	0,5	0,3	0,7 (0,3~1,2)	0,7	0,7	0,5	XP2040
	Hardened Steel (SKD11)	50~55HRC	60 (40~90)	0,2 (0,2~0,5)	0,3	0,3	0,2	0,3 (0,2~0,7)	0,3	0,3	0,2	0,5 (0,3~0,8)	0,5	0,5	0,4	XP2040

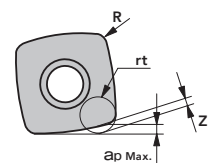
## Maximum Ramping Angle (E)

Insert Size	SPMT07...			SDMT09...			SXMT12...					
	Ramping Angle E°	Helical Milling(mm)		Helical Angle P°	Ramping Angle E°	Helical Milling(mm)		Helical Angle P°	Ramping Angle E°	Helical Milling(mm)		Helical Angle P°
		D Min.	D Max.			D Min.	D Max.			D Min.	D Max.	
16	5,9	22	31	4,5	-	-	-	-	-	-	-	-
17	4,9	24	33	3,6	-	-	-	-	-	-	-	-
18	4,2	26	35	3,1	-	-	-	-	-	-	-	-
20	3,2	30	39	2,3	-	-	-	-	-	-	-	-
21	2,8	32	41	2,0	-	-	-	-	-	-	-	-
22	2,6	34	43	1,8	-	-	-	-	-	-	-	-
25	2,0	40	49	1,3	3,6	35	48	3,1	-	-	-	-
26	1,8	42	51	1,1	3,1	37	50	2,6	-	-	-	-
28	1,6	46	55	1,0	2,6	41	54	2,1	-	-	-	-
30	1,4	50	59	0,8	2,2	45	58	1,9	7,9	40	58	6,5
32	1,3	54	63	0,7	2,0	49	62	1,7	7,2	44	62	6,1
33	1,2	56	65	0,6	1,8	51	64	1,5	6,4	46	64	4,4
35	1,1	60	69	0,5	1,6	55	68	1,4	4,4	50	68	3,7
40	-	-	-	-	1,2	65	78	1,0	2,9	60	78	2,5
50	-	-	-	-	0,9	85	98	0,8	1,5	80	98	1,3
63	-	-	-	-	0,8	111	124	0,7	1,1	106	124	0,9
80	-	-	-	-	-	-	-	-	1,3	140	158	1,1
100	-	-	-	-	-	-	-	-	0,7	180	198	0,6



### Flute shape dimensions (for programming)

Insert size	R	ap max	R rt	Z
SPMT07...	0,5	0,8	1,2	0,35
SDMT09...	0,8	1	2	0,7
SXMT12...	1	2	3	1,15



For machining purposes: create machining programs for the recommended simulated R. Unit: mm

Milling | Indexables

Cutting conditions

# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

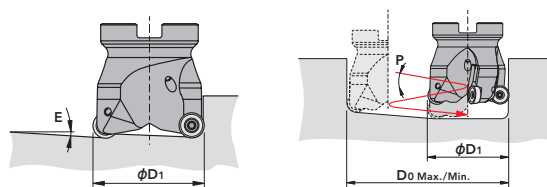
## PRC

Radius cutter

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Insert size						Grade
				RPH.10...		RPH.12...		RPH.16...		
				Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)	Depth of Cut ap (mm)	
<b>P</b>	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	200 (100 ~ 300)	0,25 (0,1 ~ 0,35)	2	0,3 (0,1 ~ 0,4)	2,4	0,35 (0,1 ~ 0,5)	3,2	XP3035
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	180 (100 ~ 250)	0,2 (0,1 ~ 0,3)	2	0,25 (0,1 ~ 0,35)	2,4	0,3 (0,1 ~ 0,45)	3,2	XP3035
	Die Steel (SKD11-SKD61)	~280HB	150 (80 ~ 200)	0,2 (0,1 ~ 0,3)	2	0,25 (0,1 ~ 0,35)	2,4	0,3 (0,1 ~ 0,45)	3,2	XP3035
<b>M</b>	Stainless Steel (DRY) (SUS304-SUS420)	~250HB	160 (80 ~ 200)	0,25 (0,1 ~ 0,35)	2	0,3 (0,1 ~ 0,4)	2,4	0,35 (0,1 ~ 0,5)	3,2	XC5035
	Stainless Steel (WET) (SUS304-SUS420)	~250HB	120 (60 ~ 180)	0,25 (0,1 ~ 0,35)	2	0,3 (0,1 ~ 0,4)	2,4	0,35 (0,1 ~ 0,5)	3,2	XP2040
<b>K</b>	Cast Iron (FC250)	~350N/mm <sup>2</sup>	220 (100 ~ 350)	0,25 (0,05 ~ 0,4)	2	0,3 (0,1 ~ 0,5)	2,4	0,35 (0,1 ~ 0,6)	3,2	XC1015
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	150 (100 ~ 220)	0,2 (0,1 ~ 0,3)	2	0,25 (0,1 ~ 0,35)	2,4	0,3 (0,1 ~ 0,45)	3,2	XC1015
<b>N</b>	Aluminium Alloys	~13%Si	600 (300 ~ 1.500)	0,4 (0,2 ~ 0,8)	2	0,6 (0,2 ~ 1)	2,4	0,8 (0,3 ~ 1,5)	3,2	CK010
<b>S</b>	Heat Resistant Alloys (Inconel 718)	-	40 (25 ~ 60)	0,15 (0,05 ~ 0,25)	2	0,2 (0,05 ~ 0,3)	2,4	0,25 (0,05 ~ 0,4)	3,2	XC5040
	Titanium Alloy (Ti-6Al-4V)	-	80 (50 ~ 120)	0,2 (0,1 ~ 0,3)	2	0,25 (0,1 ~ 0,35)	2,4	0,3 (0,1 ~ 0,45)	3,2	XC5040
<b>H</b>	Pre-hardened Steel (NAK80)	40~43HRC	120 (40 ~ 150)	0,15 (0,05 ~ 0,25)	1,5	0,2 (0,05 ~ 0,3)	1,5	0,25 (0,05 ~ 0,4)	1,5	XP6015
	Steel for Die Casting (DAC55-DH31)	43~48HRC	80 (40 ~ 120)	0,15 (0,05 ~ 0,25)	1	0,2 (0,05 ~ 0,3)	1	0,25 (0,05 ~ 0,4)	1	XP6015
	Hardened Steel (SKD11)	50~55HRC	60 (30 ~ 90)	0,15 (0,05 ~ 0,25)	0,5	0,2 (0,05 ~ 0,3)	0,5	0,25 (0,05 ~ 0,4)	0,5	XP6015

## Maximum Ramping Angle (E)

Insert Size	RPH*10...				RPH*12...				RPH*16...				
	D	Ramping Angle E°	Helical Milling(mm)		Ramping Angle E°	Helical Milling(mm)		Helical Angle p°	Ramping Angle E°	Helical Milling(mm)		Helical Angle p°	
			D Min.	D Max.		D Min.	D Max.			D Min.	D Max.		
	20	1,3	26	30	1,3	-	-	-	-	-	-	-	
	24	-	-	-	6,0	30	36	2,2	-	-	-	-	
	25	2,0	37	40	1,8	-	-	-	-	-	-	-	
	30	2,5	46	50	1,6	5,3	42	48	1,9	-	-	-	
	32	3,0	50	54	1,5	4,0	46	52	1,7	7,0	39	48	2,1
	40	-	-	-	-	2,8	62	68	1,4	4,8	55	64	1,8
	50	-	-	-	-	2,6	81	88	1,1	4,0	75	84	1,5
	63	-	-	-	-	1,9	107	114	0,9	2,8	101	110	1,1
	80	-	-	-	-	1,3	142	148	0,7	2,0	135	144	0,9
	100	-	-	-	-	1,0	181	188	0,5	1,5	175	184	0,7



Milling | Indexables

Cutting conditions



# CUTTING CONDITIONS

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## PMD

### Side Milling - Slot Milling

For horizontal milling, calculate by per tooth.

	Work Material	Tensile Strength / Hardness	Side Milling ap: 10mm ae:0,2D		Slot Milling ap: 3mm ae:1,0D	
			Cutting Speed Vc (m/min)	Feed per tooth fz (mm/t)	Cutting Speed Vc (m/min)	Feed per tooth fz (mm/t)
P	Mild Steel-Carbon Steel (S5400-S10C)	~180HB	180 (100~250)	0,25 (0,2~0,5)	180 (100~250)	0,12(0,05~0,2)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	180 (100~250)	0,2(0,15~0,4)	180 (100~250)	0,11(0,05~0,2)
	Die Steel (SKD11-SKD61)	~280HB	150 (80~200)	0,2(0,15~0,4)	150 (80~200)	0,1(0,05~0,18)
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	150 (80~200)	0,18(0,15~0,4)	150 (80~200)	0,1(0,05~0,18)
	Stainless Steel (Wet) (SUS304,SUS420)	~250HB	80 (60~120)	0,18(0,15~0,4)	80 (60~120)	0,1(0,05~0,18)
K	Cast Iron (FC250)	~350N/mm <sup>2</sup>	180 (100~300)	0,25(0,15~0,5)	180 (100~300)	0,12(0,05~0,2)
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	180 (100~250)	0,15(0,1~0,4)	180 (100~250)	0,12(0,05~0,2)
N	Aluminium Alloy	~13%Si	300 (200~1.500)	0,3(0,2~0,5)	300 (200~1.500)	0,15(0,1~0,25)
S	Superalloy (Wet) (Inconel®718)	-	35 (25~60)	0,15 (0,1~0,3)	35 (25~60)	0,1(0,05~0,15)
	Titanium Alloy (Wet) (Ti-6Al-4V)	-	40 (30~120)	0,18(0,1~0,35)	40 (30~120)	0,1(0,08~0,25)
H	Pre-hardened Steel (NAK80)	40~43HRC	100 (40~150)	0,18(0,1~0,3)	90 (40~150)	0,1(0,08~0,2)
	Steel for Die Casting (DAC-MAGIC, DH31)	43~48HRC	80 (40~120)	0,12(0,08~0,2)	70 (40~120)	0,08(0,06~0,15)
	Hardened Steel (SKD11)	50~55HRC	60 (40~90)	0,1(0,05~0,2)	50 (40~90)	0,06(0,05~0,1)

## Drilling

For both counterboring and plunge milling

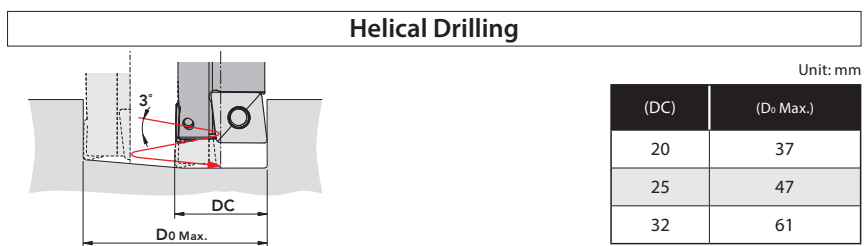
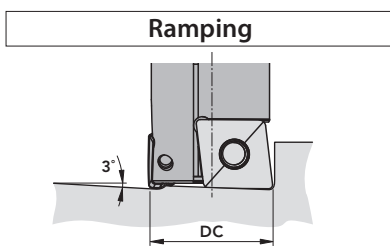
	Work Material	Tensile Strength / Hardness	Cutting Speed Vc (m/min)	Feed Rate f (mm/rev)		
				Ø20	Ø25	Ø32
P	Mild Steel-Carbon Steel (S5400-S10C)	~180HB	160(100~200)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	150(100~200)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Die Steel (SKD11-SKD61)	~280HB	120(80~180)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	130(80~180)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
K	Cast Iron (FC250)	~350N/mm <sup>2</sup>	200(150~180)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	160(100~220)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
N	Aluminium Alloy	~13%Si	200(100~800)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
S	Superalloy (Wet) (Inconel®718)	-	50(30~60)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Titanium Alloy (Wet) (Ti-6Al-4V)	-	60(30~100)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
H	Pre-hardened Steel (NAK80)	40~43HRC	100(60~120)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Steel for Die Casting (DAC-MAGIC, DH31)	43~48HRC	80(40~100)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)
	Hardened Steel (SKD11)	50~55HRC	60(40~80)	0,07(0,05~0,08)	0,08(0,06~0,1)	0,1(0,08~0,12)

\* Above recommended speed is for short shank type.

For long shank type, use the following cutting condition: cutting speed = 80% of the above settings.

1. The indicated speeds and feeds are for milling with water-soluble coolant.
2. The above cutting conditions are to be used as general guidelines. Adjustments may be necessary depending on actual cutting condition.
3. Inserts should be attached to the holder tightly in a very neat condition.
4. Fasten the work material to reduce the possibility of work deformation, deflection of machined surface, or vibration.

Set the maximum processing angle during ramping and helical drilling operations to less than 3°



Unit: mm

(DC)	(D <sub>0</sub> Max.)
20	37
25	47
32	61

# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PDR

High feed radius cutter

	Work Material	Tensile strength / Hardness	Milling Speed Vc (m/min)	PDR SS/MT/CN		Feed per Tooth fz (mm)	PDR BORE					
				Feed per Tooth fz (mm)	Depth of Cut ap (mm)		Feed per Tooth fz (mm)	Depth of Cut ap (mm)				
					120			170	100	200	300	400
P	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	180 (90~220)	0,7(0,3~1)	3	2	0,6(0,3~1)	3	3	2	2	
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	180 (90~220)	0,7(0,3~1)	3	2	0,6(0,3~1)	3	3	2	2	
	Die Steel (SKD11-SKD61)	~280HB	150 (90~180)	0,6(0,3~1)	3	2	0,5(0,3~1)	3	2	2	2	
K	Cast Iron (FC250)	~350N/mm <sup>2</sup>	180 (100~250)	0,8(0,3~1,5)	3	2	0,7(0,3~1,5)	3	3	2	2	
	Ductile Cast Iron (FCD400)	~800N/mm <sup>2</sup>	150 (100~250)	0,7(0,3~1,2)	3	2	0,6(0,3~1,2)	3	3	2	2	

## PFB-SP, PFB-SH, PFB-Q

Finishing ball nose cutter

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)			
					D			
					Ø 6,8	Ø 10,12	Ø 16,20	Ø 25-30-32
P	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	300 (200~ 400)	0,02 D	0,1	0,12	0,14	0,18
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	300 (200~ 400)	0,02 D	0,07	0,1	0,12	0,14
	Die Steel (SKD11-SKD61)	~280HB	250 (150 ~ 350)	0,02 D	0,07	0,1	0,12	0,14
M	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	250 (150 ~ 350)	0,02 D	0,07	0,12	0,14	0,17
K	Cast Iron (FC250)	~300N/mm <sup>2</sup>	400 (300~ 500)	0,02 D	0,12	0,14	0,18	0,22
	Ductile Cast Iron (FCD400)	~600N/mm <sup>2</sup>	300 (200~ 400)	0,02 D	0,1	0,12	0,14	0,18
N	Aluminium Alloy	~13% Si	500 (400~ 600)	0,03 D	0,12	0,14	0,18	0,22
	Copper Alloy (C1100)	-	300 (200 ~ 400)	0,03 D	0,11	0,13	0,17	0,22
S	Heat Resistant Alloys (Wet) (Inconel 718)	-	50 (25~ 80)	0,015 D	0,04	0,05	0,06	0,06
	Titanium Alloy (Wet) (Ti-Al-4V)	-	90 (40~120)	0,02 D	0,06	0,08	0,11	0,13
H	Pre-hardened Steel (NAK80, STAVAX)	40~43HRC	200 (100~ 300)	0,015 D	0,06	0,07	0,08	0,1
	Steel for Die Casting (DAC55-DH31)	43~48HRC	180 (90 ~ 200)	0,015 D	0,05	0,06	0,07	0,07
	Hardened Steel (SKD11)	50~60HRC	150 (100 ~ 250)	0,01 D	0,05	0,06	0,07	0,07

## PFB-D

Finishing ball nose cutter

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)			
					D			
					Ø 6,8	Ø 10,12	Ø 16,20	Ø 25-30-32
N	Graphite	-	500 (400~ 600)	0,03 D	0,14	0,17	0,21	0,25
	CFRP Carbon Fiber Reinforced Plastic	-	300 (300 ~ 500)	0,03 D	0,11	0,13	0,17	0,20

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Cutting conditions

# CUTTING CONDITIONS

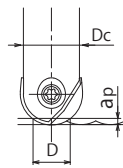
Milling | Indexables | Cutting conditions

## PFB

Chart of cutting depth and actual cutting diameter

Depth of cut		Actual cutting diameter														
D	R	0,1	0,2	0,3	0,4	0,5	0,8	1	1,5	2	2,5	3	3,5	4	4,5	5
6	3	1,5	2,2	2,6	3	3,3	4,1	-	-	-	-	-	-	-	-	-
7	3,5	1,6	2,3	2,8	3,3	3,6	4,5	-	-	-	-	-	-	-	-	-
8	4	1,8	2,5	3	3,5	3,9	4,8	-	-	-	-	-	-	-	-	-
10	5	2	2,8	3,4	3,9	4,4	5,4	6	7,1	-	-	-	-	-	-	-
12	6	2,2	3,1	3,7	4,3	4,8	6	6,6	7,9	8,9	-	-	-	-	-	-
16	8	2,5	3,6	4,3	5	5,6	7	7,7	9,3	10,6	11,6	-	-	-	-	-
20	10	2,8	4	4,9	5,6	6,2	7,8	8,7	10,5	12	13,2	14,3	15,2	-	-	-
25	12,5	3,2	4,5	5,4	6,3	7	8,8	9,8	11,9	13,6	15	16,2	17,3	18,3	-	-
30	15	3,5	4,9	6	6,9	7,7	9,7	10,8	13,1	15	16,6	18	19,3	20,4	21,4	22,4
32	16	3,6	5	6,2	7,1	7,9	10	11,1	13,5	15,5	17,2	18,7	20	21,2	22,2	23,2

