

Stable conditions:

- good cooling
- sufficient performance
- short-chipping



Application	v_c factor	f_z factor	Feed width (ae)	Feed depth (ap)
Slotting	1	1 (0.7 for $a_p = 2xd$)	1xd	0.5 up to 1xd
Roughing	1	1 (0.7 for $a_p = 2xd$)	0.4 up to 0.9xd	0.5 up to 1xd
Finishing	1	1	0.01 up to 0.1xd	1 up to 2xd
HPC-roughing	1.3	1.5	0.15 up to 0.4xd	1 up to 2xd
HSC-roughing	1.5	2	0.05 up to 0.15xd	1 up to 2xd

Material	Hardness	Recommended RF 100 type	Type of application	cut V_c	f_z (mm/z) with nom. Ø							
					3	6	8	10	12	16	20	25
Structural + free-cutting steels, unalloyed heat-treatable + case hardened steels 1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937 1.0718 11SMnPb30, 1.0736 11SMn37 1.0402 C22, 1.1178 C30E 1.0503 C45, 1.1191 C30E 1.0301 C10, 1.1121 C10E 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9	up to 850 N/mm ²	F	Slotting	180	0.016	0.031	0.042	0.06	0.072	0.01	0.12	0.15
		F	Roughing	210	0.018	0.036	0.048	0.069	0.083	0.011	0.014	0.017
		SF	Finishing	360	0.017	0.034	0.046	0.066	0.079	0.11	0.13	0.17
Free-cutting steels, unalloyed case hardened steels, nitriding steels 1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20 1.0601 C60, 1.1221 C60E 1.7043 38Cr4 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5 1.8504 34CrAl6 1.8519 31CrMoV9, 1.8550 34CrAlNi7	850-1,200 N/mm ²	F	Slotting	160	0.014	0.029	0.038	0.055	0.066	0.09	0.11	0.14
		F	Roughing	190	0.017	0.033	0.044	0.063	0.076	0.1	0.13	0.16
		SF	Finishing	320	0.016	0.032	0.042	0.061	0.073	0.1	0.12	0.15
Alloyed heat-treatable, tool and high speed steels 1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4 1.5710 36NiCr6, 1.7035 41Cr4, 1.7225 42CrMo4 1.2080 X210Cr12, 1.2083 X42Cr13, 1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2, 1.3344 S 6-5-3 Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4	850-1,400 N/mm ²	U	Slotting	135	0.014	0.027	0.036	0.05	0.06	0.08	0.1	0.13
		U	Roughing	160	0.016	0.031	0.041	0.058	0.069	0.09	0.12	0.14
		SF	Finishing	270	0.015	0.03	0.04	0.055	0.066	0.06	0.11	0.14
Hardened steel Tool steel, heat-treatable steel, spring steel, high-speed steel, case hardened steel, etc. Z.B.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4; 1.2379 X155CrVMo12-1; 1.2080 X210Cr12 1.3343 S 6-5-2	up to 54 HRC	U	Slotting	70	0.011	0.021	0.028	0.04	0.048	0.06	0.08	0.1
		U	Roughing	100	0.014	0.027	0.036	0.052	0.062	0.08	0.1	0.13
		SF	Finishing	140	0.011	0.021	0.028	0.04	0.048	0.06	0.08	0.1
		H	Roughing	80	0.021	0.042	0.056	0.075	0.09	0.12	0.15	0.19
		H	Finishing	100	0.008	0.015	0.02	0.027	0.032	0.04	0.05	0.07
Stainless steel 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 USA = 303, 410, 420F, 430, 430F	up to 750 N/mm ²	VA	Slotting	120	0.014	0.027	0.036	0.05	0.06	0.08	0.1	0.13
		VA	Roughing	140	0.016	0.031	0.041	0.058	0.069	0.09	0.12	0.14
		SF	Finishing	240	0.015	0.03	0.04	0.055	0.066	0.09	0.11	0.14
Stainless steel 1.4301 X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8 USA = 304, 304L, 420	750-850 N/mm ²	VA	Slotting	80	0.012	0.024	0.032	0.045	0.054	0.07	0.09	0.11
		VA	Roughing	100	0.014	0.028	0.037	0.052	0.062	0.08	0.1	0.12
