Contact your local PTSolutions representatives to order

PTSolutions℠
Division of BTSG

RF100 SHARP

Carbide milling cutter for soft, tough and high-alloy materials.

GUHRING

RF100 SHARP

» **Tough carbide**
prevents tool breakage - even under very unstable conditions

» **AlCrN coating**
provides optimum wear protection at all cutting speeds

» **Optimized facet grinding**
dampens vibrations and increases tool life

» **Corner protection chamfer**
provides more stability and edge strength

One milling cutter, full flexibility for all milling operations

Slotting

Roughing

Finishing

Ramping

Helical interpolation

Our specialist for **soft, tough & high-alloyed materials** with a tensile strength of

43,000 - 130,000 psi

P STEEL

N ALUMINUM

M STAINLESS STEEL

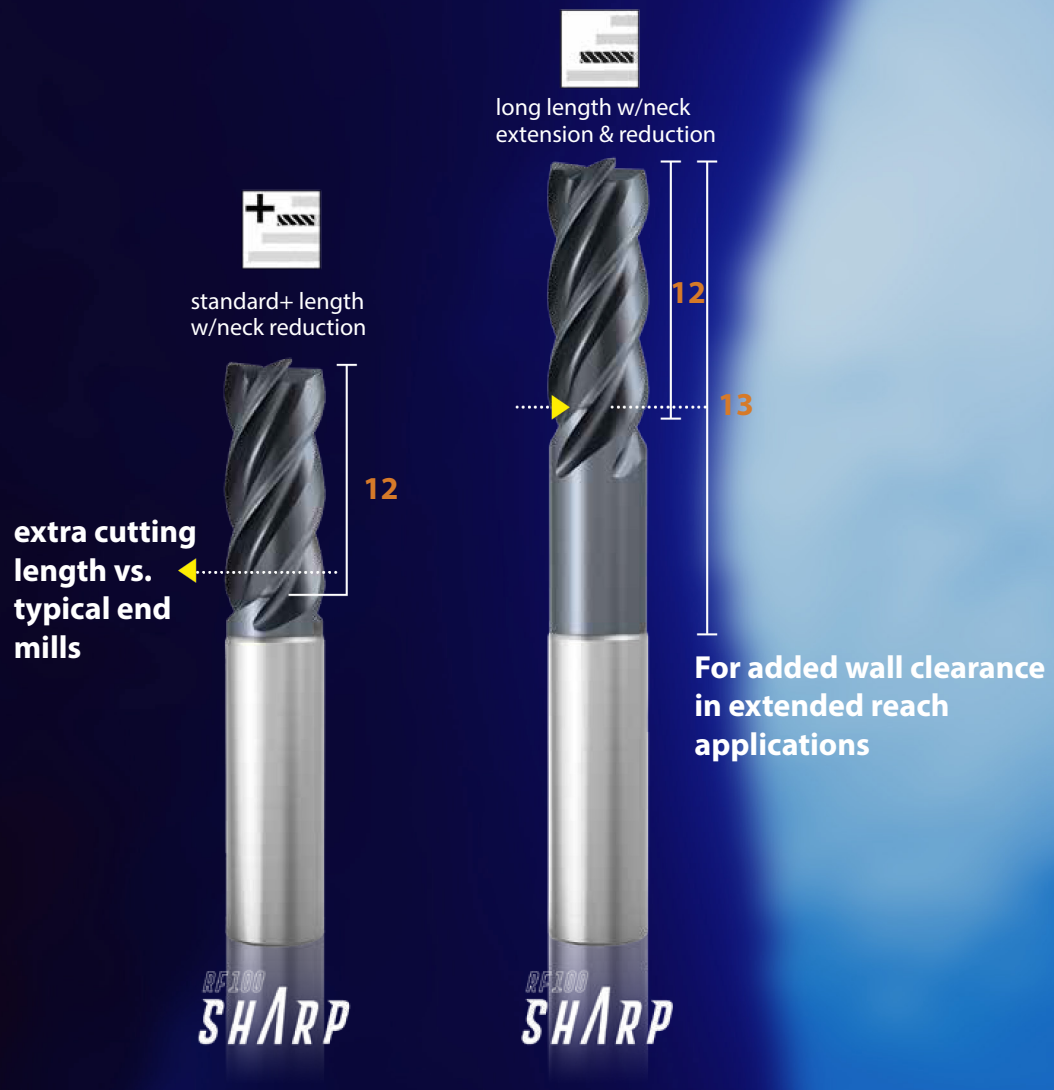
S SPECIAL ALLOYS

With a rake angle of 12°, the RF 100 Sharp carbide end mill cuts easily through all soft, tough and high-alloyed materials.