How to determine actual cutting diameter D



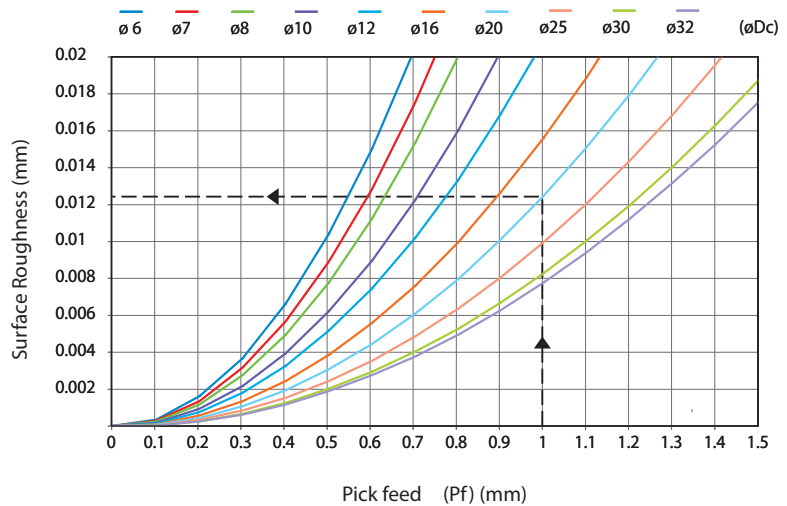
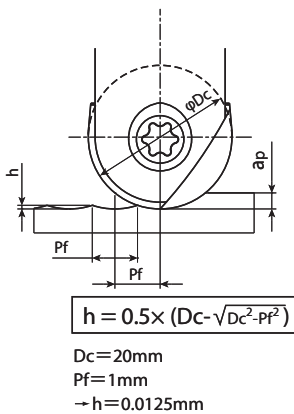
$$D = 2 \sqrt{ap \times (Dc - ap)}$$

### Recommended pick feed and milling surface roughness

Unit: mm

D	6	7	8	10	12	16	20	25	30	32
Pf	0,4	0,45	0,5	0,6	0,7	0,8	1	1,2	1,3	1,4
h	0,007	0,007	0,008	0,009	0,01	0,01	0,012	0,014	0,014	0,015

### Theoretical milling surface roughness



# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PFR-ST, PFR-SH

Standard conditions

	Work Material	Tensile Strength / Hardness	Cutting Speed Vc (m/min)			Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)			
			L/D				D			
			2,5D	5D	8D		Ø 6,7	Ø 8~11	Ø 12~17	Ø 20~32
<b>P</b>	Mild Steel-Carbon Steel S5400 - S10C	~180HB	200 (150~250)	80%	60%	0,05Dc	0,12	0,2	0,22	0,25
	Carbon Steel-Alloy Steel S50C - SCM440	~280HB	180 (150~250)	80%	60%	0,05Dc	0,15	0,18	0,22	0,25
	Die Steel SKD11 - SKD61	~280HB	150 (120~200)	80%	60%	0,05Dc	0,1	0,15	0,18	0,2
<b>M</b>	Stainless Steel (SUS304 - SUS420)	~250HB	150 (100~200)	80%	60%	0,03Dc	0,08	0,12	0,15	0,18
<b>K</b>	Cast Iron FC250	~300N/mm <sup>2</sup>	200 (150~250)	80%	60%	0,05Dc	0,15	0,2	0,25	0,3
	Ductile Cast Iron FCD400	~600N/mm <sup>2</sup>	150 (100~200)	80%	60%	0,05Dc	0,12	0,15	0,2	0,25
<b>N</b>	Aluminium Alloy	~13%Si	300 (200~400)	80%	60%	0,05Dc	0,2	0,25	0,3	0,35
<b>S</b>	Superalloy (Wet) (Inconel 718)	-	30 (20~40)	80%	60%	0,02Dc	0,04	0,05	0,08	0,12
	Titanium Alloy (Wet) (Ti-Al-4V)	-	50 (40~60)	80%	60%	0,02Dc	0,05	0,08	0,1	0,15
<b>H</b>	Pre-hardened Steel (NAK80, STAVAX)	40 ~ 43HRC	120 (100~150)	80%	60%	0,03Dc	0,08	0,1	0,12	0,18
	Die Cast Steel (DAC55, DH31)	43 ~ 48HRC	80 (50~100)	80%	60%	0,025Dc	0,05	0,08	0,1	0,15
	Hardened Steel (SKD11)	50 ~ 60HRC	60 (40~80)	80%	60%	0,02Dc	0,04	0,05	0,08	0,1

## PFR-D

Standard conditions

	Work Material	Cutting Speed Vc (m/min)			Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)			
		L/D				D			
		2,5D	5D	8D		Ø 6,7	Ø 8~11	Ø 12~17	Ø 20~32
<b>N</b>	Graphite	250 (150~350)	80%	60%	0,1Dc	0,25	0,4	0,5	0,5
	CFRP Carbon Fiber Reinforced Plastic	200 (150~250)	80%	60%	0,5Dc	0,05	0,1	0,15	0,2



# CUTTING CONDITIONS

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## PFR - High speed finishing conditions

Steel shank

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)			
					D			
					Ø 6~8	Ø 10~13	Ø 16~21	Ø 25~32
P	Mild Steel-Carbon Steel SS400 - S10C	~180HB	450	0,02Dc	0,1	0,12	0,14	0,18
	Carbon Steel-Alloy Steel S50C - SCM440	~280HB	450	0,02Dc	0,07	0,1	0,12	0,14
	Die Steel SKD11 - SKD61	~280HB	375	0,02Dc	0,07	0,1	0,12	0,14
M	Stainless Steel (SUS304 - SUS420)	~250HB	375	0,02Dc	0,07	0,12	0,14	0,17
K	Cast Iron FC250	~300N/mm <sup>2</sup>	600	0,02Dc	0,12	0,14	0,18	0,22
	Ductile Cast Iron FCD400	~600N/mm <sup>2</sup>	450	0,02Dc	0,1	0,12	0,14	0,18
N	Aluminium Alloy	~13%Si	750	0,03Dc	0,12	0,14	0,18	0,22
S	Superalloy (Wet) (Inconel 718)	-	70	0,015Dc	0,04	0,05	0,06	0,06
	Titanium Alloy (Wet) (Ti-Al-4V)	-	120	0,02Dc	0,06	0,08	0,11	0,13
H	Pre-hardened Steel (NAK80, STAVAX)	40 ~ 43HRC	300	0,015Dc	0,06	0,07	0,08	0,1
	Die Cast Steel (DAC55, DH31)	43 ~ 48HRC	270	0,015Dc	0,05	0,06	0,07	0,07
	Hardened Steel (SKD11)	50 ~ 60HRC	220	0,01Dc	0,05	0,06	0,07	0,07

## PFR - High speed finishing conditions

Carbide shank short type

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)			
					D			
					Ø 6~8	Ø 10~13	Ø 16~21	Ø 25~32
P	Mild Steel-Carbon Steel SS400 - S10C	~180HB	540	0,02Dc	0,1	0,12	0,14	0,18
	Carbon Steel-Alloy Steel S50C - SCM440	~280HB	540	0,02Dc	0,07	0,1	0,12	0,14
	Die Steel SKD11 - SKD61	~280HB	450	0,02Dc	0,07	0,1	0,12	0,14
M	Stainless Steel (SUS304 - SUS420)	~250HB	450	0,02Dc	0,07	0,12	0,14	0,17
K	Cast Iron FC250	~300N/mm <sup>2</sup>	720	0,02Dc	0,12	0,14	0,18	0,22
	Ductile Cast Iron FCD400	~600N/mm <sup>2</sup>	540	0,02Dc	0,1	0,12	0,14	0,18
N	Aluminium Alloy	~13%Si	600	0,03Dc	0,12	0,14	0,18	0,22
S	Superalloy (Wet) (Inconel 718)	-	80	0,015Dc	0,04	0,05	0,06	0,06
	Titanium Alloy (Wet) (Ti-Al-4V)	-	150	0,02Dc	0,06	0,08	0,11	0,13
H	Pre-hardened Steel (NAK80, STAVAX)	40 ~ 43HRC	340	0,015Dc	0,06	0,07	0,08	0,1
	Die Cast Steel (DAC55, DH31)	43 ~ 48HRC	290	0,015Dc	0,05	0,06	0,07	0,07
	Hardened Steel (SKD11)	50 ~ 60HRC	260	0,01Dc	0,05	0,06	0,07	0,07



# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PFR - High speed finishing conditions

Carbide shank long type

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)			
					D			
					Ø 6~8	Ø 10~13	Ø 16~21	Ø 25~32
P	Mild Steel-Carbon Steel SS400 - S10C	~180HB	480	0,02Dc	0,1	0,12	0,14	0,18
	Carbon Steel-Alloy Steel S50C - SCM440	~280HB	480	0,02Dc	0,07	0,1	0,12	0,14
	Die Steel SKD11 - SKD61	~280HB	400	0,02Dc	0,07	0,1	0,12	0,14
M	Stainless Steel (SUS304 - SUS420)	~250HB	400	0,02Dc	0,07	0,12	0,14	0,17
K	Cast Iron FC250	~300N/mm <sup>2</sup>	640	0,02Dc	0,12	0,14	0,18	0,22
	Ductile Cast Iron FCD400	~600N/mm <sup>2</sup>	480	0,02Dc	0,1	0,12	0,14	0,18
N	Aluminium Alloy	~13%Si	800	0,03Dc	0,12	0,14	0,18	0,22
S	Superalloy (Wet) (Inconel 718)	-	80	0,015Dc	0,04	0,05	0,06	0,06
	Titanium Alloy (Wet) (Ti-Al-4V)	-	144	0,02Dc	0,06	0,08	0,11	0,13
H	Pre-hardened Steel (NAK80, STAVAX)	40 ~ 43HRC	320	0,015Dc	0,06	0,07	0,08	0,1
	Die Cast Steel (DAC55, DH31)	43 ~ 48HRC	288	0,015Dc	0,05	0,06	0,07	0,07
	Hardened Steel (SKD11)	50 ~ 60HRC	240	0,01Dc	0,05	0,06	0,07	0,07

## PFR - High speed finishing conditions

Carbide shank extra long type

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Depth of Cut ap (mm)	Feed per Tooth fz (mm/t)			
					D			
					Ø 6~8	Ø 10~13	Ø 16~21	Ø 25~32
P	Mild Steel-Carbon Steel SS400 - S10C	~180HB	360	0,02Dc	0,1	0,12	0,14	0,18
	Carbon Steel-Alloy Steel S50C - SCM440	~280HB	360	0,02Dc	0,07	0,1	0,12	0,14
	Die Steel SKD11 - SKD61	~280HB	300	0,02Dc	0,07	0,1	0,12	0,14
M	Stainless Steel (SUS304 - SUS420)	~250HB	300	0,02Dc	0,07	0,12	0,14	0,17
K	Cast Iron FC250	~300N/mm <sup>2</sup>	480	0,02Dc	0,12	0,14	0,18	0,22
	Ductile Cast Iron FCD400	~600N/mm <sup>2</sup>	360	0,02Dc	0,1	0,12	0,14	0,18
N	Aluminium Alloy	~13%Si	600	0,03Dc	0,12	0,14	0,18	0,22
S	Superalloy (Wet) (Inconel 718)	-	60	0,015Dc	0,04	0,05	0,06	0,06
	Titanium Alloy (Wet) (Ti-Al-4V)	-	110	0,02Dc	0,06	0,08	0,11	0,13
H	Pre-hardened Steel (NAK80, STAVAX)	40 ~ 43HRC	240	0,015Dc	0,06	0,07	0,08	0,1
	Die Cast Steel (DAC55, DH31)	43 ~ 48HRC	220	0,015Dc	0,05	0,06	0,07	0,07
	Hardened Steel (SKD11)	50 ~ 60HRC	180	0,01Dc	0,05	0,06	0,07	0,07

Milling | Indexables



Cutting conditions

# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PFB-BR

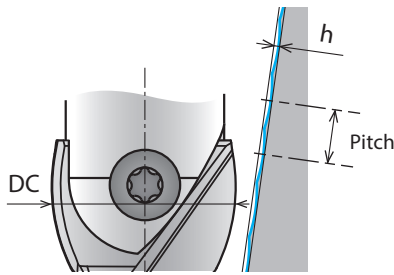
Barrel Type Tool

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Depth of Cut ap (mm)	fz (mm/t)		
					DC		
					Ø 10,12	Ø 16,20	Ø 25-32
<b>P</b>	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	300 (200~400)	0,2 D	0,12	0,14	0,18
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	300 (200~400)	0,2 D	0,1	0,12	0,14
	Die Steel (SKD11-SKD61)	~280HB	250 (150~350)	0,2 D	0,1	0,12	0,14
<b>M</b>	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	250 (150~350)	0,2 D	0,12	0,14	0,17
<b>K</b>	Cast Iron (FC250)	~300N/mm <sup>2</sup>	400 (300~500)	0,2 D	0,14	0,18	0,22
	Ductile Cast Iron (FCD400)	~600N/mm <sup>2</sup>	300 (200~400)	0,2 D	0,12	0,14	0,18
<b>S</b>	Heat Resistant Alloys (Wet) (Inconel 718)	-	50 (25~80)	0,15 D	0,05	0,06	0,06
	Titanium Alloy (Wet) (Ti-Al-4V)	-	90 (40~120)	0,2 D	0,08	0,11	0,13
<b>H</b>	Pre-hardened Steel (NAK80, STAVAX)	40~43HRC	200 (100~300)	0,15 D	0,07	0,08	0,1
	Steel for Die Casting (DAC55-DH31)	43~48HRC	180 (90~200)	0,15 D	0,06	0,07	0,07
	Hardened Steel (SKD11)	50~60HRC	150 (100~250)	0,1 D	0,06	0,07	0,07

The above cutting conditions are to be used as general guidelines. Adjustments may be necessary depending on actual cutting conditions.

### Theoretical Cusp Height

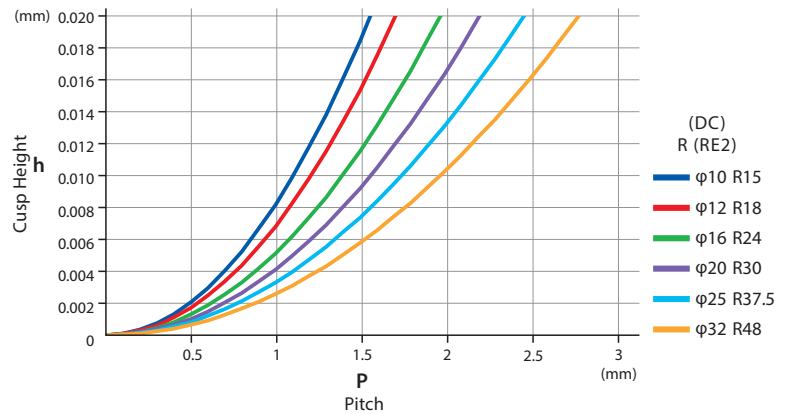
(PFB-BR) Barrel Type Tool



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

h: Cusp height  
P: Pitch  
RE2: peripheral edge R

Cusp Height and Pitch



# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PFB-LZ

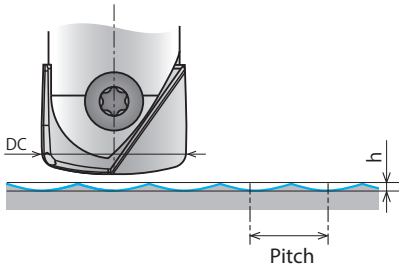
Lens Type Tool

	Work Material	Tensile Strength / Hardness	Milling Speed Vc (m/min)	Depth of Cut ap (mm)	fz (mm/t)		
					DC		
					Ø 10,12	Ø 16,20	Ø 25-32
<b>P</b>	Mild Steel-Carbon Steel (SS400-S10C)	~180HB	300 (200~800)	0,2 D	0,12	0,14	0,18
	Carbon Steel-Alloy Steel (S50C-SCM440)	~280HB	300 (200~800)	0,2 D	0,1	0,12	0,14
	Die Steel (SKD11-SKD61)	~280HB	250 (150~600)	0,2 D	0,1	0,12	0,14
<b>M</b>	Stainless Steel (Dry) (SUS304-SUS420)	~250HB	250 (150~650)	0,2 D	0,12	0,14	0,17
<b>K</b>	Cast Iron (FC250)	~300N/mm <sup>2</sup>	400 (300~800)	0,2 D	0,14	0,18	0,22
	Ductile Cast Iron (FCD400)	~600N/mm <sup>2</sup>	300 (200~800)	0,2 D	0,12	0,14	0,18
<b>S</b>	Heat Resistant Alloys (Wet) (Inconel 718)	-	50 (25~80)	0,15 D	0,05	0,06	0,06
	Titanium Alloy (Wet) (Ti-Al-4V)	-	90 (40~120)	0,2 D	0,08	0,11	0,13
<b>H</b>	Pre-hardened Steel (NAK80, STAVAX)	40~43HRC	200 (100~350)	0,15 D	0,07	0,08	0,1
	Steel for Die Casting (DAC55-DH31)	43~48HRC	180 (90~350)	0,15 D	0,06	0,07	0,07
	Hardened Steel (SKD11)	50~60HRC	150 (100~300)	0,1 D	0,06	0,07	0,07

The above cutting conditions are to be used as general guidelines. Adjustments may be necessary depending on actual cutting conditions.

### Theoretical Cusp Height

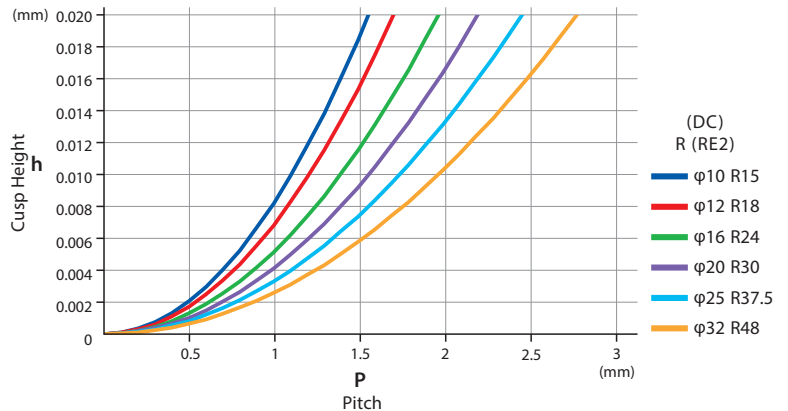
(PFB-LZ) Lens Type Tool



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

h: Cusp height  
P: Pitch  
RE2: peripheral edge R

Cusp Height and Pitch





# CUTTING CONDITIONS

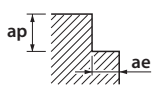
Milling | Indexables | Cutting conditions

## PXNL / PXNH

Side milling L/D ≤ 3,5

Ø	Cast iron FC250		Carbon steel		Alloy steel		Stainless steel Hardened steel		Stainless steel SUS304	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	2.860	720	3.820	840	3.180	520	2.860	350	2.550	280
12	2.390	600	3.180	700	2.650	440	2.390	290	2.120	230
16	1.790	620	2.390	720	1.990	450	1.790	300	1.590	240
20	1.430	660	1.910	760	1.590	480	1.430	310	1.270	250
25	890	450	1.270	560	1.020	340	890	220	760	170

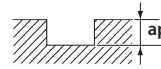
Max cutting depth	ap	ae	
	0,5 D	0,3 D	

## PXNL / PXNH

Slotting L/D ≤ 3,5

Ø	Cast iron FC250		Carbon steel		Alloy steel		Stainless steel Hardened steel		Stainless steel SUS304	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	2.230	360	3.180	450	2.550	270	2.230	170	1.910	130
12	1.860	300	2.650	370	2.120	220	1.860	140	1.590	110
16	1.390	320	1.990	400	1.590	240	1.390	150	1.190	120
20	1.110	360	1.590	450	1.270	270	1.110	170	950	130
25	760	280	1.150	370	890	210	760	130	640	100

Max cutting depth	ap	
	0,5 D	



# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PXVC

Side milling L/D≤5

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304 · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	4.780	1.150	3.820	920	3.190	770	2.550	620
12	3.980	960	3.190	770	2.660	640	2.130	520
14	3.420	830	2.730	660	2.280	550	1.820	440
16	2.990	720	2.390	580	1.990	480	1.600	390
18	2.660	640	2.130	520	1.770	430	1.420	350
20	2.390	580	1.910	460	1.600	390	1.280	310
22	2.180	530	1.740	420	1.450	350	1.160	280
25	1.910	460	1.530	370	1.280	310	1.020	250
32-5F	1.500	380	1.200	240	1.000	250	800	160
32-8F	1.500	480	1.200	390	1.000	320	800	260
Max cutting depth	ap    ae				ap    ae		ap    ae	
	0,5 D    0,2 D				0,5 D    0,1 D		0,5 D    0,05 D	

## PXVC

Side milling 5<L/D≤6

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304 · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	4.300	1.040	3.510	850	2.870	690	2.230	540
12	3.590	870	2.920	710	2.390	580	1.860	450
14	3.070	740	2.510	610	2.050	500	1.600	390
16	2.690	650	2.190	530	1.800	440	1.400	340
18	2.390	580	1.950	470	1.600	390	1.240	300
20	2.150	520	1.760	430	1.440	350	1.120	270
22	1.960	480	1.600	390	1.310	320	1.020	250
25	1.720	420	1.410	340	1.150	280	900	220
32	Maximum length of L/D=5 in combination with the standard shank							
Max cutting depth	ap    ae				ap    ae		ap    ae	
	0,5 D    0,2 D				0,5 D    0,1 D		0,5 D    0,05 D	

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. Please adjust the cutting condition when the overhang length is longer.  
 4. Please consider the overhang length as the total length of replaceable head and overhang length of shank holder.