		SF	Finishing	160	0.013	0.026	0.035	0.05	0.059	0.08	0.1	0.12
Stainless steel 1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10 USA = 310, 316, 316B, 316L, 317	above 850 N/mm ²	VA/F	Slotting	60	0.011	0.021	0.028	0.04	0.048	0.06	0.08	0.1
		VA/F	Roughing	80	0.013	0.025	0.034	0.048	0.058	0.08	0.1	0.12
		SF	Finishing	120	0.011	0.021	0.028	0.04	0.048	0.06	0.08	0.1
Special alloys (nickel based "Ni") Nimonic, Inconel, Monel, Hastelloy	up to 1,300 N/mm ²	Ti/U	Slotting	60	0.008	0.017	0.022	0.032	0.038	0.05	0.06	0.08
		Ti/U	Roughing	80	0.01	0.02	0.027	0.038	0.046	0.06	0.08	0.1
		SF	Finishing	120	0.008	0.017	0.022	0.032	0.038	0.05	0.06	0.08
Titanium alloys ("Ti") 3.7024 Ti99.5, 3.7114 TiAl5Sn2.5, 3.7124 TiCu2 3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2.5	up to 1,300 N/mm ²	Ti/U	Slotting	30	0.01	0.015	0.02	0.025	0.03	0.04	0.05	0.06
		Ti/U	Roughing	40	0.01	0.02	0.03	0.035	0.04	0.055	0.065	0.08
		SF	Finishing	60	0.015	0.025	0.035	0.045	0.05	0.065	0.08	0.12
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6010 EN-GJL100 (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	F	Slotting	160	0.017	0.033	0.044	0.065	0.078	0.1	0.13	0.16
		F	Roughing	190	0.019	0.038	0.051	0.075	0.09	0.12	0.15	0.19
		SF	Finishing	320	0.018	0.036	0.048	0.072	0.086	0.11	0.14	0.18
Cast iron, grey cast iron, spheroidal graphite and malleable cast iron 0.6025 EN-GJL250 (GG25), 0.6035 EN-GJL-350 (GG35), 0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70)	above 240 HB 30	U	Slotting	140	0.015	0.03	0.04	0.055	0.066	0.09	0.11	0.14
		U	Roughing	170	0.017	0.035	0.046	0.063	0.076	0.1	0.13	0.16
		SF	Finishing	280	0.017	0.033	0.044	0.061	0.073	0.1	0.12	0.15
Aluminum, Al-wrought alloys, Al-alloys 3.0255 Al99.5, 3.2315 AlMgSi1, 3.3515 AlMg1 3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1.5	up to 3% Si	A	Slotting	500	0.02	0.039	0.052	0.08	0.096	0.13	0.16	0.2
		A	Roughing	600	0.022	0.045	0.06	0.092	0.11	0.15	0.18	0.23
		A	Finishing	1000	0.021	0.043	0.057	0.088	0.106	0.14	0.18	0.22
Aluminum-cast alloys 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 3.2581 G-AlSi12, 3.2583 G-AlSi12Cu, - G-AlSi12CuNiMg	above 3% Si	A	Slotting	230	0.017	0.033	0.044	0.06	0.072	0.1	0.12	0.15
		A	Roughing	280	0.019	0.038	0.051	0.069	0.083	0.11	0.14	0.17
		A	Finishing	350	0.018	0.036	0.048	0.066	0.079	0.11	0.13	0.17
Magnesium-alloys MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	—	A	Slotting	180	0.015	0.03	0.04	0.055	0.066	0.09	0.11	0.14
		A	Roughing	210	0.017	0.035	0.046	0.063	0.076	0.1	0.13	0.16
		A	Finishing	360	0.017	0.033	0.044	0.061	0.073	0.1	0.12	0.15
Non-ferrous metals (copper, short- or long-chipping brass or bronze) 2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb 2.0380 CuZn39Pb2, 2.0401 CuZn39Pb3, 2.0410 CuZn43Pb2 2.0250 CuZn20, 2.0280 CuZn33, 2.0332 CuZn37Pb0.5 2.1090 CuSn7Zn2Pb, 2.1170 CuPb5Sn5, 2.1176 CuPb10Sn 2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10	up to 850 N/mm ²	A	Slotting	250	0.017	0.033	0.044	0.06	0.072	0.1	0.12	0.15
		A	Roughing	290	0.019	0.038	0.051	0.069	0.083	0.11	0.14	0.17
		SF	Finishing	500	0.018	0.036	0.048	0.066	0.079	0.11	0.13	0.17

