Solid Carbide Milling – Inch Assortment

Highest Performance. Highest Quality.

CERATIZIT is a high-technology engineering group specialised in cutting tools and hard material solutions.

Tooling a Sustainable Future

www.ceratizit.com

CERATIZIT GROUP

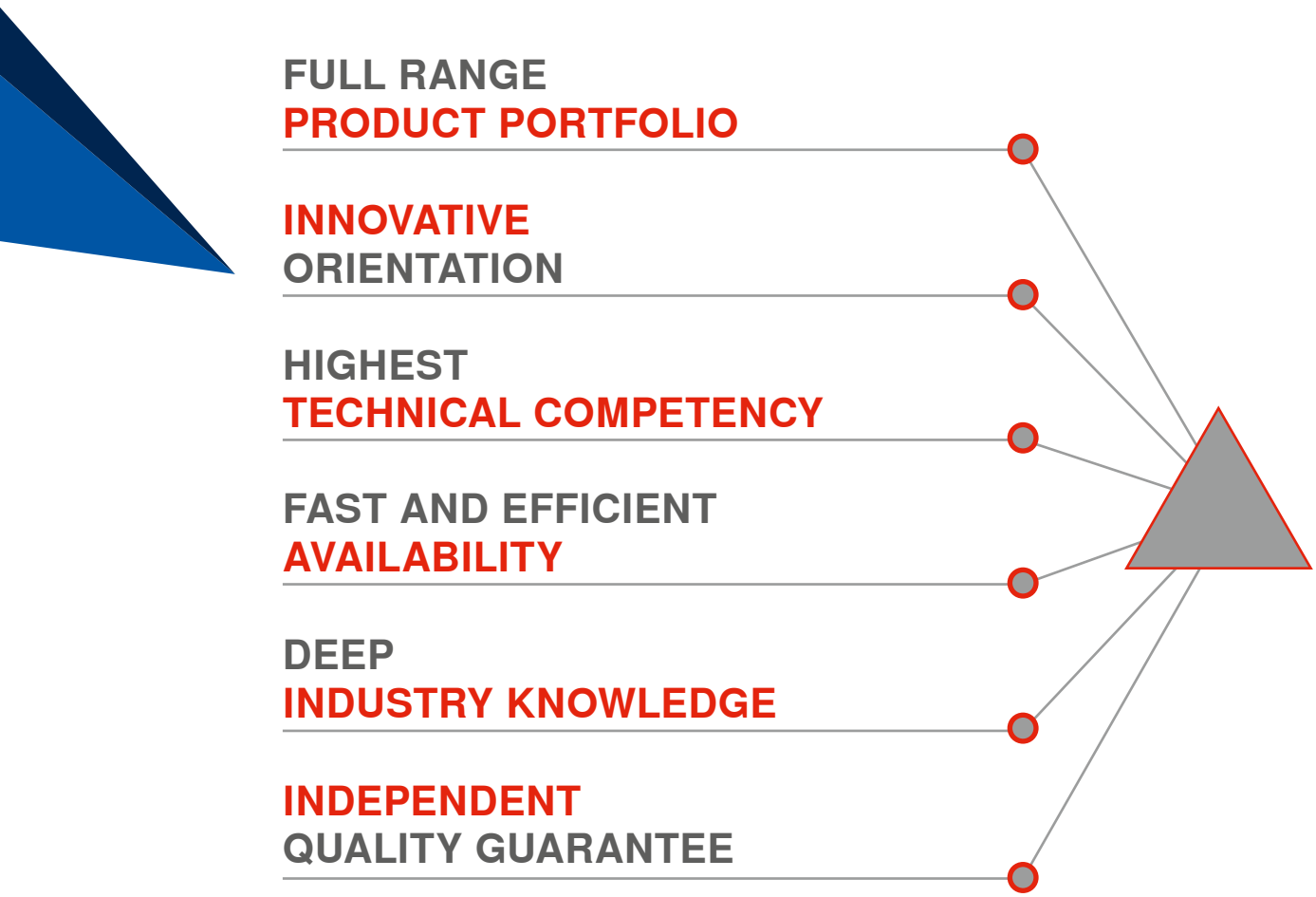
WE PROVIDE YOU WITH THE IDEAL MACHINING SOLUTION

Team Cutting Tools of the CERATIZIT Group

The machining industry today is diverse and becoming increasingly complex. Trends and innovations are moving quickly, and the possibilities and offerings seem virtually unlimited. For this reason, it is important to have a reliable and competent partner on board.

Team Cutting Tools is not just a tool supplier. We are partners who can provide advice, extensive industry knowledge, and decades of experience to provide the ideal machining solution.

The Cutting Tool Solution is



INDEPENDENT
QUALITY GUARANTEE

The CERATIZIT Group: everything from a single source, from the raw material to the finished tool

As part of the CERATIZIT group, we have exclusive raw material sourcing and many resources through the entire supply chain. From the mine to powder production, shaping, sintering, surface finishing and all the way to recycling, we ensure our customers the highest quality.

From our R&D strength, such as the development of new powder types, to our technical sales network and consulting expertise, you benefit from our vast experience and resources and a "one stop shop" for cutting tools.

INNOVATIVE ORIENTATION

Machining at the highest technological level

Team Cutting Tools can help you develop consistent, reliable process optimization through advanced technologies such as Dragonskin high-performance coating, 3D printed tools, and intelligent and customer-oriented digitalization through sensor, monitoring and assistance systems.

TOOLSCOPE

Machine monitoring solution with digital and sensory intelligence

FREETURN

Revolutionary turning process, High Dynamic Turning, with FreeTurn Tools

ACTUATING TOOLS

U-Axis tooling and KOMtronic is an efficient machining of turning contours on rotationally symmetrical parts

ADDITIVE MANUFACTURING

Customized 3D printed tooling solutions allow for high speed and lightweight machining

DRAGONSKIN

Available on a wide variety of tools, Dragonskin coating provides additional protection against heat and wear for extended tool life for up to 80% increased performance

HIGHEST
TECHNICAL COMPETENCY

Stay up-to-date about market requirements with technical support

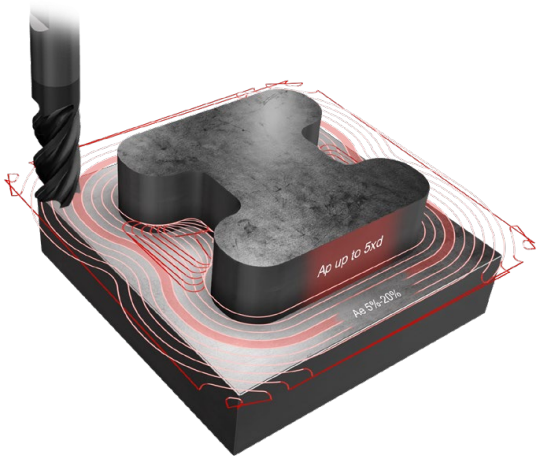
Application engineers and industry experts from Team Cutting Tools are partners in your success. From training courses online and at our Technical Centers, to on-site testing and process planning, we share our technical knowledge to help you stay current with the latest technology. Additional services such as to regrinding, reconditioning and digital access to downloadable CAD models, allow you to be more productive and efficient in an easy, flexible and environmentally friendly manner.

YOUR PERSONAL APPLICATION OR SALES ENGINEER

Manufacturing consulting and process optimization on site

TOOL DATA

Cutting data and CAD models to assist you with your tool management or for simulating a machining process



TECHNICAL COMPETENCY

We invest in both internal education and training to strengthen our internal competency. With knowledgeable field-based sales engineers, application engineers for industry segments and a dedicated technical support team, we assist customers to drive the industry forward with projects that focus on future technologies.

SUSTAINABILITY

Sustainable solutions to drive economical metal cutting include implementing lean manufacturing principles, ToolScope machine monitoring, and tool regrinding and repair services.

FAST AND EFFICIENT AVAILABILITY

EFFICIENT LOGISTICS

Well stocked inventory at our modern logistics center means fast turnaround time from order to delivery to keep your operation running smoothly.

ONLINE SOLUTIONS

Register on our website to benefit from extensive product data, downloadable files, and machining knowledge online.

CUSTOM TOOL ORDER AND DELIVERY

Contact your personal sales engineer to learn more about customized tool prices and delivery times.

DEEP
INDUSTRY KNOWLEDGE

Our experts deliver comprehensive solutions for every industry sector

With over 100 years of engineering and manufacturing experience of high-performance cutting tools, take advantage of our extensive experience in automotive, aerospace, energy technology, medical and heavy machining. Tailor made solutions help meet the specific demands of each industry sector.

PROJECT ENGINEERING

Smart solution concepts for efficient machining processes

EXPERT KNOWLEDGE

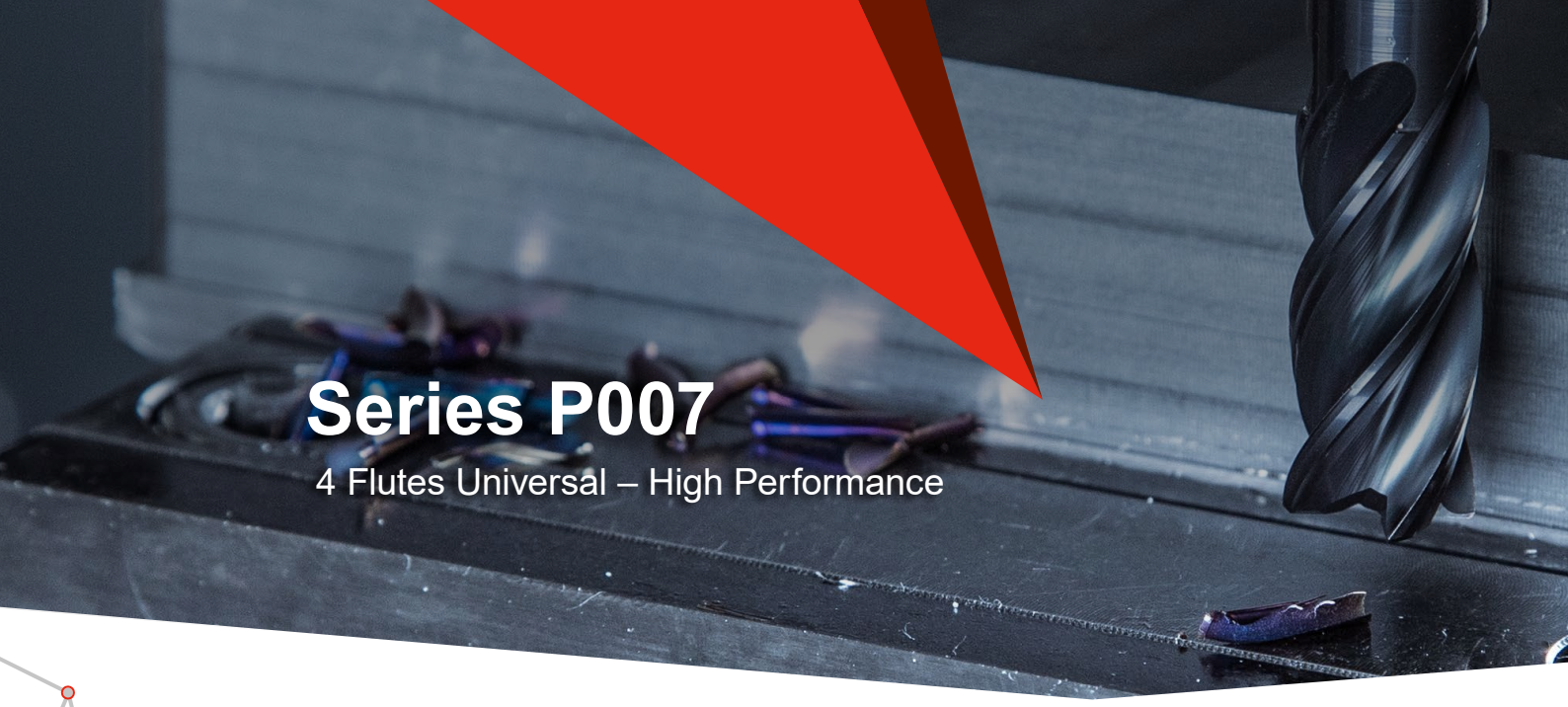
Extensive experience with high-performance cutting tools means that we provide optimal machining operations and processes for our customers.

INDUSTRY SPECIFIC TOOLS

Specific tools designed to meet the most demanding challenges in every industrial sector to provide a competitive advantage for our customers.

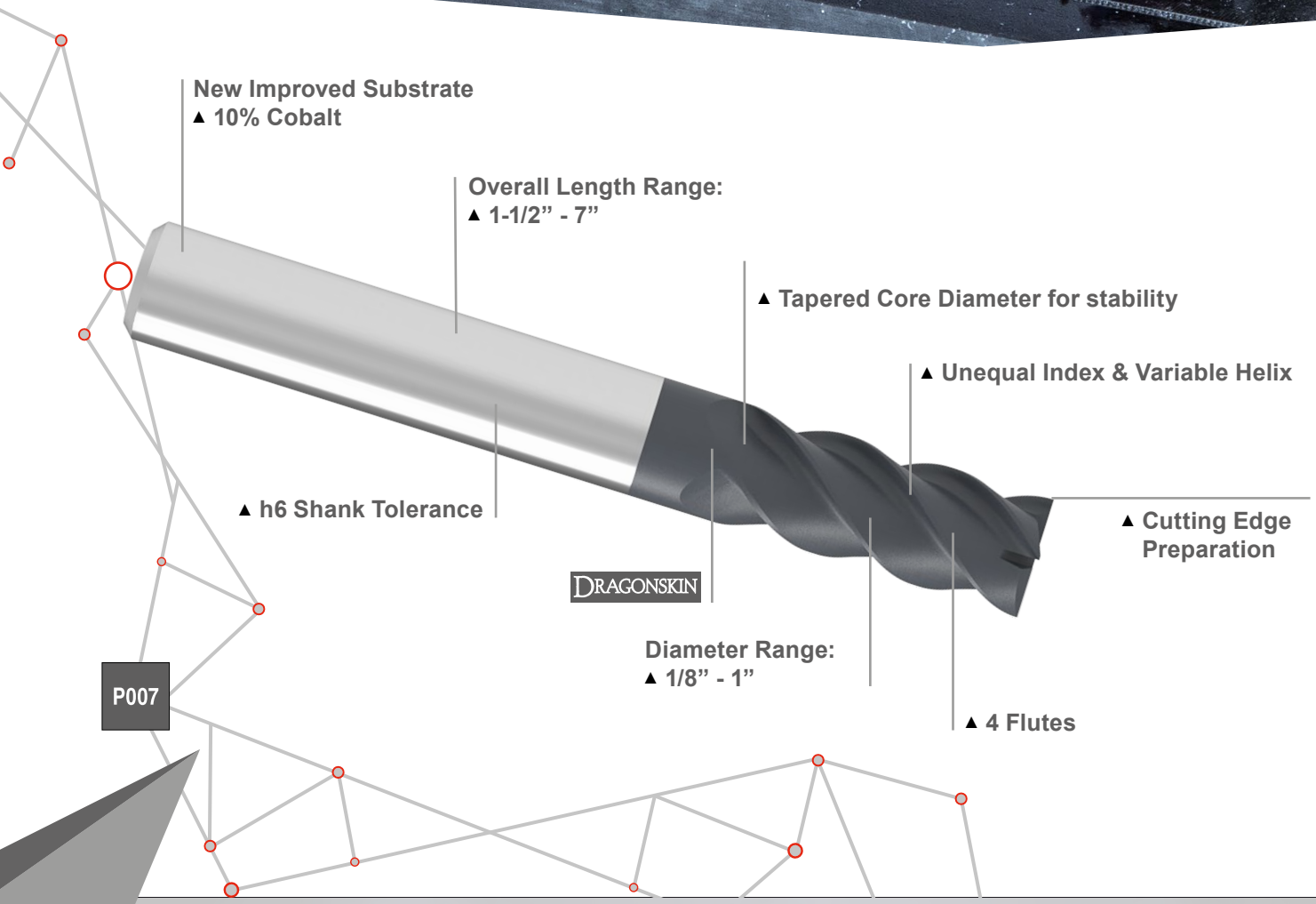
CUSTOM SOLUTIONS

Customized solutions to meet your specific machining challenges.



Series P007

4 Flutes Universal – High Performance



Series P007

High performance end mills

Designed for both roughing and finishing for a wide range of applications in:

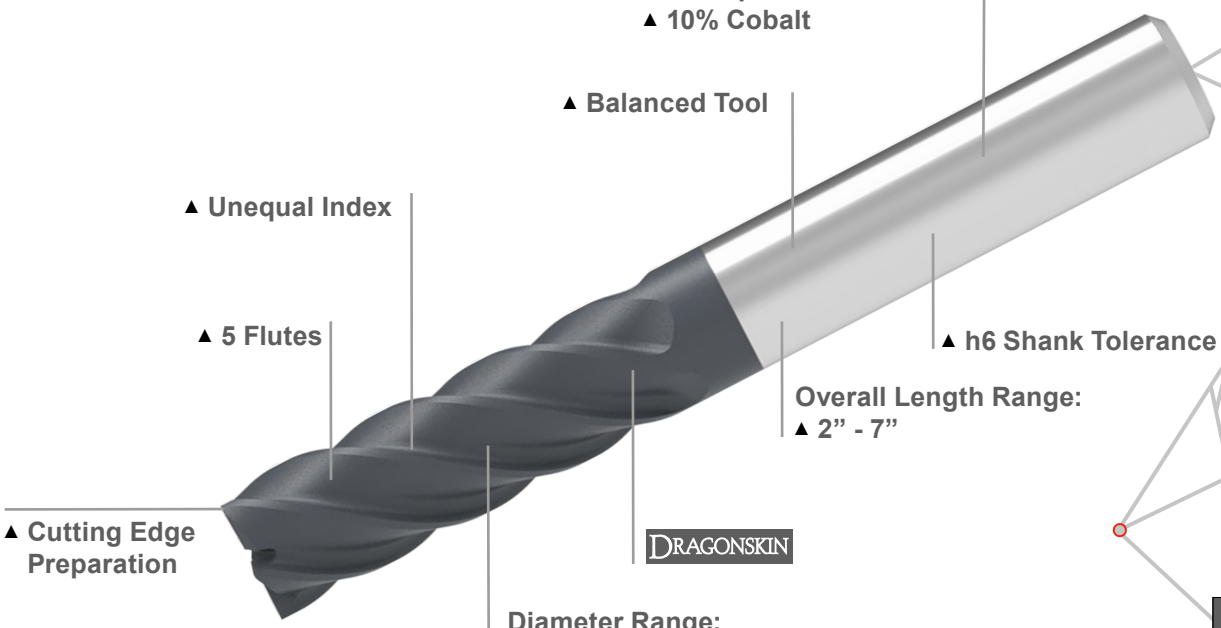
- ▲ Steel
- ▲ Tool Steel
- ▲ Stainless Steel
- ▲ Titanium
- ▲ High Temperature Alloys
- ▲ Cast Iron
- ▲ Copper, Brass
- ▲ Ferrous Aircraft and Aerospace materials including hard Aluminum

Works with a variety of parameters.

Series P556

5 Flutes Universal – High Performance

CUTTING SOLUTIONS BY CERATIZIT



P556

Series P556

High performance end mills

Designed for both roughing and finishing for a wide range of applications in:

- ▲ Steel
- ▲ Tool Steel
- ▲ Stainless Steel
- ▲ Titanium
- ▲ High Temperature Alloys
- ▲ Cast Iron

Works with a variety of parameters.

DRAGONSKIN

Table of contents

More solid carbide milling cutters, including metric dimensions, can be found in the Cutting Tools - International Metric catalog.

CERATIZIT \ Performance

Premium quality tools for high performance.

The premium quality tools from the **CERATIZIT Performance** product line have been designed for specific applications and are distinguished by their outstanding performance. If you make high demands on the performance of your production and want to achieve the very best results, we recommend the Premium tools in this product line.

CERATIZIT \ Standard

Quality tools for standard applications.

The quality tools of the **CERATIZIT Standard** product line are high quality, powerful and reliable and enjoy the highest trust of our customers worldwide. Tools from this product line are the first choice for many standard applications and guarantee optimal results.

Symbol explanation

Shank

DIN 6535
HA
HB

Shank type

Length: extra short / short / medium / long / extra long

Application

HPC — High volume machining

Machining example

The red arrows describe the possible feed directions

ZEFP — Number of flutes

λ_s=48°
γ_s=10°

Cutting geometry
λ_s = Helix Angle
γ_s = Rake Angle

Cutting edge preparation

Square end

Corner chamfer (CHW = chamfer width in inch)

Corner radius

Full Radius

● = **Main Application**

○ = Extended application

Toolfinder

softer — Material to machine — harder

Finish milling

P		•	• Steel
M		•	Stainless steel
K		•	Cast iron
N	•		Non-ferrous metals
S		•	Heat resistant alloys
H			• Hardened steel
O			Non metal materials


15–24

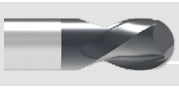

25–56


77–101


102–103


104–109


44–54

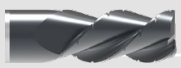

90–101

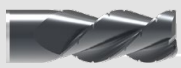

102–103


104–109

Rough and finish machining

P	•	Steel
M	•	Stainless steel
K	•	Cast iron
N	•	Non-ferrous metals
S	•	Heat resistant alloys
H		Hardened steel
O		Non metal materials


57+58


59–68


44–54

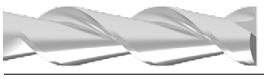
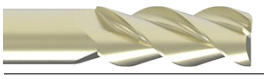
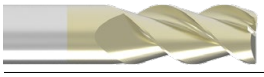
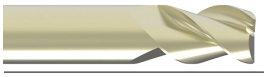
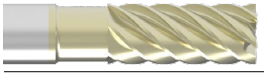
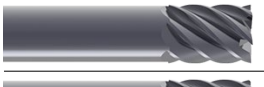
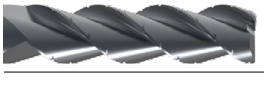
Rough machining

P	•	Steel
M	•	Stainless steel
K	•	Cast iron
N	•	Non-ferrous metals
S	•	Heat resistant alloys
H		Hardened steel
O		Non metal materials

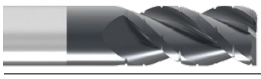
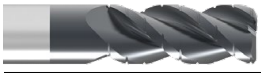
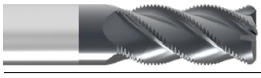
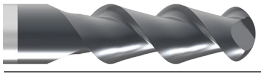

64+65


69–76

Overview High Performance Milling Cutters

	Series	Tool type	Number of flutes ZEFP	Diameter in inch Ø DC	Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat-resistant	Tempered steel	Non-metal materials	Square end	Corner chamfer	Corner radius	Full Radius	Length	Tool design	coated	uncoated	CERATIZIT \ Standard CERATIZIT \ Performance
	P220	AL	2	1/8"–3/4"			HA	●					■						□	15
	S142	AL	2	1/8"–1"			HA	●				■						■	□	16+17
	P109	AL	3	1/8"–1"			HA	●				■						■		18+19
	P362	AL	3	3/16"–1"			HA	●				■					HPC	■		20
	P362	AL	3	3/16"–1"			HA	●						■			HPC	■		21–23
	P376	AL	6	1/4"–1"			HA	●				■						■		24
	S642	UN	2	1/16"–1"	●	●	HA	●	●			■						■	□	25+26
	S642	UN	2	1/8"–3/4"	●	●	HA	●	●					■				■	□	27+28
	S643	UN	3	1/16"–1"	●	●	HA	●	●			■						■	□	29+30
	S643	UN	3	1/8"–1"	●	●	HA	●	●					■				■	□	31
	S644	UN	4	1/32"–1"	●	●	HA	●	●			■						■	□	33+34
	S644	UN	4	1/8"–1"	●	●	HA	●	●					■				■	□	35–43
	S645	UN	5	1/8"–1"	●	●	HA					■						■	□	44
	P007	UN	4	1/8"–1"	●	●	HA	●	●			■					HPC	■		45
	P007	UN	4	1/8"–1"	●	●	HA	●	●					■			HPC	■		46–49
	P556	UN	5	1/4"–1"	●	●	HA		●			■					HPC	■		50
	P556	UN	5	1/4"–1"	●	●	HA		●					■			HPC	■		51–54
	P160	UN	7	1/4"–1"	●	●	HA	●	●			■					HPC	■		55
	P161	UN	7	1/4"–1"	●	●	HA	●	●					■			HPC	■		56
	P119	AL	3	1/8"–1"			HA	●						■				■		57+58
	P117	UN	3	1/8"–3/4"	●	●	HA	●	●					■				■		59
	P120	UN	4	3/8"–1"	●		HA			HB				■			HPC	■		60–62

Overview High Performance Milling Cutters

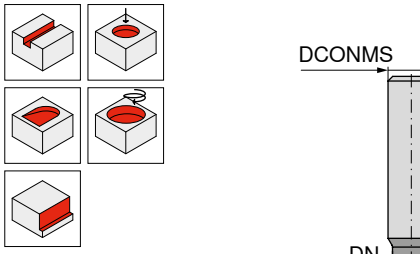
	Series	Tool type	Number of flutes ZEFP	Diameter in inch Ø DC	Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat-resistant	Tempered steel	Non-metal materials	Square end	Corner chamfer	Corner radius	Full Radius	Length	Tool design	coated	uncoated	CERATIZIT \ Standard	CERATIZIT \ Performance
	P121	UN	5	3/4“–1“	●	●	●		●					■			HPC	■			63
	P102	AL	3	3/16“–1“				●						■				■			64–66
	P190	UN	4	3/16“–1“	●		●					■					HPC	■			67
	P191	UN	4	3/16“–1“	●		●							■			HPC	■			68
	P100	UN	3	3/16“	●		●							■				■			69
	P100	UN	4	1/4“–3/4“	●		●							■				■			70+71
	P100	UN	5	1“	●		●							■				■			72
	P101	Ti	3	3/16“	●		●							■			HPC	■			73
	P101	Ti	4	1/4“–3/4“	●		●							■			HPC	■			74+75
	P101	Ti	5	1“	●		●							■				■			76
	S662	UN	2	1/16“–1“	●	●	●	●	●						■			■	□	77+78	
	S663	UN	3	1/8“–1“	●	●	●	●	●						■			■	□	79–81	
	P157	UN	4	1/8“–1“	●	●	●	●							■		HPC	■			82
	S664	UN	4	1/32“–1“	●	●	●	●							■			■	□	83+84	
	P250	ST	2	1/8“–1/2“	●	●	●	●	●						■			■			85
	P251	UN	2	0.031“–0.187“	●	●	●	●	●						■			■			86
	P252	UN	2	0.031“–0.187“	●	●	●	●	●						■			■			87
	P253	UN	2	0.031“–0.187“	●	●	●	●	●						■			■			88
	P254	UN	2	0.031“–0.187“	●	●	●	●	●						■			■			89
	P501	UN	4	0.005“–0.120“	●	●	●	●	●			■						■			90–92
	P504	UN	4	0.005“–0.120“	●	●	●	●	●			■						■			93–95
	P503	UN	4	0.005“–0.120“	●	●	●	●	●						■			■			96–98

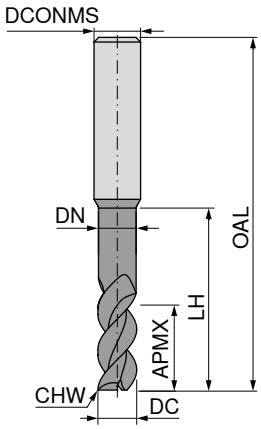
Overview High Performance Milling Cutters

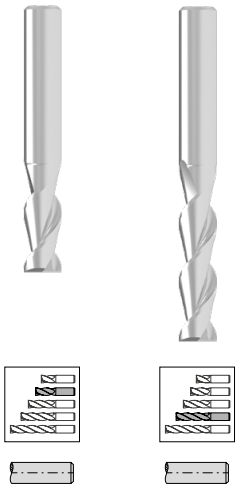
	Series	Tool type	Number of flutes ZEFP	Diameter in inch Ø DC	Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat-resistant	Tempered steel	Non-metal materials	Square end	Corner chamfer	Corner radius	Full Radius	Length	Tool design	coated	uncoated	CERATIZIT \ Standard	CERATIZIT \ Performance
	P506	UN	4	0.005–0.120	●	●	●	●	●						■	■		■			99–101
	P137	UN	2	0.010–0.155	●		●											■	□		102
	P139	UN	4	0.010–0.155	●		●											■	□		103
	P132	UN	2	1/8–1/2	●		●											■	□		104
	P133	UN	4	1/4–1/2	●		●											■	□		105
	P134	UN	2	1/8–1/2	●		●											■	□		106
	P135	UN	4	1/4–1/2	●		●											■	□		107
	P130	UN	2	1/4–1/2	●		●											■	□		108
	P131	UN	4	1/4–1/2	●		●											■	□		109

End milling cutter

P220 | AL | λ_s=50° γ_s=7°





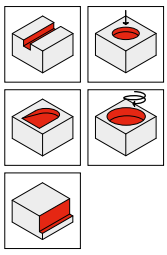


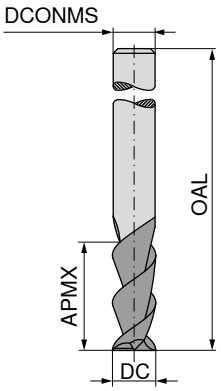
DC +0.000/-0.002 inch	APMX inch	DN inch	LH inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	CHW inch	ZEFP	59 003 ...	59 003 ...
1/8	3/8	0.120	3/4	2	1/8	0.006	2	**12530**	
3/16	7/16	0.180	3/4	2	3/16	0.006	2	**18824**	
1/4	1/2	0.240	13/16	2 1/2	1/4	0.006	2		**25020**
5/16	3/4	0.300	1	3	5/16	0.006	2		**31324**
3/8	7/8	0.360	1 1/8	3	3/8	0.006	2		**37523**
1/2	1	0.480	1 3/8	3	1/2	0.006	2	**50020**	
1/2	1 1/4	0.480	1 5/8	3 1/2	1/2	0.006	2		**50025**
5/8	1 1/4	0.600	1 7/8	4	5/8	0.006	2		**62520**
3/4	1 1/2	0.720	2 1/4	5	3/4	0.006	2		**75020**
P									
M									
K									
N								●	●
S									
H									
O									

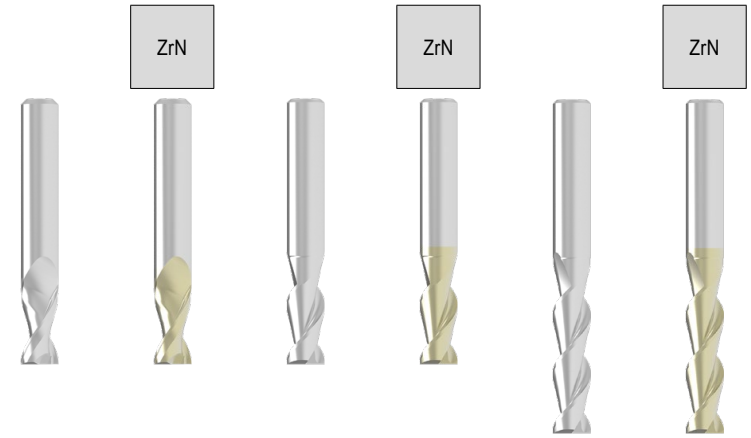
→ v_c/f_z Page 111

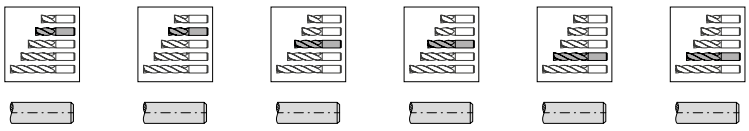
End milling cutter

S142 | AL | λ_s=40° γ_s=12°









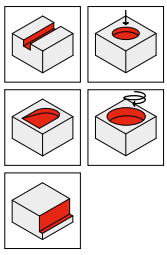
DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 053 ...	59 054 ...	59 053 ...	59 054 ...	59 053 ...	59 054 ...
1/8	1/4	1 1/2	1/8	2	**12520**	**12520**				
1/8	3/8	1 1/2	1/8	2					**12530**	**12530**
5/32	5/16	2	3/16	2	**15620**	**15620**				
5/32	9/16	2	3/16	2					**15636**	**15636**
3/16	5/16	2	3/16	2	**18817**	**18817**				
3/16	9/16	2	3/16	2					**18830**	**18830**
7/32	3/8	2	1/4	2	**21917**	**21917**				
1/4	3/8	2	1/4	2	**25015**	**25015**				
1/4	3/4	2 1/2	1/4	2					**25030**	**25030**
5/16	13/16	2 1/2	5/16	2	**31326**	**31326**				
5/16	1 1/4	4	5/16	2					**31340**	**31340**
11/32	1	2 1/2	3/8	2	**34429**	**34429**				
3/8	1/2	2 1/2	3/8	2	**37513**	**37513**				
3/8	1	2 1/2	3/8	2			**37527**	**37527**		
3/8	1 1/2	4	3/8	2					**37540**	**37540**
1/2	5/8	2 1/2	1/2	2	**50013**	**50013**				
1/2	1 1/4	3	1/2	2				**50025**	**50025**	
1/2	2	4	1/2	2			**50040**			**50040**
5/8	1 5/8	3 1/2	5/8	2					**62526**	**62526**
3/4	1	4	3/4	2	**75013**	**75013**				
3/4	1 5/8	4	3/4	2			**75022**	**75022**		
3/4	3	6	3/4	2					**75040**	**75040**
1	2	5	1	2					**99920**	**99920**

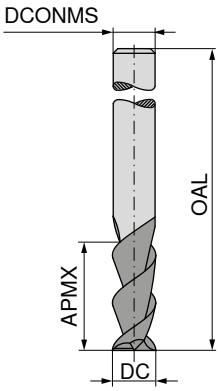
P										
M										
K										
N					●	●	●	●	●	●
S										
H										
O										

→ v_c/f_z Page 112

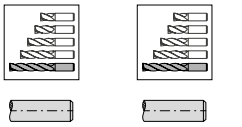
End milling cutter

S142 | AL | λ_s=40° γ_s=12°





ZrN

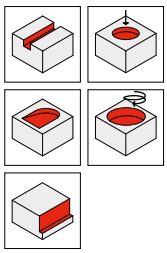


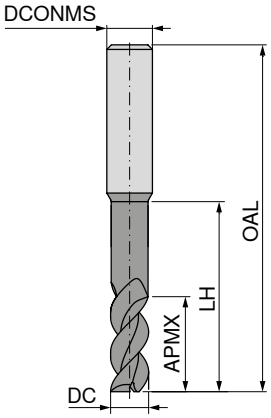
DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 053 ...	59 054 ...
1/4	1 1/4	3 1/2	1/4	2	**25050**	**25050**
5/16	2 1/8	4	5/16	2	**31368**	**31368**
3/8	2 1/2	6	3/8	2	**37567**	**37567**
1/2	3	6	1/2	2	**50060**	**50060**
3/4	4	7	3/4	2	**75053**	**75053**
1	3	6	1	2	**99930**	**99930**
P						
M						
K						
N					●	●
S						
H						
O						

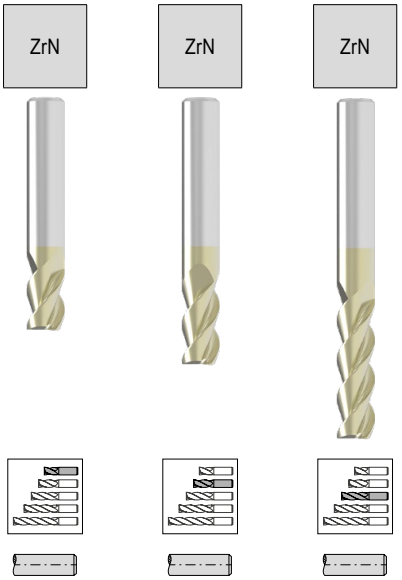
→ v_c/f_z Page 112

End milling cutter

P109 | AL | λ_s=40° γ_s=15°







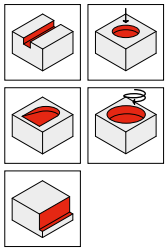
DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 027 ...	59 027 ...	59 027 ...
1/8	1/4	1 1/2	1/8	3		**12520**	
5/32	3/8	2	3/16	3		**15624**	
3/16	3/8	2	3/16	3		**18820**	
7/32	3/8	2	1/4	3		**21917**	
1/4	3/8	2	1/4	3	**25015**		
1/4	3/4	2 1/2	1/4	3		**25030**	
1/4	1 1/4	3	1/4	3			**25050**
9/32	1/2	2 1/2	5/16	3		**28118**	
5/16	1/2	2 1/2	5/16	3		**31316**	
3/8	5/8	2	3/8	3	**37517**		
3/8	7/8	2 1/2	3/8	3		**37523**	
3/8	1 1/2	3 1/2	3/8	3			**37540**
7/16	1	2 3/4	7/16	3		**43823**	
1/2	5/8	2 1/2	1/2	3		**50013**	
1/2	1 1/2	3 1/2	1/2	3			**50030**
5/8	7/8	3	5/8	3		**62514**	
5/8	1 3/4	4	5/8	3			**62528**
3/4	1	3	3/4	3		**75013**	
3/4	2 1/2	5	3/4	3			**75033**
1	2 3/4	5	1	3			**99928**

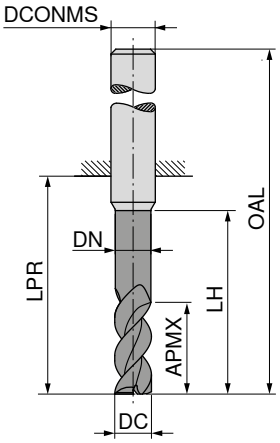
P			
M			
K			
N	●	●	●
S			
H			
O			

→ v_c/f_z Page 113

End milling cutter

P109 | AL | λ_s=40° γ_s=15°





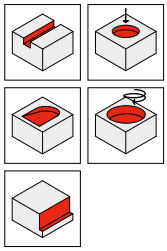
DC +0.000/-0.002 inch	APMX inch	DN inch	LH inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 027 ...	59 027 ...
1/8	1/2			1 1/2	1/8	3	**12540**	
5/32	1/2			2	3/16	3	**15632**	
3/16	5/8			2	3/16	3	**18833**	
7/32	3/4			2 1/2	1/4	3	**21934**	
1/4	3/4	0.240	2 1/8	4	1/4	3	**25130**	
1/4	1 1/2			3 1/2	1/4	3		**25060**
9/32	3/4			2 1/2	5/16	3	**28127**	
5/16	3/4			2 1/2	5/16	3	**31324**	
3/8	1	0.360	2 3/8	6	3/8	3	**37527**	
3/8	2			4	3/8	3		**37553**
1/2	1 1/4			3	1/2	3	**50025**	
1/2	2			4	1/2	3		**50040**
9/16	1 1/4			3 1/2	9/16	3	**56322**	
5/8	1 1/4			3 1/2	5/8	3	**62520**	
5/8	2 1/2			5	5/8	3		**62540**
3/4	1 5/8			4	3/4	3	**75022**	
3/4	3 1/4			6	3/4	3		**75043**
1	1 3/4			4	1	3	**99918**	
1	3 3/8			6	1	3		**99934**

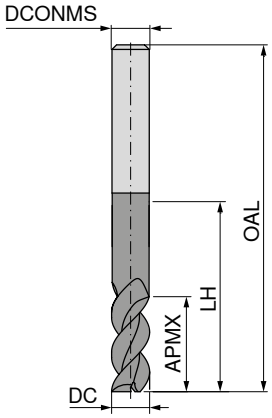
P		
M		
K		
N	●	●
S		
H		
O		

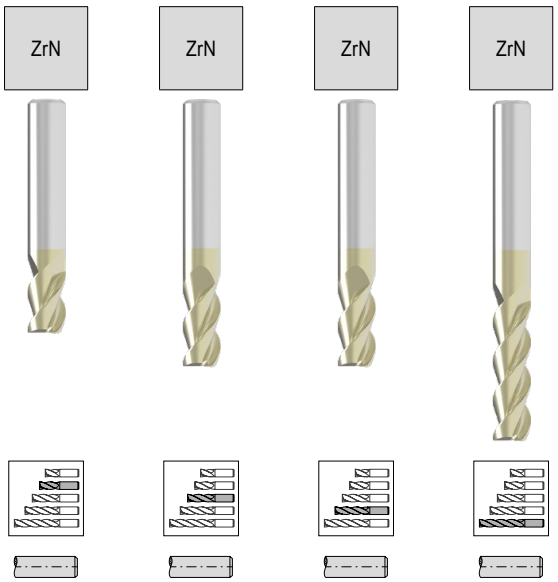
→ v_c/f_z Page 113

End milling cutter

P362 | AL | λ_s=43° 45° 48° γ_s=13° | HPC







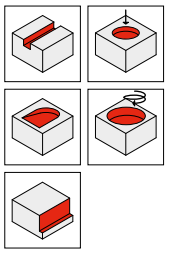
DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 004 ...	59 004 ...	59 004 ...	59 004 ...
3/16	3/8	2	3/16	3	**18820**			
3/16	3/4	2 1/2	3/16	3			**18840**	
3/16	1	3	3/16	3				**18853**
1/4	3/8	2	1/4	3	**25015**			
1/4	3/4	2 1/2	1/4	3			**25030**	
1/4	1	3	1/4	3				**25040**
3/8	1/2	2	3/8	3	**37513**			
3/8	1	2 1/2	3/8	3			**37527**	
3/8	1 1/2	3 1/2	3/8	3				**37540**
1/2	5/8	2 1/2	1/2	3	**50013**			
1/2	1	3	1/2	3		**50020**		
1/2	1 1/4	3	1/2	3			**50025**	
1/2	1 5/8	4	1/2	3				**50033**
1/2	2	4	1/2	3				**50040**
5/8	3/4	3	5/8	3	**62512**			
5/8	1 1/4	3 1/2	5/8	3		**62520**		
5/8	1 5/8	4	5/8	3			**62526**	
3/4	1	3	3/4	3	**75013**			
3/4	1 5/8	4	3/4	3			**75022**	
3/4	2 1/4	5	3/4	3				**75030**
1	1 1/4	4	1	3	**99913**			
1	2	5	1	3			**99920**	
1	3 1/4	6	1	3				**99933**
P								
M								
K								
N					●	●	●	●
S								
H								
O								

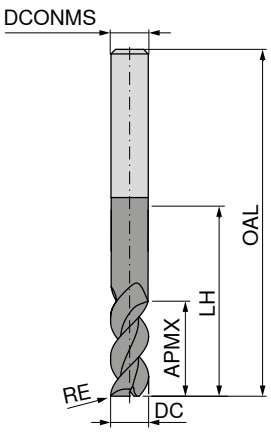
→ v_c/f_z Page 114

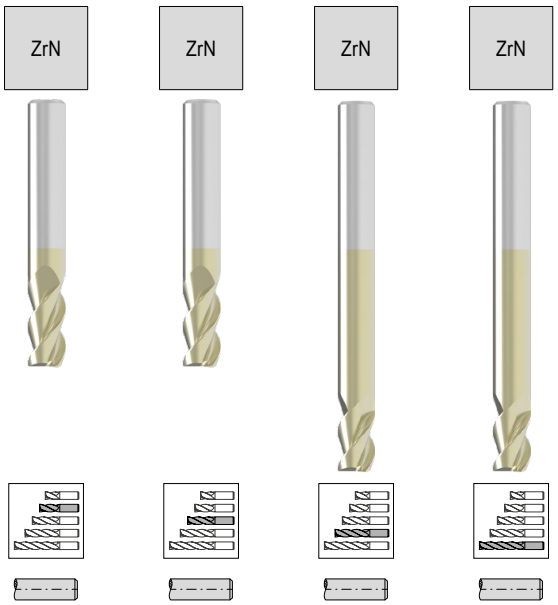
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001 for Ø ≤ 0.060
+/- 0.0015 for Ø > 0.060

P362 | AL | λ_s=43° 45° 48° γ_s=13° | HPC







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 004 ...							
3/16	0.015	3/8	2	3/16	3	90020							
3/16	0.030	3/8	2	3/16	3	90120							
3/16	0.015	3/4	2 1/2	3/16	3					90040			
3/16	0.030	3/4	2 1/2	3/16	3					90140			
3/16	0.015	1	3	3/16	3							90053	
3/16	0.030	1	3	3/16	3							90153	
1/4	0.015	3/8	2	1/4	3	90015							
1/4	0.030	3/8	2	1/4	3	90115							
1/4	0.060	3/8	2	1/4	3	90215							
1/4	0.015	3/4	2 1/2	1/4	3					90030			
1/4	0.030	3/4	2 1/2	1/4	3					90130			
1/4	0.060	3/4	2 1/2	1/4	3					90230			
1/4	0.015	1	3	1/4	3							90240	
1/4	0.030	1	3	1/4	3							90340	
1/4	0.060	1	3	1/4	3							90440	
3/8	0.015	1/2	2	3/8	3	90013							
3/8	0.030	1/2	2	3/8	3	90113							
3/8	0.060	1/2	2	3/8	3	90213							
3/8	0.090	1/2	2	3/8	3	90313							
3/8	0.015	1	2 1/2	3/8	3	90027							
3/8	0.030	1	2 1/2	3/8	3	90127							
3/8	0.060	1	2 1/2	3/8	3	90227							
3/8	0.090	1	2 1/2	3/8	3	90327							
3/8	0.015	1 1/2	3 1/2	3/8	3							90540	
3/8	0.030	1 1/2	3 1/2	3/8	3							90640	
3/8	0.060	1 1/2	3 1/2	3/8	3							90740	
3/8	0.090	1 1/2	3 1/2	3/8	3							90840	
1/2	0.015	5/8	2 1/2	1/2	3	90413							
1/2	0.030	5/8	2 1/2	1/2	3	90513							
1/2	0.060	5/8	2 1/2	1/2	3	90613							
1/2	0.090	5/8	2 1/2	1/2	3	90713							
1/2	0.125	5/8	2 1/2	1/2	3	90813							
1/2	0.015	1	3	1/2	3			90220					
1/2	0.030	1	3	1/2	3			90320					
1/2	0.060	1	3	1/2	3			90420					
1/2	0.090	1	3	1/2	3			90520					
1/2	0.125	1	3	1/2	3			90620					
1/2	0.015	1 1/4	3	1/2	3					90025			
1/2	0.030	1 1/4	3	1/2	3					90125			
P													
M													
K													
N						●		●		●		●	
S													
H													
O													

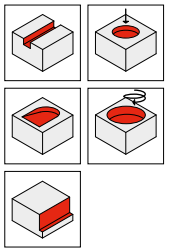
→ v_c/f_z Page 114

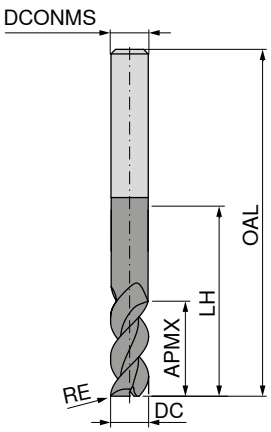
Continued on next page

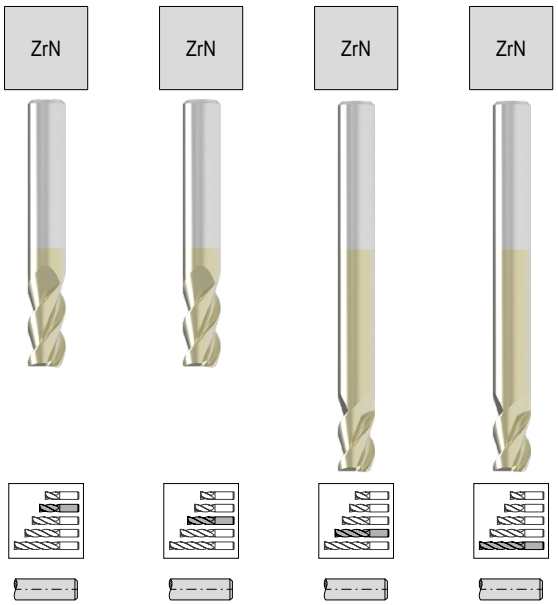
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001 for Ø ≤ 0.060
+/- 0.0015 for Ø > 0.060

P362 | AL | λ_s=43° 45° 48° γ_s=13° | HPC







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 004 ...	59 004 ...	59 004 ...	59 004 ...
1/2	0.060	1 1/4	3	1/2	3			90225	
1/2	0.090	1 1/4	3	1/2	3			90325	
1/2	0.125	1 1/4	3	1/2	3			90425	
1/2	0.015	1 5/8	4	1/2	3				90033
1/2	0.030	1 5/8	4	1/2	3				90133
1/2	0.060	1 5/8	4	1/2	3				90233
1/2	0.090	1 5/8	4	1/2	3				90333
1/2	0.125	1 5/8	4	1/2	3				90433
1/2	0.015	2	4	1/2	3				90940
1/2	0.030	2	4	1/2	3				91040
1/2	0.060	2	4	1/2	3				91140
1/2	0.090	2	4	1/2	3				91240
1/2	0.125	2	4	1/2	3				91340
5/8	0.030	3/4	3	5/8	3	90012			
5/8	0.060	3/4	3	5/8	3	90112			
5/8	0.090	3/4	3	5/8	3	90212			
5/8	0.125	3/4	3	5/8	3	90312			
5/8	0.030	1 1/4	3 1/2	5/8	3		90720		
5/8	0.060	1 1/4	3 1/2	5/8	3		90820		
5/8	0.090	1 1/4	3 1/2	5/8	3		90920		
5/8	0.125	1 1/4	3 1/2	5/8	3		91020		
5/8	0.030	1 5/8	4	5/8	3			90026	
5/8	0.060	1 5/8	4	5/8	3			90126	
5/8	0.090	1 5/8	4	5/8	3			90226	
5/8	0.125	1 5/8	4	5/8	3			90326	
3/4	0.030	1	3	3/4	3	90913			
3/4	0.060	1	3	3/4	3	91013			
3/4	0.090	1	3	3/4	3	91113			
3/4	0.125	1	3	3/4	3	91213			
3/4	0.190	1	3	3/4	3	91313			
3/4	0.250	1	3	3/4	3	91413			
3/4	0.030	1 5/8	4	3/4	3			90022	
3/4	0.060	1 5/8	4	3/4	3			90122	
3/4	0.090	1 5/8	4	3/4	3			90222	
3/4	0.125	1 5/8	4	3/4	3			90322	
3/4	0.190	1 5/8	4	3/4	3			90422	
3/4	0.250	1 5/8	4	3/4	3			90522	
3/4	0.030	2 1/4	5	3/4	3				90330
3/4	0.060	2 1/4	5	3/4	3				90430
P									
M									
K									
N						●	●	●	●
S									
H									
O									