## PXVC

Side milling 6<L/D≤7

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304 · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	3.820	920	3.190	770	2.550	620	1.910	460
12	3.190	770	2.660	640	2.130	520	1.600	390
14	2.730	660	2.280	550	1.820	440	1.370	330
16	2.390	580	1.990	480	1.600	390	1.200	290
18	2.130	520	1.770	430	1.420	350	1.070	260
20	1.910	460	1.600	390	1.280	310	960	240
22	1.740	420	1.450	350	1.160	280	870	210
25	1.530	370	1.280	310	1.020	250	770	190
32	Maximum length of L/D=5 in combination with the standard shank							
Max cutting depth	ap    ae				ap    ae		ap    ae	
	0,5 D    0,2 D				0,5 D    0,1 D		0,5 D    0,05 D	

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. Please adjust the cutting condition when the overhang length is longer.  
 4. Please consider the overhang length as the total length of replaceable head and overhang length of shank holder.

Milling | Indexables

Cutting conditions

# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PXVC

Slotting L/D ≤ 5

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304 · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	4.780	960	3.820	770	3.180	640	2.390	480
12	3.980	800	3.180	640	2.650	530	1.990	400
14	3.410	680	2.730	550	2.270	450	1.710	340
16	2.980	600	2.390	480	1.990	400	1.490	300
18	2.650	530	2.120	420	1.770	350	1.330	270
20	2.390	480	1.910	380	1.590	320	1.190	240
22	2.170	430	1.740	350	1.450	290	1.090	220
25	1.910	380	1.530	310	1.270	250	950	190
32	Not recommended (due to the large number of flutes)							
Max cutting depth	ap ≤ 0,5 D		ap ≤ 0,4 D		ap ≤ 0,3 D		ap ≤ 0,3 D	

## PXVC

Slotting 5 < L/D ≤ 6

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304 · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	3.820	770	3.190	640	2.550	510	2.070	420
12	3.190	640	2.660	540	2.130	430	1.730	350
14	2.730	550	2.280	460	1.820	370	1.480	300
16	2.390	480	1.990	400	1.600	320	1.300	260
18	2.130	430	1.770	360	1.420	290	1.150	230
20	1.910	390	1.600	320	1.280	260	1.040	210
22	1.740	350	1.450	290	1.160	240	950	190
25	1.530	310	1.280	260	1.020	210	830	170
32	Maximum length of L/D=5 in combination with the standard shank							
Max cutting depth	ap ≤ 0,5 D		ap ≤ 0,4 D		ap ≤ 0,3 D		ap ≤ 0,3 D	
<ol style="list-style-type: none"> <li>1. Use a rigid and precise machine and holder.</li> <li>2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used</li> <li>3. Please adjust the cutting condition when the overhang length is longer.</li> <li>4. Please consider the overhang length as the total length of replaceable head and overhang length of shank holder.</li> </ol>								

## PXVC

Slotting 6 < L/D ≤ 7

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304 · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	3.190	640	2.550	510	2.230	450	1.910	390
12	2.660	540	2.130	430	1.860	380	1.600	320
14	2.280	460	1.820	370	1.600	320	1.370	280
16	1.990	400	1.600	320	1.400	280	1.200	240
18	1.770	360	1.420	290	1.240	250	1.070	220
20	1.600	320	1.280	260	1.120	230	960	200
22	1.450	290	1.160	240	1.020	210	870	180
25	1.280	260	1.020	210	900	180	770	160
32	Maximum length of L/D=5 in combination with the standard shank							
Max cutting depth	ap ≤ 0,3 D		ap ≤ 0,3 D		ap ≤ 0,25 D		ap ≤ 0,2 D	
<ol style="list-style-type: none"> <li>1. Use a rigid and precise machine and holder.</li> <li>2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used</li> <li>3. Please adjust the cutting condition when the overhang length is longer.</li> <li>4. Please consider the overhang length as the total length of replaceable head and overhang length of shank holder.</li> </ol>								



# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PXSE

Side milling L/D ≤ 3,5

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304 · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC		Heat steel Inconel	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	3.810	920	3.190	770	2.070	500	2.070	420	800	130
12	3.180	760	2.650	640	1.700	400	1.700	350	650	100
16	2.390	570	1.950	470	1.250	300	1.250	250	500	80
20	1.910	460	1.550	370	1.000	250	1.000	200	400	65
25	1.530	370	1.240	300	800	200	800	160	320	50
Max cutting depth	ap    ae				ap    ae		ap    ae		ap    ae	
	0,5 D    0,15 D				0,5 D    0,1 D		0,5 D    0,05 D		0,5 D    0,05 D	

## PXSE

Slotting L/D ≤ 3,5

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304 · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC		Heat steel Inconel	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	3.030	610	3.030	610	1.600	320	1.600	260	800	130
12	2.500	500	1.550	300	1.300	250	1.300	250	650	100
16	1.850	350	1.150	250	1.000	200	1.000	200	500	80
20	1.500	300	950	200	750	160	750	160	400	65
25	1.200	240	760	160	600	130	600	130	320	50
Max cutting depth	ap				ap		ap		ap	
	≤ 0,35 D				≤ 0,3 D		≤ 0,2 D		0,1 D	

## PXSM

Side milling L/D ≤ 3,5

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304 · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC		Heat steel Inconel	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	5.730	2.070	4.780	1.440	3.820	1.150	3.190	960	1.910	420
12	4.780	1.730	3.980	1.200	3.190	960	2.660	800	1.600	350
16-6F	3.590	1.300	2.990	900	2.390	720	1.990	600	1.200	260
16-8F	3.590	1.730	2.990	1.200	2.390	960	1.990	800	1.200	350
20	2.870	1.730	2.390	1.200	1.910	960	1.600	800	960	350
25	2.300	1.380	1.910	960	1.530	770	1.280	640	770	280
Max cutting depth	ap    ae				ap    ae		ap    ae		ap    ae	
	≤ 0,5 D    ≤ 0,05 D				≤ 0,5 D    ≤ 0,02 D		≤ 0,3 D    ≤ 0,02 D			

# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PXRE

Corner radius type  $L/D \leq 3,5$

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Hardened steel Prehardened steel SKD · NAK80 · HPM50 (38~45 HRC)		Hardened steel 45~55 HRC		Hardened steel 55~60 HRC	
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)
10	6.370	12.800	4.800	7.800	3.900	6.000	3.300	4.100	2.800	2.700
12	5.800	10.600	4.000	6.500	3.200	4.900	2.700	3.300	2.300	2.200
16	4.000	11.900	3.000	7.700	2.400	5.900	2.000	3.900	1.700	2.700
20	3.200	9.550	2.400	6.500	1.900	4.900	1.600	3.300	1.400	2.200
Max cutting depth					ap				ap	
					0,1 x R				0,1 x R	
				ae				ae		
				0,3 D				0,3 D		

## PXDR-P

Corner radius type  $L/D \leq 5$

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304S · SKD ~45 HRC		Hardened steel 45~55 HRC			
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)		
10	4.770	3.580	4.770	2.860	4.770	2.150	4.770	1.430		
12	3.980	2.980	3.980	2.390	3.980	1.790	3.980	1.190		
16	2.980	2.240	2.980	1.790	2.980	1.340	2.980	900		
20	2.390	1.790	2.390	1.430	2.390	1.070	2.390	720		
Max cutting depth					ap				ap	
					0,05 D				0,03 D	
				ae				ae		
				0,25 D				0,25 D		

## PXDR-N

Corner radius type  $L/D \leq 5$

Ø	Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304S · SKD ~45 HRC		Hardened steel SUS304S · SKD 45~55 HRC		Hardened steel 55~60 HRC			
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)		
10	4.770	3.580	3.820	2.290	3.180	1.150	3.180	950		
12	3.980	2.980	3.180	1.910	2.650	950	2.650	800		
16	2.980	2.240	2.390	1.430	1.990	720	1.990	600		
20	2.390	1.790	1.910	1.150	1.590	570	1.590	480		
Max cutting depth					ap				ap	
					0,03 D				0,02 D	
				ae				ae		
				0,25 D				0,2 D		



# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PXBE-P

Ball nose type L/D≤5

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304S · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC									
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)								
10	4.770	2.150	3.820	1.720	3.180	1.430	3.180	950								
12	3.980	1.790	3.180	1.430	2.650	1.190	2.650	800								
16	2.980	1.340	2.390	1.070	1.990	900	1.990	600								
20	2.390	1.070	1.910	860	1.590	720	1.590	480								
Max cutting depth	<table border="1"> <tr> <td>ap</td> <td>Pf</td> </tr> <tr> <td>0,07D</td> <td>0,15 D</td> </tr> </table>				ap	Pf	0,07D	0,15 D	<table border="1"> <tr> <td>ap</td> <td>Pf</td> </tr> <tr> <td>0,04D</td> <td>0,1 D</td> </tr> </table>				ap	Pf	0,04D	0,1 D
	ap	Pf														
0,07D	0,15 D															
ap	Pf															
0,04D	0,1 D															

## PXBE-N

Ball nose type L/D≤3,5

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304S · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC		Hardened steel 55~60 HRC															
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)														
10	7.960	3.580	7.960	3.580	6.370	2.290	4.770	1.430	3.180	480														
12	6.630	2.980	6.630	2.980	5.310	1.910	3.980	1.190	2.650	400														
16	4.970	2.240	4.970	2.240	3.980	1.430	2.980	900	1.990	300														
20	3.980	1.790	3.980	1.790	3.180	1.150	2.390	720	1.590	240														
Max cutting depth	<table border="1"> <tr> <td>ap</td> <td>Pf</td> </tr> <tr> <td>0,05D</td> <td>0,15 D</td> </tr> </table>				ap	Pf	0,05D	0,15 D	<table border="1"> <tr> <td>ap</td> <td>Pf</td> </tr> <tr> <td>0,04D</td> <td>0,1 D</td> </tr> </table>				ap	Pf	0,04D	0,1 D	<table border="1"> <tr> <td>ap</td> <td>Pf</td> </tr> <tr> <td>0,03D</td> <td>0,05 D</td> </tr> </table>				ap	Pf	0,03D	0,05 D
	ap	Pf																						
0,05D	0,15 D																							
ap	Pf																							
0,04D	0,1 D																							
ap	Pf																							
0,03D	0,05 D																							

## PXBM

Ball nose type L/D≤3,5

Ø	Mild steel - Carbon steel Cast iron SS400 · S55C · FC250 ~750 N/mm <sup>2</sup>		Alloy steel Tool steel SCM · SKT · SKS · SKD ~30 HRC		Stainless steel Hardened steel SUS304S · SKD ~45 HRC		Hardened steel Titanium alloy steel (wet) Ti-6Al-4V 45~55 HRC		Hardened steel 55~60 HRC			
	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)		
10	7.960	4.770	7.960	4.770	6.360	3.050	4.770	1.910	3.180	640		
12	6.600	3.900	6.600	3.900	5.300	2.500	3.950	1.500	2.600	550		
16	4.950	4.500	4.950	4.500	3.950	2.900	2.950	1.800	1.900	600		
20	3.950	3.500	3.950	3.500	3.150	2.300	2.350	1.500	1.600	500		
Max cutting depth					<table border="1"> <tr> <td>ap</td> <td>Pf</td> </tr> <tr> <td>0,02 D</td> <td>0,05 D</td> </tr> </table>				ap	Pf	0,02 D	0,05 D
	ap	Pf										
0,02 D	0,05 D											

Milling | Indexables

Cutting conditions

# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PXAL

Side milling  $L/D \leq 3$

Aluminium Alloy Expanding Material A5052 • A7075			
$\emptyset$	S ( $\text{min}^{-1}$ )	F ( $\text{mm}/\text{min}$ )	
10	16.000	4.800	
12	13.300	3.990	
14	11.400	3.420	
16	10.000	3.600	
18	8.900	3.210	
20	8.000	3.840	
22	7.300	3.510	
25	6.400	3.840	
Depth of cut	ap		ae
	0,7 D		0,2 D

## PXAL

Side milling  $3 < L/D \leq 5$

Aluminium Alloy Expanding Material A5052 • A7075			
$\emptyset$	S ( $\text{min}^{-1}$ )	F ( $\text{mm}/\text{min}$ )	
10	9.600	2.310	
12	8.000	1.920	
14	6.900	1.660	
16	6.000	1.730	
18	5.400	1.560	
20	4.800	1.850	
22	4.400	1.690	
25	3.900	1.880	
Depth of cut	ap		ae
	0,7 D		0,08 D

## PXAL

Side milling  $5 < L/D \leq 7$

Aluminium Alloy Expanding Material A5052 • A7075			
$\emptyset$	S ( $\text{min}^{-1}$ )	F ( $\text{mm}/\text{min}$ )	
10	6.400	1.390	
12	5.400	1.170	
14	4.600	1.000	
16	4.000	1.040	
18	3.600	940	
20	3.200	1.110	
22	2.900	1.010	
25	2.600	1.130	
Depth of cut	ap		ae
	0,7 D		0,04 D



# CUTTING CONDITIONS

Milling | Indexables | Cutting conditions

## PXAL

Slot milling L/D ≤ 3

Aluminium Alloy Expanding Material A5052 • A7075			
Ø	S (min <sup>-1</sup> )	F (mm/min)	
10	16.000	4.800	
12	13.300	3.990	
14	11.400	3.420	
16	10.000	3.000	
18	8.900	2.670	
20	8.000	2.400	
22	7.300	2.190	
25	6.400	1.920	
Depth of cut	ap		
	0,5 D		

## PXAL

Slot milling 3 < L/D ≤ 5

Aluminium Alloy Expanding Material A5052 • A7075			
Ø	S (min <sup>-1</sup> )	F (mm/min)	
10	9.600	2.160	
12	8.000	1.800	
14	6.900	1.560	
16	6.000	1.350	
18	5.400	1.220	
20	4.800	1.080	
22	4.400	990	
25	3.900	880	
Depth of cut	ap		
	0,35 D		

## PXAL

Slot milling 5 < L/D ≤ 7

Aluminium Alloy Expanding Material A5052 • A7075			
Ø	S (min <sup>-1</sup> )	F (mm/min)	
10	6.400	960	
12	5.400	810	
14	4.600	690	
16	4.000	600	
18	3.600	540	
20	3.200	480	
22	2.900	440	
25	2.600	390	
Depth of cut	ap		
	0,2 D		

1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the depth of cut is large or when machines with low rigidity are used.
3. Please adjust the cutting condition when the overhang length is longer.
4. Please consider the overhang length as the total length of replaceable head and overhang length of shank holder.
5. When milling copper and copper alloys, lower the rotational speed by 20 to 40%, feed rate by 50 to 80%, and cutting depth by ap 50 to 80% in accordance with the table above.
6. 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.