Tool pressure and cutting forces are significantly reduced, enabling reliable machining of materials with a tensile strength of 43,000 - 130,000 psi and high ductility. These include free machining steels, stainless steels as well as tough special alloys and higher-strength aluminium alloys.

RF100 SHARP

Application-oriented dimensions
extending your productivity



PRODUCT	LENGTH	d1 inch	d2 inch	d3 inch	l1 inch	l2 inch	l3 inch
RF 100 Sharp Series 6484	standard+	1/2″	1/2″	0.480	3-1/2	1-1/4	1.681
RF 100 Sharp Series 6485	long length	1/2″	1/2″	0.480	4	1-1/4	2.181

From unstable to HPC
powerful on all machines

Whether it's a powerful CNC milling machine or a power-limited mill-turn: The RF 100 Sharp is designed to cover all of the different operating conditions – and with outstanding results.

MTC

Effective, quiet milling
on weaker machines & unstable clamping:

Application example MTC

Machine		Spinner TC 600 CNC lathe
Milling cutter		RF 100 Sharp, Series 6478, Ø 10mm, 4-flute
Operating conditions		Mill-Turn Center (MTC)
Milling operation		Hexagonal milling
Tool holder		Live Tool ER 25 collet chuck
Material/component		SAE 5115 shaft
Cutting parameters	SFM	426
	RPM	4133
	IPT	0.0028"
	IPM	46
	ae	0.315"
	ap	0.150"
	Metal removal rate	2.17 in3 / min
	Tool life	78 min

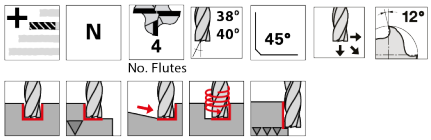
HPC

High-performance milling with extremely high cutting speeds under stable operating conditions:

Application example HPC

Machine		CNC BAZ DMG DMU 100 P
Milling cutter		RF 100 Sharp, Series 6479, Ø 16 mm, 4-flute
Operating conditions		HPC
Milling operation		Contour roughing
Tool holder		HSK 100 A GühroJet Weldon tool holder
Material/component		1045 steel block
Cutting parameters	SFM	590
	RPM	3580
	IPT	0.0039"
	IPM	55
	ae	0.236"
	ap	1.339"
	Metal removal rate	17 in3 / min
	Tool life	134 min

RF 100 Sharp 4-flute end mills - standard+ length, inch

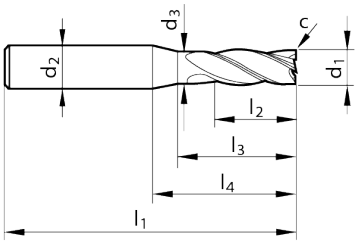


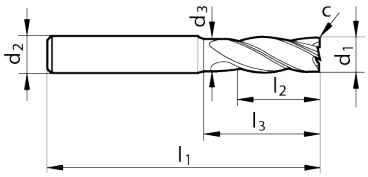
Tool material	Solid carbide
Surface	P
Type	N
Shank form	HA HB

P	•
M	•
K	
N	•
S	•
H	

Cutting data pg. 11

- especially for soft, tough and high-alloyed materials
- neck reduction for clearance
- center cutting