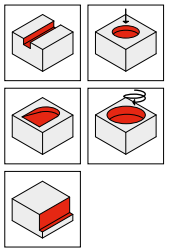
→ v_c/f_z Page 114

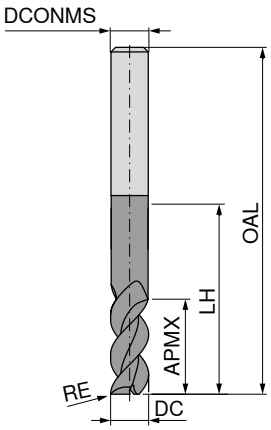
Continued on next page

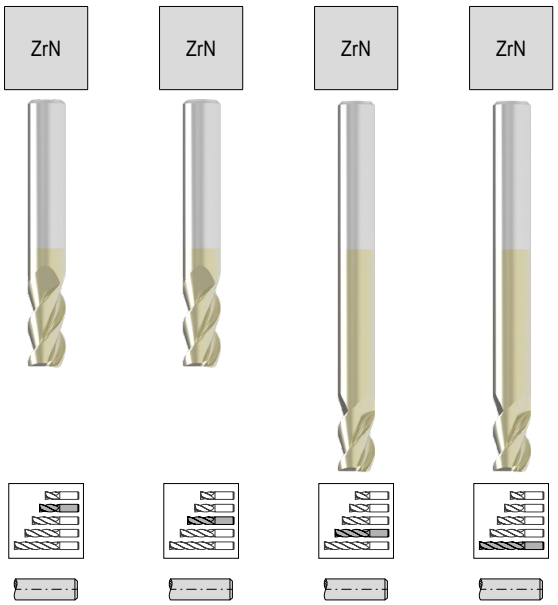
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001 for Ø ≤ 0.060
+/- 0.0015 for Ø > 0.060

P362 | AL | λ_s=43° 45° 48° γ_s=13° | HPC





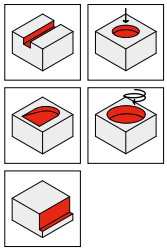


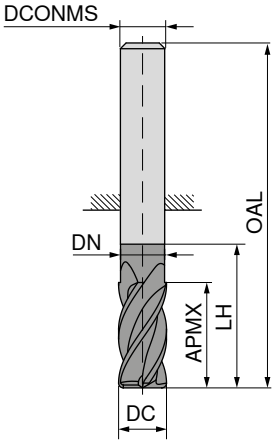
DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 004 ...	59 004 ...	59 004 ...	59 004 ...
3/4	0.090	2 1/4	5	3/4	3				**90530**
3/4	0.125	2 1/4	5	3/4	3				**90630**
3/4	0.190	2 1/4	5	3/4	3				**90730**
3/4	0.250	2 1/4	5	3/4	3				**90830**
1	0.030	1 1/4	4	1	3	**91513**			
1	0.060	1 1/4	4	1	3	**91613**			
1	0.090	1 1/4	4	1	3	**91713**			
1	0.125	1 1/4	4	1	3	**91813**			
1	0.190	1 1/4	4	1	3	**91913**			
1	0.250	1 1/4	4	1	3	**92013**			
1	0.030	2	5	1	3		**91120**		
1	0.060	2	5	1	3		**91220**		
1	0.090	2	5	1	3		**91320**		
1	0.125	2	5	1	3		**91420**		
1	0.190	2	5	1	3		**91520**		
1	0.250	2	5	1	3		**91620**		
1	0.030	3 1/4	6	1	3				**90533**
1	0.060	3 1/4	6	1	3				**90633**
1	0.090	3 1/4	6	1	3				**90733**
1	0.125	3 1/4	6	1	3				**90833**
1	0.190	3 1/4	6	1	3				**90933**
1	0.250	3 1/4	6	1	3				**91033**
P									
M									
K									
N						●	●	●	●
S									
H									
O									

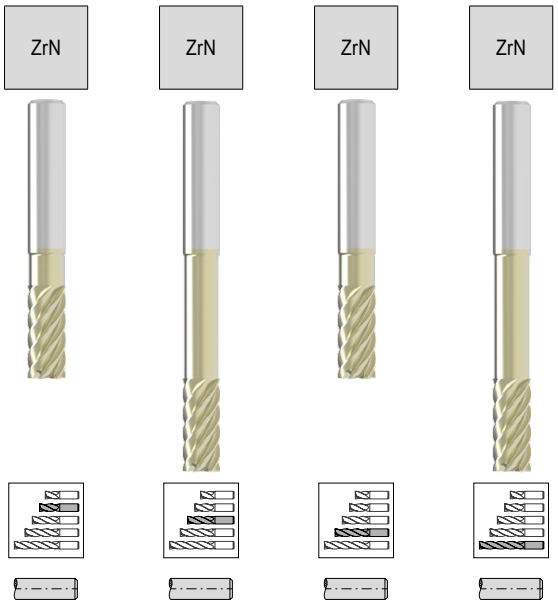
→ v_c/f_z Page 114

End milling cutter

P376 | AL | λ_s=44° 47° | γ_s=21°





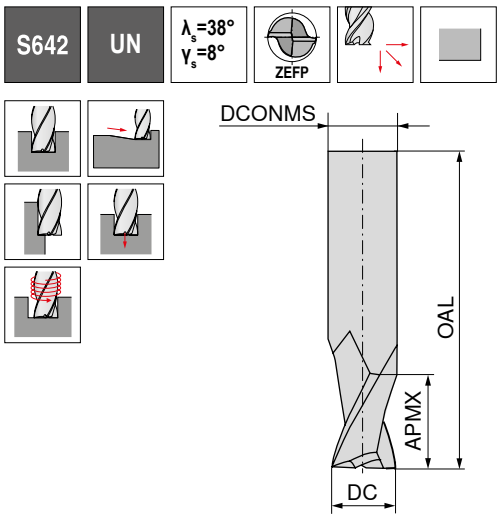


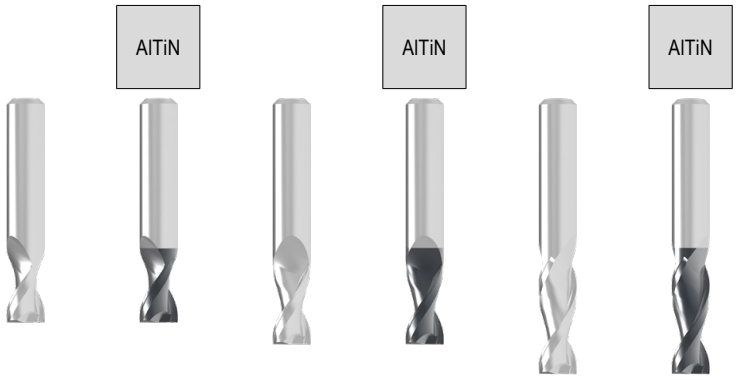
DC +0.000/-0.002 inch	APMX inch	DN inch	LH inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 005 ...	59 005 ...	59 005 ...	59 005 ...
1/4	5/8	0.240	7/8	2 1/2	1/4	6			**25025**	
1/4	5/8	0.240	1 5/8	3	1/4	6				**25125**
5/16	3/4	0.300	1	2 1/2	5/16	6			**31324**	
5/16	3/4	0.300	2 3/8	4	5/16	6				**31424**
3/8	1	0.360	1 1/4	3	3/8	6			**37527**	
3/8	1	0.360	2 1/4	4	3/8	6				**37627**
1/2	1	0.480	1 1/4	3	1/2	6	**50020**			
1/2	1 1/4	0.480	1 1/2	3 1/2	1/2	6			**50025**	
1/2	1 1/4	0.480	3	5	1/2	6		**50125**		
1/2	1 7/8			5	1/2	6				**50038**
5/8	1 1/4	0.600	1 1/2	3 1/2	5/8	6			**62520**	
5/8	1 1/4	0.600	3 5/8	6	5/8	6		**62620**		
3/4	1 5/8	0.720	2	4	3/4	6			**75022**	
3/4	1 5/8	0.720	3 5/8	6	3/4	6				**75122**
1	2	0.960	3 7/8	6	1	6				**99920**
P										
M										
K										
N							●	●	●	●
S										
H										
O										

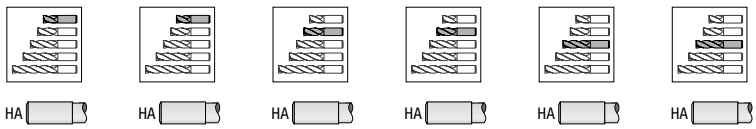
→ v_c/f_z Page 115

End milling cutter

▲ DC tolerance:
≤ Ø 7/64 inch: +/- 0.0005
≥ Ø 1/8 inch: 0 /- 0.002







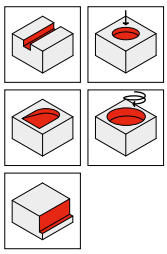
DC inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 068 ...	59 069 ...	59 068 ...	59 069 ...	59 068 ...	59 069 ...
1/16	1/8	1 1/2	1/8	2			06320	06320		
3/32	3/16	1 1/2	1/8	2			09420	09420		
1/8	1/4	1 1/2	1/8	2	12520	12520				
1/8	1/2	1 1/2	1/8	2			12540	12540		
1/8	3/4	3	1/8	2					12660	12660
5/32	3/8	2	3/16	2			15624	15624		
3/16	3/8	2	3/16	2	18820	18820				
3/16	5/8	2	3/16	2			18833	18833		
3/16	1	2 1/2	3/16	2					18853	18853
7/32	3/8	2	1/4	2			21917	21917		
1/4	3/8	2	1/4	2			25015	25015		
1/4	1 1/8	3	1/4	2					25045	25045
1/4	1	4	1/4	2					25040	25040
9/32	1/2	2	5/16	2			28118	28118		
5/16	1/2	2	5/16	2	31316	31316				
5/16	3/4	2 1/2	5/16	2			31324	31324		
5/16	1 3/8	3	5/16	2					31344	31344
5/16	1	4	5/16	2					31332	31332
3/8	5/8	2	3/8	2	37517	37517				
3/8	7/8	2 1/2	3/8	2			37523	37523		
3/8	1 3/8	3	3/8	2					37537	37537
3/8	1	4	3/8	2					37527	37527
1/2	5/8	2 1/2	1/2	2	50013	50013				
1/2	1	3	1/2	2			50020	50020		
1/2	1	4	1/2	2					50120	50120
5/8	7/8	3	5/8	2	62514	62514				
5/8	1 1/4	3 1/2	5/8	2			62520	62520		
5/8	2	6	5/8	2					62532	62532
3/4	1	3	3/4	2	75013	75013				
3/4	1 1/2	4	3/4	2			75020	75020		
3/4	2	6	3/4	2					75027	75027
1	1 3/4	4	1	2			99918	99918		
1	2	6	1	2					99920	99920
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K					●	●	●	●	●	●
N					●	●	●	●	●	●
S					●	●	●	●	●	●
H										
O										

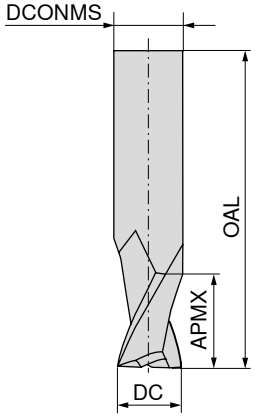
→ v_c/f_z Page 116

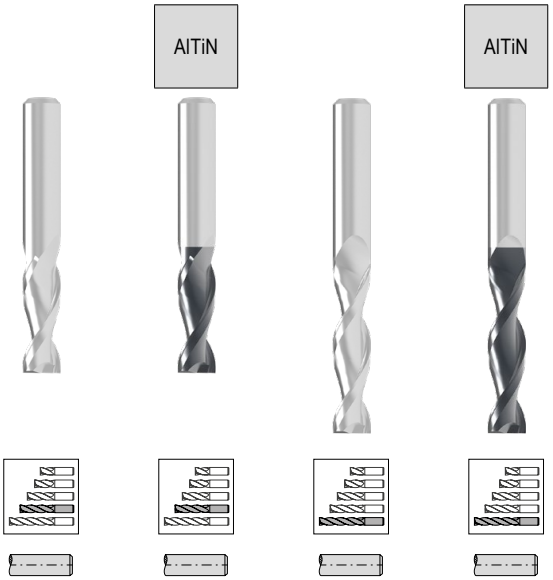
End milling cutter

▲ DC tolerance:
≤ Ø 7/64 inch: +/- 0.0005
≥ Ø 1/8 inch: 0 /- 0.002

S642 | UN | λ_s=38° γ_s=8°







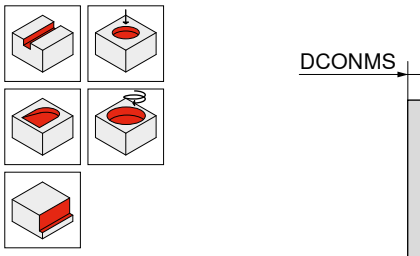
DC inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 068 ...		59 069 ...		59 068 ...		59 069 ...	
1/16	3/16	1 1/2	1/8	2		**06330**		**06330**				
3/32	9/32	1 1/2	1/8	2		**09430**		**09430**				
1/8	3/4	2 1/2	1/8	2		**12560**		**12560**				
1/8	1	3	1/8	2						**12580**		**12580**
5/32	1/2	2	3/16	2		**15632**		**15632**				
5/32	3/4	2 1/2	3/16	2						**15648**		**15648**
3/16	3/4	2 1/2	3/16	2		**18840**		**18840**				
3/16	1 1/8	3	3/16	2						**18860**		**18860**
3/16	1	4	3/16	2						**18953**		**18953**
7/32	5/8	2 1/2	1/4	2		**21929**		**21929**				
7/32	1	3	1/4	2						**21946**		**21946**
1/4	3/4	2 1/2	1/4	2		**25030**		**25030**				
1/4	1 1/4	3	1/4	2						**25050**		**25050**
1/4	1 1/2	4	1/4	2						**25060**		**25060**
1/4	1 1/2	6	1/4	2						**25160**		**25160**
9/32	3/4	2 1/2	5/16	2		**28127**		**28127**				
9/32	1 1/4	3	5/16	2						**28144**		**28144**
5/16	1 1/8	3	5/16	2		**31336**		**31336**				
5/16	1 5/8	4	5/16	2						**31352**		**31352**
5/16	1 1/2	6	5/16	2						**31348**		**31348**
3/8	1 1/8	3	3/8	2		**37530**		**37530**				
3/8	1 3/4	4	3/8	2						**37547**		**37547**
3/8	1 1/2	6	3/8	2						**37540**		**37540**
3/8	3	6	3/8	2						**37580**		**37580**
1/2	1 1/2	3 1/2	1/2	2		**50030**		**50030**				
1/2	2	4	1/2	2						**50040**		**50040**
1/2	1 1/2	6	1/2	2						**50130**		**50130**
1/2	3	6	1/2	2						**50060**		**50060**
5/8	2 1/8	4 5/8	5/8	2		**62534**		**62534**				
5/8	3	6	5/8	2						**62548**		**62548**
3/4	2 1/4	5	3/4	2		**75030**		**75030**				
3/4	3	6	3/4	2						**75040**		**75040**
1	2 1/4	5	1	2		**99923**		**99923**				
1	3	6	1	2						**99930**		**99930**
P						●		●		●		●
M						●		●		●		●
K						●		●		●		●
N						●		●		●		●
S						●		●		●		●
H												
O												

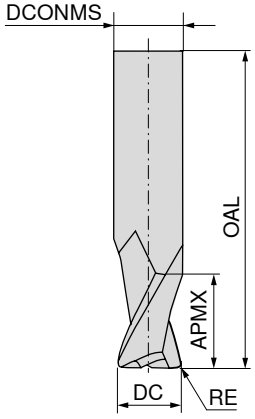
→ v_c/f_z Page 116

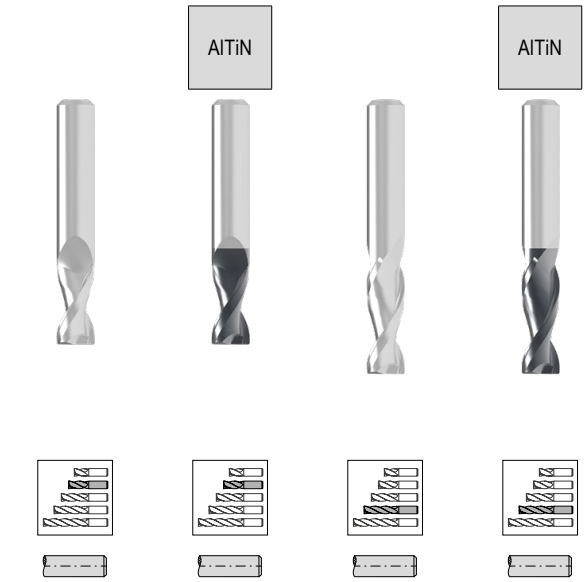
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S642 | UN | λ_s=38° γ_s=8°







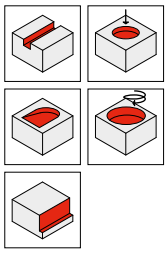
DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 068 ...	59 069 ...	59 068 ...	59 069 ...
1/8	0.010	1/2	1 1/2	1/8	2	90040	90040		
1/8	0.015	1/2	1 1/2	1/8	2	90140	90140		
1/8	0.020	1/2	1 1/2	1/8	2	90240	90240		
1/8	0.030	1/2	1 1/2	1/8	2	90340	90340		
1/8	0.045	1/2	1 1/2	1/8	2	90440	90440		
3/16	0.010	5/8	2	3/16	2	90033	90033		
3/16	0.015	5/8	2	3/16	2	90133	90133		
3/16	0.020	5/8	2	3/16	2	90233	90233		
3/16	0.030	5/8	2	3/16	2	90333	90333		
3/16	0.045	5/8	2	3/16	2	90433	90433		
3/16	0.060	5/8	2	3/16	2	90533	90533		
1/4	0.010	3/4	2 1/2	1/4	2			90030	90030
1/4	0.015	3/4	2 1/2	1/4	2			90130	90130
1/4	0.020	3/4	2 1/2	1/4	2			90230	90230
1/4	0.030	3/4	2 1/2	1/4	2			90330	90330
1/4	0.045	3/4	2 1/2	1/4	2			90430	90430
1/4	0.060	3/4	2 1/2	1/4	2			90530	90530
1/4	0.090	3/4	2 1/2	1/4	2			90630	90630
5/16	0.010	3/4	2 1/2	5/16	2	90024	90024		
5/16	0.015	3/4	2 1/2	5/16	2	90124	90124		
5/16	0.020	3/4	2 1/2	5/16	2	90224	90224		
5/16	0.030	3/4	2 1/2	5/16	2	90324	90324		
5/16	0.045	3/4	2 1/2	5/16	2	90424	90424		
5/16	0.060	3/4	2 1/2	5/16	2	90524	90524		
5/16	0.090	3/4	2 1/2	5/16	2	90624	90624		
3/8	0.010	7/8	2 1/2	3/8	2	90023	90023		
3/8	0.015	7/8	2 1/2	3/8	2	90223	90223		
3/8	0.020	7/8	2 1/2	3/8	2	90323	90323		
3/8	0.030	7/8	2 1/2	3/8	2	90423	90423		
3/8	0.045	7/8	2 1/2	3/8	2	90523	90523		
3/8	0.060	7/8	2 1/2	3/8	2	90623	90623		
3/8	0.090	7/8	2 1/2	3/8	2	90723	90723		
3/8	0.125	7/8	2 1/2	3/8	2	90123	90123		
P						●	●	●	●
M						●	●	●	●
K						●	●	●	●
N						●	●	●	●
S						●	●	●	●
H									
O									

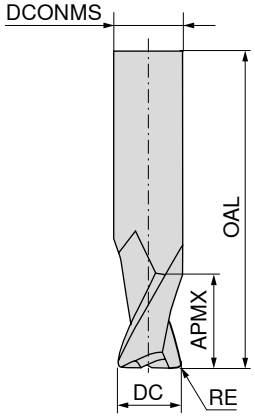
→ v_c/f_z Page 116

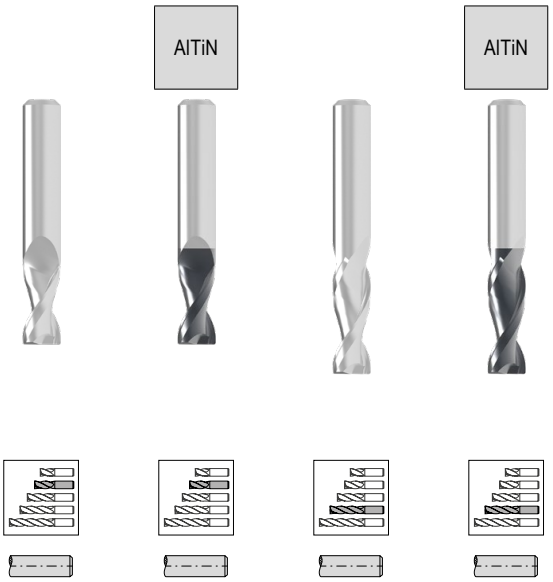
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S642 | UN | λ_s=38° γ_s=8°







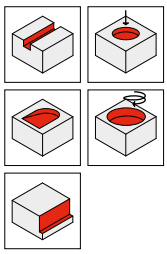
DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 068 ...	59 069 ...	59 068 ...	59 069 ...
1/2	0.010	1	3	1/2	2	**90020**	**90020**		
1/2	0.015	1	3	1/2	2	**90220**	**90220**		
1/2	0.020	1	3	1/2	2	**90320**	**90320**		
1/2	0.030	1	3	1/2	2	**90420**	**90420**		
1/2	0.045	1	3	1/2	2	**90520**	**90520**		
1/2	0.060	1	3	1/2	2	**90620**	**90620**		
1/2	0.090	1	3	1/2	2	**90720**	**90720**		
1/2	0.125	1	3	1/2	2	**90120**	**90120**		
5/8	0.030	1 1/4	3 1/2	5/8	2			**90920**	**90920**
5/8	0.045	1 1/4	3 1/2	5/8	2			**91020**	**91020**
5/8	0.060	1 1/4	3 1/2	5/8	2			**91120**	**91120**
5/8	0.090	1 1/4	3 1/2	5/8	2			**91220**	**91220**
5/8	0.125	1 1/4	3 1/2	5/8	2			**90820**	**90820**
3/4	0.030	1 1/2	4	3/4	2			**91420**	**91420**
3/4	0.045	1 1/2	4	3/4	2			**91520**	**91520**
3/4	0.060	1 1/2	4	3/4	2			**91620**	**91620**
3/4	0.090	1 1/2	4	3/4	2			**91720**	**91720**
3/4	0.125	1 1/2	4	3/4	2			**91320**	**91320**
P						●	●	●	●
M						●	●	●	●
K						●	●	●	●
N						●	●	●	●
S						●	●	●	●
H									
O									

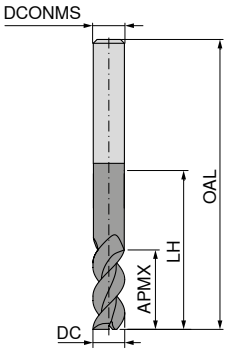
→ v_c/f_z Page 116

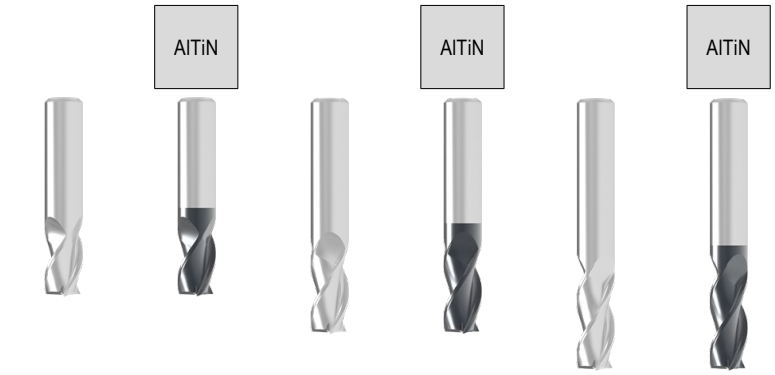
End milling cutter

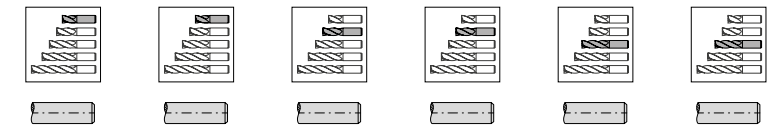
▲ DC tolerance:
≤ Ø 7/64 inch: +/- 0.0005
≥ Ø 1/8 inch: 0 /- 0.002

S643 | UN | λ_s=38° γ_s=8°









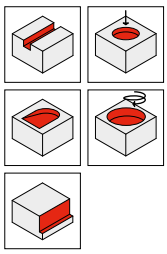
DC inch	APMX inch	OAL inch	DCONMS $^{-0.0001 / -0.0004}$ inch	ZEFP	59 070 ...	59 071 ...	59 070 ...	59 071 ...	59 070 ...	59 071 ...
1/16	1/8	1 1/2	1/8	3			06320	06320		
5/64	1/4	1 1/2	1/8	3			07832	07832		
3/32	3/16	1 1/2	1/8	3			09420	09420		
1/8	1/4	1 1/2	1/8	3	12520	12520				
1/8	1/2	1 1/2	1/8	3			12540	12540		
1/8	3/4	3	1/8	3					12660	12660
5/32	3/8	2	3/16	3			15624	15624		
3/16	3/8	2	3/16	3	18820	18820				
3/16	5/8	2	3/16	3			18833	18833		
3/16	1	2 1/2	3/16	3					18853	18853
7/32	3/8	2	1/4	3			21917	21917		
1/4	3/8	2	1/4	3	25015	25015				
1/4	3/4	2 1/2	1/4	3			25030	25030		
1/4	1 1/8	3	1/4	3					25045	25045
9/32	1/2	2	5/16	3			28118	28118		
5/16	1/2	2	5/16	3	31316	31316				
5/16	3/4	2 1/2	5/16	3			31324	31324		
5/16	1 1/8	3	5/16	3					31336	31336
3/8	5/8	2	3/8	3	37517	37517				
3/8	7/8	2 1/2	3/8	3			37523	37523		
3/8	1 1/8	3	3/8	3					37530	37530
3/8	1 1/2	6	3/8	3					37540	37540
1/2	5/8	2 1/2	1/2	3	50013	50013				
1/2	1	3	1/2	3			50020	50020		
1/2	1 1/2	6	1/2	3					50030	50030
5/8	7/8	3	5/8	3	62514	62514				
5/8	1 1/4	3 1/2	5/8	3			62520	62520		
5/8	2 1/8	4 5/8	5/8	3					62534	62534
3/4	1	3	3/4	3	75013	75013				
3/4	1 1/2	4	3/4	3			75020	75020		
3/4	2 1/4	5	3/4	3					75030	75030
1	1 3/4	4	1	3			99918	99918		
1	2 1/4	5	1	3					99923	99923
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K					●	●	●	●	●	●
N					●	●	●	●	●	●
S					●	●	●	●	●	●
H										
O										

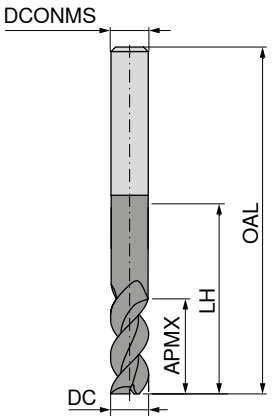
→ v_c/f_z Page 117

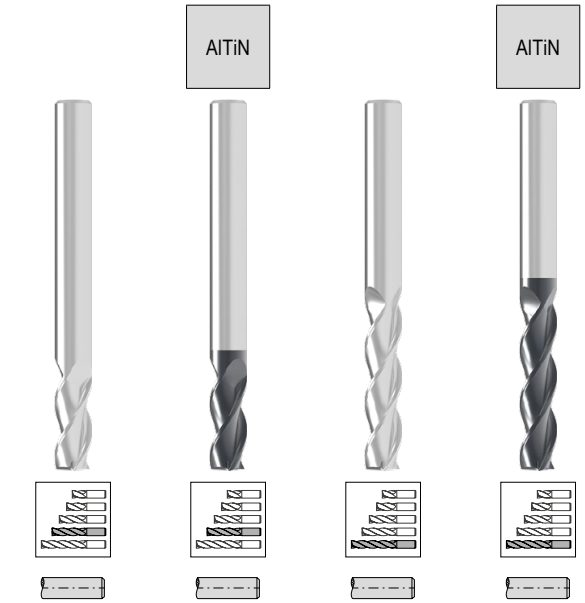
End milling cutter

▲ DC tolerance:
≤ Ø 7/64 inch: +/- 0.0005
≥ Ø 1/8 inch: 0 /- 0.002

S643 | UN | λ_s=38° γ_s=8°







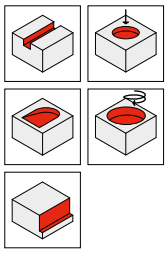
DC inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 070 ...	59 071 ...	59 070 ...	59 071 ...
1/16	3/16	1 1/2	1/8	3	06330	06330		
3/32	9/32	1 1/2	1/8	3	09430	09430		
1/8	3/4	2 1/2	1/8	3	12560	12560		
1/8	1	3	1/8	3			12580	12580
5/32	1/2	2	3/16	3	15632	15632		
3/16	3/4	2 1/2	3/16	3	18840	18840		
3/16	1	4	3/16	3			18953	18953
3/16	1 1/8	3	3/16	3			18860	18860
7/32	5/8	2 1/2	1/4	3	21929	21929		
1/4	1	4	1/4	3	25040	25040		
1/4	1 1/2	6	1/4	3			25160	25160
1/4	1 1/2	4	1/4	3			25060	25060
9/32	3/4	2 1/2	5/16	3	28127	28127		
5/16	1	4	5/16	3	31332	31332		
5/16	1 1/2	6	5/16	3			31348	31348
5/16	1 5/8	4	5/16	3			31352	31352
3/8	1	4	3/8	3	37527	37527		
3/8	1 3/4	4	3/8	3			37547	37547
3/8	3	6	3/8	3			37580	37580
1/2	1	4	1/2	3	50120	50120		
1/2	2	4	1/2	3			50040	50040
1/2	3	6	1/2	3			50060	50060
5/8	2	6	5/8	3	62532	62532		
5/8	3	6	5/8	3			62548	62548
3/4	2	6	3/4	3	75027	75027		
3/4	3	6	3/4	3			75040	75040
1	2	6	1	3	99920	99920		
1	3	6	1	3			99930	99930
P					●	●	●	●
M					●	●	●	●
K					●	●	●	●
N					●	●	●	●
S					●	●	●	●
H								
O								

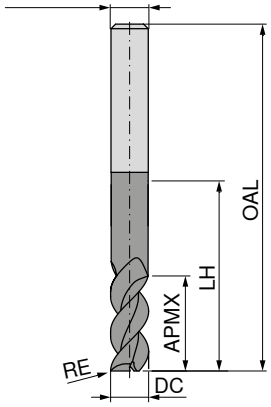
→ v_c/f_z Page 117

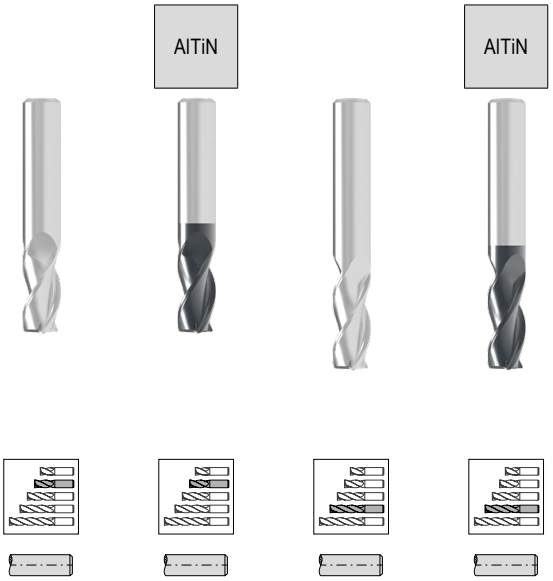
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S643 | UN | λ_s=38° γ_s=8°







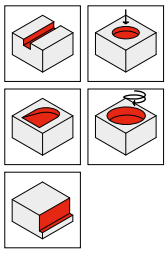
DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 070 ...	59 071 ...	59 070 ...	59 071 ...
1/8	0.010	1/2	1 1/2	1/8	3	90040	90040		
1/8	0.015	1/2	1 1/2	1/8	3	90140	90140		
1/8	0.020	1/2	1 1/2	1/8	3	90240	90240		
1/8	0.030	1/2	1 1/2	1/8	3	90340	90340		
1/8	0.045	1/2	1 1/2	1/8	3	90440	90440		
3/16	0.010	5/8	2	3/16	3	90033	90033		
3/16	0.015	5/8	2	3/16	3	90133	90133		
3/16	0.020	5/8	2	3/16	3	90233	90233		
3/16	0.030	5/8	2	3/16	3	90333	90333		
3/16	0.045	5/8	2	3/16	3	90433	90433		
3/16	0.060	5/8	2	3/16	3	90533	90533		
1/4	0.010	3/4	2 1/2	1/4	3			90030	90030
1/4	0.015	3/4	2 1/2	1/4	3			90130	90130
1/4	0.020	3/4	2 1/2	1/4	3			90230	90230
1/4	0.030	3/4	2 1/2	1/4	3			90330	90330
1/4	0.045	3/4	2 1/2	1/4	3			90430	90430
1/4	0.060	3/4	2 1/2	1/4	3			90530	90530
1/4	0.090	3/4	2 1/2	1/4	3			90630	90630
5/16	0.010	3/4	2 1/2	5/16	3	90024	90024		
5/16	0.015	3/4	2 1/2	5/16	3	90124	90124		
5/16	0.020	3/4	2 1/2	5/16	3	90224	90224		
5/16	0.030	3/4	2 1/2	5/16	3	90324	90324		
5/16	0.045	3/4	2 1/2	5/16	3	90424	90424		
5/16	0.060	3/4	2 1/2	5/16	3	90524	90524		
5/16	0.090	3/4	2 1/2	5/16	3	90624	90624		
3/8	0.010	7/8	2 1/2	3/8	3	90023	90023		
3/8	0.015	7/8	2 1/2	3/8	3	90223	90223		
3/8	0.020	7/8	2 1/2	3/8	3	90323	90323		
3/8	0.030	7/8	2 1/2	3/8	3	90423	90423		
3/8	0.045	7/8	2 1/2	3/8	3	90523	90523		
3/8	0.060	7/8	2 1/2	3/8	3	90623	90623		
3/8	0.090	7/8	2 1/2	3/8	3	90723	90723		
3/8	0.125	7/8	2 1/2	3/8	3	90123	90123		
P						●	●	●	●
M						●	●	●	●
K						●	●	●	●
N						●	●	●	●
S						●	●	●	●
H									
O									

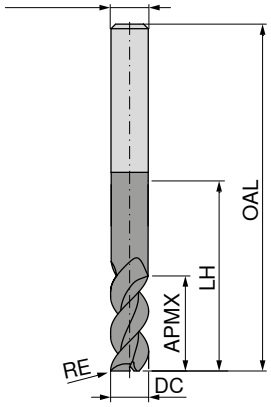
→ v_c/f_z Page 117

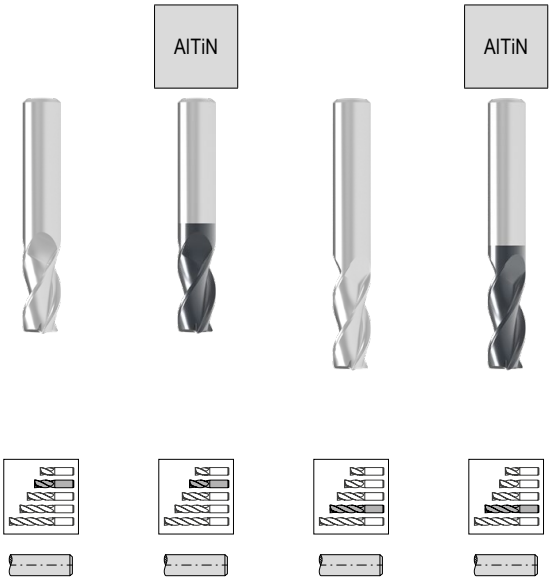
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S643 | UN | λ_s=38° γ_s=8°







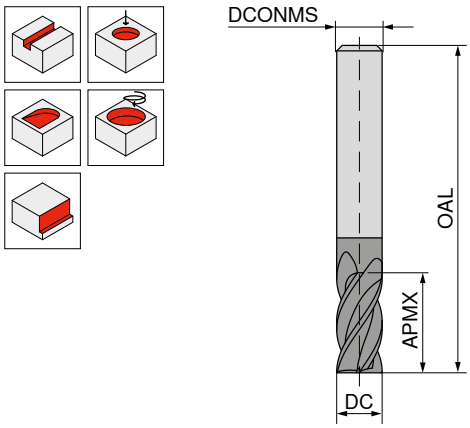
DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 070 ...	59 071 ...	59 070 ...	59 071 ...
1/2	0.010	1	3	1/2	3	90020	90020		
1/2	0.015	1	3	1/2	3	90220	90220		
1/2	0.020	1	3	1/2	3	90320	90320		
1/2	0.030	1	3	1/2	3	90420	90420		
1/2	0.045	1	3	1/2	3	90520	90520		
1/2	0.060	1	3	1/2	3	90620	90620		
1/2	0.090	1	3	1/2	3	90720	90720		
1/2	0.125	1	3	1/2	3	90120	90120		
5/8	0.015	1 1/4	3 1/2	5/8	3			90920	90920
5/8	0.020	1 1/4	3 1/2	5/8	3			91020	91020
5/8	0.030	1 1/4	3 1/2	5/8	3			91120	91120
5/8	0.045	1 1/4	3 1/2	5/8	3			91220	91220
5/8	0.060	1 1/4	3 1/2	5/8	3			91320	91320
5/8	0.090	1 1/4	3 1/2	5/8	3			91420	91420
5/8	0.125	1 1/4	3 1/2	5/8	3			90820	90820
3/4	0.020	1 1/2	4	3/4	3			91620	91620
3/4	0.030	1 1/2	4	3/4	3			91720	91720
3/4	0.045	1 1/2	4	3/4	3			91820	91820
3/4	0.060	1 1/2	4	3/4	3			91920	91920
3/4	0.090	1 1/2	4	3/4	3			92020	92020
3/4	0.125	1 1/2	4	3/4	3			91520	91520
1	0.030	1 3/4	4	1	3	90118	90118		
1	0.045	1 3/4	4	1	3	90218	90218		
1	0.060	1 3/4	4	1	3	90318	90318		
1	0.090	1 3/4	4	1	3	90418	90418		
1	0.125	1 3/4	4	1	3	90018	90018		
P						●	●	●	●
M						●	●	●	●
K						●	●	●	●
N						●	●	●	●
S						●	●	●	●
H									
O									

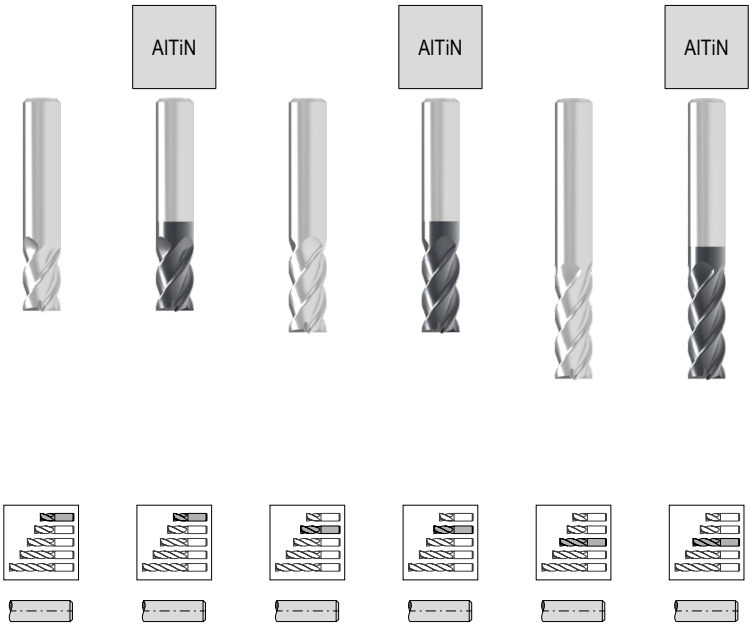
→ v_c/f_z Page 117

End milling cutter

▲ DC tolerance:
≤ Ø 7/64 inch: +/- 0.0005
≥ Ø 1/8 inch: 0 /- 0.002

S644 | UN | λ_s=38° γ_s=8°





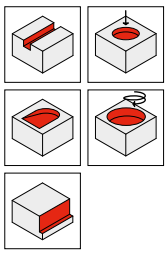
DC inch	APMX inch	OAL inch	DCONMS $_{-0.0001 / -0.0004}$ inch	ZEFP	59 072 ...	59 073 ...	59 072 ...	59 073 ...	59 072 ...	59 073 ...
1/32	1/16	1 1/2	1/8	4			03120	03120		
3/64	3/32	1 1/2	1/8	4			04720	04720		
1/16	1/8	1 1/2	1/8	4			06320	06320		
5/64	1/4	1 1/2	1/8	4			07832	07832		
3/32	3/16	1 1/2	1/8	4			09420	09420		
7/64	3/16	1 1/2	1/8	4			10917	10917		
1/8	1/4	1 1/2	1/8	4	12520	12520				
1/8	1/2	1 1/2	1/8	4			12540	12540		
1/8	3/4	3	1/8	4					12660	12660
5/32	3/8	2	3/16	4			15624	15624		
3/16	3/8	2	3/16	4	18820	18820				
3/16	5/8	2	3/16	4			18833	18833		
3/16	1	2 1/2	3/16	4					18853	18853
7/32	3/8	2	1/4	4			21917	21917		
1/4	3/8	2	1/4	4	25015	25015				
1/4	3/4	2 1/2	1/4	4			25030	25030		
1/4	1 1/4	3	1/4	4					25050	25050
1/4	1	4	1/4	4					25040	25040
9/32	1/2	2	5/16	4			28118	28118		
5/16	1/2	2	5/16	4	31316	31316				
5/16	3/4	2 1/2	5/16	4			31324	31324		
5/16	1 3/8	3	5/16	4					31344	31344
5/16	1	4	5/16	4					31332	31332
3/8	5/8	2	3/8	4	37517	37517				
3/8	7/8	2 1/2	3/8	4			37523	37523		
3/8	1 1/8	3	3/8	4					37530	37530
3/8	1 3/8	3	3/8	4					37537	37537
1/2	5/8	2 1/2	1/2	4	50013	50013				
1/2	1	3	1/2	4			50020	50020		
1/2	1 1/2	3 1/2	1/2	4					50030	50030
1/2	1 1/2	6	1/2	4					50130	50130
5/8	7/8	3	5/8	4	62514	62514				
5/8	1 1/4	3 1/2	5/8	4			62520	62520		
5/8	2 1/8	4 5/8	5/8	4					62534	62534
3/4	1	3	3/4	4	75013	75013				
3/4	1 1/2	4	3/4	4			75020	75020		
3/4	2 1/4	5	3/4	4					75030	75030
1	1 3/4	4	1	4			99918	99918		
1	2 1/4	5	1	4					99923	99923
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K					●	●	●	●	●	●
N					●	●	●	●	●	●
S					●	●	●	●	●	●
H										
O										

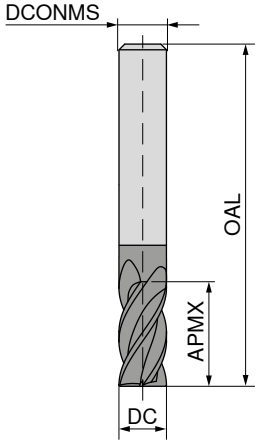
→ v_c/f_z Page 118

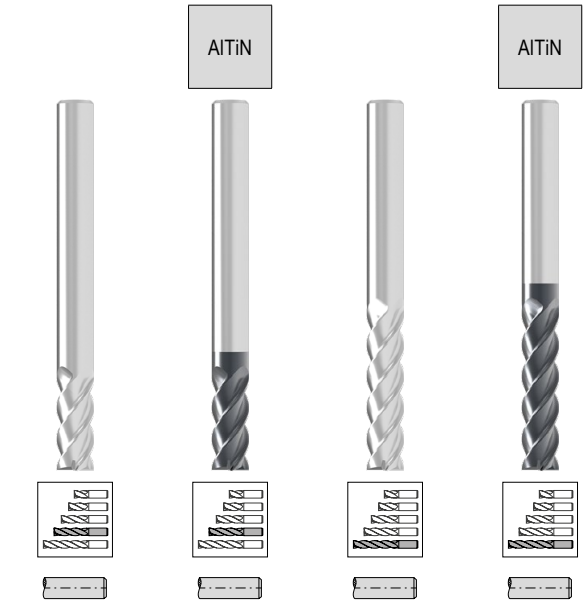
End milling cutter

▲ DC tolerance:
≤ Ø 7/64 inch: +/- 0.0005
≥ Ø 1/8 inch: 0 /- 0.002

S644 | UN | λ_s=38° γ_s=8°







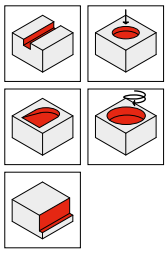
DC inch	APMX inch	OAL inch	DCONMS $^{-0.0001 / -0.0004}$ inch	ZEFP	59 072 ...		59 073 ...		59 072 ...		59 073 ...	
1/32	3/32	1 1/2	1/8	4	03130		03130					
3/64	9/64	1 1/2	1/8	4	04730		04730					
1/16	3/16	1 1/2	1/8	4	06330		06330					
3/32	9/32	1 1/2	1/8	4	09430		09430					
7/64	3/8	1 1/2	1/8	4	10934		10934					
1/8	3/4	2 1/2	1/8	4	12560		12560					
1/8	1	3	1/8	4						12580		12580
5/32	1/2	2	3/16	4	15632		15632					
5/32	3/4	2 1/2	3/16	4						15648		15648
3/16	3/4	2 1/2	3/16	4	18840		18840					
3/16	1 1/8	3	3/16	4						18860		18860
3/16	1	4	3/16	4						18953		18953
7/32	5/8	2 1/2	1/4	4	21929		21929					
7/32	1	3	1/4	4						21946		21946
1/4	1 1/8	3	1/4	4	25045		25045					
1/4	1 1/2	4	1/4	4						25060		25060
1/4	1 1/2	6	1/4	4						25160		25160
9/32	3/4	2 1/2	5/16	4	28127		28127					
9/32	1 1/4	3	5/16	4						28144		28144
5/16	1 1/8	3	5/16	4	31336		31336					
5/16	1 5/8	4	5/16	4						31352		31352
5/16	1 1/2	6	5/16	4						31348		31348
3/8	1	4	3/8	4	37527		37527					
3/8	1 3/4	4	3/8	4						37547		37547
3/8	1 1/2	6	3/8	4						37540		37540
3/8	3	6	3/8	4						37580		37580
1/2	1	4	1/2	4	50120		50120					
1/2	2	4	1/2	4						50040		50040
1/2	3	6	1/2	4						50060		50060
5/8	2	6	5/8	4	62532		62532					
5/8	3	6	5/8	4						62548		62548
3/4	2	6	3/4	4	75027		75027					
3/4	3	6	3/4	4						75040		75040
1	2	6	1	4	99920		99920					
1	3	6	1	4						99930		99930
P					●		●		●		●	
M					●		●		●		●	
K					●		●		●		●	
N					●		●		●		●	
S					●		●		●		●	
H												
O												

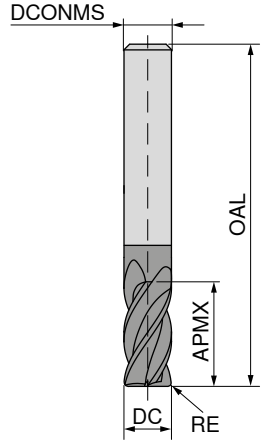
→ v_c/f_z Page 118

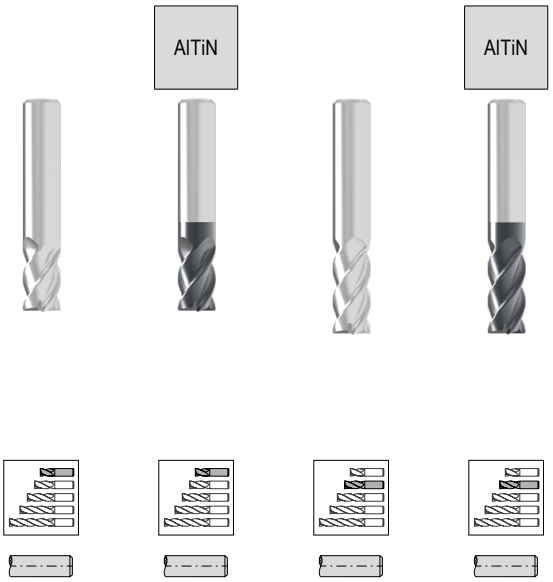
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S644 | UN | λ_s=38° γ_s=8°