# TECHNICAL • THREADING

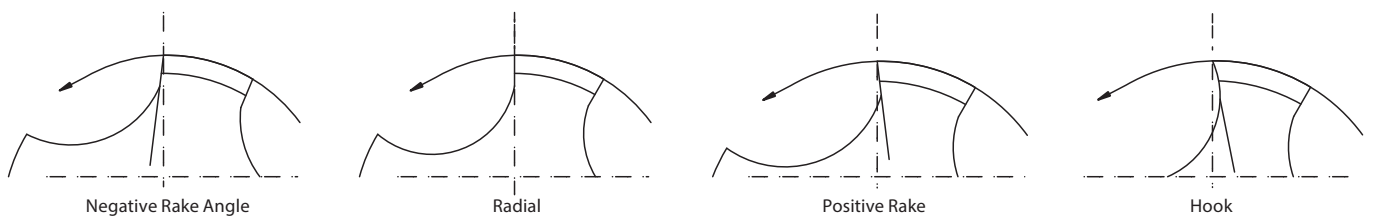
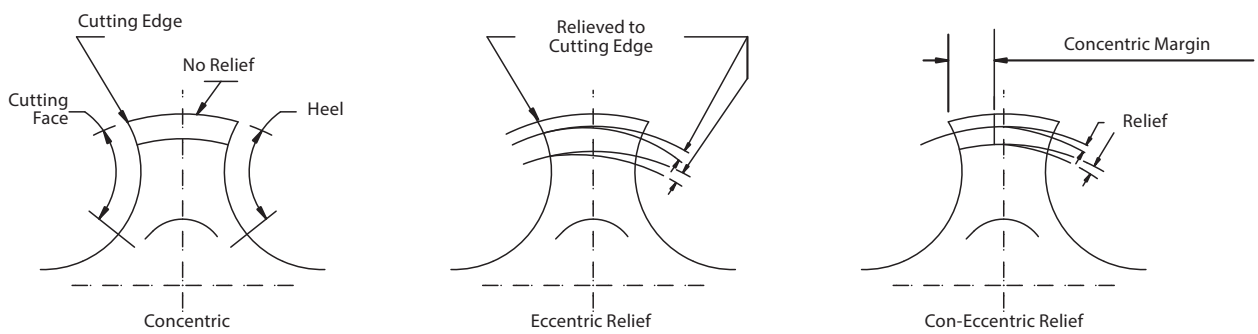
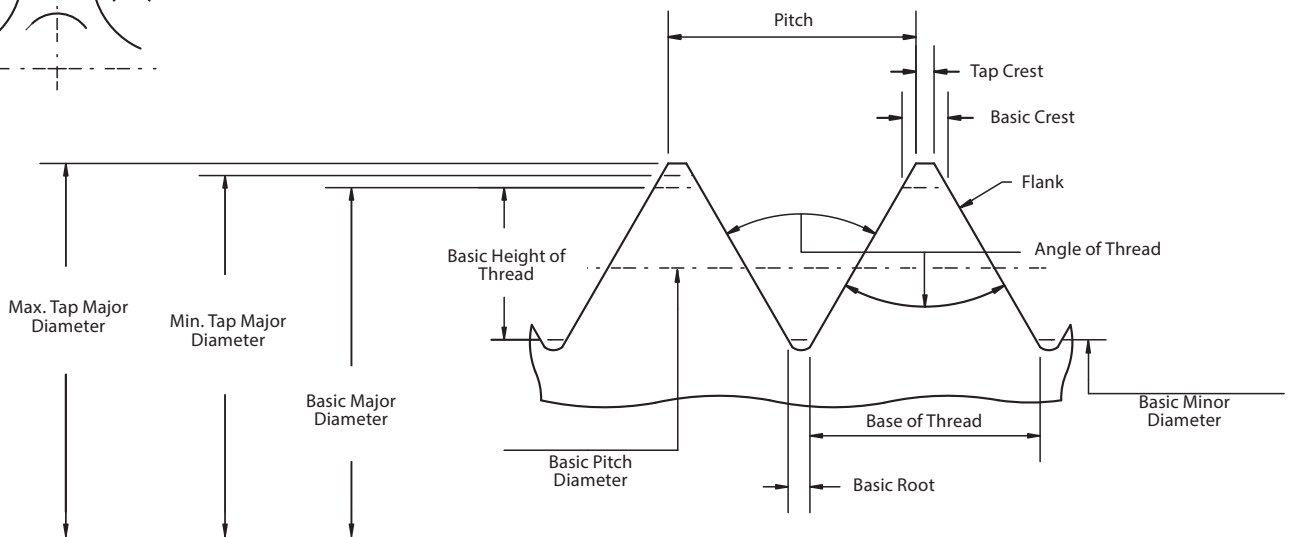
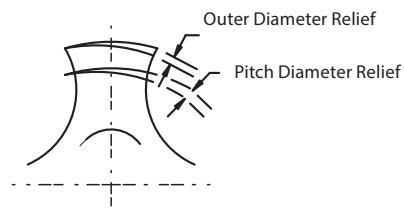
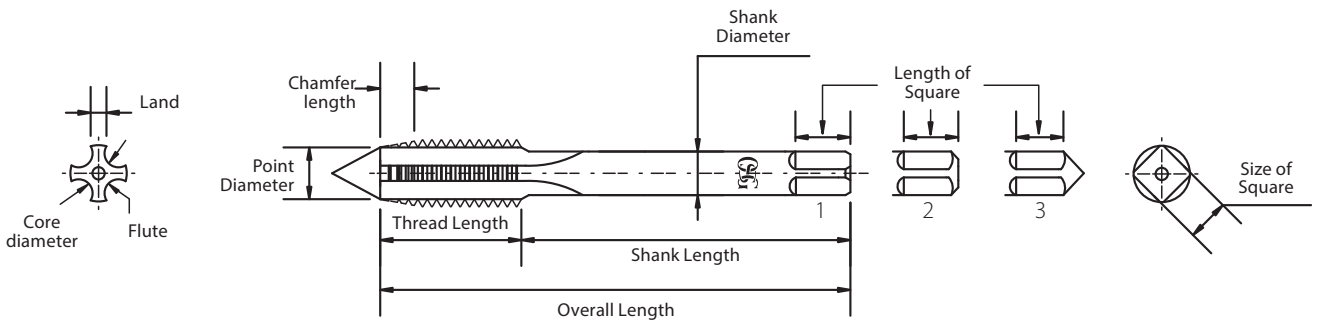
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# AN ILLUSTRATED GUIDE

Technical | Threading

## Illustration of tap terms



Technical | Threading



# NOMENCLATURE

## Technical | Threading

### Tap & Screw thread

**Allowance:** The minimum clearance or maximum interference which is intended between mating parts.

**Angle of Thread:** The angle included between the flanks of a thread measured in an axial plane.

**Back Taper:** A slight taper on the threaded portion of the tap, making the pitch diameter near the shank smaller than that at the chamfer.

**Basic:** The theoretical or nominal standard size from which all variations are made.

**Chamfer:** The tapered and relieved cutting teeth at the front end of the threaded section. Common types of chamfer are taper, 8 to 10 threads long, plug, 3 to 5 threads, semi (or modified) bottom = 2.5 - 3 threads and bottoming, 1-1/2 threads.

**Crest:** The top surface joining the two sides or flanks of a thread.

**Cutting Face:** The leading side of the land.

**Flute:** The longitudinal channels formed on a tap to create cutting edges on the thread profile.

**Heel:** The following side of the land.

**Height of Thread:** In profile, distance between crest and bottom section of thread measured to the axis.

**Hook Face:** A concave cutting face of the land. This may be varied for different materials and conditions.

**Interrupted Thread:** Alternate teeth are removed in the thread helix on a tap having an odd number of flutes.

**Land:** Threaded sections between the flutes of a tap.

**Lead of Thread:** The distance a screw thread advances axially in one turn.

**Major Diameter:** The largest diameter of the screw or nut on a straight screw thread.

**Minor Diameter:** The smallest diameter of the screw or nut on a straight screw thread.

**Neck:** The reduced diameter, on some taps, between the threaded portion and the shank.

**Pitch:** The distance from a point on one thread to a corresponding point on the next thread, measured parallel to the axis.

**Pitch Diameter:** On a straight screw thread, the diameter of an imaginary cylinder where the width of the thread and the width of the space between threads is equal.

**Point Diameter:** The diameter at the leading end of the chamfered portion.

**Radial:** The straight face of a land, the plane of which passes through the axis of the tap.

**Rake:** The angle of the cutting face of the land in relation to an axial plane intersecting the cutting face at the major diameter.

**Relief:** The removal of metal behind the cutting edge to provide clearance between the part being threaded and a portion of the threaded land. Also, see back taper.

- **Chamfer Relief:** The gradual decrease in land height from cutting edge to heel on the chamfered portion of the tap land to provide radial clearance for the cutting edge.

- **Con-eccentric Relief:** Radial relief in the thread form starting back of a concentric margin.

- **Eccentric Thread Relief:** Radial relief in the thread form starting at the cutting edge and continuing to the heel.

**Root:** The bottom surface joining the flanks of two adjacent threads.

**Side or Flank Thread:** The surface of the thread which connects the crest to the root.

**Shank:** The portion of the tap by which it is held.

**Spiral Point:** An oblique cutting edge ground into the lands to provide a shear cutting action on the first few threads.

**Square:** The squared end of the tap shank by which the tap is driven.

**Thread:** The helical formed portion of the tap which produces the pitch in a pre-existing hole.

**Thread Lead Angle:** The angle made by the helix of the thread at the pitch diameter, with a plane perpendicular to the axis.

**Threads per Inch:** The number of threads in one inch of length.

**Thread:**

- **Single:** A thread in which lead is equal to pitch.

- **Double:** A thread in which lead is equal to twice the pitch.

- **Triple:** A thread in which lead is equal to triple the pitch.



# HARDNESS CONVERSION TABLE

Technical | Threading

Approximate conversion value for hardness

Hardness				Traction	
HRA	HRC	HV	HB	Kgf/mm2	N/mm2/Mpa
		120	114	42	410
		125	119	43	420
		130	123	45	440
		135	128	46	450
		140	133	48	470
		145	138	49	480
		150	142	51	500
		155	147	52	510
		160	152	54	530
		165	157	55	540
		170	161	56	550
		175	166	58	570
		180	171	59	580
		185	176	61	600
		190	180	62	610
		195	185	64,5	630
		200	190	66,5	650
		205	195	67,5	660
		210	199	69,5	680
		215	204	70,5	690
		220	209	72,5	710
		225	214	73,5	720
		230	218	75,5	740
		235	223	76,5	750
60,7	20,5	240	228	78,5	770
61,2	21,5	245	233	79,5	780
61,6	22	250	237	81,5	800
62,4	24	260	247	84,5	830
63,1	25,5	270	256	88	860
63,8	27	280	266	91	890
64,5	28,5	290	275	95	930
65,2	30	300	285	98	960
65,8	31	310	294	101	990
66,4	32	320	304	104	1020
67	33,5	330	313	108	1060
67,6	34,5	340	323	111	1090
68,1	35,5	350	332	114	1120
68,7	36,5	360	342	118	1160
69,2	37,5	370	351	121	1190
69,8	39	380	361	124	1220
70,3	40	390	370	129	1260
70,8	41	400	380	132	1290
71,4	42	410	389	136	1330
71,8	42,5	420	399	139	1360
72,3	43,5	430	408	143	1400
72,8	44,5	440	418	146	1430
73,3	45,5	450	427	150	1470
73,6	46	460	432	153	1500
74,1	47	470	442	157	1540
74,5	47,5	480	450	160	1570
74,9	48,5	490	456	164	1610
75,7	49	500	466	168	1650
76,1	50,5	510	475	171	1680
76,4	51	520	483	175	1720
76,7	51,5	530	492	180	1760
77	52,5	540	500	183	1790
77,4	53	550	509	187	1830
77,8	53,5	560	517	191	1870
78	54	570	526	195	1910
78,4	54,5	580	535	198	1940
78,6	55	590	543	202	1980
78,6	55	600	552	206	2020
79,2	56,5	620	569	214	2100
79,8	57,5	640	586	222	2180
80,3	58,5	660			
80,8	59	680			
81,3	60	700			
81,8	61	720			
82,2	62	740			
82,6	62,5	760			
83	63,5	780			
83,4	64	800			
83,8	64,5	820			
84,1	65,5	840			
84,4	66	860			
84,7	66,5	880			
85	67	900			
85,3	67,5	920			
85,6	68	940			

Technical | Threading



# SURFACE TREATMENTS

## Technical | Threading

Generally, a tap properly designed and used under ideal conditions will produce surface results without the use of superficial treatments. However, under certain conditions and types of materials, additional tap life, improvement in finish and better gaging will be noted through the use of surface treatments applied to the finished tap.

The treatments applied can be divided into two groups: those that penetrate the surface, and those that are applied to the external surface itself.

The second group covers a wider range of choices including external treatments such as TiN, TiCN, TiAlN and oxide finishes.

### Steam Oxide:

A black oxidized surface ( $Fe_3O_4$ ) produced on the surface of a finished tap by means of a steam furnace. This oxidized surface is porous and helps retain cutting fluid in the working portion of the tap. The materials on which steam oxide has shown improvement in performance are stainless steels, steel forgings, tool and die steels, hot and cold rolled steels, and high nickel alloys.

### Nitride:

A hard superficial case, approximately 69 HRC, on the surface of a finished tap produced by means of an ion furnace. The advantages of a Nitride surface treatment is the increase in wear resistance due to the higher surface hardness. This surface treatment is very effective in both abrasive and tough materials such as cast iron, plastics and high silicon cast aluminium. Note: Extra caution is needed when selecting a Nitride surface treatment because the increased hardness is not recommended for fast spiral flute taps and taps smaller than machine screw No. 2.

### Titanium Nitride (TiN):

A thin deposit (approx. 0.0001") applied to the surface of a finished tap utilizing PVD coating technology. TiN coating increases the surface hardness and wear resistance. Use of TiN coating on standard tools will help increase tool life in harder materials (up to 32 HRC), such as stainless steels, steel forgings, tool and die steels and hot and cold rolled steels. TiN coating also works very well with water-base cutting fluids.

### Titanium Carbon Nitride (TiCN):

Similar to TiN, TiCN is applied utilizing PVD coating technology. This coating combines high hardness (approx. 2800 vickers) with the anti-seizure properties of Nitride. A lower coefficient of friction helps reduce welding by 75% over TiN coated tools. These features make TiCN especially beneficial in non-ferrous material and hardened steels. OSG's special TiCN coating is incorporated into many of our stocked items.

### Titanium Aluminium Nitride (TiAlN):

TiAlN is applied using PVD coating technology. The addition of aluminium reduces friction and increases the coating oxidation temperature. As a result, TiAlN has increased resistance to heat and oxidation wear. This makes TiAlN better suited for High Speed/High Heat applications. OSG's special TiAlN coating is incorporated into many of our tools.

### Chrome Nitride (CrN):

An extremely high surface lubricity makes CrN the proper selection of coating for non-ferrous materials. Aluminium (6061, 7075, etc.) and copper alloys (bronze, brass, etc.) are notorious for their tendency to adhere to the tool when heat is generated. This coating negates the effects of heat by reducing the amount of friction caused when these materials are being machined, while adding increased hardness.

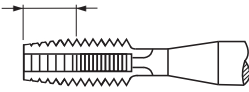
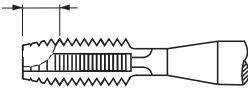
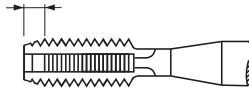
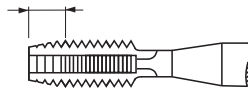
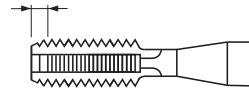
### Diamond:

OSG's patented Ultra-Fine diamond coating is grown on the tools at our laboratories. It is ideal for materials such as graphite, aluminium, and copper alloys. Commonly mistaken for a "Diamond-like" coating because of its shiny and smooth surface, this tool promotes finer surface finishes versus the competition's diamond coating and exponentially more tool life than that of PVD coated tools. Special processes enable high adherence to the tool and prevent it from flaking off. Diamond is not intended to cut steel.







# CHAMFER FORMS

Technical | Threading

FORM A	FORM B	FORM C	FORM D	FORM E
				
<ul style="list-style-type: none"> <li>• Long</li> <li>• 6 - 8 threads</li> <li>• For short through holes</li> <li>• Increases the torque and therefore the possibility danger of breakage</li> </ul>	<ul style="list-style-type: none"> <li>• Medium</li> <li>• 3,5 - 5,5 threads</li> <li>• With spiral point, useful for through holes</li> <li>• For all through holes and deep tapping holes</li> <li>• Efficient in tough and hard materials</li> </ul>	<ul style="list-style-type: none"> <li>• Short</li> <li>• 2 - 3 threads</li> <li>• For blind holes</li> <li>• For aluminium, grey cast iron and brass</li> </ul>	<ul style="list-style-type: none"> <li>• Medium</li> <li>• 3,5 - 5 threads</li> <li>• For through and blind holes with sufficient run-out</li> </ul>	<ul style="list-style-type: none"> <li>• Extremely short</li> <li>• 1,5 - 2 threads</li> <li>• For blind holes with little run-out depth</li> </ul>

Technical | Threading

## Type of taps & features

Type	Features	Application
<b>Spiral Fluted Taps</b> 	<ul style="list-style-type: none"> <li>• Spiral flute</li> <li>• Chips flow out against tapping direction (ejected from holes)</li> <li>• Lower tapping torque and applicable for tapping to the bottom of holes</li> <li>• Good cutting action</li> </ul>	<ul style="list-style-type: none"> <li>• For blind holes</li> <li>• Materials where chips come out continuously in coil shape</li> </ul>
<b>Spiral Pointed Taps</b> 	<ul style="list-style-type: none"> <li>• Spiral point(Chip Drive)</li> <li>• Pushes chips forward with low cutting torque</li> <li>• Shallow and unique flute form provides strong structure</li> <li>• Good cutting action</li> </ul>	<ul style="list-style-type: none"> <li>• For through holes</li> <li>• Materials where chips come out continuously in coil shape</li> <li>• High speed tapping</li> </ul>
<b>Forming Taps</b> 	<ul style="list-style-type: none"> <li>• Taps do not produce chips</li> <li>• Precise uniformity of tapped thread limit</li> <li>• Excellent rigidity</li> </ul>	<ul style="list-style-type: none"> <li>• For both through &amp; blind holes</li> <li>• Materials with Formability</li> </ul>
<b>Straight Fluted Taps Hand Taps</b> 	<ul style="list-style-type: none"> <li>• Straight flute</li> <li>• Strong cutting edges</li> <li>• Applicable for various cutting conditions</li> <li>• Easy to re-grind</li> </ul>	<ul style="list-style-type: none"> <li>• For both through &amp; blind holes (short thread depth only)</li> <li>• Materials where chips come out in powder form</li> <li>• Hard materials</li> </ul>

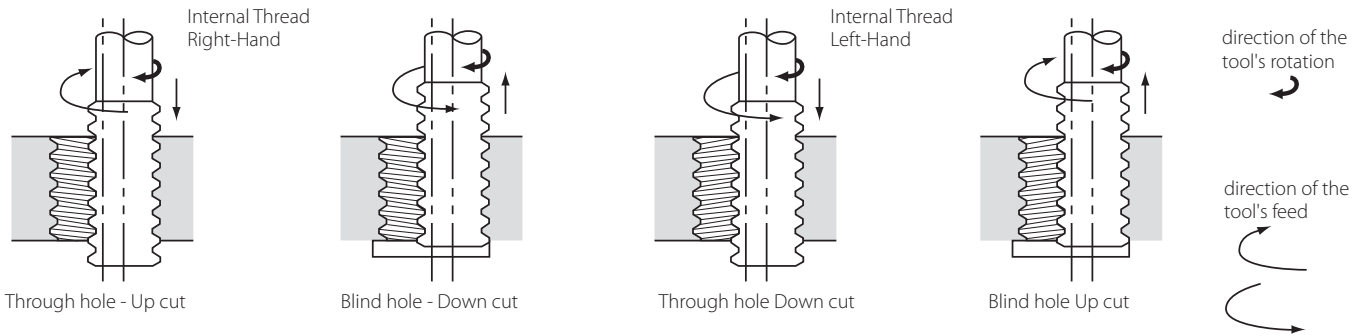


# HOW-TO GUIDE

## Technical | Threading

### By CNC simultaneous three-axis control

OSG's Thread Mills are developed for thread milling on a 3-Axis CNC controlled machine tool. Threads are produced by advancing one pitch feed per revolution in the axial direction, utilizing the planet-like rotation and revolution movements of the tool. Internal/external and right/left hand threads can all be produced with this one tool by simply changing the direction of rotation and/or feed.