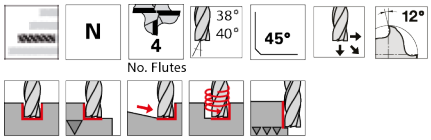




Series no.	6484	6484

d1 h10	d2 h6	d3	l1	l2	l3	l4	c	Code no.	EDP #	
inch	inch	inch	inch	inch	inch	inch	inch x 45°			
1/16	3/16	0.058	2	3/16	0.250	0.551	0.002	1.59	9064840015900	
1/8	3/16	0.117	2	3/8	0.500	0.630	0.005	3.17	9064840031700	
3/16	1/4	0.179	2-1/2	5/8	0.750	1.142	0.005	4.76	9064840047600	
1/4	1/4	0.238	2-1/2	3/4	1.083		0.005	6.35	9064840063500	
5/16	5/16	0.300	2-1/2	13/16	1.043		0.005	7.94	9064840079400	
3/8	3/8	0.355	2-3/4	1	1.293		0.005	9.52	9064840095200	
7/16	7/16	0.417	2-3/4	1	1.246		0.010	11.11	9064840111100	
1/2	1/2	0.480	3-1/2	1-1/4	1.681		0.010	12.70		9064840127000
5/8	5/8	0.605	3-3/4	1-1/2	1.805		0.010	15.87		9064840158700
3/4	3/4	0.730	4	1-5/8	1.929		0.010	19.05		9064840190500
1	1	0.960	4-1/2	2	2.138		0.010	25.40		9064840254000

RF 100 Sharp 4-flute end mills - long length, inch

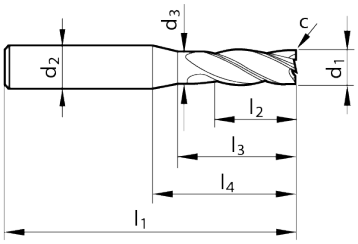


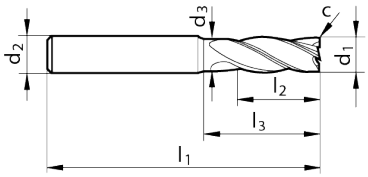
Tool material	Solid carbide
Surface	P
Type	N
Shank form	HA HB

P	•
M	•
K	
N	•
S	•
H	

Cutting data pg. 11

- especially for soft, tough and high-alloyed materials
- neck reduction for clearance
- extended neck length
- center cutting



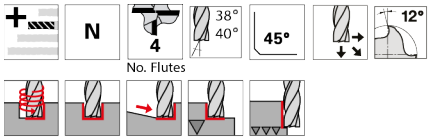


Series no.

d1 h10	d2 h6	d3	l1	l2	l3	l4	c	Code no.
inch	inch	inch	inch	inch	inch	inch	inch x 45°	
1/16	3/16	0.058	2	3/16	0.375	0.551	0.002	1.59
1/8	3/16	0.117	2-1/2	3/8	0.750	0.630	0.005	3.17
3/16	1/4	0.179	2-1/2	5/8	1.250	1.142	0.005	4.76
1/4	1/4	0.238	3	3/4	1.583		0.005	6.35
5/16	5/16	0.300	3-1/4	13/16	1.793		0.005	7.94
3/8	3/8	0.355	3-1/2	1	2.043		0.005	9.52
7/16	7/16	0.417	4	1	2.346		0.010	11.11
1/2	1/2	0.480	4	1-1/4	2.142		0.010	12.70
5/8	5/8	0.605	5	1-1/2	3.016		0.010	15.87
3/4	3/4	0.730	5	1-5/8	2.890		0.010	19.05
1	1	0.960	6	2	3.638		0.010	25.40

Series no.	6484	6484
EDP #		
9064840015900		
9064840031700		
9064840047600		
9064840063500		
9064840079400		
9064840095200		
9064840111100		
	9064840127000	
	9064840158700	
	9064840190500	
	9064840254000	

RF 100 Sharp Inch end mill sets



P	•
M	•
K	
N	•
S	•
H	

Cutting data pg. 11

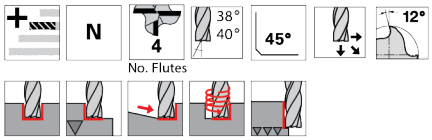
- especially for soft, tough and high-alloyed materials
- neck reduction for clearance
- center cutting
- consisting of Series 6484

Tool material	Solid carbide
Surface	P
Type	N

Series no.	6486

Ø-range	Pieces / Set	Code No.	EDP #
inch			
1/4, 5/16, 3/8, 1/2"	4	1.000	9064860010000