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 072 ...	59 073 ...	59 072 ...	59 073 ...
1/8	0.010	1/4	1 1/2	1/8	4			92120	92120
1/8	0.015	1/4	1 1/2	1/8	4			92220	92220
1/8	0.020	1/4	1 1/2	1/8	4			92320	92320
1/8	0.030	1/4	1 1/2	1/8	4			92420	92420
1/8	0.045	1/4	1 1/2	1/8	4			92520	92520
3/16	0.010	3/8	2	3/16	4			92620	92620
3/16	0.015	3/8	2	3/16	4			92720	92720
3/16	0.020	3/8	2	3/16	4			92820	92820
3/16	0.030	3/8	2	3/16	4			92920	92920
3/16	0.045	3/8	2	3/16	4			93020	93020
3/16	0.060	3/8	2	3/16	4			93120	93120
1/4	0.010	3/8	2	1/4	4	90015	90015		
1/4	0.015	3/8	2	1/4	4	90115	90115		
1/4	0.020	3/8	2	1/4	4	90215	90215		
1/4	0.030	3/8	2	1/4	4	90315	90315		
1/4	0.045	3/8	2	1/4	4	90415	90415		
1/4	0.060	3/8	2	1/4	4	90515	90515		
1/4	0.090	3/8	2	1/4	4	90615	90615		
1/4	0.010	3/4	2 1/2	1/4	4			90030	90030
1/4	0.015	3/4	2 1/2	1/4	4			90130	90130
1/4	0.020	3/4	2 1/2	1/4	4			90230	90230
1/4	0.030	3/4	2 1/2	1/4	4			90330	90330
1/4	0.045	3/4	2 1/2	1/4	4			90430	90430
1/4	0.060	3/4	2 1/2	1/4	4			90530	90530
1/4	0.090	3/4	2 1/2	1/4	4			90630	90630
5/16	0.010	1/2	2	5/16	4	90016	90016		
5/16	0.015	1/2	2	5/16	4	90216	90216		
5/16	0.020	1/2	2	5/16	4	90316	90316		
5/16	0.030	1/2	2	5/16	4	90416	90416		
5/16	0.045	1/2	2	5/16	4	90516	90516		
5/16	0.060	1/2	2	5/16	4	90616	90616		
5/16	0.090	1/2	2	5/16	4	90716	90716		
5/16	0.125	1/2	2	5/16	4	90116	90116		
5/16	0.010	3/4	2 1/2	5/16	4			90024	90024
5/16	0.015	3/4	2 1/2	5/16	4			90224	90124
5/16	0.020	3/4	2 1/2	5/16	4			90324	90224
5/16	0.030	3/4	2 1/2	5/16	4			90424	90324
5/16	0.045	3/4	2 1/2	5/16	4			90524	90424
5/16	0.060	3/4	2 1/2	5/16	4			90624	90524
5/16	0.090	3/4	2 1/2	5/16	4			90724	90624

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→ v_c/f_z Page 118

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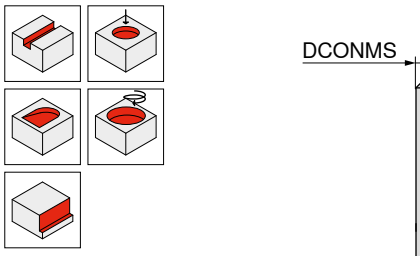
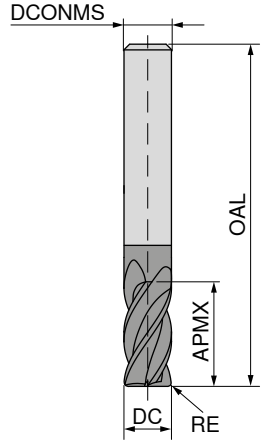
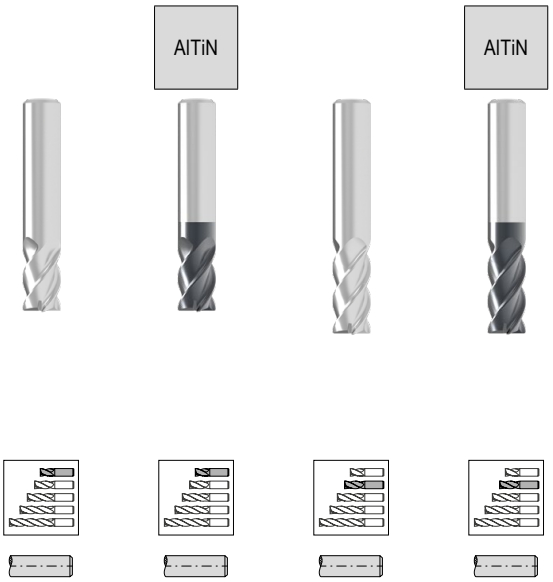
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S644 | UN | λ_s=38° γ_s=8°







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 072 ...	59 073 ...	59 072 ...	59 073 ...
5/16	0.125	3/4	2 1/2	5/16	4			90124	
3/8	0.010	5/8	2	3/8	4	90017	90017		
3/8	0.015	5/8	2	3/8	4	90217	90217		
3/8	0.020	5/8	2	3/8	4	90317	90317		
3/8	0.030	5/8	2	3/8	4	90417	90417		
3/8	0.045	5/8	2	3/8	4	90517	90517		
3/8	0.060	5/8	2	3/8	4	90617	90617		
3/8	0.090	5/8	2	3/8	4	90717	90717		
3/8	0.125	5/8	2	3/8	4	90117	90117		
3/8	0.010	7/8	2 1/2	3/8	4			90023	90023
3/8	0.015	7/8	2 1/2	3/8	4			90223	90223
3/8	0.020	7/8	2 1/2	3/8	4			90323	90323
3/8	0.030	7/8	2 1/2	3/8	4			90423	90423
3/8	0.045	7/8	2 1/2	3/8	4			90523	90523
3/8	0.060	7/8	2 1/2	3/8	4			90623	90623
3/8	0.090	7/8	2 1/2	3/8	4			90723	90723
3/8	0.125	7/8	2 1/2	3/8	4			90123	90123
1/2	0.010	5/8	2 1/2	1/2	4	90013	90013		
1/2	0.015	5/8	2 1/2	1/2	4	90213	90213		
1/2	0.020	5/8	2 1/2	1/2	4	90313	90313		
1/2	0.030	5/8	2 1/2	1/2	4	90413	90413		
1/2	0.045	5/8	2 1/2	1/2	4	90513	90513		
1/2	0.060	5/8	2 1/2	1/2	4	90613	90613		
1/2	0.090	5/8	2 1/2	1/2	4	90713	90713		
1/2	0.125	5/8	2 1/2	1/2	4	90113	90113		
1/2	0.010	1	3	1/2	4			90020	90020
1/2	0.015	1	3	1/2	4			90220	90220
1/2	0.020	1	3	1/2	4			90320	90320
1/2	0.030	1	3	1/2	4			90420	90420
1/2	0.045	1	3	1/2	4			90520	90520
1/2	0.060	1	3	1/2	4			90620	90620
1/2	0.090	1	3	1/2	4			90720	90720
1/2	0.125	1	3	1/2	4			90120	90120
1/2	0.010	1	4	1/2	4			93720	93720
1/2	0.015	1	4	1/2	4			93920	93920
1/2	0.020	1	4	1/2	4			94020	94020
1/2	0.030	1	4	1/2	4			94120	94120
1/2	0.045	1	4	1/2	4			94220	94220
1/2	0.060	1	4	1/2	4			94320	94320
1/2	0.090	1	4	1/2	4			94420	94420
P						●	●	●	●
M						●	●	●	●
K						●	●	●	●
N						●	●	●	●
S						●	●	●	●
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→ v_c/f_z Page 118

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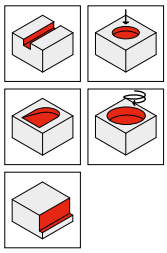
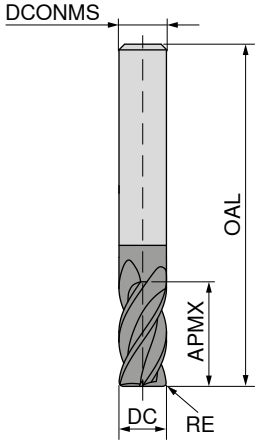
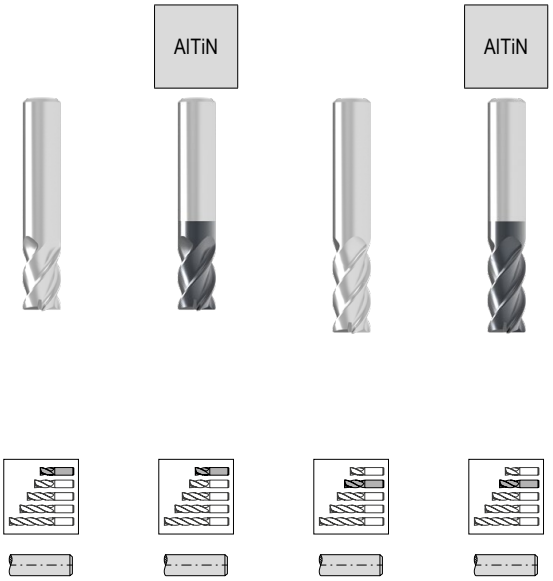
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S644 | UN | λ_s=38° γ_s=8°







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 072 ...	59 073 ...	59 072 ...	59 073 ...
1/2	0.125	1	4	1/2	4			**93820**	**93820**
5/8	0.015	1 1/4	3 1/2	5/8	4			**90920**	**90920**
5/8	0.020	1 1/4	3 1/2	5/8	4			**91020**	**91020**
5/8	0.030	1 1/4	3 1/2	5/8	4			**91120**	**91120**
5/8	0.045	1 1/4	3 1/2	5/8	4			**91220**	**91220**
5/8	0.060	1 1/4	3 1/2	5/8	4			**91320**	**91320**
5/8	0.090	1 1/4	3 1/2	5/8	4			**91420**	**91420**
5/8	0.125	1 1/4	3 1/2	5/8	4			**90820**	**90820**
3/4	0.020	1 1/2	4	3/4	4			**91620**	**91620**
3/4	0.030	1 1/2	4	3/4	4			**91720**	**91720**
3/4	0.045	1 1/2	4	3/4	4			**91820**	**91820**
3/4	0.060	1 1/2	4	3/4	4			**91920**	**91920**
3/4	0.090	1 1/2	4	3/4	4			**92020**	**92020**
3/4	0.125	1 1/2	4	3/4	4			**91520**	**91520**
1	0.030	1 3/4	4	1	4			**90118**	**90118**
1	0.045	1 3/4	4	1	4			**90218**	**90218**
1	0.060	1 3/4	4	1	4			**90318**	**90318**
1	0.090	1 3/4	4	1	4			**90418**	**90418**
1	0.125	1 3/4	4	1	4			**90018**	**90018**
P						●	●	●	●
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K						●	●	●	●
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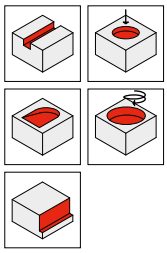
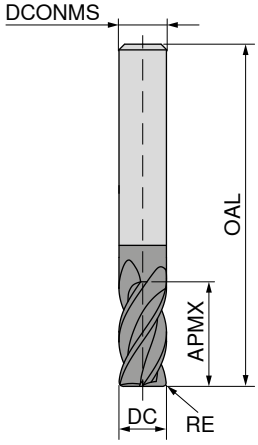
→ v_c/f_z Page 118

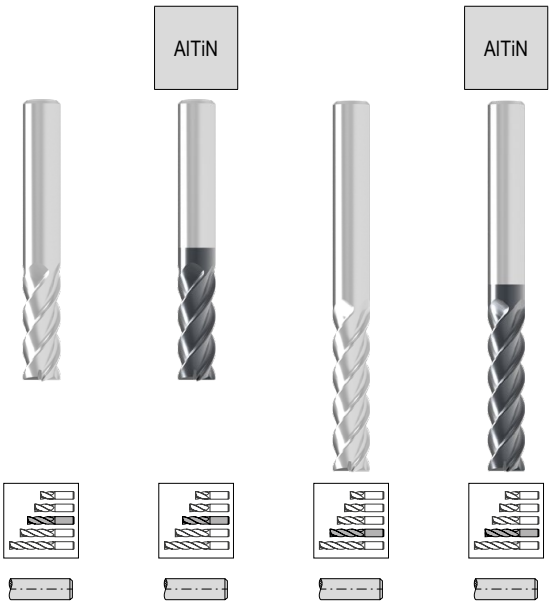
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S644 | UN | λ_s=38° γ_s=8°







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 072 ...	59 073 ...	59 072 ...	59 073 ...
1/8	0.010	1/2	1 1/2	1/8	4			90040	90040
1/8	0.015	1/2	1 1/2	1/8	4			90140	90140
1/8	0.020	1/2	1 1/2	1/8	4			90240	90240
1/8	0.030	1/2	1 1/2	1/8	4			90340	90340
3/16	0.010	5/8	2	3/16	4	90033	90033		
3/16	0.015	5/8	2	3/16	4	90133	90133		
3/16	0.020	5/8	2	3/16	4	90233	90233		
3/16	0.030	5/8	2	3/16	4	90333	90333		
3/16	0.045	5/8	2	3/16	4	90433	90433		
3/16	0.060	5/8	2	3/16	4	90533	90533		
3/16	0.010	1	4	3/16	4			90053	90153
3/16	0.015	1	4	3/16	4			90153	90253
3/16	0.020	1	4	3/16	4			90253	90353
3/16	0.030	1	4	3/16	4			90353	90453
3/16	0.045	1	4	3/16	4			90453	90553
3/16	0.060	1	4	3/16	4			90553	90653
1/4	0.010	1	4	1/4	4	91840	91840		
1/4	0.015	1	4	1/4	4	91940	91940		
1/4	0.020	1	4	1/4	4	92040	92040		
1/4	0.030	1	4	1/4	4	92140	92140		
1/4	0.045	1	4	1/4	4	92240	92240		
1/4	0.060	1	4	1/4	4	92340	92340		
1/4	0.090	1	4	1/4	4	92440	92440		
1/4	0.010	1 1/8	3	1/4	4			90045	90045
1/4	0.015	1 1/8	3	1/4	4			90145	90145
1/4	0.020	1 1/8	3	1/4	4			90245	90245
1/4	0.030	1 1/8	3	1/4	4			90345	90345
1/4	0.045	1 1/8	3	1/4	4			90445	90445
1/4	0.060	1 1/8	3	1/4	4			90545	90545
1/4	0.090	1 1/8	3	1/4	4			90645	90645
5/16	0.010	1	4	5/16	4	90032	90032		
5/16	0.015	1	4	5/16	4	90232	90232		
5/16	0.020	1	4	5/16	4	90332	90332		
5/16	0.030	1	4	5/16	4	90432	90432		
5/16	0.045	1	4	5/16	4	90532	90532		
5/16	0.060	1	4	5/16	4	90632	90632		
5/16	0.090	1	4	5/16	4	90732	90732		
5/16	0.125	1	4	5/16	4	90132	90132		
5/16	0.010	1 1/8	3	5/16	4	90036	90036		
5/16	0.015	1 1/8	3	5/16	4	90236	90236		

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→ v_c/f_z Page 118

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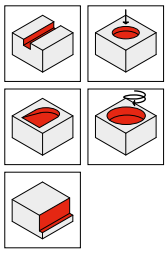
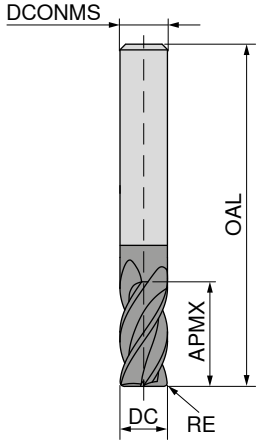
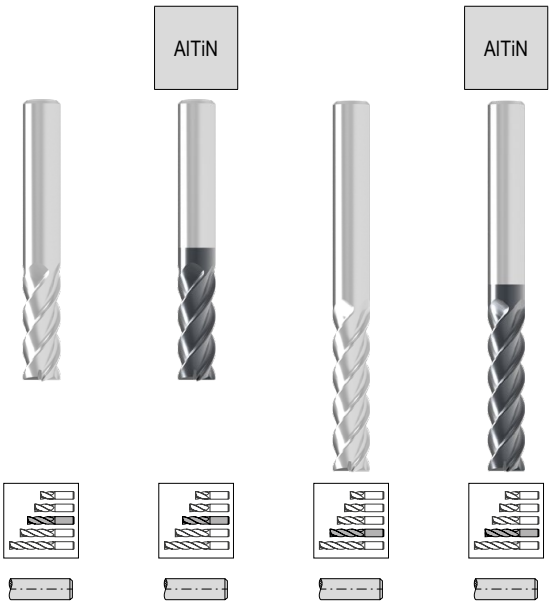
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S644 | UN | λ_s=38° γ_s=8°







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 072 ...	59 073 ...	59 072 ...	59 073 ...
5/16	0.020	1 1/8	3	5/16	4	90336	90336		
5/16	0.030	1 1/8	3	5/16	4	90436	90436		
5/16	0.045	1 1/8	3	5/16	4	90536	90536		
5/16	0.060	1 1/8	3	5/16	4	90636	90636		
5/16	0.090	1 1/8	3	5/16	4	90736	90736		
5/16	0.125	1 1/8	3	5/16	4	90136	90136		
5/16	0.010	1 1/2	6	5/16	4			90748	90748
5/16	0.015	1 1/2	6	5/16	4			90948	90948
5/16	0.020	1 1/2	6	5/16	4			91048	91048
5/16	0.030	1 1/2	6	5/16	4			91148	91148
5/16	0.045	1 1/2	6	5/16	4			91248	91248
5/16	0.060	1 1/2	6	5/16	4			91348	91348
5/16	0.090	1 1/2	6	5/16	4			91448	91448
5/16	0.125	1 1/2	6	5/16	4			90848	90848
3/8	0.010	1	4	3/8	4	90027	90027		
3/8	0.015	1	4	3/8	4	90227	90227		
3/8	0.020	1	4	3/8	4	90327	90327		
3/8	0.030	1	4	3/8	4	90427	90427		
3/8	0.045	1	4	3/8	4	90527	90527		
3/8	0.060	1	4	3/8	4	90627	90627		
3/8	0.090	1	4	3/8	4	90727	90727		
3/8	0.125	1	4	3/8	4	90127	90127		
3/8	0.010	1 1/8	3	3/8	4	90730	90730		
3/8	0.015	1 1/8	3	3/8	4	90930	90930		
3/8	0.020	1 1/8	3	3/8	4	91030	91030		
3/8	0.030	1 1/8	3	3/8	4	91130	91130		
3/8	0.045	1 1/8	3	3/8	4	91230	91230		
3/8	0.060	1 1/8	3	3/8	4	91330	91330		
3/8	0.090	1 1/8	3	3/8	4	91430	91430		
3/8	0.125	1 1/8	3	3/8	4	90830	90830		
3/8	0.010	1 1/2	6	3/8	4			92540	92540
3/8	0.015	1 1/2	6	3/8	4			92740	92740
3/8	0.020	1 1/2	6	3/8	4			92840	92840
3/8	0.030	1 1/2	6	3/8	4			92940	92940
3/8	0.045	1 1/2	6	3/8	4			93040	93040
3/8	0.060	1 1/2	6	3/8	4			93140	93140
3/8	0.090	1 1/2	6	3/8	4			93240	93240
3/8	0.125	1 1/2	6	3/8	4			92640	92640
3/8	0.010	1 3/4	4	3/8	4			90047	90047
3/8	0.015	1 3/4	4	3/8	4			90247	90247

P	●	●	●	●
M	●	●	●	●
K	●	●	●	●
N	●	●	●	●
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→ v_c/f_z Page 118

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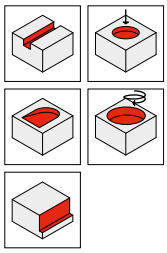
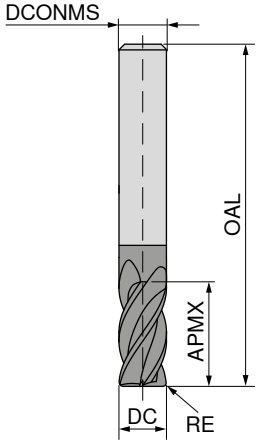
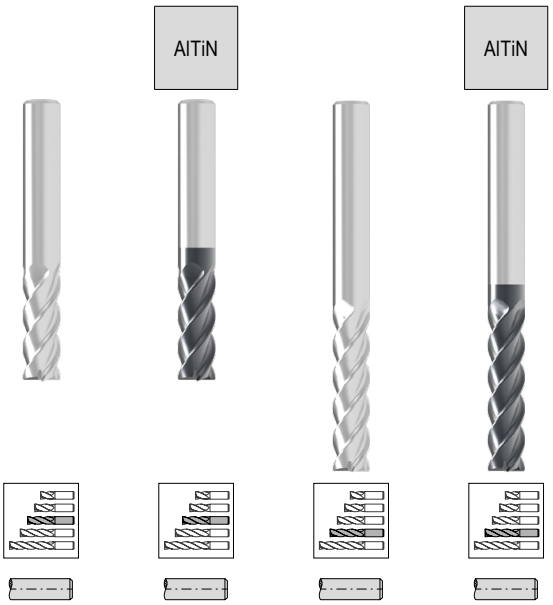
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S644 | UN | λ_s=38° γ_s=8°







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 072 ...	59 073 ...	59 072 ...	59 073 ...
3/8	0.020	1 3/4	4	3/8	4			90347	90347
3/8	0.030	1 3/4	4	3/8	4			90447	90447
3/8	0.045	1 3/4	4	3/8	4			90547	90547
3/8	0.060	1 3/4	4	3/8	4			90647	90647
3/8	0.090	1 3/4	4	3/8	4			90747	90747
3/8	0.125	1 3/4	4	3/8	4			90147	90147
1/2	0.010	1 1/2	6	1/2	4	92630	92630		
1/2	0.015	1 1/2	6	1/2	4	92830	92830		
1/2	0.020	1 1/2	6	1/2	4	92930	92930		
1/2	0.030	1 1/2	6	1/2	4	93030	93030		
1/2	0.045	1 1/2	6	1/2	4	93130	93130		
1/2	0.060	1 1/2	6	1/2	4	93230	93230		
1/2	0.090	1 1/2	6	1/2	4	93330	93330		
1/2	0.125	1 1/2	6	1/2	4	92730	92730		
1/2	0.010	2	4	1/2	4			90440	90440
1/2	0.015	2	4	1/2	4			90640	90640
1/2	0.020	2	4	1/2	4			90740	90740
1/2	0.030	2	4	1/2	4			90840	90840
1/2	0.045	2	4	1/2	4			90940	90940
1/2	0.060	2	4	1/2	4			91040	91040
1/2	0.090	2	4	1/2	4			91140	91140
1/2	0.125	2	4	1/2	4			90540	90540
5/8	0.015	2	6	5/8	4	90932	90932		
5/8	0.020	2	6	5/8	4	91032	91032		
5/8	0.030	2	6	5/8	4	91132	91132		
5/8	0.045	2	6	5/8	4	91232	91232		
5/8	0.060	2	6	5/8	4	91332	91332		
5/8	0.090	2	6	5/8	4	91432	91432		
5/8	0.125	2	6	5/8	4	90832	90832		
5/8	0.015	2 1/8	4 5/8	5/8	4			90134	90134
5/8	0.020	2 1/8	4 5/8	5/8	4			90234	90234
5/8	0.030	2 1/8	4 5/8	5/8	4			90334	90334
5/8	0.045	2 1/8	4 5/8	5/8	4			90434	90434
5/8	0.060	2 1/8	4 5/8	5/8	4			90534	90534
5/8	0.090	2 1/8	4 5/8	5/8	4			90634	90634
5/8	0.125	2 1/8	4 5/8	5/8	4			90034	90034
3/4	0.020	2	6	3/4	4	90927	90927		
3/4	0.030	2	6	3/4	4	91027	91027		
3/4	0.045	2	6	3/4	4	91127	91127		
3/4	0.060	2	6	3/4	4	91227	91227		

P	●	●	●	●
M	●	●	●	●
K	●	●	●	●
N	●	●	●	●
S	●	●	●	●
H				
O				

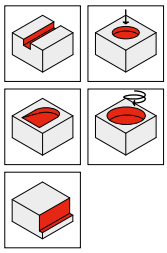
→ v_c/f_z Page 118

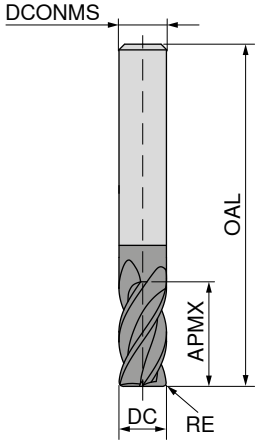
Continued on next page

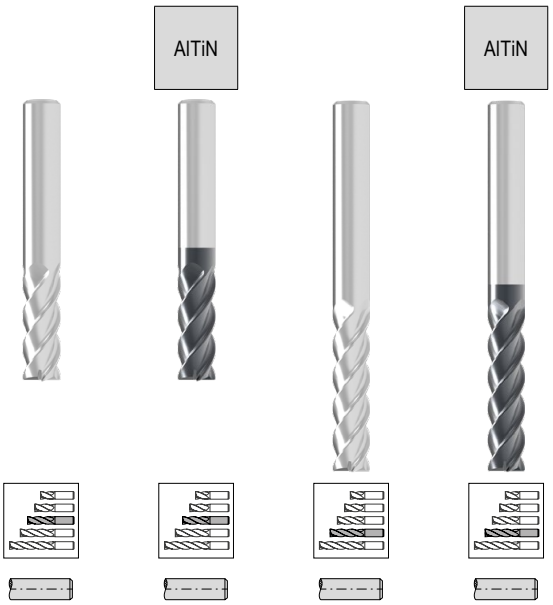
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S644 | UN | λ_s=38° γ_s=8°







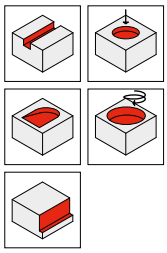
DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 072 ...		59 073 ...		59 072 ...		59 073 ...	
3/4	0.090	2	6	3/4	4	**91327**		**91327**					
3/4	0.125	2	6	3/4	4	**90827**		**90827**					
3/4	0.020	2 1/4	5	3/4	4						**91630**		**91630**
3/4	0.030	2 1/4	5	3/4	4						**91730**		**91730**
3/4	0.045	2 1/4	5	3/4	4						**91830**		**91830**
3/4	0.060	2 1/4	5	3/4	4						**91930**		**91930**
3/4	0.090	2 1/4	5	3/4	4						**92030**		**92030**
3/4	0.125	2 1/4	5	3/4	4						**91530**		**91530**
1	0.030	2	6	1	4	**93320**		**93320**					
1	0.045	2	6	1	4	**93420**		**93420**					
1	0.060	2	6	1	4	**93520**		**93520**					
1	0.090	2	6	1	4	**93620**		**93620**					
1	0.125	2	6	1	4	**93220**		**93220**					
1	0.030	2 1/4	5	1	4						**90923**		**90923**
1	0.045	2 1/4	5	1	4						**91023**		**91023**
1	0.060	2 1/4	5	1	4						**91123**		**91123**
1	0.090	2 1/4	5	1	4						**91223**		**91223**
1	0.125	2 1/4	5	1	4						**90823**		**90823**
P						●		●		●		●	
M						●		●		●		●	
K						●		●		●		●	
N						●		●		●		●	
S						●		●		●		●	
H													
O													

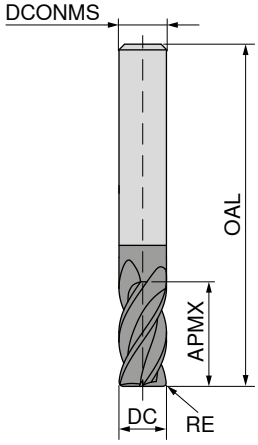
→ v_c/f_z Page 118

End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S644 | UN | λ_s=38° γ_s=8°





DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 072 ...	59 073 ...
1/8	0.010	1	3	1/8	4	90080	90180
1/8	0.015	1	3	1/8	4	90180	90280
1/8	0.020	1	3	1/8	4	90280	90380
1/8	0.030	1	3	1/8	4	90380	90480
1/8	0.045	1	3	1/8	4	90480	90580
3/16	0.010	1 1/8	3	3/16	4	90060	90160
3/16	0.015	1 1/8	3	3/16	4	90160	90260
3/16	0.020	1 1/8	3	3/16	4	90260	90360
3/16	0.030	1 1/8	3	3/16	4	90360	90460
3/16	0.045	1 1/8	3	3/16	4	90460	90560
3/16	0.060	1 1/8	3	3/16	4	90560	90660
1/4	0.010	1 1/2	4	1/4	4	90660	90760
1/4	0.015	1 1/2	4	1/4	4	90760	90860
1/4	0.020	1 1/2	4	1/4	4	90860	90960
1/4	0.030	1 1/2	4	1/4	4	90960	91060
1/4	0.045	1 1/2	4	1/4	4	91060	91160
1/4	0.060	1 1/2	4	1/4	4	91160	91260
1/4	0.090	1 1/2	4	1/4	4	91260	91360
1/4	0.010	1 1/2	6	1/4	4	92160	92260
1/4	0.015	1 1/2	6	1/4	4	92260	92360
1/4	0.020	1 1/2	6	1/4	4	92360	92460
1/4	0.030	1 1/2	6	1/4	4	92460	92560
1/4	0.045	1 1/2	6	1/4	4	92560	92660
1/4	0.060	1 1/2	6	1/4	4	92660	92760
1/4	0.090	1 1/2	6	1/4	4	92760	92860
5/16	0.010	1 5/8	4	5/16	4	90052	90152
5/16	0.015	1 5/8	4	5/16	4	90252	90352
5/16	0.020	1 5/8	4	5/16	4	90352	90452
5/16	0.030	1 5/8	4	5/16	4	90452	90552
5/16	0.045	1 5/8	4	5/16	4	90552	90652
5/16	0.060	1 5/8	4	5/16	4	90652	90752
5/16	0.090	1 5/8	4	5/16	4	90752	90852
5/16	0.125	1 5/8	4	5/16	4	90152	90252
3/8	0.010	3	6	3/8	4	90580	90680
3/8	0.015	3	6	3/8	4	90780	90880
3/8	0.020	3	6	3/8	4	90880	90980
3/8	0.030	3	6	3/8	4	90980	91080
3/8	0.045	3	6	3/8	4	91080	91180
3/8	0.060	3	6	3/8	4	91180	91280
3/8	0.090	3	6	3/8	4	91280	91380
P						●	●
M						●	●
K						●	●
N						●	●
S						●	●
H							
O							

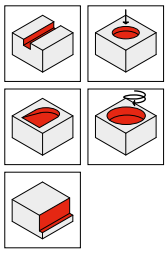
→ v_c/f_z Page 118

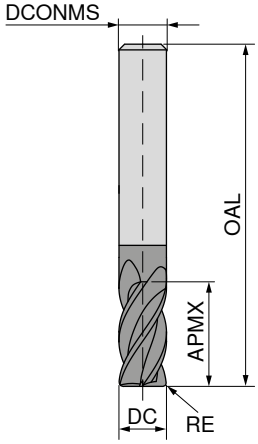
Continued on next page

End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001

S644 | UN | λ_s=38° γ_s=8°





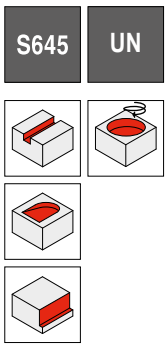
AlTiN

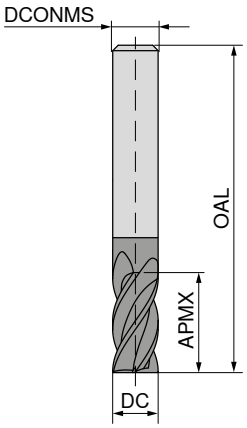
DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 072 ...	59 073 ...
3/8	0.125	3	6	3/8	4	**90680**	**90780**
1/2	0.010	3	6	1/2	4	**91360**	**91460**
1/2	0.015	3	6	1/2	4	**91560**	**91660**
1/2	0.020	3	6	1/2	4	**91660**	**91760**
1/2	0.030	3	6	1/2	4	**91760**	**91860**
1/2	0.045	3	6	1/2	4	**91860**	**91960**
1/2	0.060	3	6	1/2	4	**91960**	**92060**
1/2	0.090	3	6	1/2	4	**92060**	**92160**
1/2	0.125	3	6	1/2	4	**91460**	**91560**
5/8	0.015	3	6	5/8	4	**90148**	**90148**
5/8	0.020	3	6	5/8	4	**90248**	**90248**
5/8	0.030	3	6	5/8	4	**90348**	**90348**
5/8	0.045	3	6	5/8	4	**90448**	**90448**
5/8	0.060	3	6	5/8	4	**90548**	**90548**
5/8	0.090	3	6	5/8	4	**90648**	**90648**
5/8	0.125	3	6	5/8	4	**90048**	**90048**
3/4	0.020	3	6	3/4	4	**91340**	**91340**
3/4	0.030	3	6	3/4	4	**91440**	**91440**
3/4	0.045	3	6	3/4	4	**91540**	**91540**
3/4	0.060	3	6	3/4	4	**91640**	**91640**
3/4	0.090	3	6	3/4	4	**91740**	**91740**
3/4	0.125	3	6	3/4	4	**91240**	**91240**
1	0.030	3	6	1	4	**92230**	**92230**
1	0.045	3	6	1	4	**92330**	**92330**
1	0.060	3	6	1	4	**92430**	**92430**
1	0.090	3	6	1	4	**92530**	**92530**
1	0.125	3	6	1	4	**92130**	**92130**
P						●	●
M						●	●
K						●	●
N						●	●
S						●	●
H							
O							

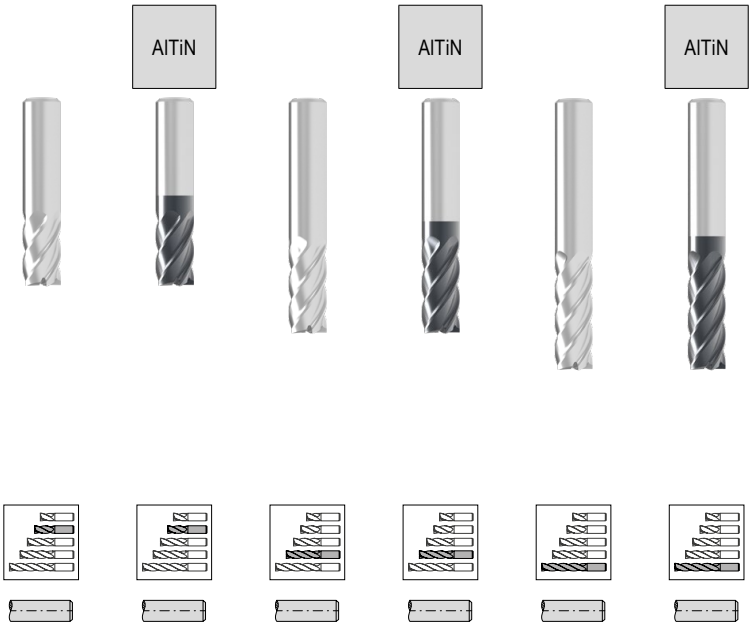
→ v_c/f_z Page 118

End milling cutter

S645 | UN | λ_s=43° γ_s=8°





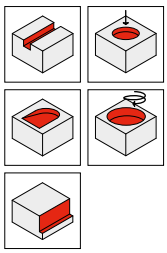


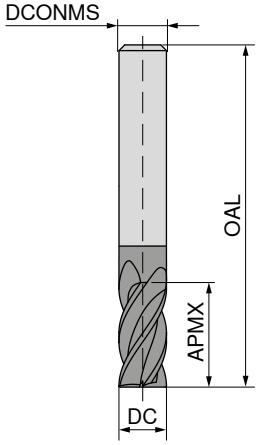
DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 074 ...	59 075 ...	59 074 ...	59 075 ...	59 074 ...	59 075 ...
1/8	1/4	1 1/2	1/8	5	**12520**	**12520**				
1/8	1/2	1 1/2	1/8	5			**12540**	**12540**		
5/32	5/16	2	3/16	5	**15620**	**15620**				
5/32	9/16	2	3/16	5			**15636**	**15636**		
3/16	5/16	2	3/16	5	**18817**	**18817**				
3/16	9/16	2	3/16	5			**18830**	**18830**		
7/32	3/8	2	1/4	5	**21917**	**21917**				
7/32	3/4	2 1/2	1/4	5			**21934**	**21934**		
1/4	3/8	2	1/4	5	**25015**	**25015**				
1/4	3/4	2 1/2	1/4	5			**25030**	**25030**		
1/4	1 1/4	4	1/4	5					**25050**	**25050**
5/16	7/16	2	5/16	5	**31314**	**31314**				
5/16	13/16	2 1/2	5/16	5			**31326**	**31326**		
3/8	1/2	2	3/8	5	**37513**	**37513**				
3/8	1	2 1/2	3/8	5			**37527**	**37527**		
3/8	1 1/2	4	3/8	5					**37540**	**37540**
1/2	5/8	2 1/2	1/2	5	**50013**	**50013**				
1/2	1 1/4	3	1/2	5			**50025**	**50025**		
1/2	2	4	1/2	5					**50040**	**50040**
5/8	3/4	3	5/8	5	**62512**	**62512**				
5/8	1 5/8	3 1/2	5/8	5			**62526**	**62526**		
5/8	2 1/2	5	5/8	5					**62540**	**62540**
3/4	1	3	3/4	5	**75013**	**75013**				
3/4	1 5/8	4	3/4	5			**75022**	**75022**		
3/4	3 1/4	6	3/4	5					**75043**	**75043**
1	1 1/4	3	1	5	**99913**	**99913**				
1	2	4	1	5			**99920**	**99920**		
1	3 1/4	6	1	5					**99933**	**99933**
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K					●	●	●	●	●	●
N										
S										
H										
O										

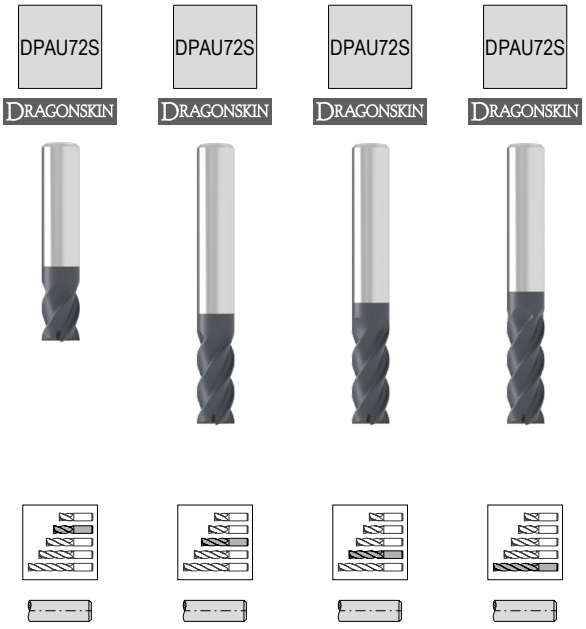
→ v_c/f_z Page 119

End milling cutter

P007 | UN | λ_s –35° –38° γ_s = 9° | HPC







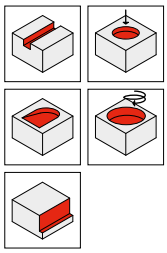
DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 002 ...		59 002 ...		59 002 ...		59 002 ...	
1/8	1/4	1 1/2	1/8	4	**12520**							
1/8	1/2	2 1/2	1/8	4								**12640**
3/16	5/16	2	3/16	4	**18817**							
3/16	5/8	2 1/2	3/16	4						**18833**		
1/4	3/8	2	1/4	4	**25015**							
1/4	1/2	2 1/2	1/4	4			**25020**					
1/4	3/4	2 1/2	1/4	4						**25030**		
1/4	1	3	1/4	4								**25040**
5/16	1/2	2	5/16	4	**31316**							
5/16	3/4	2 1/2	5/16	4			**31324**					
5/16	1 1/4	3	5/16	4						**31340**		
3/8	1/2	2	3/8	4	**37513**							
3/8	7/8	3	3/8	4			**37523**					
3/8	1	3	3/8	4						**37527**		
3/8	1 1/4	3	3/8	4								**37533**
1/2	5/8	2 1/2	1/2	4	**50013**							
1/2	1	3	1/2	4			**50020**					
1/2	1 1/4	3	1/2	4						**50025**		
1/2	1 5/8	4	1/2	4								**50033**
5/8	3/4	3	5/8	4	**62512**							
5/8	1 1/4	3 1/2	5/8	4			**62520**					
5/8	1 5/8	3 1/2	5/8	4						**62526**		
5/8	2	4	5/8	4								**62532**
5/8	3 1/4	6	5/8	4								**62552**
3/4	7/8	3	3/4	4	**75012**							
3/4	1 1/4	4	3/4	4			**75017**					
3/4	1 5/8	4	3/4	4						**75022**		
3/4	2 1/4	5	3/4	4								**75030**
3/4	3 1/4	6	3/4	4								**75043**
1	1 1/2	4	1	4	**99915**							
1	2	4 1/2	1	4			**99920**					
1	2 5/8	5	1	4						**99926**		
1	3	6	1	4								**99930**
1	4 1/4	7	1	4								**99943**
P					●		●		●		●	
M					●		●		●		●	
K					●		●		●		●	
N					●		●		●		●	
S					●		●		●		●	
H												
O												

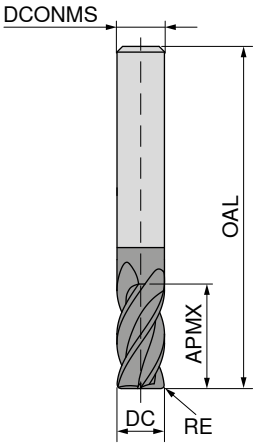
→ v_c/f_z Page 120

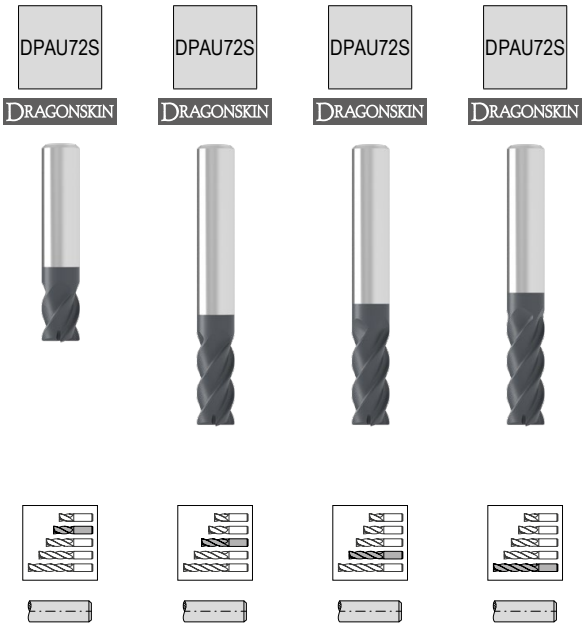
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001 for Ø ≤ 0.060
+/- 0.0015 for Ø > 0.060

P007 | UN | λ_s = 35° 38° γ_s = 9° | HPC







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 002 ...	59 002 ...	59 002 ...	59 002 ...
1/8	0.010	1/4	1 1/2	1/8	4	90020			
1/8	0.030	1/4	1 1/2	1/8	4	90120			
1/8	0.010	1/2	2 1/2	1/8	4			90040	
1/8	0.030	1/2	2 1/2	1/8	4				90140
3/16	0.010	5/16	2	3/16	4	90017			
3/16	0.030	5/16	2	3/16	4	90117			
3/16	0.010	5/8	2 1/2	3/16	4			90033	
3/16	0.030	5/8	2 1/2	3/16	4			90133	
1/4	0.020	3/8	2	1/4	4	90015			
1/4	0.030	3/8	2	1/4	4	90115			
1/4	0.060	3/8	2	1/4	4	90215			
1/4	0.020	1/2	2 1/2	1/4	4		90220		
1/4	0.030	1/2	2 1/2	1/4	4		90320		
1/4	0.060	1/2	2 1/2	1/4	4		90420		
1/4	0.020	3/4	2 1/2	1/4	4			90030	
1/4	0.030	3/4	2 1/2	1/4	4			90130	
1/4	0.060	3/4	2 1/2	1/4	4			90230	
1/4	0.020	1	3	1/4	4				90240
1/4	0.030	1	3	1/4	4				90340
1/4	0.060	1	3	1/4	4				90440
5/16	0.020	1/2	2	5/16	4	90016			
5/16	0.030	1/2	2	5/16	4	90116			
5/16	0.060	1/2	2	5/16	4	90216			
5/16	0.020	3/4	2 1/2	5/16	4		90024		
5/16	0.030	3/4	2 1/2	5/16	4		90124		
5/16	0.060	3/4	2 1/2	5/16	4		90224		
5/16	0.020	1 1/4	3	5/16	4			90540	
5/16	0.030	1 1/4	3	5/16	4			90640	
5/16	0.060	1 1/4	3	5/16	4			90740	
3/8	0.020	1/2	2	3/8	4	90013			
3/8	0.030	1/2	2	3/8	4	90113			
3/8	0.060	1/2	2	3/8	4	90213			
3/8	0.090	1/2	2	3/8	4	90313			
3/8	0.020	7/8	3	3/8	4		90023		
3/8	0.030	7/8	3	3/8	4		90123		
3/8	0.060	7/8	3	3/8	4		90223		
3/8	0.090	7/8	3	3/8	4		90323		
3/8	0.020	1	3	3/8	4			90027	

P	●	●	●	●
M	●	●	●	●
K	●	●	●	●
N	●	●	●	●
S	●	●	●	●
H				
O				

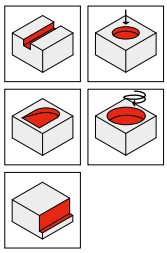
→ v_c/f_z Page 120

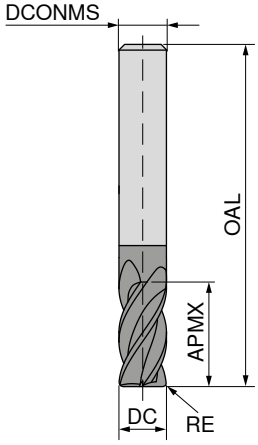
Continued on next page

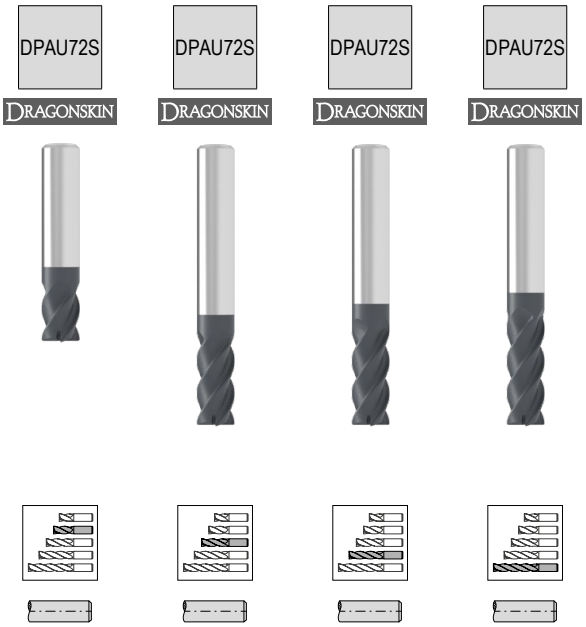
End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001 for Ø ≤ 0.060
+/- 0.0015 for Ø > 0.060

P007 | UN | λ_s=35° 38° γ_s= 9° | HPC







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 002 ...		59 002 ...		59 002 ...		59 002 ...	
3/8	0.030	1	3	3/8	4						90127		
3/8	0.060	1	3	3/8	4						90227		
3/8	0.090	1	3	3/8	4						90327		
3/8	0.020	1 1/4	3	3/8	4								90233
3/8	0.030	1 1/4	3	3/8	4								90333
3/8	0.060	1 1/4	3	3/8	4								90433
3/8	0.090	1 1/4	3	3/8	4								90533
1/2	0.020	5/8	2 1/2	1/2	4	90413							
1/2	0.030	5/8	2 1/2	1/2	4	90513							
1/2	0.060	5/8	2 1/2	1/2	4	90613							
1/2	0.090	5/8	2 1/2	1/2	4	90713							
1/2	0.125	5/8	2 1/2	1/2	4	90813							
1/2	0.020	1	3	1/2	4			90520					
1/2	0.030	1	3	1/2	4			90620					
1/2	0.060	1	3	1/2	4			90720					
1/2	0.090	1	3	1/2	4			90820					
1/2	0.125	1	3	1/2	4			90920					
1/2	0.020	1 1/4	3	1/2	4						90025		
1/2	0.030	1 1/4	3	1/2	4						90125		
1/2	0.060	1 1/4	3	1/2	4						90225		
1/2	0.090	1 1/4	3	1/2	4						90325		
1/2	0.125	1 1/4	3	1/2	4						90425		
1/2	0.020	1 5/8	4	1/2	4								90633
1/2	0.030	1 5/8	4	1/2	4								90733
1/2	0.060	1 5/8	4	1/2	4								90833
1/2	0.090	1 5/8	4	1/2	4								90933
1/2	0.125	1 5/8	4	1/2	4								91033
5/8	0.030	3/4	3	5/8	4	90012							
5/8	0.060	3/4	3	5/8	4	90112							
5/8	0.090	3/4	3	5/8	4	90212							
5/8	0.125	3/4	3	5/8	4	90312							
5/8	0.030	1 1/4	3 1/2	5/8	4			91020					
5/8	0.060	1 1/4	3 1/2	5/8	4			91120					
5/8	0.090	1 1/4	3 1/2	5/8	4			91220					
5/8	0.125	1 1/4	3 1/2	5/8	4			91320					
5/8	0.030	1 5/8	3 1/2	5/8	4						90026		
5/8	0.060	1 5/8	3 1/2	5/8	4						90126		
5/8	0.090	1 5/8	3 1/2	5/8	4						90226		