### Threading proces

- 1-2 Move to edge (maintain clearance)
- 2-3 Cut with helical milling
- 3-4 Mill the circumference of the circle
- 4-5 Pull away from the edge
- 5-6 Remove tool

The transition between the start and finish of the milling operation must be smooth and the appropriate amount of feed is essential for minimizing milling resistance. There are many different methods for using this tool, but our research has shown that this technique provides the most precise and efficient operation.

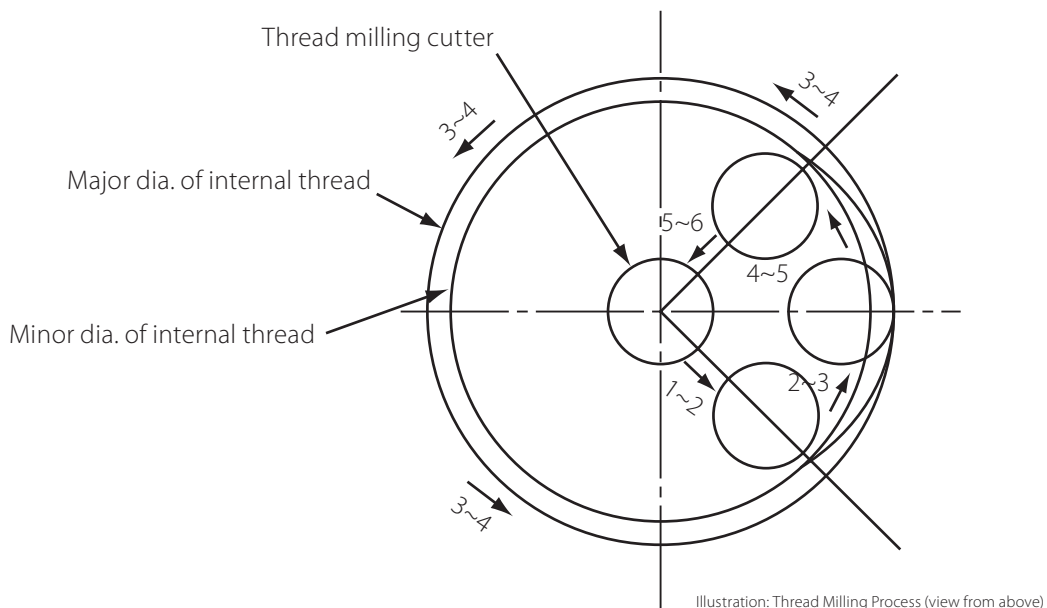


Illustration: Thread Milling Process (view from above)



# TAP DRILL SIZES GUIDE

Technical | Threading

## Recommended drill sizes for cutting taps

### M

According to DIN 13 and DIN-ISO 965-1

Dia	P	
M 1	0,25	0,75
M 1,1	0,25	0,85
M 1,2	0,25	0,95
M 1,4	0,3	1,10
M 1,6	0,35	1,25
M 1,7	0,35	1,35
M 1,8	0,35	1,45
M 2	0,4	1,60
M 2,2	0,45	1,75
M 2,3	0,4	1,90
M 2,5	0,45	2,05
M 2,6	0,45	2,15
M 3	0,5	2,50
M 3,5	0,6	2,90
M 4	0,7	3,30
M 4,5	0,75	3,70
M 5	0,8	4,20
M 5,5	0,9	4,60
M 6	1	5,00
M 7	1	6,00
M 8	1,25	6,80
M 9	1,25	7,80
M 10	1,5	8,50
M 11	1,5	9,50
M 12	1,75	10,20
M 14	2	12,00
M 16	2	14,00
M 18	2,5	15,50
M 20	2,5	17,50
M 22	2,5	19,50
M 24	3	21,00
M 27	3	24,00
M 30	3,5	26,50
M 33	3,5	29,50
M 36	4	32,00
M 39	4	35,00
M 42	4,5	37,50
M 45	4,5	40,50
M 48	5	43,00
M 52	5	47,00
M 56	5,5	50,50
M 60	5,5	54,50
M 64	6	58,00
M 68	6	62,00

### MF

According to DIN 13 and DIN-ISO 965-1

Dia	P	
M 2	0,25	1,75
M 2,2	0,25	1,95
M 2,3	0,25	2,05
M 2,5	0,35	2,15
M 3	0,25	2,75
M 3	0,35	2,65
M 3,5	0,35	3,15
M 4	0,35	3,65
M 4	0,5	3,50
M 4,5	0,5	4,00
M 5	0,35	4,65
M 5	0,5	4,50
M 5	0,75	4,20
M 6	0,5	5,50
M 6	0,75	5,25
M 7	0,5	6,50
M 7	0,75	6,25
M 8	0,5	7,50
M 8	0,75	7,25
M 8	1	7,00
M 9	0,75	8,20
M 9	1	8,00
M 10	0,5	9,50
M 10	0,75	9,25
M 10	1	9,00
M 10	1,25	8,80
M 11	1	10,00
M 12	0,5	11,50
M 12	1	11,00
M 12	1,25	10,80
M 12	1,5	10,50
M 13	1	12,00
M 14	0,75	13,20
M 14	1	13,00
M 14	1,25	12,75
M 14	1,5	12,50
M 15	1	14,00
M 15	1,5	13,50
M 16	0,75	15,20
M 16	1	15,00
M 16	1,25	14,80
M 16	1,5	14,50
M 17	1	16,00
M 18	1	17,00
M 18	1,5	16,50
M 18	2	16,00
M 20	1	19,00
M 20	1,5	18,50
M 20	2	18,00
M 22	1	21,00
M 22	1,5	20,50
M 22	2	20,00

### MF

According to DIN 13 and DIN-ISO 965-1

Dia	P	
M 24	1	23,00
M 24	1,5	22,50
M 24	2	22,00
M 25	1	24,00
M 25	1,5	23,50
M 26	1,5	24,50
M 27	1	26,00
M 27	1,5	25,50
M 27	2	25,00
M 28	1,5	26,50
M 28	2	26,00
M 30	1	29,00
M 30	1,5	28,50
M 30	2	28,00
M 32	1,5	30,50
M 32	2	30,00
M 33	1,5	31,50
M 33	2	31,00
M 34	1,5	32,50
M 35	1,5	33,50
M 36	1,5	34,50
M 36	2	34,00
M 36	3	33,00
M 38	1,5	36,50
M 39	1,5	37,50
M 39	2	37,00
M 39	3	36,00
M 40	1,5	38,50
M 40	2	38,00
M 40	3	37,00
M 42	1,5	40,50
M 42	2	40,00
M 42	3	39,00
M 45	1,5	43,50
M 45	2	43,00
M 45	3	42,00
M 48	1,5	46,50
M 48	2	46,00
M 48	3	45,00
M 50	1,5	48,50
M 50	2	48,00
M 50	3	47,00
M 52	1,5	50,50
M 52	2	50,00
M 52	3	49,00
M 56	1,5	54,50
M 56	2	54,00
M 56	3	53,00
M 58	1,5	56,50
M 60	1,5	58,50
M 60	2	58,00
M 60	3	57,00

### MJ

According to DIN-ISO 5855

Dia	P	
MJ 3	0,5	2,60
MJ 4	0,7	3,40
MJ 5	0,8	4,30
MJ 6	1	5,10
MJ 8	1,25	6,90
MJ 10	1,5	8,70
MJ 12	1,75	10,50
MJ 16	2	14,30





# TAP DRILL SIZES GUIDE

Technical | Threading

## Recommended drill sizes for cutting taps

### Pg

According to  
DIN 40430

Dia	P	
7	20	11,4
9	18	14
11	18	17,25
13,5	18	19
16	18	21,25
21	16	27
29	16	35,5
36	16	45,5
42	16	52,5
48	16	58

### Tr

According to ISO

Dia	P	
8	1,5	6,6
9	2	7,2
10	2	8,2
11	3	8,25
12	3	9,25
14	3	11,25
16	4	12,25
18	4	14,25
20	4	16,25
22	5	17,25
24	5	19,25
26	5	21,25
28	5	23,25
30	6	24,25
32	6	26,25
34	6	28,25
36	6	30,25
38	7	31,5
40	7	33,5
42	7	35,5
44	7	37,5
46	8	38,5
48	8	40,5
50	8	42,5

### G

According to  
DIN EN ISO 228

Dia	P	
1/16	28	6,80
1/8	28	8,70
1/4	19	11,80
3/8	19	15,25
1/2	14	19,00
5/8	14	21,00
3/4	14	24,50
7/8	14	28,25
1	11	30,75
1 1/8	11	35,50
1 1/4	11	39,50
1 3/8	11	41,90
1 1/2	11	45,25
1 3/4	11	51,00
2	11	57,00
2 1/4	11	63,00
2 1/2	11	72,60
3	11	85,00

### BSW

According to BS 84

Dia	P	
1/16	60	1,20
3/32	48	1,90
1/8	40	2,50
5/32	32	3,20
3/16	24	3,60
7/32	24	4,60
1/4	20	5,10
5/16	18	6,50
3/8	16	7,90
7/16	14	9,20
1/2	12	10,50
9/16	12	12,00
5/8	11	13,40
3/4	10	16,40
7/8	9	19,25
1	8	22,00
1 1/8	7	24,75
1 1/4	7	27,50
1 3/8	6	30,00
1 1/2	6	33,50
1 5/8	5	35,50
1 3/4	5	39,00
1 7/8	4 1/2	41,50
2	4 1/2	44,50

Technical | Threading



### BSF

According to BS 84

Dia	P	
3/16	32	4,00
7/32	28	4,60
1/4	26	5,30
5/16	22	6,80
3/8	20	8,30
7/16	18	9,70
1/2	16	11,00
9/16	16	12,70
5/8	14	14,00
3/4	12	16,80
7/8	12	19,80
1	10	22,70
1 1/8	9	25,50
1 1/4	9	28,50
1 3/8	8	31,50
1 1/2	8	34,50
1 5/8	8	38,00

### Rp

According to  
DIN EN 10226-2

Dia	P	
1/16	28	6,55
1/8	28	8,60
1/4	19	11,50
3/8	19	15,00
1/2	14	18,50
5/8	14	20,50
3/4	14	24,00
1	11	30,25
1 1/4	11	39,00
1 1/2	11	45,00
2	11	56,50
2 1/2	11	72,20
3	11	85,00

### BA

According to  
BS 949 part 2

Dia	P	
0	1	5,00
1	0,9	4,40
2	0,81	3,90
3	0,73	3,40
4	0,66	3,00
5	0,59	2,60
6	0,53	2,30
7	0,48	2,00
8	0,43	1,80
9	0,39	1,50
10	0,35	1,30
11	0,31	1,20
12	0,28	1,00
13	0,25	0,95
14	0,23	0,75

### Rc

According to DIN EN  
10226-2 taper 1/16

Dia	P	d1	D1	A	B min
1/16	28	6,30	6,49	8,31	10,00
1/8	28	8,30	8,50	8,31	10,10
1/4	19	11,00	11,35	12,37	15,00
3/8	19	14,50	14,85	12,77	15,40
1/2	14	18,10	18,49	16,83	20,50
3/4	14	23,50	23,98	18,13	21,80
1	11	29,60	30,11	21,42	26,00
1 1/4	11	38,10	38,78	23,72	28,30
1 1/2	11	44,00	44,67	23,72	28,30
2	11	55,60	56,48	28,02	32,60
2 1/2	11	71,10	72,00	31,32	37,10
3	11	83,60	84,71	34,42	40,20

# TAP DRILL SIZES GUIDE

Technical | Threading

## Recommended drill sizes for forming taps

### M

According to DIN 13  
and DIN-ISO 965-1

Dia	P	6 HX		6 GX		7 GX	
		Min.	Max.	Min.	Max.	Min.	Max.
1	0,25	0,87	0,89	-	-	-	-
1,2	0,25	1,07	1,09	-	-	-	-
1,4	0,3	1,244	1,263	-	-	-	-
2	0,4	1,82	1,84	1,85	1,88	-	-
2,2	0,45	2,01	2,04	2,02	2,06	-	-
2,5	0,45	2,31	2,34	2,32	2,36	-	-
3	0,5	2,77	2,81	2,79	2,84	2,81	2,85
3,5	0,6	3,23	3,27	3,24	3,3	-	-
4	0,7	3,66	3,72	3,69	3,73	3,71	3,77
5	0,8	4,61	4,68	4,65	4,71	4,66	4,73
6	1	5,51	5,59	5,55	5,63	5,56	5,64
8	1,25	7,37	7,45	7,4	7,47	7,42	7,5
10	1,5	9,24	9,33	9,26	9,35	9,3	9,39
12	1,75	11,1	11,2	11,14	11,24	11,17	11,28
14	2	12,96	13,08	13	13,12	13,04	13,16
16	2	14,96	15,08	15	15,12	15,04	15,16
18	2,5	16,66	16,81				
20	2,5	18,66	18,81				
22	2,5	20,66	20,81				
24	3	22,39	22,56				
27	3	25,39	25,56				
30	3,5	28,09	28,28				
33	3,5	31,09	31,28				
36	4	33,8	34,01				
39	4	36,8	37,01				
42	4,5	39,52	39,73				
45	4,5	42,52	42,73				

### MF

According to DIN 13  
and DIN-ISO 965-1

Dia	P	6 HX	
		Min.	Max.
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
8	1	7,50	7,56
10	1	9,50	9,56
10	1,25	9,35	9,43
12	1	11,50	11,56
12	1,25	11,35	11,43
12	1,5	11,21	11,30
14	1,5	13,25	13,34
16	1,5	15,25	15,34
18	1,5	17,25	17,34
20	1,5	19,25	19,34
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

## Recommended drill sizes for wire insert taps

### EG M

According to DIN 8140

Dia	P	
2	0,4	2,10
2,5	0,45	2,65
3	0,5	3,15
4	0,7	4,20
5	0,8	5,25
6	1	6,30
8	1,25	8,40
10	1,5	10,50
12	1,75	12,50
16	2	16,60
20	2,5	20,70

### EG UNC

Dia	P	
-	-	-
-	-	-
-	-	-
-	-	-
Nr. 4	40	3,10
Nr. 6	32	3,80
Nr. 8	32	4,40
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

### EG UNF

Dia	P	
-	-	-
-	-	-
Nr. 10	32	5,10
¼	28	6,60
⅜	24	8,25
½	24	9,80
¾	20	11,50
1	20	13,10
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-



# TROUBLE SHOOTING

Technical | Threading

## Tapping

Dimensional Accuracy		
Specific Problem	Cause	Solution
Oversize Pitch Diameter	Incorrect Tap	<ul style="list-style-type: none"> <li>• Use proper pitch diameter limits of taps.</li> <li>• Use longer chamfered taps.</li> </ul>
	Chip Packing	<ul style="list-style-type: none"> <li>• Use spiral point or spiral fluted taps.</li> <li>• Reduce number of flutes to provide extra chip room.</li> <li>• Use larger hole size.</li> <li>• If tapping a blind hole, allow deeper holes where applicable or shorten the thread length of the parts.</li> <li>• Use proper lubricant.</li> </ul>
	Galling	<ul style="list-style-type: none"> <li>• Apply proper surface treatment such as steam oxide or TiN.</li> <li>• Use proper cutting lubricant.</li> <li>• Reduce tapping speed.</li> <li>• Use proper cutting angle in accordance with material being tapped.</li> <li>• Use larger hole size.</li> </ul>
	Operating Conditions	<ul style="list-style-type: none"> <li>• Apply proper tapping speed.</li> <li>• Correct alignment of tap and drilled hole.</li> <li>• Use proper tapping speed to avoid torn or rough threads.</li> <li>• Use lead screw tapper.</li> <li>• Use proper tapping machine with suitable power.</li> <li>• Avoid misalignment of the tap and drilled hole from loose spindle or worn holder.</li> </ul>
	Tool Conditions	<ul style="list-style-type: none"> <li>• Obtain proper indexing angle for the flutes at the cutting edge.</li> <li>• Grind proper cutting angle and chamfer angle.</li> <li>• Avoid too narrow a land width.</li> <li>• Remove burrs from regrinding.</li> </ul>
Oversize Internal Diameter	Hole Size	<ul style="list-style-type: none"> <li>• Use minimum hole size.</li> <li>• Avoid tapered hole.</li> <li>• Use proper chamfered taps.</li> </ul>
	Galling	Galling solutions 1 through 4 under "Tool Conditions" can be applied to this specific problem.

Technical | Threading



# TROUBLE SHOOTING

Technical | Threading

## Tapping

Dimensional Accuracy		
Specific Problem	Cause	Solution
Undersize Pitch Diameter	Incorrect Tap	<ul style="list-style-type: none"> <li>• Use oversize taps:                             <ol style="list-style-type: none"> <li>a. Use for cutting materials such as copper alloy, aluminium alloy, and cast iron.</li> <li>b. Use for cutting tubing which will have “spring back” action after tapping.</li> </ol> </li> <li>• Apply proper chamfer angle.</li> <li>• Increase cutting angle.</li> </ul>
	Damaged Thread	Use proper reversing speed to avoid damaging tapped thread on the way out of the hole.
	Left-over Chips	<ul style="list-style-type: none"> <li>• Increase cutting performance to avoid any left over chips in the hole.</li> <li>• Remove left over chips from the hole for gage checking.</li> </ul>
Undersize Internal Diameter	Hole Size	Use maximum drill size.