All recommendations are valid for coated tools. For bright milling cutters please v_c - 40% and f_z - 25%

RF 100 U (3-flute) - Metric - Standard Length

F

center cutting



Standard



No. Flutes



Helix angle



Chamfer



Rake Angle



Slotting



Roughing



Ramping



Helix



Plunging



HA



HB

Tool material

Solid Carbide

Surface finish

FIREX®

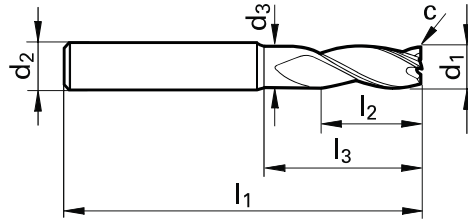
Series

3891

3892

Application group	Material examples	Ideal for
P	Steel	●
M	Stainless steel	○
K	Cast iron	●
N	Aluminum	—
S	Ni / Ti alloys	○
H	Hardened steel	○
●=Optimal ○=Secondary		

Speed and Feed data found on page 302



d1 e8	d2 h6	d3	l1	l2	l3	c	No. of Flutes	Code no.	EDP Number	
mm	mm	mm	mm	mm	mm	mm x 45°				
3.000	6.000	2.800	57.00	8.00	15.00	0.03	3	3.000	9038910030000	9038920030000
3.500	6.000	3.300	57.00	10.00	15.00	0.05	3	3.500	9038910035000	9038920035000
3.700	6.000	3.500	57.00	11.00	15.00	0.06	3	3.700	9038910037000	9038920037000
4.000	6.000	3.800	57.00	11.00	18.00	0.06	3	4.000	9038910040000	9038920040000
4.500	6.000	4.300	57.00	11.00	18.00	0.07	3	4.500	9038910045000	9038920045000
4.700	6.000	4.500	57.00	13.00	18.00	0.07	3	4.700	9038910047000	9038920047000
5.000	6.000	4.800	57.00	13.00	18.00	0.08	3	5.000	9038910050000	9038920050000
5.500	6.000	5.300	57.00	13.00	19.40	0.08	3	5.500	9038910055000	9038920055000
5.700	6.000	5.500	57.00	13.00	20.40	0.09	3	5.700	9038910057000	9038920057000
6.000	6.000	5.700	57.00	13.00	20.00	0.09	3	6.000	9038910060000	9038920060000
6.500	8.000	6.200	63.00	16.00	24.40	0.10	3	6.500	9038910065000	9038920065000
7.000	8.000	6.700	63.00	16.00	24.90	0.11	3	7.000	9038910070000	9038920070000
7.500	8.000	7.200	63.00	19.00	25.30	0.11	3	7.500	9038910075000	9038920075000
8.000	8.000	7.700	63.00	19.00	26.00	0.12	3	8.000	9038910080000	9038920080000
8.500	10.000	8.200	72.00	19.00	29.40	0.13	3	8.500	9038910085000	9038920085000
9.000	10.000	8.700	72.00	19.00	29.90	0.14	3	9.000	9038910090000	9038920090000
9.500	10.000	9.200	72.00	22.00	30.30	0.14	3	9.500	9038910095000	9038920095000
10.000	10.000	9.500	72.00	22.00	30.00	0.15	3	10.000	9038910100000	9038920100000
12.000	12.000	11.500	83.00	26.00	36.00	0.18	3	12.000	9038910120000	9038920120000
16.000	16.000	15.500	92.00	32.00	42.00	0.19	3	16.000	9038910160000	9038920160000
20.000	20.000	19.500	104.00	38.00	52.00	0.24	3	20.000	9038910200000	9038920200000

RF 100 U

High-performance end mills for materials
up to 1600 N/mm² (48 HRC)

P M K N S H

The suitable solution for multiple materials: Steel, cast iron, stainless materials, titanium- and special alloys and aluminum

For extremely high feed rates thanks to especially light cutting operation. Low power consumption allows application on weaker machines. Large selection of lengths, intermediate and undersized dimensions. New end geometry with three faceted center cutting edges for asymmetrical load and symmetrical chips and large chip spaces for outstanding chip evacuation.



Face cutting geometry with reinforced cutting edges and larger chip spaces for drilling and ramping operations.



Micro-corner protection for longer tool life

RF 100 U • Guhring series 3114