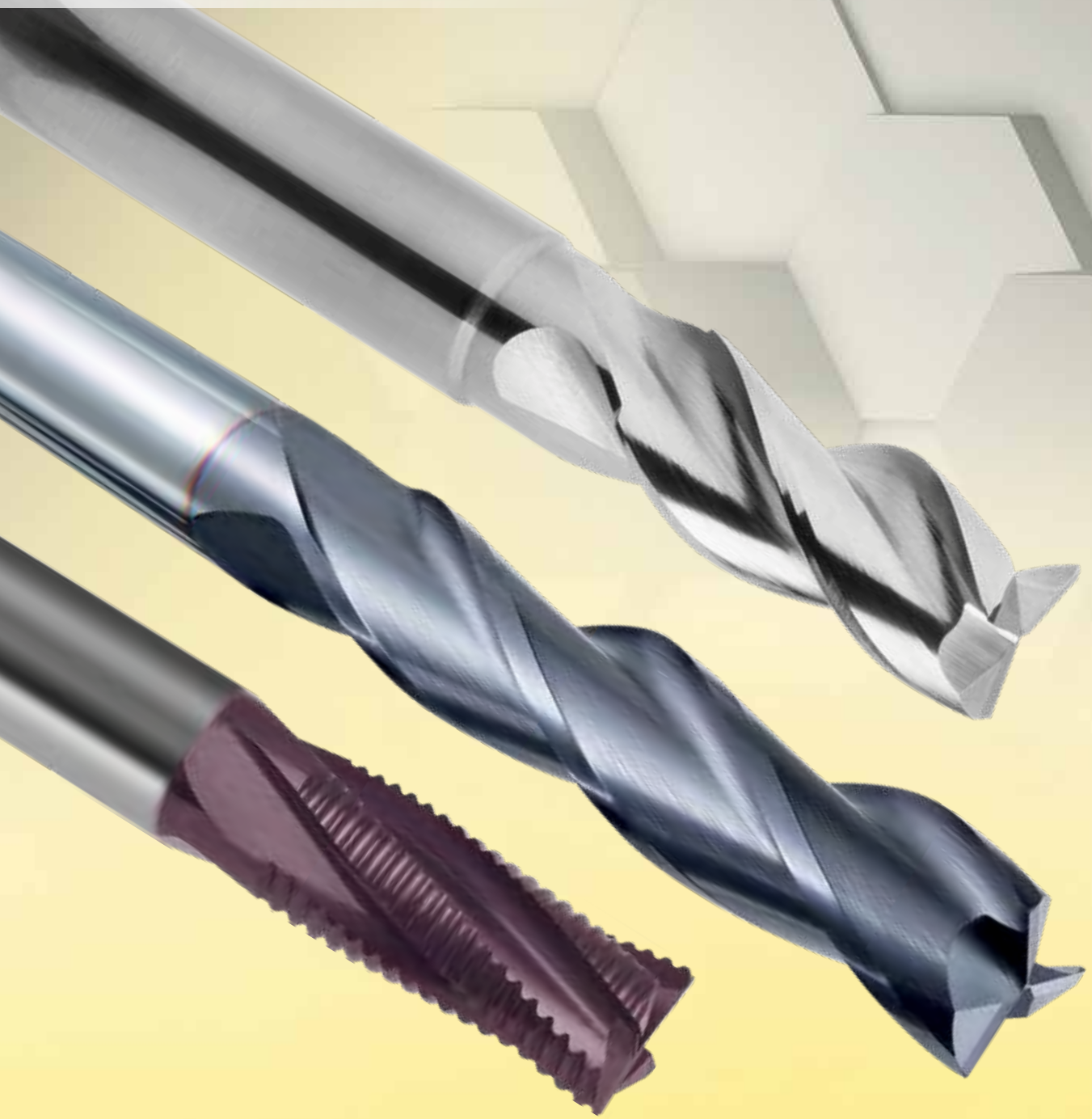
SELECT MILL GUHRING

UNIVERSAL ***MILLING CUTTER PROGRAM***

Unique in
PRICE AND EFFICIENCY



SELECTMILL

With the **SELECTMILL PROGRAM** Guhring introduces a complete range of universal milling cutters for optimal performance at competitive prices

Outstanding in
PRICE AND EFFICIENCY

Unique in *PRICE AND EFFICIENCY*

SELECTMILL cutting geometries are optimized to achieve high metal removal rates and long tool life in universal applications. In addition, nearly all the end mills in the **SELECTMILL PROGRAM** have Guhring's proven FIREX® coating for extended tool life.

Guhring developed geometries for maximum performance

Precision ground on specially developed machinery

The best fine grain carbide substrate, produced by Guhring

A complete all-round PROGRAM suitable for most material types

SELECTMILL

by GUHRING

P	M	K	N	S	H	Tool illustration	No. Flutes	Feed	Shank form	Length	Tool material	Surface	d1/fract. in.	Series no.	Page
HPC end mills															
•	•	•		•	○		4		HA		VHM	F	1/8 - 1”	19959	5
Fine tooth roughing end mills															
•		•			•		3-4		HA		VHM	F	1/4 - 1”	19960	6
3-flute Aluminum end mills															
			•				3		HA		VHM	○	1/8 - 1”	19958	7
2-flute general purpose end mills															
•	•	•	○	•			2		HA		VHM	F	1/16 - 1”	19952	8
•	•	•	○	•			2		HA		VHM	F	1/8 - 1”	19953	9
3-flute general purpose end mills															
•	•	•	○	•			3		HA		VHM	F	1/16 - 1”	19954	10
•	•	•	○	•			3		HA		VHM	F	1/8 - 1”	19955	11
4-flute general purpose end mills															
•	•	•		•	○		4		HA		VHM	F	1/16 - 1”	19956	12
•	•	•		•	○		4		HA		VHM	F	1/8 - 1”	19957	3

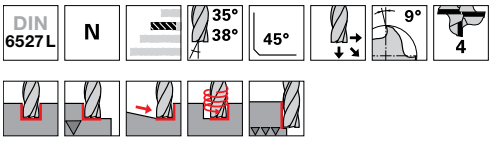
ISO material codes

P	Steel, high-alloyed steel
M	Stainless steel Stainless
K	Grey cast iron, spher, graphite/mall. cast iron
N	Aluminum and other non-ferrous metals
S	Special, super and titanium alloys
H	Hardened steel and chilled cast iron

On the following pages you will find recommendations regarding suitability for the application groups and details of max. tensile strength and hardness:

- ● optimal suitability
- ○ limited suitability

4-flute HPC end mills

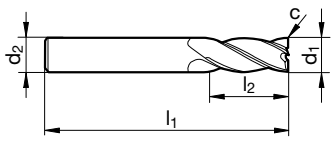


Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	cyl.