Tool Life		
Specific Problem	Cause	Solution
Undersize Pitch Diameter	Chamfer Too Short	Increase chamfer length.
	Wrong Cutting Angle	Apply proper cutting angle.
	Galling	<ul style="list-style-type: none"> <li>• Use thread relieved taps.</li> <li>• Reduce land width.</li> <li>• Apply surface treatment such as steam oxide or TiN.</li> <li>• Use proper cutting lubricant.</li> <li>• Reduce tapping speed.</li> <li>• Use larger hole size.</li> <li>• Obtain proper alignment between tap and work.</li> </ul>
	Chip Packing	<ul style="list-style-type: none"> <li>• Use spiral pointed or spiral fluted taps.</li> <li>• Use larger drill size.</li> </ul>
Chattering on Tapped Thread	Tool Free Cutting	<ul style="list-style-type: none"> <li>• Reduce cutting angle.</li> <li>• Reduce amount of thread relief.</li> </ul>
Undersize Internal Diameter	Hole Size	<ul style="list-style-type: none"> <li>• Avoid too narrow a land.</li> <li>• Do not grind the bottom of the flute.</li> </ul>



# TROUBLE SHOOTING

Technical | Threading

## Tapping

Tool Life		
Specific Problem	Cause	Solution
Breakage	<b>Incorrect Tap Selection</b>	<ul style="list-style-type: none"> <li>• Avoid chip packing in the flutes or the bottom of the hole. Use spiral pointed or spiral fluted taps or fluteless taps.</li> <li>• Apply correct surface treatment such as steam oxide or TiN.</li> </ul>
	<b>Excessive Tapping Torque</b>	<ul style="list-style-type: none"> <li>• Use larger drill size.</li> <li>• Try to shorten thread length.</li> <li>• Increase cutting angle.</li> <li>• Use a tap with more thread relief and reduced land width.</li> <li>• Use spiral pointed or spiral fluted taps.</li> </ul>
	<b>Operating Conditions</b>	<ul style="list-style-type: none"> <li>• Reduce tapping speed.</li> <li>• Avoid misalignment between tap and the hole and tapered hole.</li> <li>• Use floating type of tapping holder.</li> <li>• Use tapping holder with torque adjustment.</li> <li>• Avoid hitting bottom of the hole with tap.</li> </ul>
	<b>Tool Condition</b>	<ul style="list-style-type: none"> <li>• Do not grind the bottom of the flute.</li> <li>• Avoid too narrow a land width.</li> <li>• Remove all worn sections when regrinding the flutes.</li> <li>• Regrind tool more frequently.</li> </ul>
Chipping	<b>Incorrect Tap Selection</b>	<ul style="list-style-type: none"> <li>• Reduce cutting angle.</li> <li>• Use a different kind of high-speed steel tap.</li> <li>• Reduce hardness of the tap.</li> <li>• Increase chamfer length.</li> <li>• Avoid chip packing in the flutes or in the bottom of the hole by using spiral fluted or spiral pointed taps.</li> </ul>
	<b>Operating Conditions</b>	<ul style="list-style-type: none"> <li>• Reduce tapping speed.</li> <li>• Avoid misalignment between tap and hole.</li> <li>• Avoid sudden return of reverse in blind hole tapping.</li> <li>• Avoid galling.</li> <li>• Use large hole size.</li> </ul>
Wear	<b>Incorrect Tap Selection</b>	<ul style="list-style-type: none"> <li>• Use specially designed taps for tapping heat treated material.</li> <li>• Change to a type of high-speed steel tap that contains vanadium.</li> <li>• Apply special surface treatment such as steam oxide or TiN.</li> <li>• Increase chamfer length.</li> </ul>
	<b>Operating Conditions</b>	<ul style="list-style-type: none"> <li>• Reduce tapping speed.</li> <li>• Apply proper cutting lubricants.</li> <li>• Avoid work hardening.</li> <li>• Use larger hole size.</li> </ul>
	<b>Tool Condition</b>	<ul style="list-style-type: none"> <li>• Grind proper cutting angle.</li> <li>• Avoid hardness reduction from grinding process.</li> </ul>





[www.osgeurope.com](http://www.osgeurope.com)

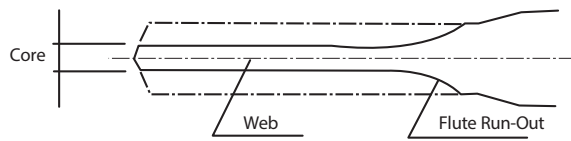
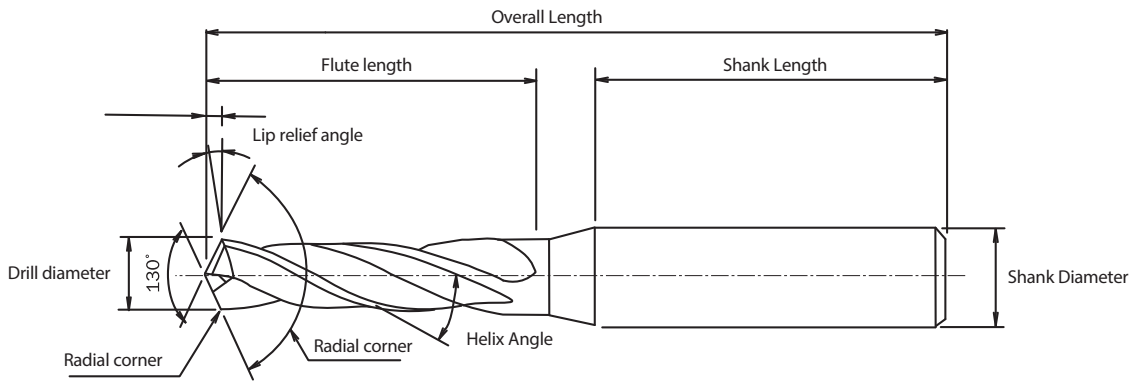




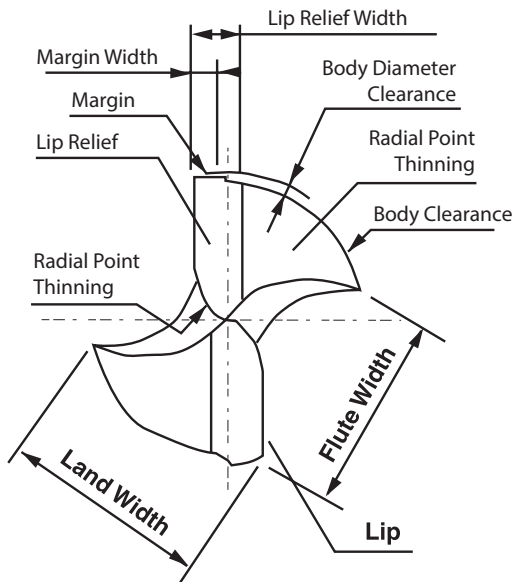


# NOMENCLATURE

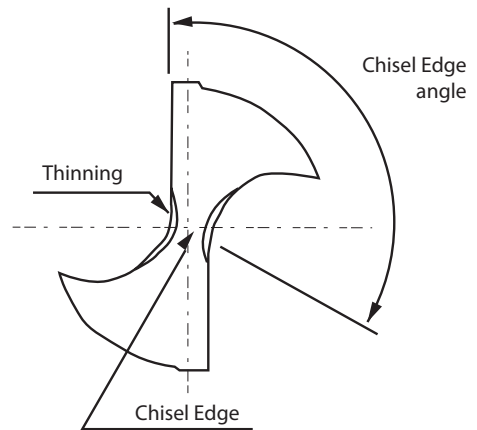
Technical | Drills



OSG Drill



Conventional Drill



Technical | Drills



# DRILL CHARACTERISTICS

Technical | Drills

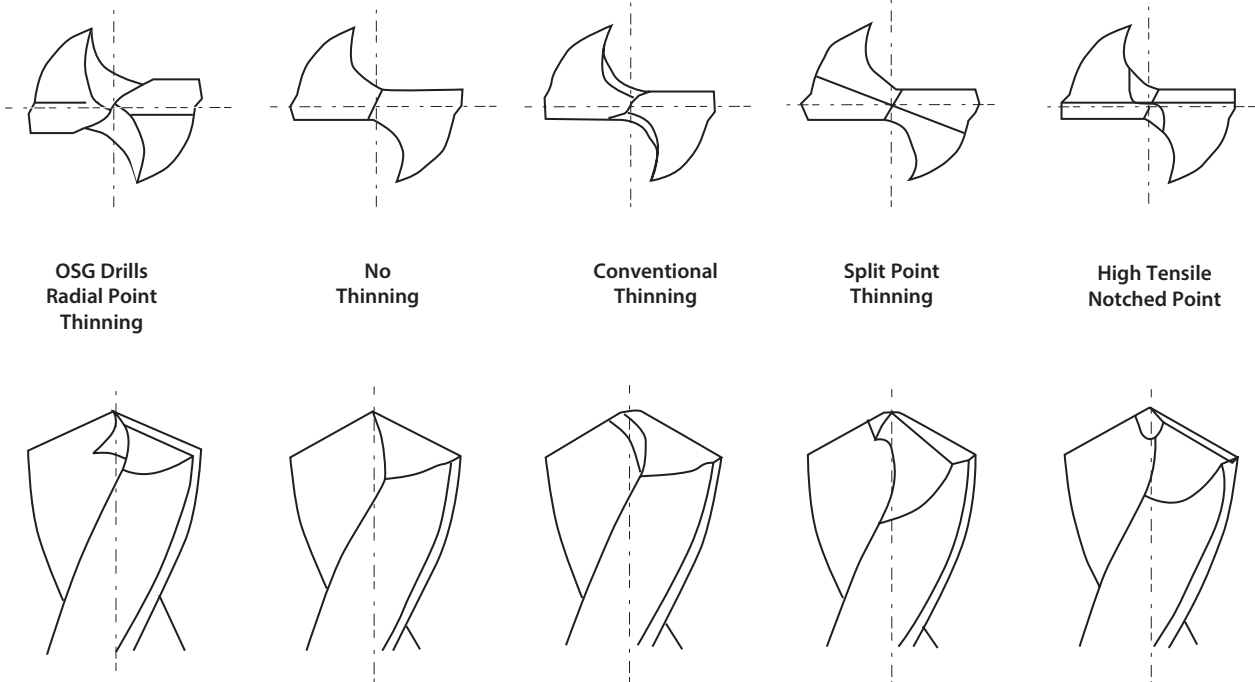
## OSG drill characteristics

### Unique Point Design

With OSG drills, the chisel edge in the centre section of a conventional drill is eliminated. Instead, there is a radius cutting edge. This provides a better biting action than a conventional drill, where the chisel edge is easily crushed against the harder to drill material.

OSG drills have a chip pocket for smooth chip action along the radius cutting edge. Also, the point angle is 130° instead of the conventional 118°. This creates small broken chips rather than the long, stringy chips created by a conventional drill.

### Point thinning



Technical | Drills



# CUTTING CONDITIONS

## Technical | Drills

For excellent results, it is best to follow established criterion for maximizing tool efficiency. Feed per table, expressed as F (mm/min) shows the drills' cutting efficiency. Although the spindle speed significantly influences the life of HSS drills, feed rate does not. Therefore, increasing feed rate will help improve cutting efficiency. However, if feed rate is too high, chips may end up being too thick. Users should be careful to find the appropriate feed rate for their particular operation.

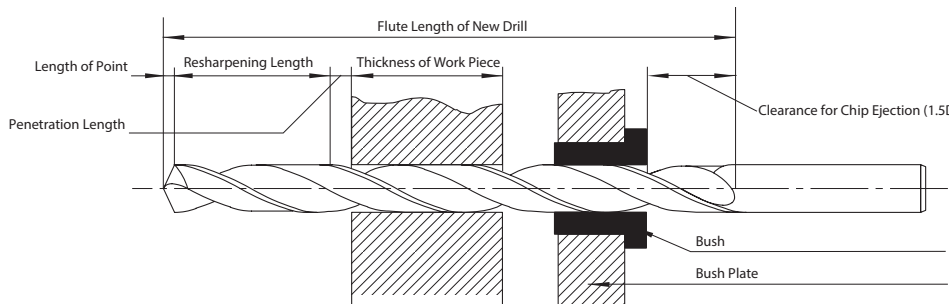
The range of appropriate feed rates for carbide alloy drills is smaller than that of HSS drills because carbide alloy drills have negative chamfered cutting edge. If a feed rate outside the recommended range is used, tool life declines considerably. Carbide alloy drills, however, have higher heat resistance than HSS tools. Also, cutting efficiency can be improved by using a higher cutting speed (i.e. increasing the number of revolutions per minute).

Similar to cutting speed, feed and cutting fluid, flute length is a critical determinant of tool life. Considering drilling depth, bush and reshaping requirements, flute length should usually be as short as possible. Unnecessarily long flute length can cause instability because of lower rigidity and possible twisting or/and deflection (depending on the holder). For most operations, suitable flute length can be calculated by using the following formula.

Formulas	
$N = \frac{1,000V}{\pi Dc}$ $V = \frac{\pi Dc N}{1,000}$ $F = f \cdot N$	<p><b>V</b> : Cutting Speed (m/min)  <b>F</b> : Feed/min. (mm/rev)  <b>Dc</b> : Drill Dia. (mm)  <b>N</b> : Speed (min-1)  <math>\pi</math> : The ratio of the circumference of a circle  <b>f</b> : Feed rate/rev. (mm/rev)</p>

### Depth of Hole\* + 1.5×Dc\*\* + Reshaping Length + Penetration Length

\*(Includes bush length and distance between bush and work piece.) \*\*(D = Drill Diameter)



### Recommended Cutting Fluid Selection Table-Based on Work Material

Tool	Coated HSS Drill						Coated Carbide Drill			Coated Carbide Drill			Diamond Coated Carbide Drill						
	Wet			Dry			Wet			Wet			Wet			Dry			
Type of Supply	Water Soluble			Dry			Water Soluble			Water Soluble			Water Soluble			Dry			
Type of Cutting Fluid	Non Water Soluble	Water Soluble			Dry	Semi Dry	Non Water Soluble	Water Soluble		Water Soluble	Dry	Semi Dry	Non Water Soluble	Water Soluble			Dry	Semi Dry	
Work Material	JIS N (JIS N)	JIS A1 Emulsion (JIS A-1)	JIS A2 Soluble (JIS A-2)	JIS A3 Solution (JIS A-3)	Air Blow	Mist	JIS N (JIS N)	JIS A1 Emulsion (JIS A-1)	JIS A2 Soluble (JIS A-2)	JIS A3 Solution (JIS A-3)	Air Blow	Mist	JIS N (JIS N)	JIS A1 Emulsion (JIS A-1)	JIS A2 Soluble (JIS A-2)	JIS A3 Solution (JIS A-3)	Air Blow	Mist	
Carbon Steel		o			o	o		o			o	o		x	x	x	x	x	
Cast Iron		o	o		o	o		o	o		o	o					x	x	
High Hardened Steel		o				o		o				o		x	x	x	x	x	
Stainless Steel		o			x	o		o						x	x	x	x	x	
Titanium Alloy		o			x			o			x			x	x	x	x	x	
Heat Resistant Alloy (ex. Inconel®)		o			x			o						x	x	x	x	x	
Aluminium Alloy		o	o					o	o					o	o			x	o
Copper	o						o				x		o				x	o	



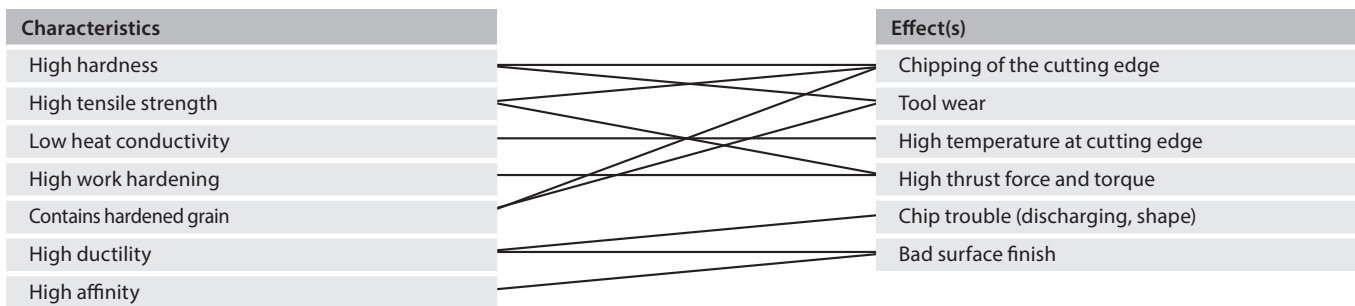
# DIFFICULT TO MACHINE MATERIALS

Technical | Drills





## Drilling


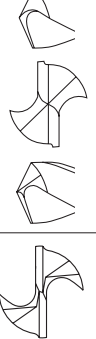
Certain materials have special characteristics (listed below), that make drilling difficult. In order to successfully drill these materials it is critical to use proper cutting conditions based on information about the material and the tool and to understand how variations of these characteristics can influence the final outcome.

### Characteristics of difficult to machine materials



Work Material	Characteristics	Machining recommendations	Recommended drills
<b>Austenitic Stainless Steel</b> SUS304-SUS316	<ul style="list-style-type: none"> <li>High work hardening</li> <li>High tensile strength at high temperatures</li> <li>Low heat conductivity</li> <li>High ductility. Easy to get build up at the edge. =&gt; chipping</li> </ul>	<ul style="list-style-type: none"> <li>Use tough drill material with sharp cutting edge and coating</li> <li>High feed rate</li> <li>High coolant supply</li> </ul>	ADO-SUS-3D ADO-3D ADO-SUS-5D NEXUS-GDS EX-SUS-GDS NEXUS-GDR EX-SUS-GDR EX-SUS-GDN VP-HO-GDR
<b>Die Steel</b> SKD11	<ul style="list-style-type: none"> <li>Made of hard carbide grain (under 0.4%C =&gt;carbide grain is melted)</li> </ul>	<ul style="list-style-type: none"> <li>Use high rigid HSS coated tools</li> <li>Use lower cutting speed and higher feed rate</li> </ul>	AD-2D ADO-3D ADO-3D ADO-4D ADO-5D VPH-GDS VPH-GDS
<b>High Manganese Steel</b> SCMnH	<ul style="list-style-type: none"> <li>High tensile strength and high toughness</li> <li>High work hardening</li> </ul>	<ul style="list-style-type: none"> <li>Use rigid tools, machine and work clamping device</li> </ul>	VPH-GDS
<b>Titanium Alloy</b> Ti-6Al-4V	<ul style="list-style-type: none"> <li>High tensile strength per Lower case</li> <li>Low heat conductivity</li> <li>Chemically active high affinity with tools</li> </ul>	<ul style="list-style-type: none"> <li>Use sufficient coolant and low cutting speed to maintain low cutting temperature.</li> </ul>	EX-SUS-GDS ADO-SUS-3D ADO-SUS-5D VP-HO-GDR
<b>Heat Resistant Alloy</b> Inconel-Hastelloy	<ul style="list-style-type: none"> <li>High hardness</li> <li>High work hardening</li> <li>Tough Difficult to machine</li> </ul>	<ul style="list-style-type: none"> <li>Improve rigidity of tools and machines</li> <li>Use an stub drill with coating and rigidity</li> </ul>	AD-2D WH55-5D VPH-GDS AD-4D
<b>High Hardened Quenched and Tempered Steels</b>	<ul style="list-style-type: none"> <li>High hardness</li> <li>High shearing stress</li> <li>High cutting resistance</li> </ul>	<ul style="list-style-type: none"> <li>Use a drill made from high hardened and rigid material if the work material is over 45 HRC, use a carbide drill.</li> </ul>	AD-2D VPH-GDS ADO-15D/ 20D/30D
<b>High Silicon Aluminium Alloy</b> AC9A-A390	<ul style="list-style-type: none"> <li>High hardened grain causes large wear on tools</li> </ul>	<ul style="list-style-type: none"> <li>Use a drill made from high hardened material</li> <li>Provide sufficient coolant supply</li> </ul>	D-GDN
<b>Kovar</b> Fe-Ni-Co	<ul style="list-style-type: none"> <li>Low thermal expansion material</li> <li>Tend to Build-up, but easy to machine</li> </ul>	<ul style="list-style-type: none"> <li>Use high helix and sharp edge drill</li> </ul>	WX-MS-GDS NEXUS-GDS EX-SUS-GDS NEXUS-GDR EX-SUS-GDR
<b>Co-Cr Alloy</b>	<ul style="list-style-type: none"> <li>Better anti-rust, better rigidity</li> <li>Harmonize with organism</li> </ul>	<ul style="list-style-type: none"> <li>Easy to break chips, but recommended to use better drill on wear resistance</li> </ul>	ADO-3D ADO-3D AD-4D ADO-5D
<b>Composite</b> C-FRP - G-FRP	<ul style="list-style-type: none"> <li>Tough fibre causes extreme wear</li> <li>Tend to have naps and peel off</li> </ul>	<ul style="list-style-type: none"> <li>Use sharp and wear resistant tools</li> <li>Design the tool to prevent naps and peeling</li> </ul>	D-STAD