P	●	●	●	●
M	●	●	●	●
K	●	●	●	●
N	●	●	●	●
S	●	●	●	●
H				
O				

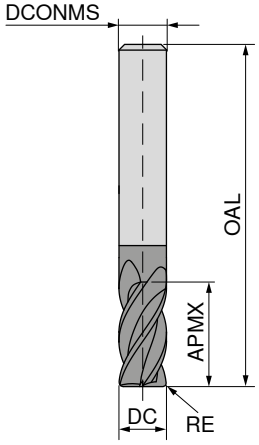
→ v_c/f_z Page 120

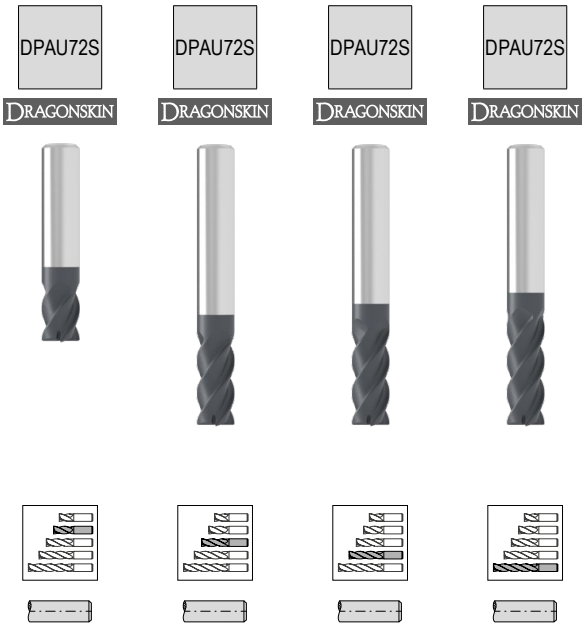
Continued on next page

End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001 for Ø ≤ 0.060
+/- 0.0015 for Ø > 0.060

P007 | UN | λ_s=35° 38° γ_s= 9° | HPC





DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 002 ...							
5/8	0.125	1 5/8	3 1/2	5/8	4								90326
5/8	0.030	2	4	5/8	4								90032
5/8	0.060	2	4	5/8	4								90132
5/8	0.090	2	4	5/8	4								90232
5/8	0.125	2	4	5/8	4								90332
5/8	0.030	3 1/4	6	5/8	4								90052
5/8	0.060	3 1/4	6	5/8	4								90152
5/8	0.090	3 1/4	6	5/8	4								90252
5/8	0.125	3 1/4	6	5/8	4								90352
3/4	0.030	7/8	3	3/4	4	90412							
3/4	0.060	7/8	3	3/4	4	90512							
3/4	0.090	7/8	3	3/4	4	90612							
3/4	0.125	7/8	3	3/4	4	90712							
3/4	0.190	7/8	3	3/4	4	90812							
3/4	0.250	7/8	3	3/4	4	90912							
3/4	0.030	1 1/4	4	3/4	4			90217					
3/4	0.060	1 1/4	4	3/4	4			90317					
3/4	0.090	1 1/4	4	3/4	4			90417					
3/4	0.125	1 1/4	4	3/4	4			90517					
3/4	0.190	1 1/4	4	3/4	4			90617					
3/4	0.250	1 1/4	4	3/4	4			90717					
3/4	0.030	1 5/8	4	3/4	4					90022			
3/4	0.060	1 5/8	4	3/4	4					90122			
3/4	0.090	1 5/8	4	3/4	4					90222			
3/4	0.125	1 5/8	4	3/4	4					90322			
3/4	0.190	1 5/8	4	3/4	4					90422			
3/4	0.250	1 5/8	4	3/4	4					90522			
3/4	0.030	2 1/4	5	3/4	4								90330
3/4	0.060	2 1/4	5	3/4	4								90430
3/4	0.090	2 1/4	5	3/4	4								90530
3/4	0.125	2 1/4	5	3/4	4								90630
3/4	0.190	2 1/4	5	3/4	4								90730
3/4	0.250	2 1/4	5	3/4	4								90830
3/4	0.030	3 1/4	6	3/4	4								90043
3/4	0.060	3 1/4	6	3/4	4								90143
3/4	0.090	3 1/4	6	3/4	4								90243
3/4	0.125	3 1/4	6	3/4	4								90343
3/4	0.190	3 1/4	6	3/4	4								90443

P	●	●	●	●
M	●	●	●	●
K	●	●	●	●
N	●	●	●	●
S	●	●	●	●
H				
O				

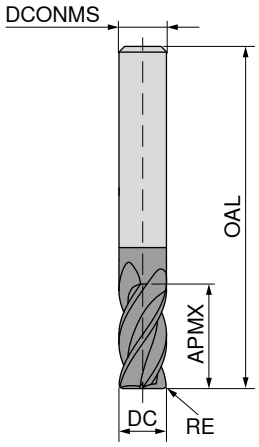
→ v_c/f_z Page 120

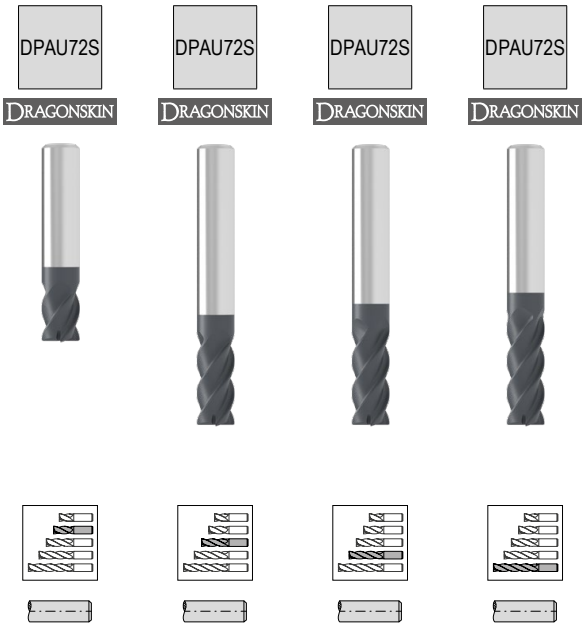
Continued on next page

End milling cutter with corner radius

▲ Radius accuracy: +/- 0.001 for Ø ≤ 0.060
+/- 0.0015 for Ø > 0.060

P007 | UN | λ_s = 35° 38° γ_s = 9° | HPC





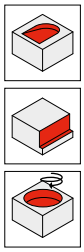
DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 002 ...	59 002 ...	59 002 ...	59 002 ...
3/4	0.250	3 1/4	6	3/4	4				90543
1	0.030	1 1/2	4	1	4	90315			
1	0.060	1 1/2	4	1	4	90415			
1	0.090	1 1/2	4	1	4	90515			
1	0.125	1 1/2	4	1	4	90615			
1	0.190	1 1/2	4	1	4	90715			
1	0.250	1 1/2	4	1	4	90815			
1	0.030	2	4 1/2	1	4		91420		
1	0.060	2	4 1/2	1	4		91520		
1	0.090	2	4 1/2	1	4		91620		
1	0.125	2	4 1/2	1	4		91720		
1	0.190	2	4 1/2	1	4		91820		
1	0.250	2	4 1/2	1	4		91920		
1	0.030	2 5/8	5	1	4			90426	
1	0.060	2 5/8	5	1	4			90526	
1	0.090	2 5/8	5	1	4			90626	
1	0.125	2 5/8	5	1	4			90726	
1	0.190	2 5/8	5	1	4			90826	
1	0.250	2 5/8	5	1	4			90926	
1	0.030	3	6	1	4				90930
1	0.060	3	6	1	4				91030
1	0.090	3	6	1	4				91130
1	0.125	3	6	1	4				91230
1	0.190	3	6	1	4				91330
1	0.250	3	6	1	4				91430
1	0.030	4 1/4	7	1	4				90643
1	0.060	4 1/4	7	1	4				90743
1	0.090	4 1/4	7	1	4				90843
1	0.125	4 1/4	7	1	4				90943
1	0.190	4 1/4	7	1	4				91043
1	0.250	4 1/4	7	1	4				91143
P						●	●	●	●
M						●	●	●	●
K						●	●	●	●
N						●	●	●	●
S						●	●	●	●
H									
O									

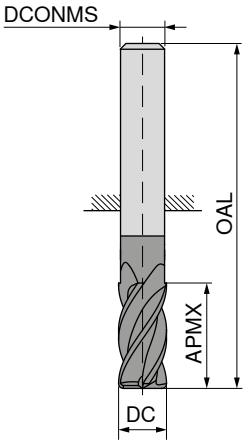
→ v_c/f_z Page 120

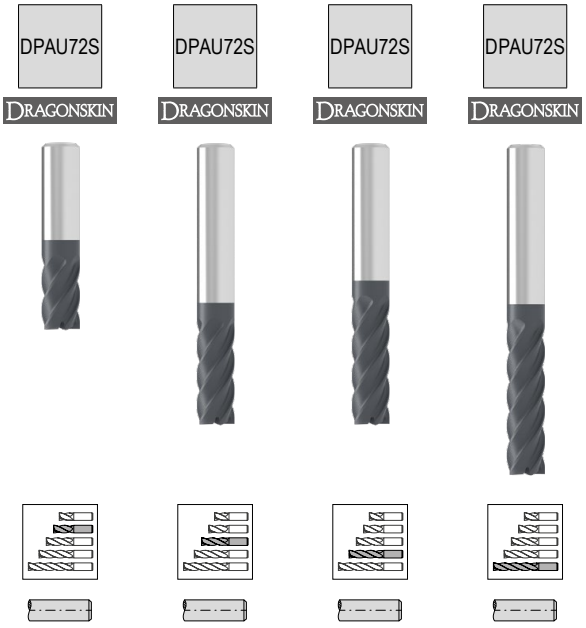
End milling cutter

▲ Cutting edges with irregular pitch

P556 | UN | λ_s=38° γ_s=07° | HPC







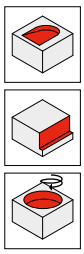
DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 006 ...	59 006 ...	59 006 ...	59 006 ...
1/4	3/8	2	1/4	5	25015			
1/4	1/2	2 1/2	1/4	5		25020		
1/4	3/4	2 1/2	1/4	5			25030	
1/4	1	3	1/4	5				25040
1/4	1 1/4	3	1/4	5				25050
3/8	1/2	2	3/8	5	37513			
3/8	1	3	3/8	5		37527		
3/8	1 1/4	3	3/8	5			37533	
3/8	1 1/2	3 1/2	3/8	5				37540
1/2	5/8	2 1/2	1/2	5	50013			
1/2	1	3	1/2	5		50020		
1/2	1 1/4	3	1/2	5			50025	
1/2	1 5/8	4	1/2	5				50033
1/2	2	4	1/2	5				50040
5/8	3/4	3	5/8	5	62512			
5/8	1 1/4	3 1/2	5/8	5		62520		
5/8	1 5/8	3 1/2	5/8	5			62526	
5/8	2 1/4	4	5/8	5				62536
5/8	2 1/2	5	5/8	5				62540
3/4	1	3	3/4	5	75013			
3/4	1 5/8	4	3/4	5		75022		
3/4	2 1/4	5	3/4	5			75030	
3/4	2 3/4	5	3/4	5				75037
3/4	3 1/4	6	3/4	5				75043
1	1 1/4	4	1	5	99913			
1	2	4 1/2	1	5		99920		
1	2 5/8	5	1	5			99926	
1	3 1/4	6	1	5				99933
1	4 1/4	7	1	5				99943
P					●	●	●	●
M					●	●	●	●
K					●	●	●	●
N								
S					●	●	●	●
H								
O								

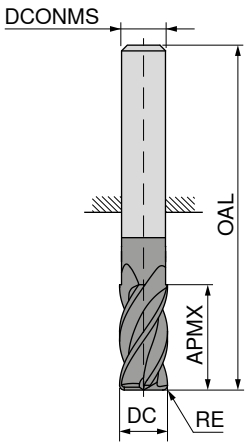
→ v_c/f_z Page 121

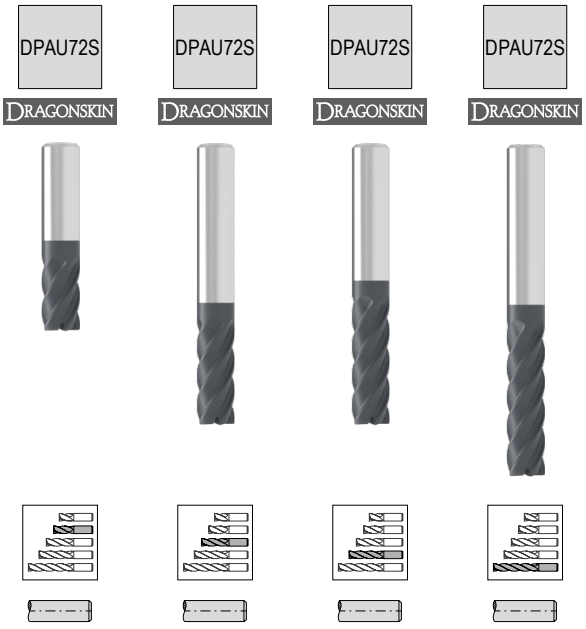
End milling cutter with corner radius

▲ Cutting edges with irregular pitch
▲ Radius accuracy: +/- 0.001 for Ø ≤ 0.060
+/- 0.0015 for Ø > 0.060

P556 | UN | λ_s=38° γ_s=07° | HPC







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 006 ...		59 006 ...		59 006 ...		59 006 ...	
1/4	0.015	3/8	2	1/4	5	**90015**							
1/4	0.030	3/8	2	1/4	5	**90115**							
1/4	0.060	3/8	2	1/4	5	**90215**							
1/4	0.015	1/2	2 1/2	1/4	5			**90020**					
1/4	0.030	1/2	2 1/2	1/4	5			**90120**					
1/4	0.060	1/2	2 1/2	1/4	5			**90220**					
1/4	0.015	3/4	2 1/2	1/4	5					**90030**			
1/4	0.030	3/4	2 1/2	1/4	5					**90130**			
1/4	0.060	3/4	2 1/2	1/4	5					**90230**			
1/4	0.015	1	3	1/4	5							**90040**	
1/4	0.030	1	3	1/4	5							**90140**	
1/4	0.060	1	3	1/4	5							**90240**	
1/4	0.015	1 1/4	3	1/4	5							**90050**	
1/4	0.030	1 1/4	3	1/4	5							**90150**	
1/4	0.060	1 1/4	3	1/4	5							**90250**	
3/8	0.015	1/2	2	3/8	5	**90013**							
3/8	0.030	1/2	2	3/8	5	**90113**							
3/8	0.060	1/2	2	3/8	5	**90213**							
3/8	0.090	1/2	2	3/8	5	**90313**							
3/8	0.015	1	3	3/8	5			**90027**					
3/8	0.030	1	3	3/8	5			**90127**					
3/8	0.060	1	3	3/8	5			**90227**					
3/8	0.090	1	3	3/8	5			**90327**					
3/8	0.015	1 1/4	3	3/8	5					**90033**			
3/8	0.030	1 1/4	3	3/8	5					**90133**			
3/8	0.060	1 1/4	3	3/8	5					**90233**			
3/8	0.090	1 1/4	3	3/8	5					**90333**			
3/8	0.015	1 1/2	3 1/2	3/8	5							**90340**	
3/8	0.030	1 1/2	3 1/2	3/8	5							**90440**	
3/8	0.060	1 1/2	3 1/2	3/8	5							**90540**	
3/8	0.090	1 1/2	3 1/2	3/8	5							**90640**	
1/2	0.015	5/8	2 1/2	1/2	5	**90413**							
1/2	0.030	5/8	2 1/2	1/2	5	**90513**							
1/2	0.060	5/8	2 1/2	1/2	5	**90613**							
1/2	0.090	5/8	2 1/2	1/2	5	**90713**							
1/2	0.125	5/8	2 1/2	1/2	5	**90813**							
1/2	0.015	1	3	1/2	5			**90320**					
P						●		●		●		●	
M						●		●		●		●	
K						●		●		●		●	
N													
S						●		●		●		●	
H													
O													

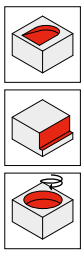
→ v_c/f_z Page 121

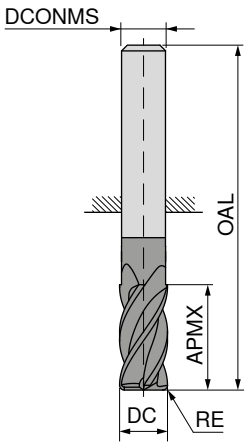
Continued on next page

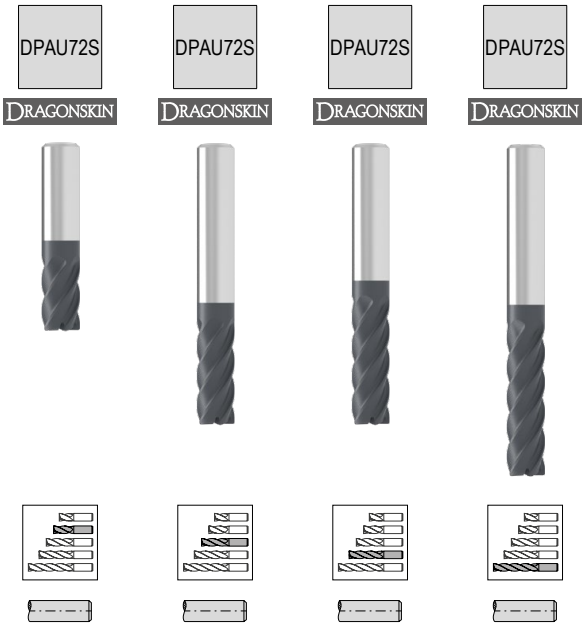
End milling cutter with corner radius

▲ Cutting edges with irregular pitch
▲ Radius accuracy: +/- 0.001 for Ø ≤ 0.060
+/- 0.0015 for Ø > 0.060

P556 | UN | λ_s=38° γ_s=07° | HPC







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 006 ...	59 006 ...	59 006 ...	59 006 ...
1/2	0.030	1	3	1/2	5		90420		
1/2	0.060	1	3	1/2	5		90520		
1/2	0.090	1	3	1/2	5		90620		
1/2	0.125	1	3	1/2	5		90720		
1/2	0.015	1 1/4	3	1/2	5			90025	
1/2	0.030	1 1/4	3	1/2	5			90125	
1/2	0.060	1 1/4	3	1/2	5			90225	
1/2	0.090	1 1/4	3	1/2	5			90325	
1/2	0.125	1 1/4	3	1/2	5			90425	
1/2	0.015	1 5/8	4	1/2	5				90433
1/2	0.030	1 5/8	4	1/2	5				90533
1/2	0.060	1 5/8	4	1/2	5				90633
1/2	0.090	1 5/8	4	1/2	5				90733
1/2	0.125	1 5/8	4	1/2	5				90833
1/2	0.015	2	4	1/2	5				90740
1/2	0.030	2	4	1/2	5				90840
1/2	0.060	2	4	1/2	5				90940
1/2	0.090	2	4	1/2	5				91040
1/2	0.125	2	4	1/2	5				91140
5/8	0.030	3/4	3	5/8	5	90012			
5/8	0.060	3/4	3	5/8	5	90112			
5/8	0.090	3/4	3	5/8	5	90212			
5/8	0.125	3/4	3	5/8	5	90312			
5/8	0.030	1 1/4	3 1/2	5/8	5		90820		
5/8	0.060	1 1/4	3 1/2	5/8	5		90920		
5/8	0.090	1 1/4	3 1/2	5/8	5		91020		
5/8	0.125	1 1/4	3 1/2	5/8	5		91120		
5/8	0.030	1 5/8	3 1/2	5/8	5			90026	
5/8	0.060	1 5/8	3 1/2	5/8	5			90126	
5/8	0.090	1 5/8	3 1/2	5/8	5			90226	
5/8	0.125	1 5/8	3 1/2	5/8	5			90326	
5/8	0.030	2 1/4	4	5/8	5				90036
5/8	0.060	2 1/4	4	5/8	5				90136
5/8	0.090	2 1/4	4	5/8	5				90236
5/8	0.125	2 1/4	4	5/8	5				90336
5/8	0.030	2 1/2	5	5/8	5				91240
5/8	0.060	2 1/2	5	5/8	5				91340
P						●	●	●	●
M						●	●	●	●
K						●	●	●	●
N									
S						●	●	●	●
H									
O									

→ v_c/f_z Page 121

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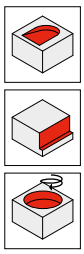
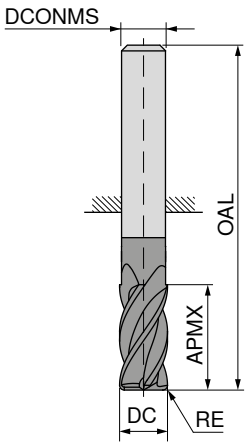
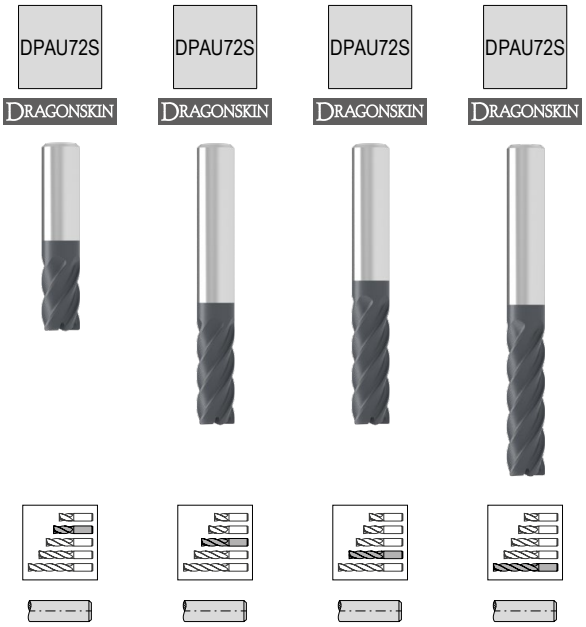
End milling cutter with corner radius

▲ Cutting edges with irregular pitch
▲ Radius accuracy: +/- 0.001 for Ø ≤ 0.060
+/- 0.0015 for Ø > 0.060

P556 | UN | λ_s=38° γ_s=07° | HPC







DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 006 ...		59 006 ...		59 006 ...		59 006 ...	
5/8	0.090	2 1/2	5	5/8	5								**91440**
5/8	0.125	2 1/2	5	5/8	5								**91540**
3/4	0.030	1	3	3/4	5	**90913**							
3/4	0.060	1	3	3/4	5	**91013**							
3/4	0.090	1	3	3/4	5	**91113**							
3/4	0.125	1	3	3/4	5	**91213**							
3/4	0.190	1	3	3/4	5	**91313**							
3/4	0.250	1	3	3/4	5	**91413**							
3/4	0.030	1 5/8	4	3/4	5			**90022**					
3/4	0.060	1 5/8	4	3/4	5			**90122**					
3/4	0.090	1 5/8	4	3/4	5			**90222**					
3/4	0.125	1 5/8	4	3/4	5			**90322**					
3/4	0.190	1 5/8	4	3/4	5			**90422**					
3/4	0.250	1 5/8	4	3/4	5			**90522**					
3/4	0.030	2 1/4	5	3/4	5					**90330**			
3/4	0.060	2 1/4	5	3/4	5					**90430**			
3/4	0.090	2 1/4	5	3/4	5					**90530**			
3/4	0.125	2 1/4	5	3/4	5					**90630**			
3/4	0.190	2 1/4	5	3/4	5					**90730**			
3/4	0.250	2 1/4	5	3/4	5					**90830**			
3/4	0.030	2 3/4	5	3/4	5								**90037**
3/4	0.060	2 3/4	5	3/4	5								**90137**
3/4	0.090	2 3/4	5	3/4	5								**90237**
3/4	0.125	2 3/4	5	3/4	5								**90337**
3/4	0.190	2 3/4	5	3/4	5								**90437**
3/4	0.250	2 3/4	5	3/4	5								**90537**
3/4	0.030	3 1/4	6	3/4	5								**90043**
3/4	0.060	3 1/4	6	3/4	5								**90143**
3/4	0.090	3 1/4	6	3/4	5								**90243**
3/4	0.125	3 1/4	6	3/4	5								**90343**
3/4	0.190	3 1/4	6	3/4	5								**90443**
3/4	0.250	3 1/4	6	3/4	5								**90543**
1	0.030	1 1/4	4	1	5	**91513**							
1	0.060	1 1/4	4	1	5	**91613**							
1	0.090	1 1/4	4	1	5	**91713**							
1	0.125	1 1/4	4	1	5	**91813**							
1	0.190	1 1/4	4	1	5	**91913**							

P	●	●	●	●
M	●	●	●	●
K	●	●	●	●
N				
S	●	●	●	●
H				
O				

→ v_c/f_z Page 121

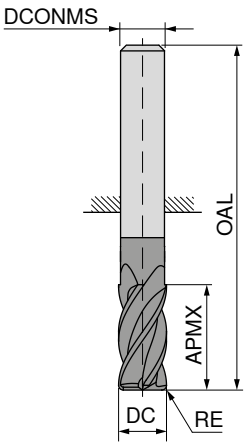
Continued on next page

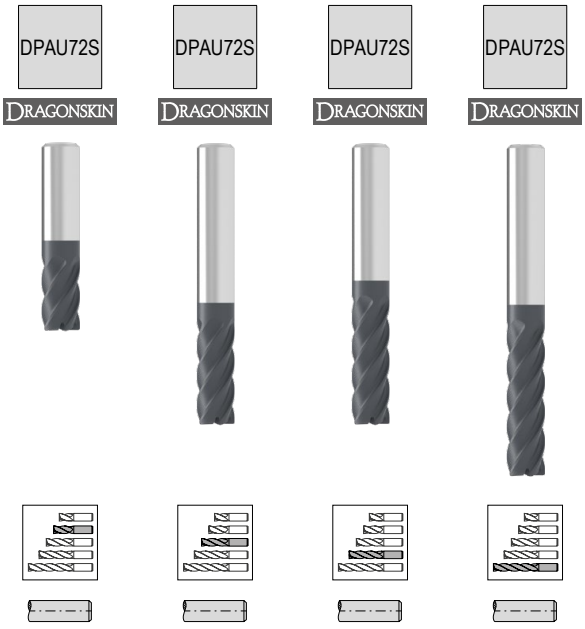
End milling cutter with corner radius

▲ Cutting edges with irregular pitch
▲ Radius accuracy: +/- 0.001 for Ø ≤ 0.060
+/- 0.0015 for Ø > 0.060

P556 | UN | λ_s=38° γ_s=07° | HPC







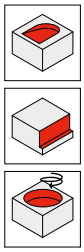
DC +0.000/-0.002 inch	RE inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 006 ...	59 006 ...	59 006 ...	59 006 ...
1	0.250	1 1/4	4	1	5	92013			
1	0.030	2	4 1/2	1	5		91220		
1	0.060	2	4 1/2	1	5		91320		
1	0.090	2	4 1/2	1	5		91420		
1	0.125	2	4 1/2	1	5		91520		
1	0.190	2	4 1/2	1	5		91620		
1	0.250	2	4 1/2	1	5		91720		
1	0.030	2 5/8	5	1	5			90426	
1	0.060	2 5/8	5	1	5			90526	
1	0.090	2 5/8	5	1	5			90626	
1	0.125	2 5/8	5	1	5			90726	
1	0.190	2 5/8	5	1	5			90826	
1	0.250	2 5/8	5	1	5			90926	
1	0.030	3 1/4	6	1	5				90933
1	0.060	3 1/4	6	1	5				91033
1	0.090	3 1/4	6	1	5				91133
1	0.125	3 1/4	6	1	5				91233
1	0.190	3 1/4	6	1	5				91333
1	0.250	3 1/4	6	1	5				91433
1	0.030	4 1/4	7	1	5				90643
1	0.060	4 1/4	7	1	5				90743
1	0.090	4 1/4	7	1	5				90843
1	0.125	4 1/4	7	1	5				90943
1	0.190	4 1/4	7	1	5				91043
1	0.250	4 1/4	7	1	5				91143
P						●	●	●	●
M						●	●	●	●
K						●	●	●	●
N									
S						●	●	●	●
H									
O									

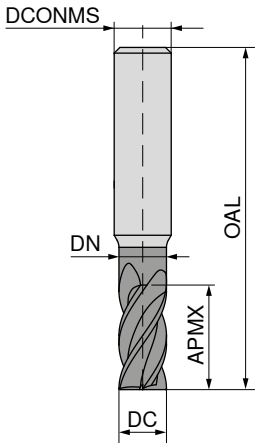
→ v_c/f_z Page 121

End milling cutter

▲ Cutting edges with irregular pitch

P160 | UN | λ_s=38° γ_s=10° | HPC





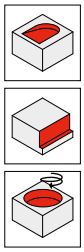
DC +0.000/-0.002 inch	APMX inch	DN inch	LH inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 057 ...	59 057 ...	59 057 ...
1/4	3/4			2 1/2	1/4	7	**25030**		
3/8	7/8			2 1/2	3/8	7	**37523**		
3/8	1 1/4			3	3/8	7		**37533**	
3/8	1/2	0.360	3 1/8	6	3/8	7			**37513**
1/2	1 1/4			3	1/2	7	**50025**		
1/2	1 5/8			4	1/2	7		**50033**	
1/2	5/8	0.480	3 1/8	6	1/2	7			**50013**
5/8	1 5/8			3 1/2	5/8	7	**62526**		
5/8	2 1/8			4	5/8	7		**62534**	
5/8	3/4	0.600	3 1/8	6	5/8	7			**62512**
3/4	1 5/8			4	3/4	7	**75022**		
3/4	2 1/4			5	3/4	7		**75030**	
3/4	1	0.720	3 1/8	6	3/4	7			**75013**
1	2			4	1	7	**99920**		
1	2 5/8			5	1	7			**99926**
P							●	●	●
M							●	●	●
K							●	●	●
N							●	●	●
S							●	●	●
H									
O									

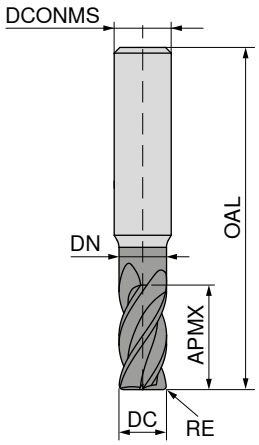
→ v_c/f_z Page 122

End milling cutter with corner radius

▲ Cutting edges with irregular pitch

P161 | UN | λ_s=38° γ_s=10°



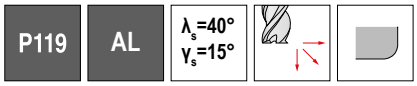


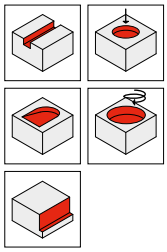
DC +0.000/-0.002 inch	RE inch	APMX inch	DN inch	LH inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 058 ...	59 058 ...	59 058 ...
1/4	0.020	3/4			2 1/2	1/4	7	**25030**		
1/4	0.030	3/4			2 1/2	1/4	7	**90030**		
1/4	0.020	1 1/8			3	1/4	7		**25045**	
1/4	0.030	3/8	0.240	2 1/2	4	1/4	7			**90015**
1/4	0.020	3/8	0.240	2 1/2	4	1/4	7			**25015**
3/8	0.020	7/8			2 1/2	3/8	7	**37523**		
3/8	0.030	7/8			2 1/2	3/8	7	**90023**		
3/8	0.030	1 1/4			3	3/8	7		**90033**	
3/8	0.020	1 1/4			3	3/8	7		**37533**	
3/8	0.020	1/2	0.360	3 1/8	6	3/8	7			**37513**
1/2	0.020	1 1/4			3	1/2	7	**50025**		
1/2	0.030	1 1/4			3	1/2	7	**90025**		
1/2	0.030	1 5/8			4	1/2	7		**90133**	
1/2	0.020	1 5/8			4	1/2	7		**50033**	
1/2	0.030	5/8	0.480	3 1/8	6	1/2	7			**90013**
1/2	0.020	5/8	0.480	3 1/8	6	1/2	7			**50013**
5/8	0.030	1 5/8			3 1/2	5/8	7	**62526**		
5/8	0.030	2 1/8			4	5/8	7		**62534**	
5/8	0.030	3/4	0.600	3 1/8	6	5/8	7			**62512**
3/4	0.030	1 5/8			4	3/4	7	**75022**		
3/4	0.030	2 1/4			5	3/4	7		**75030**	
3/4	0.030	1	0.720	3 1/8	6	3/4	7			**75013**
1	0.030	2 5/8			5	1	7		**99926**	
P								●	●	●
M								●	●	●
K								●	●	●
N								●	●	●
S								●	●	●
H										
O										

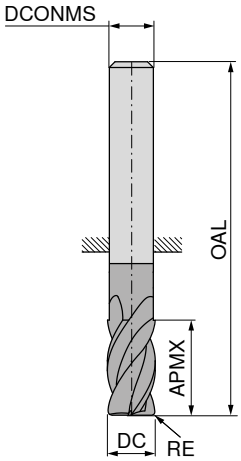
→ v_c/f_z Page 122

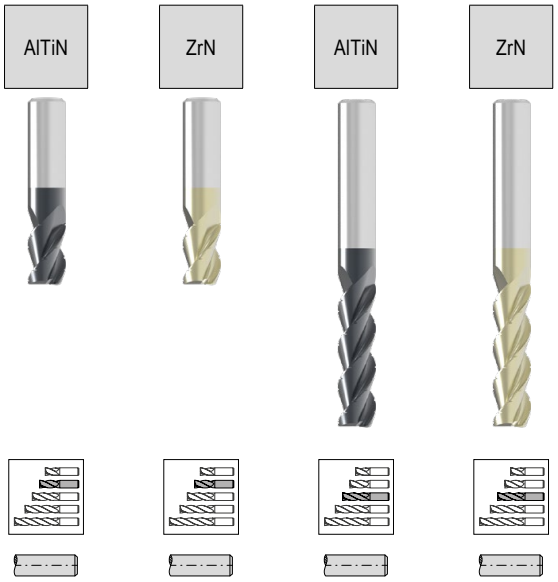
End milling cutter with corner radius

▲ with chip breaker









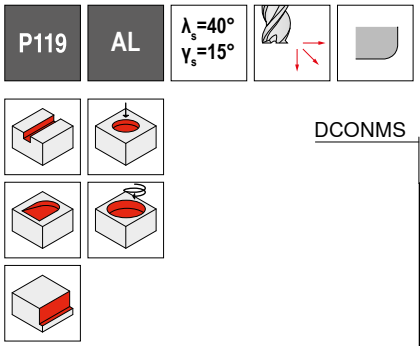
DC +0.000/-0.002 inch	RE ±0.001 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 029 ...		59 030 ...		59 029 ...		59 030 ...	
1/8	0.010	1/4	1 1/2	1/8	3	**12520**		**12520**					
5/32	0.010	3/8	2	3/16	3	**15624**		**15624**					
3/16	0.010	3/8	2	3/16	3	**18820**		**18820**					
7/32	0.020	3/8	2	1/4	3	**21917**		**21917**					
1/4	0.020	3/8	2	1/4	3	**25015**		**25015**					
1/4	0.020	1 1/4	3	1/4	3					**25050**		**25050**	
9/32	0.020	1/2	2 1/2	5/16	3	**28118**		**28118**					
5/16	0.020	1/2	2 1/2	5/16	3	**31316**		**31316**					
11/32	0.020	5/8	2	3/8	3	**34418**		**34418**					
3/8	0.020	5/8	2	3/8	3	**37517**		**37517**					
3/8	0.020	1 1/2	3 1/2	3/8	3					**37540**		**37540**	
7/16	0.020	1	2 3/4	7/16	3	**43823**		**43823**					
1/2	0.020	5/8	2 1/2	1/2	3	**50013**		**50013**					
1/2	0.020	1 1/2	3 1/2	1/2	3					**50030**		**50030**	
5/8	0.030	7/8	3	5/8	3	**62514**		**62514**					
5/8	0.030	1 3/4	4	5/8	3					**62528**		**62528**	
3/4	0.030	1	3	3/4	3	**75013**		**75013**					
3/4	0.030	2 1/2	5	3/4	3					**75033**		**75033**	
1	0.030	2 3/4	5	1	3					**99928**		**99928**	
P													
M													
K													
N							●		●		●		●
S													
H													
O													

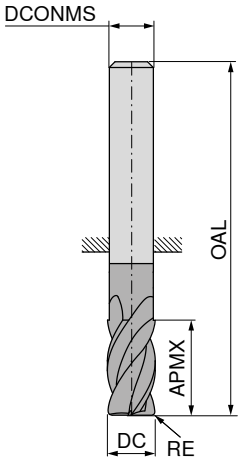
→ v_c/f_z Page 123

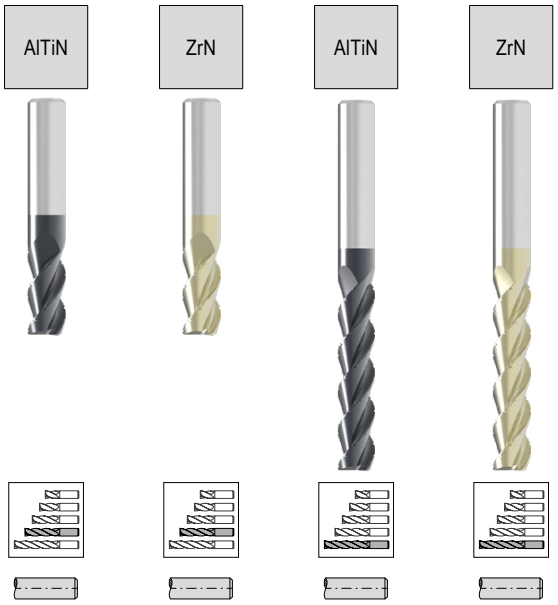
End milling cutter with corner radius

▲ with chip breaker

P119 AL λ_s=40° γ_s=15°







DC +0.000/-0.002 inch	RE ±0.001 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 029 ...		59 030 ...		59 029 ...		59 030 ...	
1/8	0.010	1/2	1 1/2	1/8	3	**12540**		**12540**					
5/32	0.010	1/2	2	3/16	3	**15632**		**15632**					
3/16	0.010	5/8	2	3/16	3	**18833**		**18833**					
7/32	0.020	3/4	2 1/2	1/4	3	**21934**		**21934**					
1/4	0.020	3/4	2 1/2	1/4	3	**25030**		**25030**					
1/4	0.020	1 1/2	3 1/2	1/4	3						**25060**		**25060**
9/32	0.020	3/4	2 1/2	5/16	3	**28127**		**28127**					
5/16	0.020	3/4	2 1/2	5/16	3	**31324**		**31324**					
11/32	0.020	7/8	2 1/2	3/8	3	**34425**		**34425**					
3/8	0.020	7/8	2 1/2	3/8	3	**37523**		**37523**					
3/8	0.020	2	4	3/8	3						**37553**		**37553**
1/2	0.020	1 1/4	3	1/2	3	**50025**		**50025**					
1/2	0.020	2	4	1/2	3						**50040**		**50040**
9/16	0.030	1 1/4	3 1/2	9/16	3	**56322**		**56322**					
5/8	0.030	1 1/4	3 1/2	5/8	3	**62520**		**62520**					
5/8	0.030	2 1/2	5	5/8	3						**62540**		**62540**
3/4	0.030	1 5/8	4	3/4	3	**75022**		**75022**					
3/4	0.030	3 1/4	6	3/4	3						**75043**		**75043**
1	0.030	1 3/4	4	1	3	**99918**		**99918**					
1	0.030	3 3/8	6	1	3						**99934**		**99934**

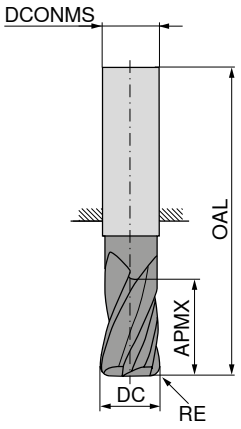
P															
M															
K															
N															
S															
H															
O															

→ v_c/f_z Page 123

End milling cutter with corner radius

▲ with chip breaker

P117 | UN | λ_s=35° γ_s=8°

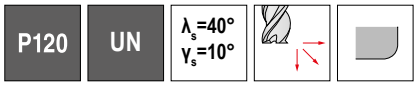


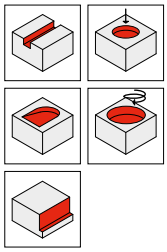
DC +0.000/-0.002 inch	RE ±0.001 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 028 ...	59 028 ...
1/8	0.010	1/2	1 1/2	1/8	3	**12540**	
3/16	0.010	5/16	2	3/16	3	**18817**	
3/16	0.010	5/8	2	3/16	3		**18833**
1/4	0.020	3/8	2	1/4	3	**25015**	
1/4	0.020	3/4	2 1/2	1/4	3		**25030**
5/16	0.020	13/16	2 1/2	5/16	3	**31326**	
3/8	0.020	1	2 1/2	3/8	3	**37527**	
7/16	0.020	5/8	2 3/4	7/16	3	**43814**	
7/16	0.020	1	2 3/4	7/16	3		**43823**
1/2	0.020	5/8	2 1/2	1/2	3	**50013**	
1/2	0.020	1 1/4	3	1/2	3		**50025**
5/8	0.030	1 1/4	3 1/2	5/8	3		**62520**
3/4	0.030	1 5/8	4	3/4	3		**75022**
P						●	●
M						●	●
K						●	●
N						●	●
S						●	●
H							
O							

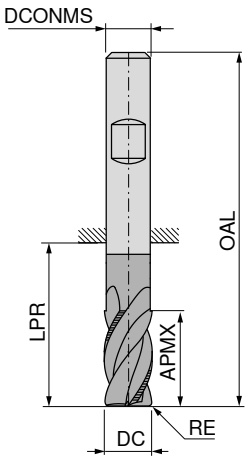
→ v_c/f_z Page 124

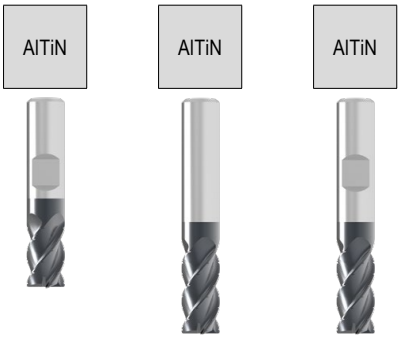
End milling cutter with corner radius

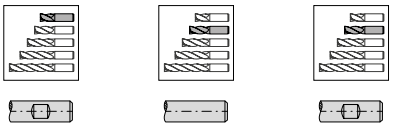
▲ with chip breaker











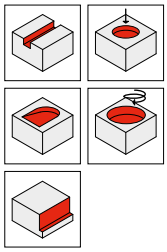
DC +0.000/-0.002 inch	RE ±0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 032 ...	59 031 ...	59 032 ...
1/8	0.010	1/4	0.520	1 1/2	1/8	4		**12520**	
5/32	0.010	3/8	0.898	2	3/16	4		**15624**	
3/16	0.010	3/8	0.898	2	3/16	4		**18820**	
7/32	0.020	3/8	1.083	2	1/4	4		**21917**	
1/4	0.020	3/8	0.583	2	1/4	4		**25015**	
9/32	0.020	1/2	1.083	2 1/2	5/16	4		**28118**	
5/16	0.020	1/2	1.083	2 1/2	5/16	4		**31316**	
11/32	0.020	5/8	0.825	2	3/8	4			**34418**
3/8	0.020	5/8	0.825	2	3/8	4	**37517**		
3/8	0.020	7/8	0.960	2 1/2	3/8	4			**37523**
7/16	0.020	1	1.165	2 3/4	7/16	4			**43823**
1/2	0.020	5/8	0.735	2 1/2	1/2	4	**50013**		
1/2	0.020	1 1/4	1.425	3	1/2	4			**50025**
5/8	0.030	7/8	1.113	3	5/8	4			**62514**
3/4	0.030	1	1.228	3	3/4	4			**75013**
P							●	●	●
M									
K							●	●	●
N									
S									
H									
O									

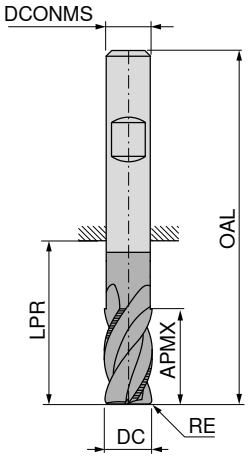
→ v_c/f_z Page 125

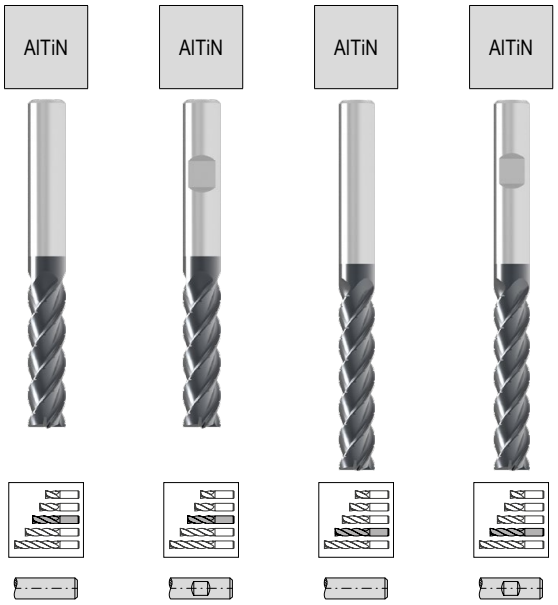
End milling cutter with corner radius

▲ with chip breaker

P120 | UN | λ_s=40° γ_s=10°







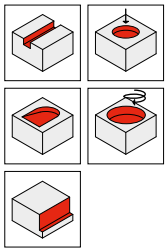
DC +0.000/-0.002 inch	RE ±0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 031 ...	59 032 ...	59 031 ...	59 032 ...
1/8	0.010	1/2	0.520	1 1/2	1/8	4				
5/32	0.010	1/2	0.898	2	3/16	4			**12540**	
3/16	0.010	5/8	0.898	2	3/16	4			**15632**	
7/32	0.020	3/4	0.583	2 1/2	1/4	4			**18833**	
1/4	0.020	3/4	1.083	2 1/2	1/4	4	**25030**		**21934**	
1/4	0.020	1 1/4	1.583	3	1/4	4			**25050**	
9/32	0.020	3/4	1.083	2 1/2	5/16	4			**28127**	
5/16	0.020	3/4	1.083	2 1/2	5/16	4			**31324**	
11/32	0.020	7/8	0.960	2 1/2	3/8	4				**34425**
3/8	0.020	1 1/2	1.925	3 1/2	3/8	4		**37540**		
3/8	0.020	2	2.460	4	3/8	4				**37553**
1/2	0.020	1 1/2	1.735	3 1/2	1/2	4		**50030**		
1/2	0.020	2	2.235	4	1/2	4				**50040**
9/16	0.030	1 1/4	1.675	3 1/2	9/16	4				**56322**
5/8	0.030	1 1/4	1.613	3 1/2	5/8	4		**62520**		
5/8	0.030	1 3/4	2.113	4	5/8	4				**62528**
3/4	0.030	1 5/8	1.978	4	3/4	4				**75022**
P							●	●	●	●
M										
K							●	●	●	●
N										
S										
H										
O										

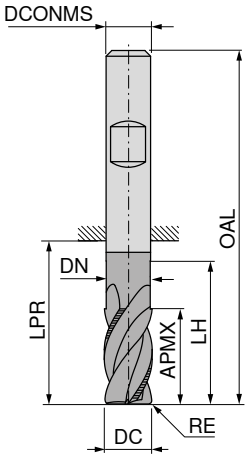
→ v_c/f_z Page 125

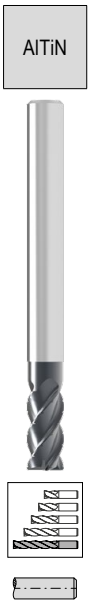
End milling cutter with corner radius

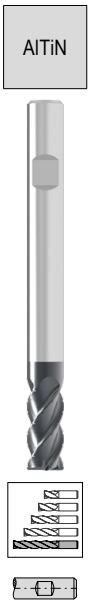
▲ with chip breaker

P120 | UN | λ_s=40° γ_s=10°









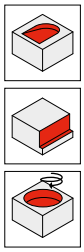
DC +0.000/-0.002 inch	RE ±0.001 inch	APMX inch	DN inch	LH inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 031 ...	59 032 ...
1/4	0.020	3/4	0.240	2 1/8	2.5	4	1/4	4	**25130**	
1/4	0.020	1 1/2			2.0	3 1/2	1/4	4	**25060**	
3/8	0.020	7/8	0.360	2 1/8	2.4	4	3/8	4	**37523**	
3/8	0.020	7/8	0.360	3 3/8	4.4	6	3/8	4	**37623**	
1/2	0.020	1	0.480	2 3/8	4.2	6	1/2	4	**50020**	
1/2	0.020	1	0.480	3 3/8	4.2	6	1/2	4	**50120**	
5/8	0.030	2 1/2			3.1	5	5/8	4		**62540**
3/4	0.030	1 5/8	0.720	2 1/2	3.6	6	3/4	4	**75022**	
1	0.030	1 3/4			1.7	4	1	4		**99918**
P									●	●
M										
K									●	●
N										
S										
H										
O										