RF 100 Sharp 4-flute end mills - standard+ length, metric

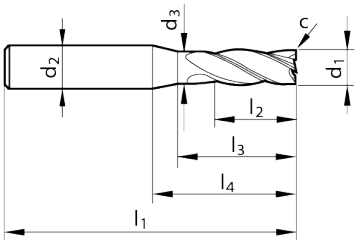


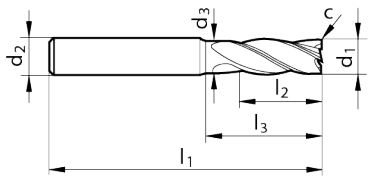
Tool material	Solid carbide
Surface	P
Type	N
Shank form	HA HB

P	•
M	•
K	
N	•
S	•
H	

Cutting data pg. 11

- especially for soft, tough and high-alloyed materials
- neck reduction for clearance
- center cutting



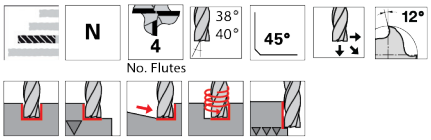


Series no.

d1 h10	d2 h6	d3	l1	l2	l3	l4	c	Code no.
mm	mm	mm	mm	mm	mm	mm	mm x 45°	
1.000	4.000	0.920	50.000	3.000	4.000	10.54	0.020	1.000
1.500	4.000	1.400	50.000	4.500	6.000	11.36	0.030	1.500
2.000	6.000	1.850	50.000	6.000	8.500	16.89	0.040	2.000
2.500	6.000	2.350	50.000	7.500	10.500	17.71	0.050	2.500
3.000	6.000	2.850	57.000	10.000	15.000	18.54	0.060	3.000
4.000	6.000	3.800	57.000	14.000	18.000	21.00	0.080	4.000
5.000	6.000	4.800	57.000	15.000	20.000	21.00	0.100	5.000
6.000	6.000	5.700	57.000	16.000	20.000		0.120	6.000
8.000	8.000	7.700	63.000	21.000	26.000		0.160	8.000
10.000	10.000	9.500	72.000	25.000	31.000		0.200	10.000
12.000	12.000	11.500	83.000	28.000	37.000		0.240	12.000
14.000	14.000	13.500	83.000	28.000	37.000		0.280	14.000
16.000	16.000	15.500	92.000	36.000	43.000		0.320	16.000
20.000	20.000	19.500	104.000	41.000	53.000		0.400	20.000

6478	6479
EDP #	
9064780010000	
9064780015000	
9064780020000	
9064780025000	
9064780030000	
9064780040000	9064790040000
9064780050000	9064790050000
9064780060000	9064790060000
9064780080000	9064790080000
9064780100000	9064790100000
9064780120000	9064790120000
9064780140000	9064790140000
9064780160000	9064790160000
9064780200000	9064790200000

RF 100 Sharp 4-flute end mills - long length, metric



Tool material	Solid carbide
Surface	P
Type	N
Shank form	HA HB

P	•
M	•
K	
N	•
S	•
H	

Cutting data pg. 11

- especially for soft, tough and high-alloyed materials
- neck reduction for clearance
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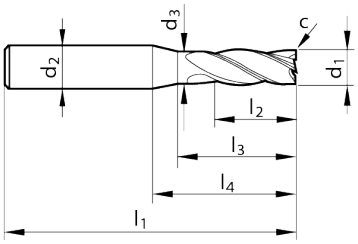
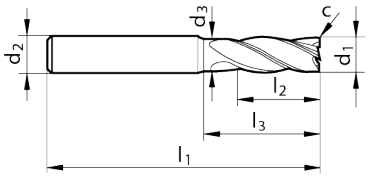




Series no.

d1 h10	d2 h6	d3	l1	l2	l3	l4	c	Code no.
mm	mm	mm	mm	mm	mm	mm	mm x 45°	
1.000	4.000	0.920	50.000	3.000	5.500	12.04	0.020	1.000
1.500	4.000	1.400	50.000	4.500	8.500	13.86	0.030	1.500
2.000	6.000	1.850	57.000	6.000	11.500	20.39	0.040	2.000
2.500	6.000	2.350	57.000	7.500	14.500	22.21	0.050	2.500
3.000	6.000	2.850	65.000	10.000	20.000	24.04	0.060	3.000
4.000	6.000	3.800	65.000	14.000	27.000	29.00	0.080	4.000
5.000	6.000	4.800	65.000	15.000	28.000	29.00	0.100	5.000
6.000	6.000	5.700	75.000	19.000	38.000		0.120	6.000
8.000	8.000	7.700	80.000	21.000	43.000		0.160	8.000
10.000	10.000	9.500	93.000	26.000	52.000		0.200	10.000
12.000	12.000	11.500	100.000	28.000	54.000		0.240	12.000
14.000	14.000	13.500	100.000	28.000	54.000		0.280	14.000
16.000	16.000	15.500	123.000	38.000	74.000		0.320	16.000
20.000	20.000	19.500	126.000	41.000	75.000		0.400	20.000