Type	Design	Characteristics & applications
<b>R Thinning</b>		<ul style="list-style-type: none"> <li>For heavy drilling</li> <li>Good chamfering</li> <li>Creates small chips</li> <li>Reduces thrust force</li> </ul>
<b>X Thinning</b>		<ul style="list-style-type: none"> <li>Good chamfering</li> <li>For drills with large web diameter</li> <li>Reduces thrust force</li> </ul>
<b>N Thinning</b>		<ul style="list-style-type: none"> <li>For drills with small web diameter and/or with small point angle</li> <li>Large chip pocket</li> <li>High strength at the point</li> </ul>
<b>S Thinning</b>		<ul style="list-style-type: none"> <li>For drills with small web diameter and/or with small point angle</li> <li>High strength at the point</li> <li>Easy to regrind</li> </ul>

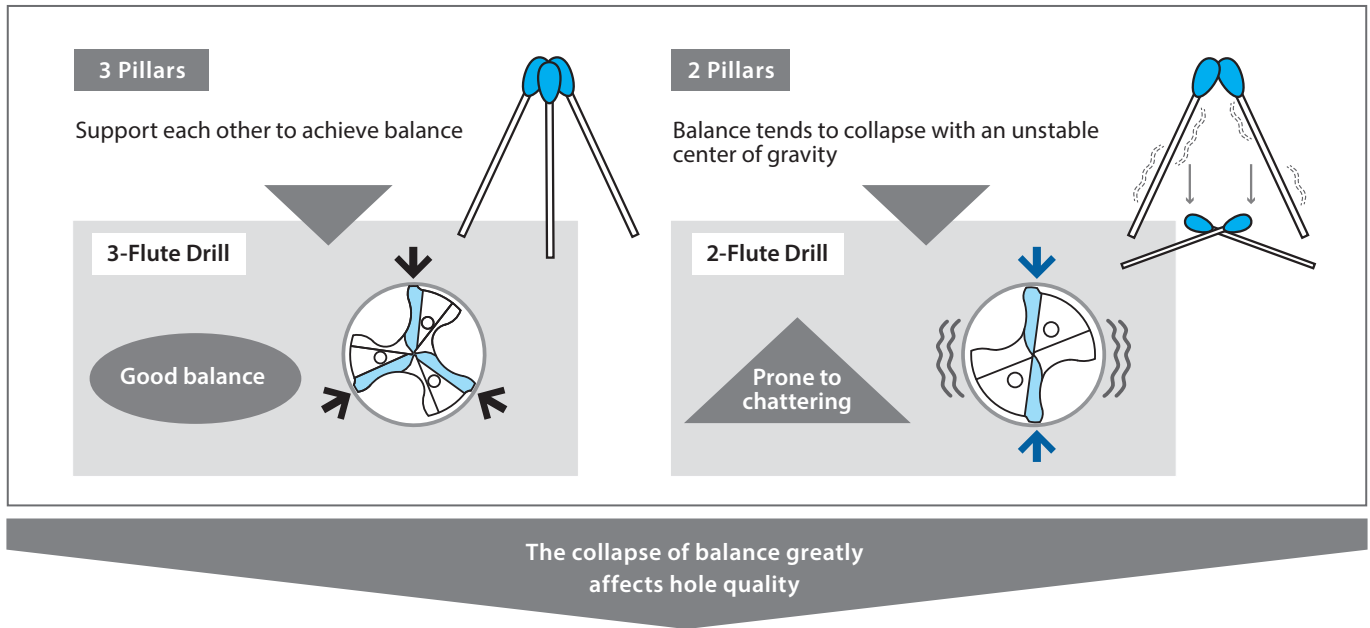
Type	Design	Characteristics & applications
<b>W+R</b> <b>W Thinning,</b> <b>W + R Thinning</b>		<ul style="list-style-type: none"> <li>For heavy drilling</li> <li>Prevents chipping on cutting edge</li> <li>For high hardened materials</li> <li>Prevents chipping that can occur when drilling in high hardened steel materials</li> <li>High strength on the cutting edge</li> <li>Reduces thrust force</li> </ul>
<b>Three-rake Thinning</b>		<ul style="list-style-type: none"> <li>Accurate at cutting edge tolerance</li> <li>Better hole size control not good for high feed rate</li> </ul>

Technical | Drills



# QUICK GUIDE FOR ADO-TRS

Technical | Drills



		ADO-TRS	Competitor (3FL)	Competitor (2FL)		
Hole Expansion Comparison	Entry	0,005mm	0,051mm	0,025mm		
	Middle	0,002mm	0,039mm	0,022mm		
	Exit	0,003mm	0,05mm	0,018mm		
Roundness Cylindricity	16 μm	28 μm	30 μm	32 μm	52 μm	40 μm

<b>Tool</b>	ADO-TRS	<b>Cutting Speed</b>	90m/min (1.791min <sup>-1</sup> )		<b>Coolant</b>	Water Soluble 3MPa
<b>Work Material</b>	SCM420H	<b>Feed</b>	3FL 1,075mm/min (0.6mm/rev)	2FL 537mm/min (0.3mm/rev)	<b>Machine</b>	Horizontal Machining Center

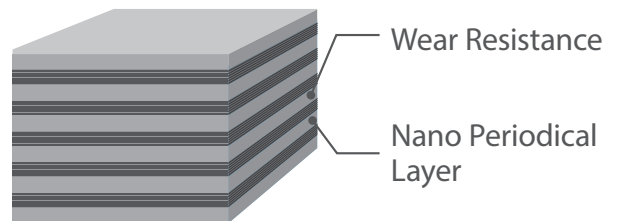
The quality of the pre-drilled hole will affect the performance of the next process such as tapping.

## EgiAs Coating

### EgiAs coating with high toughness and wear resistance characteristics

Constructed with extreme toughness, high wear and heat resistance characteristics to ensure stable and consistent tool life.

# EgiAs



Coating Color	Coating Structure	Hardness (Hv)	Oxidation Temperature (C°)	Heat Resistance	Adhesion Strength	Wear Resistance	Welding Resistance	Toughness
Interference Color	Periodic Nano-layered	40	1.100	☉	☉	☉	☉	☉

Technical | Drills



# ADO-MICRO 12D/15D/20D/25D/30D

Technical | Drills

## Recommended drilling method for deep-holes

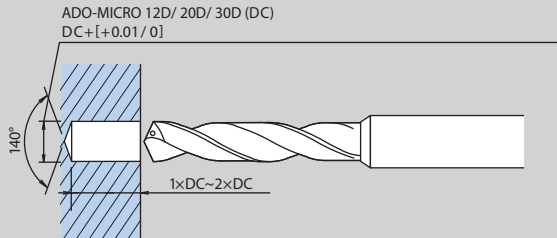
### 1 ADO-MICRO 2D

Make a pilot hole with the ADO-MICRO 2D.

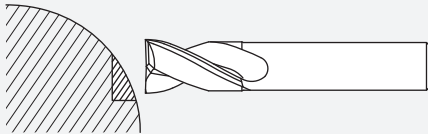
ADO-MICRO 12D/20D/30D

ADO-MICRO 2D (140°)

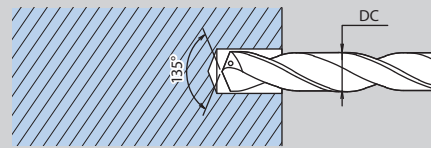
The ADO-MICRO 2D (140° point angle) is the recommended pilot hole drills of the ADO-MICRO 12D/20D/30D.



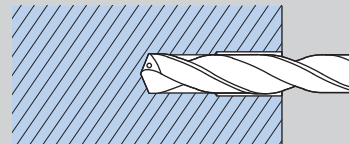
When working on a curved surface, use the FX-ZDS (end mill for counterboring) or the ADF (carbide flat drill) to counterbore a flat surface before drilling a pilot hole.



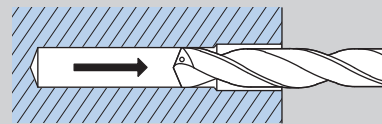
2 Insert the long drill into a pilot hole with a low revolution of 500 to 1,000 min<sup>-1</sup> (n).



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 min<sup>-1</sup> (n) while pulling it out of the hole.



Make sure to use internal coolant supply when drilling.

## For drilling applications exceeding Ø2

Carbide Drill Series  
AD & ADO



Carbide Drill Series for Stainless Steel and Titanium Alloy  
ADO-SUS



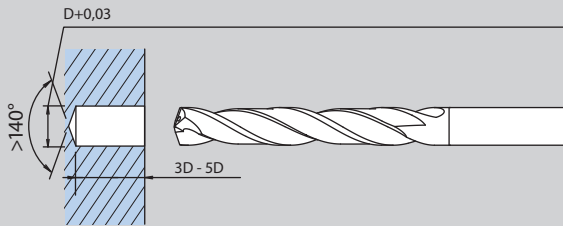
# ADO-40D/50D

Technical | Drills

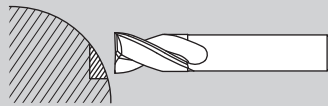
## OPERATIONAL GUIDELINE

### 1 ADO-5D/ADO-TRS-5D

Make a pilot hole with the ADO-5D or ADO-TRS-5D.  
 ADO-40D /ADO-50D  
 ADO-5D/ADO-TRS-5D (140°)  
 The ADO-5D and ADO-TRS-5D (140° point angle) are the recommended pilot hole drills of the ADO-40D/50D.



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

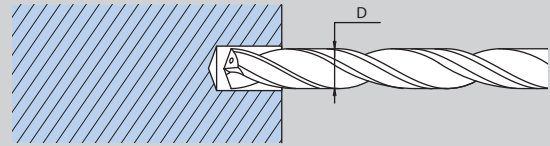


If it is difficult to process or if the straightness of the hole needed to be improved, use the coolant-through carbide drill ADO-20/30D after drilling a pilot hole, then process with the ADO-40/50D.

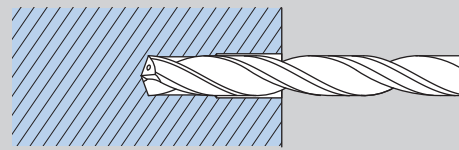
When processing with 3 tools, the ADO-40/50D may be used at a more aggressive cutting condition than those listed in the recommended cutting condition table.

### 2 (n)300~500min<sup>-1</sup>

Insert the long drill into the pilot hole with a low speed reverse (revolution of about 300 to 500 min<sup>-1</sup> (n)).

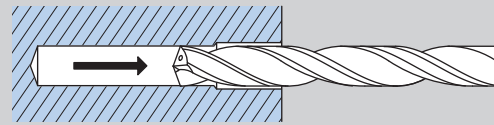


### 3 Increase the revolution to the designated speed and start drilling.



### 4 (n)300~500min<sup>-1</sup>

After drilling, move the drill away from the bottom of the hole, then reduce its speed to 300 to 500 min<sup>-1</sup> (n) while pulling it out of the hole.



Make sure to use internal coolant supply when drilling.

Technical | Drills

## Manufacturable Range of Special Sizes

Diameter range	Maximum overall length	Maximum flute length	Maximum drilling depth of hole												
			50	100	150	200	250	300	350	400	450				
3	209	159			150										
~4	262	212				200									
~5	315	265					250								
~6	428	378							360						
~7	456	406								380					
~8	500	450												430	
~9	500	450												420	
~10	500	450												420	
~11	500	450												420	
~12	500	450												420	
~13	500	450												410	
~14	500	450												410	
~15	500	450												410	
~16	500	450												410	

The above chart indicates the maximum overall length and maximum flute length of each range's maximum diameter. For sizes and lengths outside of the above parameters, please consult with your OSG sales representative.

Manufacturable range

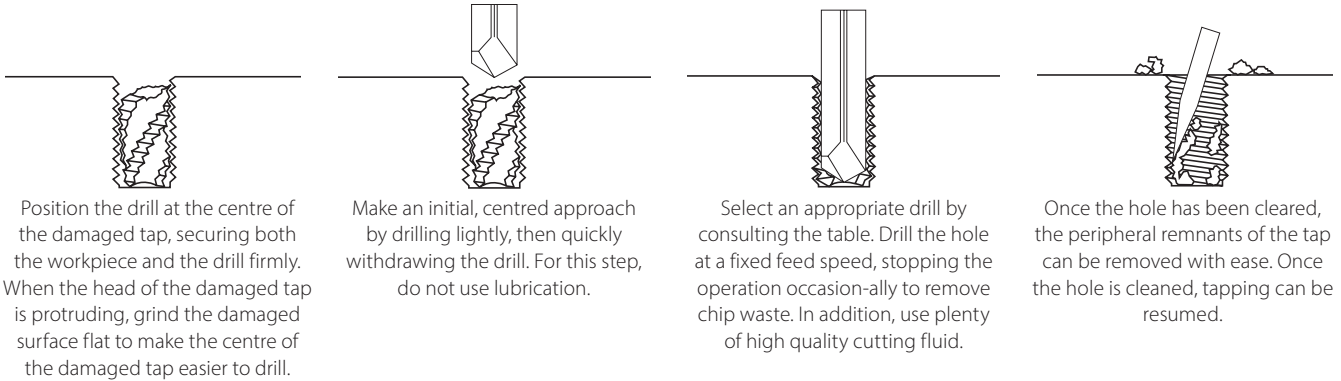
# DRILLING INSTRUCTIONS

Technical | Drills

## Work procedure for removing damaged tap in hole



**EX-H-DRL**



Position the drill at the centre of the damaged tap, securing both the workpiece and the drill firmly. When the head of the damaged tap is protruding, grind the damaged surface flat to make the centre of the damaged tap easier to drill.

Make an initial, centred approach by drilling lightly, then quickly withdrawing the drill. For this step, do not use lubrication.

Select an appropriate drill by consulting the table. Drill the hole at a fixed feed speed, stopping the operation occasionally to remove chip waste. In addition, use plenty of high quality cutting fluid.

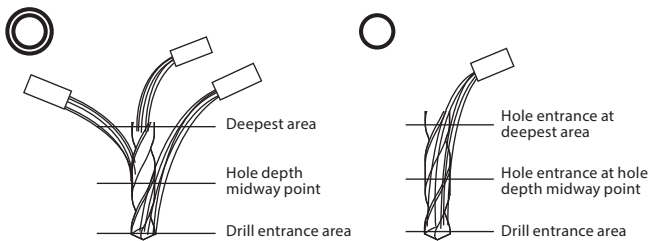
Once the hole has been cleared, the peripheral remnants of the tap can be removed with ease. Once the hole is cleaned, tapping can be resumed.

## Cutting conditions and procedures to note

1. Use a drilling speed of 20-25 m/min.
2. Hand feed of 0.01mm - 0.05mm/rev. is the norm.
3. Use a rigid holder.
4. Select a high quality cutting oil and apply sufficient amounts.
5. This tool should not be used to drill soft steel, aluminium alloy equivalents, or other soft materials.
6. Resharpening should be done periodically.
7. For through hole processing of heat treated steel etc., using a cut off - positioned under the work material - to prevent breakage caused by sudden torque.

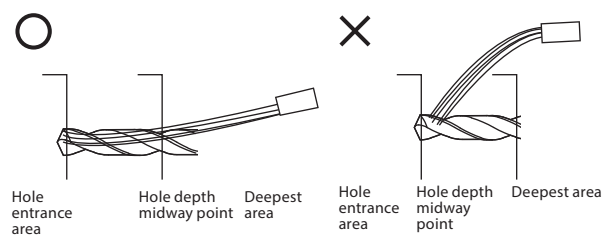
## Guide for drilling with TDXL

### Vertical Machine



Allow the coolant to move along the drill if the discharge flow rate is low or the number of nozzles is little.

### Horizontal Machine



If there are little coolant nozzles, increase the amount of coolant and its discharge pressure and allow the coolant to move along the drill so that it is applied constantly to the entrance.

If there are little coolant nozzles, the coolant that is applied to the hole entrance will stray from the hole along the way

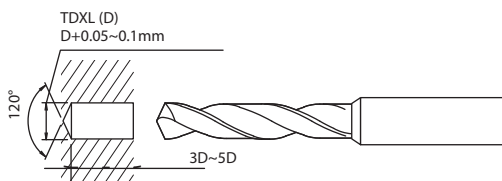
### 1. Make a pilot hole

Recommended drill : EX-SUS-GDS

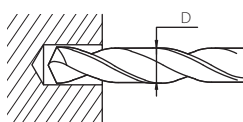
For a pilot hole, select 0.05mm to 0.1mm larger size drill than TDXL. For deep hole, we recommend to drill deeper pilot hole.

For a vertical machining center. When drilling many holes in a small area with vertical machining center. We recommend only centering by 130 degree point angle LDS to avoid chips building up in pilot holes, which can cause drill chipping or breakage. When drilling the pilot hole it is recommended to make the hole 3xD in depth, at a feed rate equal to (Drill  $\phi$  x 0.01) per revolution. Straightness will be less accurate than a comparable operation in a horizontal machining center.

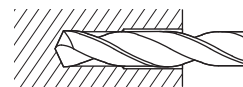
We recommended to use point angle from 120 degree and over.



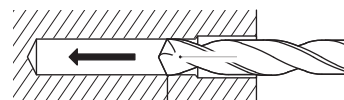
### 2. Insert the TDXL into a pilot hole with low revolution. (~500 min<sup>-1</sup>)



### 3. Start supplying the coolant.

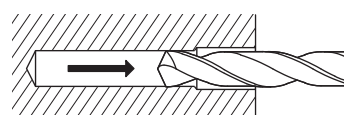


### 4. Increase the revolution to the designated speed and start drilling. At the start of drilling, set the feed rate to 1% of the drill dia. and increase the feed rate when the depth reaches between 3xD and 5xD.



Increase feed rate to between 1 and 2% Set it to 1% D between 3xD and 5xD

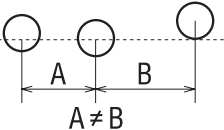
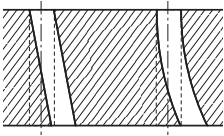
### 5. After drilling, move the drill away from the bottom of the hole; then reduce its speed while pulling it out of the hole.