P	•
M	•
K	•
N	
S	•
H	○

Cutting data page 16

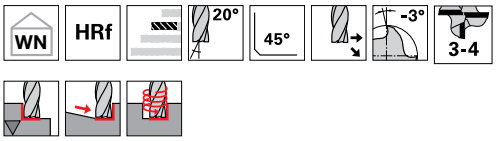
- high-performance with variable helix angle
- center cutting



Series no. **19959**

d1 e8	d2 h6	l1	l2	c	No. of	Code no.	EDP Number
inch	inch	inch	inch	in x 45°	flutes		
1/8	1/8	1 1/2	3/8	0.005	4	3.170	**9199590031700**
3/16	3/16	2	5/8	0.005	4	4.760	**9199590047600**
1/4	1/4	2 1/2	3/4	0.005	4	6.350	**9199590063500**
5/16	5/16	2 1/2	13/16	0.005	4	7.940	**9199590079400**
3/8	3/8	2 1/2	1	0.005	4	9.520	**9199590095200**
7/16	7/16	2 3/4	1	0.01	4	11.110	**9199590111100**
1/2	1/2	3	1	0.01	4	12.700	**9199590127000**
5/8	5/8	3 1/2	1 1/4	0.01	4	15.870	**9199590158700**
3/4	3/4	4	1 1/2	0.01	4	19.050	**9199590190500**
1	1	4	1 1/2	0.01	4	25.400	**9199590254000**

Fine tooth roughing end mills

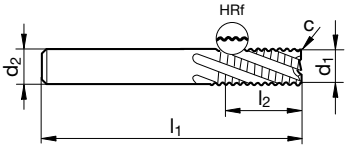


Tool material	**Solid carbide**
Surface	F
Type	HRf
Shank form	cyl.

P	•
M	
K	•
N	
S	
H	•

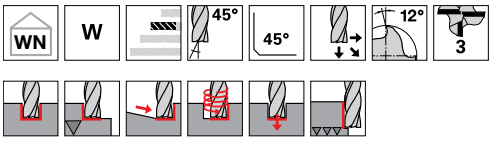
Cutting data page 17

• center cutting



						Series no.	**19960**
d1 e8	d2 h6	l1	l2	c	No. of	Code no.	EDP Number
inch	inch	inch	inch	in x 45°	flutes		
1/4	1/4	2 1/2	3/4	0.005	3	6.350	**9199600063500**
5/16	5/16	2 1/2	13/16	0.005	3	7.940	**9199600079400**
3/8	3/8	2 1/2	1	0.005	4	9.520	**9199600095200**
7/16	7/16	2 3/4	1	0.01	4	11.110	**9199600111100**
1/2	1/2	3	1	0.01	4	12.700	**9199600127000**
5/8	5/8	3 1/2	1 1/4	0.01	4	15.870	**9199600158700**
3/4	3/4	4	1 1/2	0.01	4	19.050	**9199600190500**
1	1	4	1 1/2	0.01	4	25.400	**9199600254000**

3-flute aluminum end mill, standard length

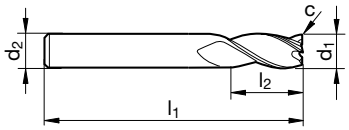


Tool material	**Solid carbide**
Surface	◯
Type	W
Shank form	cyl.

P	
M	
K	
N	•
S	
H	

Cutting data page 18

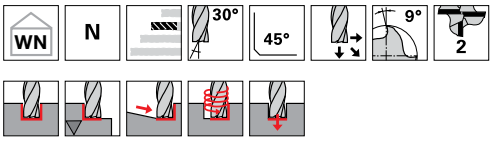
- high-performance slot drill with a quick helix for an especially smooth cutting operation
- center cutting
- with special drill face



Series no. **19958**

d1 e8	d2 h6	l1	l2	c	No. of	Code no.	EDP Number
inch	inch	inch	inch	in x 45°	flutes		
1/8	1/8	1 1/2	3/8	0.005	3	3.170	**9199580031700**
3/16	3/16	2	5/8	0.005	3	4.760	**9199580047600**
1/4	1/4	2 1/2	3/4	0.005	3	6.350	**9199580063500**
5/16	5/16	2 1/2	13/16	0.005	3	7.940	**9199580079400**
3/8	3/8	2 1/2	1	0.005	3	9.520	**9199580095200**
7/16	7/16	2 3/4	1	0.01	3	11.00	**9199580111100**
1/2	1/2	3	1	0.01	3	12.700	**9199580127000**
5/8	5/8	3 1/2	1 1/4	0.01	3	15.870	**9199580158700**
3/4	3/4	4	1 1/2	0.01	3	19.050	**9199580190500**
1	1	4	1 1/2	0.01	3	25.400	**9199580254000**

General purpose 2-flute end mills, standard length

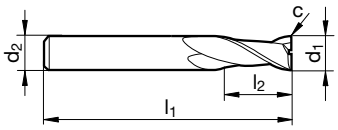


Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	cyl.