6480	6481
EDP #	
9064800010000	
9064800015000	
9064800020000	
9064800025000	
9064800030000	
9064800040000	9064810040000
9064800050000	9064810050000
9064800060000	9064810060000
9064800080000	9064810080000
9064800100000	9064810100000
9064800120000	9064810120000
9064800140000	9064810140000
9064800160000	9064810160000
9064800200000	9064810200000

FEEDS & SPEEDS FOR RF 100 SHARP

Milling conditions:

HPC stable machining conditions high drive power

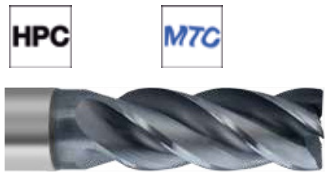
M7C unstable machining conditions low drive power

standard + tools

Correction factors:

a_p roughing > 1,5 x D — SFM -25%I PT -25%

long length tools — SFM -40%I PT -40%



Material	Hard-ness	Application	WOC (a_e) max	SFM	Feed rate IPT (Inch per tooth)									
					1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1"
Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels A283, 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx	Up to 25 HRC	Slotting	1 x D	590	0.0006	0.0007	0.0010	0.0013	0.0016	0.0023	0.0030	0.0039	0.0045	0.0060
		Roughing	0.75 x D	690	0.0007	0.0008	0.0011	0.0015	0.0019	0.0026	0.0035	0.0043	0.0050	0.0066
		Finishing	0.02 x D	1180	0.0007	0.0007	0.0011	0.0014	0.0018	0.0025	0.0033	0.0043	0.0050	0.0066
Free-cutting steels, unalloyed case hardened steels, nitriding steels 1151, 1215, L10, 10Lxx, 11Lxx, 12Lxx, 41Lxx, 51Lxx, 86Lxx, 86Lxx, 10xx, 11xx	25-38 HRC	Slotting	1 x D	525	0.0006	0.0006	0.0009	0.0012	0.0015	0.0021	0.0028	0.0035	0.0041	0.0056
		Roughing	0.75 x D	620	0.0006	0.0007	0.0010	0.0014	0.0017	0.0024	0.0032	0.0039	0.0045	0.0062
		Finishing	0.02 x D	1050	0.0006	0.0007	0.0010	0.0013	0.0016	0.0023	0.0030	0.0039	0.0045	0.0062
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	25-44 HRC	Slotting	1 x D	440	0.0005	0.0006	0.0008	0.0011	0.0014	0.0019	0.0025	0.0031	0.0038	0.0052
		Roughing	0.75 x D	525	0.0006	0.0007	0.0010	0.0013	0.0016	0.0022	0.0029	0.0035	0.0041	0.0057
		Finishing	0.02 x D	880	0.0006	0.0006	0.0009	0.0013	0.0016	0.0021	0.0028	0.0035	0.0041	0.0057
Stainless steel 303, 410, 420F, 430, 430F, 416	Up to 20 HRC	Slotting	1 x D	390	0.0004	0.0006	0.0008	0.0011	0.0014	0.0019	0.0025	0.0031	0.0038	0.0052
		Roughing	0.75 x D	460	0.0005	0.0007	0.0010	0.0013	0.0016	0.0022	0.0029	0.0035	0.0042	0.0057
		Finishing	0.02 x D	780	0.0005	0.0006	0.0009	0.0013	0.0016	0.0021	0.0028	0.0035	0.0042	0.0057
Stainless steel 304, 304L, 420	20-25 HRC	Slotting	1 x D	260	0.0003	0.0005	0.0008	0.0010	0.0013	0.0017	0.0023	0.0027	0.0034	0.0044
		Roughing	0.75 x D	325	0.0004	0.0006	0.0008	0.0012	0.0014	0.0020	0.0026	0.0031	0.0037	0.0048