# TROUBLE SHOOTING

Technical | Drills

## Drilling

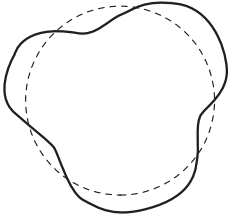
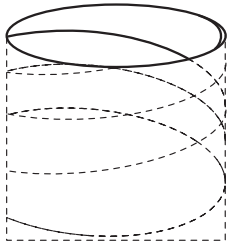
Dimensional Accuracy		
Specific Problem	Cause	Solution
Hole expansion	<b>Large run out after attachment to the machine</b> <b>Large spindle run out</b>	<ul style="list-style-type: none"> <li>• Check holder and/or select another one</li> <li>• Check the spindle</li> <li>• Check run out after fixing to the chuck</li> </ul>
	<b>Non-symmetric point angle</b> <b>Large lip height</b> <b>Run out of chisel edge</b>	<ul style="list-style-type: none"> <li>• Regrind correctly</li> <li>• Check precision after regrinding</li> </ul>
Irregular hole size	<b>Non-symmetric point angle</b> <b>Large lip height</b> <b>Run out of chisel edge</b> <b>Major margin wear</b>	<ul style="list-style-type: none"> <li>• Regrind correctly</li> <li>• Check precision after regrinding</li> </ul>
	<b>Large run out after attachment to machine</b> <b>Loose hold</b> <b>Low work holding rigidity</b>	<ul style="list-style-type: none"> <li>• Check holder and/or select another one</li> <li>• Check the spindle</li> <li>• Check run out after fixing to the chuck</li> </ul>
	<b>Feed rate is too high</b>	Decrease the feed rate
	<b>Not enough coolant</b>	Change method of coolant supply, or increase volume
Poor accuracy Irregular pitch  	<b>Large run out after attachment to machine</b> <b>Large spindle run out</b>	<ul style="list-style-type: none"> <li>• Check holder and/or select another one</li> <li>• Check the spindle</li> <li>• Check run out after fixing to the chuck</li> </ul>
	<b>Run out when cutting</b>	<ol style="list-style-type: none"> <li>1. Increase rigidity of tools and machines</li> <li>2. Increase work clamping rigidity</li> <li>3. Select a thinning for low cutting resistance</li> <li>4. Use centring</li> <li>5. Double-check that the work piece is horizontal</li> <li>6. Use a drill bush</li> </ol>
	<b>Poor alignment accuracy</b>	Check alignment before operation
Bad hole perpendicularity  	<b>Excessive tool wear</b>	Regrind correctly
	<b>Poor position accuracy</b>	Increase position accuracy
	<b>Non-symmetric point angle</b> <b>Large lip height</b> <b>Run out of chisel edge</b>	<ul style="list-style-type: none"> <li>• Regrind correctly</li> <li>• Check precision after regrinding</li> </ul>
	<b>Not enough drill rigidity</b>	Use a more rigid drill
	<b>Drilling surface is not horizontal</b> <b>Poor alignment accuracy</b>	<ul style="list-style-type: none"> <li>• The work piece must be horizontal or pre-drilled</li> <li>• Use centring</li> </ul>



# TROUBLE SHOOTING

Technical | Drills

## Drilling

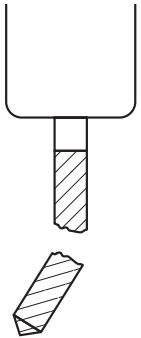
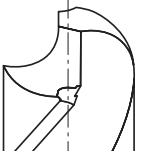
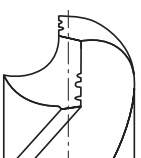
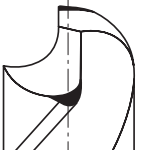
Dimensional Accuracy		
Specific Problem	Cause	Solution
<b>Bad cylindrical accuracy</b>  	<b>Non-symmetric point angle</b> <b>Large lip height</b> <b>Run out of chisel edge</b>	<ul style="list-style-type: none"> <li>• Regrind correctly</li> <li>• Check precision after regrinding</li> </ul>
	<b>Large run out after attachment to machine</b> <b>Large spindle run out</b> <b>Loose clamping of work material</b>	<ul style="list-style-type: none"> <li>• Check holder and/or select another one</li> <li>• Check the spindle</li> <li>• Check work clamping after fixing to the machine</li> </ul>
	<b>Relief angle is too large</b>	Regrind correctly
	<b>Low drill rigidity</b>	Use a more rigid drill
<b>Poor surface finish</b>	<b>Poor regrinding</b>	Regrind correctly
	<b>Not suitable coolant for the material</b> <b>Not enough coolant</b>	Change method of coolant supply, or increase volume Select higher quality coolant
	<b>Large run out after attachment to machine</b> <b>large spindle run out</b>	<ul style="list-style-type: none"> <li>• Check holder and/or select another one</li> <li>• Check the spindle</li> </ul>
	<b>Feed rate is too high</b>	Reduce the feed rate
	<b>Excessive wear on cutting edge</b> <b>Build up on margin is too large</b>	<ul style="list-style-type: none"> <li>• Regrind correctly</li> <li>• Use a coated tool</li> </ul>
	<b>Chip packing</b>	<ul style="list-style-type: none"> <li>• Use the most suitable drill (consider flute form &amp; helix angle)</li> <li>• Change cutting conditions (feed rate, try step feed)</li> </ul>
<b>Bad cylindrical shape</b>  	<b>Non-symmetric point angle</b> <b>Large lip height</b> <b>Run out of chisel edge</b> <b>Large margin wear</b>	<ul style="list-style-type: none"> <li>• Regrind correctly</li> <li>• Check precision after regrinding</li> </ul>
	<b>Feed rate is too low</b>	Increase feed rate



# TROUBLE SHOOTING

Technical | Drills

## Drilling

Dimensional Accuracy		
Specific Problem	Cause	Solution
<b>Breakage</b> 	<b>Deflection and recess of machine and work material</b>	Increase the rigidity of machine, drill and work clamping
	<b>Relief angle is too small</b>	Regrind precisely
	<b>Feed rate is too high</b>	Decrease the feed rate
	<b>Excessive tool wear</b>	Regrind
	<b>Chip packing</b>	Use the most suitable drill (consider flute form & helix angle) Change cutting conditions (feed rate, try step feed)
	<b>Difficulty entering the material</b>	<ul style="list-style-type: none"> <li>• Use a highly rigid tool and machine</li> <li>• Increase work clamping rigidity</li> <li>• Select a thinning for low cutting resistance</li> <li>• Use centring</li> <li>• The work piece should be horizontal</li> <li>• Use drill bush</li> </ul>
<b>Chipping of corner edge</b> 	<b>Inappropriate tool material</b>	Use the most suitable tool material
	<b>Uneven hardness distribution on the work material</b>	<ul style="list-style-type: none"> <li>• Use the most suitable tool material</li> <li>• Change cutting conditions (feed rate, drilling speed) or machining method</li> </ul>
	<b>Drilling speed or feed rate too high</b>	Reduce drilling speed or feed rate
	<b>Not enough coolant</b>	Change coolant method and increase volume
<b>Chipping of cutting edge</b> 	<b>Large run out after attachment to machine</b> <b>Large spindle run out</b>	<ul style="list-style-type: none"> <li>• Check holder and/or select another one</li> <li>• Check the spindle</li> <li>• Check run out after fixing to the chuck</li> </ul>
	<b>Drilling speed or feed rate</b>	Reduce drilling or feed rate
	<b>Relief angle is too small</b>	Regrind correctly
	<b>Tool not suitable for work material</b>	Use the most suitable tool material
<b>Abnormal wear on the corner part</b> 	<b>Regrinding should have occurred earlier</b>	Regrind sooner
	<b>Poor alignment accuracy</b>	Check /adjust alignment before drilling
	<b>Drilling speed or feed rate too high</b>	Decrease the drilling speed
	<b>Point shape is inappropriate</b>	Select correct point dimensions
	<b>Tool not suitable for work material</b>	Use the most suitable tool material
	<b>Inappropriate coolant type</b>	Change coolant



# TROUBLE SHOOTING

Technical | Drills

## Drilling

Dimensional Accuracy		
Specific Problem	Cause	Solution
Wear, chipping and crushing of the chisel edge	Feed rate is too high	Decrease feed rate
	Point shape is inappropriate	Select correct point dimensions
	Tool not suitable for work material	Choose suitable tool material
	Relief angle is too small	Regrind precisely
Chipping of the margin	Bush size is too large	Select correct bush size
Margin build-up	High heat generation due to large wear on the cutting edge	Regrind correctly
	Coolant is not sufficient	Change coolant method and increase volume
	Coolant is not suitable	Change coolant
	Bad chip discharging / Ductile material	Change drills or alter cutting conditions
Tang breakage	Shank slippage due to defect	Eliminate the defect
	Defective inner surface of morse taper holder	Change holders or correct the surface of the morse taper holder
	Inaccurate regrinding	Regrind correctly
Chattering sounds	Relief angle is too large	Regrind correctly
	Low tool rigidity	Use a more rigid drill
Chips roll around the drill	Long chips Chips are stuck in the flute	Change drill and cutting conditions
One-sided wear	Poor alignment accuracy	Check/adjust the alignment
	Large run out after attachment to machine	Decrease run out when fixing to the chuck





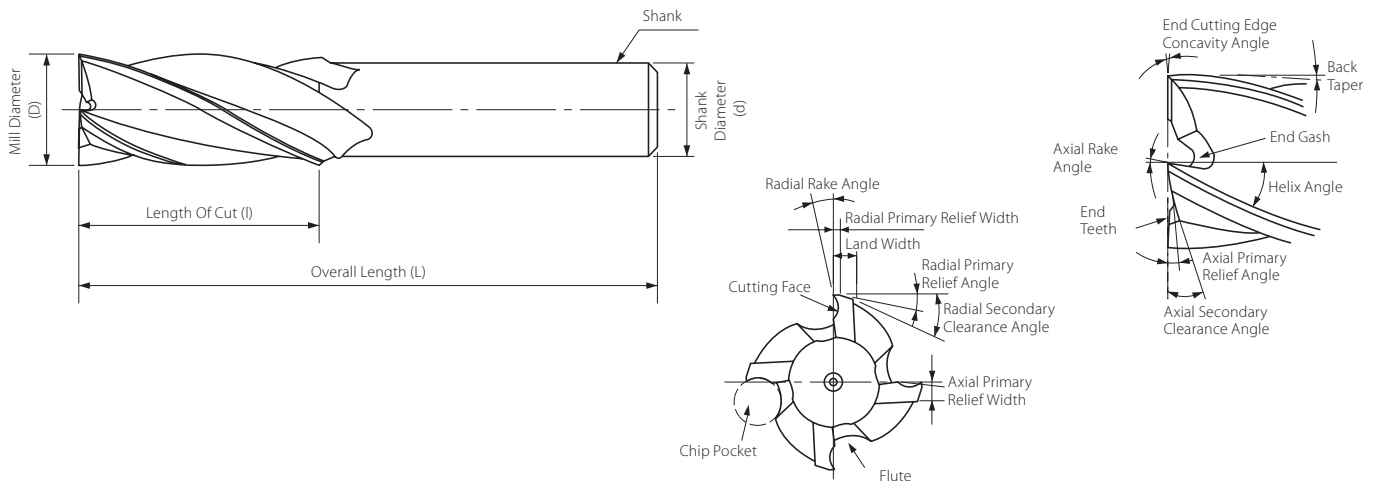




# INFORMATION

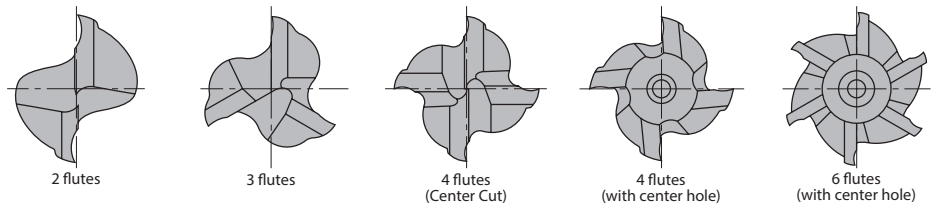
## Technical | Endmills

### Terminology



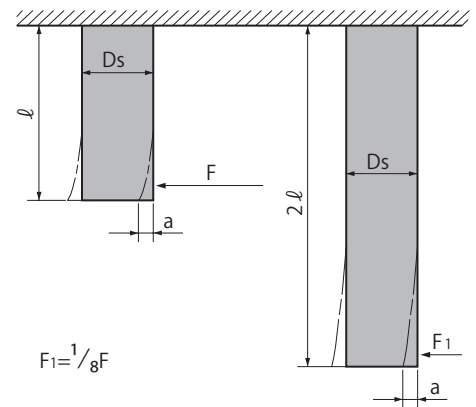
### Number of flutes

The number of flutes should be determined by the work material, dimensions of the work piece and milling conditions. In general, an end mill with a small number of flutes and large chip room is used for roughing, and an end mill with a large number of flutes is used for finishing.



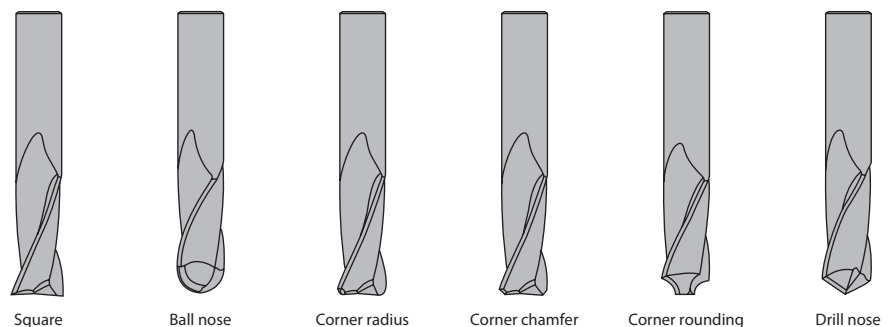
### Length of cut

The shorter the end mill, the smaller the deflection and the stronger the rigidity. Because rigidity varies in proportion to length of cut by a factor to the power of 3 (for example, when the length of cut doubles, the rigidity decreases to 1/8), it is necessary to keep the length of cut as short as possible.



### End profile

Stocked end profiles are typically square end ball nose and corner radius, Corner chamfer, corner rounding and drill nose end profiles can be supplied via special order.



# TROUBLE SHOOTING

Technical | Endmills

## Milling

Dimensional Accuracy		
Specific Problem	Cause	Solution
Chip packing	<p>Too great cutting amount</p> <p>Not enough chip room</p> <p>Not enough coolant pressure</p>	<ul style="list-style-type: none"> <li>• Adjust feed or speed</li> <li>• Use end mill with fewer flutes</li> <li>• Apply more coolant. Use air</li> </ul>
Rough surface finish	<p>Feed too fast</p> <p>Slow speed</p> <p>Too much wear</p> <p>Chip biting</p> <p>No end tooth concavity</p>	<ul style="list-style-type: none"> <li>• Slow down to correct feed</li> <li>• Use higher speed</li> <li>• Regrind earlier stage</li> <li>• Cut less amount per pass</li> <li>• Add margin (touch primary with oilstone)</li> </ul>
Burr	<p>Too much wear on primary relief</p> <p>Incorrect conditions</p> <p>Improper cutting angle</p>	<ul style="list-style-type: none"> <li>• Regrind sooner</li> <li>• Correct milling conditions</li> <li>• Change to correct cutting edge</li> </ul>
No dimensional accuracy	<p>Too tough conditions</p> <p>Lack of accuracy (machine &amp; holder)</p> <p>Not enough rigidity (machine &amp; holder)</p> <p>Not sufficient number of flutes</p>	<ul style="list-style-type: none"> <li>• Change to easier condition</li> <li>• Repair machine or holder</li> <li>• Change machine or holder or condition</li> <li>• Use end mill with greater number of flutes</li> </ul>
No perpendicular side	<p>Feed too fast</p> <p>Too great cutting amount</p> <p>Too long flute length or long overall length</p> <p>Not sufficient number of flutes</p>	<ul style="list-style-type: none"> <li>• Slow down to correct feed</li> <li>• Reduce cutting amount</li> <li>• Use proper length tool. Hold shank deeper</li> <li>• Use end mill with greater number of flutes</li> </ul>



# TROUBLE SHOOTING

Technical | Endmills

## Milling

Dimensional Accuracy		
Specific Problem	Cause	Solution
Chipping	<p>Feed too fast Feed too fast on first cut Not enough rigidity of machine tool &amp; holder Loose tool holder Loose fixture (workpiece) Lack of rigidity (tool)</p> <p>Teeth too sharp</p>	<ul style="list-style-type: none"> <li>• Slow down to proper feed</li> <li>• Slow down on first bite</li> <li>• Change rigid machine tool or holder</li> <li>• Tighten tool holder</li> <li>• Tighten workpiece fixture</li> <li>• Use shortest end mill available. Hold shank deeper. Try down cut.</li> <li>• Change to lower cutting edge, primary relief</li> </ul>
Wear	<p>Speed too fast Hard material</p> <p>Biting chips</p> <p>Improper feed speed (too slow) Improper cutting angle Too low primary relief angle</p>	<ul style="list-style-type: none"> <li>• Slow down, use more coolant</li> <li>• Use higher grade, tool material, add surface treatment</li> <li>• Change feed speed to change chip size or clear chips with coolant or air pressure</li> <li>• Increase feed speed. Try down cut</li> <li>• Change to correct cutting angle</li> <li>• Change to larger relief angle</li> </ul>
Breakage	<p>Feed too fast Too large cutting amount Too long flute length or long overall length Too much wear</p>	<ul style="list-style-type: none"> <li>• Slow down feed</li> <li>• Adjust to smaller cutting amount per teeth</li> <li>• Hold shank deeper, use shorter end mill</li> <li>• Regrind at earlier stage</li> </ul>
Chattering	<p>Feed and speed too fast Not enough rigidity</p> <p>Too much relief angle</p> <p>Loose holder (workpiece) Cutting too deep Too long flute length or long overall length</p>	<ul style="list-style-type: none"> <li>• Correct feed and speed</li> <li>• Use better machine tool or holder or change conditions</li> <li>• Change to smaller relief angle. Add margin (touch primary with oilstone)</li> <li>• Hold workpiece tighter</li> <li>• Correct to smaller cutting depth</li> <li>• Hold shank deeper, use shorter end mill or try down cut</li> </ul>
Short tool life (dull teeth)	<p>Too much cutting friction Tough work material Improper cutting angle</p>	<ul style="list-style-type: none"> <li>• Regrind at earlier stage</li> <li>• Select premium tool</li> <li>• Change cutting angle &amp; primary</li> </ul>











*shaping your dreams*

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