P	•
M	•
K	•
N	○
S	•
H	

Cutting data page 19

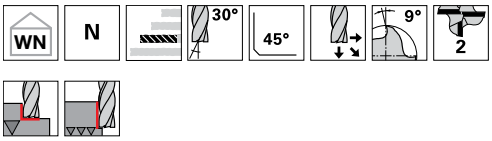
• center cutting
• with special drill face



Series no. **19952**

d1 e8	d2 h6	l1	l2	c	No. of	Code no.	EDP Number
inch	inch	inch	inch	in x 45°	flutes		
1/16	1/8	1 1/2	3/16	0.002	2	1.590	**9199520015900**
1/8	1/8	1 1/2	3/8	0.005	2	3.170	**9199520031700**
3/16	3/16	2	5/8	0.005	2	4.760	**9199520047600**
1/4	1/4	2 1/2	3/4	0.005	2	6.350	**9199520063500**
5/16	5/16	2 1/2	13/16	0.005	2	7.940	**9199520079400**
3/8	3/8	2 1/2	1	0.005	2	9.520	**9199520095200**
7/16	7/16	2 3/4	1	0.01	2	11.110	**9199520111100**
1/2	1/2	3	1	0.01	2	12.700	**9199520127000**
5/8	5/8	3 1/2	1 1/4	0.01	2	15.870	**9199520158700**
3/4	3/4	4	1 1/2	0.01	2	19.050	**9199520190500**
1	1	4	1 1/2	0.01	2	25.400	**9199520254000**

General purpose 2-flute end mills, long length

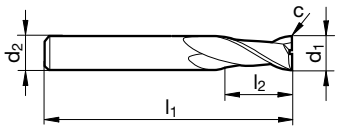


Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	cyl.

P	•
M	•
K	•
N	○
S	•
H	

Cutting data page 19

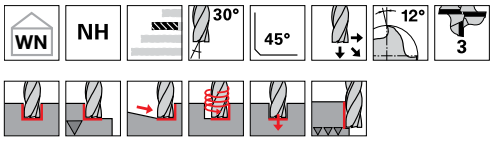
- center cutting
- with special drill face



Series no. **19953**

d1 e8	d2 h6	l1	l2	c	No. of	Code no.	EDP Number
inch	inch	inch	inch	in x 45°	flutes		
1/8	1/8	2 1/4	3/4	0.005	2	3.170	**9199530031700**
3/16	3/16	2 1/2	3/4	0.005	2	4.760	**9199530047600**
1/4	1/4	3	1 1/8	0.005	2	6.350	**9199530063500**
5/16	5/16	3	1 1/8	0.005	2	7.940	**9199530079400**
3/8	3/8	3	1 1/8	0.005	2	9.520	**9199530095200**
7/16	7/16	4	2	0.010	2	11.110	**9199530111100**
1/2	1/2	4	2	0.010	2	12.700	**9199530127000**
5/8	5/8	5	2 1/4	0.010	2	15.870	**9199530158700**
3/4	3/4	5	2 1/4	0.010	2	19.050	**9199530190500**
1	1	5	2 1/4	0.010	2	25.400	**9199530254000**

General purpose 3-flute end mills, standard length

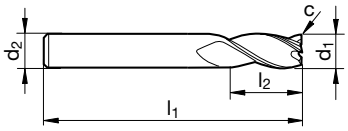


Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	cyl.

P	•
M	•
K	•
N	○
S	•
H	

Cutting data page 19

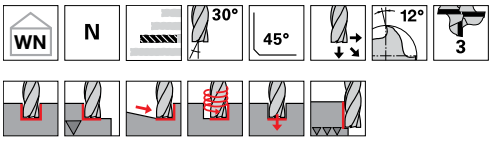
• center cutting
• with special drill face



Series no. **19954**

d1 e8	d2 h6	l1	l2	c	No. of	Code no.	EDP Number
inch	inch	inch	inch	in x 45°	flutes		
1/16	1/8	1 1/2	3/16	0.002	3	1.590	**9199540015900**
1/8	1/8	1 1/2	3/8	0.005	3	3.170	**9199540031700**
3/16	3/16	2	5/8	0.005	3	4.760	**9199540047600**
1/4	1/4	2 1/2	3/4	0.005	3	6.350	**9199540063500**
5/16	5/16	2 1/2	13/16	0.005	3	7.940	**9199540079400**
3/8	3/8	2 1/2	1	0.005	3	9.520	**9199540095200**
7/16	7/16	2 3/4	1	0.010	3	11.110	**9199540111100**
1/2	1/2	3	1	0.010	3	12.700	**9199540127000**
5/8	5/8	3 1/2	1 1/4	0.010	3	15.870	**9199540158700**
3/4	3/4	4	1 1/2	0.010	3	19.050	**9199540190500**
1	1	4	1 1/2	0.010	3	25.400	**9199540254000**

General purpose 3-flute end mills, long length

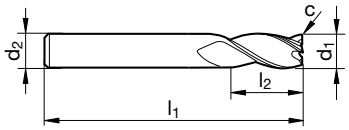


Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	cyl.

P	•
M	•
K	•
N	○
S	•
H	

Cutting data page 19

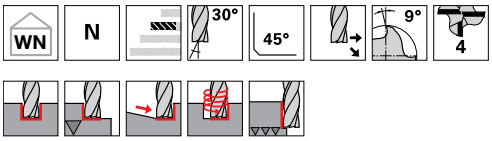
- center cutting
- with special drill face



Series no. **19955**

d1 e8	d2 h6	l1	l2	c	No. of	Code no.	EDP Number
inch	inch	inch	inch	in x 45°	flutes		
1/8	1/8	2 1/4	3/4	0.005	3	3.170	**9199550031700**
3/16	3/16	2 1/2	3/4	0.005	3	4.760	**9199550047600**
1/4	1/4	3	1 1/8	0.005	3	6.350	**9199550063500**
5/16	5/16	3	1 1/8	0.005	3	7.940	**9199550079400**
3/8	3/8	3	1 1/8	0.005	3	9.520	**9199550095200**
7/16	7/16	4	2	0.010	3	11.110	**9199550111100**
1/2	1/2	4	2	0.010	3	12.700	**9199550127000**
5/8	5/8	5	2 1/4	0.010	3	15.870	**9199550158700**
3/4	3/4	5	2 1/4	0.010	3	19.050	**9199550190500**
1	1	5	2 1/4	0.010	3	25.400	**9199550254000**

General purpose 4-flute end mills, standard length

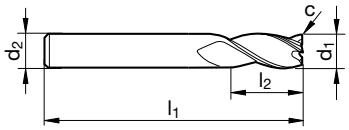


Tool material	**Solid carbide**
Surface	F
Type	N
Shank form	cyl.