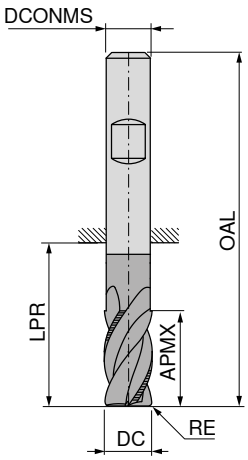
→ v_c/f_z Page 125

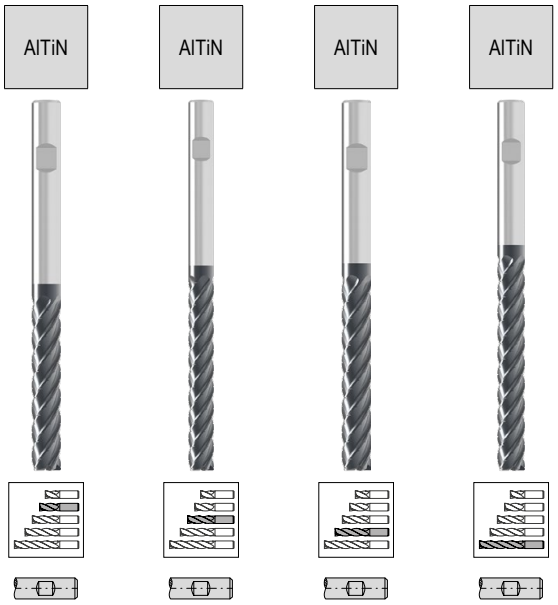
End milling cutter with corner radius

▲ with chip breaker

P121 | UN | λ_s=40° γ_s=10°





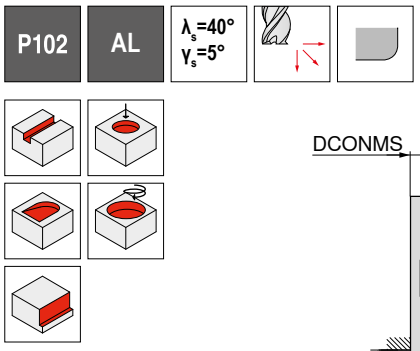


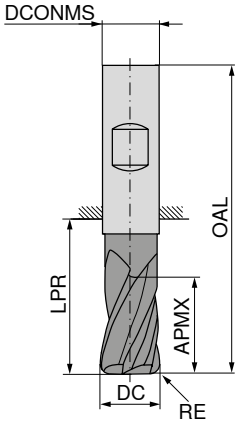
DC +0.000/-0.002 inch	RE ±0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 035 ...	59 035 ...	59 035 ...	59 035 ...
3/4	0.030	2 1/2	2.9	5	3/4	5	**75033**			
3/4	0.030	3 1/4	3.9	6	3/4	5		**75043**		
1	0.030	2 3/4	2.7	5	1	5			**99928**	
1	0.030	3 3/8	3.7	6	1	5				**99934**
P							●	●	●	●
M							●	●	●	●
K							●	●	●	●
N										
S							●	●	●	●
H										
O										

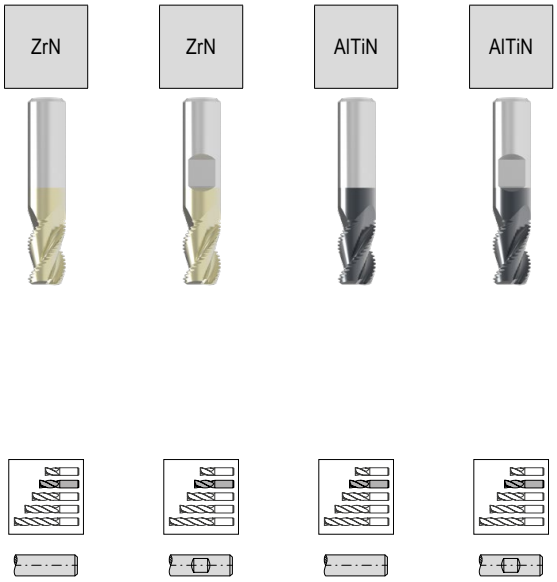
→ v_c/f_z Page 126

End milling cutter with corner radius

▲ with coarse pitch profile
▲ Radius accuracy: +/- 0.001







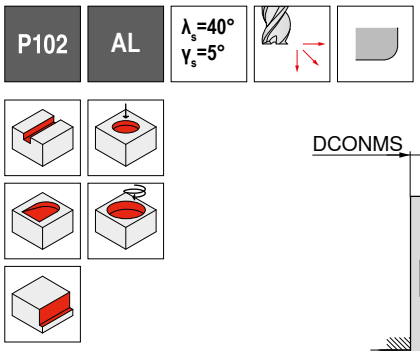
DC +0.000/-0.002 inch	RE +/-0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 023 ...	59 024 ...	59 025 ...	59 026 ...
3/16	0.030	3/8	0.898	2	3/16	3	**18820**		**18820**	
1/4	0.045	3/8	0.583	2	1/4	3	**25015**		**25015**	
5/16	0.045	1/2	0.583	2	5/16	3	**31316**		**31316**	
3/8	0.060	5/8	0.825	2	3/8	3		**37517**		**37517**
7/16	0.060	1	1.165	2 3/4	7/16	3		**43823**		**43823**
1/2	0.060	5/8	0.735	2 1/2	1/2	3		**50013**		**50013**

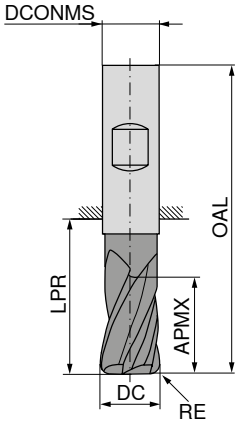
P				
M				
K				
N	●	●	●	●
S				
H				
O				

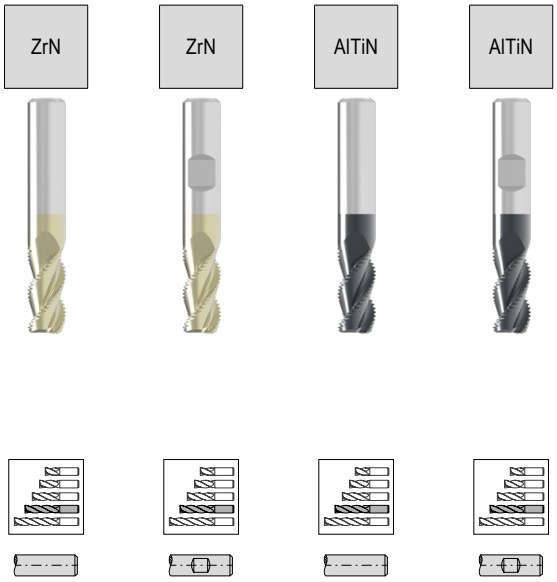
→ v_c/f_z Page 127

End milling cutter with corner radius

▲ with coarse pitch profile
▲ Radius accuracy: +/- 0.001







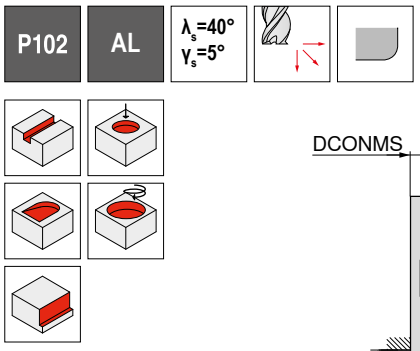
DC +0.000/-0.002 inch	RE +/-0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 023 ...	59 024 ...	59 025 ...	59 026 ...
3/16	0.030	5/8	0.898	2	3/16	3	**18833**		**18833**	
1/4	0.045	3/4	1.083	2 1/2	1/4	3	**25030**		**25030**	
5/16	0.045	3/4	1.083	2 1/2	5/16	3	**31324**		**31324**	
3/8	0.060	7/8	0.960	2 1/2	3/8	3		**37523**		**37523**
1/2	0.060	1 1/4	1.425	3	1/2	3		**50025**		**50025**
9/16	0.060	1 1/4	1.675	3 1/2	9/16	3		**56322**		**56322**
5/8	0.060	1 1/4	1.613	3 1/2	5/8	3		**62520**		**62520**
3/4	0.060	1 5/8	1.978	4	3/4	3		**75022**		**75022**
1	0.060	1 3/4	1.795	4	1	3		**99918**		**99918**

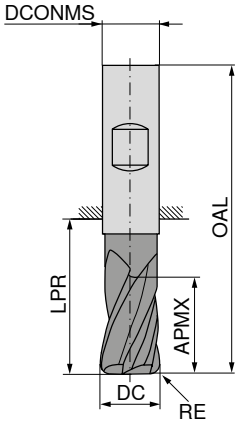
P				
M				
K				
N	●	●	●	●
S				
H				
O				

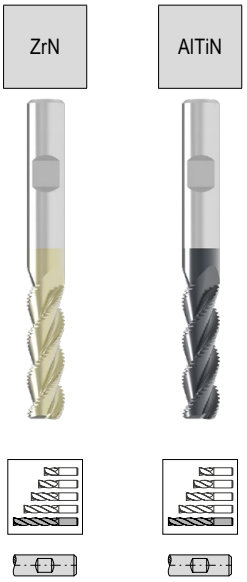
→ v_c/f_z Page 127

End milling cutter with corner radius

▲ with coarse pitch profile
▲ Radius accuracy: +/- 0.001







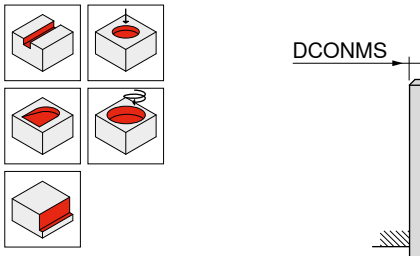
DC +0.000/-0.002 inch	RE +/-0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 024 ...	59 026 ...
1/2	0.060	1 1/2	1.735	3 1/2	1/2	3	**50030**	**50030**
3/4	0.060	2 1/4	2.978	5	3/4	3	**75030**	**75030**
1	0.060	2 5/8	2.795	5	1	3	**99926**	**99926**
P								
M								
K								
N							●	●
S								
H								
O								

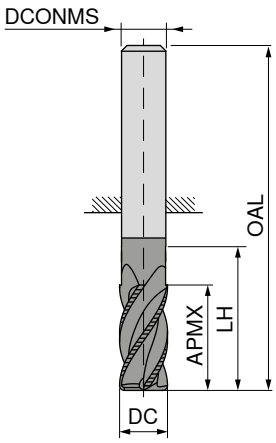
→ v_c/f_z Page 127

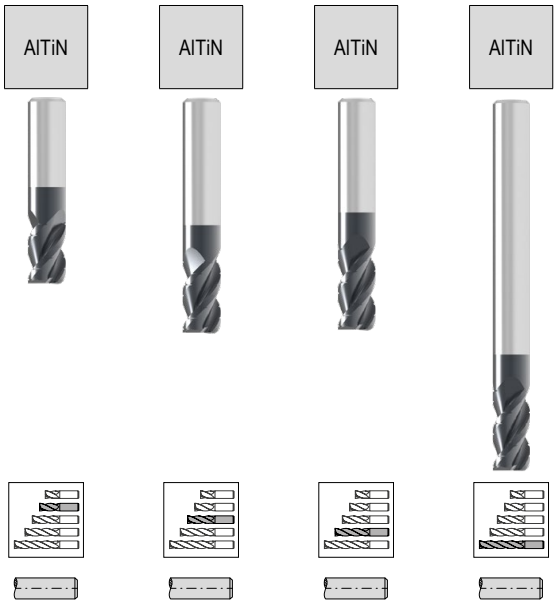
End milling cutter

▲ with chip breaker

P190 | UN | λ_s=40° γ_s=10°







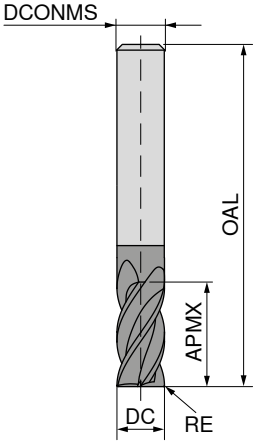
DC +0.000/-0.002 inch	APMX inch	LH inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 059 ...	59 059 ...	59 059 ...	59 059 ...
3/16	5/8		2	3/16	4	**18833**			
1/4	3/8		2	1/4	4	**25015**			
1/4	3/4		2 1/2	1/4	4			**25030**	
5/16	3/4		2 1/2	5/16	4	**31324**			
3/8	5/8		2	3/8	4	**37517**			
3/8	7/8		2 1/2	3/8	4			**37523**	
3/8	7/8	2.125	4	3/8	4				**37623**
1/2	5/8		2 1/2	1/2	4	**50013**			
1/2	1	2.375	6	1/2	4				**50020**
1/2	1 1/4		3	1/2	4			**50025**	
1/2	2		4	1/2	4		**50040**		
5/8	7/8		3	5/8	4	**62514**			
5/8	1 1/4		3 1/2	5/8	4			**62520**	
3/4	1		3	3/4	4	**75013**			
3/4	1 5/8		4	3/4	4			**75022**	
1	1 3/4		4	1	4			**99918**	
P						●	●	●	●
M									
K						●	●	●	●
N									
S									
H									
O									

→ v_c/f_z Page 128

End milling cutter with corner radius

▲ with chip breaker

P191 | UN | λ_s=40° γ_s=10°

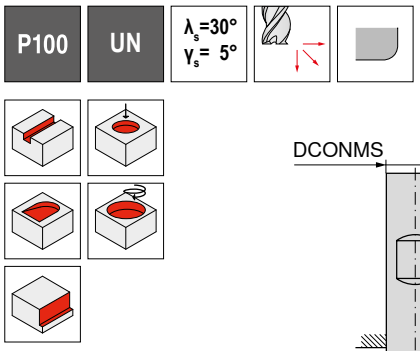


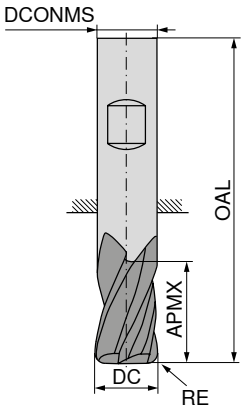
DC +0.000/-0.002 inch	RE +/- 0.001 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 061 ...	59 061 ...	59 061 ...
3/16	0.010	5/8	2	3/16	4	**18833**		
1/4	0.020	3/4	2 1/2	1/4	4	**25030**		
5/16	0.020	3/4	2 1/2	5/16	4	**31324**		
3/8	0.020	7/8	2 1/2	3/8	4	**37523**		
3/8	0.030	7/8	2 1/2	3/8	4	**90023**		
1/2	0.030	5/8	2 1/2	1/2	4	**90013**		
1/2	0.020	5/8	2 1/2	1/2	4	**50013**		
1/2	0.030	1 1/4	3	1/2	4		**90025**	
1/2	0.020	1 1/4	3	1/2	4		**50025**	
1/2	0.030	2	4	1/2	4			**90040**
1/2	0.020	2	4	1/2	4			**50040**
5/8	0.030	1 1/4	3 1/2	5/8	4		**62520**	
3/4	0.030	1 5/8	4	3/4	4		**75022**	
1	0.030	1 3/4	4	1	4		**99918**	
P						●	●	●
M								
K						●	●	●
N								
S								
H								
O								

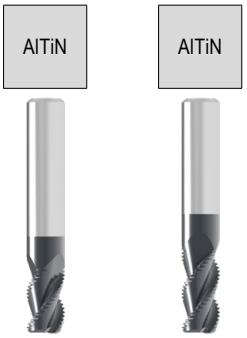
→ v_c/f_z Page 128

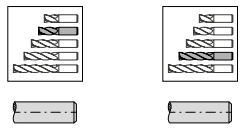
End milling cutter with corner radius

▲ with coarse pitch profile
▲ Radius accuracy: +/- 0.001







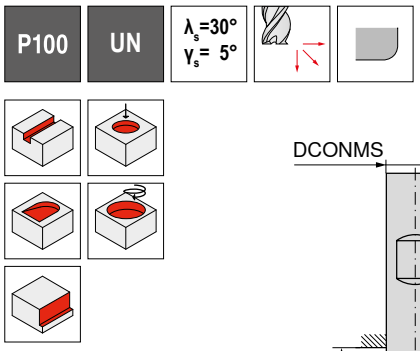


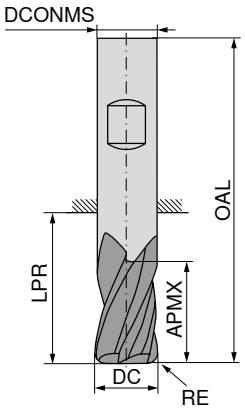
DC +0.000/-0.002 inch	RE +/-0.001/+/- 0.001 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 011 ...	59 011 ...
3/16	0.030	3/8	2	3/16	3	**18820**	
3/16	0.030	5/8	2	3/16	3		**18833**
P						●	●
M							
K						●	●
N							
S							
H							
O							

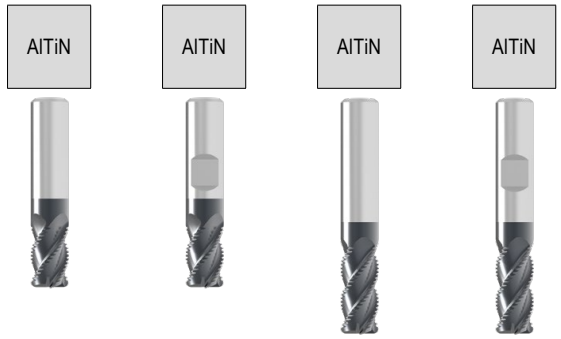
→ v_c/f_z Page 129

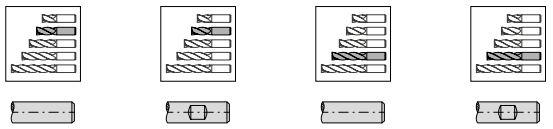
End milling cutter with corner radius

▲ with coarse pitch profile
▲ Radius accuracy: +/- 0.001









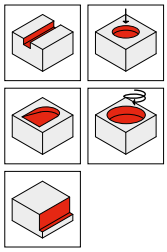
DC +0.000/-0.002 inch	RE +/- 0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 012 ...	59 013 ...	59 012 ...	59 013 ...
1/4	0.045	3/8	0.5	2	1/4	4	**25015**			
1/4	0.045	3/4	1.0	2 1/2	1/4	4			**25030**	
5/16	0.045	1/2	1.0	2 1/2	5/16	4	**31316**			
5/16	0.045	3/4	1.0	2 1/2	5/16	4			**31324**	
3/8	0.060	5/8	0.8	2	3/8	4		**37517**		
3/8	0.060	7/8	0.9	2 1/2	3/8	4				**37523**
7/16	0.060	1	1.1	2 3/4	7/16	4		**43823**		
1/2	0.060	5/8	0.7	2 1/2	1/2	4		**50013**		
1/2	0.060	1 1/4	1.4	3	1/2	4				**50025**
9/16	0.060	1 1/4	1.6	3 1/2	9/16	4				**56322**
5/8	0.060	7/8	1.1	3	5/8	4		**62514**		
5/8	0.060	1 1/4	1.6	3 1/2	5/8	4				**62520**
3/4	0.060	1	1.2	3	3/4	4		**75013**		
3/4	0.060	1 5/8	1.9	4	3/4	4				**75022**
P							●	●	●	●
M										
K							●	●	●	●
N										
S										
H										
O										

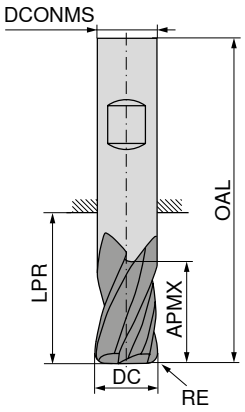
→ v_c/f_z Page 129

End milling cutter with corner radius

▲ with coarse pitch profile
▲ Radius accuracy: +/- 0.001

P100 | UN | λ_s=30° γ_s= 5°





AlTiN

59 013 ...

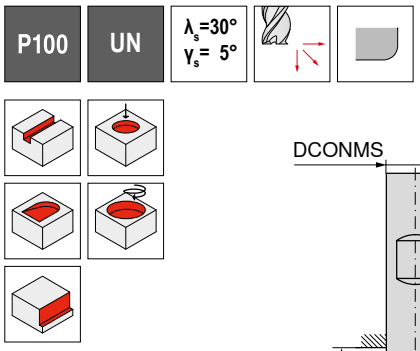
DC +0.000/-0.002 inch	RE +/- 0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
1/2	0.060	1 1/2	1.735	3 1/2	1/2	4	**50030**
5/8	0.060	2	2.113	4	5/8	4	**62532**
3/4	0.060	2 1/4	2.978	5	3/4	4	**75030**

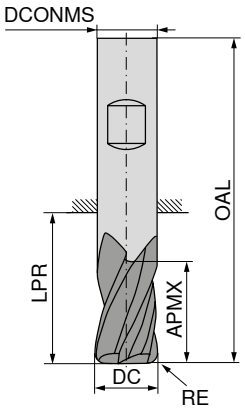
P	●
M	
K	●
N	
S	
H	
O	

→ v_c/f_z Page 129

End milling cutter with corner radius

▲ with coarse pitch profile
▲ Radius accuracy: +/- 0.001



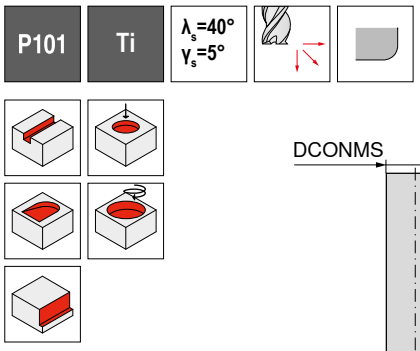


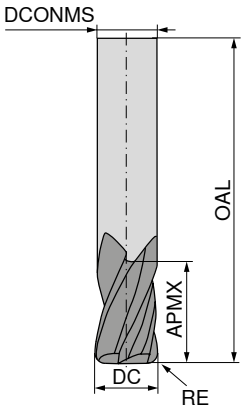
DC +0.000/-0.002 inch	RE +/- 0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 014 ...	59 014 ...
1	0.060	1 3/4	1.795	4	1	5	**99918**	
1	0.060	2 5/8	2.795	5	1	5		**99926**
P							●	●
M								
K							●	●
N								
S								
H								
O								

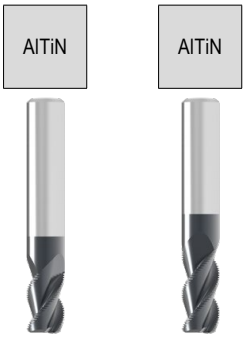
→ v_c/f_z Page 129

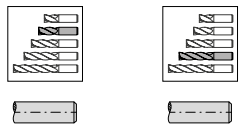
End milling cutter with corner radius

▲ with fine pitch profile
▲ Radius accuracy: +/- 0.001









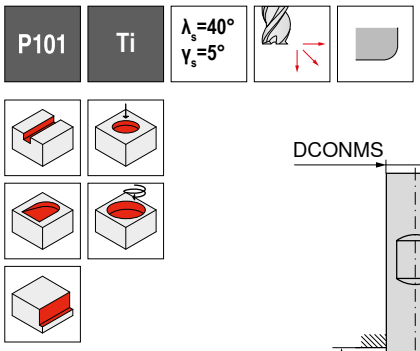
DC +0.000/-0.002 inch	RE +/- 0.001 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 015 ...	59 015 ...
3/16	0.030	3/8	2	3/16	3	**18820**	**18833**
3/16	0.030	5/8	2	3/16	3		

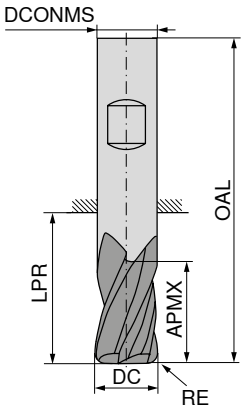
P	●	●
M		
K	●	●
N		
S		
H		
O		

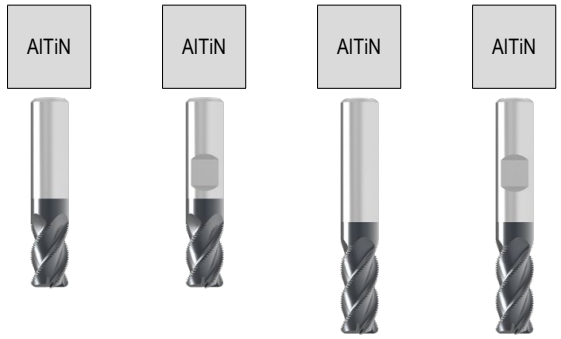
→ v_c/f_z Page 130

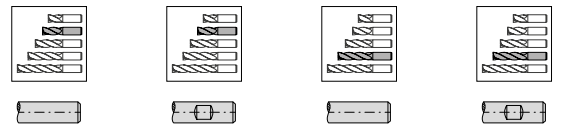
End milling cutter with corner radius

▲ with fine pitch profile
▲ Radius accuracy: +/- 0.001







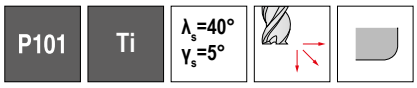


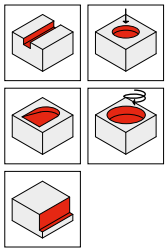
DC +0.000/-0.002 inch	RE +/- 0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 016 ...	59 017 ...	59 016 ...	59 017 ...
1/4	0.045	3/8	0.583	2	1/4	4	**25015**			
1/4	0.045	3/4	1.083	2 1/2	1/4	4			**25030**	
5/16	0.045	1/2	1.083	2 1/2	5/16	4	**31316**			
5/16	0.045	3/4	1.083	2 1/2	5/16	4			**31324**	
3/8	0.060	5/8	0.825	2	3/8	4		**37517**		
3/8	0.060	7/8	0.960	2 1/2	3/8	4				**37523**
7/16	0.060	1	1.165	2 3/4	7/16	4		**43823**		
1/2	0.060	5/8	0.735	2 1/2	1/2	4		**50013**		
1/2	0.060	1 1/4	1.425	3	1/2	4				**50025**
9/16	0.060	1 1/4	1.675	3 1/2	9/16	4				**56322**
5/8	0.060	7/8	1.113	3	5/8	4		**62514**		
5/8	0.060	1 1/4	1.613	3 1/2	5/8	4				**62520**
3/4	0.060	1	1.228	3	3/4	4		**75013**		
3/4	0.060	1 5/8	1.978	4	3/4	4				**75022**
P							●	●	●	●
M										
K							●	●	●	●
N										
S										
H										
O										

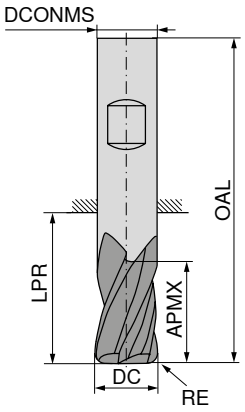
→ v_c/f_z Page 130

End milling cutter with corner radius

▲ with fine pitch profile
▲ Radius accuracy: +/- 0.001







59 017 ...

DC +0.000/-0.002 inch	RE +/- 0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
1/2	0.060	1 1/2	1.735	3 1/2	1/2	4	**50030**
5/8	0.060	2	2.113	4	5/8	4	**62532**
3/4	0.060	2 1/4	2.978	5	3/4	4	**75030**

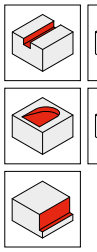
P	●
M	
K	●
N	
S	
H	
O	

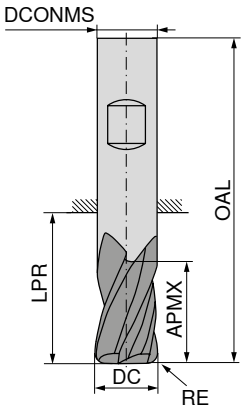
→ v_c/f_z Page 130

End milling cutter with corner radius

▲ with fine pitch profile
▲ Radius accuracy: +/- 0.001

P101 | Ti | λ_s=40° γ_s=5°





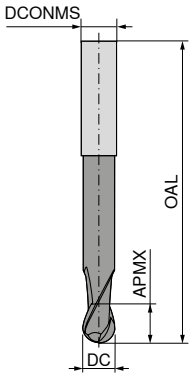
DC +0.000/-0.002 inch	RE +/- 0.001 inch	APMX inch	LPR inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 022 ...	59 022 ...
1	0.060	1 3/4	1.795	4	1	5	**99918**	
1	0.060	2 5/8	2.795	5	1	5		**99926**
P							●	●
M								
K							●	●
N								
S								
H								
O								

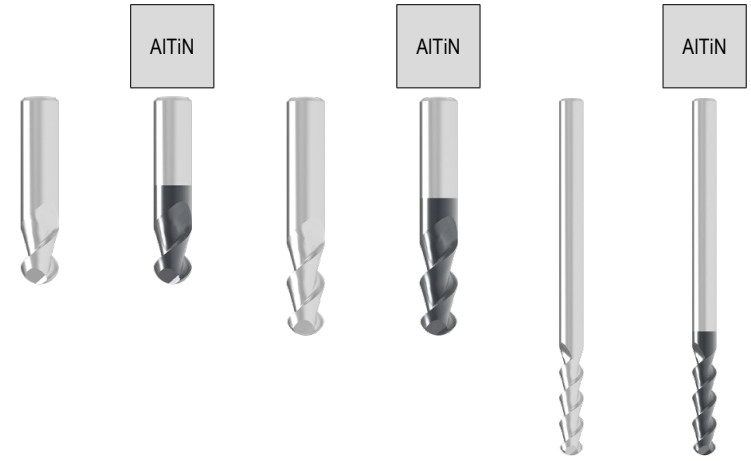
→ v_c/f_z Page 130

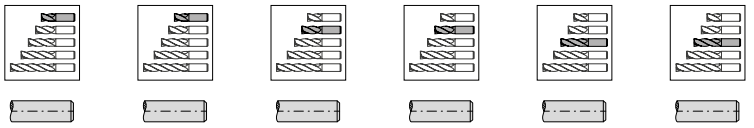
Ball Nosed Cutter

▲ DC tolerance:
≤ Ø 7/64 inch: +/- 0.0005
≥ Ø 1/8 inch: 0 /- 0.002
▲ Radius accuracy: +/- 0.001

S662 | UN | λ_s=38° γ_s=8°







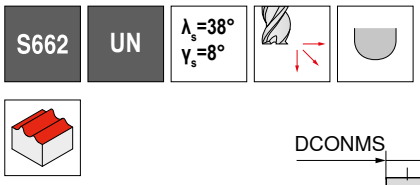
DC inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 076 ...	59 077 ...	59 076 ...	59 077 ...	59 076 ...	59 077 ...
1/16	1/8	1 1/2	1/8	2			06320	06320		
1/8	1/4	1 1/2	1/8	2	12520	12520				
1/8	1/2	1 1/2	1/8	2			12540	12540		
1/8	3/4	3	1/8	2					12660	12660
3/16	3/8	2	3/16	2	18820	18820				
3/16	5/8	2	3/16	2			18833	18833		
3/16	1	4	3/16	2					18853	18853
1/4	3/8	2	1/4	2	25015	25015				
1/4	3/4	2 1/2	1/4	2			25030	25030		
1/4	1 1/8	3	1/4	2					25045	25045
5/16	1/2	2	5/16	2	31316	31316				
5/16	3/4	2 1/2	5/16	2			31324	31324		
5/16	1 1/8	3	5/16	2					31336	31336
3/8	5/8	2	3/8	2	37517	37517				
3/8	7/8	2 1/2	3/8	2			37523	37523		
3/8	1 1/2	6	3/8	2					37540	37540
1/2	5/8	2 1/2	1/2	2	50013	50013				
1/2	1	3	1/2	2			50020	50020		
1/2	1 1/2	6	1/2	2					50030	50030
5/8	7/8	3	5/8	2	62514	62514				
5/8	1 1/4	3 1/2	5/8	2			62520	62520		
5/8	2 1/8	4 5/8	5/8	2					62534	62534
3/4	1	3	3/4	2	75013	75013				
3/4	1 1/2	4	3/4	2			75020	75020		
3/4	2 1/4	5	3/4	2					75030	75030
1	2	6	1	2					99920	99920
1	2 1/4	5	1	2			99923	99923		
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K					●	●	●	●	●	●
N					●	●	●	●	●	●
S					●	●	●	●	●	●
H										
O										

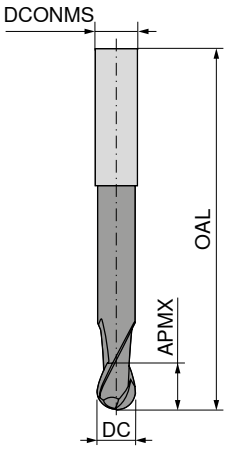
→ v_c/f_z Page 131

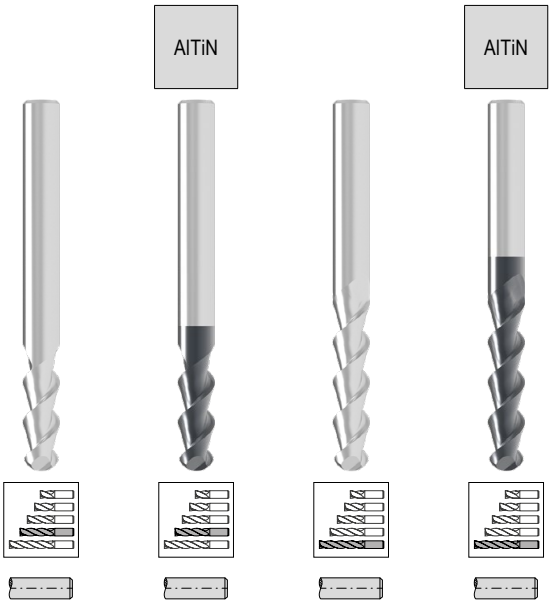
Ball Nosed Cutter

▲ DC tolerance:
≤ Ø 7/64 inch: +/- 0.0005
≥ Ø 1/8 inch: 0 /- 0.002
▲ Radius accuracy: +/- 0.001

S662 | UN | λ_s=38° γ_s=8°







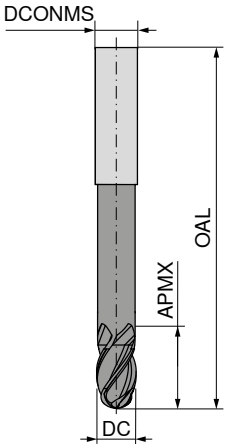
DC inch	APMX inch	OAL inch	DCONMS $_{-0.0001 / -0.0004}$ inch	ZEFP	59 076 ...	59 077 ...	59 076 ...	59 077 ...
1/16	3/16	1 1/2	1/8	2	06330	06330		
1/8	3/4	2 1/2	1/8	2	12560	12560		
1/8	1	3	1/8	2			12580	12580
3/16	3/4	2 1/2	3/16	2	18840	18840		
3/16	1 1/8	3	3/16	2			18860	18860
1/4	1	4	1/4	2	25040	25040		
1/4	1 1/2	4	1/4	2			25060	25060
1/4	1 1/2	6	1/4	2			25160	25160
5/16	1	4	5/16	2	31332	31332		
5/16	1 1/2	6	5/16	2			31348	31348
5/16	1 5/8	4	5/16	2			31352	31352
3/8	1	4	3/8	2	37527	37527		
3/8	1 1/8	3	3/8	2	37530	37530		
3/8	1 3/4	4	3/8	2			37547	37547
3/8	3	6	3/8	2			37580	37580
1/2	1	4	1/2	2	50120	50120		
1/2	2	4	1/2	2			50040	50040
1/2	3	6	1/2	2			50060	50060
5/8	2	6	5/8	2	62532	62532		
5/8	3	6	5/8	2			62548	62548
3/4	2	6	3/4	2	75027	75027		
3/4	3	6	3/4	2			75040	75040
1	1 3/4	4	1	2	99918	99918		
1	3	6	1	2			99930	99930
P					●	●	●	●
M					●	●	●	●
K					●	●	●	●
N					●	●	●	●
S					●	●	●	●
H								
O								

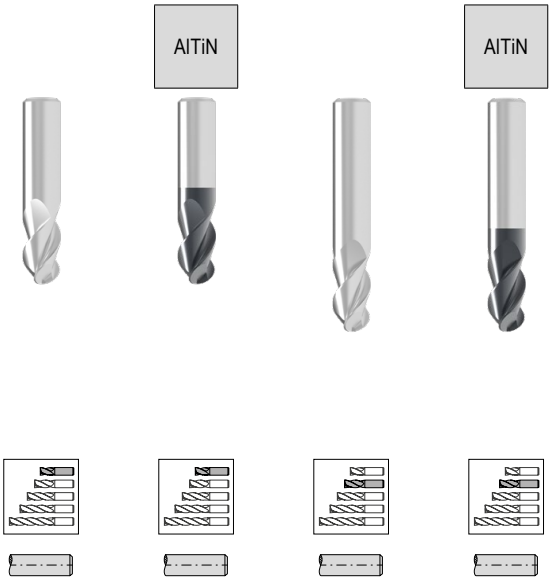
→ v_c/f_z Page 131

Ball Nosed Cutter

▲ Radius accuracy: +/- 0.001

S663 | UN | λ_s=38° γ_s=8°





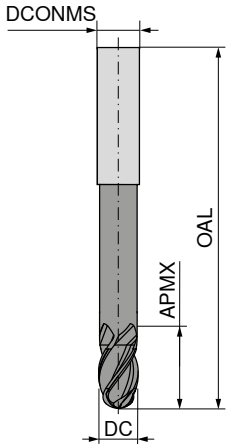
DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 078 ...		59 079 ...		59 078 ...		59 079 ...	
1/8	1/4	1 1/2	1/8	3	**12520**		**12520**					
1/8	1/2	1 1/2	1/8	3						**12540**		**12540**
3/16	3/8	2	3/16	3	**18820**		**18820**					
3/16	5/8	2	3/16	3						**18833**		**18833**
1/4	3/8	2	1/4	3	**25015**		**25015**					
1/4	3/4	2 1/2	1/4	3						**25030**		**25030**
5/16	3/4	2 1/2	5/16	3						**31324**		**31324**
3/8	5/8	2	3/8	3	**37517**		**37517**					
3/8	7/8	2 1/2	3/8	3						**37523**		**37523**
1/2	5/8	2 1/2	1/2	3	**50013**		**50013**					
1/2	1	3	1/2	3						**50020**		**50020**
5/8	1 1/4	3 1/2	5/8	3						**62520**		**62520**
3/4	1 1/2	4	3/4	3						**75020**		**75020**
1	1 3/4	4	1	3						**99918**		**99918**
P					●		●		●		●	
M					●		●		●		●	
K					●		●		●		●	
N					●		●		●		●	
S					●		●		●		●	
H												
O												

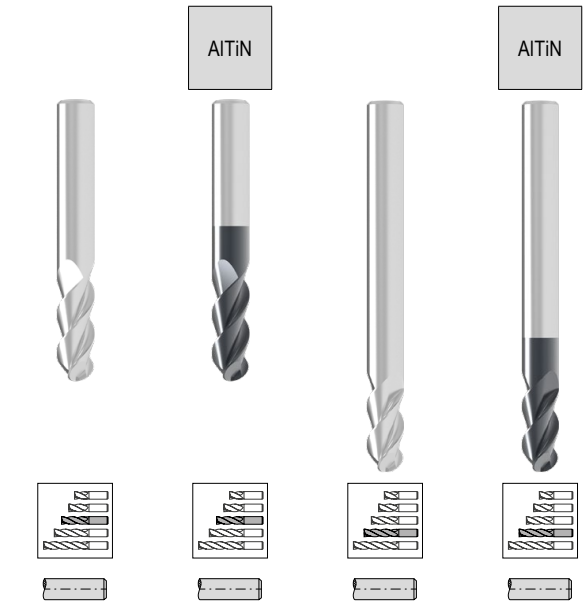
→ v_c/f_z Page 132

Ball Nosed Cutter

▲ Radius accuracy: +/- 0.001

S663 | UN | λ_s=38° γ_s=8°





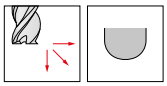
DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 078 ...	59 079 ...	59 078 ...	59 079 ...
1/8	3/4	2 1/2	1/8	3			**12560**	**12560**
1/8	3/4	3	1/8	3	**12660**	**12660**		
3/16	1	2 1/2	3/16	3	**18853**	**18853**		
3/16	3/4	2 1/2	3/16	3			**18840**	**18840**
1/4	1 1/8	3	1/4	3			**25045**	**25045**
1/4	1	4	1/4	3	**25040**	**25040**		
5/16	1	4	5/16	3			**31332**	**31332**
3/8	1 1/8	3	3/8	3	**37530**	**37530**		
3/8	1	4	3/8	3			**37527**	**37527**
3/8	1 1/2	6	3/8	3	**37540**	**37540**		
1/2	1	4	1/2	3			**50120**	**50120**
1/2	1 1/2	6	1/2	3	**50030**	**50030**		
5/8	2 1/8	4 5/8	5/8	3	**62534**	**62534**		
5/8	2	6	5/8	3			**62532**	**62532**
3/4	2 1/4	5	3/4	3	**75030**	**75030**		
3/4	2	6	3/4	3			**75027**	**75027**
1	2 1/4	5	1	3	**99923**	**99923**		
1	2	6	1	3			**99920**	**99920**
P					●	●	●	●
M					●	●	●	●
K					●	●	●	●
N					●	●	●	●
S					●	●	●	●
H								
O								

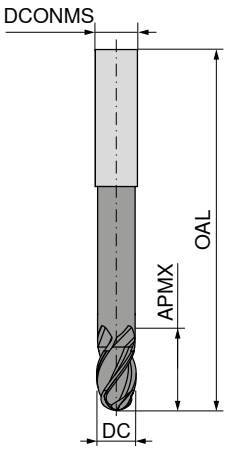
→ v_c/f_z Page 132

Ball Nosed Cutter

▲ Radius accuracy: +/- 0.001

S663 | UN | λ_s=38° γ_s=8°





AlTiN

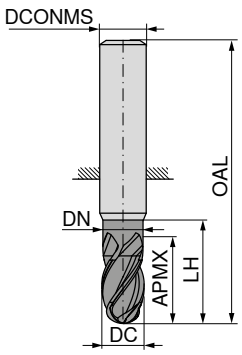
DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 078 ...	59 079 ...
1/8	1	3	1/8	3	12580	12580
3/16	1 1/8	3	3/16	3	18860	18860
3/16	1	4	3/16	3	18953	18953
1/4	1 1/2	4	1/4	3	25060	25060
1/4	1 1/2	6	1/4	3	25160	25160
5/16	1 1/2	6	5/16	3	31348	31348
3/8	1 3/4	4	3/8	3	37547	37547
3/8	3	6	3/8	3	37580	37580
1/2	2	4	1/2	3	50040	50040
1/2	3	6	1/2	3	50060	50060
5/8	3	6	5/8	3	62548	62548
3/4	3	6	3/4	3	75040	75040
1	3	6	1	3	99930	99930
P					●	●
M					●	●
K					●	●
N					●	●
S					●	●
H						
O						

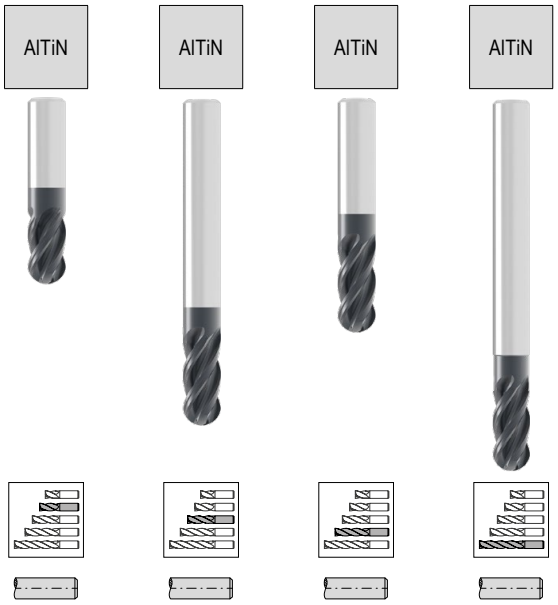
→ v_c/f_z Page 132

Ball Nosed Cutter

▲ Cutting edges with irregular pitch
▲ Radius accuracy: +/- 0.001"

P157 | UN | λ_s=40° γ_s=10°





DC +0.000/-0.002 inch	APMX inch	DN inch	LH inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 055 ...	59 055 ...	59 055 ...	59 055 ...
1/8	1/4			1 1/2	1/8	4	**12520**			
1/8	1/2			1 1/2	1/8	4			**12540**	
5/32	1/2			2	3/16	4	**15632**			
3/16	3/8			2	3/16	4	**18820**			
3/16	5/8			2	3/16	4			**18833**	
7/32	3/8			2	1/4	4	**21917**			
7/32	3/4			2 1/2	1/4	4			**21934**	
1/4	3/8			2	1/4	4	**25015**			
1/4	3/4			2 1/2	1/4	4			**25030**	
1/4	3/4	0.240	2 1/8	4	1/4	4				**25130**
5/16	3/4			2 1/2	5/16	4			**31324**	
5/16	1/2			2 1/2	5/16	4	**31316**			
3/8	5/8			2	3/8	4	**37517**			
3/8	7/8			2 1/2	3/8	4			**37523**	
3/8	7/8	0.360	2 3/8	4	3/8	4				**37623**
1/2	5/8			2 1/2	1/2	4	**50013**			
1/2	1			3	1/2	4			**50020**	
1/2	1	0.480	2 3/8	6	1/2	4		**50120**		
1/2	1	0.480	3 3/8	6	1/2	4				**50220**
9/16	1 1/4			3 1/2	9/16	4			**56322**	
5/8	1 1/4			3 1/2	5/8	4			**62520**	
5/8	1 1/4	0.600	3 3/8	6	5/8	4				**62620**
3/4	1 5/8			4	3/4	4			**75022**	
1	1 3/4			4	1	4			**99918**	
1	2 3/4			5	1	4		**99928**		
1	1 7/8	0.960	3 3/8	6	1	4				**99919**

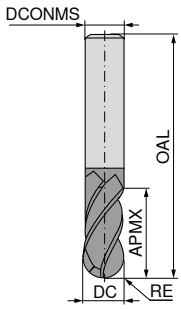
P	●	●	●	●
M	●	●	●	●
K	●	●	●	●
N	●	●	●	●
S				
H				
O				

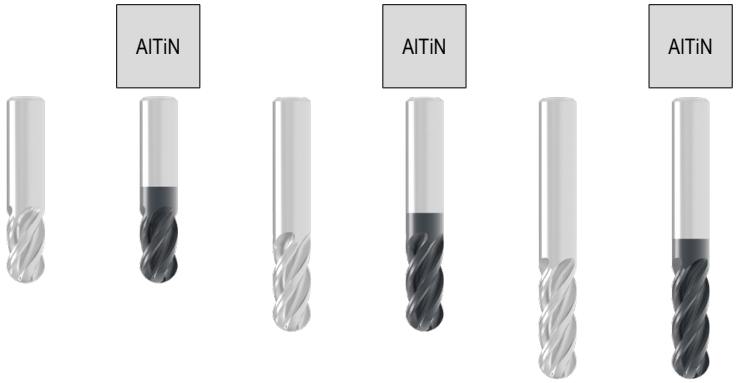
→ v_c/f_z Page 136

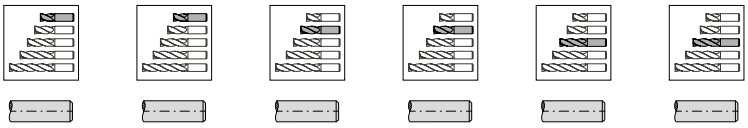
Ball Nosed Cutter

▲ DC tolerance:
≤ Ø 7/64 inch: +/- 0.0005
≥ Ø 1/8 inch: 0 /- 0.002
▲ Radius accuracy: +/- 0.001

S664 | UN | λ_s=38° γ_s=8°







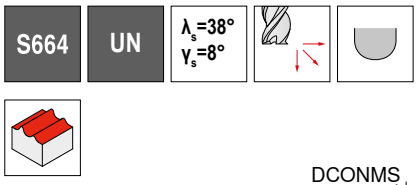
DC inch	APMX inch	OAL inch	DCONMS $_{-0.0001 / -0.0004}$ inch	ZEFP	59 080 ...	59 081 ...	59 080 ...	59 081 ...	59 080 ...	59 081 ...
1/32	3/32	1 1/2	1/8	4			03130	03130		
3/64	9/64	1 1/2	1/8	4			04730	04730		
1/16	1/8	1 1/2	1/8	4			06320	06320		
3/32	3/16	1 1/2	1/8	4			09420	09420		
1/8	1/4	1 1/2	1/8	4	12520	12520				
1/8	1/2	1 1/2	1/8	4			12540	12540		
1/8	3/4	3	1/8	4					12660	12660
5/32	3/8	2	3/16	4			15624	15624		
3/16	3/8	2	3/16	4	18820	18820				
3/16	5/8	2	3/16	4			18833	18833		
3/16	1	4	3/16	4					18853	18853
1/4	3/8	2	1/4	4	25015	25015				
1/4	3/4	2 1/2	1/4	4			25030	25030		
1/4	1 1/8	3	1/4	4					25045	25045
5/16	1/2	2	5/16	4	31316	31316				
5/16	3/4	2 1/2	5/16	4			31324	31324		
5/16	1 1/8	3	5/16	4					31336	31336
3/8	5/8	2	3/8	4	37517	37517				
3/8	7/8	2 1/2	3/8	4			37523	37523		
3/8	1 1/8	3	3/8	4					37530	37530
3/8	1 1/2	6	3/8	4					37540	37540
1/2	5/8	2 1/2	1/2	4	50013	50013				
1/2	1	3	1/2	4			50020	50020		
1/2	1 1/2	6	1/2	4					50030	50030
5/8	7/8	3	5/8	4	62514	62514				
5/8	1 1/4	3 1/2	5/8	4			62520	62520		
5/8	2 1/8	4 5/8	5/8	4					62534	62534
3/4	1	3	3/4	4	75013	75013				
3/4	1 1/2	4	3/4	4			75020	75020		
3/4	2 1/4	5	3/4	4					75030	75030
1	1 3/4	4	1	4			99918	99918		
1	2 1/4	5	1	4					99923	99923
P					●	●	●	●	●	●
M					●	●	●	●	●	●
K					●	●	●	●	●	●
N					●	●	●	●	●	●
S										
H										
O										

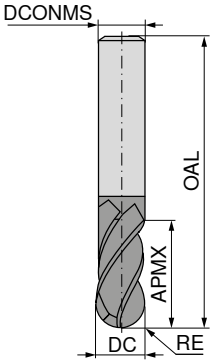
→ v_c/f_z Page 134

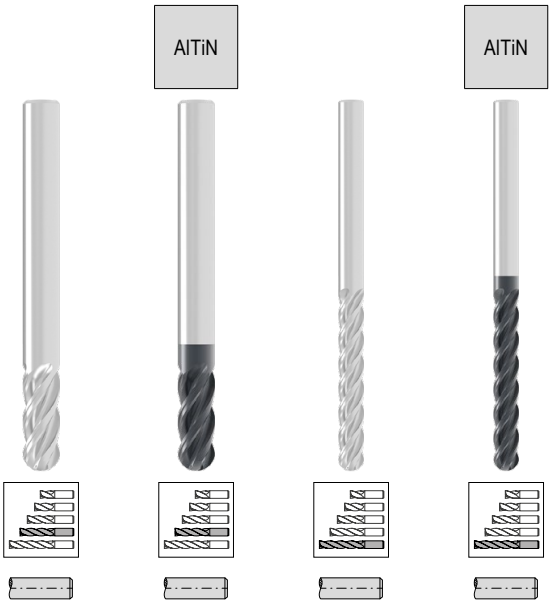
Ball Nosed Cutter

▲ DC tolerance:
≤ Ø 7/64 inch: +/- 0.0005
≥ Ø 1/8 inch: 0 /- 0.002
▲ Radius accuracy: +/- 0.001

S664 | UN | λ_s=38° γ_s=8°







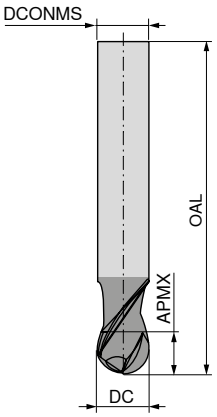
DC inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 080 ...	59 081 ...	59 080 ...	59 081 ...
1/16	3/16	1 1/2	1/8	4	**06330**	**06330**		
3/32	9/32	1 1/2	1/8	4	**09430**	**09430**		
1/8	3/4	2 1/2	1/8	4	**12560**	**12560**		
1/8	1	3	1/8	4			**12580**	**12580**
5/32	1/2	2	3/16	4	**15632**	**15632**		
3/16	3/4	2 1/2	3/16	4	**18840**	**18840**		
3/16	1 1/8	3	3/16	4			**18860**	**18860**
1/4	1 1/2	4	1/4	4			**25060**	**25060**
1/4	1	4	1/4	4	**25040**	**25040**		
1/4	1 1/2	6	1/4	4			**25160**	**25160**
5/16	1 5/8	4	5/16	4			**31352**	**31352**
5/16	1	4	5/16	4	**31332**	**31332**		
5/16	1 1/2	6	5/16	4			**31348**	**31348**
3/8	1 3/4	4	3/8	4			**37547**	**37547**
3/8	1	4	3/8	4	**37527**	**37527**		
3/8	3	6	3/8	4			**37580**	**37580**
1/2	2	4	1/2	4			**50040**	**50040**
1/2	1	4	1/2	4	**50120**	**50120**		
1/2	3	6	1/2	4			**50060**	**50060**
5/8	3	6	5/8	4			**62548**	**62548**
5/8	2	6	5/8	4	**62532**	**62532**		
3/4	3	6	3/4	4			**75040**	**75040**
3/4	2	6	3/4	4	**75027**	**75027**		
1	3	6	1	4			**99930**	**99930**
1	2	6	1	4	**99920**	**99920**		
P					●	●	●	●
M					●	●	●	●
K					●	●	●	●
N					●	●	●	●
S								
H								
O								

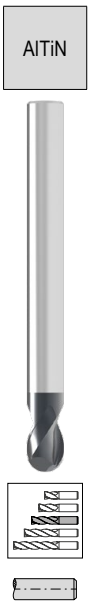
→ v_c/f_z Page 134

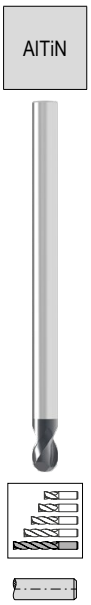
Ball Nosed Cutter

▲ Radius accuracy: + 0.000 / - 0.0004

P250 | ST | λ_s=30° γ_s= 8°







DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 063 ...	59 063 ...
1/8	1/8	3	1/8	2		**12510**
3/16	3/16	3	3/16	2		**18810**
1/4	1/4	4	1/4	2		**25010**
3/8	3/8	4	3/8	2	**37510**	
3/8	3/8	6	3/8	2		**37610**
1/2	1/2	4	1/2	2	**50010**	
1/2	1/2	6	1/2	2		**50110**

P	●	●
M	●	●
K	●	●
N	●	●
S	●	●
H		
O		

→ v_c/f_z Page 135

Ball Nosed Cutter

▲ Radius accuracy: + 0.000 / - 0.0004

P251 | UN | λ_s=30° γ_s= 8°



AlTiN



59 064 ...