		Finishing	0.02 x D	525	0.0004	0.0005	0.0008	0.0011	0.0014	0.0019	0.0025	0.0031	0.0037	0.0048
Stainless steel 310, 316, 316B, 316L, 317	Over 25 HRC	Slotting	1 x D	195	0.0003	0.0005	0.0007	0.0009	0.0011	0.0015	0.0020	0.0023	0.0030	0.0040
		Roughing	0.60 x D	260	0.0004	0.0005	0.0008	0.0010	0.0013	0.0018	0.0024	0.0031	0.0033	0.0044
		Finishing	0.01 x D	390	0.0004	0.0005	0.0007	0.0009	0.0011	0.0015	0.0020	0.0023	0.0030	0.0040
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	Up to 40 HRC	Slotting	1 x D	95	0.0003	0.0003	0.0005	0.0007	0.0009	0.0012	0.0016	0.0020	0.0023	0.0032
		Roughing	0.60 x D	130	0.0004	0.0004	0.0006	0.0008	0.0011	0.0014	0.0019	0.0023	0.0025	0.0035
		Finishing	0.01 x D	195	0.0004	0.0003	0.0005	0.0007	0.0009	0.0012	0.0016	0.0020	0.0023	0.0032
Titanium alloys ("Ti") 6Al-4V, 5Al-2.5 Sn, 6Al-2Sn-4Zr-6Mo, 3Ai-8V-6Cr4Mo-4Zr, 10V-2Fe-3Ai, 13V-11Cr-3Ai	Over 40 HRC	Slotting	1 x D	195	0.0003	0.0005	0.0008	0.0010	0.0013	0.0017	0.0023	0.0027	0.0035	0.0045
		Roughing	0.60 x D	260	0.0004	0.0006	0.0009	0.0012	0.0015	0.0020	0.0027	0.0035	0.0044	0.0056
		Finishing	0.02 x D	390	0.0004	0.0005	0.0008	0.0011	0.0014	0.0019	0.0025	0.0031	0.0039	0.0050
Aluminium, Al-wrought alloys, Al-alloys 2024, 6061, 7075, 1050, 6351, 5005, 2017, 7075	≤ 7% Si	Slotting	1 x D	1640	0.0007	0.0008	0.0012	0.0016	0.0020	0.0030	0.0040	0.0051	0.0060	0.0080
		Roughing	0.75 x D	1965	0.0008	0.0009	0.0014	0.0019	0.0023	0.0035	0.0046	0.0059	0.0069	0.0092
		Finishing	0.02 x D	3280	0.0008	0.0009	0.0014	0.0018	0.0022	0.0033	0.0044	0.0055	0.0066	0.0088
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	≥ 7% Si	Slotting	1 x D	750	0.0006	0.0007	0.0010	0.0014	0.0017	0.0023	0.0030	0.0039	0.0045	0.0060
		Roughing	0.75 x D	980	0.0007	0.0008	0.0012	0.0016	0.0020	0.0026	0.0035	0.0043	0.0052	0.0069
		Finishing	0.02 x D	1500	0.0007	0.0008	0.0011	0.0015	0.0019	0.0025	0.0033	0.0043	0.0050	0.0066
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	-	Slotting	1 x D	590	0.0006	0.0006	0.0009	0.0013	0.0016	0.0021	0.0028	0.0035	0.0041	0.0056
		Roughing	0.75 x D	685	0.0006	0.0007	0.0011	0.0015	0.0018	0.0024	0.0032	0.0039	0.0045	0.0062
		Finishing	0.02 x D	1180	0.0006	0.0007	0.0010	0.0014	0.0017	0.0023	0.0030	0.0039	0.0045	0.0062
Non-ferr. met. (copper, short-/long-chipp. brass/bronze)	Up to 25 HRC	Slotting	1 x D	820	0.0006	0.0007	0.0010	0.0014	0.0017	0.0023	0.0030	0.0039	0.0045	0.0060
		Roughing	0.75 x D	950	0.0007	0.0008	0.0012	0.0016	0.0020	0.0026	0.0035	0.0043	0.0050	0.0066
		Finishing	0.02 x D	1640	0.0006	0.0008	0.0011	0.0015	0.0019	0.0025	0.0033	0.0043	0.0050	0.0066

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