P	•
M	•
K	•
N	
S	•
H	○

Cutting data page 19

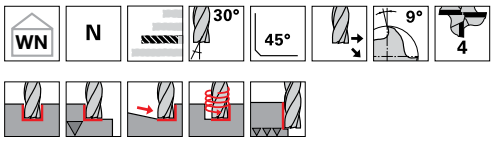
• center cutting
• with special drill face



Series no. **19956**

d1 e8	d2 h6	l1	l2	c	No. of	Code no.	EDP Number
inch	inch	inch	inch	in x 45°	flutes		
1/16	1/8	1 1/2	3/16	0.002	4	1.590	**9199560015900**
1/8	1/8	1 1/2	3/8	0.005	4	3.170	**9199560031700**
3/16	3/16	2	5/8	0.005	4	4.760	**9199560047600**
1/4	1/4	2 1/2	3/4	0.005	4	6.350	**9199560063500**
5/16	5/16	2 1/2	13/16	0.005	4	7.940	**9199560079400**
3/8	3/8	2 1/2	1	0.005	4	9.520	**9199560095200**
7/16	7/16	2 3/4	1	0.010	4	11.110	**9199560111100**
1/2	1/2	3	1	0.010	4	12.700	**9199560127000**
5/8	5/8	3 1/2	1 1/4	0.010	4	15.870	**9199560158700**
3/4	3/4	4	1 1/2	0.010	4	19.050	**9199560190500**
1	1	4	1 1/2	0.010	4	25.400	**9199560254000**

General purpose 4-flute end mills, long length

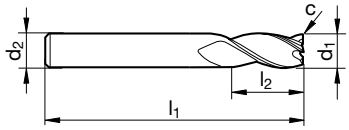


Tool material	Solid carbide
Surface	F
Type	N
Shank form	cyl.

P	•
M	•
K	•
N	
S	•
H	○

Cutting data page 19

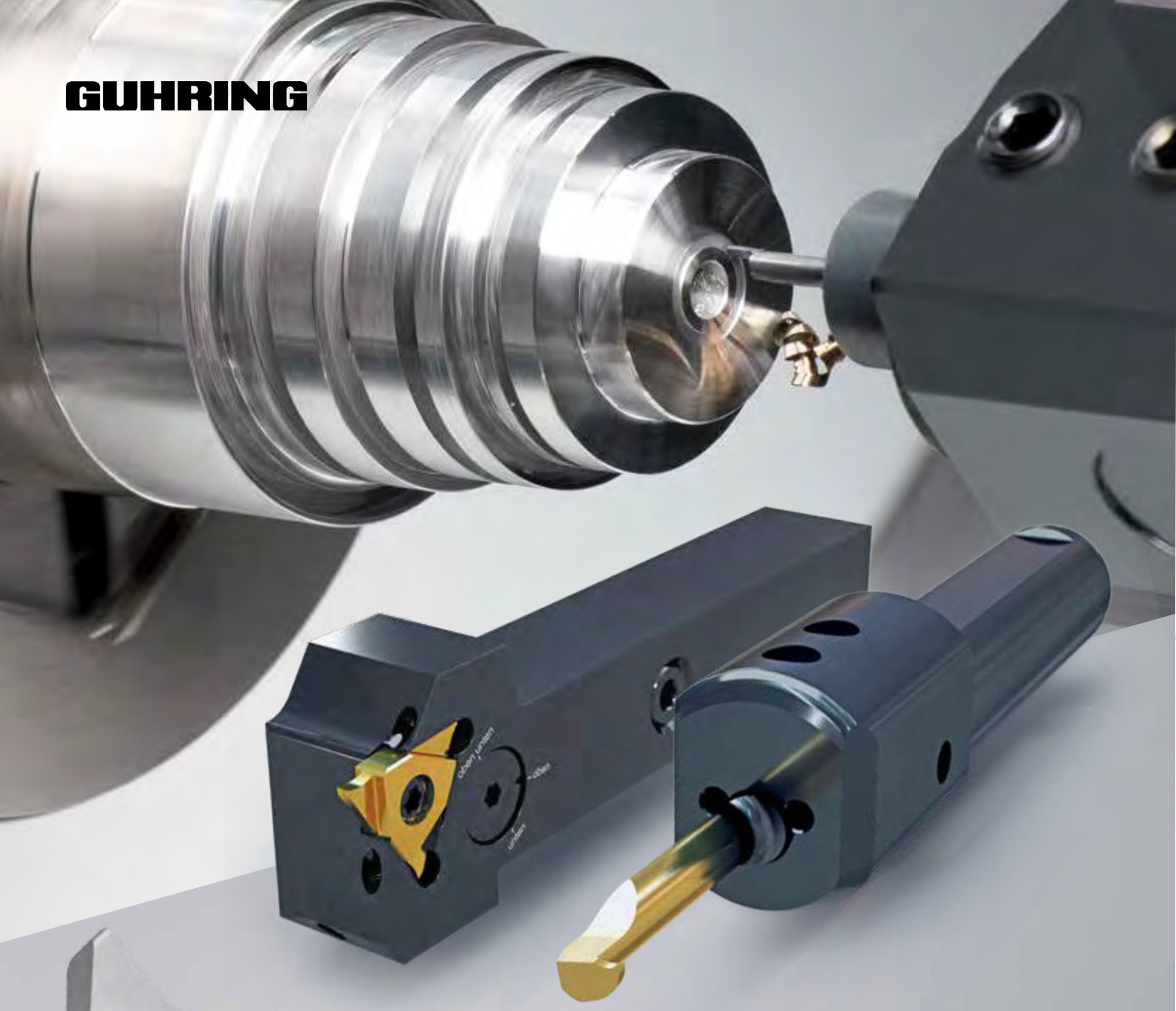
- center cutting
- with special drill face