DC +/-0.0005 inch	APMX inch	LH inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.031	0.031	5/8	4	1/4	2	**03110**
0.060	0.060	1 1/4	4	1/4	2	**06010**
0.080	0.080	1 5/8	4	1/4	2	**08010**
0.094	0.094	1 7/8	4	1/4	2	**09410**
0.125	0.125	2 1/2	4	1/4	2	**12510**
0.188	0.188	2.265	4	1/4	2	**18810**

P	●
M	●
K	●
N	●
S	●
H	
O	

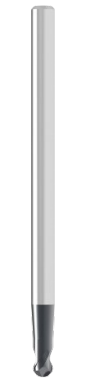
→ v_c/f_z Page 136

Ball Nosed Cutter

▲ Radius accuracy: + 0.000 / - 0.0004

P252 | UN | λ_s=30° γ_s= 8°

AlTiN



59 065 ...

DC +/-0.0005 inch	APMX inch	LH inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.031	0.031	2.125	4	1/4	2	**03110**
0.060	0.060	1.875	4	1/4	2	**06010**
0.080	0.080	1.704	4	1/4	2	**08010**
0.094	0.094	1.584	4	1/4	2	**09410**
0.125	0.125	1.324	4	1/4	2	**12510**
0.188	0.188	0.785	4	1/4	2	**18810**

P	●
M	●
K	●
N	●
S	●
H	
O	

→ v_c/f_z Page 136

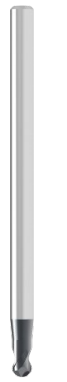
Ball Nosed Cutter

▲ Radius accuracy: + 0.000 / - 0.0004

P253 | UN | λ_s=30° γ_s= 8°



AlTiN



59 066 ...

DC +/-0.0005 inch	APMX inch	LH inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.031	0.031	1.282	4	1/4	2	**03110**
0.060	0.060	1.175	4	1/4	2	**06010**
0.080	0.080	1.084	4	1/4	2	**08010**
0.094	0.094	1.018	4	1/4	2	**09410**
0.125	0.125	0.897	4	1/4	2	**12510**
0.188	0.188	0.687	4	1/4	2	**18810**

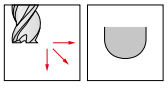
P	●
M	●
K	●
N	●
S	●
H	
O	

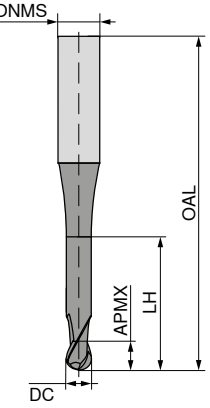
→ v_c/f_z Page 136

Ball Nosed Cutter 8°

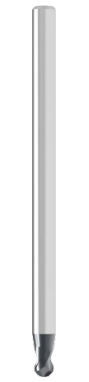
▲ Radius accuracy: + 0.000 / - 0.0004

P254 | UN | λ_s=30° γ_s= 8°





AlTiN



59 067 ...

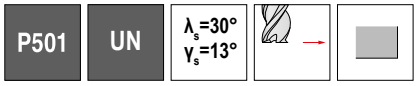
DC +/-0.0005 inch	APMX inch	LH inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.031	0.031	0.773	4	1/4	2	**03110**
0.060	0.060	0.726	4	1/4	2	**06010**
0.080	0.080	0.690	4	1/4	2	**08010**
0.094	0.094	0.750	4	1/4	2	**09410**
0.125	0.125	0.636	4	1/4	2	**12510**
0.188	0.188	0.454	4	1/4	2	**18810**

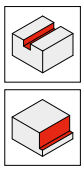
P	●
M	●
K	●
N	●
S	●
H	
O	

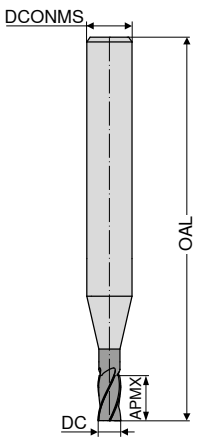
→ v_c/f_z Page 136

Micro end milling cutter

P501 | UN | λ_s=30° γ_s=13°







AlTiN

59 007 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.005	0.015	1 1/2	1/8	4	**00530**
0.006	0.018	1 1/2	1/8	4	**00630**
0.007	0.021	1 1/2	1/8	4	**00730**
0.008	0.024	1 1/2	1/8	4	**00830**
0.009	0.027	1 1/2	1/8	4	**00930**
0.010	0.030	1 1/2	1/8	4	**01030**
0.011	0.033	1 1/2	1/8	4	**01130**
0.012	0.036	1 1/2	1/8	4	**01230**
0.013	0.039	1 1/2	1/8	4	**01330**
0.014	0.042	1 1/2	1/8	4	**01430**
0.015	0.045	1 1/2	1/8	4	**01530**
0.016	0.048	1 1/2	1/8	4	**01630**
0.017	0.051	1 1/2	1/8	4	**01730**
0.018	0.054	1 1/2	1/8	4	**01830**
0.019	0.057	1 1/2	1/8	4	**01930**
0.020	0.060	1 1/2	1/8	4	**02030**
0.021	0.063	1 1/2	1/8	4	**02130**
0.022	0.066	1 1/2	1/8	4	**02230**
0.023	0.069	1 1/2	1/8	4	**02330**
0.024	0.072	1 1/2	1/8	4	**02430**
0.025	0.075	1 1/2	1/8	4	**02530**
0.026	0.078	1 1/2	1/8	4	**02630**
0.027	0.081	1 1/2	1/8	4	**02730**
0.028	0.084	1 1/2	1/8	4	**02830**
0.029	0.087	1 1/2	1/8	4	**02930**
0.030	0.090	1 1/2	1/8	4	**03030**
0.031	0.093	1 1/2	1/8	4	**03130**
0.032	0.096	1 1/2	1/8	4	**03230**
0.033	0.099	1 1/2	1/8	4	**03330**
0.034	0.102	1 1/2	1/8	4	**03430**
0.035	0.105	1 1/2	1/8	4	**03530**
0.036	0.108	1 1/2	1/8	4	**03630**
0.037	0.111	1 1/2	1/8	4	**03730**
0.038	0.114	1 1/2	1/8	4	**03830**
0.039	0.117	1 1/2	1/8	4	**03930**
0.040	0.120	1 1/2	1/8	4	**04030**
0.041	0.123	1 1/2	1/8	4	**04130**
0.042	0.126	1 1/2	1/8	4	**04230**
0.043	0.129	1 1/2	1/8	4	**04330**
0.044	0.132	1 1/2	1/8	4	**04430**
0.045	0.135	1 1/2	1/8	4	**04530**

P	●
M	●
K	●
N	●
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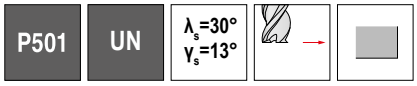
O	

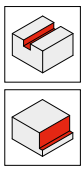
→ v_c/f_z Page 138

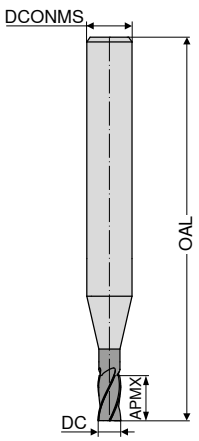
Continued on next page

Micro end milling cutter

P501 | UN | λ_s=30° γ_s=13°







AlTiN

59 007 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.046	0.138	1 1/2	1/8	4	**04630**
0.047	0.141	1 1/2	1/8	4	**04730**
0.048	0.144	1 1/2	1/8	4	**04830**
0.049	0.147	1 1/2	1/8	4	**04930**
0.050	0.150	1 1/2	1/8	4	**05030**
0.051	0.153	1 1/2	1/8	4	**05130**
0.052	0.156	1 1/2	1/8	4	**05230**
0.053	0.159	1 1/2	1/8	4	**05330**
0.054	0.162	1 1/2	1/8	4	**05430**
0.055	0.165	1 1/2	1/8	4	**05530**
0.056	0.168	1 1/2	1/8	4	**05630**
0.057	0.171	1 1/2	1/8	4	**05730**
0.058	0.174	1 1/2	1/8	4	**05830**
0.059	0.177	1 1/2	1/8	4	**05930**
0.060	0.180	1 1/2	1/8	4	**06030**
0.061	0.183	1 1/2	1/8	4	**06130**
0.062	0.186	1 1/2	1/8	4	**06230**
0.063	0.189	1 1/2	1/8	4	**06330**
0.064	0.192	1 1/2	1/8	4	**06430**
0.065	0.195	1 1/2	1/8	4	**06530**
0.066	0.198	1 1/2	1/8	4	**06630**
0.067	0.201	1 1/2	1/8	4	**06730**
0.068	0.204	1 1/2	1/8	4	**06830**
0.069	0.207	1 1/2	1/8	4	**06930**
0.070	0.210	1 1/2	1/8	4	**07030**
0.071	0.213	1 1/2	1/8	4	**07130**
0.072	0.216	1 1/2	1/8	4	**07230**
0.073	0.219	1 1/2	1/8	4	**07330**
0.074	0.222	1 1/2	1/8	4	**07430**
0.075	0.225	1 1/2	1/8	4	**07530**
0.076	0.228	1 1/2	1/8	4	**07630**
0.077	0.231	1 1/2	1/8	4	**07730**
0.078	0.234	1 1/2	1/8	4	**07830**
0.079	0.237	1 1/2	1/8	4	**07930**
0.080	0.240	1 1/2	1/8	4	**08030**
0.081	0.243	1 1/2	1/8	4	**08130**
0.082	0.246	1 1/2	1/8	4	**08230**
0.083	0.249	1 1/2	1/8	4	**08330**
0.084	0.252	1 1/2	1/8	4	**08430**
0.085	0.255	1 1/2	1/8	4	**08530**
0.086	0.258	1 1/2	1/8	4	**08630**

P	●
M	●
K	●
N	●
S	●
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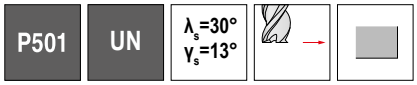
O	

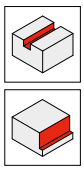
→ v_c/f_z Page 138

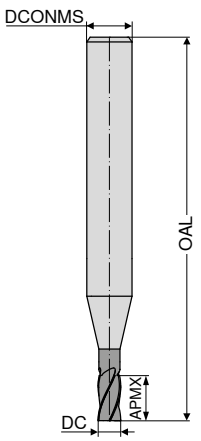
Continued on next page

Micro end milling cutter

P501 | UN | λ_s=30° γ_s=13°







AlTiN

59 007 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.087	0.261	1 1/2	1/8	4	**08730**
0.088	0.264	1 1/2	1/8	4	**08830**
0.089	0.267	1 1/2	1/8	4	**08930**
0.090	0.270	1 1/2	1/8	4	**09030**
0.091	0.273	1 1/2	1/8	4	**09130**
0.092	0.276	1 1/2	1/8	4	**09230**
0.093	0.279	1 1/2	1/8	4	**09330**
0.094	0.282	1 1/2	1/8	4	**09430**
0.095	0.285	1 1/2	1/8	4	**09530**
0.096	0.288	1 1/2	1/8	4	**09630**
0.097	0.291	1 1/2	1/8	4	**09730**
0.098	0.294	1 1/2	1/8	4	**09830**
0.099	0.297	1 1/2	1/8	4	**09930**
0.100	0.300	1 1/2	1/8	4	**10030**
0.101	0.303	1 1/2	1/8	4	**10130**
0.102	0.306	1 1/2	1/8	4	**10230**
0.103	0.309	1 1/2	1/8	4	**10330**
0.104	0.312	1 1/2	1/8	4	**10430**
0.105	0.315	1 1/2	1/8	4	**10530**
0.106	0.318	1 1/2	1/8	4	**10630**
0.107	0.321	1 1/2	1/8	4	**10730**
0.108	0.324	1 1/2	1/8	4	**10830**
0.109	0.327	1 1/2	1/8	4	**10930**
0.110	0.330	1 1/2	1/8	4	**11030**
0.111	0.333	1 1/2	1/8	4	**11130**
0.112	0.336	1 1/2	1/8	4	**11230**
0.113	0.339	1 1/2	1/8	4	**11330**
0.114	0.341	1 1/2	1/8	4	**11430**
0.115	0.345	1 1/2	1/8	4	**11530**
0.116	0.348	1 1/2	1/8	4	**11630**
0.117	0.351	1 1/2	1/8	4	**11730**
0.118	0.354	1 1/2	1/8	4	**11830**
0.119	0.357	1 1/2	1/8	4	**11930**
0.120	0.360	1 1/2	1/8	4	**12030**

P	●
M	●
K	●
N	●
S	●
H	
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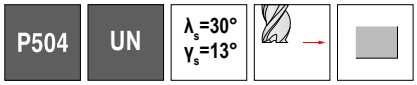
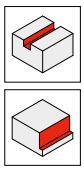
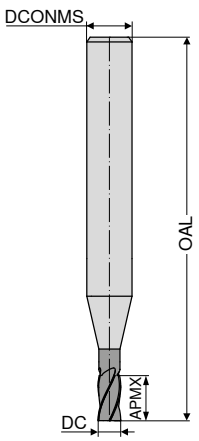
→ v_c/f_z Page 138

Micro end milling cutter

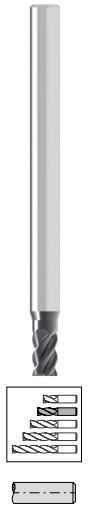
P504 | UN | λ_s=30° γ_s=13°







AlTiN



59 009 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.005	0.008	1 1/2	1/8	4	**00516**
0.006	0.009	1 1/2	1/8	4	**00615**
0.007	0.011	1 1/2	1/8	4	**00716**
0.008	0.012	1 1/2	1/8	4	**00815**
0.009	0.014	1 1/2	1/8	4	**00916**
0.010	0.015	1 1/2	1/8	4	**01015**
0.011	0.017	1 1/2	1/8	4	**01115**
0.012	0.018	1 1/2	1/8	4	**01215**
0.013	0.020	1 1/2	1/8	4	**01315**
0.014	0.021	1 1/2	1/8	4	**01415**
0.015	0.023	1 1/2	1/8	4	**01515**
0.016	0.024	1 1/2	1/8	4	**01615**
0.017	0.026	1 1/2	1/8	4	**01715**
0.018	0.027	1 1/2	1/8	4	**01815**
0.019	0.029	1 1/2	1/8	4	**01915**
0.020	0.030	1 1/2	1/8	4	**02015**
0.021	0.032	1 1/2	1/8	4	**02115**
0.022	0.033	1 1/2	1/8	4	**02215**
0.023	0.035	1 1/2	1/8	4	**02315**
0.024	0.036	1 1/2	1/8	4	**02415**
0.025	0.038	1 1/2	1/8	4	**02515**
0.026	0.039	1 1/2	1/8	4	**02615**
0.027	0.041	1 1/2	1/8	4	**02715**
0.028	0.042	1 1/2	1/8	4	**02815**
0.029	0.044	1 1/2	1/8	4	**02915**
0.030	0.045	1 1/2	1/8	4	**03015**
0.031	0.047	1 1/2	1/8	4	**03115**
0.032	0.048	1 1/2	1/8	4	**03215**
0.033	0.050	1 1/2	1/8	4	**03315**
0.034	0.051	1 1/2	1/8	4	**03415**
0.035	0.053	1 1/2	1/8	4	**03515**
0.036	0.054	1 1/2	1/8	4	**03615**
0.037	0.056	1 1/2	1/8	4	**03715**
0.038	0.057	1 1/2	1/8	4	**03815**
0.039	0.059	1 1/2	1/8	4	**03915**
0.040	0.060	1 1/2	1/8	4	**04015**
0.041	0.062	1 1/2	1/8	4	**04115**
0.042	0.063	1 1/2	1/8	4	**04215**
0.043	0.065	1 1/2	1/8	4	**04315**
0.044	0.066	1 1/2	1/8	4	**04415**
0.045	0.068	1 1/2	1/8	4	**04515**

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→ v_c/f_z Page 137

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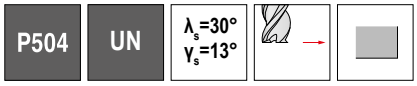
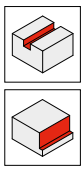
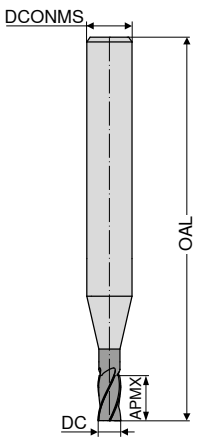
Micro end milling cutter

P504 | UN | λ_s=30° γ_s=13°







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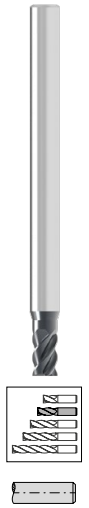

59 009 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.046	0.069	1 1/2	1/8	4	**04615**
0.047	0.071	1 1/2	1/8	4	**04715**
0.048	0.072	1 1/2	1/8	4	**04815**
0.049	0.074	1 1/2	1/8	4	**04915**
0.050	0.075	1 1/2	1/8	4	**05015**
0.051	0.077	1 1/2	1/8	4	**05115**
0.052	0.078	1 1/2	1/8	4	**05215**
0.053	0.080	1 1/2	1/8	4	**05315**
0.054	0.081	1 1/2	1/8	4	**05415**
0.055	0.083	1 1/2	1/8	4	**05515**
0.056	0.084	1 1/2	1/8	4	**05615**
0.057	0.086	1 1/2	1/8	4	**05715**
0.058	0.087	1 1/2	1/8	4	**05815**
0.059	0.089	1 1/2	1/8	4	**05915**
0.060	0.090	1 1/2	1/8	4	**06015**
0.061	0.092	1 1/2	1/8	4	**06115**
0.062	0.093	1 1/2	1/8	4	**06215**
0.063	0.095	1 1/2	1/8	4	**06315**
0.064	0.096	1 1/2	1/8	4	**06415**
0.065	0.098	1 1/2	1/8	4	**06515**
0.066	0.099	1 1/2	1/8	4	**06615**
0.067	0.101	1 1/2	1/8	4	**06715**
0.068	0.102	1 1/2	1/8	4	**06815**
0.069	0.104	1 1/2	1/8	4	**06915**
0.070	0.105	1 1/2	1/8	4	**07015**
0.071	0.107	1 1/2	1/8	4	**07115**
0.072	0.108	1 1/2	1/8	4	**07215**
0.073	0.110	1 1/2	1/8	4	**07315**
0.074	0.111	1 1/2	1/8	4	**07415**
0.075	0.113	1 1/2	1/8	4	**07515**
0.076	0.114	1 1/2	1/8	4	**07615**
0.077	0.116	1 1/2	1/8	4	**07715**
0.078	0.117	1 1/2	1/8	4	**07815**
0.079	0.119	1 1/2	1/8	4	**07915**
0.080	0.120	1 1/2	1/8	4	**08015**
0.081	0.122	1 1/2	1/8	4	**08115**
0.082	0.123	1 1/2	1/8	4	**08215**
0.083	0.125	1 1/2	1/8	4	**08315**
0.084	0.126	1 1/2	1/8	4	**08415**
0.085	0.128	1 1/2	1/8	4	**08515**
0.086	0.129	1 1/2	1/8	4	**08615**

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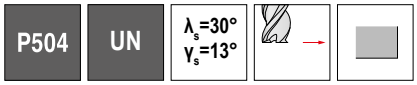
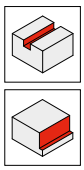
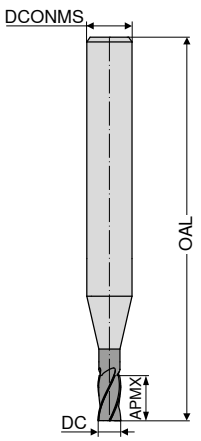
Micro end milling cutter

P504 | UN | λ_s=30° γ_s=13°







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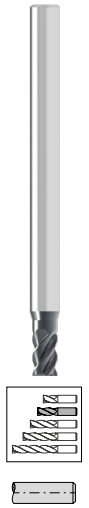

59 009 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.087	0.131	1 1/2	1/8	4	**08715**
0.088	0.132	1 1/2	1/8	4	**08815**
0.089	0.134	1 1/2	1/8	4	**08915**
0.090	0.135	1 1/2	1/8	4	**09015**
0.091	0.137	1 1/2	1/8	4	**09115**
0.092	0.138	1 1/2	1/8	4	**09215**
0.093	0.140	1 1/2	1/8	4	**09315**
0.094	0.141	1 1/2	1/8	4	**09415**
0.095	0.143	1 1/2	1/8	4	**09515**
0.096	0.144	1 1/2	1/8	4	**09615**
0.097	0.146	1 1/2	1/8	4	**09715**
0.098	0.147	1 1/2	1/8	4	**09815**
0.099	0.149	1 1/2	1/8	4	**09915**
0.100	0.150	1 1/2	1/8	4	**10015**
0.101	0.152	1 1/2	1/8	4	**10115**
0.102	0.153	1 1/2	1/8	4	**10215**
0.103	0.155	1 1/2	1/8	4	**10315**
0.104	0.156	1 1/2	1/8	4	**10415**
0.105	0.158	1 1/2	1/8	4	**10515**
0.106	0.159	1 1/2	1/8	4	**10615**
0.107	0.161	1 1/2	1/8	4	**10715**
0.108	0.162	1 1/2	1/8	4	**10815**
0.109	0.164	1 1/2	1/8	4	**10915**
0.110	0.165	1 1/2	1/8	4	**11015**
0.111	0.167	1 1/2	1/8	4	**11115**
0.112	0.168	1 1/2	1/8	4	**11215**
0.113	0.170	1 1/2	1/8	4	**11315**
0.114	0.171	1 1/2	1/8	4	**11415**
0.115	0.173	1 1/2	1/8	4	**11515**
0.116	0.174	1 1/2	1/8	4	**11615**
0.117	0.176	1 1/2	1/8	4	**11715**
0.118	0.177	1 1/2	1/8	4	**11815**
0.119	0.179	1 1/2	1/8	4	**11915**
0.120	0.180	1 1/2	1/8	4	**12015**

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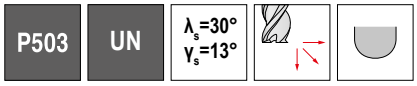
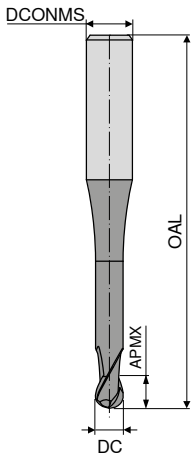
Micro ball nosed cutter

P503 | UN | λ_s=30° γ_s=13°





AlTiN

59 008 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.005	0.015	1 1/2	1/8	4	**00530**
0.006	0.018	1 1/2	1/8	4	**00630**
0.007	0.021	1 1/2	1/8	4	**00730**
0.008	0.024	1 1/2	1/8	4	**00830**
0.009	0.027	1 1/2	1/8	4	**00930**
0.010	0.030	1 1/2	1/8	4	**01030**
0.011	0.033	1 1/2	1/8	4	**01130**
0.012	0.036	1 1/2	1/8	4	**01230**
0.013	0.039	1 1/2	1/8	4	**01330**
0.014	0.042	1 1/2	1/8	4	**01430**
0.015	0.045	1 1/2	1/8	4	**01530**
0.016	0.048	1 1/2	1/8	4	**01630**
0.017	0.051	1 1/2	1/8	4	**01730**
0.018	0.054	1 1/2	1/8	4	**01830**
0.019	0.057	1 1/2	1/8	4	**01930**
0.020	0.060	1 1/2	1/8	4	**02030**
0.021	0.063	1 1/2	1/8	4	**02130**
0.022	0.066	1 1/2	1/8	4	**02230**
0.023	0.069	1 1/2	1/8	4	**02330**
0.024	0.072	1 1/2	1/8	4	**02430**
0.025	0.075	1 1/2	1/8	4	**02530**
0.026	0.078	1 1/2	1/8	4	**02630**
0.027	0.081	1 1/2	1/8	4	**02730**
0.028	0.084	1 1/2	1/8	4	**02830**
0.029	0.087	1 1/2	1/8	4	**02930**
0.030	0.090	1 1/2	1/8	4	**03030**
0.031	0.093	1 1/2	1/8	4	**03130**
0.032	0.096	1 1/2	1/8	4	**03230**
0.033	0.099	1 1/2	1/8	4	**03330**
0.034	0.102	1 1/2	1/8	4	**03430**
0.035	0.105	1 1/2	1/8	4	**03530**
0.036	0.108	1 1/2	1/8	4	**03630**
0.037	0.111	1 1/2	1/8	4	**03730**
0.038	0.114	1 1/2	1/8	4	**03830**
0.039	0.117	1 1/2	1/8	4	**03930**
0.040	0.120	1 1/2	1/8	4	**04030**
0.041	0.123	1 1/2	1/8	4	**04130**
0.042	0.126	1 1/2	1/8	4	**04230**
0.043	0.129	1 1/2	1/8	4	**04330**
0.044	0.132	1 1/2	1/8	4	**04430**
0.045	0.135	1 1/2	1/8	4	**04530**

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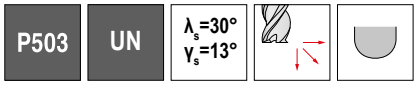
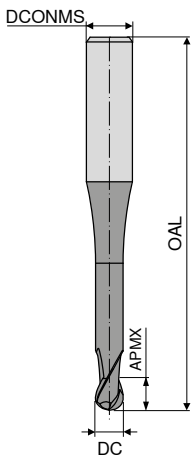
Micro ball nosed cutter

P503 | UN | λ_s=30° γ_s=13°





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59 008 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.046	0.138	1 1/2	1/8	4	**04630**
0.047	0.141	1 1/2	1/8	4	**04730**
0.048	0.144	1 1/2	1/8	4	**04830**
0.049	0.147	1 1/2	1/8	4	**04930**
0.050	0.150	1 1/2	1/8	4	**05030**
0.051	0.153	1 1/2	1/8	4	**05130**
0.052	0.156	1 1/2	1/8	4	**05230**
0.053	0.159	1 1/2	1/8	4	**05330**
0.054	0.162	1 1/2	1/8	4	**05430**
0.055	0.165	1 1/2	1/8	4	**05530**
0.056	0.168	1 1/2	1/8	4	**05630**
0.057	0.171	1 1/2	1/8	4	**05730**
0.058	0.174	1 1/2	1/8	4	**05830**
0.059	0.177	1 1/2	1/8	4	**05930**
0.060	0.180	1 1/2	1/8	4	**06030**
0.061	0.183	1 1/2	1/8	4	**06130**
0.062	0.186	1 1/2	1/8	4	**06230**
0.063	0.189	1 1/2	1/8	4	**06330**
0.064	0.192	1 1/2	1/8	4	**06430**
0.065	0.195	1 1/2	1/8	4	**06530**
0.066	0.198	1 1/2	1/8	4	**06630**
0.067	0.201	1 1/2	1/8	4	**06730**
0.068	0.204	1 1/2	1/8	4	**06830**
0.069	0.207	1 1/2	1/8	4	**06930**
0.070	0.210	1 1/2	1/8	4	**07030**
0.071	0.213	1 1/2	1/8	4	**07130**
0.072	0.216	1 1/2	1/8	4	**07230**
0.073	0.219	1 1/2	1/8	4	**07330**
0.074	0.222	1 1/2	1/8	4	**07430**
0.075	0.225	1 1/2	1/8	4	**07530**
0.076	0.228	1 1/2	1/8	4	**07630**
0.077	0.231	1 1/2	1/8	4	**07730**
0.078	0.234	1 1/2	1/8	4	**07830**
0.079	0.237	1 1/2	1/8	4	**07930**
0.080	0.240	1 1/2	1/8	4	**08030**
0.081	0.243	1 1/2	1/8	4	**08130**
0.082	0.246	1 1/2	1/8	4	**08230**
0.083	0.249	1 1/2	1/8	4	**08330**
0.084	0.252	1 1/2	1/8	4	**08430**
0.085	0.255	1 1/2	1/8	4	**08530**
0.086	0.258	1 1/2	1/8	4	**08630**

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Micro ball nosed cutter

P503 | UN | λ_s=30° γ_s=13°



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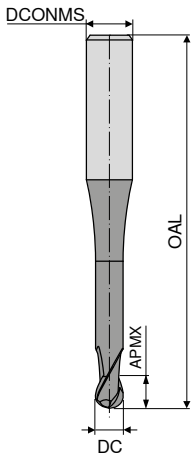



59 008 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.087	0.261	1 1/2	1/8	4	**08730**
0.088	0.264	1 1/2	1/8	4	**08830**
0.089	0.267	1 1/2	1/8	4	**08930**
0.090	0.270	1 1/2	1/8	4	**09030**
0.091	0.273	1 1/2	1/8	4	**09130**
0.092	0.276	1 1/2	1/8	4	**09230**
0.093	0.279	1 1/2	1/8	4	**09330**
0.094	0.282	1 1/2	1/8	4	**09430**
0.095	0.285	1 1/2	1/8	4	**09530**
0.096	0.288	1 1/2	1/8	4	**09630**
0.097	0.291	1 1/2	1/8	4	**09730**
0.098	0.294	1 1/2	1/8	4	**09830**
0.099	0.297	1 1/2	1/8	4	**09930**
0.100	0.300	1 1/2	1/8	4	**10030**
0.101	0.303	1 1/2	1/8	4	**10130**
0.102	0.306	1 1/2	1/8	4	**10230**
0.103	0.309	1 1/2	1/8	4	**10330**
0.104	0.312	1 1/2	1/8	4	**10430**
0.105	0.315	1 1/2	1/8	4	**10530**
0.106	0.318	1 1/2	1/8	4	**10630**
0.107	0.321	1 1/2	1/8	4	**10730**
0.108	0.324	1 1/2	1/8	4	**10830**
0.109	0.327	1 1/2	1/8	4	**10930**
0.110	0.330	1 1/2	1/8	4	**11030**
0.111	0.333	1 1/2	1/8	4	**11130**
0.112	0.336	1 1/2	1/8	4	**11230**
0.113	0.339	1 1/2	1/8	4	**11330**
0.114	0.341	1 1/2	1/8	4	**11430**
0.115	0.345	1 1/2	1/8	4	**11530**
0.116	0.348	1 1/2	1/8	4	**11630**
0.117	0.351	1 1/2	1/8	4	**11730**
0.118	0.354	1 1/2	1/8	4	**11830**
0.119	0.357	1 1/2	1/8	4	**11930**
0.120	0.360	1 1/2	1/8	4	**12030**

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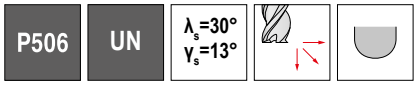
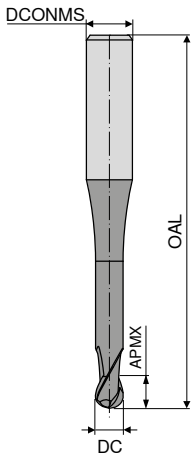
→ v_c/f_z Page 138

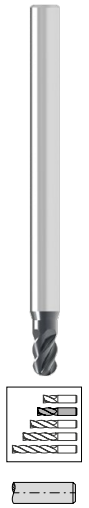
Micro ball nosed cutter

P506 | UN | λ_s=30° γ_s=13°





AlTiN



59 010 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.005	0.008	1 1/2	1/8	4	**00516**
0.006	0.009	1 1/2	1/8	4	**00615**
0.007	0.011	1 1/2	1/8	4	**00716**
0.008	0.012	1 1/2	1/8	4	**00815**
0.009	0.014	1 1/2	1/8	4	**00916**
0.010	0.015	1 1/2	1/8	4	**01015**
0.011	0.017	1 1/2	1/8	4	**01115**
0.012	0.018	1 1/2	1/8	4	**01215**
0.013	0.020	1 1/2	1/8	4	**01315**
0.014	0.021	1 1/2	1/8	4	**01415**
0.015	0.023	1 1/2	1/8	4	**01515**
0.016	0.024	1 1/2	1/8	4	**01615**
0.017	0.026	1 1/2	1/8	4	**01715**
0.018	0.027	1 1/2	1/8	4	**01815**
0.019	0.029	1 1/2	1/8	4	**01915**
0.020	0.030	1 1/2	1/8	4	**02015**
0.021	0.032	1 1/2	1/8	4	**02115**
0.022	0.033	1 1/2	1/8	4	**02215**
0.023	0.035	1 1/2	1/8	4	**02315**
0.024	0.036	1 1/2	1/8	4	**02415**
0.025	0.038	1 1/2	1/8	4	**02515**
0.026	0.039	1 1/2	1/8	4	**02615**
0.027	0.041	1 1/2	1/8	4	**02715**
0.028	0.042	1 1/2	1/8	4	**02815**
0.029	0.044	1 1/2	1/8	4	**02915**
0.030	0.045	1 1/2	1/8	4	**03015**
0.031	0.047	1 1/2	1/8	4	**03115**
0.032	0.048	1 1/2	1/8	4	**03215**
0.033	0.050	1 1/2	1/8	4	**03315**
0.034	0.051	1 1/2	1/8	4	**03415**
0.035	0.053	1 1/2	1/8	4	**03515**
0.036	0.054	1 1/2	1/8	4	**03615**
0.037	0.056	1 1/2	1/8	4	**03715**
0.038	0.057	1 1/2	1/8	4	**03815**
0.039	0.059	1 1/2	1/8	4	**03915**
0.040	0.060	1 1/2	1/8	4	**04015**
0.041	0.062	1 1/2	1/8	4	**04115**
0.042	0.063	1 1/2	1/8	4	**04215**
0.043	0.065	1 1/2	1/8	4	**04315**
0.044	0.066	1 1/2	1/8	4	**04415**
0.045	0.068	1 1/2	1/8	4	**04515**

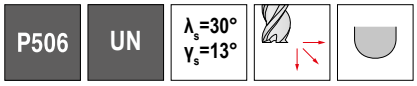
P	●
M	●
K	●
N	●
S	●
H	
O	

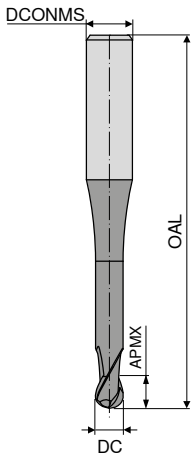
→ v_c/f_z Page 137

Continued on next page

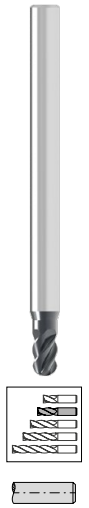
Micro ball nosed cutter

P506 | UN | λ_s=30° γ_s=13°





AlTiN



59 010 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.046	0.069	1 1/2	1/8	4	**04615**
0.047	0.071	1 1/2	1/8	4	**04715**
0.048	0.072	1 1/2	1/8	4	**04815**
0.049	0.074	1 1/2	1/8	4	**04915**
0.050	0.075	1 1/2	1/8	4	**05015**
0.051	0.077	1 1/2	1/8	4	**05115**
0.052	0.078	1 1/2	1/8	4	**05215**
0.053	0.080	1 1/2	1/8	4	**05315**
0.054	0.081	1 1/2	1/8	4	**05415**
0.055	0.083	1 1/2	1/8	4	**05515**
0.056	0.084	1 1/2	1/8	4	**05615**
0.057	0.086	1 1/2	1/8	4	**05715**
0.058	0.087	1 1/2	1/8	4	**05815**
0.059	0.089	1 1/2	1/8	4	**05915**
0.060	0.090	1 1/2	1/8	4	**06015**
0.061	0.092	1 1/2	1/8	4	**06115**
0.062	0.093	1 1/2	1/8	4	**06215**
0.063	0.095	1 1/2	1/8	4	**06315**
0.064	0.096	1 1/2	1/8	4	**06415**
0.065	0.098	1 1/2	1/8	4	**06515**
0.066	0.099	1 1/2	1/8	4	**06615**
0.067	0.101	1 1/2	1/8	4	**06715**
0.068	0.102	1 1/2	1/8	4	**06815**
0.069	0.104	1 1/2	1/8	4	**06915**
0.070	0.105	1 1/2	1/8	4	**07015**
0.071	0.107	1 1/2	1/8	4	**07115**
0.072	0.108	1 1/2	1/8	4	**07215**
0.073	0.110	1 1/2	1/8	4	**07315**
0.074	0.111	1 1/2	1/8	4	**07415**
0.075	0.113	1 1/2	1/8	4	**07515**
0.076	0.114	1 1/2	1/8	4	**07615**
0.077	0.116	1 1/2	1/8	4	**07715**
0.078	0.117	1 1/2	1/8	4	**07815**
0.079	0.119	1 1/2	1/8	4	**07915**
0.080	0.120	1 1/2	1/8	4	**08015**
0.081	0.122	1 1/2	1/8	4	**08115**
0.082	0.123	1 1/2	1/8	4	**08215**
0.083	0.125	1 1/2	1/8	4	**08315**
0.084	0.126	1 1/2	1/8	4	**08415**
0.085	0.128	1 1/2	1/8	4	**08515**
0.086	0.129	1 1/2	1/8	4	**08615**

P	●
M	●
K	●
N	●
S	●
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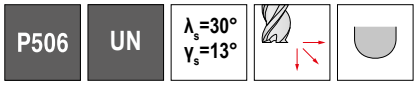
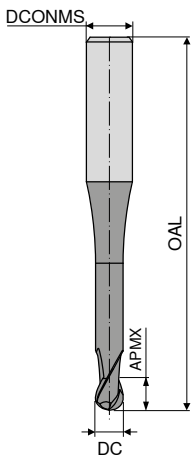
→ v_c/f_z Page 137

Continued on next page

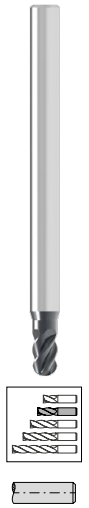
Micro ball nosed cutter

P506 | UN | λ_s=30° γ_s=13°





AlTiN



59 010 ...