Series no. **19957**

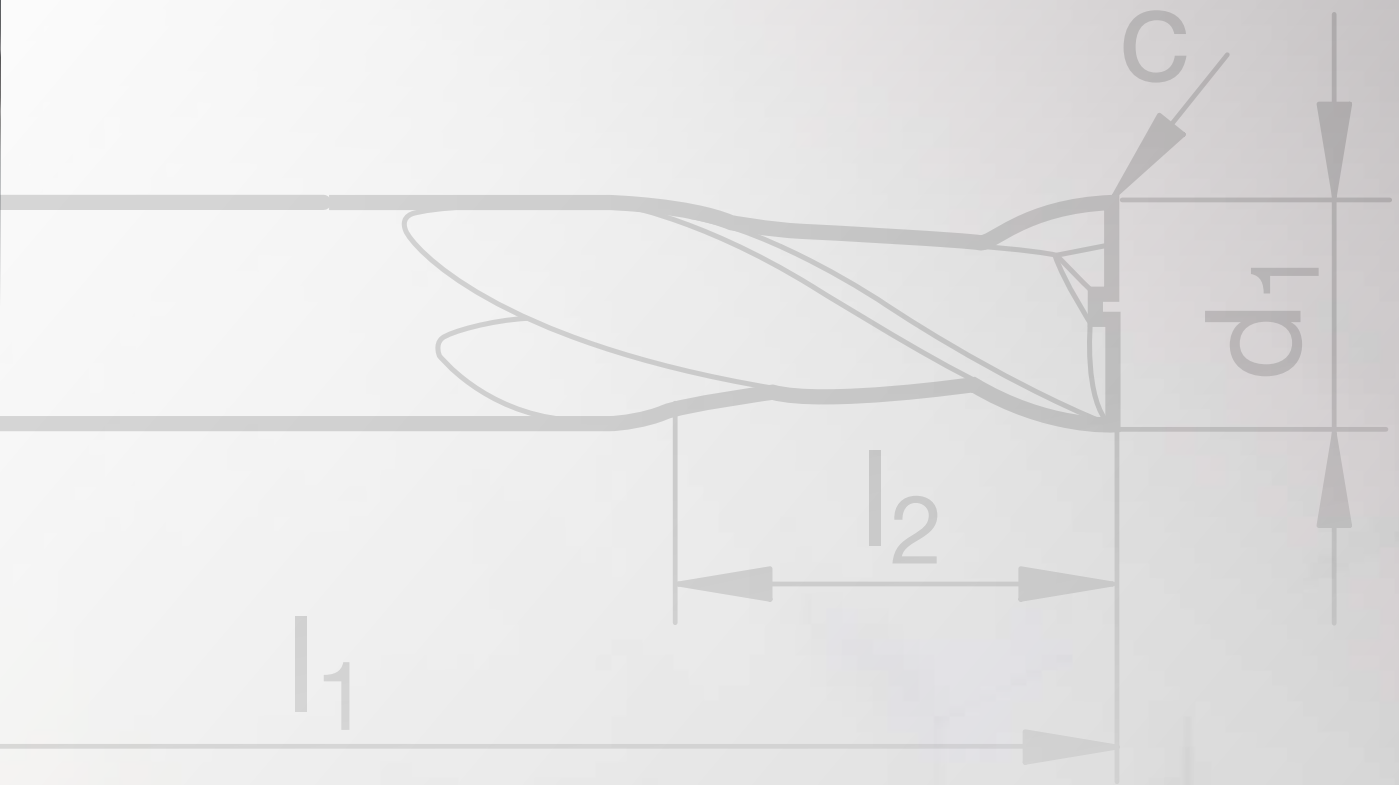
d1 e8 inch	d2 h6 inch	l1 inch	l2 inch	c in x 45°	No. of flutes	Code no.	EDP Number
1/8	1/8	2 1/4	3/4	0.005	4	3.170	**9199570031700**
3/16	3/16	2 1/2	3/4	0.005	4	4.760	**9199570047600**
1/4	1/4	3	1 1/8	0.005	4	6.350	**9199570063500**
5/16	5/16	3	1 1/8	0.005	4	7.940	**9199570079400**
3/8	3/8	3	1 1/8	0.005	4	9.520	**9199570095200**
7/16	7/16	4	2	0.010	4	11.110	**9199570111100**
1/2	1/2	4	2	0.010	4	12.700	**9199570127000**
5/8	5/8	5	2 1/4	0.010	4	15.870	**9199570158700**
3/4	3/4	5	2 1/4	0.010	4	19.050	**9199570190500**
1	1	5	2 1/4	0.010	4	25.400	**9199570254000**

GUHRING



GROOVING SYSTEMS

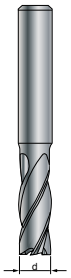
Highest quality and flexibility
thanks to a vast product offering.
All from one supplier.

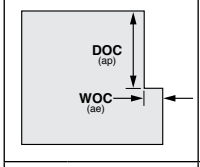


TECHNICAL

Feeds & Speeds for SELECT MILL HPC end mills

****Large cutting depths and/or less than ideal machining conditions will require a reduction in both Surface Feet Per Minute and Inches Per Revolution ****





$$RPM = \frac{SFM}{d_1} \times 3.82$$

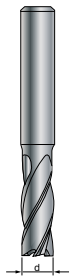
IPM = No. of teeth x IPT x RPM

For finishing use WOC (ae) .01 up to .1xd, use SFM from .25xd column, do not increase IPT from table values

Material	Hardness	Surface feet per minute - SFM					Feed Rate Inch per Tooth - IPT							
		High Speed Milling			Rough	Slot	d1 End Mill Diameter							
		DOC 2xd			DOC 1xd									
		WOC .05xd	WOC .1xd	WOC .25xd	WOC .4 to .9xd	WOC 1xd	1/8 3.17mm	1/4 6.35mm	5/16 7.94mm	3/8 9.52mm	1/2 12.70mm	5/8 15.87mm	3/4 19.05mm	1 25.40mm
		2.5	2.3	1.5	1	1	Multiply IPT x this factor based on WOC							
Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels A283, 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx	up to 28 HRc	1050	950	800	550	500	.0006	.0011	.0014	.0020	.0026	.0034	.0038	.0051
Free-cutting steels, unalloyed case hardened steels, nitriding steels 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx, 11xx	28 to 38 HRc	945	855	720	495	450	.0005	.0010	.0013	.0018	.0024	.0030	.0035	.0048
Alloyed heat-treatable, tool and high speed steels 13xx, 2340, 31xx, 32xx, 33xx, 34xx, 40xx, 41xx, 43xx, 4640, 50xx, 51xx, 61xx, 71xx, 86xx, 87xx, 92xx, 98xx, 98xx, Ax, Ox, Dx, Hxx, Lx, Wx, Mx, Tx	28 to 44 HRc	735	665	560	385	350	.0005	.0009	.0012	.0016	.0021	.0026	.0032	.0044
Hardened Steels Carbon and Alloy Steels, Tool & Die Steels	Up to 54 HRc	420	380	320	220	200	.0004	.0008	.0009	.0013	.0017	.0020	.0026	.0034
	54 to 60 HRc	--	--	--	--	--	--	--	--	--	--	--	--	--
Stainless steel 303, 410, 420F, 430, 430F, 416	--	715	645	545	375	340	.0005	.0009	.0012	.0016	.0021	.0026	.0032	.0044
Stainless steel 304, 304L, 420, 17-4PH, 17-7PH, 15-5PH, 13-8PH	--	440	400	335	230	210	.0004	.0009	.0011	.0014	.0020	.0023	.0029	.0038
Stainless steel 310, 316, 316B, 316L, 317, Duplex	--	370	335	280	195	175	.0004	.0008	.0009	.0013	.0017	.0020	.0026	.0034
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2Sn-4Zr-6Mo, 3Ai-8V-6Cr4Mo-4Zr, 10V-2Fe-3Ai, 13V-11Cr-3Ai	up to 42 HRc	355	320	270	185	170	.0003	.0006	.0008	.0010	.0014	.0017	.0020	.0027
High-Temperature Alloys Inconel, Nimonic, Monel, Hastelloy, Waspalloy, A286, Rene 41, Udimet, Stellite	up to 42 HRc	180	160	135	95	85	.0003	.0005	.0007	.0008	.0011	.0013	.0016	.0020
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	up to 240 HB 30	945	855	720	495	450	.0006	.0012	.0015	.0020	.0028	.0033	.0042	.0054
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	over 240 HB 30	810	730	615	425	385	.0005	.0011	.0014	.0018	.0024	.0030	.0035	.0048
Aluminum, Al-wrought alloys, Al-alloys 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	up to 3% Si	--	--	--	--	--	--	--	--	--	--	--	--	--
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9, 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	over 3% Si	--	--	--	--	--	--	--	--	--	--	--	--	--
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	—	--	--	--	--	--	--	--	--	--	--	--	--	--
Non-ferrous metals (copper, short- or long-chipping brass or bronze)	up to 28 HRc	--	--	--	--	--	--	--	--	--	--	--	--	--

Feeds & Speeds for SELECT MILL Fine tooth roughing end mills

****Large cutting depths and/or less than ideal machining conditions will require a reduction in both Surface Feet Per Minute and Inches Per Revolution ****



$$RPM = \frac{SFM}{d_1} \times 3.82$$

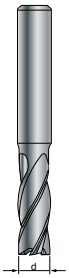
IPM = No. of teeth x IPT x RPM

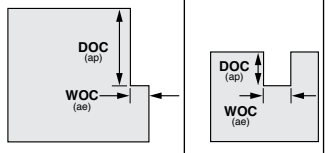
For finishing use WOC (ae) .01 up to .1xd, use SFM from .25xd column, do not increase IPT from table values

Material	Hardness	SFM	Feed Rate Inch per Tooth - IPT d1 End Mill Diameter 1/8 3.17mm	1/4 6.35mm	5/16 7.94mm	3/8 9.52mm	1/2 12.70mm	5/8 15.87mm	3/4 19.05mm	1 25.40mm
Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels A283, 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx	up to 28 HRc	--	--	--	--	--	--	--	--	--
Free-cutting steels, unalloyed case hardened steels, nitriding steels 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx, 11xx	28 to 38 HRc	--	--	--	--	--	--	--	--	--
Alloyed heat-treatable, tool and high speed steels 13xx, 2340, 31xx, 32xx, 33xx, 34xx, 40xx, 41xx, 43xx, 4640, 50xx, 51xx, 61xx, 71xx, 86xx, 87xx, 92xx, 98xx, 98xx, Ax, Ox, Dx, Hxx, Lx, Wx, Mx, Tx	28 to 44 HRc	250	.0003	.0005	.0007	.0009	.0012	.0014	.0020	.0024
Hardened Steels Carbon and Alloy Steels, Tool & Die Steels	Up to 54 HRc	140	.0002	.0004	.0005	.0007	.0009	.0010	.0013	.0017
	54 to 60 HRc	70	.0001	.0003	.0005	.0006	.0008	.0009	.0011	.0014
Stainless steel 303, 410, 420F, 430, 430F, 416	--	--	--	--	--	--	--	--	--	--
Stainless steel 304, 304L, 420, 17-4PH, 17-7PH, 15-5PH, 13-8PH	--	--	--	--	--	--	--	--	--	--
Stainless steel 310, 316, 316B, 316L, 317, Duplex	--	--	--	--	--	--	--	--	--	--
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2Sn-4Zr-6Mo, 3Ai-8V-6Cr4Mo-4Zr, 10V-2Fe-3Ai, 13V-11Cr-3Ai	up to 42 HRc	--	--	--	--	--	--	--	--	--
High-Temperature Alloys Inconel, Nimonic, Monel, Hastelloy, Waspalloy, A286, Rene 41, Udimet, Stellite	up to 42 HRc	--	--	--	--	--	--	--	--	--
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	up to 240 HB 30	280	.0004	.0009	.0011	.0014	.0020	.0023	.0029	.0037
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	over 240 HB 30	250	.0004	.0009	.0010	.0014	.0018	.0023	.0026	.0037
Aluminum, Al-wrought alloys, Al-alloys 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	up to 3% Si	--	--	--	--	--	--	--	--	--
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9, 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	over 3% Si	--	--	--	--	--	--	--	--	--
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	—	--	--	--	--	--	--	--	--	--
Non-ferrous metals (copper, short- or long-chipping brass or bronze)	up to 28 HRc	--	--	--	--	--	--	--	--	--