DC +/-0.0005 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	
0.087	0.131	1 1/2	1/8	4	**08715**
0.088	0.132	1 1/2	1/8	4	**08815**
0.089	0.134	1 1/2	1/8	4	**08915**
0.090	0.135	1 1/2	1/8	4	**09015**
0.091	0.137	1 1/2	1/8	4	**09115**
0.092	0.138	1 1/2	1/8	4	**09215**
0.093	0.140	1 1/2	1/8	4	**09315**
0.094	0.141	1 1/2	1/8	4	**09415**
0.095	0.143	1 1/2	1/8	4	**09515**
0.096	0.144	1 1/2	1/8	4	**09615**
0.097	0.146	1 1/2	1/8	4	**09715**
0.098	0.147	1 1/2	1/8	4	**09815**
0.099	0.149	1 1/2	1/8	4	**09915**
0.100	0.150	1 1/2	1/8	4	**10015**
0.101	0.152	1 1/2	1/8	4	**10115**
0.102	0.153	1 1/2	1/8	4	**10215**
0.103	0.155	1 1/2	1/8	4	**10315**
0.104	0.156	1 1/2	1/8	4	**10415**
0.105	0.158	1 1/2	1/8	4	**10515**
0.106	0.159	1 1/2	1/8	4	**10615**
0.107	0.161	1 1/2	1/8	4	**10715**
0.108	0.162	1 1/2	1/8	4	**10815**
0.109	0.164	1 1/2	1/8	4	**10915**
0.110	0.165	1 1/2	1/8	4	**11015**
0.111	0.167	1 1/2	1/8	4	**11115**
0.112	0.168	1 1/2	1/8	4	**11215**
0.113	0.170	1 1/2	1/8	4	**11315**
0.114	0.171	1 1/2	1/8	4	**11415**
0.115	0.173	1 1/2	1/8	4	**11515**
0.116	0.174	1 1/2	1/8	4	**11615**
0.117	0.176	1 1/2	1/8	4	**11715**
0.118	0.177	1 1/2	1/8	4	**11815**
0.119	0.179	1 1/2	1/8	4	**11915**
0.120	0.180	1 1/2	1/8	4	**12015**

P	●
M	●
K	●
N	●
S	●
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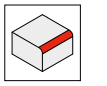
O	

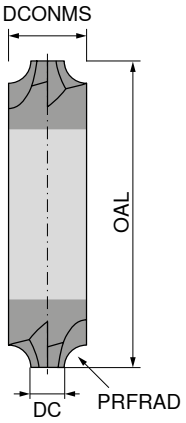
→ v_c/f_z Page 137

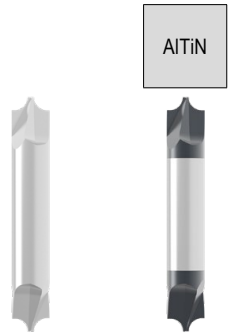
Profile end milling cutter

▲ PRFRAD ≤ 1.397 [Inch] Tol. = ± 0.01
▲ PRFRAD > 1.397 [Inch] Tol. = ± 0.015

P137 | UN | λ_s = 0° γ_s=-5°







PRFRAD inch	DC +0.000/-0.002 inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 049 ...	59 050 ...
0.010	0.125	1 1/2	1/8	2	12510	12510
0.015	0.125	1 1/2	1/8	2	12515	12515
0.020	0.125	1 1/2	1/8	2	12520	12520
0.025	0.125	1 1/2	1/8	2	12525	12525
0.031	0.125	1 1/2	1/8	2	12531	12531
0.035	0.125	1 1/2	1/8	2	12535	12535
0.040	0.125	1 1/2	1/8	2	12540	12540
0.046	0.125	1 1/2	1/8	2	12546	12546
0.050	0.188	2	3/16	2	18850	18850
0.055	0.188	2	3/16	2	18855	18855
0.062	0.188	2	3/16	2	18862	18862
0.072	0.250	2 1/2	1/4	2	25072	25072
0.078	0.250	2 1/2	1/4	2	25078	25078
0.085	0.250	2 1/2	1/4	2	25085	25085
0.094	0.250	2 1/2	1/4	2	25094	25094
0.100	0.250	2 1/2	1/4	2	25000	25000
0.109	0.250	2 1/2	1/4	2	25009	25009
0.118	0.313	2 1/2	5/16	2	31318	31318
0.125	0.313	2 1/2	5/16	2	31325	31325
0.140	0.375	2 1/2	3/8	2	37540	37540
0.156	0.375	2 1/2	3/8	2	37556	37556

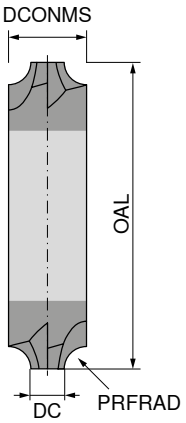
P	●	●
M		
K	●	●
N		
S		
H		
O		

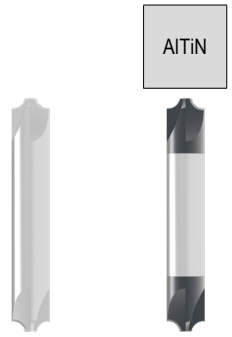
→ v_c/f_z Page 140

Profile end milling cutter

▲ PRFRAD ≤ 1.397 [Inch] Tol. = ± 0.01
▲ PRFRAD > 1.397 [Inch] Tol. = ± 0.015

P139 | UN | λ_s=0° γ_s=3,5°





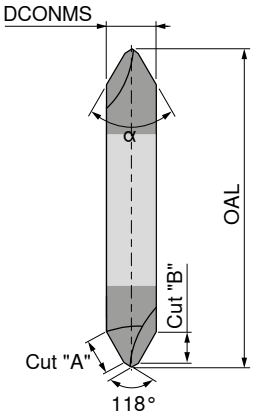
PRFRAD inch	DC +0.000/-0.002 inch	APMX inch	OAL inch	DCONMS -0.0001 / -0.0004 inch	ZEFP	59 051 ...	59 052 ...
0.010	3/16	3/16	2	3/16	4	**18810**	**18810**
0.015	3/16	3/16	2	3/16	4	**18910**	**18910**
0.020	3/16	3/16	2	3/16	4	**19010**	**19010**
0.025	3/16	3/16	2	3/16	4	**19110**	**19110**
0.031	3/16	3/16	2	3/16	4	**19210**	**19210**
0.035	3/16	3/16	2	3/16	4	**19310**	**19310**
0.040	1/4	1/4	2 1/2	1/4	4	**25010**	**25010**
0.046	1/4	1/4	2 1/2	1/4	4	**25110**	**25110**
0.050	1/4	1/4	2 1/2	1/4	4	**25210**	**25210**
0.055	1/4	1/4	2 1/2	1/4	4	**25410**	**25410**
0.062	1/4	1/4	2 1/2	1/4	4	**25310**	**25310**
0.078	3/8	3/8	2 1/2	3/8	4	**37510**	**37510**
0.094	3/8	3/8	2 1/2	3/8	4	**37610**	**37610**
0.100	3/8	3/8	2 1/2	3/8	4	**37710**	**37710**
0.118	3/8	3/8	2 1/2	3/8	4	**37810**	**37810**
0.125	3/8	3/8	2 1/2	3/8	4	**37910**	**37910**
0.156	1/2	1/2	3	1/2	4	**50010**	**50010**

P	●	●
M		
K	●	●
N		
S		
H		
O		

→ v_c/f_z Page 141

Chamfer milling cutter 60°

P132 | UN | λ_s=0° γ_s=0°



α = 60°

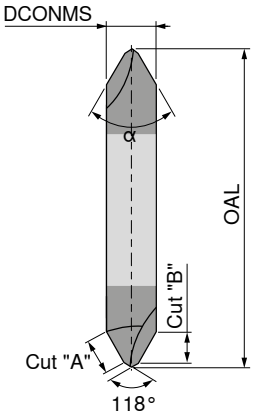
α = 60°

DC inch	Cut "A" mm	Cut "B" mm	OAL inch	DCONMS inch	ZEFP	59 041 ...	59 042 ...
1/8	2.489	2.159	1 1/2	1/8	2	**12506**	**12506**
3/16	3.734	3.226	2	3/16	2	**18806**	**18806**
1/4	5.080	4.394	2 1/2	1/4	2	**25006**	**25006**
3/8	7.950	6.883	2 1/2	3/8	2	**37506**	**37506**
1/2	10.922	9.449	3	1/2	2	**50006**	**50006**
P						●	●
M							
K						●	●
N							
S							
H							
O							

→ v_c/f_z Page 142–143

Chamfer milling cutter 60°

P133 | UN | λ_s=0° γ_s=0°



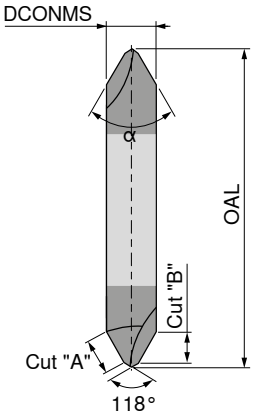
AlTiN

						α = 60°	α = 60°
						59 043 ...	59 044 ...
DC inch	Cut "A" mm	Cut "B" mm	OAL inch	DCONMS inch	ZEFP		
1/4	5.080	4.394	2 1/2	1/4	4	25006	25006
3/8	7.950	6.883	2 1/2	3/8	4	37506	37506
1/2	10.922	9.449	3	1/2	4	50006	50006
P						●	●
M							
K						●	●
N							
S							
H							
O							

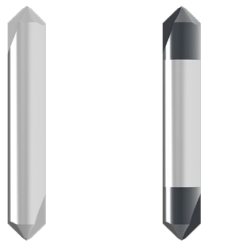
→ v_c/f_z Page 144–145

Chamfer milling cutter 90°

P134 | UN | λ_s=0° γ_s=0°



AlTiN



α = 90°

α = 90°

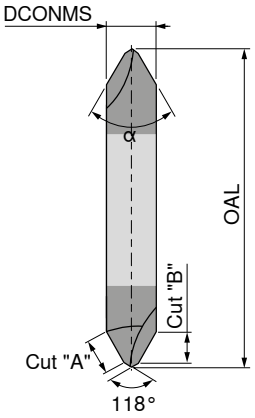
DC inch	Cut "A" mm	Cut "B" mm	OAL inch	DCONMS inch	ZEFP	59 045 ...	59 046 ...
1/8	1.803	1.270	1 1/2	1/8	2	**12509**	**12509**
3/16	2.718	1.930	2	3/16	2	**18809**	**18809**
1/4	3.581	2.540	2 1/2	1/4	2	**25009**	**25009**
3/8	5.613	3.988	2 1/2	3/8	2	**37509**	**37509**
1/2	7.722	5.461	3	1/2	2	**50009**	**50009**

P	●	●
M		
K	●	●
N		
S		
H		
O		

→ v_c/f_z Page 142–143

Chamfer milling cutter 90°

P135 | UN | λ_s=0° γ_s=0°



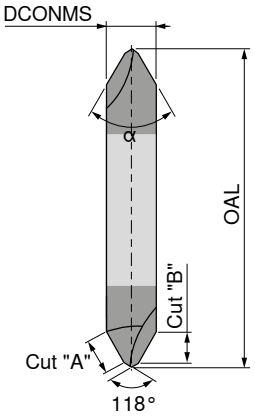
AlTiN

						α = 90°	α = 90°
						59 047 ...	59 048 ...
DC inch	Cut "A" mm	Cut "B" mm	OAL inch	DCONMS inch	ZEFP		
1/4	3.581	2.540	2 1/2	1/4	4	**25009**	**25009**
3/8	5.613	3.988	2 1/2	3/8	4	**37509**	**37509**
1/2	7.722	5.461	3	1/2	4	**50009**	**50009**
P						●	●
M							
K						●	●
N							
S							
H							
O							

→ v_c/f_z Page 144–145

Chamfer milling cutter 120°

P130 | UN | λ_s=0° γ_s=0°



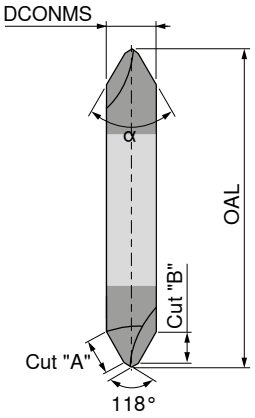
AlTiN

						α = 120°	α = 120°
						59 037 ...	59 038 ...
DC inch	Cut "A" mm	Cut "B" mm	OAL inch	DCONMS inch	ZEFP		
1/4	3.150	1.575	2 1/2	1/4	2	25012	25012
3/8	5.055	2.540	2 1/2	3/8	2	37512	37512
1/2	6.756	3.378	3	1/2	2	50012	50012
P						●	●
M							
K						●	●
N							
S							
H							
O							

→ v_c/f_z Page 142–143

Chamfer milling cutter 120°

P131 | UN | λ_s=0° γ_s=0°



AlTiN

						α = 120°	α = 120°
						59 039 ...	59 040 ...
DC inch	Cut "A" mm	Cut "B" mm	OAL inch	DCONMS inch	ZEFP		
1/4	3.658	1.829	2 1/2	1/4	4	25012	25012
3/8	5.512	2.743	2 1/2	3/8	4	37512	37512
1/2	7.341	3.658	3	1/2	4	50012	50012
P						●	●
M							
K						●	●
N							
S							
H							
O							

→ v_c/f_z Page 144–145

Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment		Tensile strength lbf/in²* / HB / HRC	Material number	Material designation	Material number	Material designation
P	Unalloyed steel	P.1.1	< 0.15 % C	Annealed	60900 lbf/in² / 125 HB	1.0401	1015	1.0301	1010
		P.1.2	< 0.45 % C	Annealed	92800 lbf/in² / 190 HB	1.1191	1045	1.0737	12L14
		P.1.3		Tempered	121800 lbf/in² / 250 HB	1.1191	1045	1.0503	1043
		P.1.4	< 0.75 % C	Annealed	132000 lbf/in² / 270 HB	1.1223	1060	1.0535	1055
		P.1.5		Tempered	146500 lbf/in² / 300 HB	1.1223	1060	1.1274	1095
	Low-alloy steel	P.2.1		Annealed	88500 lbf/in² / 180 HB	1.7131	5115	1.6523	8620
		P.2.2		Tempered	134900 lbf/in² / 275 HB	1.7131	5115	1.6582	4340
		P.2.3		Tempered	146500 lbf/in² / 300 HB	1.7225	4142	1.7131	5115
		P.2.4		Tempered	174000 lbf/in² / 375 HB	1.7225	4142	17223	4140
	High-alloy steel and high-alloy tool steel	P.3.1		Annealed	98600 lbf/in² / 200 HB	1.4021	420	1.2379	D2
		P.3.2		Hardened and tempered	159500 lbf/in² / 300 HB	1.2343	H11	1.3343	M2
		P.3.3		Hardened and tempered	188500 lbf/in² / 400 HB	1.2343	H11	1.2363	A2
	Stainless steel	P.4.1	Ferritic / martensitic	Annealed	98600 lbf/in² / 200 HB	1.4016	430	1.4125	440C
		P.4.2	Martensitic	Tempered	117500 lbf/in² / 250 HB	1.4112	S44003	1.4021	420
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic	Quenched	88500 lbf/in² / 200 HB	1.4301	304	1.4401	316
		M.2.1	Austenitic	Tempered	300 HB	1.4841	314	1.4568	17-7 PH
		M.3.1	Austenitic / ferritic (Duplex)		113100 lbf/in² / 230 HB	1.4462	S32205	1.4410	S32750
K	Grey cast iron	K.1.1	Pearlitic / ferritic		88500 lbf/in² / 180 HB	0.6010	A48-20B	0.6025	A48-40 B
		K.1.2	Pearlitic (martensitic)		127600 lbf/in² / 260 HB	0.6030	A48-45B	0.6040	A48-60 B
	Spherulitic graphite cast iron	K.2.1	Ferritic		78300 lbf/in² / 160 HB	0.7040	60-40-18	0.7050	65-45-12
		K.2.2	Pearlitic		122600 lbf/in² / 250 HB	0.7070	100-70-03	0.7660	A439 Type D2
	Malleable iron	K.3.1	Ferritic		63800 lbf/in² / 130 HB	0.8035	GTW-35-04		
		K.3.2	Pearlitic		113100 lbf/in² / 230 HB	0.8170	70003		
N	Aluminium wrought alloy	N.1.1	Non-hardenable		60 HB	3.0255	A91060	3.0255	A91060
		N.1.2	Hardenable		49300 lbf/in² / 100 HB	3.1355	2024	3.1355	2024
	Cast aluminium alloy	N.2.1	≤ 12 % Si, non-hardenable		36300 lbf/in² / 75 HB	3.2581	A04130 / A413-0	3.2581	A04130 / A413-0
		N.2.2	≤ 12 % Si, hardenable		43500 lbf/in² / 90 HB	3.2134	G-AlSi5Cu1Mg		
		N.2.3	> 12 % Si, non-hardenable		63800 lbf/in² / 130 HB		G-AlSi17Cu4Mg		
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %		54400 lbf/in² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0380	C37700
		N.3.2	CuZn, CuSnZn		43500 lbf/in² / 90 HB	2.0331	CuZn15	2.0331	C34000
		N.3.3	CuSn, lead-free copper and electrolytic copper		49300 lbf/in² / 100 HB	2.0060	E-Cu57		
	Magnesium alloys	N.4.1	Magnesium and magnesium alloys		70 HB	3.5612	MgAl6Zn		
S	Heat-resistant alloys	S.1.1	Fe - basis	Annealed	98600 lbf/in² / 200 HB	1.4864	X12NiCrSi 36-16	1.4864	330
		S.1.2			137800 lbf/in² / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4980	S66286
		S.2.1	Ni or Co basis	Annealed	121800 lbf/in² / 250 HB	2.4856	Inconel 625	2.4812	Hastelloy C
		S.2.2			171100 lbf/in² / 350 HB	2.4952	Nimonic 80A	2.4668	Inconel 718
		S.2.3		Cast	156600 lbf/in² / 320 HB	2.4674	Nimocast PK24	2.4670	Nimocast 713
	Titanium alloys	S.3.1	Pure titanium		5800 lbf/in²	3.7025	Ti99,8		
		S.3.2	Alpha + beta alloys		152300 lbf/in²	3.7165	TiAl6V4		
		S.3.3	Beta alloys		203100 lbf/in² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr		
H	Hardened steel	H.1.1		Hardened and tempered	46-55 HRC				
		H.1.2		Hardened and tempered	56-60 HRC				
		H.1.3		Hardened and tempered	61-65 HRC				
		H.1.4		Hardened and tempered	66-70 HRC				
	Chilled iron	H.2.1		Cast	400 HB				
	Hardened cast iron	H.3.1		Hardened and tempered	55 HRC				
O	Non-metal materials	O.1.1	Plastics, duroplastic		≤ 21800 lbf/in²				
		O.1.2	Plastics, thermoplastic		≤ 14500 lbf/in²				
		O.2.1	Aramid fibre-reinforced		≤ 145000 lbf/in²				
		O.2.2	Glass/carbon-fibre reinforced		≤ 145000 lbf/in²				
		O.3.1	Graphite						

*** Tensile Strength at Rupture (Rm)**

Cutting Data – P220 – End Milling Cutter, short – long

			59 003 ...									
		Ø DC =	1/8"	3/16"	1/4–5/16"	3/8"	1/2"	5/8"	3/4"	● 1st choice		
										○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1												
P.1.2												
P.1.3												
P.1.4												
P.1.5												
P.2.1												
P.2.2												
P.2.3												
P.2.4												
P.3.1												
P.3.2												
P.3.3												
P.4.1												
P.4.2												
M.1.1												
M.2.1												
M.3.1												
K.1.1												
K.1.2												
K.2.1												
K.2.2												
K.3.1												
K.3.2												
N.1.1	1970	1.0	0.0015	0.0019	0.0029	0.0036	0.0050	0.0053	0.0060	●	○	○
N.1.2	1970	1.0	0.0015	0.0019	0.0029	0.0036	0.0050	0.0053	0.0060	●	○	○
N.2.1	1180	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	●	○	○
N.2.2	1180	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	●	○	○
N.2.3	790	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	●	○	○
N.3.1	790	1.0	0.0010	0.0013	0.0020	0.0026	0.0036	0.0039	0.0044	●	○	○
N.3.2	790	1.0	0.0010	0.0013	0.0020	0.0026	0.0036	0.0039	0.0044	●	○	○
N.3.3	560	1.0	0.0010	0.0013	0.0020	0.0026	0.0036	0.0039	0.0044	●	○	○
N.4.1	720	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	●	○	○
S.1.1												
S.1.2												
S.2.1												
S.2.2												
S.2.3												
S.3.1												
S.3.2												
S.3.3												
H.1.1												
H.1.2												
H.1.3												
H.1.4												
H.2.1												
H.3.1												
O.1.1												
O.1.2												
O.2.1												
O.2.2												
O.3.1												

Cutting Data – S142 – End Milling Cutter, short – extra long

			59 053 ... / 59 054 ...										
		Ø DC =	5/32"	3/16"	1/4–5/16"	11/32–3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
											○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1													
P.1.2													
P.1.3													
P.1.4													
P.1.5													
P.2.1													
P.2.2													
P.2.3													
P.2.4													
P.3.1													
P.3.2													
P.3.3													
P.4.1													
P.4.2													
M.1.1													
M.2.1													
M.3.1													
K.1.1													
K.1.2													
K.2.1													
K.2.2													
K.3.1													
K.3.2													
N.1.1	980	1.0	0.0015	0.0019	0.0029	0.0036	0.0050	0.0053	0.0060	0.0069	●	○	○
N.1.2	980	1.0	0.0015	0.0019	0.0029	0.0036	0.0050	0.0053	0.0060	0.0069	●	○	○
N.2.1	590	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
N.2.2	590	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
N.2.3	390	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
N.3.1	390	1.0	0.0010	0.0013	0.0020	0.0026	0.0036	0.0039	0.0044	0.0050	●	○	○
N.3.2	390	1.0	0.0010	0.0013	0.0020	0.0026	0.0036	0.0039	0.0044	0.0050	●	○	○
N.3.3	280	1.0	0.0010	0.0013	0.0020	0.0026	0.0036	0.0039	0.0044	0.0050	●	○	○
N.4.1	360	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
S.1.1													
S.1.2													
S.2.1													
S.2.2													
S.2.3													
S.3.1													
S.3.2													
S.3.3													
H.1.1													
H.1.2													
H.1.3													
H.1.4													
H.2.1													
H.3.1													
O.1.1													
O.1.2													
O.2.1													
O.2.2													
O.3.1													

Cutting Data – P109 – End Milling Cutter, extra short – extra long

			59 027 ...												
		Ø DC =	1/8–5/32"	3/16"	7/32"	1/4–9/32–5/16"	3/8"	7/16"	1/2"	9/16–5/8"	3/4"	1"	● 1st choice		
													○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1															
P.1.2															
P.1.3															
P.1.4															
P.1.5															
P.2.1															
P.2.2															
P.2.3															
P.2.4															
P.3.1															
P.3.2															
P.3.3															
P.4.1															
P.4.2															
M.1.1															
M.2.1															
M.3.1															
K.1.1															
K.1.2															
K.2.1															
K.2.2															
K.3.1															
K.3.2															
N.1.1	1380	1.0	0.0012	0.0015	0.0019	0.0025	0.0031	0.0038	0.0044	0.0047	0.0054	0.0062	●	○	○
N.1.2	1380	1.0	0.0012	0.0015	0.0019	0.0025	0.0031	0.0038	0.0044	0.0047	0.0054	0.0062	●	○	○
N.2.1	830	1.0	0.0011	0.0014	0.0017	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
N.2.2	830	1.0	0.0011	0.0014	0.0017	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
N.2.3	550	1.0	0.0011	0.0014	0.0017	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
N.3.1	550	1.0	0.0008	0.0011	0.0013	0.0017	0.0022	0.0026	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.2	550	1.0	0.0008	0.0011	0.0013	0.0017	0.0022	0.0026	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.3	390	1.0	0.0008	0.0011	0.0013	0.0017	0.0022	0.0026	0.0031	0.0033	0.0037	0.0043	●	○	○
N.4.1	510	1.0	0.0011	0.0014	0.0017	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
S.1.1															
S.1.2															
S.2.1															
S.2.2															
S.2.3															
S.3.1															
S.3.2															
S.3.3															
H.1.1															
H.1.2															
H.1.3															
H.1.4															
H.2.1															
H.3.1															
O.1.1															
O.1.2															
O.2.1															
O.2.2															
O.3.1															

Cutting Data – P362 – End Milling Cutter, short – extra long

			59 004 ...									
		Ø DC =	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
										○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1												
P.1.2												
P.1.3												
P.1.4												
P.1.5												
P.2.1												
P.2.2												
P.2.3												
P.2.4												
P.3.1												
P.3.2												
P.3.3												
P.4.1												
P.4.2												
M.1.1												
M.2.1												
M.3.1												
K.1.1												
K.1.2												
K.2.1												
K.2.2												
K.3.1												
K.3.2												
N.1.1	1970	1.0	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
N.1.2	1970	1.0	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
N.2.1	1180	1.0	0.0014	0.0023	0.0029	0.0040	0.0043	0.0049	0.0056	●	○	○
N.2.2	1180	1.0	0.0014	0.0023	0.0029	0.0040	0.0043	0.0049	0.0056	●	○	○
N.2.3	790	1.0	0.0014	0.0023	0.0029	0.0040	0.0043	0.0049	0.0056	●	○	○
N.3.1	790	1.0	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.2	790	1.0	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.3	560	1.0	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.4.1	720	1.0	0.0014	0.0023	0.0029	0.0040	0.0043	0.0049	0.0056	●	○	○
S.1.1												
S.1.2												
S.2.1												
S.2.2												
S.2.3												
S.3.1												
S.3.2												
S.3.3												
H.1.1												
H.1.2												
H.1.3												
H.1.4												
H.2.1												
H.3.1												
O.1.1												
O.1.2												
O.2.1												
O.2.2												
O.3.1												

Cutting Data – P376 – End Milling Cutter, short – extra long

			59 005 ...								
		Ø DC =	1/4–5/16"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
									○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1											
P.1.2											
P.1.3											
P.1.4											
P.1.5											
P.2.1											
P.2.2											
P.2.3											
P.2.4											
P.3.1											
P.3.2											
P.3.3											
P.4.1											
P.4.2											
M.1.1											
M.2.1											
M.3.1											
K.1.1											
K.1.2											
K.2.1											
K.2.2											
K.3.1											
K.3.2											
N.1.1	1640	1.0	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
N.1.2	1640	1.0	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
N.2.1	980	1.0	0.0009	0.0012	0.0017	0.0018	0.0020	0.0023	●	○	○
N.2.2	980	1.0	0.0009	0.0012	0.0017	0.0018	0.0020	0.0023	●	○	○
N.2.3	690	1.0	0.0009	0.0012	0.0017	0.0018	0.0020	0.0023	●	○	○
N.3.1	690	1.0	0.0009	0.0012	0.0017	0.0018	0.0020	0.0023	●	○	○
N.3.2	690	1.0	0.0009	0.0012	0.0017	0.0018	0.0020	0.0023	●	○	○
N.3.3	490	1.0	0.0009	0.0012	0.0017	0.0018	0.0020	0.0023	●	○	○
N.4.1	660	1.0	0.0009	0.0012	0.0017	0.0018	0.0020	0.0023	●	○	○
S.1.1											
S.1.2											
S.2.1											
S.2.2											
S.2.3											
S.3.1											
S.3.2											
S.3.3											
H.1.1											
H.1.2											
H.1.3											
H.1.4											
H.2.1											
H.3.1											
O.1.1											
O.1.2											
O.2.1											
O.2.2											
O.3.1											

Cutting Data – S642 – End Milling Cutter, extra short – extra long

			59 068... / 59 069 ...													
		Ø DC =	1/16"	3/32"	1/8–5/32"	3/16"	7/32"	1/4–9/32–5/16"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
														○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1	220	1.0	0.0006	0.0007	0.0008	0.0010	0.0011	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
P.1.2	180	1.0	0.0004	0.0005	0.0007	0.0008	0.0009	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.1.3	180	1.0	0.0004	0.0005	0.0007	0.0008	0.0009	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.1.4	160	1.0	0.0004	0.0005	0.0007	0.0008	0.0009	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.1.5	160	1.0	0.0004	0.0005	0.0007	0.0008	0.0009	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.2.1	180	1.0	0.0004	0.0005	0.0007	0.0008	0.0009	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.2.2	140	1.0	0.0004	0.0005	0.0007	0.0008	0.0009	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.2.3	140	1.0	0.0004	0.0005	0.0007	0.0008	0.0009	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.2.4	110	1.0	0.0004	0.0005	0.0007	0.0008	0.0009	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.3.1																
P.3.2																
P.3.3																
P.4.1	98	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●		
P.4.2	79	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●		
M.1.1	79	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●		
M.2.1	98	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●		
M.3.1	98	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●		
K.1.1	260	1.0	0.0009	0.0011	0.0013	0.0016	0.0018	0.0023	0.0028	0.0037	0.0039	0.0044	0.0050	●	○	○
K.1.2	240	1.0	0.0009	0.0011	0.0013	0.0016	0.0018	0.0023	0.0028	0.0037	0.0039	0.0044	0.0050	●	○	○
K.2.1	260	1.0	0.0006	0.0008	0.0009	0.0011	0.0013	0.0016	0.0019	0.0025	0.0026	0.0030	0.0033	●	○	○
K.2.2	240	1.0	0.0006	0.0008	0.0009	0.0011	0.0013	0.0016	0.0019	0.0025	0.0026	0.0030	0.0033	●	○	○
K.3.1	260	1.0	0.0009	0.0011	0.0013	0.0016	0.0018	0.0023	0.0028	0.0037	0.0039	0.0044	0.0050	●	○	○
K.3.2	240	1.0	0.0009	0.0011	0.0013	0.0016	0.0018	0.0023	0.0028	0.0037	0.0039	0.0044	0.0050	●	○	○
N.1.1																
N.1.2																
N.2.1																
N.2.2																
N.2.3																
N.3.1	390	1.0	0.0006	0.0008	0.0010	0.0012	0.0014	0.0018	0.0022	0.0030	0.0031	0.0035	0.0040	●	○	○
N.3.2	390	1.0	0.0006	0.0008	0.0010	0.0012	0.0014	0.0018	0.0022	0.0030	0.0031	0.0035	0.0040	●	○	○
N.3.3	280	1.0	0.0006	0.0008	0.0010	0.0012	0.0014	0.0018	0.0022	0.0030	0.0031	0.0035	0.0040	●	○	○
N.4.1																
S.1.1	59	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.1.2	59	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.1	59	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.2	59	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.3	59	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.1	98	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●		
S.3.2	39	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●		
S.3.3																
H.1.1																
H.1.2																
H.1.3																
H.1.4																
H.2.1																
H.3.1																
O.1.1																
O.1.2																
O.2.1																
O.2.2																
O.3.1																

Cutting Data – S643 – End-Milling-Cutter, extra short – extra long

			59 070... / 59 071 ...													
		Ø DC =	1/16–5/64"	3/32"	1/8–5/32"	3/16"	7/32"	1/4–9/32–5/16"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
														○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1	220	1.0	0.0004	0.0005	0.0007	0.0008	0.0009	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.1.2	180	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.3	180	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.4	160	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.5	160	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.1	180	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.2	140	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.3	140	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.4	110	1.0	0.0003	0.0004	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.3.1																
P.3.2																
P.3.3																
P.4.1	100	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
P.4.2	80	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.1.1	79	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.2.1	98	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.3.1	98	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
K.1.1	260	1.0	0.0007	0.0009	0.0011	0.0013	0.0015	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.1.2	240	1.0	0.0007	0.0009	0.0011	0.0013	0.0015	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.2.1	260	1.0	0.0006	0.0007	0.0008	0.0010	0.0011	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.2.2	240	1.0	0.0006	0.0007	0.0008	0.0010	0.0011	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.3.1	260	1.0	0.0007	0.0009	0.0011	0.0013	0.0015	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.3.2	240	1.0	0.0007	0.0009	0.0011	0.0013	0.0015	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
N.1.1																
N.1.2																
N.2.1																
N.2.2																
N.2.3																
N.3.1	390	1.0	0.0004	0.0006	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
N.3.2	390	1.0	0.0004	0.0006	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
N.3.3	280	1.0	0.0004	0.0006	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
N.4.1																
S.1.1	59	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.1.2	59	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.1	59	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.2	59	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.3	59	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.1	98	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.2	39	1.0	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.3																
H.1.1																
H.1.2																
H.1.3																
H.1.4																
H.2.1																
H.3.1																
O.1.1																
O.1.2																
O.2.1																
O.2.2																
O.3.1																

Cutting Data – S644 – End Milling Cutter, extra short – extra long

			59 043... / 59 044 ... / 59 072... / 59 073 ...													● 1st choice		
		Ø DC =	1/32"	3/64"	1/16–5/64"	3/32–7/64"	1/8–5/32"	3/16"	7/32"	1/4–9/32–5/16"	3/8"	1/2"	5/8"	3/4"	1"	○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1	450	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.1.2	430	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.1.3	430	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.1.4	410	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.1.5	410	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.2.1	430	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.2.2	410	1.0	0.0002	0.0002	0.0004	0.0006	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.2.3	390	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.2.4	370	1.0	0.0002	0.0002	0.0004	0.0006	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.3.1	390	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.3.2	370	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.3.3	310	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.4.1	220	1.0	0.0000	0.0000	0.0002	0.0003	0.0005	0.0006	0.0007	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
P.4.2	180	1.0	0.0000	0.0000	0.0002	0.0003	0.0005	0.0006	0.0007	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.1.1	220	1.0	0.0000	0.0000	0.0002	0.0003	0.0005	0.0006	0.0007	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.2.1	220	1.0	0.0000	0.0000	0.0002	0.0003	0.0005	0.0006	0.0007	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.3.1	220	1.0	0.0000	0.0000	0.0002	0.0003	0.0005	0.0006	0.0007	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
K.1.1	430	1.0	0.0003	0.0003	0.0006	0.0009	0.0012	0.0015	0.0019	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
K.1.2	390	1.0	0.0003	0.0003	0.0006	0.0009	0.0012	0.0015	0.0019	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
K.2.1	410	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.2.2	370	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.3.1	390	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.3.2	350	1.0	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
N.1.1																		
N.1.2																		
N.2.1																		
N.2.2																		
N.2.3																		
N.3.1	690	1.0	0.0003	0.0003	0.0006	0.0009	0.0012	0.0015	0.0019	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
N.3.2	690	1.0	0.0003	0.0003	0.0006	0.0009	0.0012	0.0015	0.0019	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
N.3.3	550	1.0	0.0003	0.0003	0.0006	0.0009	0.0012	0.0015	0.0019	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
N.4.1																		
S.1.1	59	1.0	0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.1.2	59	1.0	0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.1	59	1.0	0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.2	59	1.0	0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.3	59	1.0	0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.1	180	1.0	0.0002	0.0002	0.0004	0.0006	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●		
S.3.2																		
S.3.3																		
H.1.1																		
H.1.2																		
H.1.3																		
H.1.4																		
H.2.1																		
H.3.1																		
O.1.1																		
O.1.2																		
O.2.1																		
O.2.2																		
O.3.1																		

Cutting Data – P645 – End Milling Cutter, short – extra long

			59 074 ... / 59 075 ...											
		Ø DC =	1/8–5/32"	3/16"	7/32"	1/4–5/16"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
												○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	410	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.2	390	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.3	390	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.4	370	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.5	370	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.2.1	390	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.2.2	370	1.0	0.0006	0.0007	0.0009	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●	○	○
P.2.3	350	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.2.4	330	1.0	0.0006	0.0007	0.0009	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●	○	○
P.3.1	350	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.3.2	330	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.3.3	280	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.4.1	200	1.0	0.0005	0.0006	0.0007	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
P.4.2	160	1.0	0.0005	0.0006	0.0007	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.1.1	200	1.0	0.0005	0.0006	0.0007	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.2.1	200	1.0	0.0005	0.0006	0.0007	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.3.1	200	1.0	0.0005	0.0006	0.0007	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
K.1.1	390	1.0	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.1.2	350	1.0	0.0009	0.0012	0.0014	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.2.1	370	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
K.2.2	330	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
K.3.1	350	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
K.3.2	310	1.0	0.0007	0.0010	0.0012	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
N.1.1														
N.1.2														
N.2.1														
N.2.2														
N.2.3														
N.3.1														
N.3.2														
N.3.3														
N.4.1														
S.1.1														
S.1.2														
S.2.1														
S.2.2														
S.2.3														
S.3.1														
S.3.2														
S.3.3														
H.1.1														
H.1.2														
H.1.3														
H.1.4														
H.2.1														
H.3.1														
O.1.1														
O.1.2														
O.2.1														
O.2.2														
O.3.1														

Cutting Data – P007 – High Performance End Milling Cutter, short – extra long

			59 002 ...										
		Ø DC =	1/8"	3/16"	1/4–5/16"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
											○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	750	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.1.2	720	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.1.3	720	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.1.4	690	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.1.5	690	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.2.1	720	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.2.2	690	1.0	0.0007	0.0010	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.2.3	660	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.2.4	620	1.0	0.0007	0.0010	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.3.1	660	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.3.2	620	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.3.3	520	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
P.4.1	360	1.0	0.0005	0.0006	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
P.4.2	300	1.0	0.0005	0.0006	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.1.1	360	1.0	0.0005	0.0006	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.2.1	360	1.0	0.0005	0.0006	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.3.1	360	1.0	0.0005	0.0006	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
K.1.1	720	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
K.1.2	660	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
K.2.1	690	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.2.2	620	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.3.1	660	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.3.2	590	1.0	0.0009	0.0012	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
N.1.1													
N.1.2													
N.2.1													
N.2.2													
N.2.3													
N.3.1	1150	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
N.3.2	1150	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
N.3.3	920	1.0	0.0012	0.0015	0.0025	0.0031	0.0044	0.0047	0.0054	0.0062	●	○	○
N.4.1													
S.1.1	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.1.2	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.1	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.2	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.3	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.1	300	1.0	0.0007	0.0010	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●		
S.3.2													
S.3.3													
H.1.1													
H.1.2													
H.1.3													
H.1.4													
H.2.1													
H.3.1													
O.1.1													
O.1.2													
O.2.1													
O.2.2													
O.3.1													

Cutting Data – P556 – High Performance End milling cutter, short – extra long

			59 006 ...								
		Ø DC =	1/4"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
									○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1	690	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.2	660	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.3	660	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.4	620	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.5	620	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.2.1	660	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.2.2	620	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●	○	○
P.2.3	590	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.2.4	560	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●	○	○
P.3.1	590	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.3.2	560	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.3.3	460	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.4.1	330	1.0	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
P.4.2	260	1.0	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.1.1	330	1.0	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.2.1	330	1.0	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.3.1	330	1.0	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
K.1.1	660	1.0	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.1.2	590	1.0	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.2.1	620	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
K.2.2	560	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
K.3.1	590	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
K.3.2	520	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
N.1.1											
N.1.2											
N.2.1											
N.2.2											
N.2.3											
N.3.1											
N.3.2											
N.3.3											
N.4.1											
S.1.1	180	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●		
S.1.2	180	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●		
S.2.1	180	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●		
S.2.2	180	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●		
S.2.3	180	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●		
S.3.1	390	1.0	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●		
S.3.2	260	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●		
S.3.3											
H.1.1											
H.1.2											
H.1.3											
H.1.4											
H.2.1											
H.3.1											
O.1.1											
O.1.2											
O.2.1											
O.2.2											
O.3.1											

Cutting Data – P160 / P161 – Multi-flute milling cutter, short – extra long

			59 041 ... / 59 042 ...								
		Ø DC =	1/4"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
									○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	850	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.2	820	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.3	820	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.4	750	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.1.5	750	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.2.1	820	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.2.2	750	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●	○	○
P.2.3	720	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.2.4	690	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	●	○	○
P.3.1	720	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.3.2	690	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.3.3	570	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
P.4.1	390	1.0	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
P.4.2	330	1.0	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.1.1	390	1.0	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.2.1	390	1.0	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
M.3.1	390	1.0	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
K.1.1	820	1.0	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.1.2	720	1.0	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
K.2.1	750	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
K.2.2	690	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
K.3.1	720	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
K.3.2	660	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●	○	○
N.1.1											
N.1.2											
N.2.1											
N.2.2											
N.2.3											
N.3.1	1410	1.0	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
N.3.2	1410	1.0	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
N.3.3	1150	1.0	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	●	○	○
N.4.1											
S.1.1	130	1.0	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.1.2	130	1.0	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.1	130	1.0	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.2	130	1.0	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.3	130	1.0	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.1	660	1.0	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	●		
S.3.2	410	1.0	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	●		
S.3.3											
H.1.1											
H.1.2											
H.1.3											
H.1.4											
H.2.1											
H.3.1											
O.1.1											
O.1.2											
O.2.1											
O.2.2											
O.3.1											

Cutting Data – P130 – Chamfer milling cutter

			59 029 ... / 59 030 ...												
		Ø DC =	1/8–5/32"	3/16"	7/32"	1/4–3/32 –5/16"	3/8"	7/16"	1/2"	3/16–5/8"	3/4"	1"	● 1st choice		
													○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1															
P.1.2															
P.1.3															
P.1.4															
P.1.5															
P.2.1															
P.2.2															
P.2.3															
P.2.4															
P.3.1															
P.3.2															
P.3.3															
P.4.1															
P.4.2															
M.1.1															
M.2.1															
M.3.1															
K.1.1															
K.1.2															
K.2.1															
K.2.2															
K.3.1															
K.3.2															
N.1.1	1970	1.0	0.0012	0.0015	0.0019	0.0025	0.0031	0.0038	0.0044	0.0047	0.0054	0.0062	●	○	○
N.1.2	1970	1.0	0.0012	0.0015	0.0019	0.0025	0.0031	0.0038	0.0044	0.0047	0.0054	0.0062	●	○	○
N.2.1	1180	1.0	0.0011	0.0014	0.0017	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
N.2.2	1180	1.0	0.0011	0.0014	0.0017	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
N.2.3	790	1.0	0.0011	0.0014	0.0017	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
N.3.1	790	1.0	0.0008	0.0011	0.0013	0.0017	0.0022	0.0026	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.2	790	1.0	0.0008	0.0011	0.0013	0.0017	0.0022	0.0026	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.3	560	1.0	0.0008	0.0011	0.0013	0.0017	0.0022	0.0026	0.0031	0.0033	0.0037	0.0043	●	○	○
N.4.1	720	1.0	0.0011	0.0014	0.0017	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
S.1.1															
S.1.2															
S.2.1															
S.2.2															
S.2.3															
S.3.1															
S.3.2															
S.3.3															
H.1.1															
H.1.2															
H.1.3															
H.1.4															
H.2.1															
H.3.1															
O.1.1															
O.1.2															
O.2.1															
O.2.2															
O.3.1															

Cutting Data – P117 – Rough-Finishing Cutter with corner radius, short – long

			59 028 ...										
		Ø DC =	1/8"	3/16"	1/4–5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	● 1st choice		
											○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	360	1.0	0.0007	0.0008	0.0012	0.0015	0.0018	0.0020	0.0022	0.0024	●	○	○
P.1.2	300	1.0	0.0006	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	●	○	○
P.1.3	300	1.0	0.0006	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	●	○	○
P.1.4	260	1.0	0.0006	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	●	○	○
P.1.5	260	1.0	0.0006	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	●	○	○
P.2.1	300	1.0	0.0006	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	●	○	○
P.2.2	230	1.0	0.0006	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	●	○	○
P.2.3	230	1.0	0.0006	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	●	○	○
P.2.4	180	1.0	0.0006	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	●	○	○
P.3.1													
P.3.2													
P.3.3													
P.4.1	160	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
P.4.2	130	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
M.1.1	130	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
M.2.1	160	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
M.3.1	160	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
K.1.1	430	1.0	0.0011	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	●	○	○
K.1.2	400	1.0	0.0011	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	●	○	○
K.2.1	420	1.0	0.0008	0.0010	0.0014	0.0017	0.0020	0.0023	0.0024	0.0027	●	○	○
K.2.2	400	1.0	0.0008	0.0010	0.0014	0.0017	0.0020	0.0023	0.0024	0.0027	●	○	○
K.3.1	430	1.0	0.0011	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	●	○	○
K.3.2	400	1.0	0.0011	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	●	○	○
N.1.1													
N.1.2													
N.2.1													
N.2.2													
N.2.3													
N.3.1	660	1.0	0.0007	0.0010	0.0016	0.0020	0.0024	0.0028	0.0030	0.0033	●	○	○
N.3.2	660	1.0	0.0007	0.0010	0.0016	0.0020	0.0024	0.0028	0.0030	0.0033	●	○	○
N.3.3	460	1.0	0.0007	0.0010	0.0016	0.0020	0.0024	0.0028	0.0030	0.0033	●	○	○
N.4.1													
S.1.1	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
S.1.2	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
S.2.1	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
S.2.2	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
S.2.3	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
S.3.1	160	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
S.3.2	66	1.0	0.0004	0.0005	0.0008	0.0010	0.0012	0.0014	0.0015	0.0017	●		
S.3.3													
H.1.1													
H.1.2													
H.1.3													
H.1.4													
H.2.1													
H.3.1													
O.1.1													
O.1.2													
O.2.1													
O.2.2													
O.3.1													

Cutting Data – P120 – Roughing-Finishing cutter with corner radius, extra short – extra long

			59 031 ... / 59 032 ...												
		Ø DC =	1/8–5/32"	3/16"	7/32"	1/4–9/32", 5/16"	11/32–3/8"	7/16"	1/2"	9/16–5/8"	3/4"	1"	● 1st choice		
													○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1	310	1.0	0.0007	0.0008	0.0009	0.0012	0.0015	0.0018	0.0020	0.0022	0.0024	0.0028	●	○	○
P.1.2	260	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.3	260	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.4	230	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.5	230	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.1	250	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.2	200	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.3	200	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.4	180	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.3.1															
P.3.2															
P.3.3															
P.4.1															
P.4.2															
M.1.1															
M.2.1															
M.3.1															
K.1.1	390	1.0	0.0011	0.0013	0.0015	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
K.1.2	330	1.0	0.0011	0.0013	0.0015	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
K.2.1	390	1.0	0.0008	0.0010	0.0011	0.0014	0.0017	0.0020	0.0023	0.0024	0.0027	0.0031	●	○	○
K.2.2	330	1.0	0.0008	0.0010	0.0011	0.0014	0.0017	0.0020	0.0023	0.0024	0.0027	0.0031	●	○	○
K.3.1	390	1.0	0.0011	0.0013	0.0015	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
K.3.2	330	1.0	0.0011	0.0013	0.0015	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
N.1.1															
N.1.2															
N.2.1															
N.2.2															
N.2.3															
N.3.1															
N.3.2															
N.3.3															
N.4.1															
S.1.1															
S.1.2															
S.2.1															
S.2.2															
S.2.3															
S.3.1															
S.3.2															
S.3.3															
H.1.1															
H.1.2															
H.1.3															
H.1.4															
H.2.1															
H.3.1															
O.1.1															
O.1.2															
O.2.1															
O.2.2															
O.3.1															

Cutting Data – P121 – Roughing-Finishing cutter with corner radius, short – extra long

			59 035 ...				
		Ø DC =	3/4"	1"	● 1st choice		
					○ suitable		
			a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	480	1.0	0.0033	0.0039	●	○	○
P.1.2	460	1.0	0.0033	0.0039	●	○	○
P.1.3	460	1.0	0.0033	0.0039	●	○	○
P.1.4	440	1.0	0.0033	0.0039	●	○	○
P.1.5	440	1.0	0.0033	0.0039	●	○	○
P.2.1	460	1.0	0.0033	0.0039	●	○	○
P.2.2	440	1.0	0.0026	0.0030	●	○	○
P.2.3	410	1.0	0.0033	0.0039	●	○	○
P.2.4	390	1.0	0.0026	0.0030	●	○	○
P.3.1	410	1.0	0.0033	0.0039	●	○	○
P.3.2	390	1.0	0.0033	0.0039	●	○	○
P.3.3	320	1.0	0.0033	0.0039	●	○	○
P.4.1	230	1.0	0.0023	0.0026	●		
P.4.2	180	1.0	0.0023	0.0026	●		
M.1.1	230	1.0	0.0023	0.0026	●		
M.2.1	230	1.0	0.0023	0.0026	●		
M.3.1	230	1.0	0.0023	0.0026	●		
K.1.1	460	1.0	0.0039	0.0044	●	○	○
K.1.2	410	1.0	0.0039	0.0044	●	○	○
K.2.1	440	1.0	0.0033	0.0039	●	○	○
K.2.2	390	1.0	0.0033	0.0039	●	○	○
K.3.1	410	1.0	0.0033	0.0039	●	○	○
K.3.2	370	1.0	0.0033	0.0039	●	○	○
N.1.1							
N.1.2							
N.2.1							
N.2.2							
N.2.3							
N.3.1							
N.3.2							
N.3.3							
N.4.1							
S.1.1	130	1.0	0.0026	0.0030	●		
S.1.2	130	1.0	0.0026	0.0030	●		
S.2.1	130	1.0	0.0026	0.0030	●		
S.2.2	130	1.0	0.0026	0.0030	●		
S.2.3	130	1.0	0.0026	0.0030	●		
S.3.1	280	1.0	0.0039	0.0044	●		
S.3.2	180	1.0	0.0026	0.0030	●		
S.3.3							
H.1.1							
H.1.2							
H.1.3							
H.1.4							
H.2.1							
H.3.1							
O.1.1							
O.1.2							
O.2.1							
O.2.2							
O.3.1							

Cutting Data – P102 –Rough milling cutter with corner radius, short – extra long

			59 023 ... / 59 024 ... / 59 025 ... / 59 026 ...										
		Ø DC =	3/16"	1/4–5/16"	3/8"	7/16"	1/2"	3/16–5/8"	3/4"	1"	● 1st choice		
											○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1													
P.1.2													
P.1.3													
P.1.4													
P.1.5													
P.2.1													
P.2.2													
P.2.3													
P.2.4													
P.3.1													
P.3.2													
P.3.3													
P.4.1													
P.4.2													
M.1.1													
M.2.1													
M.3.1													
K.1.1													
K.1.2													
K.2.1													
K.2.2													
K.3.1													
K.3.2													
N.1.1	1970	1.0	0.0015	0.0025	0.0031	0.0038	0.0044	0.0047	0.0054	0.0062	●	○	○
N.1.2	1970	1.0	0.0015	0.0025	0.0031	0.0038	0.0044	0.0047	0.0054	0.0062	●	○	○
N.2.1	1180	1.0	0.0014	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
N.2.2	1180	1.0	0.0014	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
N.2.3	790	1.0	0.0014	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
N.3.1	790	1.0	0.0011	0.0017	0.0022	0.0026	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.2	790	1.0	0.0011	0.0017	0.0022	0.0026	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.3	560	1.0	0.0011	0.0017	0.0022	0.0026	0.0031	0.0033	0.0037	0.0043	●	○	○
N.4.1	720	1.0	0.0014	0.0023	0.0029	0.0035	0.0040	0.0043	0.0049	0.0056	●	○	○
S.1.1													
S.1.2													
S.2.1													
S.2.2													
S.2.3													
S.3.1													
S.3.2													
S.3.3													
H.1.1													
H.1.2													
H.1.3													
H.1.4													
H.2.1													
H.3.1													
O.1.1													
O.1.2													
O.2.1													
O.2.2													
O.3.1													

Cutting Data – P190 / P191 – Rough milling cutter, short – extra long

			59 059 ... / 59 061 ...									
		Ø DC =	3/16“	1/4–5/16"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
										○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	310	1.0	0.0007	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.1.2	260	1.0	0.0006	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.3	260	1.0	0.0006	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.4	230	1.0	0.0006	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.5	230	1.0	0.0006	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.1	250	1.0	0.0006	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.2	200	1.0	0.0006	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.3	200	1.0	0.0006	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.4	180	1.0	0.0006	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.3.1												
P.3.2												
P.3.3												
P.4.1												
P.4.2												
M.1.1												
M.2.1												
M.3.1												
K.1.1	390	1.0	0.0011	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.1.2	330	1.0	0.0011	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.2.1	390	1.0	0.0008	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.2.2	330	1.0	0.0008	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.3.1	390	1.0	0.0011	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.3.2	330	1.0	0.0011	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
N.1.1												
N.1.2												
N.2.1												
N.2.2												
N.2.3												
N.3.1												
N.3.2												
N.3.3												
N.4.1												
S.1.1												
S.1.2												
S.2.1												
S.2.2												
S.2.3												
S.3.1												
S.3.2												
S.3.3												
H.1.1												
H.1.2												
H.1.3												
H.1.4												
H.2.1												
H.3.1												
O.1.1												
O.1.2												
O.2.1												
O.2.2												
O.3.1												

Cutting Data – P100 – Rough milling cutter with corner radius, short – extra long

			59 011 ... / 59 012 ... / 59 013 ... / 59 014 ...										
		Ø DC =	3/16"	1/4–5/16"	3/8"	7/16"	1/2"	9/16–5/8"	3/4"	1"	● 1st choice		
											○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	312	1.0	0.0008	0.0012	0.0015	0.0018	0.0020	0.0022	0.0024	0.0028	●	○	○
P.1.2	262	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.3	262	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.4	230	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.5	230	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.1	246	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.2	197	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.3	197	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.4	180	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.3.1													
P.3.2													
P.3.3													
P.4.1													
P.4.2													
M.1.1													
M.2.1													
M.3.1													
K.1.1	390	1.0	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
K.1.2	330	1.0	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
K.2.1	390	1.0	0.0010	0.0014	0.0017	0.0020	0.0023	0.0024	0.0027	0.0031	●	○	○
K.2.2	330	1.0	0.0010	0.0014	0.0017	0.0020	0.0023	0.0024	0.0027	0.0031	●	○	○
K.3.1	390	1.0	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
K.3.2	330	1.0	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
N.1.1													
N.1.2													
N.2.1													
N.2.2													
N.2.3													
N.3.1													
N.3.2													
N.3.3													
N.4.1													
S.1.1													
S.1.2													
S.2.1													
S.2.2													
S.2.3													
S.3.1													
S.3.2													
S.3.3													
H.1.1													
H.1.2													
H.1.3													
H.1.4													
H.2.1													
H.3.1													
O.1.1													
O.1.2													
O.2.1													
O.2.2													
O.3.1													

Cutting Data – P101 – Rough milling cutter with corner radius, short – extra long

			59 015 ... / 59 016 ... / 59 017 ... / 59 022 ...										
		Ø DC =	3/16"	1/4–5/16"	3/8"	7/16"	1/2"	9/16–5/8"	3/4"	1"	● 1st choice		
											○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1	310	1.0	0.0008	0.0012	0.0015	0.0018	0.0020	0.0022	0.0024	0.0028	●	○	○
P.1.2	260	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.3	260	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.4	230	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.5	230	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.1	250	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.2	200	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.3	200	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.4	180	1.0	0.0007	0.0011	0.0013	0.0016	0.0018	0.0019	0.0022	0.0025	●	○	○
P.3.1													
P.3.2													
P.3.3													
P.4.1													
P.4.2													
M.1.1													
M.2.1													
M.3.1													
K.1.1	390	1.0	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
K.1.2	330	1.0	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
K.2.1	390	1.0	0.0010	0.0014	0.0017	0.0020	0.0023	0.0024	0.0027	0.0031	●	○	○
K.2.2	330	1.0	0.0010	0.0014	0.0017	0.0020	0.0023	0.0024	0.0027	0.0031	●	○	○
K.3.1	390	1.0	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
K.3.2	330	1.0	0.0013	0.0020	0.0024	0.0028	0.0033	0.0035	0.0039	0.0045	●	○	○
N.1.1													
N.1.2													
N.2.1													
N.2.2													
N.2.3													
N.3.1													
N.3.2													
N.3.3													
N.4.1													
S.1.1													
S.1.2													
S.2.1													
S.2.2													
S.2.3													
S.3.1													
S.3.2													
S.3.3													
H.1.1													
H.1.2													
H.1.3													
H.1.4													
H.2.1													
H.3.1													
O.1.1													
O.1.2													
O.2.1													
O.2.2													
O.3.1													