Feeds & Speeds for SELECT MILL Aluminum end mills

****Large cutting depths and/or less than ideal machining conditions will require a reduction in both Surface Feet Per Minute and Inches Per Revolution ****





$$RPM = \frac{SFM}{d_1} \times 3.82$$

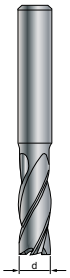
IPM = No. of teeth x IPT x RPM

For finishing use WOC (ae) .01 up to .1xd, use SFM from .25xd column, do not increase IPT from table values

Material	Hardness	Surface feet per minute - SFM					Feed Rate Inch per Tooth - IPT							
		High Speed Milling			Rough	Slot	d1 End Mill Diameter							
		DOC 2xd			DOC 1xd		1/8 3.17mm	1/4 6.35mm	5/16 7.94mm	3/8 9.52mm	1/2 12.70mm	5/8 15.87mm	3/4 19.05mm	1 25.40mm
		WOC .05xd	WOC .1xd	WOC .25xd	WOC .4 to .9xd	WOC 1xd								
		2.5	2.3	1.5	1	1	Multiply IPT x this factor based on WOC							
Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardened Steels	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Stainless steel	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Titanium Alloys	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aluminum, Al-wrought alloys, Al-alloys 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	up to 3% Si	1755	1585	1335	920	835	.0005	.0011	.0014	.0018	.0024	.0030	.0035	.0048
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9, 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	over 3% Si	1050	950	800	550	500	.0005	.0009	.0012	.0016	.0021	.0026	.0032	.0044
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	–	885	810	680	470	425	.0004	.0009	.0011	.0014	.0020	.0023	.0029	.0037
Non-ferrous metals (copper, short- or long-chipping brass or bronze)	up to 28 HRc	1155	1045	880	605	550	.0005	.0009	.0012	.0016	.0021	.0026	.0032	.0044

Feeds & Speeds for SELECT MILL General purpose end mills

****Large cutting depths and/or less than ideal machining conditions will require a reduction in both Surface Feet Per Minute and Inches Per Revolution ****



$$RPM = \frac{SFM}{d_1} \times 3.82$$

IPM = No. of teeth x IPT x RPM

For finishing use WOC (ae) .01 up to .1xd, use SFM from .25xd column, do not increase IPT from table values

Material	Hardness	SFM	Feed Rate Inch per Tooth - IPT d1 End Mill Diameter 1/8 (3.17mm)	1/4 (6.35mm)	5/16 (7.94mm)	3/8 (9.52mm)	1/2 (12.70mm)	5/8 (15.87mm)	3/4 (19.05mm)	1 (25.40mm)
Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels A283, 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx	up to 28 HRc	340	.0004	.0009	.0011	.0014	.0018	.0023	.0026	.0038
Free-cutting steels, unalloyed case hardened steels, nitriding steels 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx, 11xx	28 to 38 HRc	300	.0004	.0009	.0011	.0014	.0018	.0023	.0026	.0038
Alloyed heat-treatable, tool and high speed steels 13xx, 2340, 31xx, 32xx, 33xx, 34xx, 40xx, 41xx, 43xx, 4640, 50xx, 51xx, 61xx, 71xx, 86xx, 87xx, 92xx, 98xx, 98xx, Ax, Ox, Dx, Hxx, Lx, Wx, Mx, Tx	28 to 44 HRc	225	.0004	.0008	.0009	.0013	.0017	.0020	.0026	.0034
Hardened Steels Carbon and Alloy Steels, Tool & Die Steels	Up to 54 HRc	100	.0003	.0004	.0006	.0008	.0010	.0014	.0016	.0020
	54 to 60 HRc	--	--	--	--	--	--	--	--	--
Stainless steel 303, 410, 420F, 430, 430F, 416	--	220	.0003	.0006	.0008	.0009	.0013	.0017	.0020	.0027
Stainless steel 304, 304L, 420, 17-4PH, 17-7PH, 15-5PH, 13-8PH	--	150	.0003	.0005	.0006	.0009	.0011	.0014	.0016	.0024
Stainless steel 310, 316, 316B, 316L, 317, Duplex	--	130	.0002	.0004	.0006	.0008	.0010	.0014	.0016	.0020
Titanium Alloys 6Al-4V, 5Al-2.5 Sn, 6Al-2Sn-4Zr-6Mo, 3Ai-8V-6Cr4Mo-4Zr, 10V-2Fe-3Ai, 13V-11Cr-3Ai	up to 42 HRc	110	.0002	.0003	.0004	.0006	.0008	.0010	.0013	.0017
High-Temperature Alloys Inconel, Nimonic, Monel, Hastelloy, Waspalloy, A286, Rene 41, Udimet, Stellite	up to 42 HRc	70	.0002	.0003	.0004	.0006	.0008	.0010	.0013	.0017
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20), 0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35)	up to 240 HB 30	310	.0004	.0008	.0010	.0013	.0017	.0020	.0026	.0034
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	over 240 HB 30	265	.0003	.0007	.0009	.0010	.0014	.0017	.0022	.0027
Aluminum, Al-wrought alloys, Al-alloys 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	up to 3% Si	835	.0007	.0013	.0017	.0020	.0028	.0033	.0042	.0054
Aluminium-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9, 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	over 3% Si	500	.0006	.0011	.0014	.0018	.0024	.0030	.0035	.0048
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	–	800	.0006	.0011	.0014	.0018	.0024	.0030	.0035	.0048
Non-ferrous metals (copper, short- or long-chipping brass or bronze)	up to 28 HRc	330	.0004	.0009	.0011	.0014	.0020	.0023	.0029	.0041

Guhring's tool dispensing systems TM 326, TM 426 and TM 526 optimize your tool storage and your tool management. Gain increased security of your tool stock and increase the transparency of your tool management!

Tool Management
Powered by
TM GUHRING

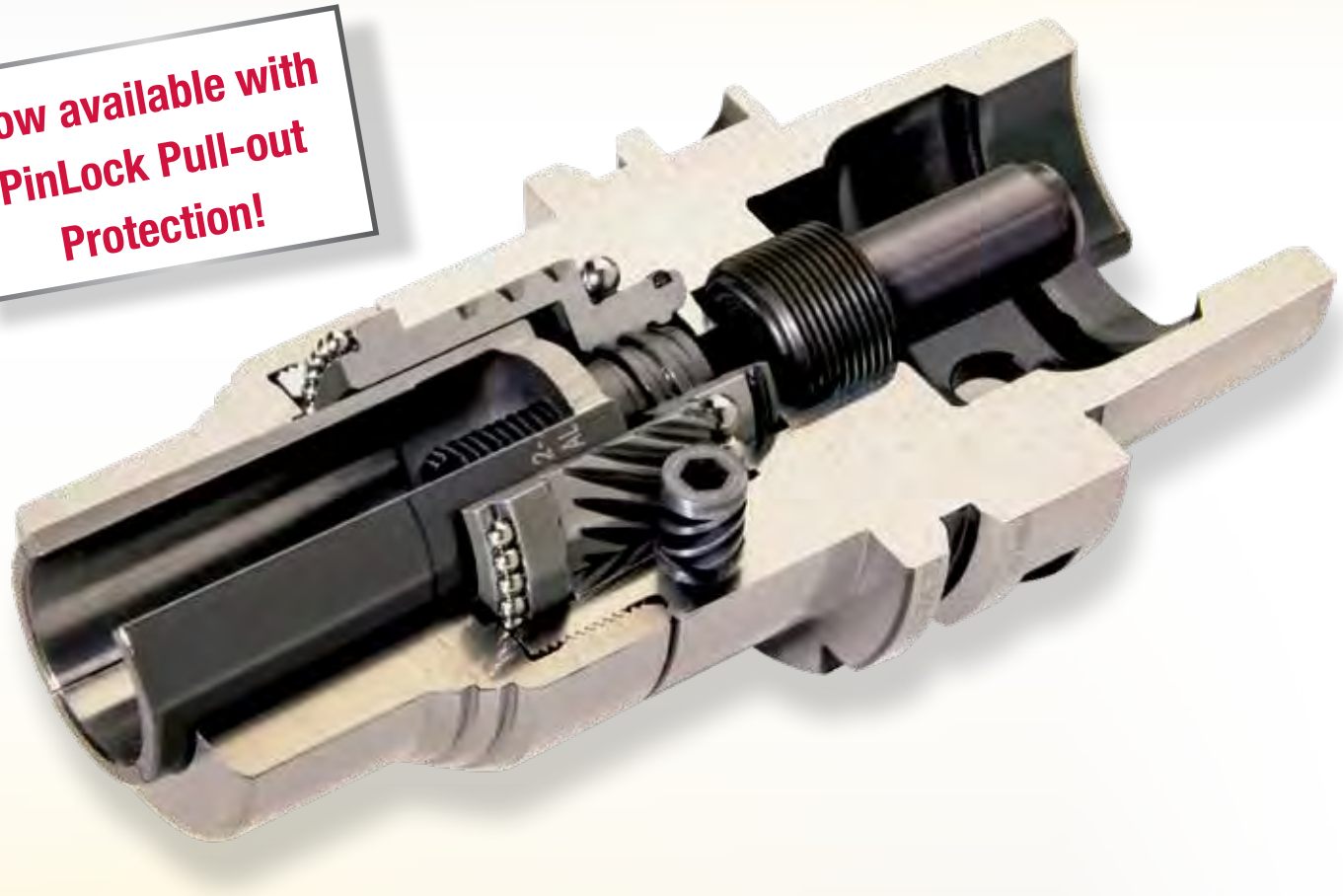

GTMS
Gühring Tool Management Software
GUHRING

Recommended holders for Guhring end mills:

HPC PRECISION CLAMPING CHUCKS

Guhring's precision clamping chucks offer extremely high clamping forces while maintaining extremely tight concentricity tolerances, making it an ideal solution for milling operations, as well as drilling and reaming applications. It excels in both heavy-duty and high-speed machining applications. The special clamping sleeve is clamped via a worm gear, which transfers the optimal clamping force onto the tool shank. This creates clamping forces of > 200 Nm for 12 mm shank diameters and > 300 Nm for 16 mm shank diameters.

Now available with PinLock Pull-out Protection!



This system offers the following advantages:

- Increased cutting depths in comparison to conventional tool holders
- Increased radial engagement and subsequently higher material removal rate
- Maintenance-free technology
- Suitable for use with both round shanks and flatted shanks
- Concentricity 3 µm with 2,5 x D
- Balancing quality: G2.5 / 20.000 rev./min or U< 1.2gmm

ISO materials

P	Steel, high-alloyed steel
M	Stainless steel Stainless
K	Grey cast iron, spher, graphite/mall. cast iron
N	Aluminum and other non-ferrous metals
S	Special, super and titanium alloys
H	Hardened steel and chilled cast iron

Pictograms

Tool material

Solid carbide finest grain (HM-UF)

Shank form

to DIN 6535

Standard

to DIN

to Guhring standard

Type

Application

Slotting | Roughing | Ramping | Helix | Drilling | Finishing | Copying

Length

short (DIN) | long (DIN) | medium | extra length

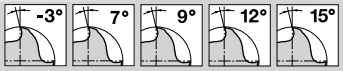
No. of cutting edges

no. of major cutting edges

Helix angle

Size of helix angle / no. of different helix angles

Rake angle



Rake angle of circumference cutting edges

Cutting edge form

Corner chamfer | Radius with tolerance

Feed

for lateral feed

for lateral feed and oblique plunging

for lateral feed, oblique plunging and drilling

Guhring, Inc. Main Office
1445 Commerce Avenue
Brookfield, WI 53045
Tel (262) 784-6730 (800) 776-6170
Fax (262) 784-9096

East Coast Reconditioning Facility
121 W Dudley Town Rd.
Bloomfield, CT 06002

West Coast Distribution Center and Reconditioning Facility
15581 Computer Ln
Huntington Beach, CA 92649

Michigan Manufacturing and Reconditioning Facility
24875 Trans-X Road
Novi, MI 48375

Guhring Corp. (Canada)
20 Steckle Place, Unit #14
Kitchener, ON N2E 2C3
Tel (519) 748-9664 (800) 463-5555
Fax (519) 748-2954

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