Cutting Data – P662 – Ball nosed Cutter, extra short – extra long

			59 074 ... / 59 075 ...											
		Ø DC =	1/16"	1/8"	3/16"	1/4–5/16"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
												○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	350	1.0	0.0003	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.2	310	1.0	0.0003	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.3	310	1.0	0.0003	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.4	300	1.0	0.0003	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.5	300	1.0	0.0003	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.1	330	1.0	0.0003	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.2	280	1.0	0.0003	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.3	280	1.0	0.0003	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.4	260	1.0	0.0003	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.3.1														
P.3.2														
P.3.3														
P.4.1	200	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
P.4.2	80	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.1.1	98	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.2.1	98	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.3.1	98	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
K.1.1	240	1.0	0.0007	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.1.2	160	1.0	0.0007	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.2.1	240	1.0	0.0006	0.0008	0.0010	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.2.2	390	1.0	0.0006	0.0008	0.0010	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.3.1	240	1.0	0.0007	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.3.2	200	1.0	0.0007	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
N.1.1														
N.1.2														
N.2.1														
N.2.2														
N.2.3														
N.3.1	390	1.0	0.0004	0.0008	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.2	390	1.0	0.0004	0.0008	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.3	280	1.0	0.0004	0.0008	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.4.1														
S.1.1	59	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.1.2	59	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.1	59	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.2	59	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.3	59	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.1	98	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.2	39	1.0	0.0002	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.3														
H.1.1														
H.1.2														
H.1.3														
H.1.4														
H.2.1														
H.3.1														
O.1.1														
O.1.2														
O.2.1														
O.2.2														
O.3.1														

Cutting Data – S663 – Ball nosed Cutter, extra short – extra long

			59 078 ... / 59 079 ...										
		Ø DC =	1/8"	3/16"	1/4–5/16"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
											○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	590	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.2	520	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.3	520	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.4	490	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.5	490	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.1	560	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.2	460	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.3	460	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.4	430	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.3.1													
P.3.2													
P.3.3													
P.4.1	330	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
P.4.2	130	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.1.1	160	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.2.1	160	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.3.1	160	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
K.1.1	390	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.1.2	260	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.2.1	390	1.0	0.0008	0.0010	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.2.2	660	1.0	0.0008	0.0010	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.3.1	390	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.3.2	330	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
N.1.1													
N.1.2													
N.2.1													
N.2.2													
N.2.3													
N.3.1	660	1.0	0.0008	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.2	660	1.0	0.0008	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.3	460	1.0	0.0008	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.4.1													
S.1.1	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.1.2	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.1	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.2	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.2.3	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.1	160	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.2	66	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
S.3.3													
H.1.1													
H.1.2													
H.1.3													
H.1.4													
H.2.1													
H.3.1													
O.1.1													
O.1.2													
O.2.1													
O.2.2													
O.3.1													

Cutting Data – P157 – Ball nosed cutter, short – extra long

			59 055 ...											
		Ø DC =	1/8–5/32"	3/16"	7/32"	1/4–5/16"	3/8"	1/2"	9/16"	3/4"	1"	● 1st choice		
												○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	430	1.0	0.0007	0.0008	0.0009	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.1.2	360	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.3	360	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.4	310	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.5	310	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.1	360	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.2	280	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.3	280	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.4	210	1.0	0.0006	0.0007	0.0008	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.3.1														
P.3.2														
P.3.3														
P.4.1	200	1.0	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
P.4.2	160	1.0	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.1.1	160	1.0	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.2.1	200	1.0	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.3.1	200	1.0	0.0004	0.0005	0.0006	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
K.1.1	510	1.0	0.0011	0.0013	0.0015	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.1.2	480	1.0	0.0011	0.0013	0.0015	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.2.1	510	1.0	0.0008	0.0010	0.0011	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.2.2	480	1.0	0.0008	0.0010	0.0011	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.3.1	510	1.0	0.0011	0.0013	0.0015	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.3.2	480	1.0	0.0011	0.0013	0.0015	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
N.1.1														
N.1.2														
N.2.1														
N.2.2														
N.2.3														
N.3.1	790	1.0	0.0008	0.0011	0.0013	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.2	790	1.0	0.0008	0.0011	0.0013	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.3	560	1.0	0.0008	0.0011	0.0013	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.4.1														
S.1.1														
S.1.2														
S.2.1														
S.2.2														
S.2.3														
S.3.1														
S.3.2														
S.3.3														
H.1.1														
H.1.2														
H.1.3														
H.1.4														
H.2.1														
H.3.1														
O.1.1														
O.1.2														
O.2.1														
O.2.2														
O.3.1														

Cutting Data – S664 – Ball nosed Cutter, extra short – extra long

			59 080... / 59 081 ...														
		Ø DC =	1/32"	3/64"	1/16"	3/32"	1/8–5/32"	3/16"	1/4–5/16"	3/8"	1/2"	5/8"	3/4"	1"	● 1st choice		
															○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1	260	1.0	0.0003	0.0003	0.0004	0.0005	0.0007	0.0008	0.0012	0.0015	0.0020	0.0022	0.0024	0.0028	●	○	○
P.1.2	220	1.0	0.0002	0.0002	0.0003	0.0004	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.3	220	1.0	0.0002	0.0002	0.0003	0.0004	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.4	190	1.0	0.0002	0.0002	0.0003	0.0004	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.1.5	190	1.0	0.0002	0.0002	0.0003	0.0004	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.1	220	1.0	0.0002	0.0002	0.0003	0.0004	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.2	170	1.0	0.0002	0.0002	0.0003	0.0004	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.3	170	1.0	0.0002	0.0002	0.0003	0.0004	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.2.4	130	1.0	0.0002	0.0002	0.0003	0.0004	0.0006	0.0007	0.0011	0.0013	0.0018	0.0019	0.0022	0.0025	●	○	○
P.3.1																	
P.3.2																	
P.3.3																	
P.4.1	120	1.0	0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
P.4.2	100	1.0	0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.1.1	98	1.0	0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.2.1	120	1.0	0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
M.3.1	120	1.0	0.0001	0.0001	0.0002	0.0003	0.0004	0.0005	0.0008	0.0010	0.0014	0.0015	0.0017	0.0019	●		
K.1.1	310	1.0	0.0004	0.0006	0.0007	0.0009	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.1.2	290	1.0	0.0004	0.0006	0.0007	0.0009	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.2.1	310	1.0	0.0004	0.0005	0.0006	0.0007	0.0008	0.0010	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.2.2	290	1.0	0.0004	0.0005	0.0006	0.0007	0.0008	0.0010	0.0014	0.0017	0.0023	0.0024	0.0027	0.0031	●	○	○
K.3.1	310	1.0	0.0004	0.0006	0.0007	0.0009	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
K.3.2	290	1.0	0.0004	0.0006	0.0007	0.0009	0.0011	0.0013	0.0020	0.0024	0.0033	0.0035	0.0039	0.0045	●	○	○
N.1.1																	
N.1.2																	
N.2.1																	
N.2.2																	
N.2.3																	
N.3.1	470	1.0	0.0002	0.0003	0.0004	0.0006	0.0008	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.2	470	1.0	0.0002	0.0003	0.0004	0.0006	0.0008	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.3.3	330	1.0	0.0002	0.0003	0.0004	0.0006	0.0008	0.0011	0.0017	0.0022	0.0031	0.0033	0.0037	0.0043	●	○	○
N.4.1																	
S.1.1																	
S.1.2																	
S.2.1																	
S.2.2																	
S.2.3																	
S.3.1																	
S.3.2																	
S.3.3																	
H.1.1																	
H.1.2																	
H.1.3																	
H.1.4																	
H.2.1																	
H.3.1																	
O.1.1																	
O.1.2																	
O.2.1																	
O.2.2																	
O.3.1																	

Cutting Data – P250 – Ball Nosed Cutter, medium long – extra long

			59 063 ...							
		Ø DC =	1/8"	3/16"	1/4"	3/8"	1/2"	● 1st choice		
								○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	350	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.2	310	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.3	310	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.4	300	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.5	300	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.1	330	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.2	280	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.3	280	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.4	260	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.3.1										
P.3.2										
P.3.3										
P.4.1	200	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
P.4.2	80	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
M.1.1	100	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
M.2.1	100	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
M.3.1	100	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
K.1.1	240	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	●	○	○
K.1.2	160	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	●	○	○
K.2.1	240	1.0	0.0008	0.0010	0.0014	0.0017	0.0023	●	○	○
K.2.2	390	1.0	0.0008	0.0010	0.0014	0.0017	0.0023	●	○	○
K.3.1	240	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	●	○	○
K.3.2	200	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	●	○	○
N.1.1										
N.1.2										
N.2.1										
N.2.2										
N.2.3										
N.3.1	390	1.0	0.0008	0.0011	0.0017	0.0022	0.0031	●	○	○
N.3.2	390	1.0	0.0008	0.0011	0.0017	0.0022	0.0031	●	○	○
N.3.3	280	1.0	0.0008	0.0011	0.0017	0.0022	0.0031	●	○	○
N.4.1										
S.1.1	59	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
S.1.2	59	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
S.2.1	59	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
S.2.2	59	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
S.2.3	59	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
S.3.1	98	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
S.3.2	39	1.0	0.0004	0.0005	0.0008	0.0010	0.0014	●		
S.3.3										
H.1.1										
H.1.2										
H.1.3										
H.1.4										
H.2.1										
H.3.1										
O.1.1										
O.1.2										
O.2.1										
O.2.2										
O.3.1										

Cutting Data – P251, P251, P253, P254 – Ball nosed cutter, extra long

			59 064 ... / 59 065 ... / 59 066 ... / 59 067 ...							
		Ø DC =	1/32"	.060"	3/32"	1/8"	3/16"	● 1st choice		
								○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	300	1.0	0.0002	0.0003	0.0004	0.0006	0.0007	●	○	○
P.1.2	260	1.0	0.0002	0.0003	0.0004	0.0006	0.0007	●	○	○
P.1.3	260	1.0	0.0002	0.0003	0.0004	0.0006	0.0007	●	○	○
P.1.4	250	1.0	0.0002	0.0003	0.0004	0.0006	0.0007	●	○	○
P.1.5	250	1.0	0.0002	0.0003	0.0004	0.0006	0.0007	●	○	○
P.2.1	280	1.0	0.0002	0.0003	0.0004	0.0006	0.0007	●	○	○
P.2.2	230	1.0	0.0002	0.0003	0.0004	0.0006	0.0007	●	○	○
P.2.3	230	1.0	0.0002	0.0003	0.0004	0.0006	0.0007	●	○	○
P.2.4	210	1.0	0.0002	0.0003	0.0004	0.0006	0.0007	●	○	○
P.3.1										
P.3.2										
P.3.3										
P.4.1	160	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
P.4.2	70	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
M.1.1	82	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
M.2.1	82	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
M.3.1	82	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
K.1.1	200	1.0	0.0004	0.0007	0.0009	0.0011	0.0013	●	○	○
K.1.2	130	1.0	0.0004	0.0007	0.0009	0.0011	0.0013	●	○	○
K.2.1	200	1.0	0.0004	0.0006	0.0007	0.0008	0.0010	●	○	○
K.2.2	330	1.0	0.0004	0.0006	0.0007	0.0008	0.0010	●	○	○
K.3.1	200	1.0	0.0004	0.0007	0.0009	0.0011	0.0013	●	○	○
K.3.2	160	1.0	0.0004	0.0007	0.0009	0.0011	0.0013	●	○	○
N.1.1										
N.1.2										
N.2.1										
N.2.2										
N.2.3										
N.3.1	330	1.0	0.0002	0.0004	0.0006	0.0008	0.0011	●	○	○
N.3.2	330	1.0	0.0002	0.0004	0.0006	0.0008	0.0011	●	○	○
N.3.3	230	1.0	0.0002	0.0004	0.0006	0.0008	0.0011	●	○	○
N.4.1										
S.1.1	49	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
S.1.2	49	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
S.2.1	49	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
S.2.2	49	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
S.2.3	49	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
S.3.1	82	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
S.3.2	33	1.0	0.0001	0.0002	0.0003	0.0004	0.0005	●		
S.3.3										
H.1.1										
H.1.2										
H.1.3										
H.1.4										
H.2.1										
H.3.1										
O.1.1										
O.1.2										
O.2.1										
O.2.2										
O.3.1										

Cutting Data – P504, P506 – Micro end milling cutter, short

			59 009 ... / 59 010...									
		Ø DC =	0.005–015"	0.015–031"	0.031–047"	0.047–062"	0.062–078"	0.078–093"	0.093–0120"	● 1st choice		
										○ suitable		
			a_e 0.30 x DC	a_e 0.30 x DC	a_e 0.30 x DC	a_e 0.60 x DC	a_e 0.60 x DC	a_e 0.60 x DC	a_e 0.60 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	600	1.0	0.00007	0.00014	0.00021	0.00024	0.00031	0.00036	0.00049	●		
P.1.2	600	1.0	0.00007	0.00014	0.00021	0.00024	0.00031	0.00036	0.00049	●		
P.1.3	200	1.0	0.00006	0.00013	0.00019	0.00022	0.00028	0.00033	0.00045	●		
P.1.4	200	1.0	0.00006	0.00013	0.00019	0.00022	0.00028	0.00033	0.00045	●		
P.1.5	200	1.0	0.00006	0.00013	0.00019	0.00022	0.00028	0.00033	0.00045	●		
P.2.1	200	1.0	0.00006	0.00013	0.00019	0.00022	0.00028	0.00033	0.00045	●		
P.2.2	200	1.0	0.00006	0.00013	0.00019	0.00022	0.00028	0.00033	0.00045	●		
P.2.3	200	1.0	0.00006	0.00013	0.00019	0.00022	0.00028	0.00033	0.00045	●		
P.2.4	100	1.0	0.00003	0.00006	0.00010	0.00011	0.00014	0.00017	0.00022	●		
P.3.1	150	1.0	0.00004	0.00008	0.00012	0.00014	0.00017	0.00021	0.00028	●		
P.3.2	150	1.0	0.00004	0.00008	0.00012	0.00014	0.00017	0.00021	0.00028	●		
P.3.3	90	1.0	0.00002	0.00004	0.00006	0.00007	0.00009	0.00012	0.00018	●		
P.4.1	450	1.0	0.00007	0.00014	0.00021	0.00024	0.00031	0.00036	0.00049	●		
P.4.2	450	1.0	0.00007	0.00014	0.00021	0.00024	0.00031	0.00036	0.00049	●		
M.1.1	200	1.0	0.00006	0.00013	0.00019	0.00022	0.00028	0.00033	0.00045	●		
M.2.1	200	1.0	0.00003	0.00006	0.00010	0.00011	0.00014	0.00017	0.00022	●		
M.3.1	100	1.0	0.00003	0.00006	0.00010	0.00011	0.00014	0.00017	0.00022	●		
K.1.1	400	1.0	0.00007	0.00014	0.00021	0.00024	0.00031	0.00036	0.00049	●		
K.1.2	400	1.0	0.00007	0.00014	0.00021	0.00024	0.00031	0.00036	0.00049	●		
K.2.1	300	1.0	0.00007	0.00014	0.00021	0.00024	0.00031	0.00036	0.00049	●		
K.2.2	300	1.0	0.00007	0.00014	0.00021	0.00024	0.00031	0.00036	0.00049	●		
K.3.1	250	1.0	0.00007	0.00014	0.00021	0.00024	0.00031	0.00036	0.00049	●		
K.3.2	250	1.0	0.00007	0.00014	0.00021	0.00024	0.00031	0.00036	0.00049	●		
N.1.1	1000	1.0	0.00022	0.00045	0.00068	0.00780	0.00099	0.00118	0.00158	●		
N.1.2	1000	1.0	0.00022	0.00045	0.00068	0.00780	0.00099	0.00118	0.00158	●		
N.2.1	750	1.0	0.00022	0.00045	0.00068	0.00780	0.00099	0.00118	0.00158	●		
N.2.2	750	1.0	0.00022	0.00045	0.00068	0.00780	0.00099	0.00118	0.00158	●		
N.2.3												
N.3.1	500	1.0	0.00017	0.00036	0.00055	0.00063	0.00079	0.00094	0.00127	●		
N.3.2	800	1.0	0.00017	0.00036	0.00055	0.00063	0.00079	0.00094	0.00127	●		
N.3.3	400	1.0	0.00017	0.00036	0.00055	0.00063	0.00079	0.00094	0.00127	●		
N.4.1	1500	1.0	0.00022	0.00045	0.00068	0.00078	0.00099	0.00118	0.00158	●		
S.1.1	70	1.0	0.00004	0.00008	0.00012	0.00014	0.00017	0.00021	0.00028	●		
S.1.2	50	1.0	0.00002	0.00004	0.00006	0.00007	0.00009	0.00012	0.00018	●		
S.2.1	70	1.0	0.00004	0.00008	0.00012	0.00014	0.00017	0.00021	0.00028	●		
S.2.2	50	1.0	0.00002	0.00004	0.00006	0.00007	0.00009	0.00012	0.00018	●		
S.2.3	50	1.0	0.00002	0.00004	0.00006	0.00007	0.00009	0.00012	0.00018	●		
S.3.1	200	1.0	0.00004	0.00008	0.00012	0.00014	0.00017	0.00021	0.00028	●		
S.3.2	150	1.0	0.00004	0.00008	0.00012	0.00014	0.00017	0.00021	0.00028	●		
S.3.3	75	1.0	0.00002	0.00004	0.00006	0.00007	0.00009	0.00012	0.00018	●		
H.1.1												
H.1.2												
H.1.3												
H.1.4												
H.2.1												
H.3.1												
O.1.1												
O.1.2												
O.2.1												
O.2.2												
O.3.1												

Cutting Data – P501, P503 – Micro End Milling Cutter, long

			59 007 ... / 59 008 ...									
		Ø DC =	0.005–015"		0.015–031"		0.031–047"		0.047–062"		0.062–078“	
			a_e 0.13 x DC	a_e 0.25 x DC	a_e 0.13 x DC	a_e 0.25 x DC	a_e 0.13 x DC	a_e 0.25 x DC	a_e 0.13 x DC	a_e 0.25 x DC	a_e .13 x DC	a_e 0.25 x DC
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch
P.1.1	600	3.0	0.00005		0.00010		0.00015			0.00170		0.00021
P.1.2	600	3.0	0.00005		0.00010		0.00015			0.00170		0.00021
P.1.3	200	3.0	0.00004		0.00009		0.00013			0.00020		0.00025
P.1.4	200	3.0	0.00004		0.00009		0.00013			0.00020		0.00025
P.1.5	200	3.0	0.00004		0.00009		0.00013			0.00020		0.00025
P.2.1	200	3.0	0.00004		0.00009		0.00013			0.00015		0.00019
P.2.2	200	3.0	0.00004		0.00009		0.00013			0.00015		0.00019
P.2.3	200	3.0	0.00004		0.00009		0.00013			0.00015		0.00019
P.2.4	100	3.0	0.00002		0.00004		0.00007			0.00008		0.00100
P.3.1	150	3.0	0.00003		0.00006		0.00008			0.00010		0.00012
P.3.2	150	3.0	0.00003		0.00006		0.00008			0.00010		0.00012
P.3.3	90	3.0	0.00001		0.00003		0.00004			0.00005		0.00006
P.4.1	450	3.0	0.00005		0.00010		0.00015			0.00017		0.00021
P.4.2	450	3.0	0.00005		0.00010		0.00015			0.00017		0.00021
M.1.1	200	3.0	0.00004		0.00009		0.00013			0.00015		0.00019
M.2.1	200	3.0	0.00002		0.00004		0.00007			0.00008		0.00100
M.3.1	100	3.0	0.00002		0.00004		0.00007			0.00008		0.00100
K.1.1	400	3.0	0.00005		0.00010		0.00015			0.00017		0.00021
K.1.2	400	3.0	0.00005		0.00010		0.00015			0.00017		0.00021
K.2.1	300	3.0	0.00005		0.00010		0.00015			0.00017		0.00021
K.2.2	300	3.0	0.00005		0.00010		0.00015			0.00017		0.00021
K.3.1	250	3.0	0.00005		0.00010		0.00015			0.00017		0.00021
K.3.2	250	3.0	0.00005		0.00010		0.00015			0.00017		0.00021
N.1.1	1000	3.0	0.00015		0.00031		0.00047			0.00055		0.00069
N.1.2	1000	3.0	0.00015		0.00031		0.00047			0.00055		0.00069
N.2.1	750	3.0	0.00015		0.00031		0.00047			0.00055		0.00069
N.2.2	750	3.0	0.00015		0.00031		0.00047			0.00055		0.00069
N.2.3												
N.3.1	500	3.0	0.00012		0.00025		0.00038		0.00044		0.00055	
N.3.2	800	3.0	0.00015		0.00031		0.00048		0.00055		0.00069	
N.3.3	400	3.0	0.00012		0.00025		0.00038		0.00044		0.00055	
N.4.1	1500	3.0	0.00015		0.00031		0.00048		0.00055		0.00069	
S.1.1	70	3.0	0.00003		0.00006		0.00009			0.00010		0.00012
S.1.2	50	3.0	0.00001		0.00003		0.00004			0.00005		0.00006
S.2.1	70	3.0	0.00003		0.00006		0.00009			0.00010		0.00012
S.2.2	50	3.0	0.00003		0.00006		0.00009			0.00010		0.00012
S.2.3	50	3.0	0.00001		0.00003		0.00004			0.00005		0.00006
S.3.1	200	3.0	0.00003		0.00006		0.00008			0.00010		0.00012
S.3.2	150	3.0	0.00003		0.00006		0.00008			0.00010		0.00012
S.3.3	75	3.0	0.00001		0.00003		0.00004			0.00005		0.00006
H.1.1												
H.1.2												
H.1.3												
H.1.4												
H.2.1												
H.3.1												
O.1.1												
O.1.2												
O.2.1												
O.2.2												
O.3.1												

	59 007 ... / 59 008 ...						
	0.078–093"		0.093–0120"		● 1st choice		
					○ suitable		
	a_e 0.13 x DC	a_e 0.25 x DC	a_e 0.13 x DC	a_e 0.25 x DC			
Index	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1		0.00025		0.00034	●		
P.1.2		0.00025		0.00034	●		
P.1.3		0.00030		0.00040	●		
P.1.4		0.00030		0.00040	●		
P.1.5		0.00030		0.00040	●		
P.2.1		0.00023		0.00031	●		
P.2.2		0.00023		0.00031	●		
P.2.3		0.00023		0.00031	●		
P.2.4		0.00012		0.00016	●		
P.3.1		0.00014		0.00019	●		
P.3.2		0.00014		0.00019	●		
P.3.3		0.00007		0.00010	●		
P.4.1		0.00025		0.00034	●		
P.4.2		0.00025		0.00034	●		
M.1.1		0.00023		0.00031	●		
M.2.1		0.00012		0.00016	●		
M.3.1		0.00012		0.00016	●		
K.1.1		0.00025		0.00034	●		
K.1.2		0.00025		0.00034	●		
K.2.1		0.00025		0.00034	●		
K.2.2		0.00025		0.00034	●		
K.3.1		0.00025		0.00034	●		
K.3.2		0.00025		0.00034	●		
N.1.1		0.00082		0.00110	●		
N.1.2		0.00082		0.00110	●		
N.2.1		0.00082		0.00110	●		
N.2.2		0.00082		0.00110	●		
N.2.3							
N.3.1	0.00065		0.00088		●		
N.3.2	0.00082		0.00110		●		
N.3.3	0.00065		0.00088		●		
N.4.1	0.00082		0.00110		●		
S.1.1		0.00014		0.00019	●		
S.1.2		0.00007		0.00010	●		
S.2.1		0.00014		0.00019	●		
S.2.2		0.00014		0.00019	●		
S.2.3		0.00007		0.00010	●		
S.3.1		0.00014		0.00019	●		
S.3.2		0.00014		0.00019	●		
S.3.3		0.00007		0.00010	●		
H.1.1							
H.1.2							
H.1.3							
H.1.4							
H.2.1							
H.3.1							
O.1.1							
O.1.2							
O.2.1							
O.2.2							
O.3.1							

Cutting Data – P137 – Profile milling cutter

			59 049 ... / 59 050 ...						
		Ø DC =	1/8"	3/16"	1/4–5/16"	3/8"	● 1st choice		
							○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	310	1.0	0.0006	0.0007	0.0011	0.0013	●	○	○
P.1.2	260	1.0	0.0006	0.0007	0.0011	0.0013	●	○	○
P.1.3	260	1.0	0.0006	0.0007	0.0011	0.0013	●	○	○
P.1.4	230	1.0	0.0006	0.0007	0.0011	0.0013	●	○	○
P.1.5	230	1.0	0.0006	0.0007	0.0011	0.0013	●	○	○
P.2.1	250	1.0	0.0006	0.0007	0.0011	0.0013	●	○	○
P.2.2	200	1.0	0.0006	0.0007	0.0011	0.0013	●	○	○
P.2.3	200	1.0	0.0006	0.0007	0.0011	0.0013	●	○	○
P.2.4	180	1.0	0.0006	0.0007	0.0011	0.0013	●	○	○
P.3.1									
P.3.2									
P.3.3									
P.4.1									
P.4.2									
M.1.1									
M.2.1									
M.3.1									
K.1.1	390	1.0	0.0011	0.0013	0.0020	0.0024	●	○	○
K.1.2	330	1.0	0.0011	0.0013	0.0020	0.0024	●	○	○
K.2.1	390	1.0	0.0008	0.0010	0.0014	0.0017	●	○	○
K.2.2	330	1.0	0.0008	0.0010	0.0014	0.0017	●	○	○
K.3.1	390	1.0	0.0011	0.0013	0.0020	0.0024	●	○	○
K.3.2	330	1.0	0.0011	0.0013	0.0020	0.0024	●	○	○
N.1.1									
N.1.2									
N.2.1									
N.2.2									
N.2.3									
N.3.1									
N.3.2									
N.3.3									
N.4.1									
S.1.1									
S.1.2									
S.2.1									
S.2.2									
S.2.3									
S.3.1									
S.3.2									
S.3.3									
H.1.1									
H.1.2									
H.1.3									
H.1.4									
H.2.1									
H.3.1									
O.1.1									
O.1.2									
O.2.1									
O.2.2									
O.3.1									

Cutting Data – P139 – Profile milling cutter

			59 051 ... / 59 052 ...						
		Ø DC =	3/16"	1/4"	3/8"	1/2"	● 1st choice		
							○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	310	1.0	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.2	260	1.0	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.3	260	1.0	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.4	230	1.0	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.5	230	1.0	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.1	250	1.0	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.2	200	1.0	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.3	200	1.0	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.4	180	1.0	0.0007	0.0011	0.0013	0.0018	●	○	○
P.3.1									
P.3.2									
P.3.3									
P.4.1									
P.4.2									
M.1.1									
M.2.1									
M.3.1									
K.1.1	390	1.0	0.0013	0.0020	0.0024	0.0033	●	○	○
K.1.2	330	1.0	0.0013	0.0020	0.0024	0.0033	●	○	○
K.2.1	390	1.0	0.0010	0.0014	0.0017	0.0023	●	○	○
K.2.2	330	1.0	0.0010	0.0014	0.0017	0.0023	●	○	○
K.3.1	390	1.0	0.0013	0.0020	0.0024	0.0033	●	○	○
K.3.2	330	1.0	0.0013	0.0020	0.0024	0.0033	●	○	○
N.1.1									
N.1.2									
N.2.1									
N.2.2									
N.2.3									
N.3.1									
N.3.2									
N.3.3									
N.4.1									
S.1.1									
S.1.2									
S.2.1									
S.2.2									
S.2.3									
S.3.1									
S.3.2									
S.3.3									
H.1.1									
H.1.2									
H.1.3									
H.1.4									
H.2.1									
H.3.1									
O.1.1									
O.1.2									
O.2.1									
O.2.2									
O.3.1									

Cutting Data – P132/P134 – Chamfer milling cutter

			59 041 ... / 59 042 ... / 59 045 ... / 59 046 ...					● 1st choice		
		Ø DC =	1/8"	3/16"	1/4"	3/8"	1/2"	○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	f_z inch	f_z inch			
P.1.1	310	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.2	260	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.3	260	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.4	230	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.1.5	230	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.1	250	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.2	200	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.3	200	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.2.4	180	1.0	0.0006	0.0007	0.0011	0.0013	0.0018	●	○	○
P.3.1										
P.3.2										
P.3.3										
P.4.1										
P.4.2										
M.1.1										
M.2.1										
M.3.1										
K.1.1	390	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	●	○	○
K.1.2	330	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	●	○	○
K.2.1	390	1.0	0.0008	0.0010	0.0014	0.0017	0.0023	●	○	○
K.2.2	330	1.0	0.0008	0.0010	0.0014	0.0017	0.0023	●	○	○
K.3.1	390	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	●	○	○
K.3.2	330	1.0	0.0011	0.0013	0.0020	0.0024	0.0033	●	○	○
N.1.1										
N.1.2										
N.2.1										
N.2.2										
N.2.3										
N.3.1										
N.3.2										
N.3.3										
N.4.1										
S.1.1										
S.1.2										
S.2.1										
S.2.2										
S.2.3										
S.3.1										
S.3.2										
S.3.3										
H.1.1										
H.1.2										
H.1.3										
H.1.4										
H.2.1										
H.3.1										
O.1.1										
O.1.2										
O.2.1										
O.2.2										
O.3.1										

Cutting Data – P130 – Chamfer milling cutter

			59 037 ... / 59 038 ...					
		Ø DC =	1/4"	3/8"	1/2"	● 1st choice		
						○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	310	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.2	260	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.3	260	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.4	230	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.5	230	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.1	250	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.2	200	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.3	200	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.4	180	1.0	0.0011	0.0013	0.0018	●	○	○
P.3.1								
P.3.2								
P.3.3								
P.4.1								
P.4.2								
M.1.1								
M.2.1								
M.3.1								
K.1.1	390	1.0	0.0020	0.0024	0.0033	●	○	○
K.1.2	330	1.0	0.0020	0.0024	0.0033	●	○	○
K.2.1	390	1.0	0.0014	0.0017	0.0023	●	○	○
K.2.2	330	1.0	0.0014	0.0017	0.0023	●	○	○
K.3.1	390	1.0	0.0020	0.0024	0.0033	●	○	○
K.3.2	330	1.0	0.0020	0.0024	0.0033	●	○	○
N.1.1								
N.1.2								
N.2.1								
N.2.2								
N.2.3								
N.3.1								
N.3.2								
N.3.3								
N.4.1								
S.1.1								
S.1.2								
S.2.1								
S.2.2								
S.2.3								
S.3.1								
S.3.2								
S.3.3								
H.1.1								
H.1.2								
H.1.3								
H.1.4								
H.2.1								
H.3.1								
O.1.1								
O.1.2								
O.2.1								
O.2.2								
O.3.1								

Cutting Data – P133 – Chamfer milling cutter

			59 043 ... / 59 044 ...					
		Ø DC =	1/8"	3/16"	1/4"	● 1st choice		
						○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC	Emulsion	Compressed air	MMS
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch			
P.1.1	310	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.2	260	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.3	260	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.4	230	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.5	230	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.1	250	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.2	200	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.3	200	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.4	180	1.0	0.0011	0.0013	0.0018	●	○	○
P.3.1								
P.3.2								
P.3.3								
P.4.1								
P.4.2								
M.1.1								
M.2.1								
M.3.1								
K.1.1	390	1.0	0.0020	0.0024	0.0033	●	○	○
K.1.2	330	1.0	0.0020	0.0024	0.0033	●	○	○
K.2.1	390	1.0	0.0014	0.0017	0.0023	●	○	○
K.2.2	330	1.0	0.0014	0.0017	0.0023	●	○	○
K.3.1	390	1.0	0.0020	0.0024	0.0033	●	○	○
K.3.2	330	1.0	0.0020	0.0024	0.0033	●	○	○
N.1.1								
N.1.2								
N.2.1								
N.2.2								
N.2.3								
N.3.1								
N.3.2								
N.3.3								
N.4.1								
S.1.1								
S.1.2								
S.2.1								
S.2.2								
S.2.3								
S.3.1								
S.3.2								
S.3.3								
H.1.1								
H.1.2								
H.1.3								
H.1.4								
H.2.1								
H.3.1								
O.1.1								
O.1.2								
O.2.1								
O.2.2								
O.3.1								

Cutting Data – P131/P135 – Chamfer milling cutter

			59 039 ... / 59 040 ... / 59 047 ... / 59 048 ...			● 1st choice		
		Ø DC =	1/4"	3/8"	1/2"	○ suitable		
			a_e 1 x DC	a_e 1 x DC	a_e 1 x DC			
Index	v_c ft/min	$a_{p\,max.}$ x DC	f_z inch	f_z inch	f_z inch	Emulsion	Compressed air	MMS
P.1.1	310	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.2	260	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.3	260	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.4	230	1.0	0.0011	0.0013	0.0018	●	○	○
P.1.5	230	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.1	250	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.2	200	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.3	200	1.0	0.0011	0.0013	0.0018	●	○	○
P.2.4	180	1.0	0.0011	0.0013	0.0018	●	○	○
P.3.1								
P.3.2								
P.3.3								
P.4.1								
P.4.2								
M.1.1								
M.2.1								
M.3.1								
K.1.1	390	1.0	0.0020	0.0024	0.0033	●	○	○
K.1.2	330	1.0	0.0020	0.0024	0.0033	●	○	○
K.2.1	390	1.0	0.0014	0.0017	0.0023	●	○	○
K.2.2	330	1.0	0.0014	0.0017	0.0023	●	○	○
K.3.1	390	1.0	0.0020	0.0024	0.0033	●	○	○
K.3.2	330	1.0	0.0020	0.0024	0.0033	●	○	○
N.1.1								
N.1.2								
N.2.1								
N.2.2								
N.2.3								
N.3.1								
N.3.2								
N.3.3								
N.4.1								
S.1.1								
S.1.2								
S.2.1								
S.2.2								
S.2.3								
S.3.1								
S.3.2								
S.3.3								
H.1.1								
H.1.2								
H.1.3								
H.1.4								
H.2.1								
H.3.1								
O.1.1								
O.1.2								
O.2.1								
O.2.2								
O.3.1								

Technical references

Feedrate Adjustment

If the rpm indicated in the tables cannot be obtained by the machine spindle, the feed rate is to be reduced proportionally to the max rpm.

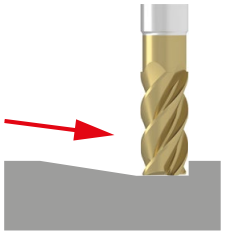
Example:
according to table = n 50000/min. and v_f 40 inch/min.,
maximum machine rpm = 40000/min.

Calculation of feed rate which can be applied:
40000 = 80 % of 50000/min. accordingly 80 % of 40 = 32 inch/min.

Feed rate which can be applied = **32 inch/min.**

Angled ramping with solid carbide cutters

Angled ramping with solid carbide cutters is possible at an angle of 3° to 6° depending on the cutter type.
A protective edge chamfer or corner radius is an advantage.



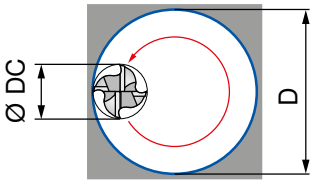
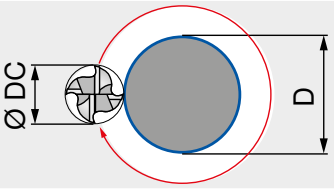
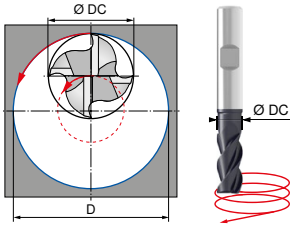
S.F.M./R.P.M. CONVERSION CHART															
	DIAMETER														
S.F.M.	**1/16**	**3/32**	**1/8**	**5/32**	**3/16**	**7/32**	**1/4**	**5/16**	**3/8**	**7/16**	**1/2**	**5/8**	**3/4**	**7/8**	**1**
50	3.050	2.040	1.530	1.220	1.020	875	765	610	510	440	380	310	250	220	190
75	4.580	3.060	2.290	1.830	1.530	1.310	1.150	920	760	660	570	460	380	330	285
100	6.100	4.080	3.050	2.450	2.040	1.750	1.530	1.220	1.020	870	760	610	510	440	385
125	7.630	5.100	3.820	3.050	2.550	2.180	1.920	1.530	1.270	1.100	950	770	630	550	475
150	9.150	6.120	4.570	3.670	3.060	2.620	2.290	1.83	1.530	1.310	1.140	920	760	660	575
175	10.680	7.140	5.350	4.270	3.570	3.060	2.680	2.140	1.780	1.540	1.330	1.080	880	770	665
200	12.200	8.150	6.100	4.900	4.070	3.500	3.100	2.450	2.00	1.750	1.500	1.200	1.000	875	750
300	18.500	12.200	9.200	7.300	6.100	5.250	4.600	3.700	3.100	2.600	2.300	1.800	1.500	1.300	1.100
400	24.500	16.300	12.200	9.800	8.150	7.000	6.100	4.900	4.100	3.500	3.050	2.450	2.050	1.750	1.525
500	30.500	20.400	15.300	12.200	10.200	8.700	7.600	6.100	5.100	4.400	3.800	3.100	2.500	2.200	1.900
750	45.800	36.700	22.900	18.300	15.300	13.100	11.500	9.200	7.600	6.550	5.700	4.600	3.800	3.700	2.850
1.000	–	40.800	30.600	24.500	20.400	17.500	15.300	12.200	103200	8.750	7.650	6.100	5.100	4.400	3.800
1.500	–	–	45.900	36.700	30.600	26.200	22.900	18.300	15.300	13.150	11.300	9.200	7.600	6.500	5.700
2.000	–	–	–	49.000	40.800	35.000	30.600	24.400	20.400	17.500	15.300	12.200	10.200	8.700	7.600
3.000	–	–	–	–	–	52.500	45.900	36.600	30.600	26.250	22.900	18.300	15.300	13.100	11.400
4.000	–	–	–	–	–	–	–	48.800	40.800	35.000	30.600	24.400	20.400	17.500	15.200
5.000	–	–	–	–	–	–	–	–	–	43.700	38.200	30.600	25.500	21.800	19.000

General formula for calculating the cutting parameters

Designation	Abbreviation	Unit	Formula	Example	
Number of revolutions	**n**	**min^{-1}**	$n = \frac{v_c \times 12}{DC \times \pi}$	v_c = 80 ft/min DC = 0.75 inch	$n = \frac{80 \times 12}{0.75 \times \pi}$ = 408 min^{-1}
Cutting speed	**v_c**	**ft/min**	$v_c = \frac{DC \times \pi \times n}{12}$	n = 400 min^{-1} DC = 0.75 inch	$v_c = \frac{0.75 \times \pi \times 400}{12}$ = 78 ft/min
Feed per tooth	**f_z**	**inch**	$f_z = \frac{v_f}{ZEFP \times n}$	v_f = 12.8 inch/min n = 400 min^{-1} ZEFP = 4	$f_z = \frac{12.8}{4 \times 400}$ = 0.008 inch
Feed per revolution	**f**	**inch/rev**	$f = f_z \times ZEFP$	f_z = 0.008 inch ZEFP = 4	f = 0.008 x 4 = 0.032 inch/rev
Feed rate	**v_f**	**inch/min.**	$v_f = f_z \times ZEFP \times n$	f_z = 0.008 ZEFP = 4 n = 400 min^{-1}	v_f = 0.008 x 4 x 400 = 12.8 inch/min
Average chip thickness	**h_m**	**inch**	$h_m = f_z \times \sqrt{\frac{a_e}{DC}}$	f_z = 0.008 inch a_e = 0.012 inch DC = 0.75	$h_m = 0.008 \times \sqrt{\frac{0.012}{0.75}}$ = 0.001 inch

ZEFP = Number of flutes
a_e = cutting width

Calculation of the feed rate on the midpoint path of the milling cutter (v_{fM})

Designation	Abbreviation	Unit	Formula	Example
Internal contour	**v_{fM}**	**inch/min.**	$V_{fM} = \frac{v_f \times (D - DC)}{D}$	
Outside profile	**v_{fM}**	**inch/min.**	$V_{fM} = \frac{v_f \times (D + DC)}{D}$	
Helical ramping	**v_{fM}**	**inch/min.**	$V_{fM} = \frac{n \times f_z \times ZEFP \times (D - D_C)}{D}$	

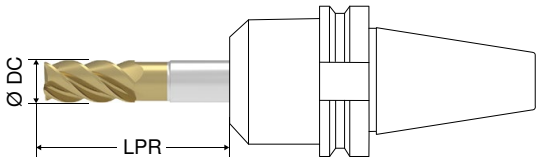
Tips for Tool Selection

Rake and helix angles combined with the coating are decisive factors for the operational area.

Characteristics	Benefits
Helix angle with slow spiral	
▲ For materials with high tensile strength	▲ High edge stability
▲ For high material removal rates	▲ Low tendency to edge chipping
▲ For slot milling, pocket milling, rough milling	
Helix angle with quick spiral	
▲ For soft steels, non ferrous metals, etc.	▲ Soft cut
▲ For low material removal rates	▲ Low cutting forces
▲ Typical for finishing processes	
Small rake angles are applied	
▲ For hard, brittle materials	▲ High edge stability
▲ For high material removal rates	▲ Low tendency to edge chipping
▲ For rough machining	
Large rake angles are applied	
▲ For soft materials	▲ Soft cut
▲ For low material removal rates	▲ Low cutting forces
▲ For finishing	▲ Favorable chip flow
	▲ Low tendency to stick

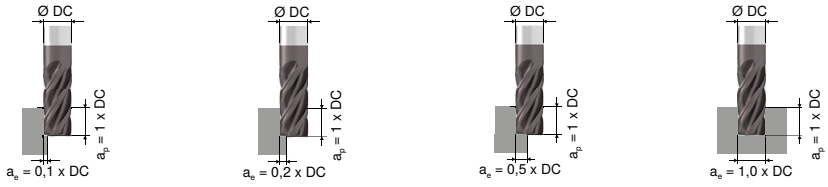
Correction factor for solid carbide milling cutters

Factors for cutting speed (v_c) and feed rate (f_z) in relation to the overhang length (LPR)



Length					
Overhang length (LPR)	1.5 x DC	4 x DC	8 x DC	12 x DC	> 12 x DC
Factor for v_c (Kf v_c)	1.0	1.0	0.9	0.85	0.7
Factor for f_z (Kf f_z)	1.2	1.0	0.8	0.7	0.5

Factors for cutting speed (v_c) and feed rate (f_z) in relation to the cutting depth (a_p) and cutting width (a_e)



Factor for v_c (Kf v_c)	1.3	1.1	1.0	0.85
Factor for f_z (Kf f_z)	1.5	1.3	1.0	0.8

Calculation aid for copy milling

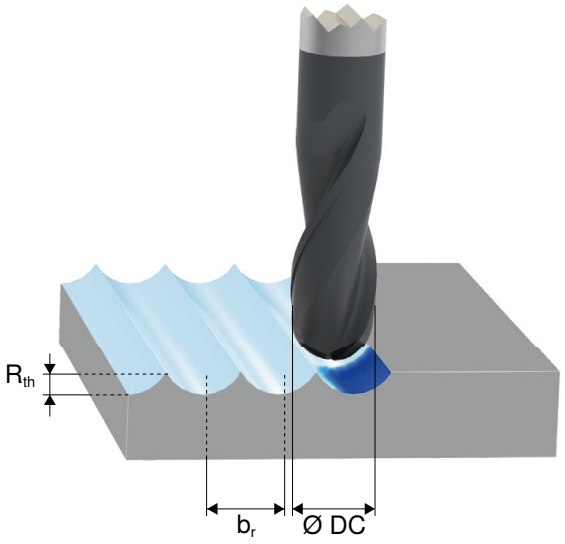
Theoretical surface roughness (R_{th}) and step over (b_r)

$$R_{th} = r - \sqrt{\frac{(r \times 2)^2 - b_r^2}{4}}$$

$$b_r = 2 \times \sqrt{R_{th} \times (r \times 2 - R_{th})}$$

$$R_{th} \simeq R_a / 0.1$$

$$R_a \simeq 0.1 \times R_{th}$$

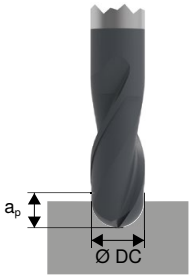
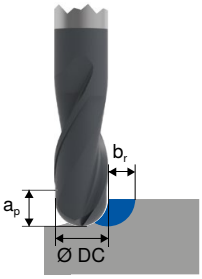
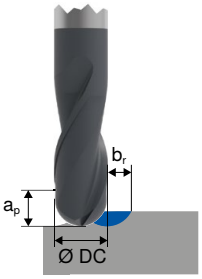


When copy milling, in order to achieve as smooth a surface as possible, the step over b_r should be adapted to the cutter diameter DC.
The smaller the cutter diameter DC is, the smaller the step over b_r must be.

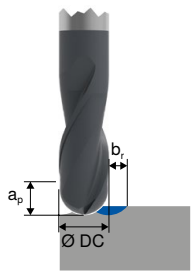
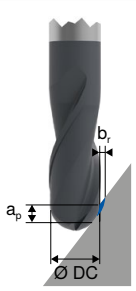
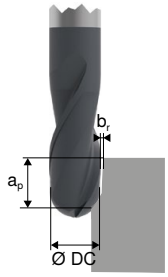
RPM correction factor (Kf n) for copy milling

$$n = \frac{v_c \times 12}{DC \times \pi} \times Kf\ n$$

Rough machining

	Peripheral and ball nose copy milling	Ball nose copy milling	
			
Axial milling depth a_p	0.5 x DC	> 0.5 x DC	0.2 x DC – 0.5 x DC
Step over b_r	1 x DC	0.2 x DC – 0.5 x DC	0.2 x DC – 0.5 x DC
Correction factor (Kf n)	1	1	1.1

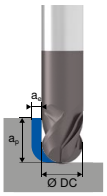
Finish milling

	Ball nose copy milling		
			
Axial milling depth a_p	< 0.2 x DC	0.2 x DC – 0.5 x DC	> 0.5 x DC
Step over b_r	< 0.2 x DC	< 0.2 x DC	< 0.2 x DC
Correction factor (Kf n)	2	1.3	1

Calculation aid for copy milling

For peripheral milling or ball nosed copy milling at cutting depths of $\mathbf{a_p} \geq 0.5 \times DC$ and $\mathbf{a_e}$ = **0.2 to 0.5 x DC** the rpm can be calculated with the following fomula:

$$n = \frac{v_C \times 12}{DC \times \pi}$$



When ball milling the effective milling diameter $\mathbf{d_{eff.}}$ must be determined using the following formula:

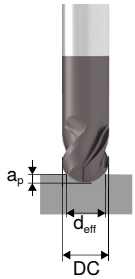
Ball nose milling cutters

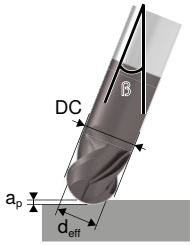
$$d_{eff.} = 2 \times \sqrt{a_p \times (DC - a_p)}$$

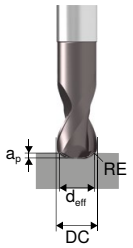
$$d_{eff.} = DC \times \sin\left(\beta \pm \arccos\left(\frac{DC - 2a_p}{DC}\right)\right)$$

Torus end milling cutters

$$d_{eff.} = (DC - 2RE) + 2 \times \sqrt{a_p \times (2RE - a_p)}$$



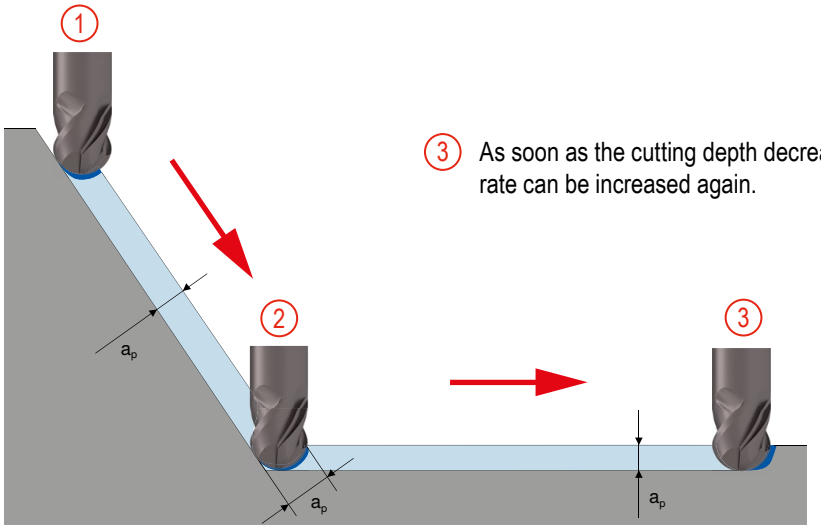




Information concerning plunge and draw milling

1. When machining the profile flanks relatively high feed rates are possible as the cutting depth is relatively low (area highlighted in blue).

2. A large increase in cutting depth occurs when the base of the profile is reached. Here the feed rate must be reduced as othwerwise tool breakage can occur due to vibrations, misalignment or chattering.



3. As soon as the cutting depth decreases during the machining of the profile base, the feed rate can be increased again.

Rule:
The steeper the angle, the lower the feed rate. The shallower the angle, the larger the feed rate.

When plunge or draw milling dies, the feed rate has to be adapted to the various milling positions. Otherwise the cutting edge can be damaged due to overload (vibrations, misalignment or chattering).

Tool types

AL	Aluminium and Non-Ferrous Material
ST	Steel and Steel Alloys
Ti	Titanium and Titanium Alloys
UN	Universal

Coatings

ALTiN	▲ Monolayer coating ▲ HV0.05 = 3500 ▲ Coefficient of friction (against steel) = 0.30 ▲ Maximum application temperature: 1000°C
ZrN	▲ Monolayer coating ▲ HV0.05 = 2500 ▲ Coefficient of friction (against steel) = 0.30 ▲ Maximum application temperature: 650°C
DPAU72S DRAGONSKIN	▲ Monolayer coating ▲ HV0.05 = 3800 ▲ Coefficient of friction (against steel) = 0.35 ▲ Maximum application temperature: 1100°C
DPXU72S DRAGONSKIN	▲ ALCrN/SiN Nano Composite coating ▲ HV0.05 = 3700 ▲ Coefficient of friction (against steel) = 0.30 ▲ Maximum application temperature: 1100°C

THE Cutting Tool Solution

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